MISSISSIPPI DEPARTMENT OF
EMERGENCY MANAGEMENT

2023 | MEMA District 7

HAZARD MITIGATION PLAN

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INTRODUCTION

1.1 BACKGROUND

The MEMA District 7 Region is in the southwestern corner of Mississippi and includes the counties of Adams, Amite, Franklin, Jefferson, Lawrence, Lincoln, Pike, Walthall, and Wilkinson. This area is vulnerable to a wide range of natural hazards such as floods, drought, tornadoes, severe thunderstorms, and wildfires. These hazards threaten the life and safety of residents in the MEMA District 7 Region and have the potential to damage or destroy both public and private property, disrupt the local economy, and impact the overall quality of life of individuals who live, work, and vacation in the MEMA District 7 Region.

While the threat of hazardous events may never be eliminated, there is much that can be done to lessen their potential impact on the built environment. The concept and practice of reducing risks to people and property from known hazards is generally referred to as *hazard mitigation*.

FEMA Definition of Hazard Mitigation:
"Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards."

Hazard mitigation techniques can include both structural measures (strengthening or protecting buildings and infrastructure) and non-structural measures (like the adoption of sound land use policies or the creation of public awareness programs). The most effective mitigation measures are implemented at the local government level, where decisions on the regulation and control of development are ultimately made. A comprehensive mitigation approach addresses hazard vulnerabilities today and in the foreseeable future. Therefore, it is essential that projected patterns of future development are evaluated and considered in terms of how that growth will increase or decrease a community's overall hazard vulnerability.

A key component in the formulation of a comprehensive approach to hazard mitigation is to develop, adopt, and update a local hazard mitigation plan. A hazard mitigation plan establishes the broad community vision and guiding principles for reducing hazard risk, and further proposes specific mitigation actions to eliminate or reduce identified vulnerabilities.

This plan is an update to the Regional Hazard Mitigation Plans (2017) and documents the region's sustained efforts to incorporate hazard mitigation principles and practices into routine government activities and functions. At its core, the Plan recommends specific actions to minimize hazard vulnerability and protect residents from losses to those hazards that pose the greatest risk. These mitigation actions include standard structural solutions like elevation, retrofitting, and acquisition projects as well as assessing local policies on community growth and development, incentives for natural resource protection, public awareness, and outreach activities. The Plan remains a living document, with implementation and evaluation procedures established to help achieve meaningful objectives and successful outcomes over time.

1.1.1 The Disaster Mitigation Act and the Flood Insurance Reform Act

To reduce the Nation's mounting natural disaster losses, the U.S. Congress passed the Disaster Mitigation Act of 2000 (DMA 2000) to amend the Robert T. Stafford Disaster Relief and Emergency

Assistance Act. Section 322 of DMA 2000 requires state, local, and Tribal government entities to develop hazard mitigation plans before applying for federal mitigation grant funds. Funds are made available through the Hazard Mitigation Assistance family of grants, which include disaster-based programs like the Hazard Mitigation Grant Program (HMGP) and non-disaster grants like Building Resilient Infrastructure and Communities (BRIC), both of which are administered by the Federal Emergency Management Agency (FEMA) under the Department of Homeland Security. Communities with an adopted and federally approved hazard mitigation plan thereby become pre- positioned to receive available mitigation funds before and after the next disaster strikes.

Additional legislation like the Flood Insurance Reform Act of 2004 (P.L. 108-264) that spawned the Flood Mitigation Assistance (FMA) program and the Disaster Recovery Reform Act of 2018 (Provisions 1230-1239), that lead to the creation of the Building Resilient Infrastructure and Communities (BRIC) grant program, acknowledge the shared responsibility for disaster response and recovery, aim to reduce the complexity of FEMA, and build the nation's capacity for the next catastrophic event.

The MEMA District 7 Regional Hazard Mitigation Plan has been prepared in coordination with FEMA Region IV and the Mississippi Emergency Management Agency (MEMA) to ensure that the Plan meets all applicable FEMA and state requirements for hazard mitigation plans. A *Local Mitigation Plan Review Tool*, compliant with the new Local Mitigation Planning Policy Guide (FP 206-21-0002) that took effect on April 19, 2023, can be found in Appendix C, and provides a summary of federal and state minimum standards and notes the location where each requirement is met within the Plan.

1.2 PURPOSE

The purpose of the MEMA District 7 Regional Hazard Mitigation Plan is to:

- Complete an update of information in the existing plan to demonstrate progress and reflect current conditions
- Increase public awareness and education about the plan and planning process
- Maintain grant eligibility for participating jurisdictions
- Maintain compliance with state and federal legislative requirements for local hazard mitigation plans

1.3 SCOPE

The focus of the MEMA District 7 Regional Hazard Mitigation Plan is on those hazards determined to be "high" or "moderate" risks to the MEMA District 7 Region, as determined through a detailed hazard risk assessment and input from local officials. Other hazards that pose a "low" or "negligible" risk will also be evaluated, but they may not be fully addressed by mitigation actions or projects. This enables the participating jurisdictions to prioritize mitigation actions based on hazards understood to present the greatest risk to lives and property.

The geographic scope (i.e., the planning area) for the Plan includes 9 counties and 19 incorporated jurisdictions listed in the table below.

TABLE 1.1: PARTICIPATING JURISDICTIONS IN THE MEMA DISTRICT 7 REGIONAL HAZARD MITIGATION PLAN

Participating Jurisdictions	
Adams County	Natchez
Amite County	Gloster Liberty
Franklin County	Bude Meadville Roxie
Jefferson County	Fayette
Lawrence County	Monticello New Hebron Silver Creek
Lincoln County	Brookhaven
Pike County	Magnolia McComb Osyka Summit
Walthall County	Tylertown
Wilkinson County	Centerville Crosby Woodville

1.4 AUTHORITY

The MEMA District 7 Regional Hazard Mitigation Plan has been developed in accordance with current state and federal rules and regulations governing local hazard mitigation plans and has been adopted by each participating county and local jurisdiction in accordance with standard local procedures. Copies of the adoption resolutions for each participating jurisdiction are provided in Appendix A. The Plan shall be routinely monitored and revised to maintain compliance with the following provisions, rules, and legislation:

- Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390)
- FEMA's Final Rule published in the Federal Register, at 44 CFR Part 201 (201.6 for local mitigation planning requirements and 201.7 for Tribal planning requirements)
- Flood Insurance Reform Act of 2004 (P.L. 108-264), Biggert-Waters Flood Insurance Reform Act of 2012 (P.L. 112-141) and the Homeowner Flood Insurance Affordability Act

1.5 SUMMARY OF PLAN CONTENTS

The body of this Plan contains background information relevant to the entire planning area, while information specific to each County has been broken out into individual Annexes.

Section 2, *Planning Process*, provides a narrative description of the process of updating the Plan. This includes the identification of participants on the hazard mitigation council and describes how the public and other stakeholders were involved. It also includes a detailed summary for each of the key meetings

and their outcomes.

The *Community Profile*, Section 3, provides a general overview of the MEMA District 7 Region, including relevant geographic, demographic, and economic characteristics. In addition, building characteristics and land use patterns are discussed where applicable/available. This baseline information provides a snapshot of the planning area and helps local officials recognize those social, environmental, and economic factors that ultimately play a role in determining the region's vulnerability to hazards.

The Risk Assessment is presented in three sections: Section 4, *Hazard Identification*; Section 5, *Hazard Profiles*; and Section 6, *Vulnerability Assessment*. Together, these sections serve to identify, analyze, and summarize hazards that pose a threat to the MEMA District 7 Region. The risk assessment also attempts to define any hazard risks that may uniquely or exclusively affect specific areas of the MEMA District 7 Region.

The Risk Assessment begins by identifying hazards that threaten the MEMA District 7 Region. Next, detailed profiles are established for each hazard, building on available historical data from past hazard occurrences, spatial extent, and probability of future occurrence. This section culminates in a hazard risk ranking based on conclusions regarding the frequency of occurrence, spatial extent, and potential impact highlighted in each of the hazard profiles. In the vulnerability assessment, FEMA's HAZUS®MH loss estimation methodology is used to evaluate known hazard risks by their relative long-term cost in expected damages. In essence, the information generated through the risk assessment serves a critical function as the MEMA District 7 Region seeks to determine the most appropriate mitigation actions to pursue and implement—enabling it to prioritize and focus its efforts on those hazards of greatest concern and those structures or planning areas facing the greatest risk(s).

The *Capability Assessment*, Section 7, provides a comprehensive examination of the MEMA District 7 Region's capacity to implement meaningful mitigation strategies and identifies opportunities to increase and enhance that capacity. Specific capabilities addressed in this section include planning and regulatory capability, staff and organizational (administrative) capability, technical capability, fiscal capability, and political capability. Information was obtained using a detailed survey questionnaire and an inventory and analysis of existing plans, ordinances, and relevant documents. The purpose of this assessment is to identify any existing gaps, weaknesses, or conflicts in programs or activities that may hinder mitigation efforts and to identify activities that should be built upon in establishing a successful and sustainable local hazard mitigation program.

The *Mitigation Strategy*, Section 8, consists of broad goals and an analysis of hazard mitigation techniques to reduce hazard vulnerabilities. The *Community Profile*, *Risk Assessment*, and *Capability Assessment* collectively serve as a basis for determining the goals for the MEMA District 7 Regional Hazard Mitigation Plan, each contributing to the development, adoption, and implementation of a meaningful and actionable Mitigation Strategy.

The strategy provides the foundation for a detailed *Mitigation Action Plan*, found in Section 9, which links specific mitigation actions for each county and municipal department or agency to locally assigned implementation mechanisms and target completion dates. Together, these sections are designed to make the Plan both strategic, through the identification of long-term goals, and functional, through the identification of immediate and short-term actions that will guide day-to-day decision-making and project implementation.

In addition to the identification and prioritization of mitigation projects, emphasis is placed on the use of program and policy alternatives to help make the MEMA District 7 Region less vulnerable to the damaging forces of hazards while improving the economic, social, and environmental health of the community. The concept of multi-objective planning was emphasized throughout the planning process,

particularly in identifying ways to link, where possible, hazard mitigation policies and programs with complimentary community goals related to disaster recovery, housing, economic development, recreational opportunities, transportation improvements, environmental quality, land development, and public health and safety.

Plan Maintenance, Section 10, includes the measures that the jurisdictions participating in the MEMA District 7 Regional plan will take to ensure the Plan's continuous long-term implementation. The procedures include how the Plan will be regularly evaluated and updated to remain a current and actionable planning document.

County-specific *Annexes* have been created for each of the counties participating in this plan. Each Annex contains information relevant to the county and the participating municipal jurisdictions in the county. Information included in each county-level Annex includes Community Profile, Risk Assessment and Capability Assessment information. The Mitigation Actions identified for that county and its municipal jurisdictions are also included in the county's Annex. This allows each county and jurisdiction to quickly locate the information contained in the plan that is most relevant for them.

PLANNING PROCESS

This section describes the planning process undertaken by the Mississippi Emergency Management Agency (MEMA) District 7 counties and jurisdictions in the development of its 2023 Regional Hazard Mitigation Plan. There are eight subsections:

- 2.1 Overview of Hazard Mitigation Planning in the MEMA District 7 Region
- 2.3 Preparing the 2023 Plan
- 2.4 The MEMA District 7 Regional Hazard Mitigation Council
- 2.5 Community Meetings and Workshops
- 2.6 Involving the Public
- 2.7 Involving the Stakeholders
- 2.8 Documentation of Plan Progress

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44 CFR Requirement
44 CFR Part 201.6(c)(1): The plan shall include documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the process and how the public was involved.

2.1 OVERVIEW OF HAZARD MITIGATION PLANNING IN MEMA DISTRICT 7 REGION

Local hazard mitigation planning is the process of identifying community resources, assessing hazard risks, and determining how to best minimize or manage those risks. This process culminates in a hazard mitigation plan that identifies specific mitigation actions, each designed to achieve both short-term planning objectives and a long-term community vision.

To ensure the functionality of a hazard mitigation plan, responsibility is assigned for each proposed mitigation action to a specific individual, department, or agency along with a schedule or target completion date for its implementation (see Section 10: *Plan Maintenance*). Plan maintenance procedures are established for the routine monitoring of implementation progress, as well as the evaluation and enhancement of the mitigation plan itself. These plan maintenance procedures ensure that the Plan remains a current, dynamic, and effective planning document over time that becomes integrated into the routine local decision-making process.

Communities that participate in hazard mitigation planning engage with the objective to:

- Save lives.
- Prevent property damage.
- Save money.
- Enhance resiliency and speed recovery post-disaster.

- Reduce future vulnerability through informed development.
- Expedite the receipt of grant funding.
- Demonstrate a firm commitment to improving community health and safety.

Communities that participate in mitigation planning have the potential to produce long-term and benefits by breaking the repetitive cycle of disaster loss. Hazard mitigation investments made before a disaster will significantly reduce disaster costs by lessening the need for emergency response, repair, recovery, and reconstruction. Furthermore, resilient practices enable residents, businesses, and industries to re-establish community economy in the wake of a disaster, getting the back on track sooner and with less interruption.

The benefits of mitigation planning go beyond solely reducing hazard vulnerability. Mitigation measures like acquisition and the regulation of land in hazard areas can help achieve community goals like preserving open space, maintaining environmental health, and enhancing recreational opportunities. It is vitally important that any local mitigation planning process be integrated with other concurrent local planning efforts, and any proposed mitigation strategies must take into account other existing community goals or initiatives that will help complement or hinder their future implementation.

Each of the jurisdictions participating have previously adopted hazard mitigation plans and participated in the MEMA District 7 Regional Hazard Mitigation Plan in 2017.

2.2 PREPARING THE 2023 PLAN UPDATE

Local hazard mitigation plans must be updated every five years to remain eligible for federal mitigation funding. To simplify planning efforts for the jurisdictions, MEMA officials worked with each county within the District 7 Region to collaboratively create the MEMA District 7 Regional Hazard Mitigation Plan. This allows resources to be shared amongst the participating jurisdictions and eases the administrative duties of all of the participants by combining the nine counties into one regional plan.

MEMA hired Witt O'Brien's to provide professional mitigation planning services. Chelsea Morganti, CFM served as the lead planner for this project. Per the contractual scope of work, the Witt O'Brien's consulting team followed the mitigation planning process outlined in recommended by FEMA in the Local Mitigation Planning Policy Guide (FP 206-21-0002) Released on April 19, 2022, Effective April 19, 2023 (OMB Collection #1660-0062). The Local Mitigation Plan Review Tool, found in Appendix C, provides a summary of how the plan meets FEMA's current minimum standards of acceptability for compliance with DMA 2000 and notes the location where each requirement is met within this Plan. These standards are based upon FEMA's Final Rule as published in the Federal Register in Part 201 of the Code of Federal Regulations (CFR).

Although each jurisdiction has participated in past regional hazard mitigation plan updates, the conversion to the new guidance included a few new elements noted in each of the relevant sections of this plan. Key elements included the incorporation of climate change resiliency, expansion of the identified actions, and incorporation of each of the 5 sectors for stakeholder inclusion (Element A2.A) It was also necessary to re-assess goals as they relate to the State Hazard Mitigation Plan and align the Actions with SHMP Objectives.

The process used to prepare this Plan included five major steps, completed over the course of approximately nine months, starting in August 2022. Each of the planning steps illustrated in the figure below, resulted in critical work products and outcomes that collectively make up the Plan.

FIGURE 2.1: MITIGATION PLANNING PROCESS FOR THE MEMA DISTRICT 7 REGION

2.3 THE MEMA DISTRICT 7 REGIONAL HAZARD MITIGATION COUNCIL

Representatives from each of the counties within MEMA District 7 (Adams, Amite, Franklin, Jefferson, Lawrence, Lincoln, Pike, Walthall, and Wilkinson), the participating municipal jurisdictions, and MEMA, made up the Regional Hazard Mitigation Council (RHMC). The RHMC members then disseminated information through their various county departments and municipalities, and with other key stakeholders identified to serve as critical partners in the planning process.

Beginning in October 2022, the RHMC members engaged in local planning workshops to discuss and complete tasks associated with preparing the Plan. This working group coordinated on all aspects of plan preparation and provided valuable input to the process. Committee members were kept informed through an e-mail distribution list and surveys.

Tasks assigned to the RHMC members included:

- Participate in RHMC meetings and workshops.
- Provide best available data for the Risk Assessment
- Review the local Capability Assessment information and provide copies of any mitigation or hazard-related documents for review and incorporation.
- Review the Mitigation Strategy, including alignment with the State Hazard Mitigation Plan Goals and Objectives.
- Discuss, propose, and select appropriate mitigation actions for incorporation into the Mitigation Action Plan.
- Review and provide timely comments on all findings and draft plan deliverables.
- Support the adoption of the 2023 MEMA District 7 Hazard Mitigation Plan.

The members of the RHMC responsible for participating in the development of the Plan are listed below, alphabetically by county name.

TABLE 2.1: MEMA DISTRICT 7 REGIONAL HAZARD MITIGATION COUNCIL MEMBERS

County/City/Town	Name	Position
Adams County	Robert Bradford	Emergency Management Director
Natchez		
Amite County	Grant McCurley	Emergency Management Director
Gloster		
Liberty		
Crosby	William Hall	Mayor
Franklin County	Mark Thornton	Emergency Management Director
Bude		
Roxie		
Meadville	Josh Scott	Alderman
Jefferson County	Brenda Hammitte	Emergency Management Director
Fayette	Londell Eanochs	Mayor
Lawrence County	Tony Norwood	Emergency Management Director
Monticello		
New Hebron		
Silver Creek		
Lincoln County	Chris Reid	Emergency Management Director
Brookhaven		
Pike County	Richard Coghlan	Emergency Management Director
Magnolia	Tammy Witherspoon	Mayor
McComb	David Myers	City Administrator
Osyka	Allen Applewhite	Mayor
Summit	Percy Robinson	Mayor
	Stan McMorris	Fire Chief
Walthall County	Royce McKee	Emergency Management Director
Tylertown		
Wilkinson County	Mattie L. Powell	Emergency Management Director
Centreville	Pamela White	Alderwoman
Woodville	Andrew Pierson	Mayor
MEMA	Calvin Williams	Emergency Management Officer, Mitigation Plans
	Frank Hill	Bureau Director, Mitigation Plans
	Kandice McNamee	Mitigation Planning
	John Michael Sledge	Area Coordinator
	Tim Gordy	Area Coordinator

This authorized representation is documented in signed letters that were provided to MEMA from each of these municipalities that designated these persons as their representatives. Copies of these letters can be obtained by contacting MEMA. Moreover, it is important to note that each of the municipalities participated in the planning process through county-level meetings and calls with their respective county's emergency management agency director, who discussed the risk assessment with them and helped them update their mitigation actions accordingly.

2.3.1 Multi-Jurisdictional Participation

The MEMA District 7 Hazard Mitigation Plan includes nine counties and nineteen incorporated municipalities. To satisfy multi-jurisdictional participation requirements, each county and its participating jurisdictions were required to perform the following tasks:

- Participate in mitigation planning workshops or designate a representative to do so
- Identify completed/new mitigation projects, if applicable
- Develop and adopt (or update) their local Mitigation Action Plan

Each jurisdiction participated in the planning process and has developed a local Mitigation Action Plan unique to their jurisdiction. Each jurisdiction will adopt their Mitigation Action Plan separately. This provides the means for jurisdictions to monitor and update their Plan on a regular basis.

2.4 COMMUNITY MEETINGS AND WORKSHOPS

The preparation of this Plan required a series of meetings and workshops for facilitating discussion, gaining consensus and initiating data collection efforts with local government staff, community officials, and other identified stakeholders. More importantly, the meetings and workshops prompted input and feedback from relevant participants throughout the drafting stages of the Plan. Due to changes in work process established by the pandemic, it was decided that increased participation would be possible if all meetings and events were held virtually. In many cases, additional discussions and meetings were held by local staff to accomplish planning tasks specific to their department or agency, such as the approval of specific mitigation actions for their department or agency to undertake and include in the Mitigation Action Plan.

Kickoff Meeting - October 7, 2022

An email was distributed which invited representatives from the participating counties and municipalities to the meeting. The regional participants are collectively known as the Regional Hazard Mitigation Council ("RHMC" or "Council").

Witt O'Brien's led the kickoff meeting. The intent of this meeting was to describe the mitigation planning process and explain the multi-jurisdictional planning requirements as well as individual roles and collect date for the HIRA. The meeting included an introduction of the assigned staff, overview of the planning process, a review of any updates within the last 5 years, explanation of Exercise 1 and 2, and discussion of possible stakeholders to involve in the planning process. The Exercises included Hazard Identification and Capability Assessment, the findings and details of which can be found in Section 4: *Hazard Identification* and Section 7: *Capability Assessment* respectively.

The presentation concluded with a discussion of the next steps to be taken in the project development, which included discussing data collection efforts, continuing public outreach, and the next meeting for

the HMPT. The meeting was open for questions and comments, but nothing of note was brought up from a technical perspective.

A Survey Monkey was distributed to the public and a separate one to the RHMC to facilitate data collection on the ranking of top hazards affecting the planning area. Questions also addressed some capacity questions to help identify existing gaps, conflicts, and/or weaknesses that may need to be addressed through future mitigation planning goals and actions. It also highlighted the measures in place or already being performed that should continue to be supported and enhanced through future mitigation efforts.

Hazard Identification Meeting
The full RHMC was invited to a Hazard Identification review meeting where the products of the mapping efforts were presented, and the hazard impact areas validated. During the meeting the resulting hazard maps were discussed. This meeting was a precursor to the individual one-on-one jurisdiction meetings with the consultant, scheduled for later in the month. During the meeting no comments were received.

The consultant also presented the results of the public participation survey that was posted from December 19, 2022 through January 6, 2023 that was distributed by MEMA and the County Emergency Managers. The survey offered a $50 Amazon gift card to be randomly selected from those participating. As of the meeting date, 28 surveys were collected.

County One-on-Ones
During the County one-on-one meetings, every line of the individual county annexes was reviewed. From the community profiles and overview to the hazard identification, capabilities, vulnerabilities, and ultimately the Mitigation Strategy, goals, and actions. These meetings were attended by the County Emergency Managers, sometimes accompanied by the individual jurisdictional representatives, MEMA staff, and a planner from Witt O'Brien's.

Each community representative validated data pertinent for their areas and were given time prior to the meeting and following to review the drafts in their own time. The results of the hazard identification and profiling process were used to generate a Priority Risk Index (PRI), which categorizes and prioritizes potential hazards as high, moderate or low risk based on probability, impact, spatial extent, warning time, and duration. The highest PRI was assigned to Hurricane/Tropical Storm followed by Tornado, Flood, Severe Thunderstorm/High Wind.

Mitigation Strategy Meeting
It was identified during the individual one-on-one meetings that there were insufficient and often unactionable actions identified for each of the jurisdictions. A separate Mitigation Strategy and Action Identification meeting was scheduled, held in two parts to accommodate scheduling. During these meetings the existing actions were summarized in a spreadsheet and allocated to the applicable hazards. Additional hazards were discussed, using the Mitigation Ideas document (January 2013) as a starting place. Actions were identified by each community, often collaborating on ideas from their neighboring jurisdictions and modifying slightly to fit individual needs. Both meetings overran the initial 1 hour scheduled time by 45-90 minutes as productive and collaborative discussion took place.

2.5 INVOLVING THE PUBLIC

44 CFR Requirement
44 CFR Part 201.6(b)(1): The planning process shall include an opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

An important component of the mitigation planning process involves public participation. Individual citizen and community-based input provides the entire Council with a greater understanding of local concerns and increases the likelihood of successfully implementing mitigation actions by developing community "buy-in" from those directly affected by the decisions of public officials. As citizens become more involved in decisions that affect their safety, they are more likely to gain a greater appreciation of the hazards present in their community and take the steps necessary to reduce their impact. Public awareness is a key component of any community's overall mitigation strategy aimed at making a home, neighborhood, school, business or entire city safer from the potential effects of hazards.

Due to changes in community expectation of communication stemming from the movement to online communication following the pandemic, public involvement in the *MEMA District 7 Hazard Mitigation Plan* was sought using digital data collection methods. During the planning process, digital public surveys were collected, and once a draft was completed, copies of the draft Plan were made available for public review on county and local websites. The public was provided two opportunities to be involved in the plan development: (1) during the drafting stage of the Plan and (2) upon completion of a final draft Plan, but prior to official plan approval and adoption. The summary of all public responses can be found in Appendix B.

2.6 INVOLVING STAKEHOLDERS

44 CFR Requirement
44 CFR Part 201.6(b)(2): The planning process shall include an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other non-profit interests to be involved in the planning process.

During the kickoff meeting, the project consultant worked with MEMA mitigation staff, the MEMA District 7 Area Coordinator, and each of the nine County Emergency Management leads to initiate outreach to stakeholders to be involved in the planning process. The project consultant discussed the kinds of stakeholders required for CFR compliance under the new FEMA in the Local Mitigation Planning Policy Guide (FP 206-21-0002) and requested input on the stakeholders necessary to incorporate.

As a result of these efforts, it was determined that stakeholder participation would best be incorporated once a draft plan was ready for overall public review. All survey results were shared with the Regional Hazard Mitigation Council and represented input from citizens, local officials, businesses, academia, and other private interests in the Region. One of these organizations contacted the consultant directly for additional information but provided no comments. The list of organizations contacted can be found in the following table.

TABLE 2.2: OTHER STAKEHOLDERS INVOLVED IN PLANNING PROCESS

ORGANIZATION	METHOD OF CONTACT	TYPE
Sanderson Farms	Website contact form	Private Business
Walmart	Website contact form	Private Business
Alcorn State University	Direct email to Dean	Accademia
Southwest Mississippi Community College	Direct email to Maintenance Department	Accademia
AJFC Community Action Agency	Website contact form	Accademia
Woodville/Wilkinson County Main Street Association, Inc.	Website contact form	Nonprofit Organization
St. Andrews Mission	Website contact form	Nonprofit Organization
Broadmoor Utilities Inc.	Website contact form	Utility Provide
Southwest Electric	Website contact form	Utility Provider

2.7 DOCUMENTATION OF PLAN PROGRESS

Progress in hazard mitigation planning for the participating jurisdictions in the MEMA District 7 Region is documented in this plan update. Since hazard mitigation planning efforts officially began in the participating counties with the development of the initial Hazard Mitigation Plans in the late 1990s/early 2000s, many mitigation actions have been completed and implemented in the participating jurisdictions. These projects reduce the overall risk to natural hazards for the people and property in the Region. Actions that have been completed since the last update are documented at the end of each County Annex.

In addition, community capability continues to improve with the implementation of new plans, policies, and programs that help to promote hazard mitigation at the local level. The current state of local capabilities for the participating jurisdictions is captured in Section 7: *Capability Assessment*. The participating jurisdictions continue to demonstrate their commitment to hazard mitigation and hazard mitigation planning and have proven this by reconvening their internal Hazard Mitigation Councils to update the Plan and by continuing to involve the public in the hazard mitigation planning.

COMMUNITY PROFILE

This section of the Plan provides a general overview of the Mississippi Emergency Management Agency (MEMA) District 7 Region. It consists of the following four subsections:

- 3.1 Geography and the Environment
- 3.2 Population and Demographics
- 3.3 Housing, Infrastructure, and Land Use
- 3.4 Employment and Industry

The county-specific annexes provide more detailed community profile information about each county.

3.1 GEOGRAPHY AND THE ENVIRONMENT

The MEMA District 7 Region is based on the Mississippi Emergency Management Agency districts lines and is one of nine MEMA regions throughout the state. The region is located in the southwestern portion of the state. It is bounded by the Mississippi/Louisiana State Line to the south and west. Interstate 55 runs north to south through the region, passing through Pike and Lincoln Counties. Other major roads include U.S. Highway 84, which runs east to west passing through Adams, Franklin, Lincoln, and Lawrence Counties and U.S. Highway 98 which east to west traveling through the Franklin, Lincoln, Pike, and Walthall Counties. The MEMA District 7 Region includes the counties of Adams, Amite, Franklin, Jefferson, Lawrence, Lincoln, Pike, Walthall, and Wilkinson.

MEMA District 7 is located adjacent to the Mississippi River supplying diverse recreational and cultural activities. The total area of each of the participating counties is presented in Table 3.1.

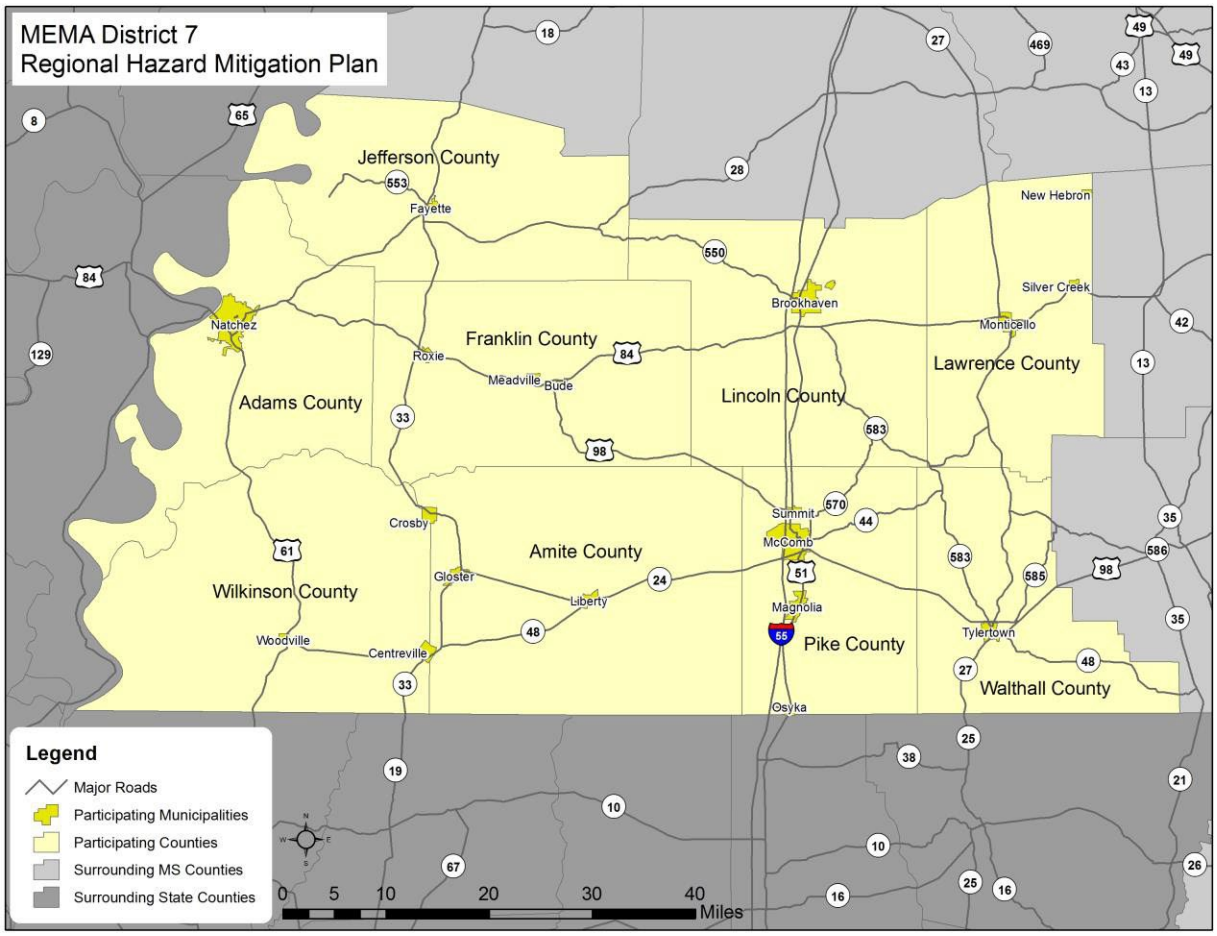
TABLE 3.1: TOTAL AREA OF PARTICIPATING COUNTIES[1]

County	Land Area (sq. mi.)	Water Area (sq. mi.)	Total Area (sq. mi.)
Adams County	462	25	488
Amite County	730	2	732
Franklin County	564	3	567
Jefferson County	520	7	527
Lawrence County	431	5	436
Lincoln County	586	2	588
Pike County	409	2	411
Walthall County	404	<1	404
Wilkinson County	678	10	688

[1] *Source: United States Census Bureau, 2010 Census*

The MEMA District 7 Region enjoys four distinct seasons but the climate in the region is generally hot and humid compared to the rest of the United States given its latitude and relative proximity to the Gulf Coast. Precipitation is generally highest in winter months when the temperatures are moderately lower, but the likelihood of precipitation remains relatively constant throughout the year. Summers in the region can become fairly hot with average highs in the nineties and lows in the seventies. The region is also often susceptible to turbulent weather when warm, wet air from the Gulf of Mexico is pushed up into the region to mix with cooler air coming down from across the continent which can result in severe weather conditions. This is particularly true in the spring when seasons are changing and diverse weather patterns interact.

FIGURE 3.1: MEMA DISTRICT 7 REGION ORIENTATION MAP



3.2 POPULATION AND DEMOGRAPHICS

Although Amite County is the largest participating county by area, the largest population is found in Pike County. An evaluation of the change in population is demonstrated in the table below.

TABLE 3.2: POPULATION COUNTS FOR PARTICIPATING COUNTIES[2]

Jurisdiction	2000 Census Pop.	2010 Census Pop.	2020 Census Pop.	% Change 2000-2020	% Change 2010-2020	Evaluation
Adams County	34,340	32,297	29,538	-13.98	-8.54	increased rate of loss
Amite County	13,599	13,131	12,270	-9.77	-6.56	increased rate of loss
Franklin County	8,448	8,118	7,675	-9.15	-5.46	increased rate of loss
Jefferson County	9,740	7,726	7,260	-25.46	-6.03	decreased rate of loss
Lawrence County	13,258	12,929	12,016	-9.37	-7.06	increased rate of loss
Lincoln County	33,166	34,869	34,907	5.25	0.11	minor growth
Pike County	38,940	40,404	40,324	3.55	-0.20	minor loss
Walthall County	15,156	15,443	14,978	-1.17	-3.01	increased rate of loss
Wilkinson County	10,312	9,878	8,587	-16.73	-13.07	increased rate of loss

Based on the 2020 Census, the median age for residents of the participating counties ranges from 37 to 48 years, many communities are trending older since the last update. The racial characteristics of the participating counties are presented in each annex. Several counties in the region have majority white populations while others have majority black populations. Most of these counties have significant minority populations (whether white or black), with very small populations falling into any other racial categorization.

3.3 HOUSING, INFRASTRUCTURE, AND LAND USE

3.3.1 Housing

According to the 2010 U.S. Census, there are 80,422 housing units in the MEMA District 7 Region, most of which are single family homes. Housing information for the nine participating counties is presented in the table below. As shown in the table, several counties have relatively high percentages of seasonal housing units.

TABLE 3.4: HOUSING CHARACTERISTICS OF PARTICIPATING COUNTIES

Jurisdiction	Housing Units (2020-2021)	Median Home Value (2016-2021)
Adams County	14,910	$94,100
Amite County	7,167	$86,200
Franklin County	4,288	$81,200
Jefferson County	3,395	$64,800
Lawrence County	5,762	$100,400
Lincoln County	15,719	$102,500
Pike County	19,017	$95,800
Walthall County	6,877	$102,600
Wilkinson County	4,554	$69,200

Infrastructure

TRANSPORTATION

There are several major thoroughfares that traverse the MEMA District 7 Region. Interstate 55 is a major north-south interstate highway connecting through Lincoln and Pike Counties to areas around Memphis, Tennessee to the north and New Orleans, Louisiana to the south. U.S. Highway 84 runs east-west, more or less connecting Natchez and Brookhaven and U.S. Highway 98 runs northwest to southeast between Bude and McComb. Finally, U.S. Highway 61, a north-south highway, travels through Jefferson, Adams, and Wilkinson Counties, providing access to the north into Vicksburg and south into Louisiana. Various state highways operate within the region providing access to adjacent areas throughout the state.

There are several small general aviation airports within the MEMA District 7 Region, including one in nearly every county. The most prominent are Natchez-Adams County Airport (Hardy-Anders Field) and McComb-Pike County Airport (John E. Lewis Field). A list of all of the airports within MEMA District 7 can be found in Table 3.5.

TABLE 3.5: AIRPORTS LOCATED IN MEMA DISTRICT 7

County	Airports
Adams County	• Natchez-Adams County Airport
Amite County	• Crosby Municipal Airport • McGehee Air Park Airport
Franklin County	*None Identified*
Jefferson County	*None Identified*
Lawrence County	• Clay Airport
Lincoln County	• Brookhaven-Lincoln County Airport
Pike County	• McComb-Pike County Airport • Southwest Regional Medical Center Heliport
Walthall County	• Paul Pittman Memorial Airport
Wilkinson County	• Forest Home Airport • Fred Netterville Lumber Company/Wilkinson Community Airport • Green Acres Airport

Source: Toll Free Airline

Multiple freight rail lines operate within the MEMA District 7 Region. Canadian National Railway, Natchez Railway, Inc., and Gloster Southern Railway travel throughout the area. Business and industries rely on and are bisected by these various rail lines within the MEMA District 7 Region.

UTILITIES

Electric power in the MEMA District 7 Region is provided by several electricity cooperatives. Southwest Mississippi Electric Power Association serves residents throughout the western part of the region. Magnolia Electric Power Cooperative is present throughout much of the eastern part of the region, including many rural areas. Entergy is focused primarily on urban areas in Pike, Lincoln, and Walthall Counties, but also serves areas of Franklin, Amite, and Adams Counties. Much of Lawrence County is served by Southern Pine Electric Power Association and relatively small portions of Lawrence County and Walthall County are served by Pearl River Valley Electric Power Association.

Water and sewer service is provided by participating jurisdictions and/or community-based associations in many of the urban areas, but unincorporated areas often rely on septic systems and wells in the MEMA District 7 Region.

COMMUNITY FACILITIES

There are a number of public buildings and community facilities located throughout the MEMA District 7 Region. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 67 fire stations, 31 police stations, and 74 schools located within the study area.

Forty-two hospitals and medical care facilities are located in the MEMA District 7 Region. These include several notable short term acute care facilities: Merit Health Natchez, a 179-bed facility located in Natchez; Southwest Mississippi Regional Medical Center, a 160-bed facility located in McComb; King's Daughter Medical Center, a 99-bed facility located in Brookhaven; Beecham Memorial Hospital, a 37-bed facility located in Magnolia; and Jefferson County Hospital, a 30-bed facility located in Fayette. There are also several additional medical care facilities located throughout the region as outlined in the vulnerability assessment (Section 6.4.1).

Several educational institutions are found in the MEMA District 7 Region. Alcorn State University has a location in Natchez and is a four-year undergraduate institution with several graduate programs. Southwest Mississippi Community College is a two-year community college located in Summit. Copiah-Lincoln Community College is also a two-year community college and has a location Natchez.

Museums based around the history and culture of MEMA District 7 Region are prevalent throughout the area. For example, in Centreville, the Camp Van Dorn World War II Museum highlights the achievements of soldiers who were trained at Camp Van Dorn during the war. The Jerry Clower Museum in Liberty chronicles the life and works of comedian Jerry Clower. In McComb, the Railroad Depot Museum contains one of the best-preserved collections of railroad history in the country. The Natchez Museum of African American History and Culture tells the story of African American culture in the southern United States and is dedicated to exploring the societal contributions of people of African origin and descent.

Recreational opportunities exist throughout the MEMA District 7 Region. The Homochitto National Forest comprises almost 200,000 acres of land located within several the MEMA District 7 counties. Visitors can camp, hike, hunt, and fish in the forest. In addition, St. Catherine Creek National Wildlife Refuge sits on roughly 25,000 acres and functions as a habitat for migratory waterfowl, birds, and other wildlife. Another prominent feature of the region is the Natchez Trace Parkway which begins in the City of Natchez and runs northeast to Nashville, Tennessee. This parkway commemorates the Old Natchez Trace which is an historic trail that was followed by Native Americans who were tracing bison along their migratory routes from the grazing pastures of central and western Mississippi to the salt licks of Tennessee.

The Mississippi River, which runs along the western border of the region, has played an integral part in the history of the region, especially in Adams, Jefferson, and Wilkinson Counties. The river acted as a major conduit for trade in the 19th century as plantations produced large quantities of cotton that could be easily shipped down to ports such as New Orleans. Today, the river is still an important part of the local economy as products are shipped worldwide out of the Natchez port. Apart from the Mississippi River there are multiple water-based refuges, activities, and recreational features focused on local water

bodies. For instance, in Adams County, the Old River, Lake St. John, and Lake Concordia all offer excellent boating opportunities. In Wilkinson County, Lake Mary is an oxbow lake formed by the Mississippi River and well-known for boating, fishing, and hunting. Fishing is also a major draw for visitors to Percy Quin State Park located in Pike County. This park contains Lake Tangipahoa which has experienced a boom in recreational tourism since it was re-opened in 2016 after Hurricane Isaac forced it to shut down in 2012. In Lincoln County, Lake Lincoln is great for camping, hiking, and water activities. As part of the Homochitto National Forest, Okhissa Lake in Franklin County offers over 1,000 acres of lake area for fishing, boating and leisure activities. There are also numerous other small lakes, creeks, and other water bodies throughout the region that offer the outstanding outdoor recreational opportunities for which the region is known.

Land Use

The MEMA District 7 Region has a blend of old and new development that contributes to physical, cultural, and economic attributes throughout the region. As shown in Figure 3.1 above, there are many small, incorporated municipalities located throughout the planning area, with a few larger urban economic hubs interspersed. These areas are where the region's population is generally concentrated. The incorporated areas are also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the study area generally consist of residential development, agricultural uses, and recreational areas, although there are some notable exceptions in larger municipalities. There are multiple county- and regional-based agencies that serve to coordinate growth and promote economic development.

Local land use and associated regulations are further discussed in Section 7: Capability Assessment

EMPLOYMENT AND INDUSTRY

Like many other parts of Mississippi, the MEMA District 7 Region's economy has traditionally been heavily reliant on the manufacturing industries. However, the region has suffered from numerous plant closings during the 1990s and 2000s. As a result, many of the communities have worked to develop place-based economies that will rely on the MEMA District 7 Region's unique location and cultural resources. Educational services, health care and social assistance industry employs most residents within MEMA District 7 Region. Agriculture and livestock-based operations also continue to play a major role in the local economy and throughout the region. This change in economic make up may also be a contributing factor in the continued decline of populations across the region.

County-specific employment and industry data is presented in each of the annexes.

HAZARD IDENTIFICATION

This section describes how the Regional Hazard Mitigation Council identified the hazards to be included this plan. It consists of the following five subsections:

- 4.1 Overview
- 4.2 Description of Full Range of Hazards
- 4.3 Disaster Declarations
- 4.4 Hazard Evaluation
- 4.5 Hazard Identification Results

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44 CFR Requirement
44 CFR Part 201.6(c)(2)(i): The risk assessment shall include a description of the type, location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

4.1 OVERVIEW

The MEMA District 7 Region is vulnerable to a wide range of natural hazards that threaten life and property. Current FEMA regulations and guidance under the Disaster Mitigation Act of 2000 (DMA 2000) require, at a minimum, an evaluation of a full range of natural hazards. An evaluation of human-caused (i.e., terrorism) and technological hazards (i.e., hazardous materials incident) is encouraged, though not required, for plan approval. While several counties expressed interest in expanding the scope of the current hazard mitigation plan, due to discrepancies in data availability and participation interest it was determined that the interested counties pursue this enhancement outside of the regional update.

In this plan, the MEMA District 7 Region has focused on completing a comprehensive assessment of all natural hazards that impact the region as well as two human-caused hazards of particular importance in the region. It should be noted however, that although great effort was made to identify all potential hazards, this list may not be all-inclusive and will be revisited with each plan update.

Table 4.1 lists the range of hazards identified for inclusion in the Plan and provides a brief description for each. In past versions of this plan, this included 22 total individual hazards based on a review of suggested hazards under the old FEMA planning guidance, input from the MEMA District 7 Regional Hazard Mitigation Council members, research of past disaster declarations in the participating counties, and review of the Mississippi State Hazard Mitigation Plan (2013). Elimination of some of those hazards was previously justified and will not be addressed in future updates. The eliminated hazards include: Avalanche, Storm Surge, Expansive Soils, Landslide, Land Subsidence, Sinkhole, Tsunami, Volcano, and Nor'easter. Please note that some of the hazards are interrelated or cascading (one hazard event may cause another, i.e. – hurricanes cause flooding), but for preliminary hazard identification purposes these individual hazards are broken out separately.

Table 4.2 lists the disaster declarations that have impacted the MEMA District 7 Region.

Table 4.3 documents the evaluation process used for determining which hazards are significant enough

to warrant further evaluation for each county. Hazard events not identified for inclusion at this time may be addressed during future evaluations and updates of the risk assessment if deemed necessary by the MEMA District 7 RHMC during the plan update process.

Lastly, **Table 4.4** provides a summary by County.

4.2 DESCRIPTION OF FULL RANGE OF HAZARDS

In this plan, hazards are grouped: flood-related hazards, fire-related hazards, geologic hazards, and wind-related hazards. In reality, some hazards cross several categorizations, but for the purposes of this planning effort, each was assigned to only one of the four categories identified above.

TABLE 4.1: DESCRIPTIONS OF THE FULL RANGE OF INITIALLY IDENTIFIED HAZARDS

Hazard	Description
FLOOD-RELATED HAZARDS	
Dam and Levee Failure	The collapse, breach, or other failure of a dam structure resulting in downstream flooding. In the event of a dam failure, the energy of the water stored behind even a small dam can cause loss of life and severe property damage if development exists downstream of the dam. Dam failure can result from natural events, human-induced events, or a combination of the two. The most common cause of dam failure is prolonged rainfall that produces flooding. Failures due to other natural events such as hurricanes, earthquakes, or landslides are significant because there is generally little or no advance warning.
Erosion	Erosion is the gradual breakdown and movement of land due to both physical and chemical processes of water, wind, and general meteorological conditions. Natural, or geologic, erosion has occurred since the Earth's formation and continues at a very slow and uniform rate each year.
Flood	The accumulation of water which results in the flow of water onto adjacent lands, usually floodplains. The floodplain is the land adjoining the channel of a river, stream ocean, lake, or other watercourse or water body that is susceptible to flooding. Most flood events in the area fall into three categories: riverine, coastal, or shallow flooding (sheet flow, ponding, and urban drainage).
FIRE RELATED HAZARDS	
Drought	A prolonged period of less than normal precipitation such that the lack of water causes a serious hydrologic imbalance. Common effects of drought include crop failure, water supply shortages, and fish and wildlife mortality. High temperatures, high winds, and low humidity can worsen drought conditions and also make areas more susceptible to wildfire. Human demands and actions have the ability to hasten or mitigate drought-related impacts on local communities.
Lightning	A discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a "bolt". This flash can occur within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes, but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes thunder. On average, 80 people are killed each year by lightning strikes in the United States. More frequently these events lead to loss of electrical power or wildfire.

Wildfire	An uncontrolled burning in an area of vegetative fuels such as grasslands, brush, or woodlands. Heavier fuels with high continuity, steep slopes, high temperatures, low humidity, low rainfall, and high winds all work to increase risk for people and property located within wildfire hazard areas or along the urban/wildland interface. Wildfires are part of the natural management of forest ecosystems, but most are caused by human factors. Over 80 percent of forest fires are started by negligent human behavior such as smoking in wooded areas or improperly extinguishing campfires. The second most common cause for wildfire is lightning.
GEOLOGIC HAZARDS	
Earthquake	A sudden, rapid shaking of the Earth caused by the breaking and shifting of rock beneath the surface. This movement forces the gradual building and accumulation of energy. Eventually, strain becomes so great that the energy is abruptly released, causing the shaking at the earth's surface which we know as an earthquake. Roughly 90 percent of all earthquakes occur at the boundaries where plates meet, although it is possible for earthquakes to occur entirely within plates. Earthquakes can affect hundreds of thousands of square miles, cause damage to property measured in the tens of billions of dollars, result in loss of life and injury to hundreds of thousands of persons, and disrupt the social and economic functioning of the affected area.
WIND-RELATED HAZARDS	
Extreme Heat (Heat Wave)	A heat wave may occur when temperatures hover 10 degrees or more above the average high temperature for the region and last for several weeks. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when a "dome" of high atmospheric pressure traps hazy, damp air near the ground. Excessively dry and hot conditions can provoke dust storms and low visibility. A heat wave combined with a drought can be very dangerous and have severe economic consequences on a community.
Hailstorm	Any storm that produces hailstones that fall to the ground; usually used when the amount or size of the hail is considered significant. Hail is formed when updrafts in thunderstorms carry raindrops into parts of the atmosphere where the temperatures are below freezing.
Hurricane and Tropical Storm	Hurricanes and tropical storms are classified as cyclones and defined as any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and with a diameter averaging 10 to 30 miles across. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. The primary damaging forces associated with these storms are high-level sustained winds, heavy precipitation, and tornadoes. Coastal areas are also vulnerable to the additional forces of storm surge, wind- driven waves, and tidal flooding which can be more destructive than cyclone wind. The majority of hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico during the official Atlantic hurricane season, which extends from June through November.
Severe Thunderstorm/ High Wind	Thunderstorms are caused by air masses of varying temperatures meeting in the atmosphere. Rapidly rising warm moist air fuels the formation of thunderstorms. Thunderstorms may occur singularly, in lines, or in clusters. They can move through an area very quickly or linger for several hours. Thunderstorms may result in hail, tornadoes, or straight-line winds. Windstorms pose a threat to lives, property, and vital utilities primarily due to the effects of flying debris and can down trees and power lines.

Tornado	A tornado is a violently rotating column of air that has contact with the ground and is often visible as a funnel cloud. Its vortex rotates cyclonically with wind speeds ranging from as low as 40 mph to as high as 300 mph. Tornadoes are most often generated by thunderstorm activity when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The destruction caused by tornadoes ranges from light to catastrophic depending on the intensity, size, and duration of the storm.
Winter Storm, Freeze, and Extreme Cold	Winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Blizzards, the most dangerous of all winter storms, combine low temperatures, heavy snowfall, and winds of at least 35 miles per hour, reducing visibility to only a few yards. Ice storms occur when moisture falls and freezes immediately upon impact on trees, power lines, communication towers, structures, roads, and other hard surfaces. Winter storms and ice storms can down trees, cause widespread power outages, damage property, and cause fatalities and injuries to human life.
HUMAN CASUED HAZARDS	
Radiological Event	A nuclear and radiation accident is defined by the International Atomic Energy Agency as "an event that has led to significant consequences to people, the environment, or the facility." Often, this type of incident results from damage to the reactor core of a nuclear power plant which can release radioactivity into the environment. The degree of exposure from nuclear accidents has varied from serious to catastrophic.
Pandemic	An outbreak of a disease that occurs over a wide geographic area (such as multiple countries or continents) and typically affects a significant proportion of the population

4.3 DISASTER DECLARATIONS

Disaster declarations provide initial insight into the hazards that may impact the MEMA District 7 Regional planning area. Since 1965, 32 presidential disaster declarations have occurred in the region, an increase from the 26 reported during the last update. Data on these disasters is displayed in the following table. It should be noted that several disasters were declared due to multiple hazard impacts.

TABLE 4.2: MEMA DISTRICT 7 REGION DISASTER DECLARATIONS BY COUNTY (NEXT PAGE)

Year	Disaster Number	Description	Adams	Amite	Franklin	Jefferson	Lawrence	Lincoln	Pike	Walthall	Wilkinson
1965	210	HURRICANE BETSY	X	X	X	X		X	X		X
1969	271	HURRICANE CAMILLE		X			X	X	X	X	X
1972	318	HEAVY RAINS & FLOODING		X	X		X	X	X	X	X
1973	368	HEAVY RAINS, TORNADOES & FLOODING	X	X	X	X	X	X	X		X
1974	430	HEAVY RAINS & FLOODING	X		X	X	X	X	X		
1975	456	TORNADOES						X	X		
1979	577	STORMS, TORNADOES, FLOODS	X			X	X				X
1980	618	STORMS, FLOOD, MUDSLIDES & TORNADOES	X						X	X	
1983	678	SEVERE STORMS, FLOODING & TORNADOES			X		X		X	X	
1983	683	SEVERE STORMS, TORNADOES, AND FLOODING				X					X
1990	859	SEVERE STORMS, TORNADOES &FLOODING	X	X			X	X	X	X	X
1991	895	SEVERE STORMS & FLOODING	X								
1992	968	SEVERE STORMS, HIGH WINDS & TORNADOES		X				X			X
1998	1251	HURRICANE GEORGES							X		
2001	1360	SEVERE STORMS AND TORNADOES		X	X			X	X	X	X
2002	1436	TROPICAL STORM ISIDORE		X				X	X		
2003	1459	SEVERE STORMS, TORNADOES, FLOODS		X	X	X	X	X	X	X	
2004	1550	HURRICANE IVAN	X	X	X	X	X	X	X	X	X
2005	1604	HURRICANE KATRINA	X	X	X	X	X	X	X	X	X
2008	1753	SEVERE STORMS AND FLOODING									X
2008	1794	HURRICANE GUSTAV	X	X	X	X	X	X	X	X	X
2009	1837	SEVERE STORMS, FLOODING, AND TORNADOES					X	X		X	X
2011	1983	FLOODING	X			X					X
2012	4081	HURRICANE ISAAC	X	X	X	X	X	X	X	X	X
2016	4268	SEVERE STORMS AND FLOODING					X	X		X	
2017	4314	SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND FLOODING	X			X					
2020	4528	BIOLOGICAL - Mississippi Covid-19 Pandemic	X	X	X	X	X	X	X	X	X
2020	4536	Severe Storms, Tornadoes, Straight-line Winds, and Flooding					X			X	
2020	4538	Severe Storms, Flooding, and Mudslides									X
2020	4551	Severe Storms, Tornadoes, Straight-line Winds, and Flooding		X			X		X		
2020	4598	Severe Winter Storms	X		X	X	X	X	X	X	X
2021	4626	HURRICANE IDA	X	X	X	X	X	X	X	X	X
TOTAL NUMBER OF DECLARED DISASTERS:			**16**	**17**	**14**	**15**	**19**	**20**	**21**	**17**	**20**

4.4 HAZARD EVALUATION

TABLE 4.3: DOCUMENTATION OF THE HAZARD EVALUATION PROCESS

Hazards Considered	To be addressed?	How was this determination made?	Why?
FLOOD-RELATED HAZARDS			
Dam and Levee Failure	YES	• Review of FEMA's Multi- Hazard Identification and Risk Assessment and • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 7 Region hazard mitigation plans • Review of MS Department of Environmental Quality dam inventory	• The National Inventory of Dams shows dams are located in every state. • Dam/levee failure is identified in the state plan as a limited hazard. • The previous MEMA District 7 Region hazard mitigation plan addresses dam failure. • 12 dams in the region are classified as high-hazard (high hazard is defined where dam failure may cause loss of life or serious damage).
Erosion	YES	• Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 7 Region hazard mitigation plans	• Coastal erosion was excluded from the State of MS Hazard Mitigation Plan as a hazard; however, it is addressed under the hurricane hazard. Riverine erosion is not addressed in the plan. • Although erosion was not originally identified in previous MEMA District 7 Region hazard mitigation plans, it was identified as a potential hazard during planning meetings. • Erosion is a natural and continuous process that may impact the region.
Flood	YES	• Review of FEMA's Multi- Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 7 Region hazard mitigation plans • Review of NOAA NCDC Storm Events Database • Review of historical disaster declarations • Review of FEMA FIRM/DFIRM data • Review of FEMA's NFIP Community Status Book and Community Rating System (CRS)	• Floods occur in all 50 states and in the U.S. territories. • The flood hazard is thoroughly discussed in the state plan. • 767.19 acres within Region 7 are within the 1% annual chance of flooding area (100-year floodplain) • Flash floods are a common occurrence during rain storms. • Previous MEMA District 7 Region hazard mitigation plans address flood hazard. • NCDC reports that MEMA District 7 Region counties have been affected by 203 flood events since 1997. These events have resulted in the loss of millions of dollars in property damages. • 8 out of 32 disaster declarations were primarily flood-related, an additional 15 were hurricane or tropical storm- related which caused flooding issues, and several

			others listed flooding as one of the causes of the declaration. • 24 of the 28 MEMA District 7 jurisdictions participate in the NFIP.
FIRE-RELATED HAZARDS			
Drought	YES	• Review of FEMA's Multi- Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 7 Region hazard mitigation plans • Review of US Drought Monitor website • Review of NOAA NCDC Storm Events Database	• Drought is a normal part of virtually all climatic regimes, including areas with high and low average rainfall. • Droughts are identified in the State of MS Hazard Mitigation Plan as a limited hazard. • Drought is addressed in previous MEMA District 7 Region hazard mitigation plans. • There are historical reports of the most extreme (exceptional) drought in each of the MEMA District 7 Region counties according to the US Drought Monitor. • NCDC reports that the MEMA District 7 Region counties have been affected by 35 drought events since 2006.
Lightning	YES	• Review of FEMA's Multi- Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 7hazard mitigation plans • Review of NOAA NCDC Storm Events Database • Review of Vaisala's NLDN Lightning Flash Density Map	• Lightning events are experienced in nearly every region. • Lightning events are discussed in the MS State Hazard Mitigation Plan. • NCDC reports 26 lightning events for the MEMA District 7 Region between 1997 and 2017. These events have resulted in 2 deaths, 1 recorded injury, and $800,000 (2017 dollars) in property damage. While additional data is harder to collect due to proprietary restrictions imposed by the Vaisala, we can assume that lighting is not a natural event that will cease to exist and pose future threats.
Wildfire	YES	• Review of FEMA's Multi- Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 7 Region hazard mitigation plans • Review of Southern Wildfire Risk Assessment (SWRA) Data • Review of Mississippi Forestry Commission website	• Wildfires occur in virtually all parts of the United States. Wildfire hazard risks will increase as low-density development along the urban/wildland interface increases. • The State of MS Hazard Mitigation Plan identifies wildfire as a significant hazard and regular occurrence. • Previous MEMA District 7 Region hazard mitigation plans address wildfire. • A review of SWRA data indicates that there are areas of concern in the MEMA District 7 Region. Wildfire hazard risks will increase as low- density development along the urban/wildland interface increases. • According to the Mississippi Forestry Commission, the MEMA District 7 Region experiences an average of 230 fires each year which burn a combined 2,929 acres annually.

GEOLOGIC HAZARDS			
Earthquake	YES	• Review of FEMA's Multi- Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 7 Region hazard mitigation plans • Review of National Geophysical Data Center • USGS Earthquake Hazards Program website	• Earthquake events are identified as a limited hazard in the State of MS Hazard Mitigation Plan, and all counties in MS are considered to be susceptible to the effects of earthquakes. • Earthquakes have occurred in and around the State of Mississippi in the past. The state is affected by the New Madrid (near Missouri) and White River Fault lines which have generated a magnitude 8.0 earthquake in the last 200 years. • Previous MEMA District 7 Region hazard mitigation plans address earthquake. • Events have been known to have occurred in the region according to the National Geophysical Data Center. The greatest MMI reported was a 6.
WIND-RELATED HAZARDS			
Extreme Heat	YES	• Review of FEMA's Multi- Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 7 Region hazard mitigation plans • Review of NOAA NCDC Storm Events Database	• Many areas of the United States are susceptible to extreme heat and heat waves, including Mississippi which is located in the hot and humid southeastern United States. • Extreme heat was incorporated into the 2018 State of MS hazard mitigation plan. • The previous MEMA District 7 Region hazard mitigation plan addresses extreme heat. • NCDC reports that the MEMA District 7 Region counties have been affected by at least 21 extreme heat events since 2000 with the highest recorded temperature in the region being 106°F in 2007, and heat index values recorded above 115°F.
Hailstorm	YES	• Review of FEMA's Multi- Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 7 Region hazard mitigation plans • Review of NOAA NCDC Storm Events Database	• Hailstorms occur in every state on the mainland U.S. Most inland regions experience hailstorms at least two or more days each year. • Hailstorm events are discussed in the MS State Hazard Mitigation Plan. • The previous MEMA District 7 Region hazard mitigation plan addresses hail. • NCDC reports 635 hailstorm events for the MEMA District 7 Region since 1950.
Hurricane and Tropical Storm	YES	• Review of FEMA's Multi- Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 7 Region hazard mitigation plans • Analysis of NOAA historical tropical	• The Atlantic and Gulf regions are most prone to landfall by hurricanes and tropical storms. • The State Hazard Mitigation Plan profiles the hurricane hazard and identifies it as a significant hazard, noting its devastating impacts on the state. • The hurricane and tropical storm hazard

		cyclone tracks and National Hurricane Center Website • Review of NOAA NCDC Storm Events Database • Review of historical presidential disaster declarations	is addressed in previous MEMA District 7 Region hazard mitigation plans. • NOAA historical records indicate 86 hurricanes and tropical storms have come within 100 miles of the MEMA District 7 Region since 1850. • 8 out of 32 disaster declarations in the MEMA District 7 Region are directly related to hurricane and tropical storm events.
Severe Thunderstorm/ High Wind	YES	• Review of FEMA's Multi- Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 7 Region hazard mitigation plans • Review of NOAA NCDC Storm Events Database • Review of historical presidential disaster declarations	• Thunderstorms are experienced in every region of the US. • Severe thunderstorm events were not profiled in the State Hazard Mitigation Plan because they do not typically impact the entire state, invoking a state response. However, severe thunderstorms were identified as a significant concern at the local level. • Severe thunderstorms and high winds are addressed in the previous MEMA District 7 Region hazard mitigation plan. • NCDC reports over 1,209 thunderstorm events in the MEMA District 7 Region counties since 1950. These events have resulted in 3 deaths and 25 injuries. • 17 of 20 disaster declarations in the MEMA District 7 Region are related to severe storm and high wind events.
Tornado	YES	• Review of FEMA's Multi- Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 7 Region hazard mitigation plans • Review of NOAA NCDC Storm Events Database • Review of historical presidential disaster declarations	• From 1991 to 2010, Mississippi experienced 9.2 tornadoes per 10,000 miles, making it the 5th ranked "tornado state" in the U.S. In 2021 alone, Mississippi experienced 92 tornados, ranking 3rd in the nation for that year. • Tornado events are listed in the State of MS Hazard Mitigation Plan as a significant hazard and are referenced as a common disaster. • Tornado events are addressed in previous MEMA District 7 Region hazard mitigation plans. • NCDC reports 242 tornado events in MEMA District 7 Region counties since 1950. These events have resulted in 14 recorded deaths and 379 injuries. • 14 out of 32 disaster declarations in the MEMA District 7 Region are related to tornado events.

Winter Storm, Freeze, and Extreme Cold	YES	• Review of FEMA's Multi- Hazard Identification and Risk Assessment • Review of State of MS Hazard Mitigation Plan • Review of previous MEMA District 7 Region hazard mitigation plans • Review of NOAA NCDC Storm Events Database • Review of historical presidential disaster declarations	• Winter storms affect every state in the U.S. • Extreme winter weather is identified in the state plan as a limited hazard. • Winter storm events are addressed in the previous MEMA District 7 Region hazard mitigation plans. • NCDC reports that the MEMA District 7 Region counties have been affected by 106 winter weather events since 1996.
HUMAN CASUED HAZARDS			
Radiological Event	YES	• Review of IAEA data on the location of nuclear reactors. • Discussion with local officials about location of nuclear power stations.	• The Grand Gulf Nuclear Station and River Bend Nuclear Station are located within fifty miles of the region. • Previous hazard mitigation plans included nuclear power plant emergency and it remains a hazard of concern. • A nuclear accident is unlikely to occur but could cause severe damage in the event of a major incident.
Pandemic	YES	• This hazard was added due to the SARS-CoV-2 virus that resulted in the pandemic impacting the US beginning in 2020.	• Viral reproduction of SARS-CoV-2 provides opportunities for the acquisition of advantageous mutations, altering viral transmissibility, disease severity, and/or allowing escape from natural or vaccine-derived immunity. • While a global pandemic is unlikely, national response efforts proved insufficient to meet the challenge, probing additional mitigation and preparedness necessary.

4.5 HAZARD IDENTIFICATION RESULTS

TABLE 4.4: SUMMARY RESULTS OF THE HAZARD IDENTIFICATION AND EVALUATION PROCESS

Description	Adams	Amite	Franklin	Jefferson	Lawrence	Lincoln	Pike	Walthall	Wilkinson
FLOOD-RELATED HAZARDS									
Dam and Levee Failure	X		X				X		
Erosion	X	X	X	X	X	X	X	X	X
Flood	X	X	X	X	X	X	X	X	X
FIRE-RELATED HAZARDS									
Drought					X	X		X	
Lightning	X	X	X	X	X	X	X	X	X
Wildfire	X	X	X	X	X	X	X	X	X
GEOLOGIC HAZARDS									
Earthquake	X	X	X	X	X	X	X	X	X
WIND-RELATED HAZARDS									
Extreme Heat	X	X	X	X	X	X	X	X	X
Hailstorm			X		X	X	X	X	
Hurricane and Tropical Storm	X	X	X	X	X	X	X	X	X
Severe Thunderstorm/ High Wind	X	X	X	X	X	X	X	X	X
Tornado	X	X	X	X	X	X	X	X	X
Winter Storm and Freeze	X	X	X	X	X	X	X	X	X
HUMAN CASUED HAZARDS									
Radiological Event	X	X	X	X	X	X	X	X	X
Pandemic	X	X	X	X	X	X	X	X	X

HAZARD PROFILES

This section includes detailed hazard profiles for each of the hazards identified in the previous section (*Hazard Identification*) as significant enough for further evaluation in the MEMA District 7 Regional Hazard Mitigation Plan. It contains the following subsections:

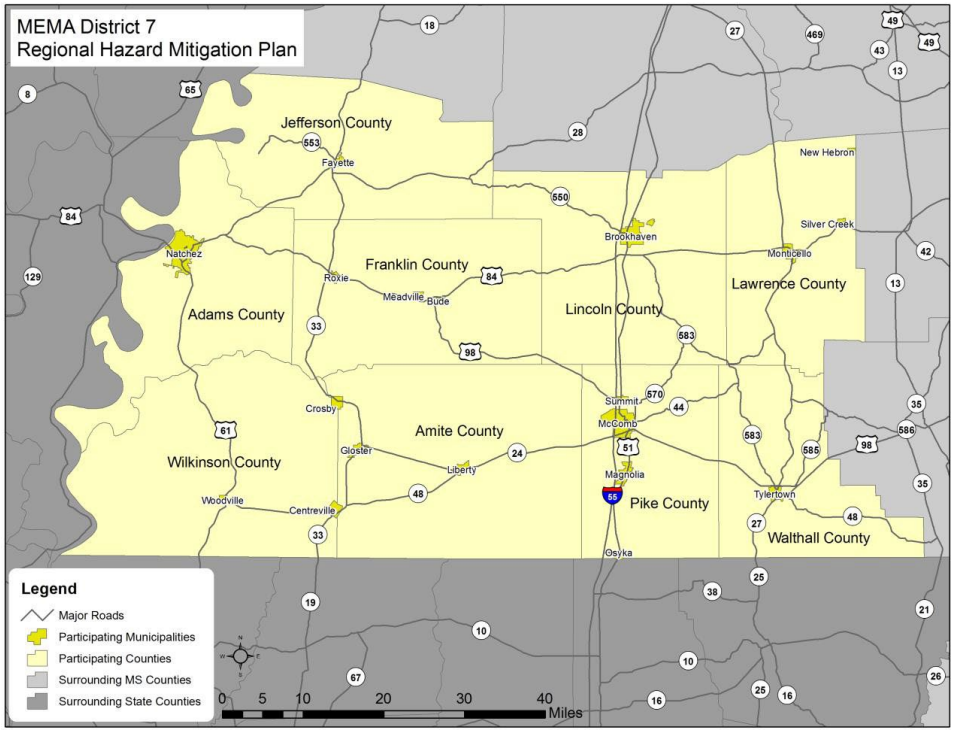
- 5.1 Overview
- 5.2 Profiled Hazards
- 5.3 Conclusions on Hazard Risk
- 5.4 Final Determinations

44 CFR Requirement
44 CFR Part 201.6(c)(2)(i): The risk assessment shall include a description of the type, location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

5.1 OVERVIEW

This section includes detailed hazard profiles that includes a general description of the hazard including its location, extent (or severity), historical occurrences, and probability of future occurrences. Each profile also includes specific items noted by members of the MEMA District 7 Regional Hazard Mitigation Council (RHMC) as it relates to unique historical or anecdotal hazard information for the counties in the MEMA District 7 Region or a participating municipality within them. The MEMA District 7 Region includes 9 counties and 19 incorporated jurisdictions.

FIGURE 5.1: MEMA DISTRICT 7 REGION BASE MAP



The following table lists each significant hazard for the MEMA District 7 Region and identifies whether or not it has been determined to be a specific hazard of concern for the municipal jurisdictions and the unincorporated areas of the counties. Based on the best available data and information from the MEMA District 7 Regional Hazard Mitigation Council, PRI Score calculation described in the annexes are displayed below, classified to reflect a perceived high (3.0 or above), moderate (2.5-2.9), or low (2.4 or below) threat hazard.

TABLE 5.1 SUMMARY OF IDENTIFIED HAZARD EVENTS IN THE MEMA DISTRICT 7 REGION

Jurisdictions	Dam/Levee Failure	Erosion	Flood	Drought	Lightning	Wildfire	Earthquake	Extreme Heat	Hailstorm	Hurricane & Tropical Storm	Severe Thunderstorm / High Wind	Tornado	Winter Storm & Freeze	Radiological Event	Pandemic
Adams County	M	M	H	M	M	L	L	M	M	H	H	H	L	L	L
Natchez	L	H	H	M	M	L	L	M	M	H	H	H	L	L	L
Amite County	L	L	H	M	M	H	L	M	M	H	H	H	L	L	L
Gloster	L	L	H	M	M	H	L	M	M	H	H	H	L	L	L
Liberty	L	L	H	M	M	H	L	M	M	H	H	H	L	L	L
Franklin County	M	L	H	M	M	H	L	M	M	H	H	H	L	L	L
Bude	M	L	H	M	M	H	L	M	M	H	H	H	L	L	L
Meadville	L	L	H	M	M	H	L	M	M	H	H	H	L	L	L
Roxie	L	L	H	M	M	H	L	M	M	H	H	H	L	L	L
Jefferson County	L	L	H	L	M	M	L	M	L	H	H	H	L	L	L
Fayette	L	L	H	L	M	M	L	M	L	H	H	H	L	L	L
Lawrence County	L	L	H	M	M	H	L	M	M	H	H	H	L	L	L
Monticello	L	L	H	M	M	H	L	M	M	H	H	H	L	L	L
New Hebron	L	L	H	M	M	H	L	M	M	H	H	H	L	L	L
Silver Creek	L	L	H	M	M	H	L	M	M	H	H	H	L	L	L
Lincoln County	M	L	H	M	M	H	L	M	M	H	H	H	L	L	L
Brookhaven	L	L	H	M	M	H	L	M	M	H	H	H	L	L	L
Pike County	M	L	H	M	M	H	L	M	M	H	H	H	L	L	L
Magnolia	L	L	H	M	M	H	L	M	M	H	H	H	L	L	L
McComb	L	L	H	M	M	H	L	M	M	H	H	H	L	L	L
Osyka	M	L	H	M	M	H	L	M	M	H	H	H	L	L	L
Summit	L	L	H	M	M	H	L	M	M	H	H	H	L	L	L
Walthall County	L	L	H	M	M	H	L	M	M	H	H	H	L	L	L
Tylertown	L	L	H	M	M	H	L	M	M	H	H	H	L	L	L
Wilkinson County	L	L	H	M	M	M	L	M	M	H	H	H	L	L	L
Centreville	L	L	H	M	M	M	L	M	M	H	H	H	L	L	L
Crosby	L	L	H	M	M	M	L	M	M	H	H	H	L	L	L
Woodville	L	L	H	M	M	M	L	M	M	H	H	H	L	L	L

5.2 PROFILED HAZARDS

FLOOD-RELATED HAZARDS

5.2.1 DAM AND LEVEE FAILURE

BACKGROUND

Worldwide interest in dam and levee safety has risen significantly in recent years. Aging infrastructure, new hydrologic information, and population growth in floodplain areas downstream from dams and near levees have resulted in an increased emphasis on safety, operation, and maintenance.

There are approximately 80,000 dams in the United States today, the majority of which are privately owned. Other owners include state and local authorities, public utilities, and federal agencies. The benefits of dams are numerous: they provide water for drinking, navigation, and agricultural irrigation. Dams also provide hydroelectric power, create lakes for fishing and recreation, and save lives by preventing or reducing floods.

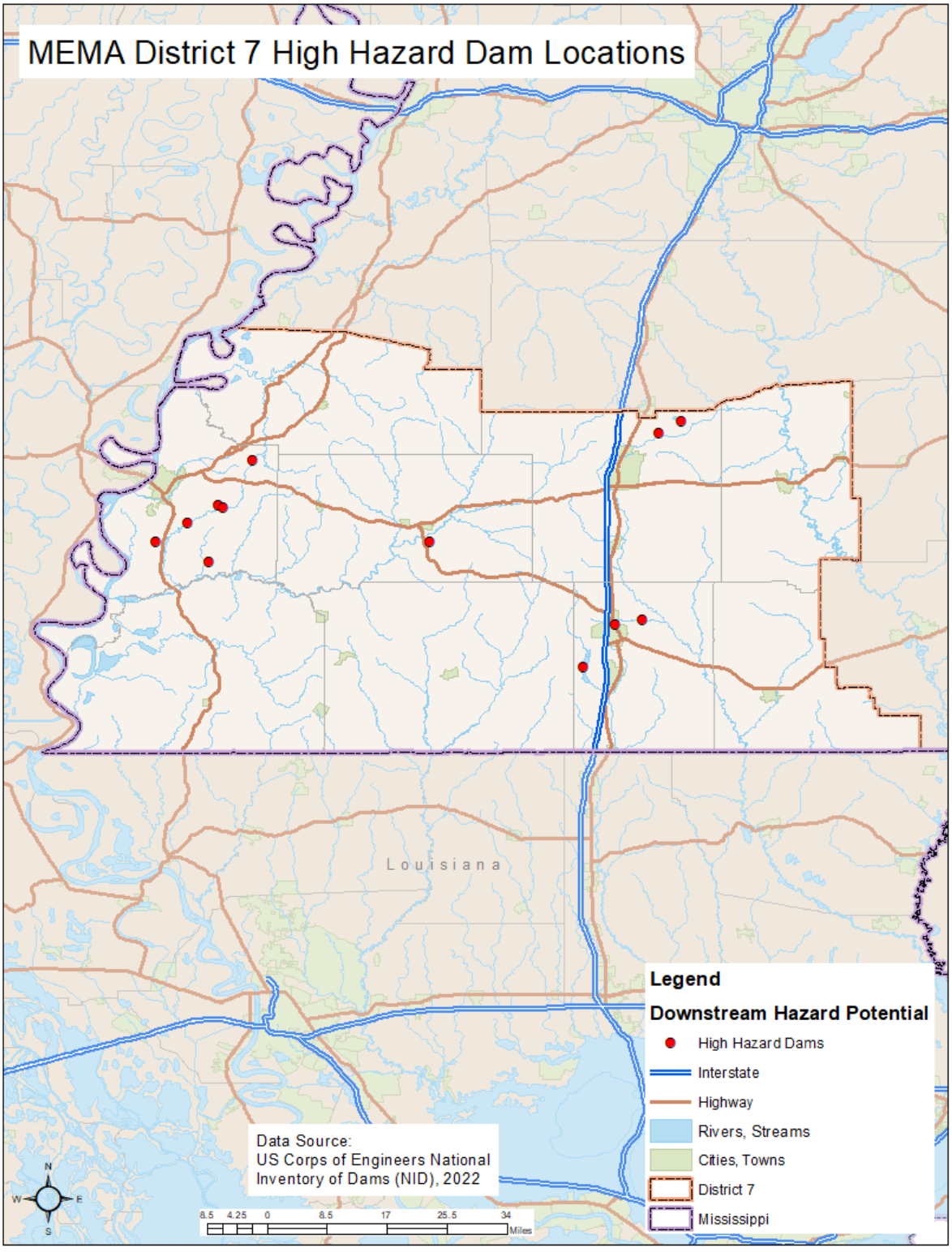
Though dams have many benefits, they also can pose a risk to communities if not designed, operated, and maintained properly. In the event of a dam failure, the energy of the water stored behind even a small dam is capable of causing loss of life and great property damage if development exists downstream. If a levee breaks, scores of properties may become submerged in floodwaters and residents may become trapped by rapidly rising water. The failure of dams and levees has the potential to place large numbers of people and great amounts of property in harm's way.

LOCATION AND SPATIAL EXTENT

Although the Mississippi Department of Environmental Quality provides information on dams that includes three hazard classifications—high, significant, and low— this plan will only focus on those dams that pose the greatest risk. Dams that hold the "High" classification are those where Dam failure may cause loss of life, serious damage to homes, industrial or commercial buildings, important public utilities, main highways or railroads. Dams constructed in existing or proposed residential, commercial or industrial areas will be classified as high hazard dams, unless the applicant presents clear and convincing evidence to the contrary.

According to the Mississippi Department of Environmental Quality, there are 12 high hazard dams located within the MEMA District 7 Region.

FIGURE 5.2: MEMA DISTRICT 7 REGION HIGH HAZARD DAM LOCATIONS[1]



[1] *Mississippi Department of Environmental Quality*

FIGURE 5.3: MEMA DISTRICT 7 DAM INUNDATION AREAS[2]

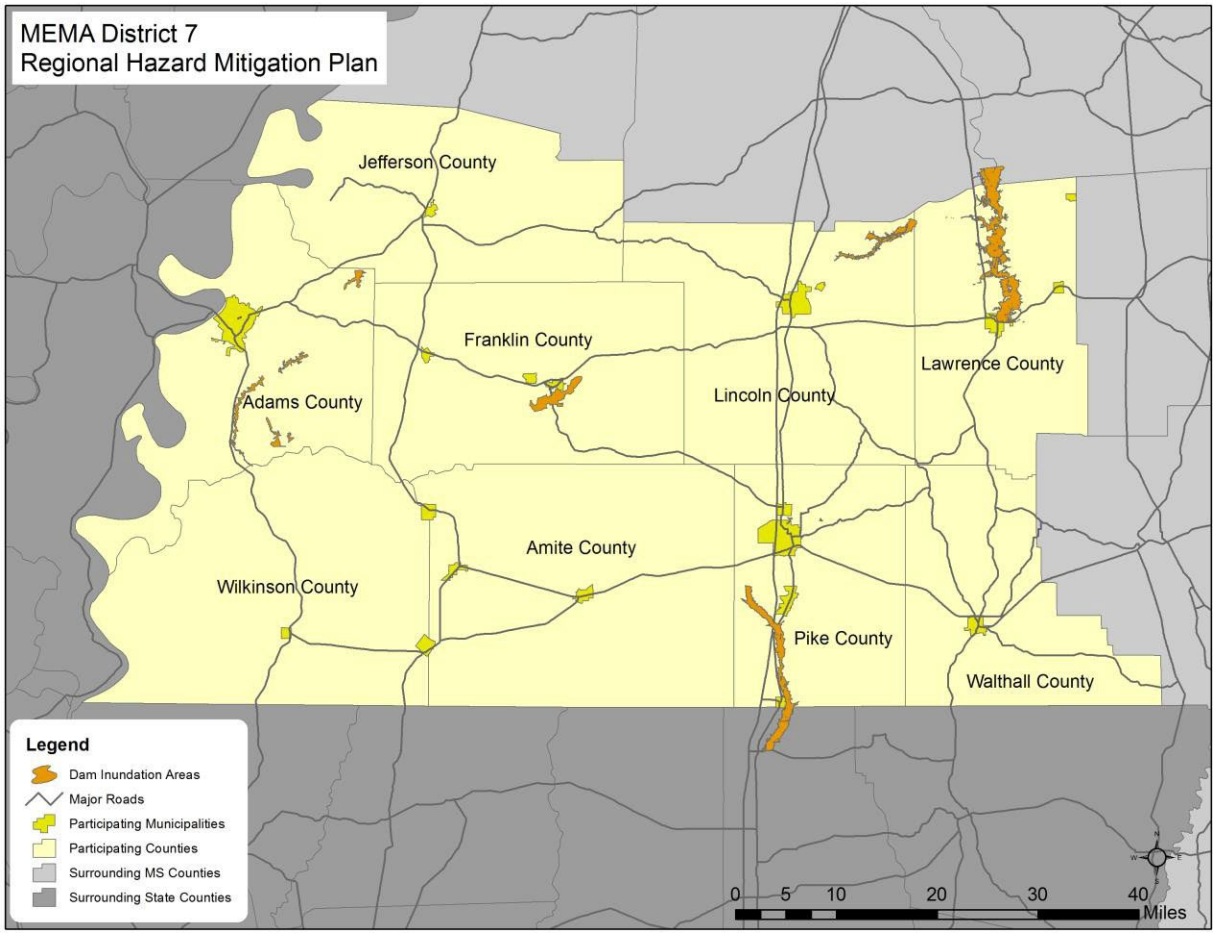


TABLE 5.2: MEMA DISTRICT 7 REGION HIGH HAZARD DAMS

Dam Name	Hazard Potential	Max Storage (ac/ft)	Dam Height (ft)
Adams County			
NATCHEZ STATE PARK DAM	High	5,671	70.0
ROBBINS LAKE DAM	High	886	32.0
SECOND CREEK WS STR NO. 12 DAM	High	1,630	31.0
SECOND CREEK WS STR NO. 6A DAM	High	3,087	53.0
SECOND CREEK WS STR NO. 6B DAM	High	4,155	52.0
SECOND CREEK WS STR NO. 7 DAM	High	9,925	52.0
Amite County			
NONE	*N/A*	*N/A*	*N/A*
Franklin County			
LAKE OKHISSA	High	44,065	98.0
Jefferson County			
NONE	*N/A*	*N/A*	*N/A*

[2] *Mississippi Department of Environmental Quality*

Dam Name	Hazard Potential	Max Storage (ac/ft)	Dam Height (ft)
Lawrence County			
ROSS BARNETT RESERVOIR DAM*	High	540,000	64.0
Lincoln County			
LAKE LINCOLN DAM	High	6,544	39.5
BAHALA CREEK WS STR 2 DAM	High	1,250	31.0
Pike County			
ICGRR RESERVOIR MCCOMB DAM	High	936	26.0
PERCY QUIN STATE PARK DAM	High	16,800	34.0
C.V. GLENNIS LAKE DAM	High	94	20.0
Walthall County			
NONE	*N/A*	*N/A*	*N/A*
Wilkinson County			
NONE	*N/A*	*N/A*	*N/A*

*Although not located within the region, inundation mapping indicates that a failure of this dam would potentially have impacts within Lawrence County.

Additionally, the Mississippi State Hazard Mitigation Plan provides some additional statewide information regarding populations that are located within two miles of a high or significant class dam and are potentially threatened by a dam failure. These areas are identified in the figure below**.**

HISTORICAL OCCURRENCES

According to the Mississippi State Hazard Mitigation Plan, there have been three dam failures reported in the MEMA District 7 Region, one in Adams County and two in Pike County. Although major damage was not reported with these events, several breach scenarios in the region could be catastrophic.

The table below provides a brief description of the three reported dam failures.

TABLE 5.3: MEMA DISTRICT 7 REGION DAM FAILURES (1982-2023)[3]

Date	County	Structure Name	Cause of Failure
January 2013	Adams	Robbins Lake Dam	Dam overtopped after a large rain event. Crest of dam was damaged, and a large hole scoured out along the edge of the crest.
August 2012	Pike	Percy Quinn	Large slides developed with seepage. Did not lead to uncontrolled release of pool.
September 2002	Pike	Lake Dixie Springs	Overtopping
April 1983	Adams	Robins Lake	Breached

PROBABILITY OF FUTURE OCCURRENCE

Given the current dam inventory and historic data, a dam breach is unlikely (less than 1 percent annual probability) in the future. As has been demonstrated in the past, regular monitoring is necessary to prevent these events. No further analysis will be completed in Section 6: *Vulnerability Assessment* as more sophisticated dam breach plans (typically completed by the U.S. Army Corp of Engineers) have been completed for dams of concern in the region. Each county has assessed their individual risks based on the information provided.

[3] *Mississippi Department of Environmental Quality*

FUTURE IMPACTS OF CLIMATE CHANGE

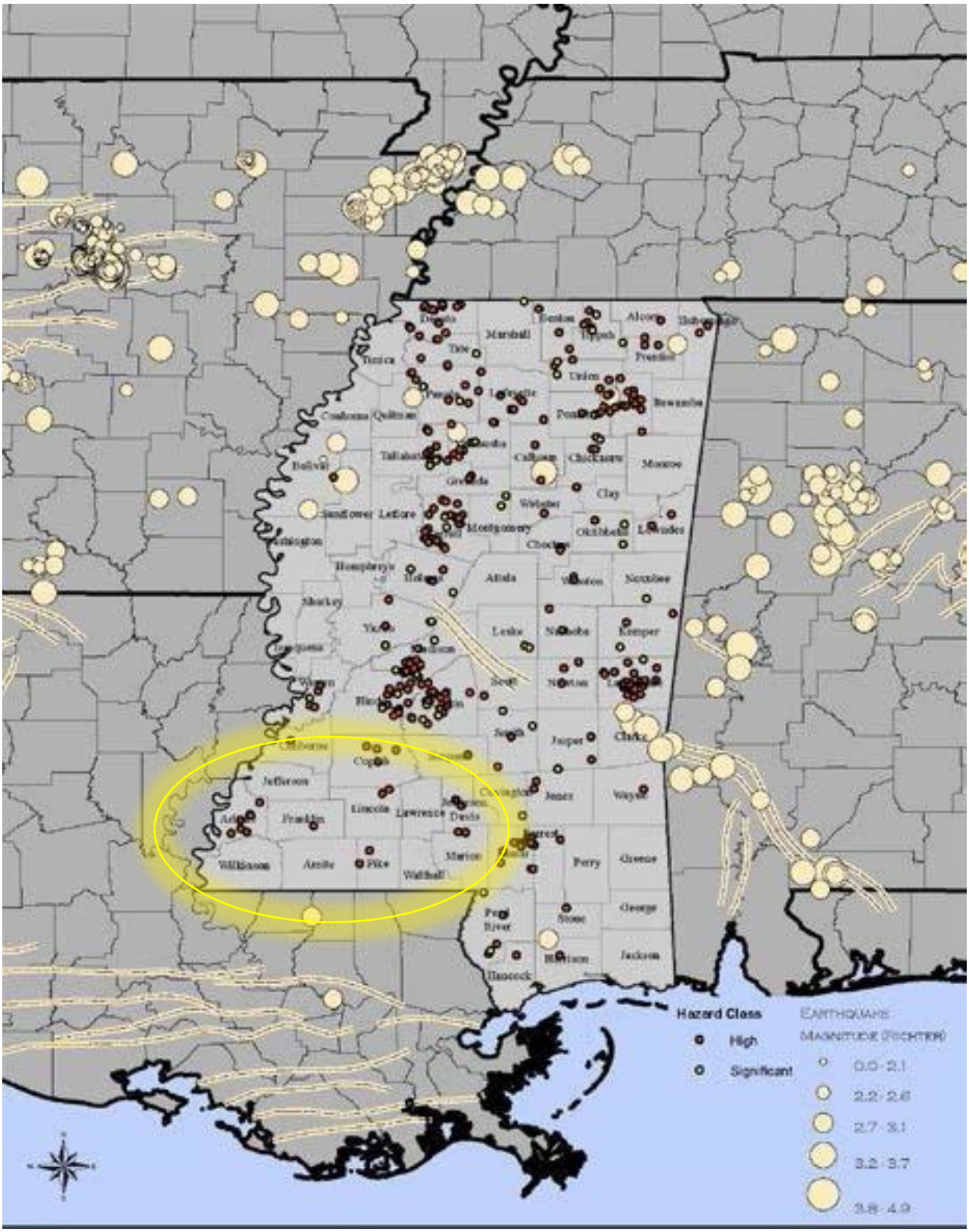
The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[4] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in the MEMA District 7 planning area. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[5]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop and will lead to increased strain on dam storage capacity.[6]

[4] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[5] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[6] Please note: there is no coastal flooding in Adams County.

FIGURE 5.4: SIGNIFICANT AND HIGH HAZARD DAM LOCATIONS



5.2.2 EROSION

BACKGROUND

Erosion is the gradual breakdown and movement of land due to both physical and chemical processes of water, wind, and general meteorological conditions. Natural, or geologic, erosion has occurred since the Earth's formation and continues at a very slow and uniform rate each year.

There are two types of soil erosion: wind erosion and water erosion. Wind erosion can cause significant soil loss. Winds blowing across sparsely vegetated or disturbed land can pick up soil particles and carry them through the air, thus displacing them. Water erosion, the hazard of topic here, can occur over land or in streams and channels. Water erosion that takes place over land may result from raindrops, shallow sheets of water flowing off the land, or shallow surface flow, which becomes concentrated in low spots. Stream channel erosion may occur as the volume and velocity of water flow increases enough to cause movement of the streambed and bank soils. Major storms, such hurricanes in coastal areas, may cause significant erosion by combining high winds with heavy surf and storm surge to significantly impact the shoreline, though MEMA District 7 is not a coastal region, so this type of erosion is not a threat.

An area's potential for erosion is determined by four factors: soil characteristics, vegetative cover, climate/rainfall, and topography. Soils composed of a large percentage of silt and fine sand are most susceptible to erosion. As the clay and organic content of these soils increases, the potential for erosion decreases. Well-drained and well-graded gravels and gravel-sand mixtures are the least likely to erode.

Coarse gravel soils are highly permeable and have a good capacity for absorption, which can prevent or delay the amount of surface runoff. Vegetative cover can be very helpful in controlling erosion by shielding the soil surface from falling rain, absorbing water from the soil, and slowing the velocity of runoff. Runoff is also affected by the topography of the area including size, shape, and slope. The greater the slope length and gradient, the more potential an area has for erosion. Climate can affect the amount of runoff, especially the frequency, intensity, and duration of rainfall and storms. When rainstorms are frequent, intense, or of long duration, erosion risks are high. Seasonal changes in temperature and rainfall amounts define the period of highest erosion risk of the year.

During the past 30 years, the importance of erosion control has gained the increased attention of the public. Implementation of erosion control measures consistent with sound agricultural and construction operations is needed to minimize the adverse effects associated with harmful chemical run-off due to wind or water events. The increase in government regulatory programs and public concern has resulted in a wide range of erosion control products, techniques, and analytical methodologies in the United States. The preferred method of erosion control in recent years has been the restoration of vegetation.

LOCATION AND SPATIAL EXTENT

Erosion in the MEMA District 7 Region is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in the MEMA District 7 Region are primarily rivers/streams and reservoirs. Generally, vegetation also helps to prevent erosion in the area, but in recent years, erosion has become a growing threat to many of the participating counties and jurisdictions.

At this time, there is no regional or state-level data available on localized areas of erosion, so it is a challenge to identify particularly prone areas on a wider geographic scale. However, a few areas of concern were reported by members of the hazard mitigation council and other local sources. Locations

along the Mississippi River in Adams, Jefferson, and Wilkinson Counties are known to be especially at-risk, but there are locations in many counties within the region where erosion is prominent.

For example, in Adams County, in Natchez, there have been several instances where abrupt erosion events caused property damage and loss of life due to the silt-like loess soil in the area. Some notable areas that were identified are along Martin Luther King Jr. Road[7] and along the railroad tracks near the Natchez-Adams County Port.[8]

HISTORICAL OCCURRENCES

Several sources were vetted to identify areas of erosion in the MEMA District 7 Region. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. Although the locations identified above are representative of areas where erosion has taken place in the past, it is also important to note significant events that had large impacts. One major historical erosion occurrence was reported in Natchez in 1980 when a severe and sudden erosion event sent a slide of mud and debris into a bar causing more than $100,000 in damage and two deaths. Retreat in some areas has been estimated at about 30 to 50 feet over the past 120 years.[9]

These incidents have caused major problems in MEMA District 7 as bridges have become damaged in many instances and made unsafe for emergency services vehicles to cross during and after storm events. This delays response times and critical life-safety support. In addition, the shutdown of roads has hurt local communities economically as trade and commerce are temporarily shut down as bridges are repaired. It has also caused disruption to daily activities for local school boards who must re-route buses around affected areas, causing additional fuel resources to be expended and increasing drive times for students.

PROBABILITY OF FUTURE OCCURRENCES

Erosion remains a natural, dynamic, and continuous process for the MEMA District 7 Region, and it will continue to occur. The annual probability level assigned for erosion is likely (between 10 and 100 percent annually). Given the lack of large-scale spatial data, no further analysis will be done in Section 6: *Vulnerability Assessment*.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[10] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Adams County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[11]. As more water vapor is evaporated into the atmosphere, it will

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[7] *Madden, Cain. County watches erosion near MLK closely. The Natchez Democrat. February 13, 2017. http://www.natchezdemocrat.com/2017/02/13/county-watches-erosion-near-mlk-closely/*

[8] *Hogan, Vershal. Riverbank erosion threatens rail line. The Natchez Democrat. May 1, 2014. http://www.natchezdemocrat.com/2014/05/01/riverbank-erosion-threatens-rail-line/*

[9] *Treadwell, David. Erosion Imperils Old Mississippi Mansions. Los Angeles Times. June 9, 1985. http://articles.latimes.com/1985-06-09/news/mn-9849_1_erosion-problems*

[10] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[11] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

become fuel for more frequent and more powerful storms to develop and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones. Both additional moisture and drying conditions can impact the rate of erosion, either by increasing the sediment transfer load due to volume and rate of flooding, or by dehydrating soils, limiting compaction, and increasing wind related erosion events.

5.2.3 FLOOD

BACKGROUND

Flooding is the most frequent and costly natural hazard in the United States and is a hazard that has caused more than 10,000 deaths since 1900. Nearly 90 percent of presidential disaster declarations result from natural events where flooding was a component.

Floods generally result from excessive precipitation and can be classified under two categories: general floods, precipitation over a given river basin for a long period of time along with possible storm-induced wave action, and flash floods, the product of heavy localized precipitation in a short time period over a given location. The severity of a flooding event is typically determined by a combination of several major factors, including stream and river basin topography and physiography, precipitation and weather patterns, recent soil moisture conditions, and the degree of vegetative clearing and impervious surface.

General floods are usually long-term events that may last for several days. The primary types of general flooding include riverine, coastal, and urban flooding. Riverine flooding is a function of excessive precipitation levels and water runoff volumes within the watershed of a stream or river. Coastal flooding is typically a result of storm surge, wind-driven waves, and heavy rainfall produced by hurricanes, tropical storms, and other large coastal storms. Urban flooding occurs where manmade development has obstructed the natural flow of water and decreased the ability of natural groundcover to absorb and retain surface water runoff.

Flash flooding is another type of flooding that can be associated with urban flooding. It is common in urbanized areas where much of the ground is covered by impervious surfaces. Most flash flooding occurs along mountain streams and is caused by slow-moving thunderstorms in a local area or by heavy rains associated with hurricanes and tropical storms. However, flash-flooding events may also occur from a dam or levee failure within minutes or hours of heavy amounts of rainfall, or from a sudden release of water held by retention basin or other stormwater control facility.

The periodic flooding of lands adjacent to rivers, streams, and shorelines (land known as floodplain) is a natural and inevitable occurrence that can be expected to take place based upon established recurrence intervals. Floodplains are designated by the frequency of the flood that is large enough to cover them. For example, the 10-year floodplain will be covered by the 100-year flood and the 100-year floodplain by the 1,000-year flood. Flood frequencies such as the 100-year flood are determined by plotting a graph of the size of all known floods for an area and determining how often floods of a particular size occur. Another way of expressing the flood frequency is the chance of occurrence in a given year, which is the percentage of the probability of flooding each year. For example, the 100-year flood has a 1-percent annual chance of occurring in any given year, and the 500-year flood has a 0.2-percent annual chance of occurring in any given year.

LOCATION AND SPATIAL EXTENT

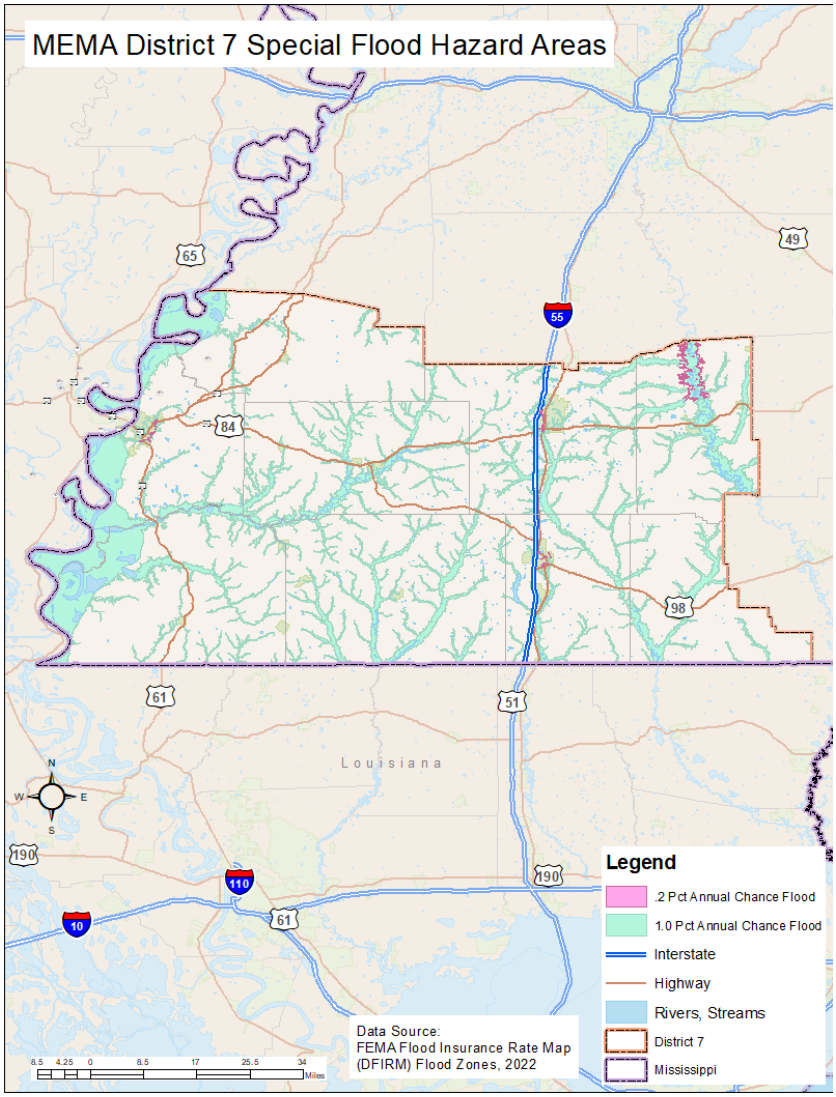
There are areas in the MEMA District 7 Region that are susceptible to flood events. Special flood hazard areas in the region were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM). This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevations), and Zone X-500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 4,835 square miles that make up the MEMA District 7 Region, there are approximately 767.19 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 2.99 square miles of land in zone X-500 (0.2 percent annual chance floodplain/500-year floodplain). The county totals are presented below.

TABLE 5.4: SUMMARY OF FLOODPLAIN AREAS IN THE MEMA DISTRICT 7 REGION

Location (DFIRM date)	1.0 percent ACF area (square miles)	0.2 percent ACF area (square miles)
Adams County (2011)	169.77	0.04
Amite County (2010)	85.85	0.00
Franklin County (2010)	70.39	0.00
Jefferson County (2010)	67.77	<0.01
Lawrence County (2011)	89.92	2.72
Lincoln County (2010)	60.42	0.04
Pike County (2010)	33.52	0.19
Walthall County (2019)	40.10	0.00
Wilkinson County (2010)	149.45	0.00
MEMA DISTRICT 7 REGION TOTAL	**767.19**	**2.99**

These flood zone values account for approximately 15.9 percent of the total area in the MEMA District 7 Region (in the counties with available digital data). It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. The figure below illustrates the location and extent of currently mapped special flood hazard areas for the region based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data. Detailed county-level maps can be found in the annexes.

FIGURE 5.5: SPECIAL FLOOD HAZARD AREAS IN MEMA DISTRICT 7 REGION



HISTORICAL OCCURRENCES

Floods were at least partially responsible for nearly all 32 disaster declarations in the MEMA District 7 Region between 1971 and 2022[12], outside of the Covid-19 Pandemic. Information from the National Climatic Data Center was used to ascertain additional historical flood events. The National Climatic Data Center reported a total of 177 events throughout the MEMA District 7 Region since 1997.[13] A summary of these events is presented below.[7] Specific information on flood events for each county, including date, type of flooding, and deaths and injuries, can be found in the county-specific annexes.

[12] *Not all of the participating counties were declared disaster areas for these events. A complete listing of historical disaster declarations, including the affected counties, can be found in Section 4: Hazard Identification.*

[13] *Flood events are inclusive of reports by the National Climatic Data Center (NCDC) from 1996 through February 2023. It is likely that additional occurrences have occurred or are unreported. As additional local data becomes available, this hazard profile will be amended.*

TABLE 5.5: SUMMARY OF FLOOD OCCURRENCES IN THE MEMA DISTRICT 7 REGION

Location	Number of Occurrences	Deaths/Injuries	Property Damage (2023)	Annualized Property Losses
Adams County	41	0/0	$4,230,000	$169,200
Amite County	7	0/0	$690,000	$34,500
Franklin County	29	0/0	$2,860,000	$119,166
Jefferson County	18	0/0	$3,865,000	$154,600
Lawrence County	32	0/0	$2,360,000	$94,400
Lincoln County	43	0/0	$6,794,000	$323,524
Pike County	14	0/0	$1,037,130	$297,705
Walthall County	8	0/0	$1,260,000	$50,400
Wilkinson County	11	1/0	$7,265,000	$279,423
MEMA DISTRICT 7 REGIONAL TOTAL	203	1/0	$30,361,130	$1,522,918

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Flood Insurance Management Agency (FIMA) Flood Insurance Data Analytics, since 2019 Mississippi has had 47 floods of record with 22 closed with payment, 19 closed without payment, and 6 remaining open. A total of $545,506 has been made in payments. This FEMA dataset is the authoritative source for FEMA's public data. This product uses the Federal Emergency Management Agency's API but is not endorsed by FEMA. FEMA cannot verify the quality and/or timeliness of any data or any analysis derived there from after the data has been retrieved from FEMA.gov. This data set was last accessed on July 2, 2023, with records updated at most every 20 minutes or at least monthly, processed the first Saturday of the month at 1:00am EST.

According to FEMA flood insurance policy records as of July 2, 2023, there were, there have been 2,085 flood losses reported in the MEMA District 7 Region through the National Flood Insurance Program (NFIP) since 1978, totaling over $29.4 million in claims payments. A summary of these figures can be found in each county annex. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought. It is likely that many additional instances of flood loss in the MEMA District 7 Region were either uninsured or not reported.

TABLE 5.6 SUMMARY OF INSURED FLOOD LOSSES IN MEMA DISTRICT 7

Location	Current Number of Policies	Flood Losses	Claims Payments
ADAMS COUNTY	29	48	$356,923.70
Natchez	29	10	$137,199.98
Unincorporated Area	0	38	$219723.72
AMITE COUNTY	0	0	$0
Gloster	0	0	$0
Liberty	0	0	$0
Unincorporated Area	0	0	$0
FRANKLIN COUNTY	0	0	$0
Bude	0	0	$0
Meadville	0	0	$0

Roxie	0	0	$0
Unincorporated Area	0	0	$0
JEFFERSON COUNTY	1	28	$364,656.32
Fayette	0	0	$0.00
Unincorporated Area	1	28	$364,656.32
LAWRENCE COUNTY	6	9	$165,019.31
Monticello	0	0	$0
New Hebron	0	0	$0
Silver Creek	0	0	$0
Unincorporated Area	6	9	$165,019.31
LINCOLN COUNTY	58	2	$53,076.97
Brookhaven	58	2	$53,076.97
Unincorporated Area*	--	--	--
PIKE COUNTY	24	52	$2,411,206.19
Magnolia	1	0	$0
McComb	4	8	$22,935.97
Osyka	0	0	$0
Summit*	--	--	--
Unincorporated Area	19	44	$2,388,270.22
WALTHALL COUNTY	22	111	$1,389,099.17
Tylertown	5	50	$533,091.91
Unincorporated Area	17	61	$856,007.26
WILKINSON COUNTY	5	299	$6,973,799.08
Centreville*	NSFHA*	--	--
Crosby	0	1	$11,028.89
Woodville	0	0	$0
Unincorporated Area	5	298	$6,962,770.19
TOTAL	**145**	**549**	**$11,713,780.74**

*This community does not participate in the NFIP. Therefore, no values are reported.

TABLE 5.7 PEAK DISCHARGE AND HISTORIC CREST HEIGHTS[14]

Location/ Jurisdiction	Date	Maximum Historic Crest (ft)	Peak Discharge (cfs)	Flood Categories			
				Action Stage (ft)	Flood Stage (ft)	Moderate Flood Stage (ft)	Major Flood Stage (ft)
Adams County							
St. Catherine Creek near Natchez	5/17/1953	33.80	31,000	NA	NA	NA	NA
Spanish Bayou at Natchez	10/12/1970	15.12	1,990	NA	NA	NA	NA
Homochitto River near Kingston	4/2/1947	26.39	45,400	NA	NA	NA	NA
Second Creek at Sibley	5/3/1953	13.70	22,500	NA	NA	NA	NA
Homochitto River near Doloroso	5/19/1953	33.00	134,000*	NA	NA	NA	NA
Mississippi River at Natchez	5/19/2011	61.95	NA	38	48	51	57

[14] Table represents data from the 2017 planning process. Data could not be validated nor updated for the 2023 planning process.

Amite County							
Stock Pond Draw near Liberty	10/16/1975	8.26	443	NA	NA	NA	NA
East Fork Amite River near Peoria	1/25/1990	21.10	34,000	NA	NA	NA	NA
Tanyard Creek at Liberty	4/13/1955	94.31	8,000	NA	NA	NA	NA
Crs Draw near Liberty	6/8/1975	11.81	993	NA	NA	NA	NA
Franklin County							
Homochitto River at Eddiceton	5/13/1990	21.06	55,400*	NA	NA	NA	NA
McCall Creek near Lucien	4/13/1974	92.70	23,000	NA	NA	NA	NA
Beaver Run near McCall Creek	4/13/1974	10.85	1,220	NA	NA	NA	NA
South Fork Coles Creek near Church Hill	3/2/2001	29.05	22,500	NA	NA	NA	NA
Coles Creek near Fayette	4/12/1974	31.96	75,000	NA	NA	NA	NA
Lawrence County							
Bahala Creek near Oma	4/12/1974	25.78	40,000	NA	NA	NA	NA
Small Pine Ditch near Monticello	3/24/1973	8.24	281	NA	NA	NA	NA
Pearl River near Monticello	4/20/1979	34.08	122,000	21	22	25	33
Roadside Park Ditch near Monticello	4/12/1974	7.06	289	NA	NA	NA	NA
New Hebron Gulley at New Hebron	4/12/1974	17.05	2,650	NA	NA	NA	NA
Silver Creek at Silver Creek	8/30/2012	17.55	20,500	NA	NA	NA	NA
Whitesand Creek near Oakvale	4/13/1974	18.76	25,400	NA	NA	NA	NA
Lincoln County							
Bogue Chitto near Brookhaven	10/4/1964	19.33	9,000*	NA	NA	NA	NA
Big Creek at Bogue Chitto	10/4/1964	27.40	13,700	NA	NA	NA	NA
Dry Draw near Brookhaven	4/12/1955	10.18	460	NA	NA	NA	NA
Pike County							
Bogue Chitto near Pricedale	12/XX/1919	53.60	70,000	NA	NA	NA	NA
Bogue Chitto near Tylertown	1/7/1950	33.50	45,700	14	15	17	23
Tangipahoa River Tributary near McComb	3/24/1973	10.23	1,460	NA	NA	NA	NA
Little Tangipahoa River at Magnolia	10/4/1964	22.22	7,600	NA	NA	NA	NA

Tangipahoa River at Osyka	4/28/1997	18.66	31,000	14	15	20	25
Walthall County							
Middle Fork Hickory Flat near Tylertown	8/22/1953	13.95	2,300	NA	NA	NA	NA
Union Creek near Tylertown	8/22/1953	19.20	12,800	NA	NA	NA	NA
McGees Creek at Tylertown	4/7/1983	31.38	30,000	NA	NA	NA	NA
Wilkinson County							
Observers Draw near Doloroso	3/17/1961	10.10	418	NA	NA	NA	NA
Buffalo River near Woodville	3/25/1973	22.30	65,000	NA	NA	NA	NA
Moores Branch near Woodville	3/24/1973	9.90	455	NA	NA	NA	NA

REPETITIVE LOSS PROPERTIES

FEMA defines a repetitive loss property as any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period, since 1978. A repetitive loss property may or may not be currently insured by the NFIP. Currently there are over 140,000 repetitive loss properties nationwide.

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Mississippi Emergency Management Agency in 2017, there are 180 non-mitigated repetitive loss properties located in the MEMA District 7 Region, which accounted for 474 losses and almost $6.2 million in claims payments under the NFIP. The average claim amount for these properties is $13,059. Of the 180 properties, 6 are multi-family, 168 are single family, and the remaining 6 are non-residential. Without mitigation, these properties will likely continue to experience flood losses. The table below presents a summary of these figures for the MEMA District 7 Region. Detailed information on repetitive loss properties and NFIP claims and policies can be found in the county-specific annexes.

TABLE 5.8: SUMMARY OF REPETITIVE LOSS PROPERTIES IN THE MEMA DISTRICT 7 REGION

Location	Number of Properties	Number of Losses	Total Payments
Adams County	29	72	$957,183.09
Amite County	3	8	$106,207.80
Franklin County	1	3	$18,268.81
Jefferson County	12	40	$459,064.65
Lawrence County	4	19	$378,751.10
Lincoln County	6	15	$681,137.34
Pike County	19	61	$2,813,437.30
Walthall County	27	62	$1,163,333.04
Wilkinson County	28	65	$1,270,245.98
Total	**129**	**345**	**$7,847,629.11**

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in the MEMA District 7 Region, and the probability of future occurrences will remain highly likely (100 percent annual probability). The probability of future flood events based on magnitude and according to best available data is illustrated in the figures above**,** which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain).

It can be inferred from the floodplain location maps, previous occurrences, and repetitive loss properties that risk varies throughout the region. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted, particularly for repetitive loss properties.

FIRE-RELATED HAZARDS

5.2.4 DROUGHT

BACKGROUND

Drought is a normal part of virtually all climatic regions, including areas with high and low average rainfall. Drought is the consequence of a natural reduction in the amount of precipitation expected over an extended period of time, usually a season or more in length. High temperatures, high winds, and low humidity can exacerbate drought conditions. In addition, human actions and demands for water resources can hasten drought-related impacts. Droughts may also lead to more severe wildfires.

Droughts are typically classified into one of four types: 1) meteorological, 2) hydrologic, 3) agricultural, or 4) socioeconomic. The table below presents definitions for these types of drought.

TABLE 5.9 DROUGHT CLASSIFICATION DEFINITIONS

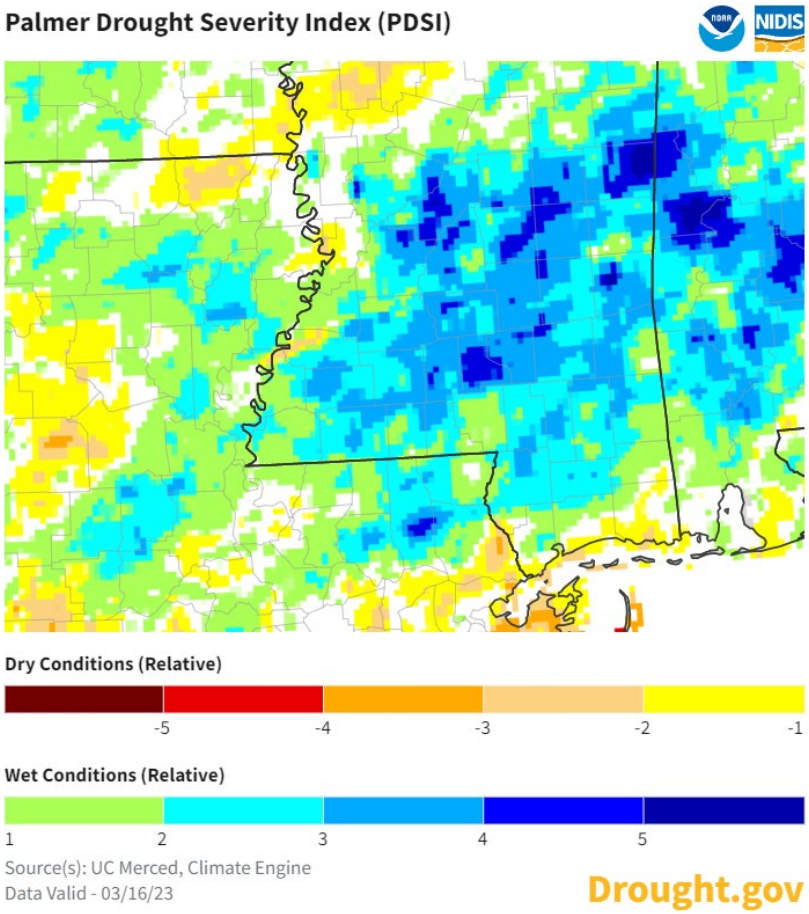
Meteorological Drought	The degree of dryness or departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
Hydrologic Drought	The effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
Agricultural Drought	Soil moisture deficiencies relative to water demands of plant life, usually crops.
Socioeconomic Drought	The effect of demands for water exceeding the supply as a result of a weather-related supply shortfall.

Source: Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy, FEMA

Droughts are slow-onset hazards, but over time can have very damaging affects to crops, municipal water supplies, recreational uses, and wildlife. If drought conditions extend over a number of years, the direct and indirect economic impact can be significant.

The Palmer Drought Severity Index (PDSI) is based on observed drought conditions and range from -0.5 (incipient dry spell) to -4.0 (extreme drought). Evident below, the Palmer Drought Severity Index Summary Map, drought affects most areas of the United States, but is less severe in the Eastern and Southeastern United States.

FIGURE 5.6: PALMER DROUGHT SEVERITY INDEX MAP



The U.S. Drought Monitor also records information on historical drought occurrence. The U.S. Drought Monitor categorizes drought on a D0-D4 scale, shown below, presents definitions for these classifications.

TABLE 5.10 U.S. DROUGHT MONITOR

D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies

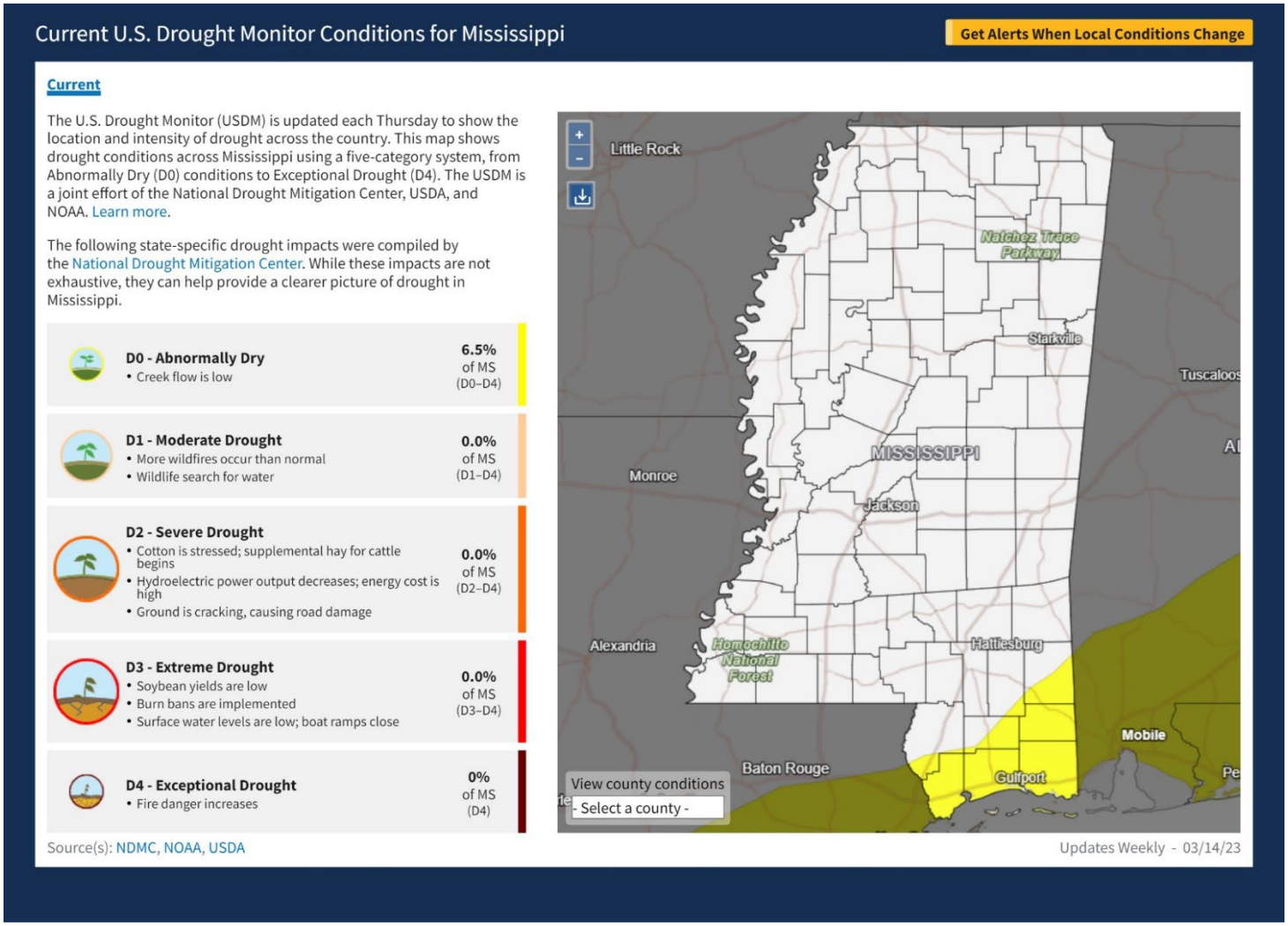
Source: United States Drought Monitor, http://droughtmonitor.unl.edu/classify.htm

LOCATION AND SPATIAL EXTENT

Drought typically covers a large area and cannot be confined to any geographic or political boundaries. Furthermore, it is assumed that the MEMA District 7 Region would be uniformly exposed to drought,

making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage directly to the built environment but may exacerbate wildfire conditions.

FIGURE 5.7: CURRENT US DROUGHT MONITOR



HISTORICAL OCCURRENCES

Data from the U.S. Drought Monitor and National Climatic Data Center (NCDC) were used to ascertain historical drought events in the MEMA District 7 Region. The U.S. Drought Monitor reports data at the county level on a weekly basis throughout the county. It classifies drought conditions on a scale of D0 to D4, as described in above.

According to the U.S. Drought Monitor, on average, the counties in the MEMA District 7 Region had drought levels of Severe or worse in at least 12 of the last 17 years (January 2000-March 2023). The most severe drought classification reported for each year, according to U.S. Drought Monitor classifications, is listed in the county-specific annexes. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional, but a majority of the county may actually be in a less severe condition.

Some additional anecdotal information was provided from the National Climatic Data Center on droughts in the MEMA District 7 Region.

Summer 2000 Drought–drought conditions were pronounced throughout much of the south and western areas of the nation.

Summer to Fall 2006 – During a four and a half month period, from June to the middle of October, abnormally dry conditions prevailed across most of the Jackson, MS County Warning Area (CWA). Widespread drought conditions were reported across the area during this time period. The U.S. Drought Monitor classified the drought as extreme (D3) over Southeast Mississippi. Drought conditions in the region peaked in intensity during early August over this area.

Summer 2007 – During the month of June, the drought peaked across the region. It held firm across the same areas since May with no expansion. What did expand was the severity as by the end of June, most of Central and East-Central Mississippi was now in extreme drought (D3) with some locations across Northeast Mississippi now experiencing exceptional drought (D4). The month of June did not offer much rain as most of the forecast area saw less than 40% of the normal rainfall.

Summer to Fall 2010 – Very dry conditions continued across central Mississippi during most of October. There were some rains that came late in the month which provided some temporary relief. Rainfall amounts ranged from a half to two inches with locally higher amounts. Most locations were 1 to 3 inches below normal for the month. The dry stretch resulted in severe (D2) drought conditions to expand during the month with even the portions of extreme (D3) drought conditions expanding as well. Crops were put under stress under the warm and dry conditions.

Fall 2015 – The very dry conditions continued across Central Mississippi in October. The extended dry stretch resulted in an area of Severe (D2) drought developing across the area by October 6th. The drought intensified and Extreme (D3) drought conditions developed by October 13th. Approximately 25 to 50 percent of normal rainfall occurred across this area from August into mid-October. Crops were put under more stress from the dry and hot conditions.

Fall to Winter 2016 – Dry conditions continued into November, which created continued stress on crops. The drought continued to get worse across the state through the month before some relief came in the form of showers and thunderstorms near the end of November.

Fall 2021 through 2022 – Severe drought conditions persisted throughout the state, beginning in December 2021 and continuing through the calendar year 2022. Conditions escalated to extreme drought from January to March, before resolving In December. Throughout this period many counties also experienced flooding events indicating that while rainfall is still occurring, the shorter, more intense bursts do not resolve the drought conditions that softer more steady rainfall would address. The beginning of 2023 has seen increased rainfall and a lightening of drought conditions overall.

PROBABILITY OF FUTURE OCCURRENCES

According to the Palmer Drought Severity Index, MEMA District 7 has a probability level of possible (between 1 and 10 percent annual probability) for future drought events. However, local areas may experience much more severe and/or frequent drought events than what is represented on the Palmer Drought Severity Index map.

Based on historical occurrence information, it is assumed that all of the MEMA District 7 Region has a probability level of possible (between 1 and 10 percent annual probability) for future drought events. However, the extent (or magnitude) of drought and the amount of geographic area covered by drought, varies with each year. Historic information indicates that there is a much lower probability for extreme, long-lasting drought conditions.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[15] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in the MEMA District 7 planning area. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of extreme heat events[16]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

5.2.5 LIGHTNING

BACKGROUND

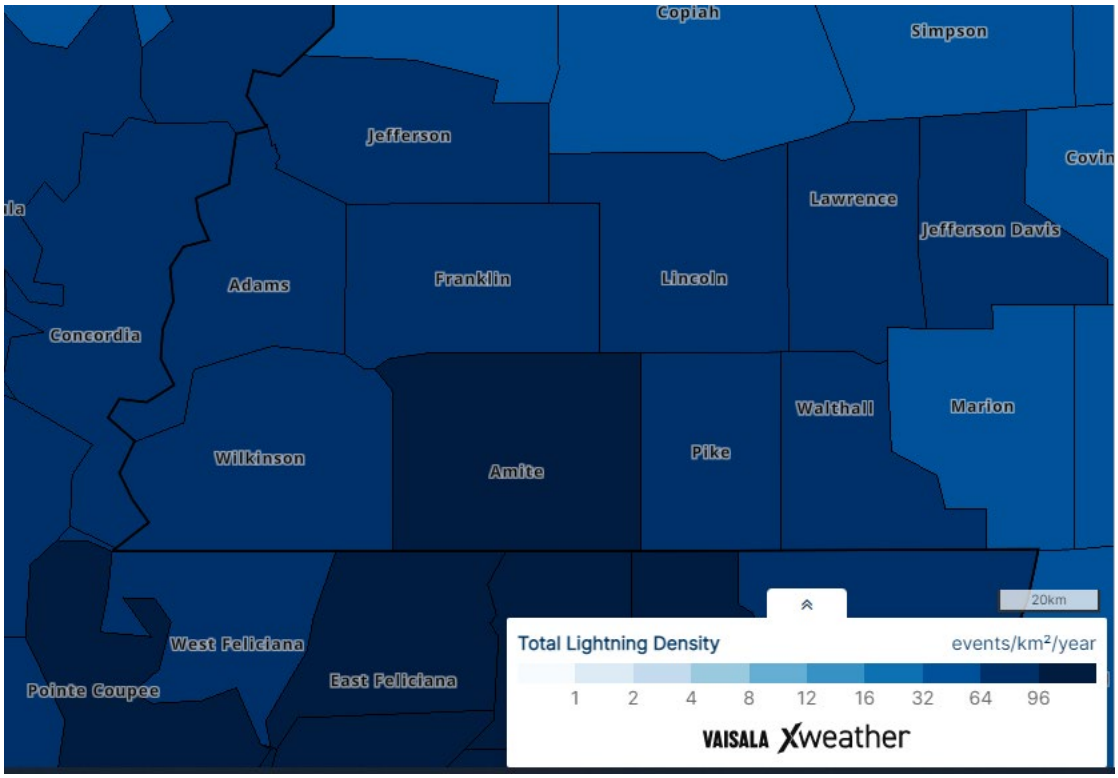
Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a "bolt" when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes the thunder which often accompanies lightning strikes. While most often affiliated with severe thunderstorms, lightning may also strike outside of heavy rain and might occur as far as 10 miles away from any rainfall.

Lightning strikes occur in very small, localized areas. For example, they may strike a building, electrical transformer, or even a person. According to the CDC, from 2006 through 2022, there were 444 lightning strike deaths in the United States. Direct lightning strikes also have the ability to cause significant damage to buildings, critical facilities, and infrastructure largely by igniting a fire. Lightning is also responsible for igniting wildfires that can result in widespread damages to property. Below is a snip from Vaisala's Interactive Global Lightning Density Map showing the average number of lightning events per km2 per year. More specific lightning data is not available without payment Vaisala as the data has become proprietary.

[15] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[16] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

FIGURE 5.8: LIGHTNING DENSITY MAP (2023)



LOCATION AND SPATIAL EXTENT

Lightning occurs randomly; therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of the MEMA District 7 Region is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

According to the National Climatic Data Center, there have been a total of 26 recorded lightning events in the MEMA District 7 Region since 1997.[8] These events resulted in nearly $800,000 (2017 dollars) in damages, as listed in summary in each annex. According to the CDC, there have been 9 lighting related fatalities in Mississippi between 2006-2021. This report is an increase from the two fatalities and three reported injuries documented in the last MEMA District 7 Region update. Detailed information on historical lightning events can be found in the county-specific annexes. It is certain that more than 26 lighting strikes have impacted the region. Many of the reported events are those that caused damage, and it should be expected that damages are likely much higher for this hazard than what is reported.

PROBABILITY OF FUTURE OCCURRENCES

Although there was not a high number of historical lightning events reported throughout the MEMA District 7 Region via NCDC data, it is a regular occurrence accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though all events will not cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN), the MEMA District 7 Region is located in an area of the country that experienced an average of 12 to 28 lightning flashes per square mile per year. While additional data is harder to collect due to proprietary restrictions imposed by the Vaisala since the last plan update, we can assume that lighting will continue to pose a threat. Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the

region.

5.2.6 WILDFIRE

BACKGROUND

A wildfire is any outdoor fire (i.e. grassland, forest, brush land) that is not under control, supervised, or prescribed.[10] Wildfires are part of the natural management of forest ecosystems, but may also be caused by human factors.

Nationally, over 80 percent of forest fires are started by negligent human behavior such as smoking in wooded areas or improperly extinguishing campfires. The second most common cause for wildfire is lightning. In Mississippi, a majority of fires are caused by debris burning.

There are three classes of wildland fires: surface fire, ground fire, and crown fire. A surface fire is the most common of these three classes and burns along the floor of a forest, moving slowly and killing or damaging trees. A ground fire (muck fire) is usually started by lightning or human carelessness and burns on or below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees. Wildfires are usually signaled by dense smoke that fills the area for miles around.

Wildfire probability depends on local weather conditions, outdoor activities such as camping, debris burning, construction, and the degree of public cooperation with fire prevention measures. Drought conditions and other natural hazards (such as tornadoes, hurricanes, etc.) increase the probability of wildfires by producing fuel in both urban and rural settings.

Many individual homes and cabins, subdivisions, resorts, recreational areas, organizational camps, businesses, and industries are located within high wildfire hazard areas. Furthermore, the increasing demand for outdoor recreation places more people in wildlands during holidays, weekends, and vacation periods. Unfortunately, wildland residents and visitors are rarely educated or prepared for wildfire events that can sweep through the brush and timber and destroy property within minutes.

Wildfires can result in severe economic losses as well. Businesses that depend on timber, such as paper mills and lumber companies, experience losses that are often passed along to consumers through higher prices and sometimes jobs are lost. The high cost of responding to and recovering from wildfires can deplete state resources and increase insurance rates. The economic impact of wildfires can also be felt in the tourism industry if roads and tourist attractions are closed due to health and safety concerns.

State and local governments can impose fire safety regulations on home sites and developments to help curb wildfire. Land treatment measures such as fire access roads, water storage, helipads, safety zones, buffers, firebreaks, fuel breaks, and fuel management can be designed as part of an overall fire defense system to aid in fire control. Fuel management, prescribed burning, and cooperative land management planning can also be encouraged to reduce fire hazards.

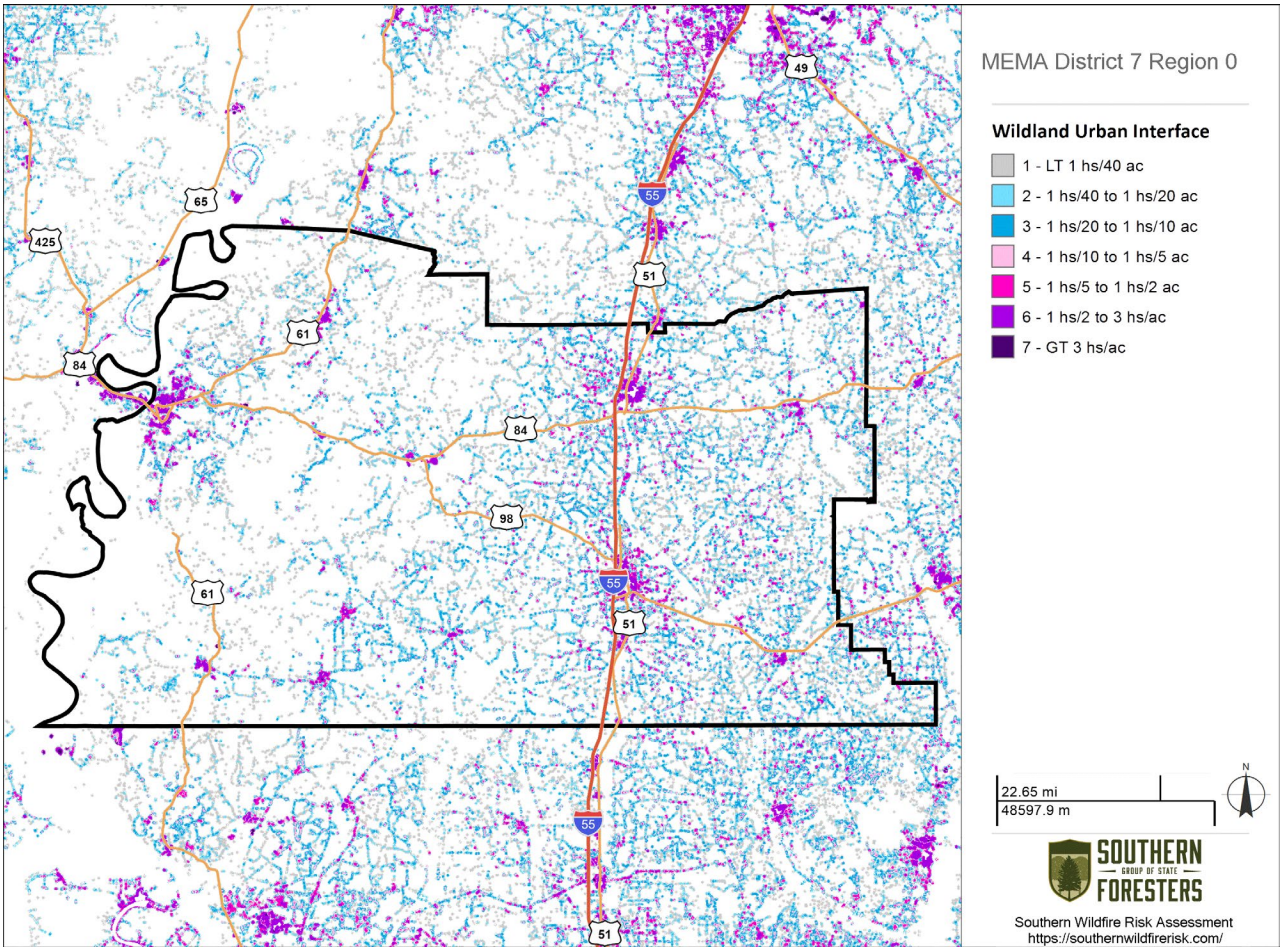
LOCATION AND SPATIAL EXTENT

The entire region is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the wildland-urban interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas. The Wildfire Ignition Density data shown in the figure below give an indication of

historic location.

The Wildland Urban Interface is the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire. For the MEMA District 7 Region project area, it is estimated that 167,199 people or 95.7 % percent of the total project area population (174,765) live within the WUI.

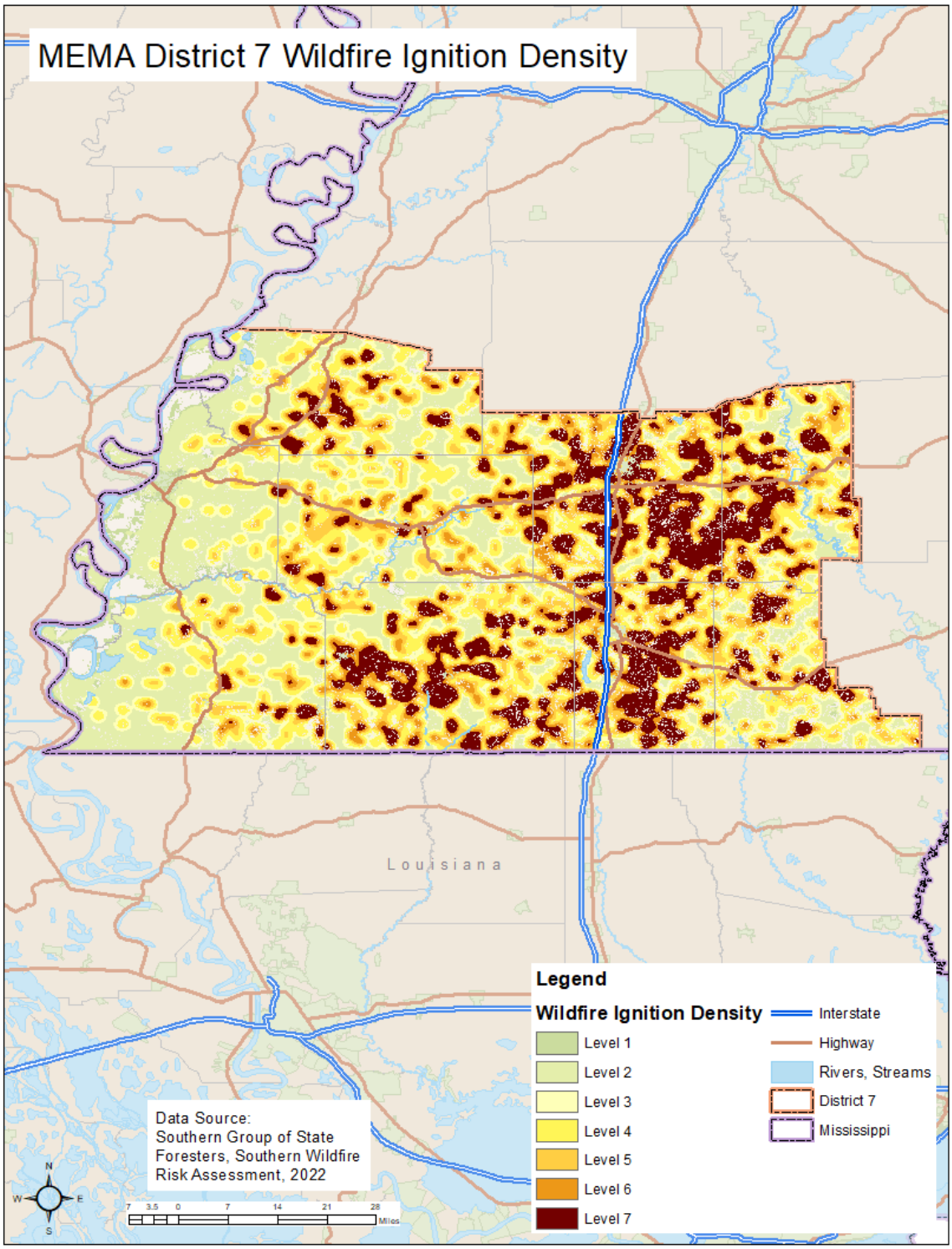
FIGURE 5.9: WILDLAND URBAN INTERFACE



HISTORICAL OCCURRENCES

The figure below shows the Wildfire Ignition Density in the MEMA District 7 Region based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and the likelihood of a wildfire igniting in an area. Occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map. This is measured in the number of fires per year per 1,000 acres.[11]

FIGURE 5.10: WILDFIRE IGNITION DENSITY IN THE MEMA DISTRICT 7 REGION



Based on data from the Mississippi Forestry Commission from 2015 to 2022, the MEMA District 7 Region experienced an average of 229.5 wildfires annually which burned a combined 2,928.9 acres per year. The Mississippi Forestry Commission reports that in state fiscal year 2021 alone they responded to and

suppressed 922 wildfires that burned 19,251 acres in FY21. FEMA's Fire Incidents for States and Counties tracing incidents through the National Fire Incident Reporting System states that the MEMA District 7 Region reported responding to 5,644 fires between 2015 and 2019, per best available data. The data indicate that most of these fires were small to moderate in size, averaging about 12.8 acres per fire. The number of reported wildfire occurrences in the participating counties between is listed in the county-specific annexes.

TABLE 5.11: AVERAGE WILDFIRE OCCURRENCES PER YEAR (2015-2022)[17]

	Adams	Amite	Franklin	Jefferson	Lawrence	Lincoln	Pike	Walthall	Wilkinson
Average # of Fires	0.87	24.125	7.125	6.62	17.75	25.63	14	16.13	3.125
Average # Acres Burned per year	11.625	461	234	108.5	222.75	333.25	207.25	242.63	62.125
Average # Acres Burned Per Fire	39.42	15.9	25.83	15.45	9.2	11.17	13.2	17.2	15.6625

	Average for MEMA District 7
Average # of Fires	12.8194
Average # Acres Burned per year	209.237
Average # Acres Burned Per Fire	18.1147

PROBABILITY OF FUTURE OCCURRENCES

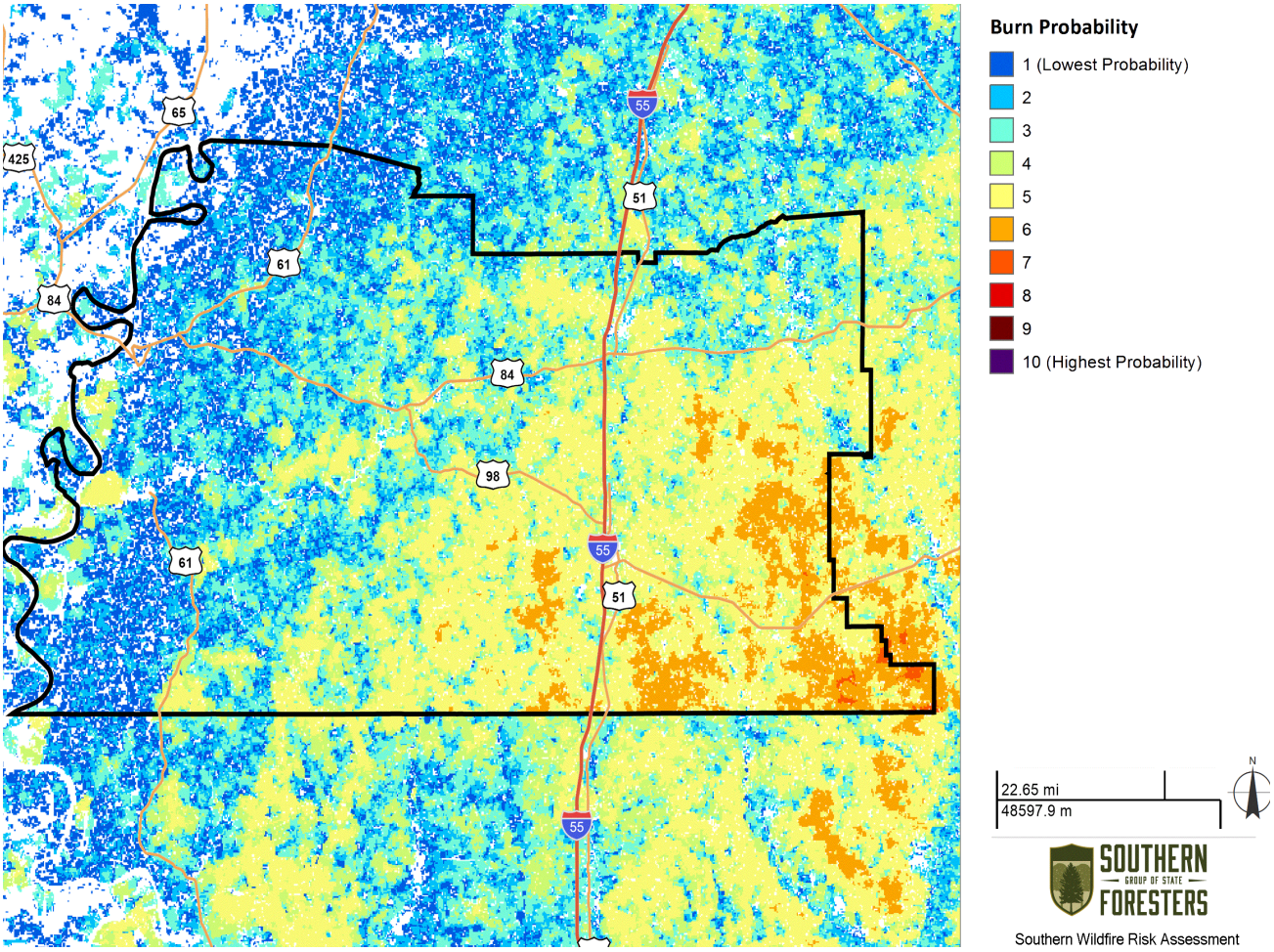
Wildfire events will be an ongoing occurrence in the MEMA District 7 Region. The figure below shows that there is some probability a wildfire will occur throughout the region. However, the likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small in size but could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the wildland-urban boundary. The risk will also vary due to assets. Areas in the wildland-urban interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to the MEMA District 7 Region for future wildfire events is highly likely (100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

[17] *Mississippi Forestry Commission – 2015 - 2022*

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[18] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in the MEMA District 7 planning area. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency wildfire events.[19]

FIGURE 5.11: BURN PROBABILITY IN THE MEMA DISTRICT 7 REGION



[18] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[19] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

GEOLOGIC HAZARDS

5.2.7 EARTHQUAKE

BACKGROUND

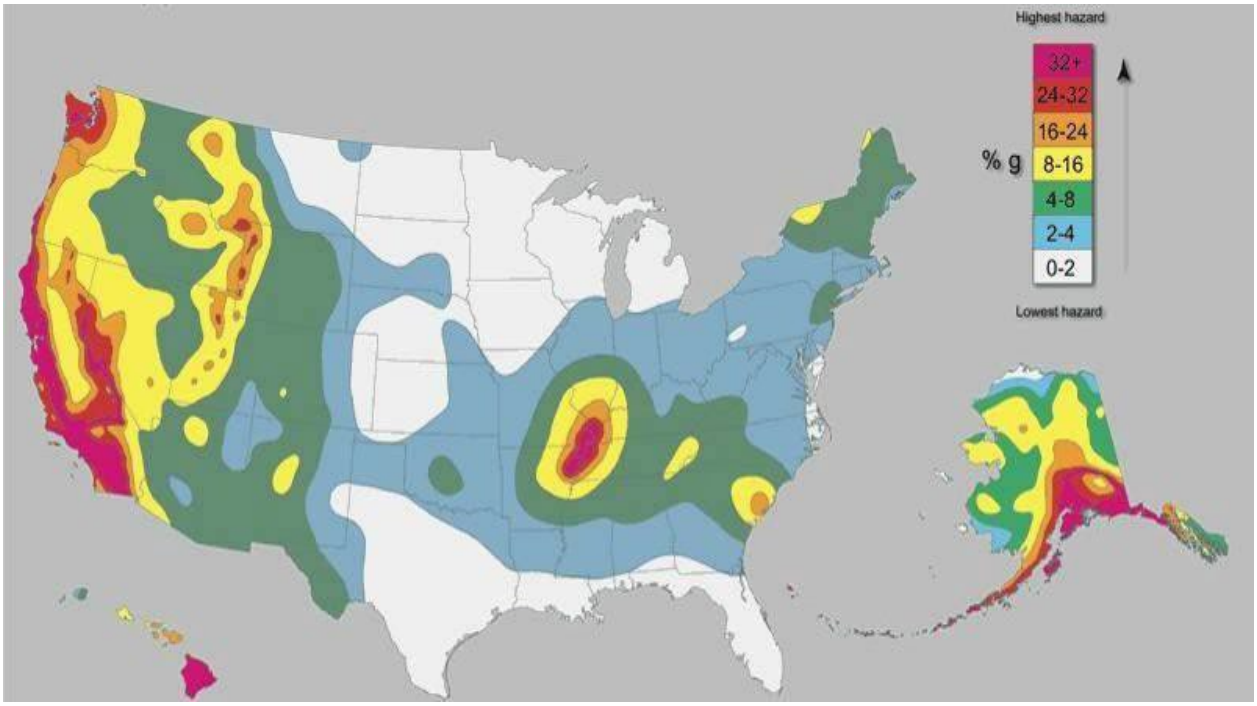
An earthquake is movement or trembling of the ground produced by sudden displacement of rock in the Earth's crust. Earthquakes result from crustal strain, volcanism, landslides, or the collapse of caverns. Earthquakes can affect hundreds of thousands of square miles, cause damage to property measured in the tens of billions of dollars, result in loss of life and injury to hundreds of thousands of persons, and disrupt the social and economic functioning of the affected area.

Most property damage and earthquake-related deaths are caused by the failure and collapse of structures due to ground shaking. The level of damage depends upon the amplitude and duration of the shaking, which are directly related to the earthquake size, distance from the fault, site, and regional geology. Other damaging earthquake effects include landslides, the down-slope movement of soil and rock (mountain regions and along hillsides), and liquefaction, in which ground soil loses the ability to resist shear and flows much like quick sand. In the case of liquefaction, anything relying on the substrata for support can shift, tilt, rupture, or collapse.

Most earthquakes are caused by the release of stresses accumulated as a result of the rupture of rocks along opposing fault planes in the Earth’s outer crust. These fault planes are typically found along borders of the Earth's 10 tectonic plates. The areas of greatest tectonic instability occur at the perimeters of the slowly moving plates, as these locations are subjected to the greatest strains from plates traveling in opposite directions and at different speeds. Deformation along plate boundaries causes strain in the rock and the consequent buildup of stored energy. When the built-up stress exceeds the rocks' strength a rupture occurs. The rock on both sides of the fracture is snapped, releasing the stored energy and producing seismic waves, generating an earthquake.

The greatest earthquake threat in the United States is along tectonic plate boundaries and seismic fault lines located in the central and western states; however, the Eastern United State does face moderate risk to less frequent, less intense earthquake events. The figure below shows relative seismic risk for the United States.

FIGURE 5.12: UNITED STATES EARTHQUAKE HAZARD MAP



Source: United States Geological Survey

Earthquakes are measured in terms of their magnitude and intensity. Magnitude is measured using the Richter Scale, an open-ended logarithmic scale that describes the energy release of an earthquake through a measure of shock wave amplitude, shown below. Each unit increase in magnitude on the Richter Scale corresponds to a 10-fold increase in wave amplitude, or a 32-fold increase in energy. Intensity is most commonly measured using the Modified Mercalli Intensity (MMI) Scale based on direct and indirect measurements of seismic effects. The scale levels are typically described using roman numerals, ranging from "I" corresponding to imperceptible (instrumental) events to "XII" for catastrophic (total destruction). A detailed description of the Modified Mercalli Intensity Scale of earthquake intensity and its correspondence to the Richter Scale is below.

TABLE 5.12: RICHTER SCALE

RICHTER MAGNITUDES	EARTHQUAKE EFFECTS
< 3.5	Generally not felt, but recorded.
3.5 - 5.4	Often felt, but rarely causes damage.
5.4 - 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1 - 6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0 - 7.9	Major earthquake. Can cause serious damage over larger areas.
8 or >	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

Source: Federal Emergency Management Agency

TABLE 5.13: MODIFIED MERCALLI INTENSITY SCALE FOR EARTHQUAKES

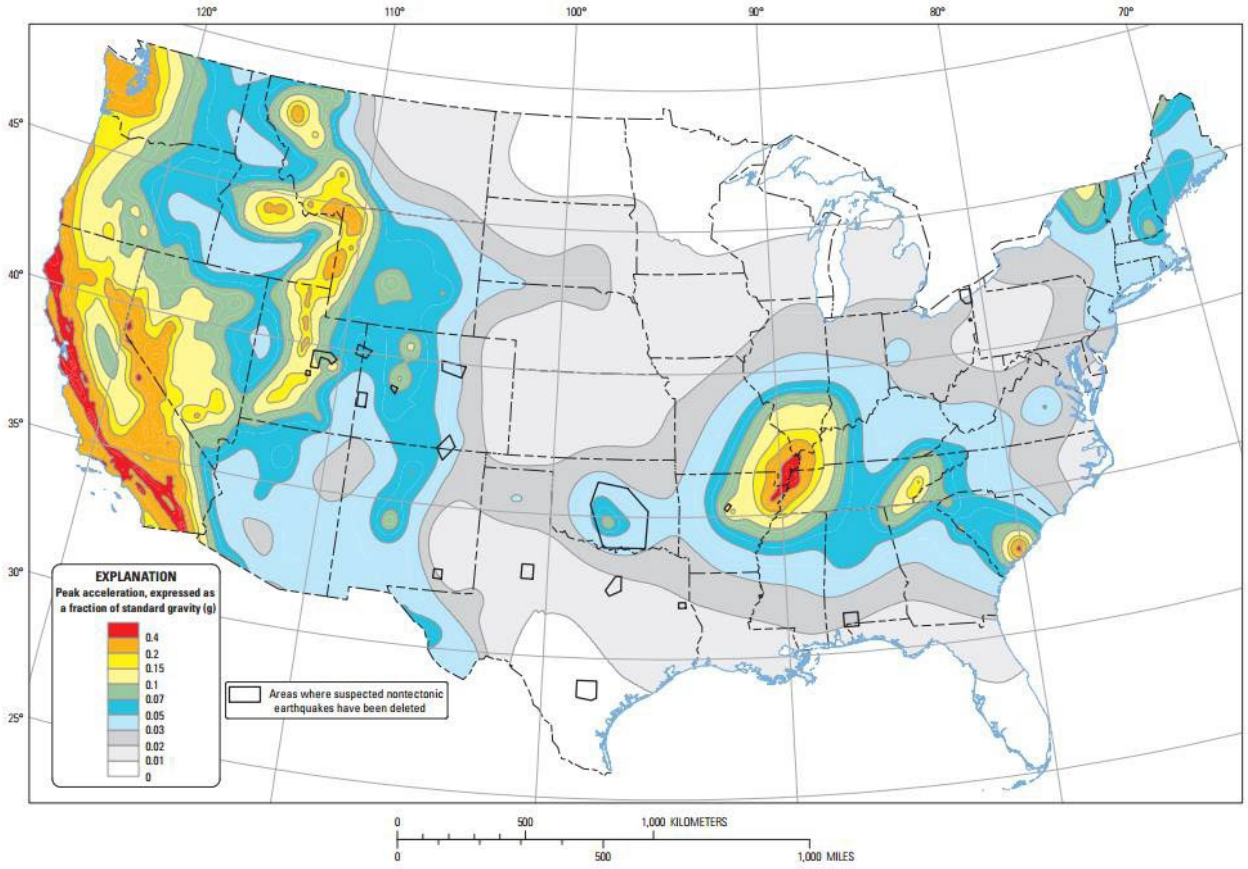
SCALE	INTENSITY	DESCRIPTION OF EFFECTS	CORRESPONDING RICHTER SCALE MAGNITUDE
I	INSTRUMENTAL	Detected only on seismographs.	
II	FEEBLE	Some people feel it.	< 4.2
III	SLIGHT	Felt by people resting; like a truck rumbling by.	
IV	MODERATE	Felt by people walking.	
V	SLIGHTLY STRONG	Sleepers awake; church bells ring.	< 4.8
VI	STRONG	Trees sway; suspended objects swing, objects fall off shelves.	< 5.4
VII	VERY STRONG	Mild alarm; walls crack; plaster falls.	< 6.1
VIII	DESTRUCTIVE	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged.	
IX	RUINOUS	Some houses collapse; ground cracks; pipes break open.	< 6.9
X	DISASTROUS	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread.	< 7.3
XI	VERY DISASTROUS	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards.	< 8.1
XII	CATASTROPHIC	Total destruction; trees fall; ground rises and falls in waves.	> 8.1

Source: Federal Emergency Management Agency

LOCATION AND SPATIAL EXTENT

The figure below shows the intensity level associated with the MEMA District 7 Region, based on the national USGS map of peak acceleration with 10 percent probability of exceedance in 50 years. It is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, all of the MEMA District 7 Region lies within an approximate zone of level "0.01" to "0.03" ground acceleration. This indicates that the region as a whole exists within an area of low seismic risk.

FIGURE 5.13: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS



Ten-percent probability of exceedance in 50 years map of peak ground acceleration

EXPLANATION

Peak acceleration, expressed as a fraction of standard gravity (g)

0.4
0.2
0.15
0.1
0.07
0.05
0.03
0.02
0.01
0

Areas where suspected nontectonic earthquakes have been deleted

The primary source of potential damage to the MEMA District 7 Region from an earthquake is the New Madrid Seismic Zone (NMSZ). Historically, a series of earthquakes in 1811 and 1812 demonstrated that this fault zone can produce high magnitude seismic events, sometimes on the scale of a 7.5-8.0 on the

Richter scale. The biggest challenge with earthquakes that occur in this area of seismic activity is predicting the recurrence of earthquakes emanating from this zone. Although the magnitude of earthquakes from the NMSZ can be large, they occur very irregularly and fairly infrequently. This makes it extremely difficult to project when they will occur.

It should also be noted that the State of Mississippi Hazard Mitigation Plan identifies certain areas of concern for liquefaction and lists the counties and corresponding zones within those counties that have the highest liquefaction potential. There are no MEMA District 7 counties identified in zones of high risk.

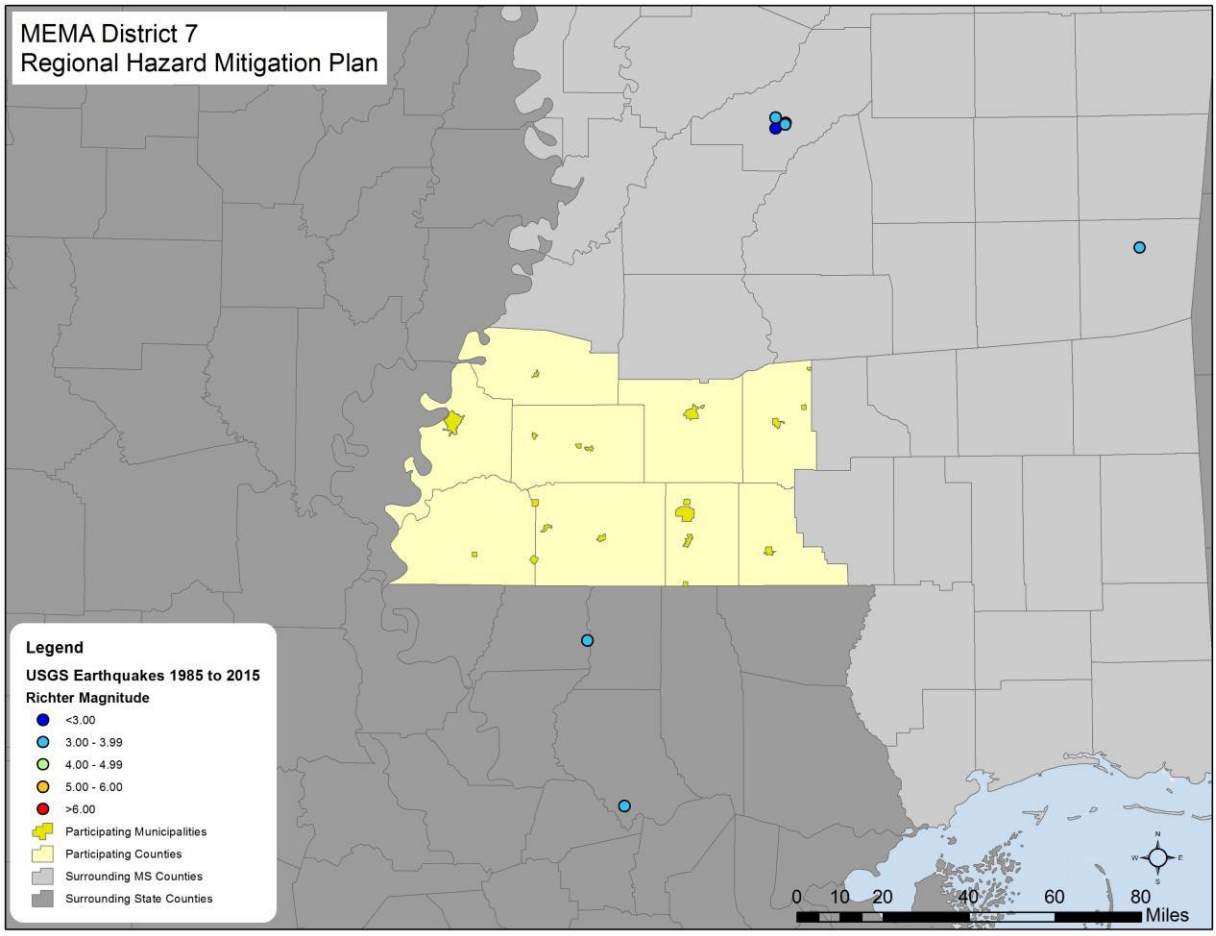
HISTORICAL OCCURRENCES

At least four earthquakes are known to have occurred within the MEMA District 7 Region since 1811. The strongest of these measured a VI on the Modified Mercalli Intensity (MMI) scale. The table below provides a summary of earthquake events reported by the National Centers for Environmental Information (formerly National Geophysical Data Center) between 1638 and 1985, and the following figure presents a map showing earthquakes whose epicenters have occurred near the region between 1985 and 2023 (no earthquakes occurred within the region's boundaries during this period). A detailed occurrence of each event including the date, distance from the epicenter, magnitude, and Modified Mercalli Intensity (if known) can be found in the county-specific annexes.[12]

TABLE 5.14: SUMMARY OF SEISMIC ACTIVITY IN THE MEMA DISTRICT 7 REGION

Location	Number of Occurrences	Greatest MMI Reported	Greatest Richter Scale Reported
Adams County	**2**	**VI**	**7.2**
Amite County	**0**	**--**	**--**
Franklin County	**0**	**--**	**--**
Jefferson County	**0**	**--**	**--**
Lawrence County	**0**	**--**	**--**
Lincoln County	**1**	**II**	**--**
Pike County	**0**	**--**	**--**
Walthall County	**1**	**III**	**--**
Wilkinson County	**0**	**--**	**--**
TOTLA	**4**	**VI**	**7.2**

FIGURE 5.14: HISTORIC EARTHQUAKES WITH EPICENTERS NEAR THE MEMA DISTRICT 7 REGION (1985-2023)



Source: United States Geological Survey

PROBABILITY OF FUTURE OCCURRENCES

The probability of significant, damaging earthquake events affecting the MEMA District 7 Region is unlikely. However, it is certainly possible that future earthquakes resulting in light or moderate perceived shaking and damages will affect the region much more frequently. The annual probability level for the region is estimated to be less than 1 percent (unlikely).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[20] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in the MEMA District 7 planning area. With increasing global surface temperatures, the possibility of more *droughts* and increased

[20] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

frequency and intensity of storms will likely occur[21]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

According to Global Climate Change, from NASA Science [22], atmospheric conditions do not have an impact on seismic activity. However, changes in stress loads on Earth's crust from periods of drought and fluctuations in reservoir levels, and corresponding changes in the weight of reservoirs, can also change the stress loads on a local fault, triggering the quakes. MEMA District 7 is not at rick due to the lack of these features in the planning area.

WIND-RELATED HAZARDS

5.2.8 EXTREME HEAT

BACKGROUND

Extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and that last for an extended period of time. A heat wave may occur when temperatures hover 10 degrees or more above the average high temperature for the region and last for a prolonged number of days or several weeks. Humid conditions may also add to the discomfort of high temperatures.

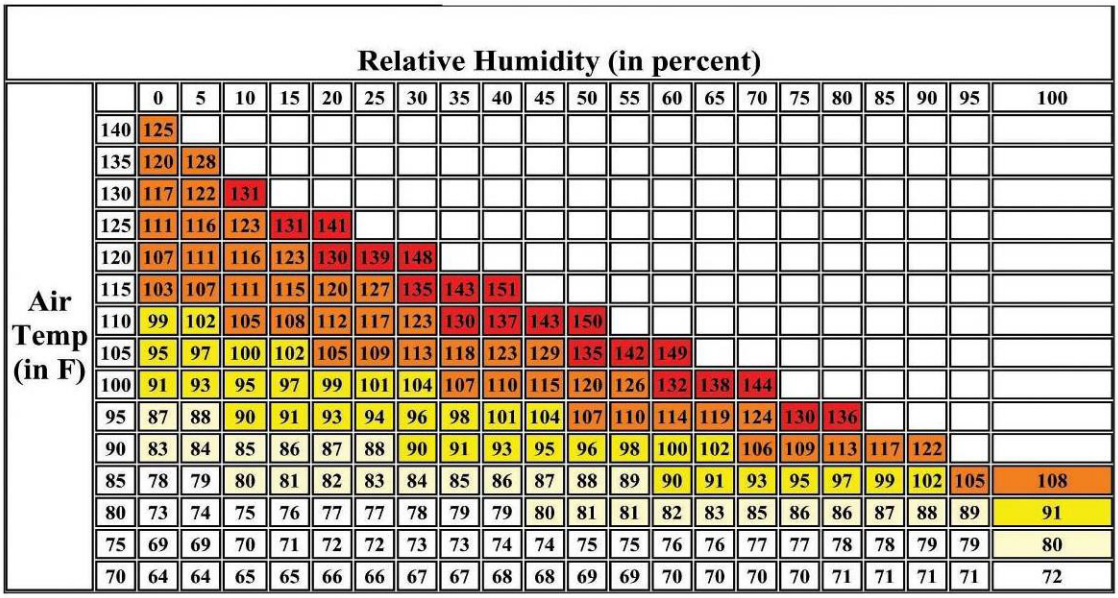
While extreme heat does not typically affect buildings and infrastructure directly, the impact to the population can have grave effects. Health risks from extreme heat include heat cramps, heat fainting, heat exhaustion and heat stroke. According to the National Weather Service (which compiles data from the National Climatic Data Center), heat is the leading weather-related killer in the United States. During the ten-year period between 2000 and 2009 heat events killed 162 people - more people than lightning, tornado, flood, cold, winter storm, wind and hurricane hazards. However, most deaths are attributed to prolonged heat waves in large cities that rarely experience hot weather. The elderly and the ill are most at-risk, along with those who exercise outdoors in hot, humid weather.

The National Weather Service devised the Heat Index as a mechanism to better inform the public of heat dangers. The Heat Index Chart, shown below, uses air temperature and humidity to determine the heat index or apparent temperature. The table below shows the dangers associated with different heat index temperatures. Some populations, such as the elderly and young, are more susceptible to heat danger than other segments of the population.

[21] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[22] Can Climate Affect Earthquakes, Or Are the Connections Shaky? – Climate Change: Vital Signs of the Planet (nasa.gov)

FIGURE 5.15: HEAT INDEX CHART



Air Temp (in F) \ Relative Humidity (in percent)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
140	125																				
135	120	128																			
130	117	122	131																		
125	111	116	123	131	141																
120	107	111	116	123	130	139	148														
115	103	107	111	115	120	127	135	143	151												
110	99	102	105	108	112	117	123	130	137	143	150										
105	95	97	100	102	105	109	113	118	123	129	135	142	149								
100	91	93	95	97	99	101	104	107	110	115	120	126	132	138	144						
95	87	88	90	91	93	94	96	98	101	104	107	110	114	119	124	130	136				
90	83	84	85	86	87	88	90	91	93	95	96	98	100	102	106	109	113	117	122		
85	78	79	80	81	82	83	84	85	86	87	88	89	90	91	93	95	97	99	102	105	108
80	73	74	75	76	77	77	78	79	79	80	81	81	82	83	85	86	86	87	88	89	91
75	69	69	70	71	72	72	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80
70	64	64	65	65	66	66	67	67	68	68	69	69	70	70	70	70	71	71	71	71	72

TABLE 5.15: HEAT DISORDERS ASSOCIATED WITH HEAT INDEX TEMPERATURE

Heat Index Temperature (Fahrenheit)	Description of Risks
80°- 90°	Fatigue possible with prolonged exposure and/or physical activity
90°- 105°	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity
105°- 130°	Sunstroke, heat cramps, and heat exhaustion likely, and heatstroke possible with prolonged exposure and/or physical activity
130° or higher	Heatstroke or sunstroke is highly likely with continued exposure

Source: National Weather Service, National Oceanic and Atmospheric Administration

LOCATION AND SPATIAL EXTENT

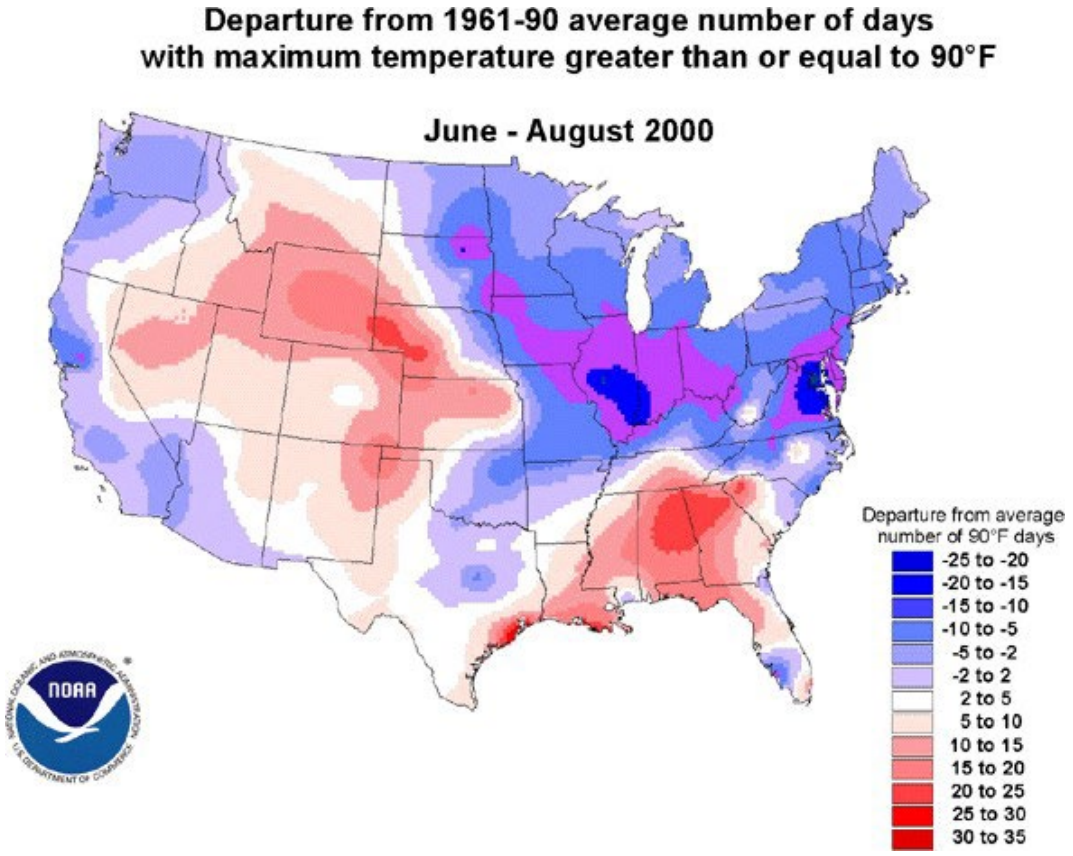
Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries. Therefore, the entire region is considered to be equally susceptible to extreme heat.

HISTORICAL OCCURRENCES

The National Climatic Data Center was used to determine historical heat wave occurrences in the region.

Summer of 2000 Heat Wave – Hot temperatures persisted from July to September across the South and Plains. Known as the Summer of 2000 Heat Wave, high temperatures commonly peaked over 100 degrees. As shown below, there were 10-15 more days over 90 degrees than the average recorded between 1961 and 1990.

FIGURE 5.16: DEPARTURE FROM AVERAGE NUMBER OF 90 DEGREE DAYS



August 2005 – A "HOT" stretch of weather occurred during the middle to later part of August 2005. This "Heat Wave" covered a large portion of the south and lasted for a period of about 10 days. Each of these days had high temperatures consistently between 95 and 100 degrees, with 1 or 2 of these days actually reaching 100 degrees or more. Additionally, overnight lows remained warm with lower and middle 70s recorded. This is the first time since August 2000 where 100 degree temperatures were reached in this area as well as having such an extended period of "HOT" weather.

July 2006 – A small "heat wave" gripped the region during the middle of July with high temperature ranging from the upper 90s to around 100 degrees for five days with overnight lows only reaching the middle 70s. The hottest temperatures during this period occurred from the Mississippi Delta, across northern Mississippi and then down to the Jackson Metro and toward Meridian. This area peaked between 100 and 102 degrees for at least two days during the hot five day stretch.

August 2007 – During the first half of August, a heat wave took hold of the region and brought some of the warmest temperatures since the summer of 2000. This heat wave began around August 5th and lasted until the 16th. Between August 10th and 15th, the entire area reached 100 degrees or higher. Twenty-three record highs were also set during this time. As the temperature soared each day, high relative humidities resulted in heat index values between 105 and 112 degrees.

August 2010 – A four day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS Jackson, MS forecast area, 19

record highs were set between August 1st and 4th. On August 2nd, the 2nd warmest average temperature was recorded. The low was 78 and the high 105, this resulted in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in 3 fatalities across the forecast area.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of the MEMA District 7 Region has a probability level of likely (between 10 and 100 percent annual probability) for future heat wave events.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[23]. There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in the MEMA District 7 planning area. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *lightning strike events*.[24] As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

5.2.9 HAILSTORM

BACKGROUND

Hailstorms are a potentially damaging outgrowth of severe thunderstorms. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until they develop to a sufficient weight and fall as precipitation. Hail typically takes the form of spheres or irregularly-shaped masses greater than 0.75 inches in diameter. The size of hailstones is a direct function of the size and severity of the storm. High velocity updraft winds are required to keep hail in suspension in thunderclouds. The strength of the updraft is a function of the intensity of heating at the Earth's surface. Higher temperature gradients relative to elevation above the surface result in increased suspension time and hailstone size. The table below shows the TORRO Hailstorm Intensity Scale which is a way of measuring hail severity.

[23] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[24] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

TABLE 5.16: TORRO HAILSTORM INTENSITY SCALE

	Intensity Category	Typical Hail Diameter (mm)*	Probable Kinetic Energy, $J\text{-}m^2$	mm to inch conversion (inches)	Typical Damage Impacts
H0	Hard Hail	5	0-20	0 - 0.2	No damage
H1	Potentially Damaging	5-**15**	>20	0.2 - 0.6	Slight general damage to plants, crops
H2	Significant	10-**20**	>100	0.4 - 0.8	Significant damage to fruit, crops, vegetation
H3	Severe	20-**30**	>300	0.8 - 1.2	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-**40**	>500	1.0 - 1.6	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30-**50**	>800	1.2 - 2.0	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-**60**		1.6 - 2.4	Bodywork of grounded aircraft dented, brick walls pitted
H7	Destructive	50-**75**		2.0 - 3.0	Severe roof damage, risk of serious injuries
H8	Destructive	60-**90**		1.6 - 3.5	(Severest recorded in the British Isles) Severe damage to aircraft bodywork
H9	Super Hailstorms	75-**100**		3.0 - 3.9	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>100			Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Source: http://www.torro.org.uk/site/hscale.php

LOCATION AND SPATIAL EXTENT

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that the MEMA District 7 Region is uniformly exposed to severe thunderstorms; therefore, all areas of the region are equally exposed to hail which may be produced by such storms.

HISTORICAL OCCURRENCES

According to the National Climatic Data Center, 635 recorded hailstorm events have affected the MEMA District 7 Region since 1961. Detailed information about each event that occurred in the region is provided in the county-specific annexes. Over the years, hail occurrences have resulted in over $5.5 million in property damages. Hail ranged in diameter from 0.75 inches to 2.75 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Climatic Data Center. Therefore, it is likely that damages are greater than the reported value. Additionally, a single storm event may have affected multiple counties.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that the probability of future hail occurrences is highly likely (100 percent annual probability). Since hail is an atmospheric hazard, it is assumed that the entire MEMA District 7 Region has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the region.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[25] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in the MEMA District 7 planning area. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *hailstorm*[26]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

5.2.10 HURRICANE AND TROPICAL STORM

BACKGROUND

Hurricanes and tropical storms are classified as cyclones and defined as any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and whose diameter averages 10 to 30 miles across. A tropical cyclone refers to any such circulation that develops over tropical waters. Tropical cyclones act as a "safety-valve," limiting the continued build-up of heat and energy in tropical regions by maintaining the atmospheric heat and moisture balance between the tropics and the pole-ward latitudes. The primary damaging forces associated with these storms are high-level sustained winds, heavy precipitation, and tornadoes.

The key energy source for a tropical cyclone is the release of latent heat from the condensation of warm water. Their formation requires a low-pressure disturbance, warm sea surface temperature, rotational force from the spinning of the earth, and the absence of wind shear in the lowest 50,000 feet of the atmosphere. The majority of hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico during the official Atlantic hurricane season, which encompasses the months of June through November. The peak of the Atlantic hurricane season is in early to mid-September and the average number of storms that reach hurricane intensity per year in the Atlantic basin is about six.

As an incipient hurricane develops, barometric pressure (measured in millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center in

[25] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[26] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

Miami, Florida. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. Hurricane intensity is further classified by the Saffir-Simpson Scale, which rates hurricane intensity on a scale of 1 to 5, with 5 being the most intense.

TABLE 5.17: SAFFIR-SIMPSON SCALE

Category	Maximum Sustained Wind Speed (MPH)
1	74–95
2	96–110
3	111–129
4	130–156
5	157 +

Source: National Hurricane Center

The Saffir-Simpson Scale categorizes hurricane intensity linearly based upon maximum sustained winds, barometric pressure and storm surge potential, which are combined to estimate potential damage. Categories 3, 4, and 5 are classified as "major" hurricanes and, while hurricanes within this range comprise only 20 percent of total tropical cyclone landfalls, they account for over 70 percent of the damage in the United States. The table below describes the damage that could be expected for each category of hurricane. Damage during hurricanes may also result from spawned tornadoes, storm surge, and inland flooding associated with heavy rainfall that usually accompanies these storms.

TABLE 5.18: HURRICANE DAMAGE CLASSIFICATIONS

Storm Category	Damage Level	Description of Damages	Photo Example
1	MINIMAL	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal flooding and minor pier damage.	
2	MODERATE	Some roofing material, door, and window damage. Considerable damage to vegetation, mobile homes, etc. Flooding damages piers and small craft in unprotected moorings may break their moorings.	
3	EXTENSIVE	Some structural damage to small residences and utility buildings, with a minor amount of curtainwall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures, with larger structures damaged by floating debris. Terrain may be flooded well inland.	
4	EXTREME	More extensive curtainwall failures with some complete roof structure failure on small residences. Major erosion of beach areas. Terrain may be flooded well inland.	
5	CATASTROPHIC	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Flooding causes major damage to lower floors of all structures near the shoreline. Massive evacuation of residential areas may be required.	

Source: National Hurricane Center; Federal Emergency Management Agency

LOCATION AND SPATIAL EXTENT

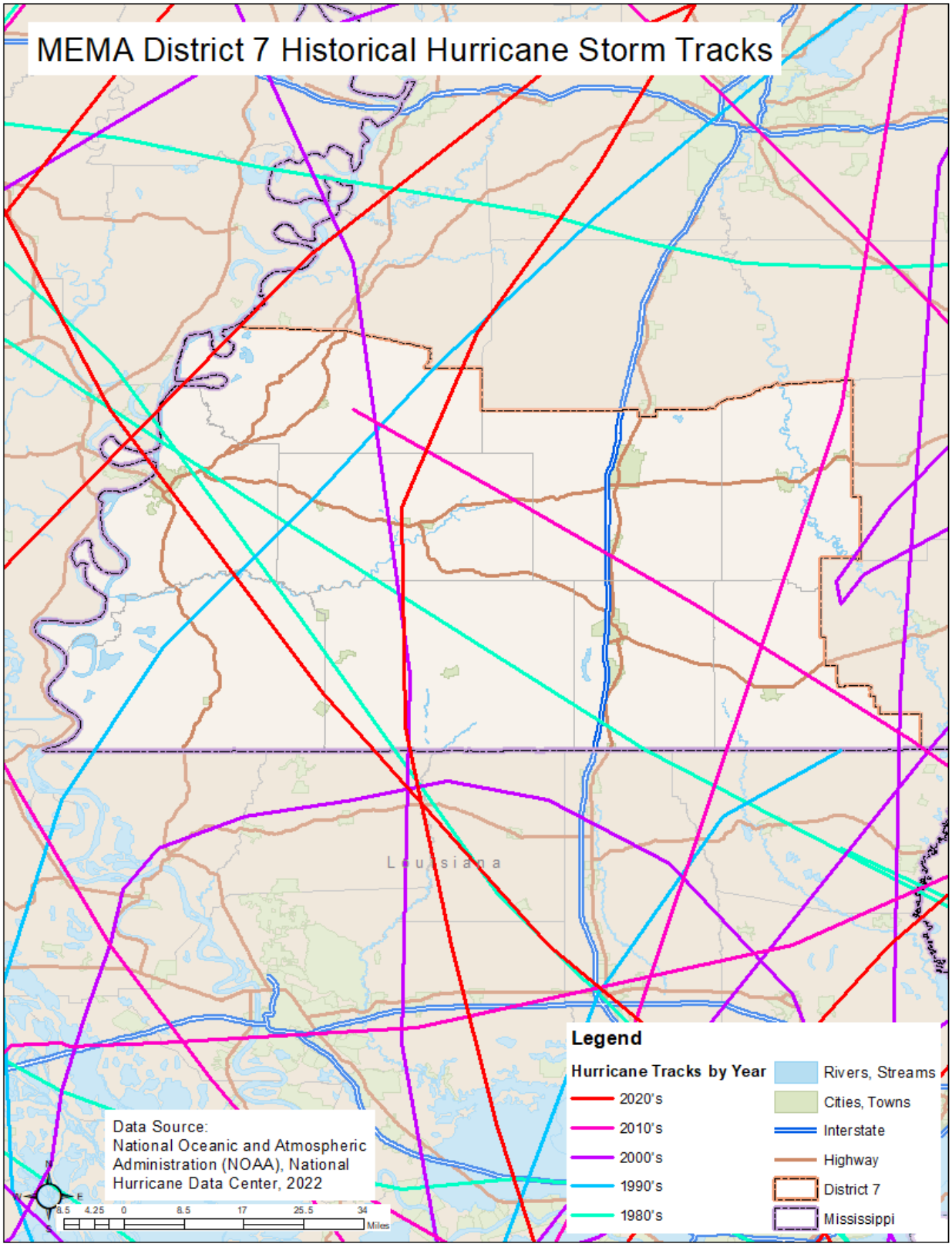
Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect the MEMA District 7 Region. All areas in the MEMA District 7 Region are equally susceptible to hurricane and tropical storms.

HISTORICAL OCCURRENCES

According to the National Hurricane Center's historical storm track records, 86 hurricane or tropical storm/depression tracks have passed within 100 miles of the MEMA District 7 Region since 1854.[15] This includes: 35 hurricanes, 21 tropical storms, and 30 tropical depressions.

A total of 61 tracks passed directly through the region. To improve readability of the hurricane map, events are bundled by decade as shown below. T**he** dates of occurrences, names (if applicable), maximum wind speeds (as recorded within 100 miles of the MEMA District 7 Region) and category of the storm based on the Saffir-Simpson Scale for each event can be found in each annex.

FIGURE 5.17: HISTORICAL HURRICANE STORM TRACKS WITHIN 100 MILES OF THE MEMA DISTRICT 7 REGION



Federal records indicate that nine disaster declarations have been declared in the MEMA District 7 Region due to hurricane and tropical storm events, which can cause substantial damage in the area due to high winds and flooding. A full table of Disaster Declarations can be found in *Section 4: Hazard Identification*, section 4.3.

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the region. Narratives are available from NCDC for the major storms that have impacted the region as found below:

Hurricane Katrina – August 29, 2005
The damage from Hurricane Katrina was devastating and widespread. Damage occurred across all of the Jackson forecast area which includes 9 parishes in Northeast Louisiana, 2 counties in Southeast Arkansas and about 2/3 of Central and Southern Mississippi. As widespread as the damage was, the more concentrated and most significant damage occurred across Southeast and East-Central Mississippi. For other areas, especially those west of Natchez to Yazoo City to Grenada line, damage to trees and power lines was significant and scattered across the landscape. As you move toward Central Mississippi and along Interstate 55 the damage and impacts increase. This portion of the state sustained widespread damage to trees and power lines.

Hurricane Gustav – September 1, 2008
As the center of Gustav crossed much of southern Louisiana, tropical storm force winds extended into southern Mississippi and portions of east central Louisiana. Sustained winds were between 35 and 45 mph with higher gusts between 70 and 100 mph occurred. Tree and power line damage was extensive across these areas which resulted in widespread power outages, some of which lasted for 3 to 5 days. As Gustav slowed across central Louisiana, the outer rainbands continued to rotate across much of southern and central Mississippi. This kept those portions of Mississippi in the region which was favorable for tornadoes. Over 3 days, 26 tornadoes were confirmed, all of which were in the EF0 to EF1 range.

Hurricane Isaac – August 29, 2012
Isaac moved very slowly to the north and northwest over the course of August 29th, which made for prolonged impacts. Forward motion of about 5 mph lead to tremendous flooding issues for both Louisiana and portions of Mississippi south of I-20. Around noon on August 29th, Isaac was downgraded to a Tropical Storm, but this was not much relief to the many residents who were being inundated with rain and wind. The worst of the wind was felt generally along and south of an axis from Marion County to Adams County. Numerous trees were down in Adams County, leaving many without power for several days. Eighty percent of the roads were blocked in Franklin County due to downed trees.

PROBABILITY OF FUTURE OCCURRENCES
Given the inland location of the region, the MEMA District 7 Region will not be susceptible to many of the sub-hazards that are often associated with hurricanes and tropical storms such as storm surge. Although the probability of experiencing major impacts is somewhat less than coastal areas because of this, hurricanes and tropical storms remain a real threat to the MEMA District 7 Region due to induced events like flooding and high wind. Based on historical evidence, the probability level of future occurrence is likely (between 10 and 100 percent annual probability). Given the regional nature of the hazard, all areas in the region are equally exposed to this hazard. However, when the region is impacted, the damage could be significant, threatening lives and property throughout the planning area.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[27] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in the MEMA District 7 planning area. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[28]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

HURRICANE EVACUATIONS

As discussed above, the MEMA District 7 Region has been directly impacted by a number of hurricane and tropical storm events historically. However, it should be noted that the region is also susceptible to indirect effects from hurricanes and tropical storms, particularly in the form of evacuations from coastal counties. The counties within MEMA District 7 are located far enough inland that they are often the primary recipients of evacuees from counties that will be (or have been) impacted by major storm events.

For example, during Hurricane Katrina in 2005, thousands of evacuees made their way to counties in southwest Mississippi to take temporary refuge from the storm. Due to the severe and devastating effects of the storm, temporary sheltering within these counties was extended much longer than originally anticipated and in some cases, the evacuees ended up staying for weeks or months. This additional population caused a major strain on resources within these relatively rural counties, as local communities with limited resources had an unexpected and immediate need to provide shelter and other life essentials such as food, water, and health care to a significant, additional number of people.

Caring for all of these evacuees was especially challenging for counties in the MEMA District 7 Region because most had been impacted themselves by the storm and were attempting to help their own citizens recover from the storm. Undoubtedly, recovering from a major disaster while simultaneously attempting to help evacuees from surrounding counties poses a number of difficulties for emergency management personnel and other local officials.

Based on Hurricane Katrina and other major hurricane events that have impacted the Gulf Coast in the past, it is likely that many of the MEMA District 7 counties will be receiver counties when it comes to evacuees. Many of these evacuees will likely come from locations in Louisiana, including New Orleans. Indeed, the State of Louisiana evacuation plan indicates that one of the primary evacuation routes from the City of New Orleans will direct evacuees north along Interstate 55, sending people through Pike County and Lincoln County. Depending on the severity of the event, officials in Louisiana may even change Interstate 55 over to a contraflow traffic pattern to enable quicker evacuations.

As a result of the influx of evacuees during storm events, it is critical for local officials in MEMA District 7 to prepare for evacuations during hurricanes and other tropical storms, even if the counties themselves

[27] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[28] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

may not be directly impacted by the storm. As in past storms, it is possible that thousands of additional people will be relocated, either temporarily or permanently, to MEMA District 7. Therefore, plans for additional shelters and other resources should be coordinated well in advance of future storm events.

FIGURE 5.18: STATE OF LOUISIANA EVACUATION ROUTES, 1 OF 2

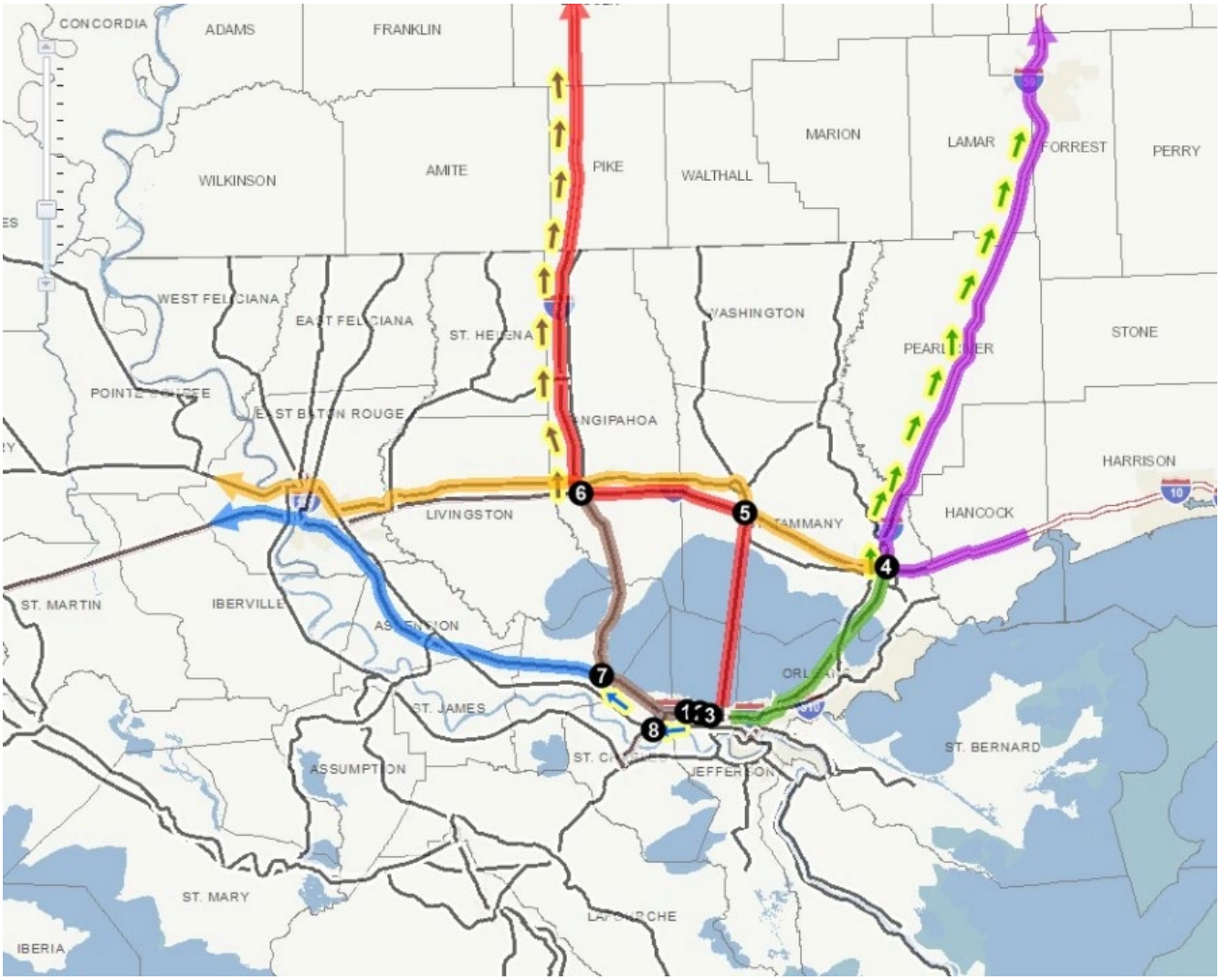
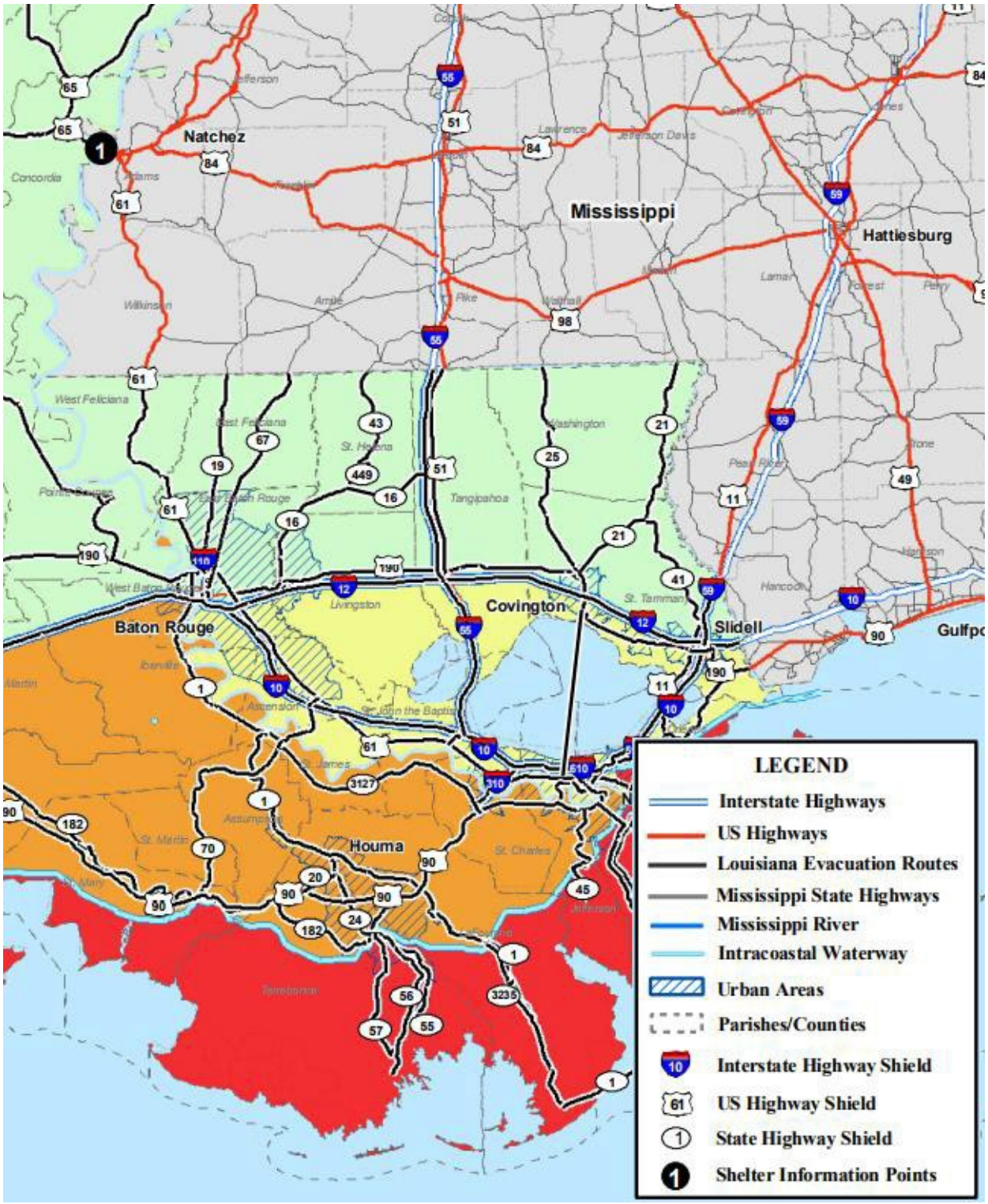


FIGURE 5.19: STATE OF LOUISIANA EVACUATION ROUTES, 2 OF 2



Source: State of Louisiana Evacuation Plan

5.2.11 SEVERE THUNDERSTORM/HIGH WIND

BACKGROUND

Thunderstorms can produce a variety of accompanying hazards including wind (discussed here), hail, and lightning. Although thunderstorms generally affect a small area, they are very dangerous and may cause substantial property damage.

Three conditions need to occur for a thunderstorm to form. First, it needs moisture to form clouds and rain. Second, it needs unstable air, such as warm air that can rise rapidly (this often referred to as the "engine" of the storm). Third, thunderstorms need lift, which comes in the form of cold or warm fronts, sea breezes, mountains, or the sun's heat. When these conditions occur simultaneously, air masses of varying temperatures meet, and a thunderstorm is formed. These storm events can occur singularly, in lines, or in clusters. Furthermore, they can move through an area very quickly or linger for several hours.

According to the National Weather Service, more than 100,000 thunderstorms occur each year, though only about 10 percent of these storms are classified as "severe." A severe thunderstorm occurs when the storm produces at least one of these three elements: 1) hail of three-quarters of an inch, 2) a tornado, or 3) winds of at least 58 miles per hour.

Downbursts are also possible with thunderstorm events. Such events are an excessive burst of wind in excess of 125 miles per hour. They are often confused with tornadoes. Downbursts are caused by down drafts from the base of a convective thunderstorm cloud. It occurs when rain-cooled air within the cloud becomes heavier than its surroundings. Thus, air rushes towards the ground in a destructive yet isolated manner. There are two types of downbursts. Downbursts less than 2.5 miles wide, duration less than 5 minutes, and winds up to 168 miles per hour are called "microbursts." Larger events greater than 2.5 miles at the surface and longer than 5 minutes with winds up to 130 miles per hour are referred to as "macrobursts."

LOCATION AND SPATIAL EXTENT

A thunderstorm event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that the MEMA District 7 Region has uniform exposure to an event and the spatial extent of an impact could be large.

HISTORICAL OCCURRENCES

Severe storms were at least partially responsible for 17 disaster declarations in the MEMA District 7 Region.[19] According to NCDC, there have been 1,398 reported thunderstorm and high wind events since 1957 in the MEMA District 7 Region.[20] These events caused over $68.6 million in damages. There were also reports of numerous fatalities and injuries. Detailed thunderstorm and high wind event reports including date, magnitude, and associated damages for each event are presented in the county-specific annexes.

PROBABILITY OF FUTURE OCCURRENCES

Given the high number of previous events, it is certain that thunderstorm events, including straight-line wind events, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for the entire planning area.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[29] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in the MEMA District 7 planning area. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[30]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

5.2.12 TORNADO

BACKGROUND

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are most often generated by thunderstorm activity (but sometimes result from hurricanes and other tropical storms) when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The damage caused by a tornado is a result of the high wind velocity and wind-blown debris, also accompanied by lightning or large hail. According to the National Weather Service, tornado wind speeds normally range from 40 miles per hour to more than 300 miles per hour. The most violent tornadoes have rotating winds of 250 miles per hour or more and are capable of causing extreme destruction and turning normally harmless objects into deadly missiles.

Each year, an average of over 800 tornadoes is reported nationwide, resulting in an average of 80 deaths and 1,500 injuries.[22] According to the NOAA Storm Prediction Center (SPC), the highest concentration of tornadoes in the United States has been in Oklahoma, Texas, Kansas, and Florida respectively. Although the Great Plains region of the Central United States does favor the development of the largest and most dangerous tornadoes (earning the designation of "tornado alley"), Mississippi has experienced the most tornadoes in the U.S., averaging 115 per year, in the last 5 years[31]. The figure below shows tornado activity in the United States based on the number of recorded tornadoes per 1,000 square miles.

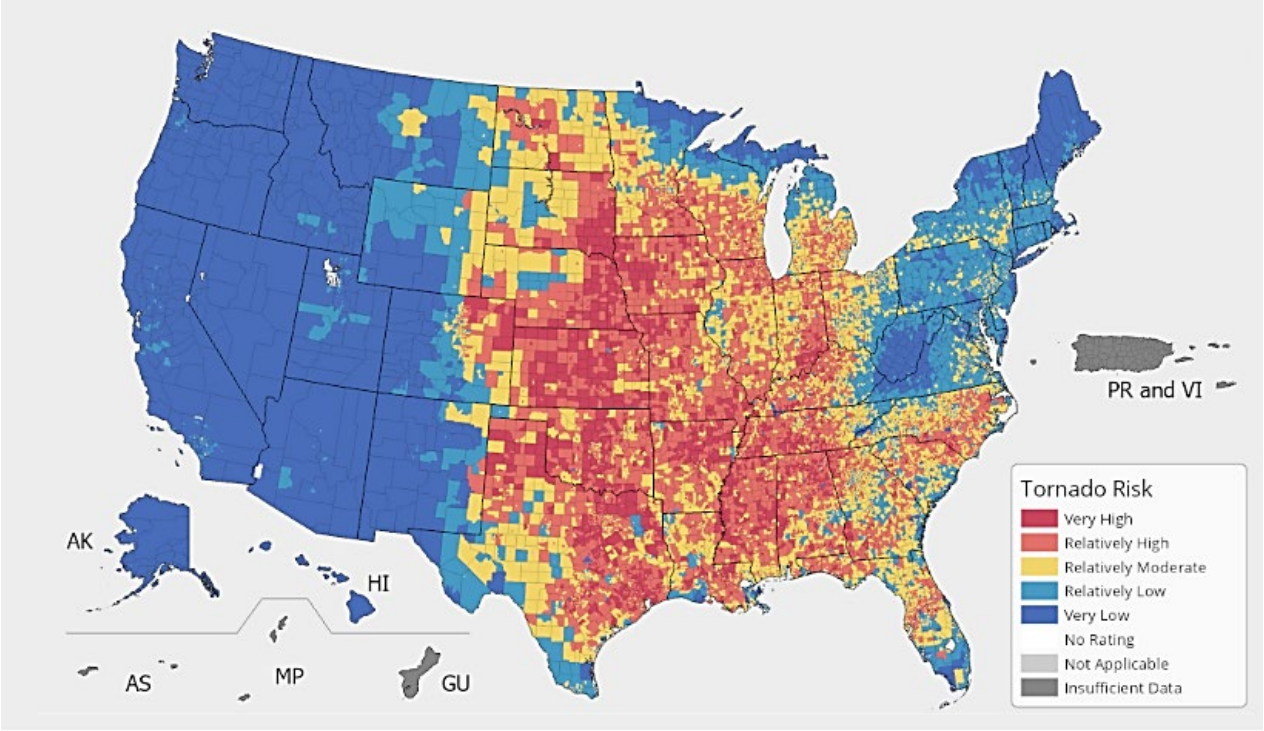
[29] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[30] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[31] Beyond Tornado Alley: Which states have the most tornadoes? - USAFacts and What States Have the Most Tornadoes? (Updated for 2023) - Policygenius

FIGURE 5.20: TORNADO ACTIVITY IN THE UNITED STATES

Source: National Risk Index, 2023



Tornadoes are more likely to occur during the months of March through May and are most likely to form in the late afternoon and early evening. Most tornadoes are a few dozen yards wide and touch down briefly, but even small short-lived tornadoes can inflict tremendous damage. Highly destructive tornadoes may carve out a path over a mile wide and several miles long.

The destruction caused by tornadoes ranges from light to inconceivable depending on the intensity, size, and duration of the storm. Typically, tornadoes cause the greatest damage to structures of light construction, including residential dwellings (particularly mobile homes). Tornadic magnitude is reported according to Fujita and Enhanced Fujita Scales. Tornado magnitudes prior to 2005 were determined using the traditional version of the Fujita Scale. Tornado magnitudes were determined in 2005 and later were determined using the Enhanced Fujita Scale.

TABLE 5.19: THE FUJITA SCALE (EFFECTIVE PRIOR TO 2005)

F-SCALE NUMBER	INTENSITY	WIND SPEED	TYPE OF DAMAGE DONE
F0	GALE TORNADO	40–72 MPH	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
F1	MODERATE TORNADO	73–112 MPH	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	SIGNIFICANT TORNADO	113–157 MPH	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.

F3	SEVERE TORNADO	158–206 MPH	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
F4	DEVASTATING TORNADO	207–260 MPH	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	INCREDIBLE TORNADO	261–318 MPH	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.
F6	INCONCEIVABLE TORNADO	319–379 MPH	These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies.

Source: National Weather Service

TABLE 5.20 THE ENHANCED FUJITA SCALE (EFFECTIVE 2005 AND LATER)

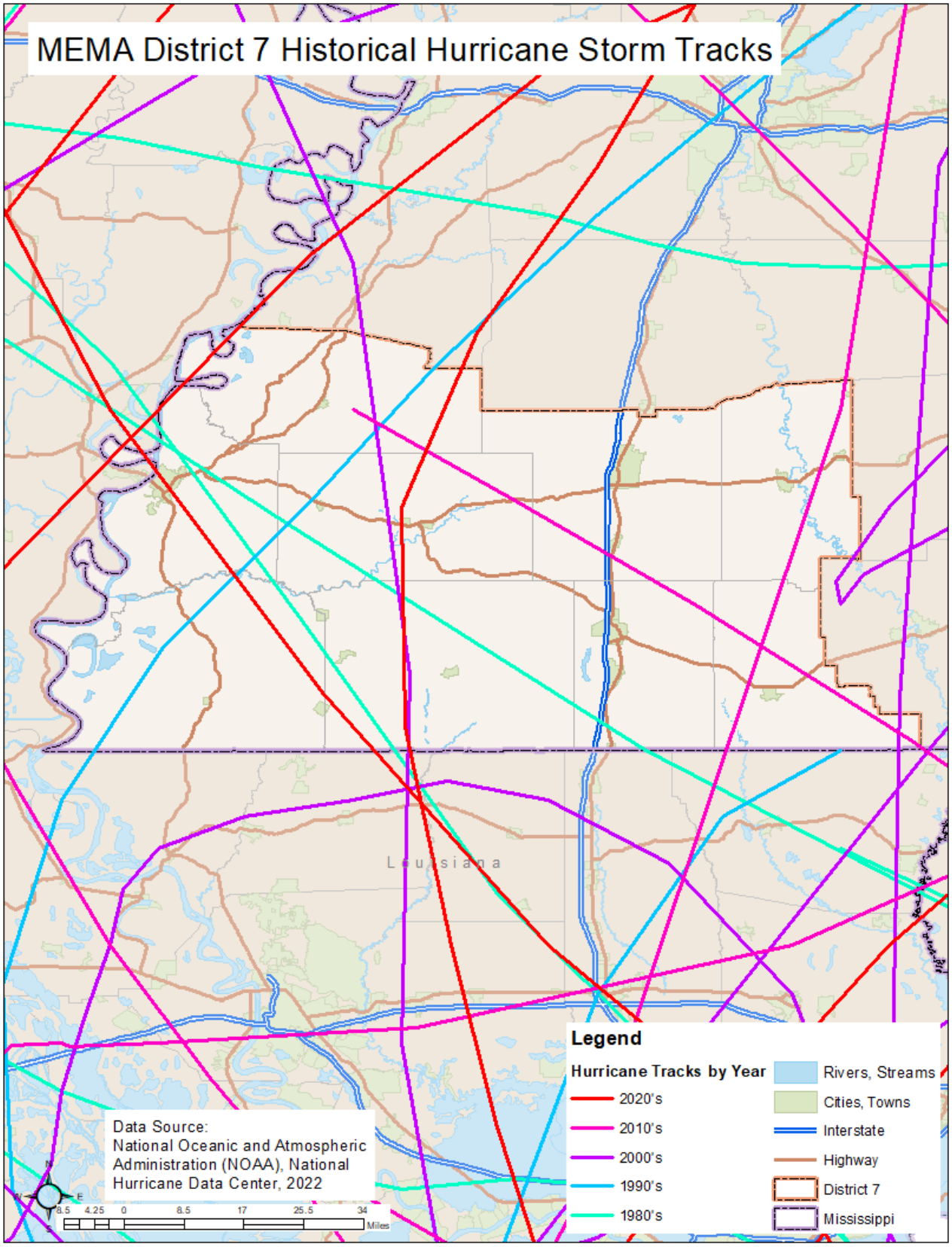
EF-SCALE NUMBER	INTENSITY PHRASE	3 SECOND GUST (MPH)	TYPE OF DAMAGE DONE
EF0	GALE	65–85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
EF1	MODERATE	86–110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
EF2	SIGNIFICANT	111–135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
EF3	SEVERE	136–165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
EF4	DEVASTATING	166–200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
EF5	INCREDIBLE	Over 200	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.

Source: National Weather Service

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, and thus in the MEMA District 7 Region. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random and it is generally not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that the MEMA District 7 Region is uniformly exposed to this hazard. With that in mind, the figure below shows tornado track data for many of the major tornado events that have impacted the region between 1950 and 2022. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

FIGURE 5.21: HISTORICAL TORNADO TRACKS IN THE MEMA DISTRICT 7 REGION



HISTORICAL OCCURRENCES

Tornadoes were at least partially responsible for 14 disaster declarations in the MEMA District 7 Region. According to the National Climatic Data Center, there have been a total of 242 recorded tornado events in the MEMA District 7 Region since 1950, resulting in more than $10 million in annualized property damage. In addition, 18 fatalities and 385 injuries were reported. The magnitude of these tornadoes ranges from F0 to F4 in intensity. Detailed information on historical tornado events can be found in the county-specific annexes.

TABLE 5.21: SUMMARY OF TORNADO OCCURRENCES IN THE MEMA DISTRICT 7 REGION

Location	Number of Occurrences	Deaths/Injuries	Annualized Property Losses
Adams County	19	0/44	$97,309
Amite County	24	0/9	$35,204
Franklin County	19	0/7	$80,800
Jefferson County	28	0/1	$39,111
Lawrence County	29	**6/55**	$9,374,519
Lincoln County	54	5/27	$171,216
Pike County	25	4/213	$403,853
Walthall County	31	**3/14**	$35,277
Wilkinson County	13	0/15	$20,964
MEMA DISTRICT 7 REGIONAL TOTAL	**242**	**14/379**	**$10,258,253.00**

PROBABILITY OF FUTURE OCCURRENCES

According to historical information, tornado events pose a significant threat to the MEMA District 7 Region. The probability of future tornado occurrences affecting MEMA District 7 Region is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[32] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in the MEMA District 7 planning area. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[33]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storm systems that spawn tornadoes to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding, and enhancing the potential for increased *tornado activity*. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

[32] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[33] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

5.2.13 WINTER STORM, FREEZE, AND EXTREME COLD

BACKGROUND

A winter storm can range from a moderate snow over a period of a few hours to blizzard conditions with blinding wind-driven snow that lasts for several days, associated with a drop in temperature. Events may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Some winter storms might be large enough to affect several states, while others might affect only localized areas. Occasionally, heavy snow might also cause significant property damages, such as roof collapses on older buildings. In cases where winter storm causes this drop in temperature, with or without precipitation, populations can be severely impacted.

All winter storm events have the potential to present dangerous conditions to the affected area. Larger snowfalls pose a greater risk, reducing visibility due to blowing snow and making driving conditions treacherous. A heavy snow event is defined by the National Weather Service as an accumulation of 4 of more inches in 12 hours or less. A blizzard is the most severe form of winter storm. It combines low temperatures, heavy snow, and winds of 35 miles per hour or more, which reduces visibility to a quarter mile or less for at least 3 hours. Winter storms are often accompanied by sleet, freezing rain, or an ice storm. Such freeze events are particularly hazardous as they create treacherous surfaces.
Ice storms are defined as storms with significant amounts of freezing rain and are a result of cold air damming (CAD). CAD is a shallow, surface-based layer of relatively cold, stably-stratified air entrenched against the eastern slopes of the Appalachian Mountains. With warmer air above, falling precipitation in the form of snow melts, then becomes either super-cooled (liquid below the melting point of water) or re-freezes. In the former case, super-cooled droplets can freeze on impact (freezing rain), while in the latter case, the re-frozen water particles are ice pellets (or sleet). Sleet is defined as partially frozen raindrops or refrozen snowflakes that form into small ice pellets before reaching the ground. They typically bounce when they hit the ground and do not stick to the surface. However, it does accumulate like snow, posing similar problems and has the potential to accumulate into a layer of ice on surfaces. Freezing rain, conversely, usually sticks to the ground, creating a sheet of ice on the roadways and other surfaces.

All of the winter storm elements – snow, low temperatures, sleet, ice, etc. – have the potential to cause significant hazard to a community. Even small accumulations can down power lines and trees limbs and create hazardous driving conditions. Furthermore, communication and power may be disrupted for days.

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. The MEMA District 7 Region is not accustomed to severe winter weather conditions and seldom receives severe winter weather, even during the winter months. Events tend to be mild in nature; however, this creates a situation where even relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage due to the fact that these events are not commonplace. Given the atmospheric nature of the hazard, the entire region has uniform exposure to a winter storm.

HISTORICAL OCCURRENCES

According to the National Climatic Data Center, there have been a total of 81 recorded winter storm

events in the MEMA District 7 Region since 1996. These events resulted in more than $6.6 million (2017 dollars) in damages.[27] Detailed information on the recorded winter storm events can be found in the county-specific annexes.

TABLE 5.22: SUMMARY OF WINTER STORM EVENTS IN THE MEMA DISTRICT 7 REGION

Location	Occurrences	Deaths/Injuries	Property Damage (2023)	Annualized Property Losses
Adams County	18	0/0	$ 1,938,000.00	$74,538.00
Amite County	12	1/0	$ -	$ -
Franklin County	7	0/0	$ 750,000.00	$28,846.00
Jefferson County	9	0/0	$ 800,000.00	$30,769.04
Lawrence County	14	0/1	$ 1,755,000.00	$125,357.00
Lincoln County	15	0/0	$ 2,360,000.00	$90,769.00
Pike County	9	0/0	$ -	$ -
Walthall County	10	0/0	$ -	$ -
Wilkinson County	12	0/0	$ -	$ -
MEMA DISTRICT 7 REGION TOTAL	**106**	**0/0**	**$7,603,000**	**$350,279.04**

There have been several severe winter weather events in the MEMA District 7 Region. The text below describes two of the major events and associated impacts on the region. Similar impacts can be expected with severe winter weather.

February 2010
Heavy snow affected a large portion of the region, especially locations across central and southern Mississippi, on Thursday night and Friday, February 11th and 12th. The heavy snow was a result of a low-pressure system that tracked eastward across the northern Gulf of Mexico, and a vigorous upper level disturbance that moved across the region while a cold air mass was in place. Light precipitation overspread the region late Thursday afternoon into the evening before becoming heavy Thursday night into early Friday morning. The snow tapered off from west to east during the midday hours Friday.

February 2011
An ice storm developed across the area on February 3rd into the early morning hours of the 4th. While this icing event was not devastating, the impact to travel was a major issue across the region. Thousands of accidents occurred from slick roads. As a result of the accidents, three fatalities occurred along with a handful of injuries. Overall, most areas received 0.25 to 0.5 inches of ice accumulation from freezing rain. Additionally, some areas had a mix of precipitation with sleet accumulating. Some snow did occur, but those were just across select areas and the accumulation was mainly one inch or less.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could lead to fire or an accumulation of toxic fumes.

PROBABILITY OF FUTURE OCCURRENCES
Winter storm events will continue to occur in the MEMA District 7 Region. Based on historical information, the probability is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems. There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in the planning area. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms). However, accelerated warming in the Artic region (i.e., Arctic amplification) may also be linked with an increase in the frequency of extreme cold events across parts of Asia and North America, including in the MEMA District 7. [34]

5.2.14 RADIOLOGICAL EVENT

BACKGROUND

A nuclear and radiation accident is defined by the International Atomic Energy Agency as "an event that has led to significant consequences to people, the environment or the facility. Often, this type of incident results from damage to the reactor core of a nuclear power plant which can release radioactivity into the environment. The degree of exposure from nuclear accidents has varied historically from serious to catastrophic.

By some estimates, over 50 percent of nuclear accidents that have ever occurred were in the United States.[28] However, it is also important to note that generally, nuclear accidents are a rare occurrence. Many incidents are extremely well known due to their large-scale impact and serious effects on people and the environment, but incidents are generally not common

One of the most notorious accidents in the United States was the Three Mile Island accident which occurred in 1979 and released small amounts of radioactive gases and iodine into the environment. Although no deaths have been directly attributed to the accident, it invoked a strong public reaction and demonstrated the potential dangers associated with nuclear power generation.
The Grand Gulf Nuclear Station and River Bend Nuclear Station, which are both located within a 50-mile radius of the region. The Grand Gulf Station is a 4,408 megawatt power plant that began commercial operation in 1984, while the River Bend Station is a 3,901 megawatt power plant that began operation in 1985. Both are boiling water reactors and operate with a very high level of security.

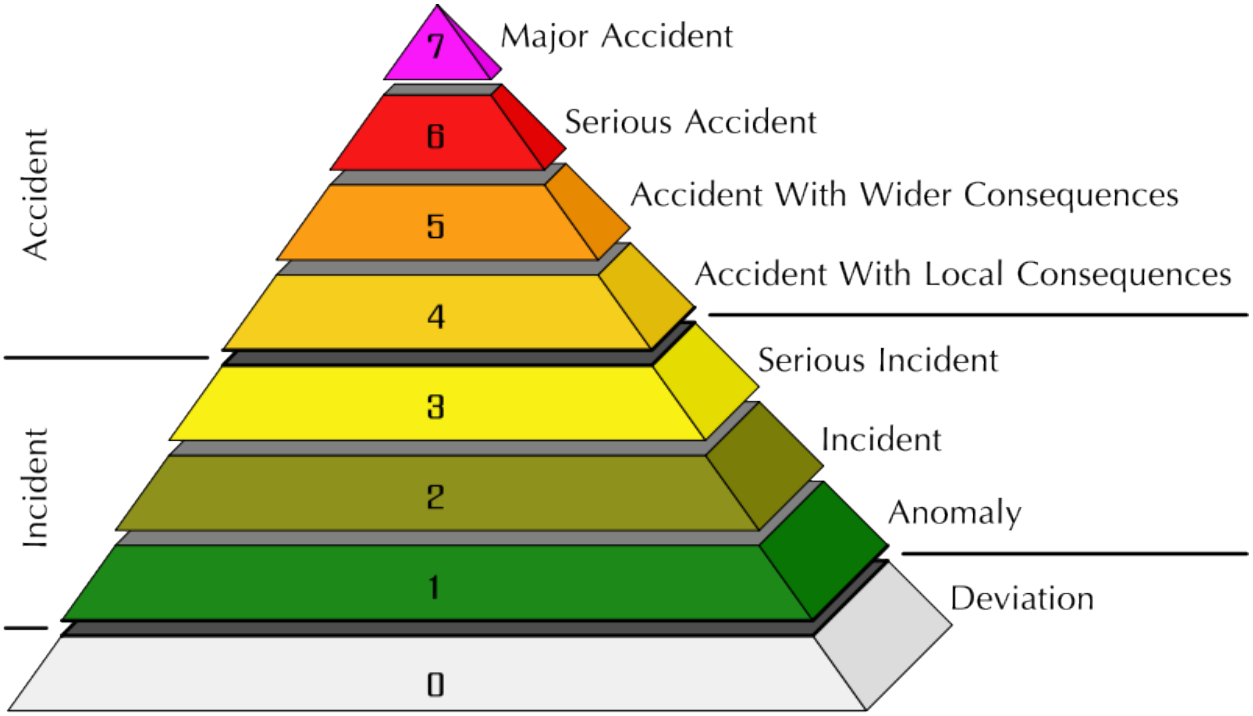
LOCATION AND SPATIAL EXTENT

The western and central portions of the region are at highest risk to a nuclear incident. Areas in this part of the region are susceptible due to their relative proximity to the aforementioned power plants. The International Atomic Energy Association has developed a scale called the International Nuclear and Radiological Event Scale (INES) which provides a quantitative means of assessing the extent of a nuclear event. This scale, like the MMI used for earthquakes, is logarithmic which means that each increasing

[34] NOAA – Communication Education & Engagement. Retrieved from: https://cpo.noaa.gov/Divisions-Programs/Communication-Education-and-Engagement/CEE-News/ArtMID/8293/ArticleID/2369/Research-Links-Extreme-Cold-Weather-in-the-United-States-to-Arctic-Warming

level on the scale represents an event 10 times more severe than the previous level.

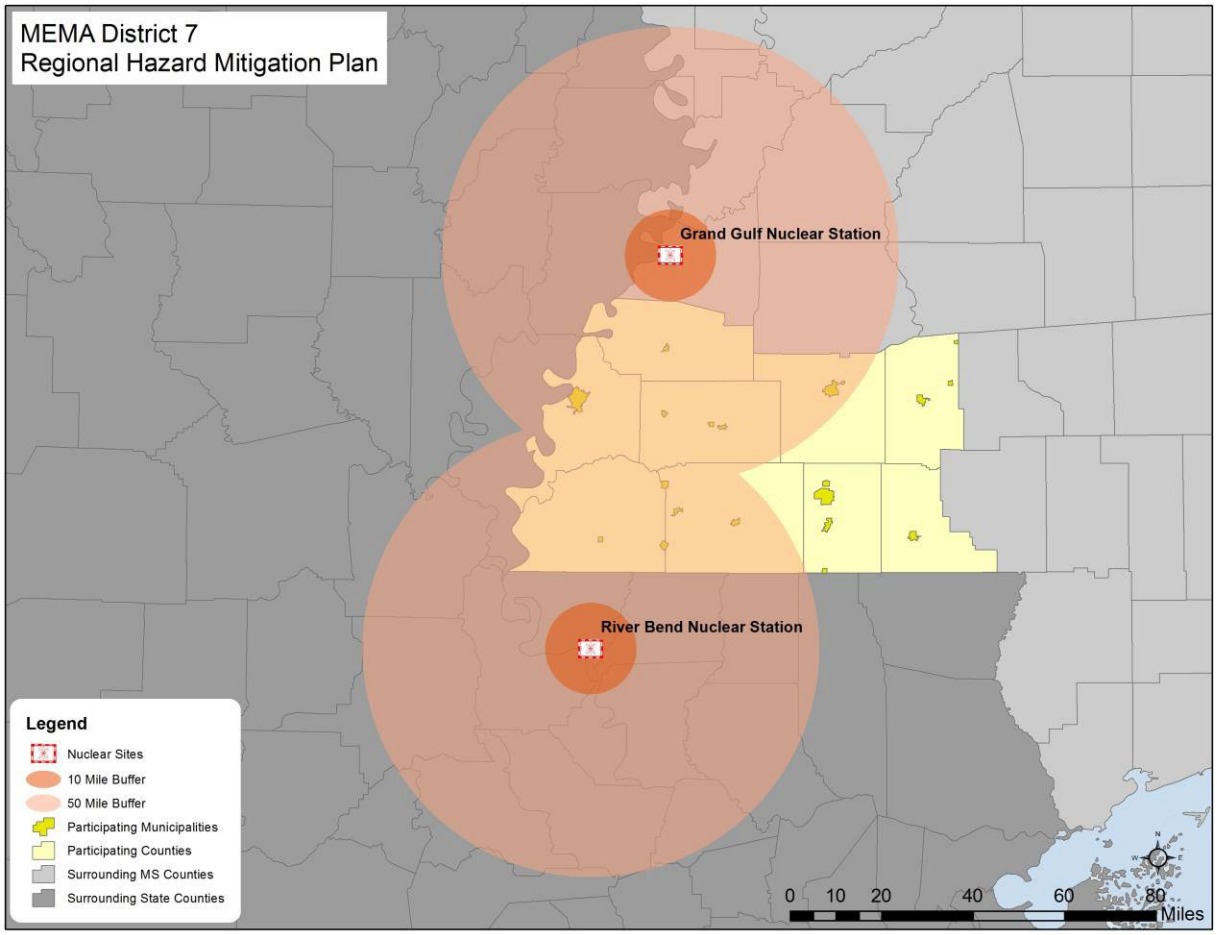
FIGURE 5.22: INTERNATIONAL NUCLEAR EVENT SCALE



Source: International Atomic Energy Agency

The Nuclear Regulatory Commission defines two emergency planning zones around nuclear plants. Areas located within 10 miles of the station are considered to be within the zone of highest risk to a nuclear incident and this radius is the designated evacuation radius recommended by the Nuclear Regulatory Commission. Within the 10-mile zone, the primary concern is exposure to and inhalation of radioactive contamination. The very northern part of Jefferson County is located on the edge of the 10-mile radius of the Grand Gulf Nuclear Station, although no part of the county is actually located within this zone. The most concerning effects in the secondary 50-mile zone are related to ingestion of food and liquids that may have been contaminated. All of Jefferson, Adams, and Wilkinson Counties are located within this 50-mile radius. Large parts of Franklin, Lincoln, and Amite County are also located within this zone. The 50-mile zone is still considered to be at risk from a nuclear incident, though the impacts may be less severe than in the 10-mile zone.

FIGURE 5.23: NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN THE MEMA DISTRICT 7 REGION



Source: International Atomic Energy Agency

HISTORICAL OCCURRENCES

Although there have been no major nuclear events at either the Grand Gulf or River Bend Nuclear Stations, there is some possibility that one could occur as there have been incidents in the past in the United States at other facilities and at facilities around the world. Additionally, a list of minor events/notifications was acquired from reports collected by the Nuclear Regulatory Commission (NRC). The NRC classifies events using the scale found in the following table. A list of events at Grand Gulf Nuclear Station and a list of events at River Bend Nuclear Station can be found in the following tables. It is noteworthy that all of the events were minor in magnitude and many were insignificant enough that they did not register on the classification scale.

TABLE 5.23: NUCLEAR REGULATORY COMMISSION EMERGENCY CLASSIFICATION SCALE FOR EVENTS OCCURRING AT NUCLEAR POWER PLANTS

Classification	Description
Notification of Unusual Event (NOUE)	Events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs. [Note: This term is sometimes shortened to Unusual Event (UE). The terms Notification of Unusual Event, NOUE and Unusual Event are used interchangeably.]
Alert	Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the Environmental Protection Agency (EPA) protective action guides (PAGs)
Site Area Emergency	Site Area Emergency (SAE) – Events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or hostile action that results in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to, equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA PAG exposure levels beyond the site boundary.
General Emergency	Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile action that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

Source: Nuclear Regulatory Commission

TABLE 5.24: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT GRAND GULF NUCLEAR STATION

Date	Retrieved From*	Classification	Plant	Description
8/29/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST
10/1/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF NUCLEAR STATION SECURITY OFFICER LOCKOUT
9/29/2016	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF EXTENDED PLANT SHUTDOWN TO ADDRESS OPERATIONS PERFORMANCE

Source: Nuclear Regulatory Commission
**Preliminary Notification Reports (http://www.nrc.gov/reading-rm/doc-collections/event-status/prelim-notice/): These are brief descriptions, generated by NRC regions when needed, of matters that are of significant safety or safeguards concern or have high public interest. PNs are used to promptly inform the Commissioners and others in NRC and Agreement States with new and current information.*
Licensee Event Reports (https://lersearch.inl.gov/Entry.aspx): Commercial nuclear reactor licensees are required to report certain event information per 10 CFR 50.73. Search was for- "Notification of Unusual Event" "Alert" "Site Area Emergency" "General Emergency"

TABLE 5.25: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT RIVER BEND NUCLEAR STATION

Date	Retrieved From*	Classification	Plant	Description
11/26/1985	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	ECCS Initiation: Improper restoration of a level transmitter causes HPSC injection
11/27/1985	Licensee Event Report	Alert	River Bend Unit 1	Failure to Perform Surveillance Tests
3/5/1992	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	REACTOR SCRAM CAUSED BY A GENERATOR TRIP DUE TO HIGH WINDS CAUSING TRANSFORMER DAMAGE
9/15/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE IVAN
10/4/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	Shutdown Greater than 72 Hours
9/23/2005	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	NRC ENTERS MONITORING MODE DUE TO HURRICANE RITA
5/23/2007	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REACTOR SHUTDOWN DUE TO UNEXPECTED CHANGE IN RECIRCULATION FLOW
9/2/2008	Preliminary Notification Reports	Notification of Unusual Event/Not Applicable	River Bend Unit 1	NRC RESPONSE TO HURRICANE GUSTAV
5/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	AUGMENTED INSPECTION TEAM ONSITE AT RIVER BEND STATION
8/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST

Source: Nuclear Regulatory Commission
**Preliminary Notification Reports (http://www.nrc.gov/reading-rm/doc-collections/event-status/prelim-notice/): These are brief descriptions, generated by NRC regions when needed, of matters that are of significant safety or safeguards concern or have high public interest. PNs are used to promptly inform the Commissioners and others in NRC and Agreement States with new and current information.*
Licensee Event Reports (https://lersearch.inl.gov/Entry.aspx): Commercial nuclear reactor licensees are required to report certain event information per 10 CFR 50.73. Search was for- "Notification of Unusual Event" "Alert" "Site Area Emergency" "General Emergency"

PROBABILITY OF FUTURE OCCURRENCES

A nuclear event is a very rare occurrence in the United States due to the intense regulation of the industry. There have been minor incidents in the past, but it is considered unlikely (less than 1 percent annual probability).

RADIOLOGICAL EVACUATIONS

Similar to the hurricane evacuations discussed above, in many ways the MEMA District 7 Region would potentially be impacted to a greater degree by evacuations caused by a radiological event than by the event itself. Since the region is not directly located within the 10-mile evacuation area but neighboring counties are located within this zone, it is highly likely that populations from those neighboring counties will be evacuated to the counties within the MEMA District 7 Region.

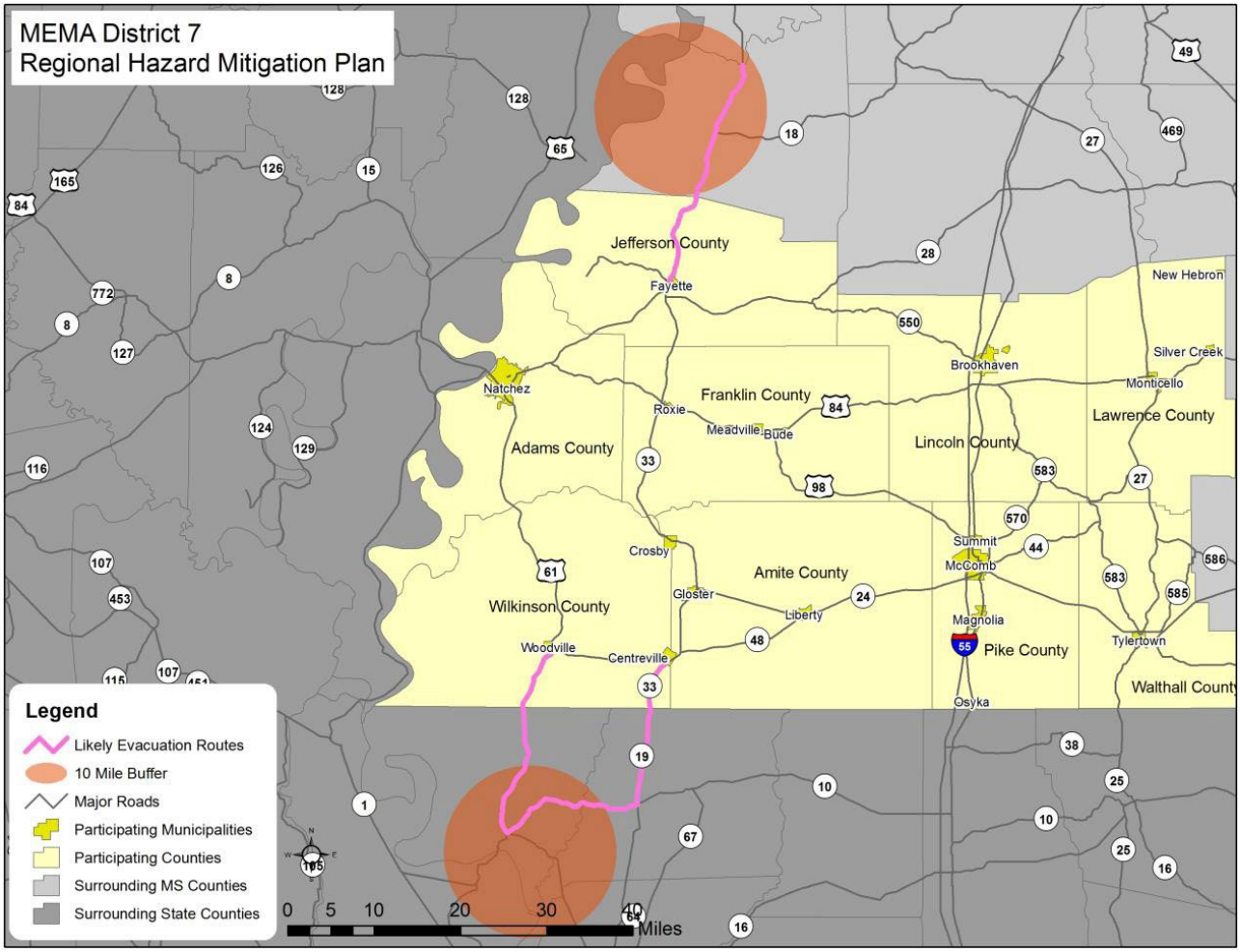
Due to the severe and long-term effects of a major radiological event, temporary sheltering will be an initial concern, but the greater challenge may be in the long-term. As has happened with historical radiological accidents in other locations, the danger in the impacted area will likely extend for a very long period after the event and evacuees may be unable to return to their homes for months or years. This additional influx of population will cause a major strain on resources within these relatively rural counties in the short-term, as local communities with limited resources will have an unexpected and immediate need to provide shelter and other life essentials such as food, water, and health care to a significant, additional number of people. In the long-term, there may be challenges for local officials as existing infrastructure will likely be inadequate to handle larger populations.

Although there have not been any major radiological events in the region historically, hurricane evacuations (discussed above) provide a similar scenario in terms of what the region might expect. However, one additional concern that officials will need to consider in a radiological event is that evacuees may be contaminated by radioactivity. According to the Centers for Disease Control, radioactive contamination can occur when radioactive materials are released into the environment and become deposited into the air, water, surfaces, soil, plants, buildings, people or animals. This contamination can then be spread when people touch other people, surfaces, or objects. Therefore, when people evacuate a contaminated zone, they pose a potential risk of spreading the contamination to others if they are not properly treated. Local officials in MEMA District 7 may need to be prepared to set up decontamination centers along major evacuation routes to ensure that the contamination is not spread. It is also important for citizens to understand the steps they can take to reduce the risk of spreading contamination such as evacuating quickly after an event and following decontamination instructions as directed by local officials.29

Based on the locations of the 10-mile evacuation areas near the region, many of these evacuees will likely come from Claiborne County to the north and West Feliciana and East Feliciana Parishes to the south. The main roads for these evacuees will probably be U.S. Highway 61 and Mississippi State Highway 33 since these are the primary and most direct roads into and out of the aforementioned evacuation counties and into MEMA District 7. Depending on the severity of the event, officials may even change these roads over to a contraflow traffic pattern to enable quicker evacuations.

As a result of the potential for an influx of evacuees during a radiological event, it is critical for local officials in MEMA District 7 to prepare for evacuations. It is possible that thousands of additional people will be relocated, either temporarily or permanently, to MEMA District 7. Therefore, plans for additional shelters and other resources should be coordinated well in advance of future events.

FIGURE 5.24: LIKELY EVACUATION ROUTES FOR A RADIOLOGICAL EVENT IN THE MEMA DISTRICT 7 REGION



Source: International Atomic Energy Agency

5.3 CONCLUSIONS ON HAZARD RISK

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled Understanding Your Risks: Identifying Hazards and Estimating Losses (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

5.3.1 Hazard Extent

The table below describes the extent of each natural hazard identified for the MEMA District 7 Region. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

TABLE 5.26: EXTENT OF MEMA DISTRICT 7 REGION HAZARDS

Flood-related Hazards	
Dam and Levee Failure	Dam Failure extent is defined using the Mississippi Department of Environmental Quality classifications which include Low, Significant, and High. Twelve dams are classified as high-hazard in the MEMA District 7 Region. • Adams County: 6 high hazard dams • Franklin County: 1 high hazard dam • Lincoln County: 2 high hazard dams • Pike County: 3 high hazard dams • Amite County, Jefferson County, Lawrence County, Walthall County, Wilkinson County: 0 high hazard dams
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no official erosion rate records in the MEMA District 7 Region but local estimates are around 0.25 to 0.50 feet per year. Some areas of erosion have been identified by local coordinators.
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 15.9 percent of the total land area in the MEMA District 7 Region. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the region was on the Homochitto River at Rosetta in Franklin County. Water reached a discharge of 150,000 cubic feet per second (recorded on March 31, 1949). The highest stream gage height was on Tanyard Creek at Liberty in Amite County with a height that was recorded at 94.31 feet (recorded on April 13, 1955). Additional peak discharge readings, historic crest heights, and the corresponding flood categories (where available) are in table 5.7. Compiled NCDC Data can be found in the Table 5.27
Fire-related Hazards	
Drought	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. All of the participating counties have received this ranking at least once over the 17-year reporting period.

Lightning	According to the Vaisala's flash density map, the MEMA District 7 Region is located in an area that experiences 12 to 28 lightning flashes per square mile per year. It should be noted that future lightning occurrences may exceed these figures.
Wildfire	Wildfire data provided by the Mississippi Forestry Commission in 2017 was reported annually by county from 2007-2016. Updated data is based on information from the Mississippi Forestry Commission from 2015 to 2022. Lincoln surpassed Amite County in the greatest number of fires to occur in a given year per county between 2015 to 2022, although Amite maintained the greatest average number of acres burned per year with 461 acres. Information on specific occurrences of wildfire and the most severe fires in each jurisdiction is not available. Analyzing the data by county indicates the following wildfire hazard extent for each county. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale or the Modified Mercalli Intensity (MMI) scale. According to data provided by the National Centers for Environmental Information, the greatest earthquake to impact the MEMA District 7 Region had an MMI of VI (strong) and a Richter Scale magnitude of 7.2 (reported on December 16, 1811). • Adams County: MMI of VI; 7.2 magnitude • Amite County: None reported (less than 2) • Franklin County: None reported (less than 2) • Jefferson County: None reported (less than 2) • Lawrence County: None reported (less than 2) • Lincoln County: MMI of II; no Richter magnitude available • Pike County: None reported (less than 2) • Walthall County: MMI of III, no Richter magnitude available • Wilkinson County: None reported (less than 2) Compiled NCDC Data can be found in the Table 5.28
Wind-related Hazards	
Extreme Heat	The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are not kept for any areas in the MEMA District 7 Region. However, the highest recorded temperature in the region was 106°F in 2007 with heat index values recorded above 115°F.
Hailstorm	Hail extent can be defined by the size of the hail stone. The largest hail stone reported in the MEMA District 7 Region was 2.75 inches (reported in several counties on multiple days). It should be noted that future events may exceed this. • Adams County, Franklin County, Jefferson County, Lawrence County, Lincoln County, Pike County, Walthall County: 2.75 inches • Amite County: 2.0 inches • Wilkinson County: 1.75 inches
Hurricane and Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5. The greatest classification of hurricane to impact the MEMA District 7 Region was a Category 3 storm. This occurred in 1969 with Hurricane Camille and in 2005 with Hurricane Katrina. The storm track of both storms passed just to the east of the region, but due to the size of these storms, their impact was felt across the region.
Severe Thunderstorm/	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 67-year history from the National Climatic Data Center, the strongest recorded wind event in the MEMA District 7 Region was reported on March 26, 2009 at 83 knots (approximately 96 mph). It should be noted that future events may exceed these historical occurrences. • Adams County: 78 knots

High Wind	• Amite County: 61 knots • Franklin County: 78 knots • Jefferson County: 70 knots • Lawrence County: 75 knots • Lincoln County: 83 knots • Pike County: 75 knots • Walthall County: 65 knots • Wilkinson County: 75 knots
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA as well as the Fujita/Enhanced Fujita Scale. The greatest magnitude reported was an F4 (last reported on April 18, 1978). • Franklin County and Wilkinson County: F2 • Adams County, Amite County, Jefferson County, Lawrence County, Lincoln County, Pike County, Walthall County: F4
Winter Storm, Freeze, Extreme Cold	The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in the MEMA District 7 Region. However, reports from NCDC of the greatest snowfall in the region have been 8-10 inches in Lawrence County (reported on December 11, 2008) and 4-10 inches in Lincoln County (reported on December 11, 2008). Reports in 2017, 2018, and 2021 all indicate snow fell between 2-5 inches, with a maximum of 8 inches in isolated areas. • Adams County: 6 inches • Amite County: 4 inches • Franklin County: 6.5 inches • Jefferson County: 6 inches • Lawrence County: 8 to 10 inches • Lincoln County: 4 to 10 inches • Pike County: 5 inches • Walthall County: 4 inches • Wilkinson County: 3 inches
Human Caused Hazards	
Radiological Event	Although there is no history of a nuclear accident at either the Grand Gulf Nuclear Station or River Bend Nuclear Station, other events across the globe and in the United States in particular indicate that an event is possible. Since several national and international events were Level 7 events on the INES, the potential for a Level 7 event at these stations is possible.
Pandemic	The extent of a pandemic impacting the region is difficult to estimate. It could result in thousands of deaths and extreme disruption of commerce and everyday life.

TABLE 5.27: NCDC FLOOD OCCURRENCES BY COUNTY 2017 TO 2023[35]

County/Zone	Date	Type	Mag.	Deaths	Injuries	Property Damage	Crop Damage	Total Losses
ADAMS CO.	12/27/2018	Flash Flood	--	0	0	$25,000	$0	$251,000
ADAMS CO.	4/2/2017	Flash Flood	--	0	0	$120,000	$0	
ADAMS CO.	8/18/2022	Flash Flood	--	0	0	$1,000	$0	
ADAMS CO.	2/17/2021	Flash Flood	--	0	0	$25,000	$0	
ADAMS CO.	4/23/2020	Flash Flood	--	0	0	$5,000	$0	
ADAMS CO.	12/14/2022	Flash Flood	--	0	0	$5,000	$0	
ADAMS CO.	1/2/2020	Flash Flood	--	0	0	$70,000	$0	
AMITE CO.	3/22/2022	Flash Flood	--	0	0	$0	$0	$300,000
AMITE CO.	12/14/2022	Flash Flood	--	0	0	$300,000	$0	
FRANKLIN CO.	7/15/2017	Flash Flood	--	0	0	$3,000	$0	$162,000
FRANKLIN CO.	12/27/2018	Flash Flood	--	0	0	$3,000	$0	
FRANKLIN CO.	7/25/2017	Flash Flood	--	0	0	$15,000	$0	
FRANKLIN CO.	6/30/2022	Flash Flood	--	0	0	$1,000	$0	
FRANKLIN CO.	7/10/2021	Flash Flood	--	0	0	$10,000	$0	
FRANKLIN CO.	9/23/2020	Flash Flood	--	0	0	$125,000	$0	
FRANKLIN CO.	4/24/2021	Flood	--	0	0	$5,000	$0	
JEFFERSON CO.	1/14/2020	Flash Flood	--	0	0	$5,000	$0	$5,000
LAWRENCE CO.	5/26/2018	Flash Flood	--	0	0	$3,000	$0	$1,157,000
LAWRENCE CO.	7/25/2017	Flood	--	0	0	$10,000	$0	
LAWRENCE CO.	7/25/2017	Flash Flood	--	0	0	$1,000,000	$0	
LAWRENCE CO.	6/6/2021	Flash Flood	--	0	0	$135,000	$0	
LAWRENCE CO.	9/23/2020	Flash Flood	--	0	0	$4,000	$0	
LAWRENCE CO.	4/18/2019	Flash Flood	--	0	0	$5,000	$0	
LINCOLN CO.	6/6/2017	Flash Flood	--	0	0	$5,000	$0	$910,000
LINCOLN CO.	7/25/2017	Flash Flood	--	0	0	$10,000	$0	
LINCOLN CO.	7/24/2017	Flash Flood	--	0	0	$15,000	$0	
LINCOLN CO.	7/25/2017	Flash Flood	--	0	0	$15,000	$0	
LINCOLN CO.	7/25/2017	Flood	--	0	0	$200,000	$0	
LINCOLN CO.	7/25/2017	Flash Flood	--	0	0	$650,000	$0	
LINCOLN CO.	12/14/2022	Flash Flood	--	0	0	$1,000	$0	
LINCOLN CO.	2/16/2023	Flash Flood	--	0	0	$1,000	$0	
LINCOLN CO.	2/20/2019	Flash Flood	--	0	0	$10,000	$0	
LINCOLN CO.	9/23/2020	Flash Flood	--	0	0	$3,000	$0	
WALTHALL CO.	12/27/2018	Flash Flood	--	0	0	$0	$0	$0
WALTHALL CO.	12/27/2018	Flash Flood	--	0	0	$0	$0	

[35] Storm Events Database - Search Results | National Centers for Environmental Information (noaa.gov)

WILKINSON CO.	12/14/2022	Flash Flood	--	0	0	$0	$0	$500,000
WILKINSON CO.	4/24/2021	Flash Flood	--	0	0	$500,000	$0	

TABLE 5.28: NCDC EARTHQUAKE OCCURRENCES BY COUNTY 2017 TO 2023[36]

Location	Number of Occurrences	Deaths/Injuries	Property Damage (2023)	Annualized Property Losses
Adams County	0	0/0	$0	$0
Amite County	0	0/0	$0	$0
Franklin County	0	0/0	$0	$0
Jefferson County	0	0/0	$0	$0
Lawrence County	0	0/0	$0	$0
Lincoln County	0	0/0	$0	$0
Pike County	0	0/0	$0	$0
Walthall County	0	0/0	$0	$0
Wilkinson County	0	0/0	$0	$0
MEMA DISTRICT 7 REGIONAL TOTAL	0	0/0	$0	$0

TABLE 5.29: NCDC HEAT WAVE OCCURRENCES BY COUNTY 2017 TO 2023[37]

Location	Number of Occurrences	Deaths/Injuries	Property Damage (2023)	Annualized Property Losses
Adams County	0	0/0	$0	$0
Amite County	0	0/0	$0	$0
Franklin County	0	0/0	$0	$0
Jefferson County	0	0/0	$0	$0
Lawrence County	0	0/0	$0	$0
Lincoln County	0	0/0	$0	$0
Pike County	0	0/0	$0	$0
Walthall County	0	0/0	$0	$0
Wilkinson County	0	0/0	$0	$0
MEMA DISTRICT 7 REGIONAL TOTAL	0	0/0	$0	$0

[36] Storm Events Database - Search Results | National Centers for Environmental Information (noaa.gov)
[37] Storm Events Database - Search Results | National Centers for Environmental Information (noaa.gov)

TABLE 5.30: NCDC HAIL OCCURRENCES BY COUNTY 2017 TO 2023[38]

County/Zone	Date	Type	Magnitude	Deaths/ Injuries	Property Damage	Crop Damage	Total Losses
ADAMS CO.	4/6/2018	Hail	0.75 in.	0/0	$0	$0	$0
ADAMS CO.	5/16/2022	Hail	1.00 in.	0/0	$0	$0	
AMITE CO.	4/2/2017	Hail	0.75 in.	0/0	$0	$0	$0
AMITE CO.	5/21/2017	Hail	1.00 in.	0/0	$0	$0	
AMITE CO.	2/21/2019	Hail	1.00 in.	0/0	$0	$0	
AMITE CO.	12/16/2019	Hail	1.25 in.	0/0	$0	$0	
AMITE CO.	4/17/2022	Hail	1.00 in.	0/0	$0	$0	
AMITE CO.	4/17/2022	Hail	1.75 in.	0/0	$0	$0	
AMITE CO.	11/29/2022	Hail	1.75 in.	0/0	$0	$0	
FRANKLIN CO.	3/27/2017	Hail	0.88 in.	0/0	$0	$0	$0
FRANKLIN CO.	4/6/2018	Hail	1.00 in.	0/0	$0	$0	
FRANKLIN CO.	10/12/2022	Hail	1.00 in.	0/0	$0	$0	
JEFFERSON CO.	4/12/2019	Hail	1.00 in.	0/0	$0	$0	$0
JEFFERSON CO.	4/22/2020	Hail	1.50 in.	0/0	$10,000	$0	
JEFFERSON CO.	2/21/2018	Hail	1.00 in.	0/0	$15,000	$0	
LAWRENCE CO.	3/9/2017	Hail	1.00 in.	0/0	$0	$0	$573,000
LAWRENCE CO.	2/5/2020	Hail	1.00 in.	0/0	$0	$0	
LAWRENCE CO.	5/27/2020	Hail	1.00 in.	0/0	$0	$0	
LAWRENCE CO.	6/3/2020	Hail	0.88 in.	0/0	$0	$0	
LAWRENCE CO.	6/12/2018	Hail	1.00 in.	0/0	$1,000	$2,000	
LAWRENCE CO.	4/15/2022	Hail	1.00 in.	0/0	$10,000	$0	
LAWRENCE CO.	4/17/2022	Hail	1.60 in.	0/0	$500,000	$0	
LAWRENCE CO.	3/9/2017	Hail	1.50 in.	0/0	$60,000	$0	
LINCOLN CO.	4/19/2020	Hail	1.00 in.	0/0	$0	$0	$32,000
LINCOLN CO.	4/22/2020	Hail	1.00 in.	0/0	$0	$0	
LINCOLN CO.	1/26/2021	Hail	1.00 in.	0/0	$0	$0	
LINCOLN CO.	4/17/2022	Hail	1.00 in.	0/0	$10,000	$0	
LINCOLN CO.	4/2/2017	Hail	1.75 in.	0/0	$15,000	$0	
LINCOLN CO.	12/16/2019	Hail	1.75 in.	0/0	$2,000	$0	
LINCOLN CO.	12/16/2019	Hail	1.25 in.	0/0	$2,000	$0	
LINCOLN CO.	12/16/2019	Hail	1.50 in.	0/0	$3,000	$0	
PIKE CO.	4/19/2020	Hail	1.00 in.	0/0	$0	$0	$0
WALTHALL CO.	4/19/2020	Hail	1.50 in.	0/0	$0	$0	$0
WALTHALL CO.	3/28/2023	Hail	1.25 in.	0/0	$0	$0	

[38] Storm Events Database - Search Results | National Centers for Environmental Information (noaa.gov)

WILKINSON CO.	4/7/2019	Hail	1.00 in.	0/0	$0	$0	$0
WILKINSON CO.	3/24/2021	Hail	1.00 in.	0/0	$0	$0	
WILKINSON CO.	4/17/2022	Hail	1.00 in.	0/0	$0	$0	

TABLE 5.31: NCDC E HURRICANE AND TROPICAL STORM OCCURRENCES BY COUNTY 2017 TO 2023[39]

County/Zone	Date	Type	Mag.	Deaths/ Injuries	Property Damage	Crop Damage	Total Losses
ADAMS (ZONE)	10/9/2020	Tropical Storm	--	0/0	$300,000	$0	$415,000
ADAMS (ZONE)	8/27/2020	Tropical Storm	--	0/0	$40,000	$0	
ADAMS (ZONE)	8/29/2021	Tropical Storm	--	0/0	$75,000	$0	
AMITE (ZONE)	8/29/2021	Hurricane	--	0/0	$1,000,000	$0	$1,500,00
AMITE (ZONE)	10/9/2020	Tropical Storm	--	0/0	$500,000	$0	
FRANKLIN (ZONE)	10/9/2020	Tropical Storm	--	0/0	$100,000	$0	$350,000
FRANKLIN (ZONE)	8/30/2021	Tropical Storm	--	0/0	$250,000	$0	
JEFFERSON (ZONE)	10/9/2020	Tropical Storm	--	0/0	$100,000	$0	$200,000
JEFFERSON (ZONE)	8/30/2021	Tropical Storm	--	0/0	$100,000	$0	
LAWRENCE (ZONE)	8/29/2021	Tropical Storm	--	0/0	$75,000	$0	$75,000
LINCOLN (ZONE)	8/29/2021	Tropical Storm	--	0/0	$100,000	$0	$150,000
LINCOLN (ZONE)	10/9/2020	Tropical Dep.	--	0/0	$50,000	$0	
PIKE (ZONE)	8/29/2021	Hurricane	--	0/0	$1,000,000	$0	$1,150,000
PIKE (ZONE)	10/9/2020	Tropical Storm	--	0/0	$100,000	$0	
PIKE (ZONE)	10/28/2020	Tropical Storm	--	0/0	$50,000	$0	
WALTHALL (ZONE)	8/29/2021	Hurricane	--	0/0	$1,000,000	$0	$1,600,000
WALTHALL (ZONE)	10/28/2020	Tropical Storm	--	0/0	$100,000	$0	
WALTHALL (ZONE)	10/9/2020	Tropical Storm	--	0/0	$500,000	$0	
WILKINSON (ZONE)	7/13/2019	Tropical Storm	--	0/0	$0	$0	$3,500,000
WILKINSON (ZONE)	10/9/2020	Tropical Storm	--	0/0	$3,000,000	$0	
WILKINSON (ZONE)	8/29/2021	Hurricane	--	0/0	$500,000	$0	

[39] Storm Events Database - Search Results | National Centers for Environmental Information (noaa.gov)

TABLE 5.32: NCDC THUNDERSTORM OCCURRENCES BY COUNTY 2017 TO 2023[40]

County	Events	Type	Magnitude Range	Dths	Injrs	Property Damage	Crop Dmg	Total Losses
ADAMS CO.	36	Thunderstorm Wind	40 to 61 kts. EG	0	0	$310,000	$0	$310,000
AMITE CO.	14	Thunderstorm Wind/Heavy Rain	50 to 60 kts. EG	0	0	$5,000	$0	$5,000
FRANKLIN CO.	26	Thunderstorm Wind	50 to 60 kts. EG	0	0	$694,500	$0	$694,500
JEFFERSON CO.	24	Thunderstorm Wind	50 to 63 kts. EG	0	0	$189,000	$0	$189,000
LAWRENCE CO.	25	Thunderstorm Wind	35 to 87 kts. EG	0	0	$431,000	$0	$431,000
LINCOLN CO.	47	Thunderstorm Wind	30 to 83 kts. EG	0	0	$1,195,300	$0	$1,195,300
PIKE CO.	15	Thunderstorm Wind/Heavy Rain	50 to 70 kts. EG	0	0	$265,000	$0	$265,000
WALTHALL CO.	13	Thunderstorm Wind	50 to 66 kts. EG	0	1	$35,000	$0	$35,000
WILKINSON CO.	9	Thunderstorm Wind	50 to 60 kts. EG	1	0	$0	$0	$0
						TOTAL		$3,124,800

TABLE 5.33: NCDC WINTER STORM OCCURRENCES BY COUNTY 2017 TO 2023[41]

County/Zone	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage	Total Losses
ADAMS (ZONE)	1/16/2018	Winter Weather	--	0	0	$0	$0	$153,000
ADAMS (ZONE)	1/10/2021	Heavy Snow	--	0	0	$0	$0	
ADAMS (ZONE)	2/17/2021	Ice Storm	--	0	0	$125,000	$0	
ADAMS (ZONE)	12/8/2017	Heavy Snow	--	0	0	$25,000	$0	
ADAMS (ZONE)	2/12/2021	Winter Weather	--	0	0	$3,000	$0	
AMITE (ZONE)	12/7/2017	Heavy Snow	--	0	0	$0	$0	$0
AMITE (ZONE)	1/16/2018	Winter Weather	--	0	0	$0	$0	
FRANKLIN (ZONE)	1/16/2018	Winter Weather	--	0	0	$0	$0	$120,000
FRANKLIN (ZONE)	1/10/2021	Winter Weather	--	0	0	$0	$0	
FRANKLIN (ZONE)	2/17/2021	Ice Storm	--	0	0	$100,000	$0	
FRANKLIN (ZONE)	12/8/2017	Heavy Snow	--	0	0	$20,000	$0	
JEFFERSON (ZONE)	12/8/2017	Heavy Snow	--	0	0	$0	$0	$200,000
JEFFERSON (ZONE)	1/16/2018	Winter Weather	--	0	0	$0	$0	
JEFFERSON (ZONE)	1/10/2021	Heavy Snow	--	0	0	$0	$0	
JEFFERSON (ZONE)	2/17/2021	Winter Storm	--	0	0	$200,000	$0	
LAWRENCE (ZONE)	12/7/2017	Heavy Snow	--	0	0	$0	$0	$275,000

[40] Storm Events Database - Search Results | National Centers for Environmental Information (noaa.gov)
[41] Storm Events Database - Search Results | National Centers for Environmental Information (noaa.gov)

LAWRENCE (ZONE)	1/10/2021	Winter Weather	--	0	0	$0	$0	
LAWRENCE (ZONE)	2/15/2021	Winter Storm	--	0	0	$200,000	$0	
LAWRENCE (ZONE)	2/17/2021	Winter Weather	--	0	0	$5,000	$0	
LAWRENCE (ZONE)	1/16/2018	Heavy Snow	--	0	1	$70,000	$0	
LINCOLN (ZONE)	1/16/2018	Winter Weather	--	0	0	$0	$0	
LINCOLN (ZONE)	1/10/2021	Winter Weather	--	0	0	$0	$0	
LINCOLN (ZONE)	2/17/2021	Ice Storm	--	0	0	$100,000	$0	$375,000
LINCOLN (ZONE)	2/15/2021	Winter Storm	--	0	0	$200,000	$0	
LINCOLN (ZONE)	12/7/2017	Heavy Snow	--	0	0	$75,000	$0	
PIKE (ZONE)	12/7/2017	Heavy Snow	--	0	0	$0	$0	$0
WALTHALL (ZONE)	12/7/2017	Heavy Snow	--	0	0	$0	$0	$0
WALTHALL (ZONE)	1/16/2018	Heavy Snow	--	0	0	$0	$0	
WILKINSON (ZONE)	12/7/2017	Heavy Snow	--	0	0	$0	$0	$0
WILKINSON (ZONE)	1/16/2018	Winter Weather	--	0	0	$0	$0	

5.3.2 Priority Risk Index

In order to draw some meaningful planning conclusions on hazard risk for the MEMA District 7 Region, the results of the hazard profiling process were used to generate region-wide hazard classifications according to a "Priority Risk Index" (PRI). The purpose of the PRI is to categorize and prioritize all potential hazards for the MEMA District 7 Region as high, moderate, or low risk. Combined with the asset inventory and quantitative vulnerability assessment provided in the next section, the summary hazard classifications generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes and, more specifically, the identification of hazard mitigation opportunities for the MEMA District 7 Region to consider as part of their proposed mitigation strategy.

The prioritization and categorization of identified hazards for the MEMA District 7 Region is based principally on the PRI, a tool used to measure the degree of risk for identified hazards in a particular planning area. The PRI is used to assist the MEMA District 7 Regional Hazard Mitigation Council in gaining consensus on the determination of those hazards that pose the most significant threat to the MEMA District 7 counties based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective planning tool for classifying and prioritizing hazard risks in the MEMA District 7 Region based on standardized criteria.

The application of the PRI results in numerical values that allow identified hazards to be ranked against one another (the higher the PRI value, the greater the hazard risk). PRI values are obtained by assigning varying degrees of risk to five categories for each hazard (probability, impact, spatial extent, warning time, and duration). Each degree of risk has been assigned a value (1 to 4) and an agreed upon weighting factor[30], as summarized in the table below. To calculate the PRI value for a given hazard, the assigned risk value for each category is multiplied by the weighting factor. The sum of all five categories equals the final PRI value, as demonstrated in the example equation below:

PRI VALUE = [(PROBABILITY x .30) + (IMPACT x .30) + (SPATIAL EXTENT x .20) + (WARNING TIME x .10) + (DURATION x .10)]

According to the weighting scheme and point system applied, the highest possible value for any hazard is 4.0. When the scheme is applied for the MEMA District 7 Region, the highest PRI value is 3.3 (hurricane and tropical storm). Prior to being finalized, PRI values for each identified hazard were reviewed and accepted by the members of the MEMA District 7 Regional Hazard Mitigation Council.

TABLE 5.34: PRIORITY RISK INDEX FOR THE MEMA DISTRICT 7 REGION

PRI Category	Degree of Risk			Assigned Weighting Factor
	Level	Criteria	Index Value	
Probability	Unlikely	Less than 1% annual probability	1	30%
	Possible	Between 1 and 10% annual probability	2	
	Likely	Between 10 and 100% annual probability	3	
	Highly Likely	100% annual probability	4	
Impact	Minor	Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities.	1	30%
	Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one day.	2	
	Critical	Multiple deaths/injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one week.	3	
	Catastrophic	High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.	4	
Spatial Extent	Negligible	Less than 1% of area affected	1	20%
	Small	Between 1 and 10% of area affected	2	
	Moderate	Between 10 and 50% of area affected	3	
	Large	Between 50 and 100% of area affected	4	
Warning Time	More than 24 hours	Self explanatory	1	10%
	12 to 24 hours	Self explanatory	2	
	6 to 12 hours	Self explanatory	3	
	Less than 6 hours	Self explanatory	4	
Duration	Less than 6 hours	Self explanatory	1	10%
	Less than 24 hours	Self explanatory	2	
	Less than one week	Self explanatory	3	
	More than one week	Self explanatory	4	

5.3.3 Priority Risk Index Results

The table below summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this section, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

TABLE 5.35: SUMMARY OF PRI RESULTS FOR THE MEMA DISTRICT 7 REGION

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Dam and Levee Failure	Unlikely	Critical	Moderate	Less than 6 hours	Less than 6 hours	**2.3**
Erosion	Likely	Critical	Moderate	More than 24 hours	More than 1 week	**2.9**
Flood	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**3.2**
Fire-related Hazards						
Drought	Likely	Limited	Large	More than 24 hours	More than 1 week	**2.8**
Lightning	Highly Likely	Limited	Small	6 to 12 hours	Less than 6 hours	**2.6**
Wildfire	Highly Likely	Limited	Small	Less than 6 hours	Less than 1 week	**2.9**
Geologic Hazards						
Earthquake	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Wind-related Hazards						
Extreme Heat	Likely	Limited	Large	More than 24 hours	More than 1 week	**2.8**
Hailstorm	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Hurricane/Tropical Storm	Likely	Catastrophic	Large	More than 24 hours	Less than 1 week	**3.3**
Severe Thunderstorm/High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Tornado	Likely	Catastrophic	Moderate	Less than 6 hours	Less than 6 hours	**3.2**
Winter Storm and Freeze	Likely	Minor	Moderate	More than 24 hours	Less than 1 week	**2.2**
Human-caused Hazards						
Radiological Event	Unlikely	Critical	Moderate	More than 24 hours	Less than 1 week	**2.2**
Pandemic	Unlikely	Limited	Large	More than 24 hours	More than 1 week	2.2

5.4 Final Determinations

The conclusions drawn from the hazard profiling process for the MEMA District 7 Region, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk. For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of the MEMA District 7 Region. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately and is described in Section 6: Vulnerability Assessment. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates. In most cases, the hazards of greatest concern did not change much since the last plan update, indicating that the priorities remained relatively stable. There were few changes in priorities that related specifically each entity's identified risk. These modifications are reflected by the new actions identified and changes in ranking as indicated in each annex.

TABLE 5.36: CONCLUSIONS ON HAZARD RISK FOR THE MEMA DISTRICT 7 REGION

HIGH RISK	Hurricane and Tropical Storm Tornado Flood Severe Thunderstorm/High Wind
MODERATE RISK	Wildfire* Hailstorm Drought Extreme Heat Lightning
LOW RISK	Dam and Levee Failure Erosion Winter Storm and Freeze Radiological Event Earthquake Pandemic

*hazard may be elevated to "High Risk" in the next planning update.

VULNERABILITY ASSESSMENT

This section identifies and quantifies the vulnerability of the MEMA District 7 Region to the significant hazards identified in the previous sections (*Hazard Identification* and *Profiles*). It consists of the following subsections:

- 6.1 Overview
- 6.2 Methodology
- 6.3 Explanation of Data Sources
- 6.4 Asset Inventory
- 6.5 Vulnerability Assessment Results
- 6.6 Conclusions on Hazard Vulnerability

44 CFR Requirement
44 CFR Part 201.6(c)(2)(ii): The risk assessment shall include a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. The description shall include an overall summary of each hazard and its impact on the community. The plan should describe vulnerability in terms of: (A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; (B) An estimate of the potential losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate; (C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

6.1 OVERVIEW

This section builds upon the information provided in Section 4: Hazard Identification and Section 5: Hazard Profiles by identifying and characterizing an inventory of assets in the MEMA District 7 Region. In addition, the potential impact and expected damages caused to these assets by each identified hazard event is assessed. The primary objective of the vulnerability assessment is to quantify exposure and the potential loss estimates for each hazard. In doing so, the MEMA District 7 counties and their participating jurisdictions may better understand their unique risks to identified hazards and be better prepared to evaluate and prioritize specific hazard mitigation actions.

Due to data limitations, the majority of information is rolled up to the county level. It can be assumed unless otherwise specified that risks to the county would be experienced also by their municipalities. Many of the municipalities also share common resources with the County, as exemplified by the representation each County Emergency Manager provided for their participating municipalities. Details where risk differs from the county can be found in the annexes.

This section begins with an explanation of the methodology applied to complete the vulnerability assessment, followed by a summary description of the asset inventory as compiled for the MEMA District 7 Region. The remainder of this section focuses on the results of the assessment conducted. A detailed list of the municipalities and county critical facilities can be found in each annex.

6.2 METHODOLOGY

This vulnerability assessment was conducted using three distinct methodologies: (1) A stochastic risk assessment; (2) a geographic information system (GIS)-based analysis; and (3) a risk modeling software analysis. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation, including historical occurrence information provided in the Hazard Identification and Analysis sections. A brief description of the three different approaches is provided on the following pages.

6.3 Stochastic Risk Assessment

The stochastic risk assessment methodology was applied to analyze hazards of concern that were outside the scope of hazard risk models and the GIS-based risk assessment. This includes hazards that do not have geographically definable boundaries and are therefore excluded from spatial analysis through GIS. A stochastic risk methodology was used for the following hazards:

- Drought
- Erosion
- Extreme Heat
- Hailstorm
- Lightning
- Severe Thunderstorm/High Wind
- Tornado
- Winter Storm and Freeze

Many of the hazards listed above are considered atmospheric and have the potential to affect all buildings and all populations. For many of the hazards listed above, no additional analysis was performed. When possible, annualized loss estimates were determined using the best available data on historical losses from sources including NOAA's National Climatic Data Center records, previous MEMA District 7 Region hazard mitigation plans, and local knowledge. Annualized loss is the estimated long-term weighted average value of losses to property in any single year in a specified geographic area (i.e., municipality or county). Annualized loss estimates were generated by totaling the amount of property damage over the period of time for which records were available and calculating the average annual loss. Given the standard weighting analysis, losses can be readily compared across hazards providing an objective approach for evaluating mitigation alternatives.

For the erosion hazard, only anecdotal information on historical property damages was available. Therefore, annualized losses for these hazards are identified as negligible, though it should be noted that this does not indicate that future losses will not occur. Drought, extreme heat, hailstorm, lightning, severe thunderstorm/high wind, tornado, and winter storm and freeze have the potential to impact the entire MEMA District 7 Region. The results for these hazards are found in the table at the end of this section.

6.4 GIS-Based Analysis

Other hazards have specified geographic boundaries that permit additional using Geographic Information Systems (GIS). These hazards include:

- Dam and Levee Failure
- Flood
- Radiological Event
- Wildfire

The objective of the GIS-based analysis was to determine the estimated vulnerability of critical facilities and populations for the identified hazards in the MEMA District 7 Region using best available geospatial data. Digital data was collected from local, regional, state, and national sources for hazards and buildings. Communities in the MEMA District 7 Region generally did not have readily available geospatial parcel or building footprint data, though where it was available, it was used in the analysis.

Despite this lack of data, the HMC wanted to have some estimate of potential building and dollar losses, so 2010 Census block data was extracted from Hazus MH that included building counts and dollar values of property in the region. Additionally, geo-referenced point locations for identified assets (critical facilities and infrastructure, special populations, etc.) were identified via from past plans and Hazus MH

5.1 and used in this vulnerability analysis. These critical facility lists were reviewed by the HMC prior to analysis. ESRI® ArcGIS™ 10.3.1 was used to assess hazard vulnerability utilizing digital hazard data, as well as local building and exposure data described above. Using these data layers, hazard vulnerability can be quantified by estimating the number and dollar value of census blocks determined to be located in identified hazard areas. However, it should be noted that this method likely overestimates the number and value of property at risk.

To estimate vulnerable populations in hazard areas, digital Census 2010 data by census block was obtained. This was intersected with hazard areas to determine exposed population counts. The results of the analysis provided an estimate of the number of people and critical facilities, as well as the value of buildings determined to be potentially at risk to those hazards with delineable geographic hazard boundaries.

6.5 Risk Modeling Software Analysis

A risk modeling software was used for the following hazards:

- Earthquake
- Hurricane and Tropical Storm

There are several models that exist to model hazards. Hazus-MH was used in this vulnerability assessment to address the aforementioned hazards.

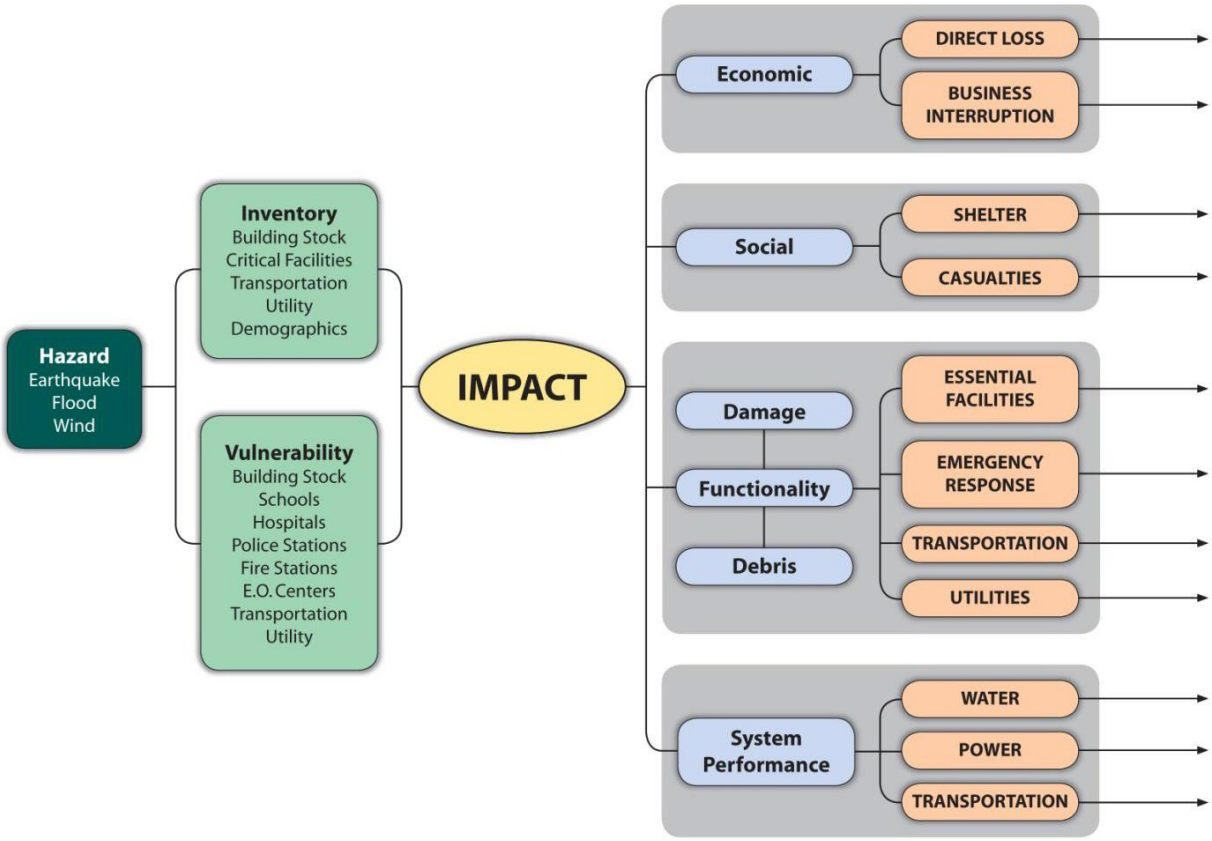
HAZUS-MH

Hazus-MH (“Hazus”) is a standardized loss estimation software program developed by FEMA. It is built upon an integrated GIS platform to conduct analysis at a regional level (i.e., not on a structure-by-structure basis). The Hazus risk assessment methodology is parametric, in that distinct hazard and inventory parameters (e.g., wind speed and building types) can be modeled using the software to determine the impact (i.e., damages and losses) on the built environment.

The MEMA District 7 Regional Risk Assessment utilized Hazus-MH to produce hazard damage loss estimations for hazards for the planning area. At the time this analysis was completed, Hazus-MH 5.1 was used to estimate potential damages from the hurricane winds and earthquake hazards using Hazus- MH methodology. Although the program can also model losses for flood and storm surge, it was not used in this Risk Assessment.

The figure below illustrates the conceptual model of the Hazus-MH methodology.

FIGURE 6.1: CONCEPTUAL MODEL OF HAZUS-MH METHODOLOGY



Hazus-MH is capable of providing a variety of loss estimation results. In order to be consistent with other hazard assessments, annualized losses are presented when possible.

Loss estimates provided in this vulnerability assessment are based on best available data and methodologies. The results are an approximation of risk. These estimates should be used to understand relative risk from hazards and potential losses. Uncertainties are inherent in any loss estimation methodology, arising in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from approximations and simplifications that

are necessary for a comprehensive analysis (e.g., incomplete inventories, non-specific locations, demographics, or economic parameters).

All conclusions are presented in "Conclusions on Hazard Vulnerability" at the end of this section.

6.6 EXPLANATION OF DATA SOURCES

DAM/LEVEE FAILURE

Dam inundation data was available in GIS format for several of the major dams in the region from the Mississippi Department of Environmental Quality. Although not all high hazard dams have inundation mapping, several of the major dams in the region are included in this data. With that in mind, analysis with this data should not be considered inclusive of every critical facility or structure that may be at risk to a dam or levee failure as the data is far from being complete.

FLOOD

FEMA Digital Flood Insurance Rate Maps (DFIRM) flood data were used to determine flood vulnerability. DFIRM data can be used in ArcGIS for mapping purposes, and they identify several features including floodplain boundaries and base flood elevations (in some cases). Identified areas on the DFIRM represent some features of Flood Insurance Rate Maps including the 100-year flood areas (1.0-percent annual chance flood), and the 500-year flood areas (0.2-percent annual chance flood). For the vulnerability assessment, local improved property data and critical facilities were overlaid on the 1.0-percent annual chance floodplain (ACF) areas for counties that had digital parcel data available. Some 0.2-percent annual chance floodplain areas were also identified in some of the county DFIRMS. It should be noted that such an analysis does not account for building elevation.

WILDFIRE

The data used to determine vulnerability to wildfire in the MEMA District 7 Region is based on GIS data called the Southern Wildfire Risk Assessment (SWRA). This data is available on the Southern Wildfire Risk Assessment website and can be downloaded and imported into ArcGIS. A specific layer, known as "Wildland Urban Interface Risk Index" (WUIRI) was used to determine vulnerability of people and property. The WUIRI is presented on a scale of 0 to -9. It combines data on housing density with the data on the impact and likelihood of a wildfire occurring in a specific area. The primary purpose of the data is to highlight areas of concern that may be conducive to mitigation actions. Due to assumptions made, it is not true probability. However, it does provide a comparison of risk throughout the region.

EARTHQUAKE

Hazus-MH 5.1 (as described above) was used to assess earthquake vulnerability. A level 1, probabilistic scenario to estimate average annualized loss was utilized. In this scenario, several return periods (events of varying intensities) are run to determine annualized loss. Default Hazus earthquake damage functions and methodology were used to determine the probability of damage. Results are calculated at the 2020 U.S. Census tract level in Hazus and presented at the county level.

HURRICANE AND TROPICAL STORM WIND

Hazus-MH 5.1 (as described above) was used to assess wind vulnerability. For the hurricane wind analysis, a probabilistic scenario was created to estimate the annualized loss damage in the MEMA

District 7 Region. Default Hazus wind speed data, damage functions, and methodology were used in to determine the probability of damage for 50-, 100-, 500-, and 1,000-year frequency events (also known as a return period) in the scenario. Results are calculated in Hazus at the 2020 U.S. Census tract level and presented at the county level.

RADIOLOGICAL EVENT

The data used to determine vulnerability to a nuclear accident in MEMA District 7 is based on the location of the Grand Gulf and River Bend Nuclear Power Stations and buffer radii recommended by the Nuclear Regulatory Commission for emergency management planning in the event of a nuclear accident.

6.7 ASSET INVENTORY

An inventory of geo-referenced assets within the MEMA District 7 counties and jurisdictions was compiled in order to identify and characterize those properties potentially at risk to the identified hazards.1 By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. Under this assessment, two categories of physical assets were created and then further assessed through GIS analysis. Additionally, social assets are addressed to determine population at risk to the identified hazards. These are presented below.

6.7.1 Physical and Improved Assets

The two categories of physical assets consist of:

1. Improved Property: Building footprint and parcel data was not available for most of the participating areas. The definition of improved property includes all improved properties in the MEMA District 7 Region according to building data extracted from Hazus MH 5.1. It should be noted that this data produced less accurate information concerning the number of buildings at risk than parcel data because the Hazus data was aggregated at a much larger geographic area, the census block level. Where local parcel data was available, it was used to improve analysis.

   Hazus inventory data provides an estimate of the number of buildings in the study region. The economic exposure is also presented to be referenced with any Hazus-related results.

2. Critical Facilities: Critical facilities vary by jurisdiction. For this Vulnerability Assessment, facilities were initially collected from existing hazard mitigation plans and Hazus-MH. This includes fire stations, police stations, medical care facilities, emergency operation centers, schools, government/public buildings, transportation infrastructure, and private facilities. This data was then reviewed by local officials who used their knowledge to supplement the existing/Hazus data. It should be noted that this listing is not all-inclusive for assets located in the region, but it is anticipated that it will be expanded during future plan updates as more geo-referenced data becomes available for use in GIS analysis.

The following tables provide a detailed listing of the geo-referenced assets that have been identified for inclusion in the vulnerability assessment for the MEMA District 7 Region, including the estimated number

of improved properties and the total value of improvements for participating areas of the MEMA District 7 Region (study area of vulnerability assessment). Because digital parcel data was not available for most communities, data obtained from Hazus-MH 5.1 inventory was utilized to complete the analysis.

TABLE 6.1: IMPROVED PROPERTY IN THE MEMA DISTRICT 7 REGION

Location	Counts of Improved Property	Total Value of Improvements
Adams County	**14,661**	**$3,129,923,000**
Natchez	8,332	$2,068,891
Unincorporated Area	6,329	$3,127,854,109
Amite County	**6,928**	**$941,412,000**
Gloster	716	$112,157
Liberty	453	$80,122
Unincorporated Area	5,759	$941,219,721
Franklin County	**4,237**	**$650,604,000**
Bude	560	$94,838
Meadville	314	$82,402
Roxie	275	$36,555
Unincorporated Area	3,088	$650,390,205
Jefferson County	**3,686**	**$697,417,000**
Fayette	1,052	$181,948
Unincorporated Area	2,634	$697,235,052
Lawrence County	**6,240**	**$1,063,674,000**
Monticello	862	$219,887
New Hebron	262	$53,898
Silver Creek	139	$19,344
Unincorporated Area	4,977	$1,063,380,871
Lincoln County	**15,788**	**$3,178,673,000**
Brookhaven	4,644	$1,333,728
Unincorporated Area	11,144	$3,177,339,272
Pike County	**18,216**	**$3,497,301,000**
Magnolia	1,106	$221,010
McComb	6,079	$1,482,797
Osyka	309	$67,670
Summit	963	$162,688
Unincorporated Area	9,759	$3,495,366,835
Walthall County	**7,509**	**$1,086,943,000**
Tylertown	962	$224,096
Unincorporated Area	6,547	$1,086,718,904
Wilkinson County	**5,220**	**$763,415,000**
Centreville	866	$150,329
Crosby	211	$25,479
Woodville	804	$157,912
Unincorporated Area	3,339	$763,081,280
MEMA DISTRICT 7 REGIONAL TOTAL	**82,485**	**$15,009,362,000**

The table below lists the fire stations, police stations, medical care facilities, emergency operation centers, schools, government/public buildings, transportation infrastructure, and private facilities located in the MEMA District 7 Region according to previous plan data and Hazus-MH 5.1 data that was reviewed and updated by local officials.

TABLE 6.2: CRITICAL FACILITY INVENTORY IN THE MEMA DISTRICT 7 REGION

Location	Fire Stations	Police Stations	Medical Care	EOC	Schools	Gov't/ Public	Trans	Private Sector
Adams County	**8**	**4**	**8**	**1**	**14**	**1**	**3**	**2**
Natchez	5	2	8	1	12	1	0	0
Unincorporated Area	3	2	0	0	2	0	3	2
Amite County	**9**	**3**	**4**	**1**	**7**	**3**	**0**	**3**
Gloster	2	1	1	0	2	1	0	0
Liberty	3	2	2	1	4	2	0	3
Unincorporated Area	4	0	1	0	1	0	0	0
Franklin County	**5**	**3**	**4**	**1**	**3**	**0**	**0**	**1**
Bude	1	1	1	0	1	0	0	1
Meadville	1	2	3	1	2	0	0	0
Roxie	1	0	0	0	0	0	0	0
Unincorporated Area	2	0	0	0	0	0	0	0
Jefferson County	**2**	**2**	**2**	**1**	**2**	**0**	**0**	**0**
Fayette	1	2	2	1	0	0	0	0
Unincorporated Area	1	0	0	0	2	0	0	0
Lawrence County	**12**	**3**	**2**	**1**	**6**	**1**	**0**	**4**
Monticello	1	2	2	1	4	1	0	3
New Hebron	1	1	0	0	1	0	0	0
Silver Creek	2	0	0	0	0	0	0	0
Unincorporated Area	8	0	0	0	1	0	0	1
Lincoln County	**14**	**2**	**16**	**1**	**18**	**1**	**1**	**1**
Brookhaven	4	2	16	1	13	1	1	1
Unincorporated Area	10	0	0	0	5	0	0	0
Pike County	**11**	**7**	**9**	**1**	20	**0**	**0**	**3**
Magnolia	1	3	2	0	4	0	0	3
McComb	4	4	7	1	10	0	0	0
Osyka	2	0	0	0	1	0	0	0
Summit	1	0	0	0	1	0	0	0
Unincorporated Area	3	0	0	0	4	0	0	0
Walthall County	6	2	**2**	**1**	**1**	**0**	**0**	**4**
Tylertown	1	2	2	1	1	0	0	3
Unincorporated Area	5	0	0	0	0	0	0	1
Wilkinson County	**4**	**2**	**4**	**1**	**6**	**2**	**0**	**1**
Centreville	1	1	4	0	3	1	0	0
Crosby	1	1	0	0	0	0	0	0
Woodville	2	2	1	1	2	0	0	0
Unincorporated Area	0	0	0	0	1	1	0	1
MEMA DISTRICT 7 REGIONAL TOTAL	**71**	**28**	**51**	**9**	**77**	**8**	**4**	**19**

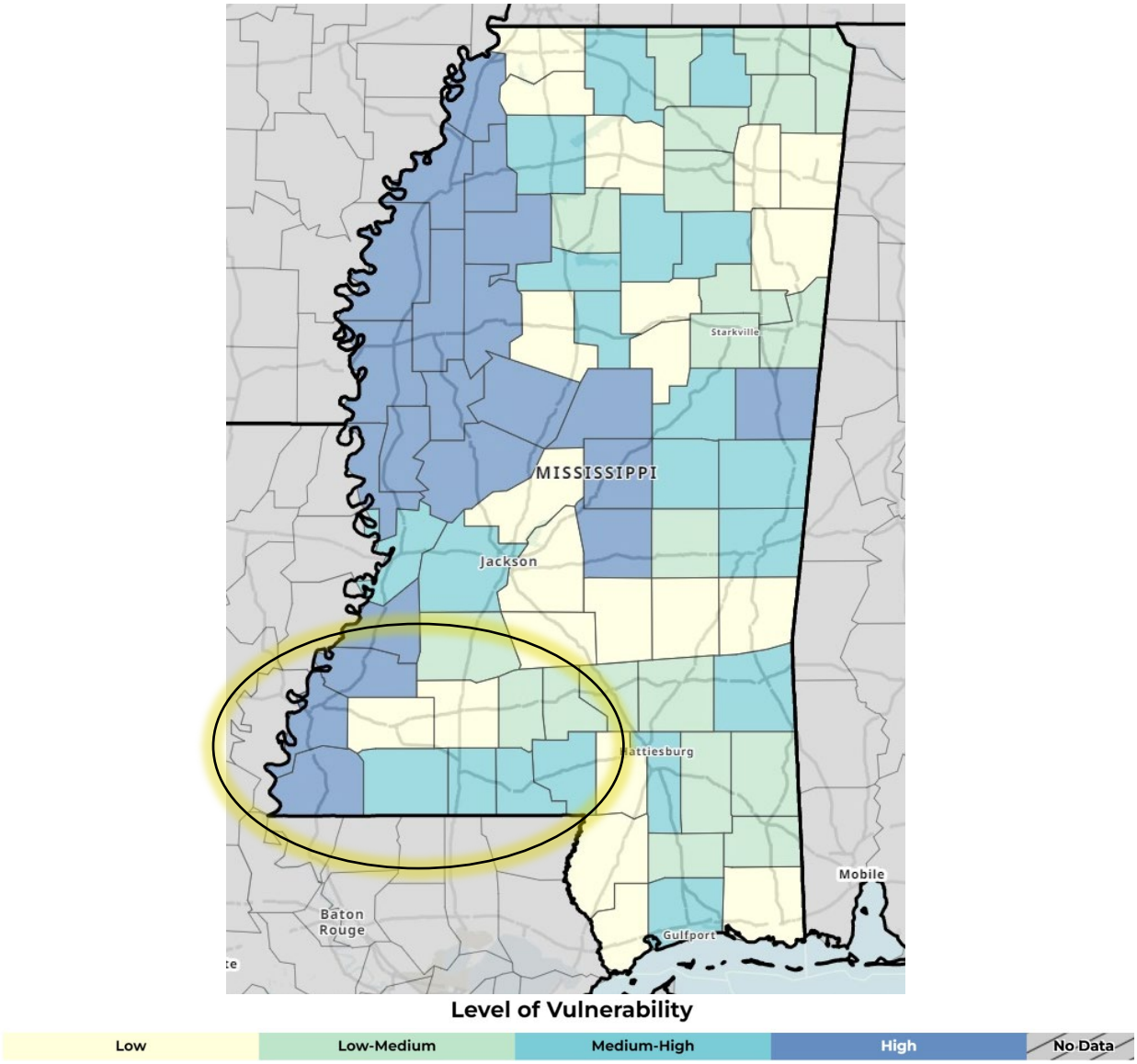
6.7.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those particular segments of the resident population in the MEMA District 7 Region that are potentially at risk to these hazards. Population loss was experienced across all counties, though lack of participation in the 2020 census could be a contributing factor to the drop in reported numbers. Individual Social Vulnerability Index scores are reported within each of the annexes.

TABLE 6.3: TOTAL POPULATION IN THE MEMA DISTRICT 7 REGION

Location	Total 2020 Population
Adams County	29,538
Amite County	12,270
Franklin County	7,675
Jefferson County	7,260
Lawrence County	12,016
Lincoln County	34,907
Pike County	40,324
Walthall County	13,884
Wilkinson County	8,587
MEMA DISTRICT 7 REGION TOTAL	**166,461**

FIGURE 6.2: CDC SOCIAL VULNERABILITY INDEX FOR THE STATE OF MISSISSIPPI



6.7.3 Development Trends and Changes in Vulnerability

Since the previous hazard mitigation plan was approved, MEMA District 7 Region has experienced limited growth and development. Based on analysis of the data (presented in each of the annexes), there has been a relatively low rate of residential development and decrease in population in the region since 2000. Although some communities, in several smaller towns, experienced minor rates of growth, since the last plan much of this population was not sustained. The housing stock has diminished and what remains is of older build. Therefore, has been a slight increase in overall vulnerability as well as a significant increase in certain areas and communities.

It is also important to note that if development increases in the future, greater populations and more structures and infrastructure will be exposed to potential hazards if development occurs in floodplains or other high-risk areas.

6.8 VULNERABILITY ASSESSMENT RESULTS

As noted earlier, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis in this section. Those results are presented here. All other hazards are assumed to impact the entire planning region (drought, extreme heat, hailstorm, lightning, severe thunderstorm/high wind, tornado, and winter storm) or, due to lack of data, analysis would not lead to credible results (erosion). The total region exposure, the risk to these hazards, is presented above.

The hazards to be further analyzed in this section include: dam/levee failure, flood, wildfire, earthquake, hurricane and tropical storm winds, and radiological event. The annualized loss estimate for all hazards is presented in the table near the end of this section.

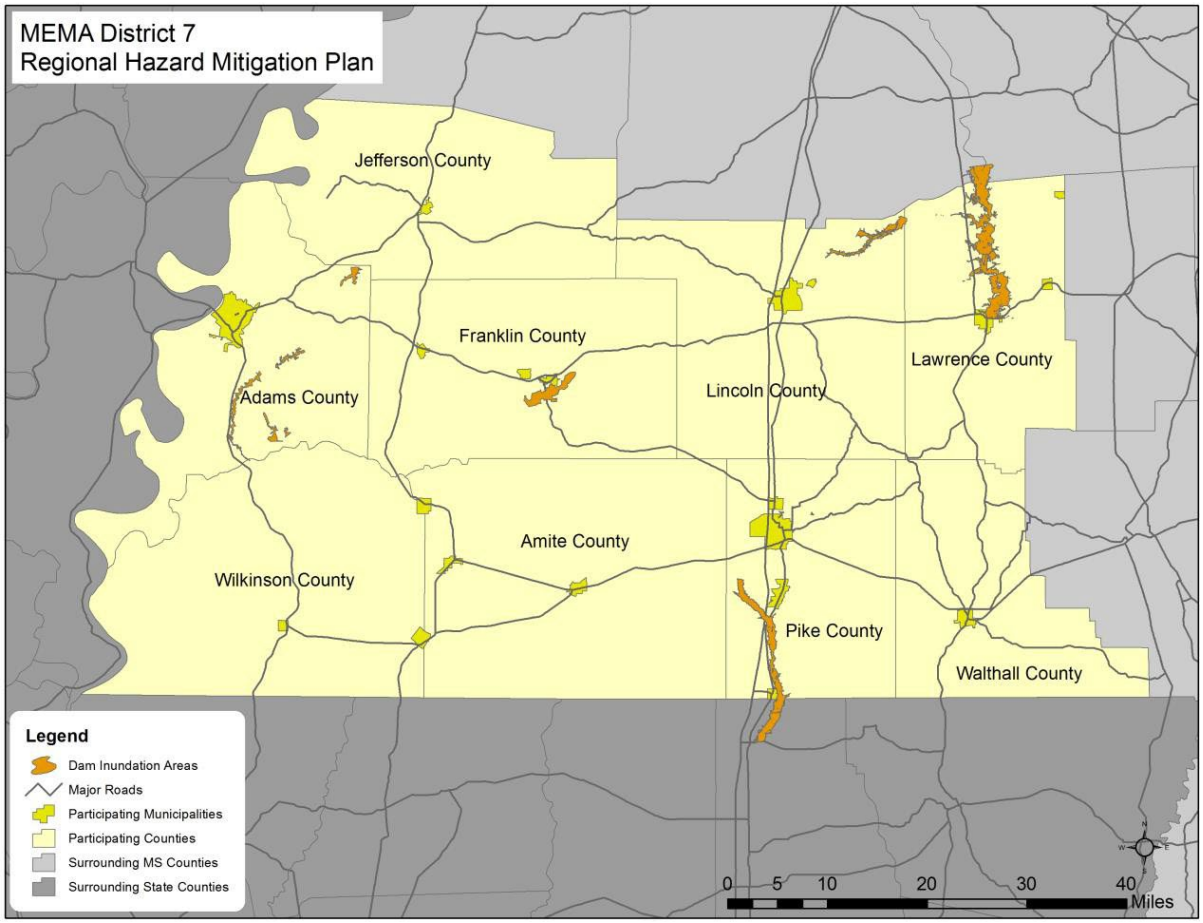
6.8.1 Dam/Levee Failure

In order to assess risk to a dam or levee failure, a GIS-based analysis was used to estimate exposure to one of the areas delineated by the Mississippi Department of Environmental Quality as a potential inundation area in the event of a failure. The determination of value at-risk (exposure) was calculated using GIS analysis by summing the values for improved properties that were located within an identified inundation area. As mentioned previously, this type of inundation mapping has not been completed for every dam/levee in the region, so the results of this analysis likely underestimate the overall vulnerability to a dam or levee failure. However, the analysis is still useful as a sort of baseline minimum of property that is potentially at-risk. The identified inundation areas can be found in the figure below.

Due to a lack of digital parcel data in most counties, it was determined that an analysis using the inventory from Hazus-MH 5.1 would be used. It should be noted that this data will merely be an estimation and may not reflect actual counts or values located in dam inundation areas. Indeed, in almost all cases, this data likely overestimates the amount of property in the identified risk zones.

The table below presents the potential at-risk property. Both the number of buildings and the approximate improved value are presented.

FIGURE 6.3: DAM INUNDATION AREAS IN THE MEMA DISTRICT 7 REGION



Source: Mississippi Department of Environmental Quality

TABLE 6.4: ESTIMATED EXPOSURE OF IMPROVED PROPERTY TO THE DAM/LEVEE FAILURE HAZARD

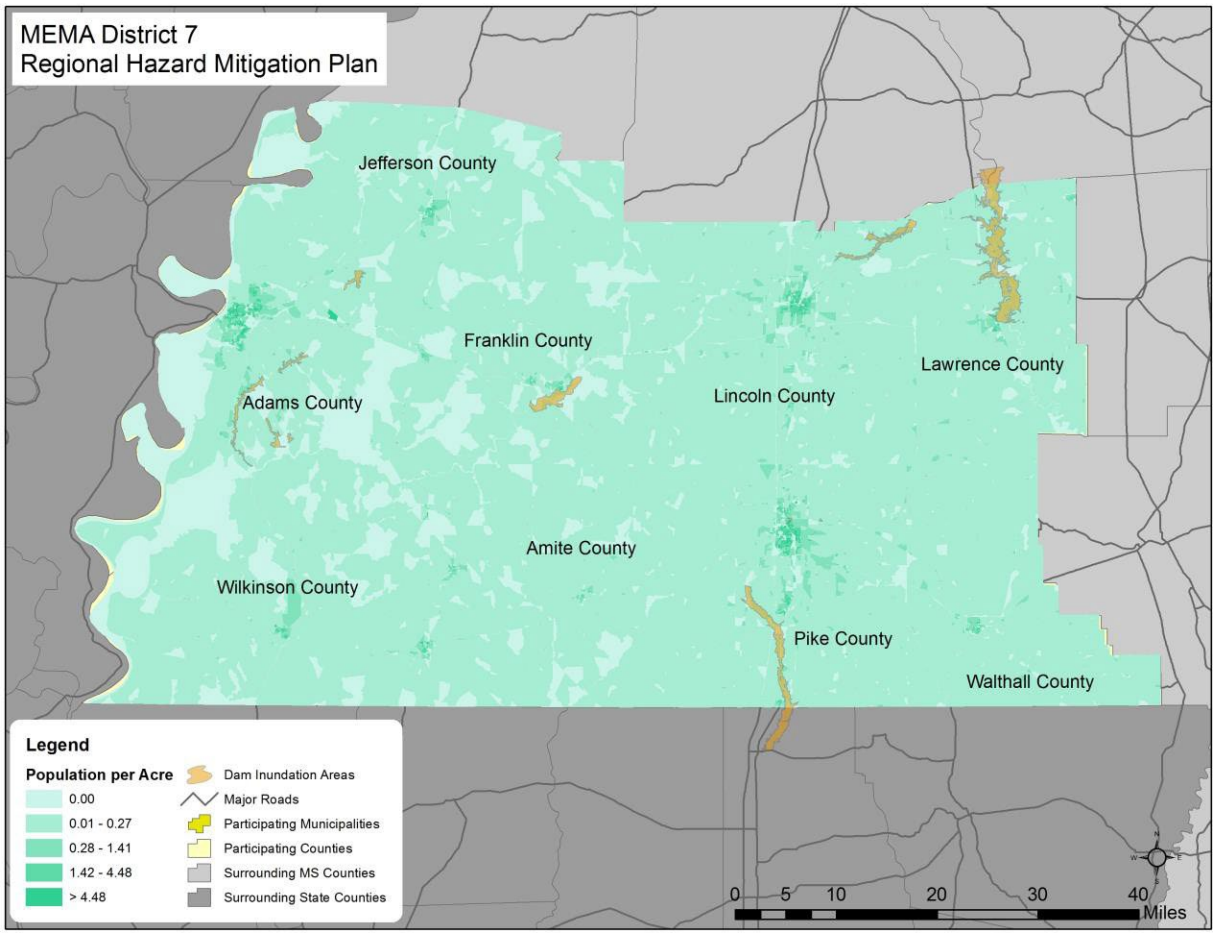
Location	Dam Inundation Area	
	Approx. Number of Improvements	Approx. Improved Value
Adams County	745	$121,632,000
Natchez	0	$0
Unincorporated Area	745	$121,632,000
Amite County	0	$0
Gloster	0	$0
Liberty	0	$0
Unincorporated Area	0	$0
Franklin County	169	$24,408,000
Bude	45	$5,836,000
Meadville	0	$0
Roxie	0	$0

Unincorporated Area	124	$18,572,000
Jefferson County	0	$0
Fayette	0	$0
Unincorporated Area	0	$0
Lawrence County	791	$119,752,000
Monticello	135	$29,179,000
New Hebron	0	$0
Silver Creek	0	$0
Unincorporated Area	656	$90,573,000
Lincoln County	166	$27,488,000
Brookhaven	0	$0
Unincorporated Area	166	$27,488,000
Pike County	653	$96,378,000
Magnolia	86	$10,018,000
McComb	157	$22,551,000
Osyka	38	$7,399,000
Summit	41	$4,841,000
Unincorporated Area	331	$51,569,000
Walthall County	0	$0
Tylertown	0	$0
Unincorporated Area	0	$0
Wilkinson County	0	$0
Centreville	0	$0
Crosby	0	$0
Woodville	0	$0
Unincorporated Area	0	$0
MEMA DISTRICT 7 REGIONAL TOTAL	**2,524**	**$389,658,000**

SOCIAL VULNERABILITY

The figure below is presented to gain a better understanding of at-risk population by evaluating census block level population data against dam inundation areas. There are areas of concern in several of the counties in this region, although it should be noted that most of the population of the region is not at risk to a dam/levee failure.

FIGURE 6.4: POPULATION DENSITY NEAR DAM INUNDATION AREAS IN THE MEMA DISTRICT 7 REGION



CRITICAL FACILITIES

There are no critical facilities located within the identified dam inundation areas. Although there are no facilities located in the identified areas, this does not indicate that there is no risk to a dam/levee failure, especially considering not all dams have delineated inundation areas. A list of specific critical facilities and their associated risk can be found in each annex.

In conclusion, a dam/levee failure has the potential to impact many existing and future buildings, facilities, and populations in the MEMA District 7 Region, though structures located near or in the dam inundation areas are at highest risk. Specific vulnerabilities for MEMA District 7 assets will be greatly dependent on their individual design and the mitigation measures in place where appropriate. Such site- specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates if data becomes available.

6.8.2 Flood

Historical evidence indicates that the MEMA District 7 Region is susceptible to flood events. A total of 177 flood events have been reported by the National Climatic Data Center resulting in over $30.8 million (2017 dollars) in property damage. On an annualized level, these damages amounted to over $2.0

million for the MEMA District 7 Region.

Between the end of 2017 and March 31, 2023, the National Climatic Data Center recorded 0 events for Adams, Amite, Jefferson, Lawrence, Lincoln, Pike, Walthall, and Wilkinson counties. However, on April 24, 2021, Franklin County and Bude experienced showers and thunderstorms that developed in association with a frontal system that moved through the region. Some of these storms produced large hail, damaging wind gusts, and some flash flooding closing highway 556 between Highways 84 and 98. Estimated damages are recorded at $5,000[1].

In order to assess flood risk, a GIS-based analysis was used to estimate exposure to flood events using Digital Flood Insurance Rate Map (DFIRM) data in combination with improved property records for each of the MEMA District 7 Counties. The determination of value at-risk (exposure) was calculated using GIS analysis by summing the values for improved properties that were located within an identified floodplain. Due to a lack of digital parcel data in most counties, it was determined that an analysis using the inventory from Hazus-MH 5.1 would be used, though it should be noted that the data will merely be an estimation and may not reflect actual counts or values located in the floodplain. Indeed, in almost all cases, this analysis likely overestimates the amount of property at risk. The table below presents the potential at-risk property. Both the number of parcels and the approximate value are presented.

TABLE 6.5: ESTIMATED EXPOSURE OF IMPROVED PROPERTY TO THE FLOOD HAZARD[2]

Location	1.0-percent ACF		0.2-percent ACF	
	Approx. Number of Improvements	Approx. Improved Value	Approx. Number of Improvements	Approx. Improved Value
Adams County	**5,484**	**$1,167,857,000**	**78**	**$20,474,000**
Natchez	3,477	$864,838,000	78	$20,474,000
Unincorporated Area	2,007	$303,019,000	0	$0
Amite County	**3,826**	**$501,729,000**	**0**	**$0**
Gloster	162	$20,779,000	0	$0
Liberty	194	$24,416,000	0	$0
Unincorporated Area	3,470	$456,534,000	0	$0
Franklin County	**2,303**	**$327,845,000**	**0**	**$0**
Bude	162	$25,687,000	0	$0
Meadville	70	$9,484,000	0	$0
Roxie	93	$11,484,000	0	$0
Unincorporated Area	1,978	$281,190,000	0	$0
Jefferson County	**998**	**$146,762,000**	**0**	**$0**
Fayette	125	$27,894,000	0	$0
Unincorporated Area	873	$118,868,000	0	$0
Lawrence County	**3,307**	**$542,171,000**	**0**	**$0**
Monticello	412	$103,031,000	0	$0
New Hebron	44	$7,794,000	0	$0
Silver Creek	94	$14,154,000	0	$0
Unincorporated Area	2,757	$417,192,000	0	$0
Lincoln County	**7,369**	**$1,380,765,000**	**0**	**$0**
Brookhaven	1,586	$441,689,000	0	$0
Unincorporated Area	5,783	$939,076,000	0	$0
Pike County	**4,032**	**$691,179,000**	**621**	**$142,579,000**
Magnolia	261	$48,177,000	621	$142,579,000
McComb	779	$171,902,000	0	$0

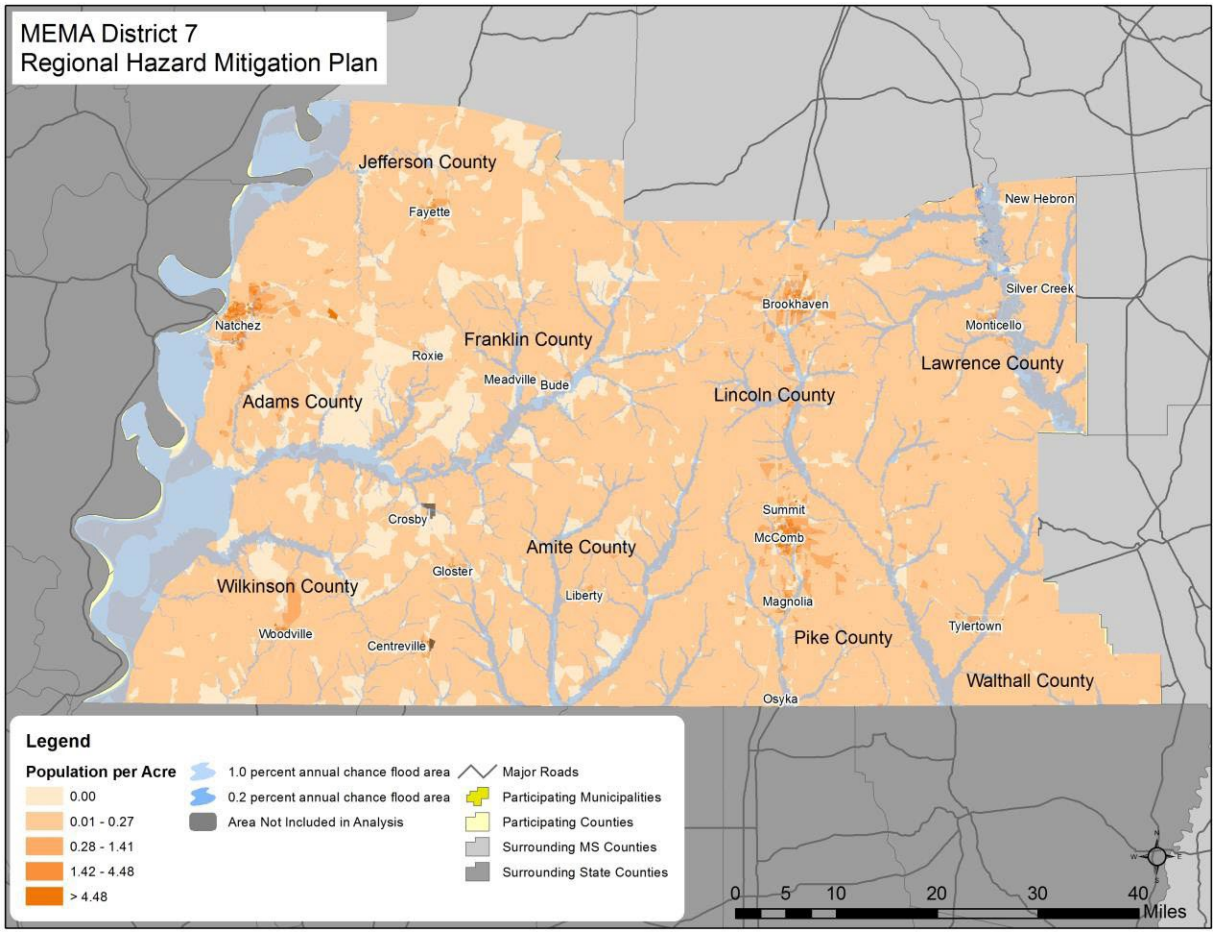
[1] Storm Events Database - Event Details | National Centers for Environmental Information (noaa.gov)

Osyka	58	$11,669,000	0	$0
Summit	107	$24,697,000	0	$0
Unincorporated Area	2,827	$434,734,000	0	$0
Walthall County	**2,703**	**$394,227,000**	**0**	**$0**
Tylertown	451	$94,415,000	0	$0
Unincorporated Area	2,252	$299,812,000	0	$0
Wilkinson County	**3,118**	**$417,218,000**	**0**	**$0**
Centreville	63	$7,299,000	0	$0
Crosby	172	$20,101,000	0	$0
Woodville	186	$42,240,000	0	$0
Unincorporated Area	2,697	$347,578,000	0	$0
MEMA DISTRICT 7 REGIONAL TOTAL	**33,140**	**$5,569,753,000**	**699**	**$163,053,000**

SOCIAL VULNERABILITY

The figure below is presented to gain a better understanding of at-risk population by evaluating census block level population data against mapped floodplains. There are areas of concern in several of the municipal population centers in this region including Natchez, McComb, and Brookhaven. Indeed, nearly every incorporated municipality is potentially at risk of being impacted by flooding within some areas of its jurisdictional boundary. Therefore, further investigation in these areas may be warranted.

FIGURE 6.5: POPULATION DENSITY NEAR FLOODPLAINS IN THE MEMA DISTRICT 7 REGION



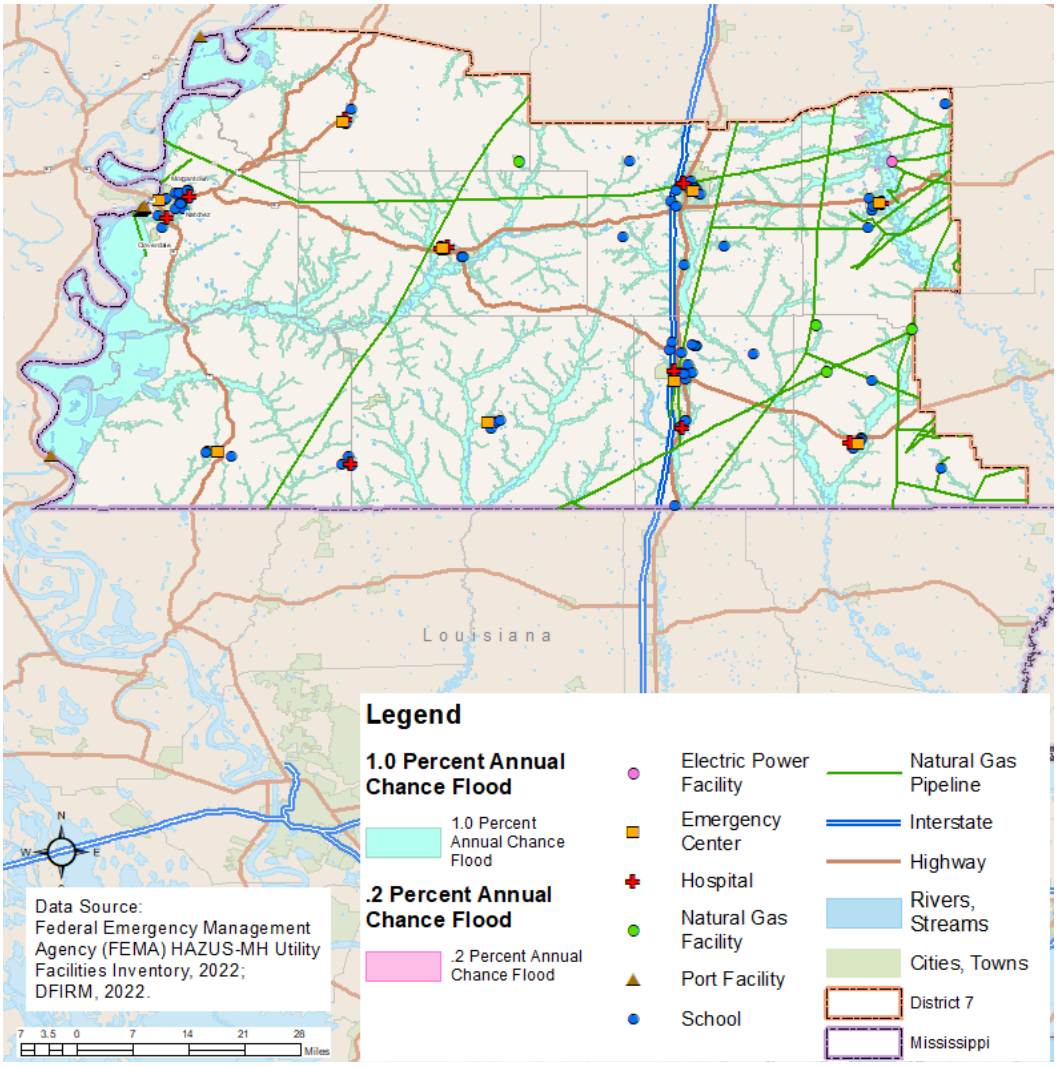
Source: Federal Emergency Management Agency DFIRM; United States Census Bureau, 2010 Census

CRITICAL FACILITIES

The critical facility analysis revealed that there are 7 critical facilities located in the floodplain. (Please note, as previously indicated, this analysis does not consider building elevation, which may negate risk.) All of these facilities are located in the 1.0 percent annual chance flood zone, and they include 2 fire stations, 1 medical care facility, 1 private sector building, and 2 transportation infrastructure facilities. There is also 1 police department located in the 0.2 percent annual chance flood zone. A list of specific critical facilities and their associated risk can be found in each annex.

In conclusion, a flood has the potential to impact many existing and future buildings, facilities, and populations in the MEMA District 7 Region, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. Such site-specific vulnerability determinations are outside the scope of this assessment but may be considered during future plan updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

FIGURE 6.6: CRITICAL FACILITIES WITHIN SPECIAL FLOOD HAZARD AREAS



6.8.3 Wildfire

Although historical evidence indicates that the MEMA District 7 Region is susceptible to wildfire events, there are few reports which include information on historic dollar losses. Therefore, it is difficult to calculate a reliable annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result in significant damages throughout the region.

To estimate exposure to wildfire, building data was obtained from Hazus-MH 5.1 which includes information that has been aggregated at the census block level and which has been deemed useful for analyzing wildfire vulnerability. However, it should be noted that the accuracy of Hazus data is somewhat lower than that of parcel data. For the critical facility analysis, areas of concern were intersected with critical facility locations.

The figures below show the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland

Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). The next figure shows Community Protection Zones (CPZ) represent those areas considered highest priority for mitigation planning activities. CPZs are based on an analysis of the Where People Live housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance.

The following table shows the results of the analysis.

FIGURE 6.7: WUI RISK INDEX AREAS IN THE MEMA DISTRICT 7 REGION

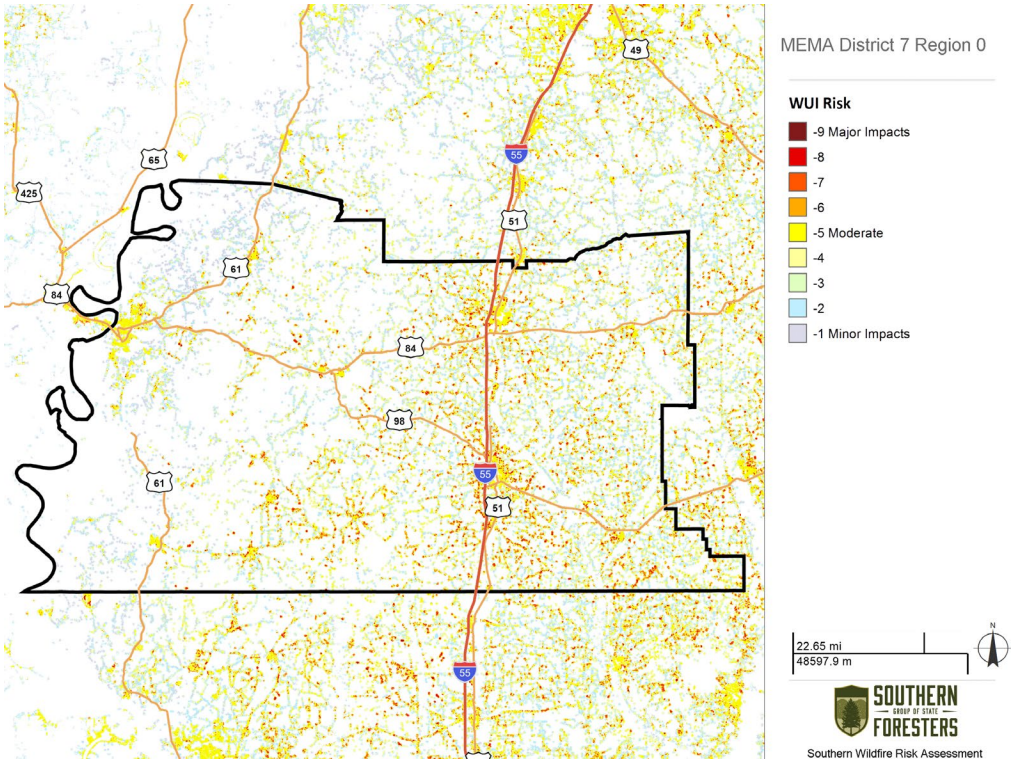
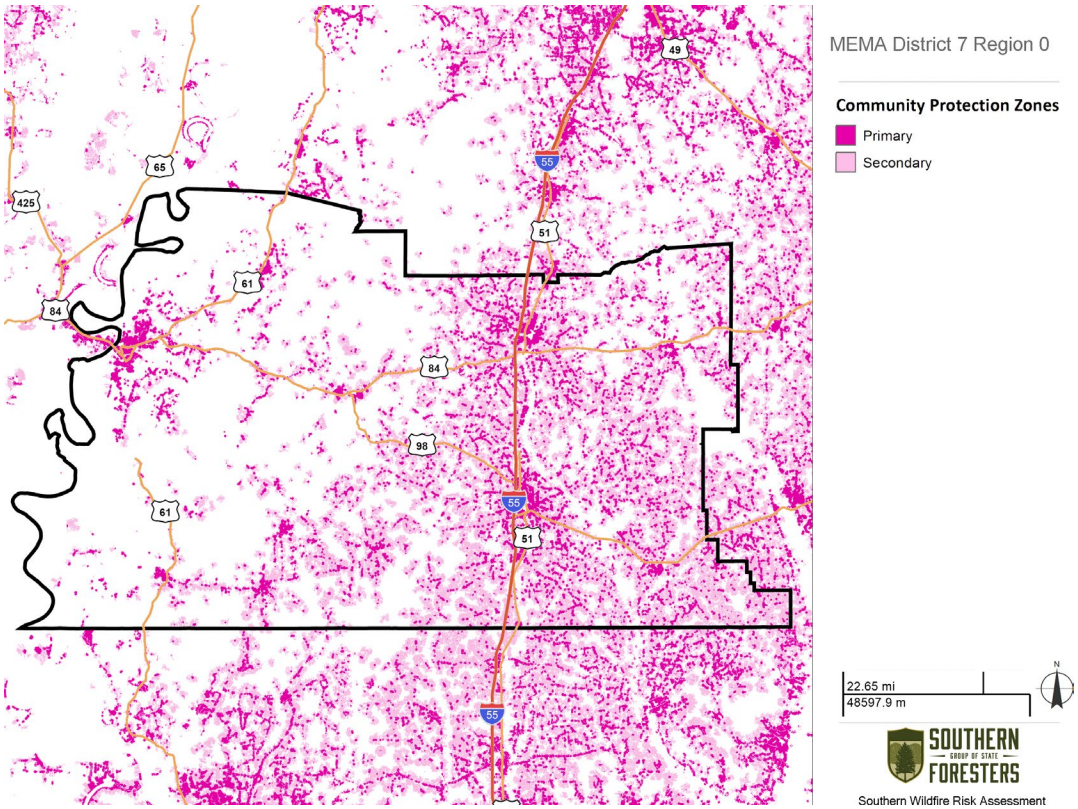


FIGURE 6.8: WILDFIRE COMMUNITY PROTECTION ZONES



Source: Southern Wildfire Risk Assessment Data

TABLE 6.6: ESTIMATED EXPOSURE OF IMPROVED PROPERTY TO WILDFIRE RISK AREAS[3]

Location	Wildfire Risk Area	
	Approx. Number of Improvements	Approx. Improved Value
Adams County	**13,868**	**$2,873,269,000**
Natchez	7,774	$1,852,133,000
Unincorporated Area	6,094	$1,021,136,000
Amite County	**6,840**	**$930,287,000**
Gloster	709	$111,025,000
Liberty	453	$80,122,000
Unincorporated Area	5,678	$739,140,000
Franklin County	**4,119**	**$625,076,000**
Bude	560	$94,838,000
Meadville	313	$82,258,000
Roxie	275	$36,555,000
Unincorporated Area	2,971	$411,425,000
Jefferson County	**3,147**	**$417,407,000**
Fayette	1,052	$181,948,000
Unincorporated Area	2,095	$235,459,000
Lawrence County	**6,159**	**$1,047,380,000**
Monticello	862	$219,887,000
New Hebron	262	$53,898,000
Silver Creek	139	$19,344,000
Unincorporated Area	4,896	$754,251,000
Lincoln County	**15,220**	**$2,903,654,000**
Brookhaven	4,223	$1,083,421,000
Unincorporated Area	10,997	$1,820,233,000
Pike County	**16,572**	**$3,056,843,000**
Magnolia	1,097	$217,471,000
McComb	4,591	$1,069,353,000
Osyka	309	$67,670,000
Summit	955	$161,433,000
Unincorporated Area	9,620	$1,540,916,000
Walthall County	**7,451**	**$1,079,582,000**
Tylertown	960	$223,826,000
Unincorporated Area	6,491	$855,756,000
Wilkinson County	**4,940**	**$724,159,000**
Centreville	857	$145,347,000
Crosby	211	$25,479,000
Woodville	804	$157,912,000
Unincorporated Area	3,068	$395,421,000
MEMA DISTRICT 7 REGIONAL TOTAL	**78,316**	**$13,657,657,000**

Source: Southern Wildfire Risk Assessment; Hazus-MH 5.1

SOCIAL VULNERABILITY

Given some level of susceptibility across the entire MEMA District 7 Region, it is assumed that the total population is at risk to the wildfire hazard. The figure above displays the wildfire risk to the population. This shows that many of the areas of high population concentration are susceptible to wildfire because of their proximity to the wildland urban interface.

CRITICAL FACILITIES

The critical facility analysis revealed that there are 161 critical facilities located in wildfire areas of concern, including 6 EOCs, 42 fire stations, 6 government/public buildings, 27 medical care facilities, 23 police stations, 8 private sector buildings, and 49 schools. It should be noted, that several factors could impact the spread of a wildfire putting all facilities at risk. A list of specific critical facilities and their associated risk can be found in each annex.

In conclusion, a wildfire event has the potential to impact many existing and future buildings, critical facilities, and populations in the MEMA District 7 Region.

6.8.4 Earthquake

As the Hazus-MH model suggests below, and historical occurrences confirm, any significant earthquake activity in the area is likely to inflict minor damage to the planning area. Hazus-MH 5.1 estimates a total annualized loss of $105,000 which includes structural and non-structural damage to buildings, contents, and inventory throughout the planning area.

For the earthquake hazard vulnerability assessment, a probabilistic scenario was created to estimate the average annualized loss4 for the region on a county-by-county basis. The results of the analysis are generated at the census tract level within Hazus-MH and then aggregated to the county level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss. They do not include losses to business interruption, lost income, or relocation. The table below summarizes the findings with results rounded to the nearest thousand.

TABLE 6.7: AVERAGE ANNUALIZED LOSS ESTIMATIONS FOR EARTHQUAKE HAZARD

Location	Structural Damage	Non-Structural Damage	Contents Damage	Inventory Loss	Total Annualized Loss
Adams County	$6,000	$13,000	$4,000	$0	$23,000
Amite County	$1,000	$3,000	$1,000	$0	$5,000
Franklin County	$1,000	$2,000	$1,000	$0	$4,000
Jefferson County	$2,000	$4,000	$1,000	$0	$7,000
Lawrence County	$2,000	$5,000	$1,000	$0	$8,000
Lincoln County	$7,000	$14,000	$4,000	$0	$25,000
Pike County	$6,000	$12,000	$4,000	$0	$22,000
Walthall County	$2,000	$4,000	$1,000	$0	$7,000
Wilkinson County	$1,000	$2,000	$1,000	$0	$4,000
MEMA DISTRICT 7 REGION TOTAL	**$28,000**	**$59,000**	**$18,000**	**$0**	**$105,000**

Source: Hazus-MH 5.1

SOCIAL VULNERABILITY

It can be assumed that all existing and future populations are at risk to the earthquake hazard.

CRITICAL FACILITIES

The Hazus-MH probabilistic analysis did not indicate that any critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor to moderate damage should an event occur. A list of specific critical facilities and their associated risk can be found in each annex.

In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in the MEMA District 7 Region. Specific vulnerabilities for these assets will be greatly dependent on their individual design and the mitigation measures in place. Such site-specific vulnerability determinations are outside the scope of this assessment but may be considered during future plan updates. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While the MEMA District 7 Region may not experience a catastrophic earthquake, localized damage is possible with a moderate to larger scale occurrence.

6.8.5 Hurricane and Tropical Storm

Historical evidence indicates that the MEMA District 7 Region has significant risk to the hurricane and tropical storm hazard. There have been eight disaster declarations due to hurricanes as noted in previous sections. Several tracks have come near or traversed through the MEMA District 7 Region, as shown and discussed in Section 5: Hazard Profiles. Hazus-MH 5.1 estimates a total annualized loss of $3,702,000 which includes buildings, contents, and inventory throughout the planning area.

Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard. Hazus-MH 5.1 was used to determine average annualized losses5 for the region as shown below in the table below. Only losses to buildings, inventory, and contents are included in the results.

TABLE 6.8: AVERAGE ANNUALIZED LOSS ESTIMATIONS FOR HURRICANE WIND HAZARD

Location	Building Damage	Contents Damage	Inventory Loss	Total Annualized Loss
Adams County	$203,000	$55,000	$0	$258,000
Amite County	$209,000	$100,000	$0	$309,000
Franklin County	$110,000	$62,000	$0	$172,000
Jefferson County	$39,000	$13,000	$0	$52,000
Lawrence County	$232,000	$103,000	$0	$335,000
Lincoln County	$497,000	$158,000	$1,000	$656,000
Pike County	$782,000	$301,000	$1,000	$1,084,000
Walthall County	$464,000	$210,000	$1,000	$675,000
Wilkinson County	$115,000	$46,000	$0	$161,000
MEMA DISTRICT 7 REGION TOTAL	**$2,651,000**	**$1,046,000**	**$3,000**	**$3,702,000**

Source: Hazus-MH 5.1

SOCIAL VULNERABILITY

Given some equal susceptibility across the entire MEMA District 7 Region, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard.

CRITICAL FACILITIES

Given equal vulnerability across the MEMA District 7 Region, all critical facilities are considered to be at risk. Some buildings may perform better than others in the face of such an event due to construction and age, among other factors. Determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation action for especially vulnerable structures and/or critical facilities to mitigate against the effects of the hurricane hazard. A list of specific critical facilities can be found in each annex.

In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in the MEMA District 7 Region.

6.8.6 Radiological Event

The location of Grand Gulf and River Bend Nuclear Stations north and south of the region, respectively, demonstrate that the region is at some risk to the effects of a nuclear accident. Although there have not been any major events at these plants in the past, there have been major events at other nuclear stations around the country. Additionally, smaller scale incidents at both these nuclear stations have occurred.

In order to assess nuclear risk, a GIS-based analysis was used to estimate exposure during a nuclear event within each of the risk zones described in Section 5: Hazard Profiles. The determination of assessed value at-risk (exposure) was calculated using GIS analysis by summing the total values for those properties that were confirmed to be located within one of the risk zones. The table below presents potential at-risk properties in the 50-mile buffer zone (no property was located in the 10-mile buffer zone). The number of buildings, parcels, and the approximate value are presented.

TABLE 6.9: ESTIMATED EXPOSURE OF IMPROVED PROPERTY TO A NUCLEAR ACCIDENT

Location	50-mile Nuclear Buffer Area	
	Approx. Number of Improvements	Approx. Improved Value
Adams County	**14,661**	**$3,129,923,000**
Natchez	8,332	$2,068,891,000
Unincorporated Area	6,329	$1,061,032,000
Amite County	**5,684**	**$769,622,000**
Gloster	716	$112,157,000
Liberty	453	$80,122,000
Unincorporated Area	4,515	$577,343,000
Franklin County	**4,237**	**$650,604,000**
Bude	560	$94,838,000
Meadville	314	$82,402,000
Roxie	275	$36,555,000
Unincorporated Area	3,088	$436,809,000
Jefferson County	**3,686**	**$697,417,000**
Fayette	1,052	$181,948,000
Unincorporated Area	2,634	$515,469,000

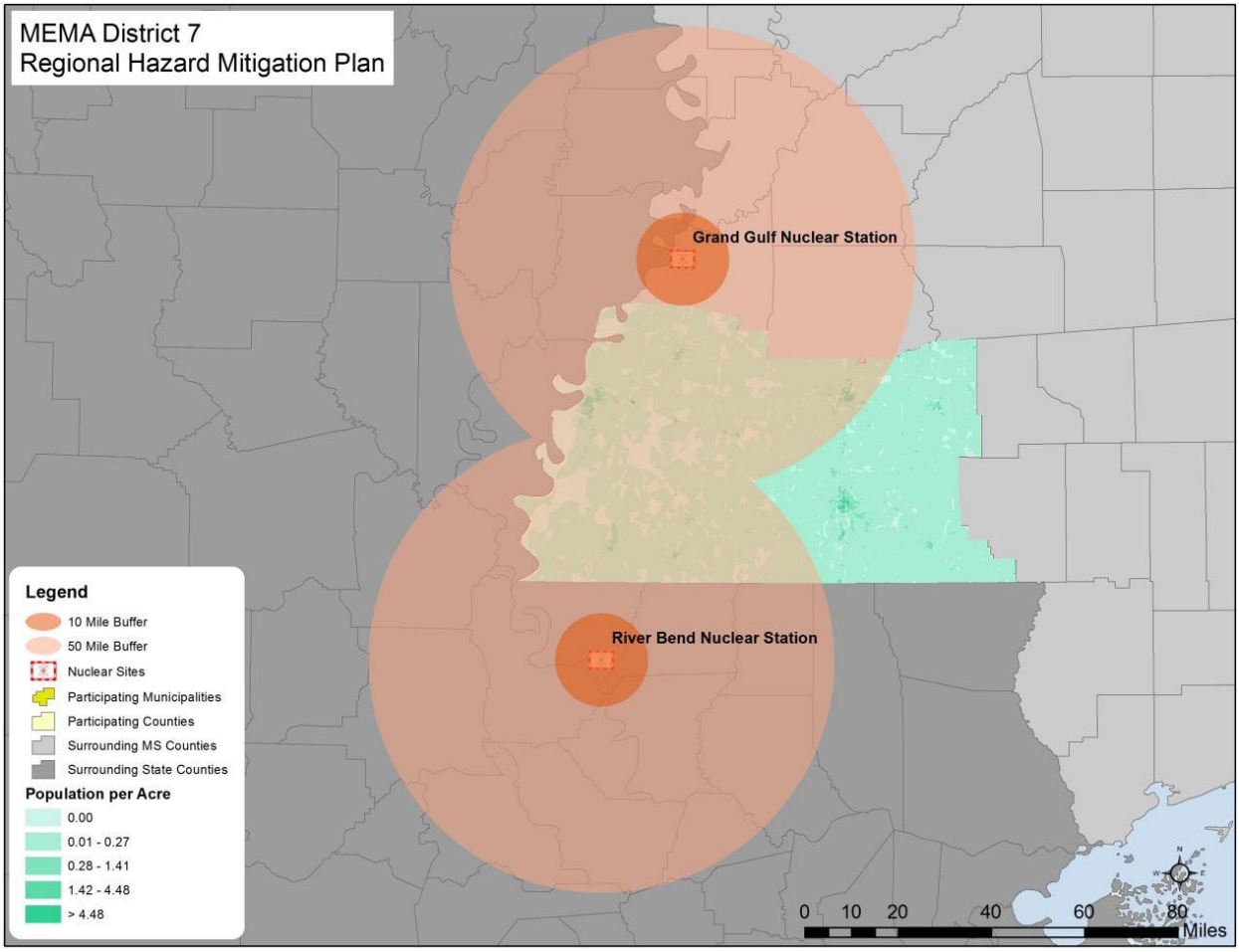
Lawrence County	**0**	**$0**
Monticello	0	$0
New Hebron	0	$0
Silver Creek	0	$0
Unincorporated Area	0	$0
Lincoln County	**12,215**	**$2,622,669,000**
Brookhaven	4,644	$1,333,728,000
Unincorporated Area	7,571	$1,288,941,000
Pike County	**27**	**$5,235,000**
Magnolia	0	$0
McComb	0	$0
Osyka	0	$0
Summit	0	$0
Unincorporated Area	27	$5,235,000
Walthall County	**0**	**$0**
Tylertown	0	$0
Unincorporated Area	0	$0
Wilkinson County	**5,220**	**$763,415,000**
Centreville	866	$150,329,000
Crosby	211	$25,479,000
Woodville	804	$157,912,000
Unincorporated Area	3,339	$429,695,000
MEMA DISTRICT 7 REGIONAL TOTAL	**45,730**	**$8,638,885,000**

Source: International Atomic Energy Agency; Hazus-MH 5.1

SOCIAL VULNERABILITY

Since much of the western part of the region is within the 50-mile buffer area, this segment of the population is considered to be at high risk to a radiological event. However, other populations in the region may also be at some risk. This risk can be seen in the figure below**.**

FIGURE 6.9: POPULATION DENSITY NEAR NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN THE MEMA DISTRICT 7 REGION



Source: International Atomic Energy Agency; United States Census Bureau, 2010 Census

CRITICAL FACILITIES

The critical facility analysis revealed that there are 148 critical facilities located in the 50-mile nuclear buffer area, including 5 EOCs, 32 fire stations, 7 government/public buildings, 29 medical care facilities, 17 police stations, 8 private sector buildings, 46 schools, and 4 transportation facilities. No critical facilities are located in the 10-mile buffer area. A list of specific critical facilities and their associated risk can be found in each annex.

In conclusion, a nuclear accident has the potential to impact many existing and future buildings, facilities, and populations in the MEMA District 7 Region, though areas in the west of the region are at a higher risk than others.

6.9 CONCLUSIONS ON HAZARD VULNERABILITY

The results of this vulnerability assessment are useful in at least three ways:

- Improving our understanding of the risk associated with the natural hazards in the MEMA District 7 Region through better understanding of the complexities and dynamics of risk, how levels of risk can be measured and compared, and the myriad of factors that influence risk. An understanding of these relationships is critical in making balanced and informed decisions on managing the risk.
- Providing a baseline for policy development and comparison of mitigation alternatives. The data used for this analysis presents a current picture of risk in the MEMA District 7 Region. Updating this risk "snapshot" with future data will enable comparison of the changes in risk with time. Baselines of this type can support the objective analysis of policy and program options for risk reduction in the region.
- Comparing the risk among the natural hazards addressed. The ability to quantify the risk to all these hazards relative to one another helps in a balanced, multi-hazard approach to risk management at each level of governing authority. This ranking provides a systematic framework to compare and prioritize the very disparate natural hazards that are present in the MEMA District 7 Region. This final step in the risk assessment provides the necessary information for local officials to craft a mitigation strategy to focus resources on only those hazards that pose the most threat to the MEMA District 7 counties.

Exposure to hazards can be an indicator of vulnerability. Economic exposure can be identified through values for improvements (buildings), and social exposure can be identified by estimating the population exposed to each hazard. This information is especially important for decision-makers to use in planning for evacuation or other public safety-related needs.

The types of assets included in these analyses include all building types in the participating jurisdictions. Specific information about the types of assets that are vulnerable to the identified hazards is included in each hazard subsection (for example all building types are considered at risk to the winter storm hazard).

The table below presents a summary of annualized loss for each hazard in the MEMA District 7 Region. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the region.

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to atmospheric hazards including drought, lightning, extreme heat, hailstorm, hurricane and tropical storm, severe thunderstorm/high wind, tornado, and winter storm and freeze. Some buildings may be more vulnerable to these hazards based on other factors such as construction and building type. The specific critical facilities vulnerable to the hazards analyzed are documented in each annex.

TABLE 6.10: ANNUALIZED LOSS FOR THE MEMA DISTRICT 7 REGION

Hazard	Adams County	Amite County	Franklin County	Jefferson County	Lawrence County
Flood-related Hazards					
Dam and Levee Failure	Negligible	Negligible	Negligible	Negligible	Negligible
Erosion	Negligible	Negligible	Negligible	Negligible	Negligible
Flood	$224,858	$46,832	$247,438	$229,109	$125,607
Fire-related Hazards					
Drought	Negligible	Negligible	$4,269	$4,269	$5,336
Lightning	$18,282	$1,202	$16,186	$5,124	$25,249
Wildfire	Negligible	Negligible	Negligible	Negligible	Negligible
Geologic Hazards					
Earthquake*	$6,000	$1,000	$1,000	$2,000	$2,000
Wind-related Hazards					
Extreme Heat	Negligible	Negligible	Negligible	Negligible	Negligible
Hailstorm	$9,363	$0	$23,521	$4,381	$13,278
Hurricane & Tropical Storm	$8,471,834	$6,245,984	$110,715	$2,115,937	$10,431,225
Severe Thunderstorm/High Wind	$2,077,786	$55,520	$97,500	$70,547	$67,885
Tornado	$363,924	$86,862	$195,723	$116,771	$11,325,217
Winter Storm & Freeze	$68,864	$0	$44,791	$45,117	$147,017
Human-caused Hazards					
Radiological Event	Negligible	Negligible	Negligible	Negligible	Negligible
Pandemic	Negligible	Negligible	Negligible	Negligible	Negligible

Hazard	Lincoln County	Pike County	Walthall County	Wilkinson County	MEMA D7 Total
Flood-related Hazards					
Dam and Levee Failure	Negligible	Negligible	Negligible	Negligible	Negligible
Erosion	Negligible	Negligible	Negligible	Negligible	Negligible
Flood	$468,178	$297,705	$68,773	$349,495	$2,057,997
Fire-related Hazards					
Drought	$5,336	Negligible	Negligible	Negligible	$19,209
Lightning	$21,898	$492	$0	$0	$88,432
Wildfire	Negligible	Negligible	Negligible	Negligible	Negligible
Geologic Hazards					
Earthquake*	$7,000	$6,000	$2,000	$1,000	$28,000
Wind-related Hazards					
Extreme Heat	Negligible	Negligible	Negligible	Negligible	Negligible
Hailstorm	$109,718	$3,548	$1,346	$35,475	$200,630
Hurricane & Tropical Storm	$8,481,674	$24,593,909	$30,644,498	$1,232,778	$92,328,554
Severe Thunderstorm/High Wind	$207,393	$51,568	$17,705	$7,379	$2,653,283
Tornado	$455,546	$2,400,146	$124,441	$63,893	$15,132,522

Winter Storm & Freeze	$97,106	$0	$0	$0	$402,896
Human-caused Hazards					
Radiological Event	Negligible	Negligible	Negligible	Negligible	Negligible
Pandemic	Negligible	Negligible	Negligible	Negligible	Negligible

*No historic losses for earthquake were recorded, so Hazus estimates for annualized loss were used.

Note: In this table, the term "Negligible" is used to indicate that no records of dollar losses for the particular hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that particular type of event is not well kept.

CAPABILITY ASSESSMENT

This section of the Plan discusses the capability of the MEMA District 7 Region to implement hazard mitigation activities. It consists of the following four subsections:

- 7.1 What is a Capability Assessment?
- 7.2 Conducting the Capability Assessment
- 7.3 Capability Assessment Findings
- 7.4 Conclusions on Local Capability

7.1 WHAT IS A CAPABILITY ASSESSMENT?

The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a comprehensive mitigation strategy and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs, or projects. As in any planning process, it is important to try to establish which goals, objectives, and/or actions are feasible based on an understanding of the organizational capacity of those agencies or departments tasked with their implementation. A capability assessment helps to determine which mitigation actions are practical, and likely to be implemented over time, given a local government's planning and regulatory framework, level of administrative and technical support, amount of fiscal resources, and current political climate.

A capability assessment has two primary components: 1) an inventory of a local jurisdiction's relevant plans, ordinances, or programs already in place and 2) an analysis of its capacity to carry them out. Careful examination of local capabilities will detect any existing gaps, shortfalls, or weaknesses with ongoing government activities that could hinder proposed mitigation activities and possibly exacerbate community hazard vulnerability. A capability assessment also highlights the positive mitigation measures already in place or being implemented at the local government level, which should continue to be supported and enhanced through future mitigation efforts.

The capability assessment completed for the MEMA District 7 Region serves as a critical planning step and an integral part of the foundation for designing an effective hazard mitigation strategy. Coupled with the Risk Assessment, the Capability Assessment helps identify and target meaningful mitigation actions for incorporation in the Mitigation Strategy portion of the Hazard Mitigation Plan. It not only helps establish the goals and objectives for the region to pursue under this Plan, but it also ensures that those goals and objectives are realistically achievable under given local conditions.

7.2 CONDUCTING THE CAPABILITY ASSESSMENT

In order to facilitate the inventory and analysis of local government capabilities within the MEMA District 7 counties, a Capability Assessment Survey was presented to each of the participating jurisdictions based on the information found in existing hazard mitigation plans and local government websites. The survey was then real-time validated by the county emergency managers during the one-on-one meeting review process. This process produced "capability indicators" such as existing local

plans, policies, programs, or ordinances that contribute to and/or hinder the region's ability to implement hazard mitigation actions. Other indicators included information related to the region's fiscal, administrative, and technical capabilities, such as access to local budgetary and personnel resources for mitigation purposes. The current political climate, an important consideration for any local planning or decision making process, was also evaluated with respect to hazard mitigation. Also collected, were an inventory of existing local plans, ordinances, programs, and resources in place or under development. The overall capability rating of "high," "moderate," or "limited" determined under the last plan update was then assessed and an updated ranking was inputted or maintained. These classifications are designed to provide nothing more than a general assessment of local government capability. The results of this capability assessment provide critical information for developing an effective and meaningful mitigation strategy.

7.3 CAPABILITY ASSESSMENT FINDINGS

The findings of the capability assessment are summarized in each plan annex. In addition to the local capabilities that are outlined in each annex, it is also important to note that during the plan development process, the HMC utilized sources outside of their own local government resources to incorporate into the plan. These plans, studies, reports, and technical information came from a number of different sources and were instrumental in helping to provide key information such as hazard histories, spatial high-risk areas, and vulnerability information. For example, at the state level, the Mississippi State Hazard Mitigation Plan provided critical data to supplement the risk assessment of several hazards, most prominently, the dam/levee failure hazard. Moreover, technical information from private sector sources such as the Southern Wildfire Risk Assessment were used to improve the HMC's understanding of spatial areas considered to be at the highest risk to this hazard. Furthermore, a great deal of information was gathered from federal sources including the National Climatic Data Center which provided hazard history information and the Federal Emergency Management Agency which tracks a great deal of data on all hazards, perhaps notably, on flooding and insurance claims.

These plans, studies, and technical information were critical in the development of this plan and were used in many areas of the planning process, especially the risk assessment. The use of disparate information from a number of different sources helped the HMC compare data across hazards and gain a better understanding of overall risk.

7.3.1 Planning and Regulatory Capability

Planning and regulatory capability is based on the implementation of plans, ordinances, and programs that demonstrate a local jurisdiction's commitment to guiding and managing growth, development, and redevelopment in a responsible manner while maintaining the general welfare of the community. It includes emergency response and mitigation planning, comprehensive land use planning, and transportation planning; the enforcement of zoning or subdivision ordinances and building codes that regulate how land is developed and structures are built; as well as protecting environmental, historic, and cultural resources in the community. Although some conflicts can arise, these planning initiatives generally present significant opportunities to integrate hazard mitigation principles and practices into the local decision-making process.

This section is designed to provide a general overview of the key planning and regulatory tools and programs that are in place or under development for the MEMA District 7 Region along with their

potential effect on loss reduction. This information will help identify opportunities to address existing gaps, weaknesses, or conflicts with other initiatives in addition to integrating the implementation of this Plan with existing planning mechanisms where appropriate.

7.3.2 Emergency Management

Hazard mitigation is widely recognized as one of the four primary phases of emergency management. The three other phases include preparedness, response, and recovery. In reality, each phase is interconnected with hazard mitigation, as **Figure 7.1** suggests. Opportunities to reduce potential losses through mitigation practices are most often implemented before disaster strikes, such as the elevation of flood prone structures or the continuous enforcement of policies that prevent and regulate development that is vulnerable to hazards due to its location, design, or other characteristics. Mitigation opportunities will also be presented during immediate preparedness or response activities, such as installing storm shutters in advance of a hurricane, and certainly during the long-term recovery and redevelopment process following a hazard event.

FIGURE 7.1: THE FOUR PHASES OF EMERGENCY MANAGEMENT

Planning for each phase is a critical part of a comprehensive emergency management program and a key to the successful implementation of hazard mitigation actions. As a result, the Capability Assessment Survey asked several questions across a range of emergency management plans in order to assess the MEMA District 7 Region's willingness to plan and their level of technical planning proficiency.

Hazard Mitigation Plan: A hazard mitigation plan represents a community's blueprint for how it intends to reduce the impact of natural and human-caused hazards on people and the built environment. The essential elements of a hazard mitigation plan include a risk assessment, capability assessment, and mitigation strategy.

- Each of the nine counties participating in this multi-jurisdictional plan has previously adopted a hazard mitigation plan. Each participating municipality was included in its respective county's plan.

Threat and Hazard Identification and Risk Assessment (THIRA): A THIRA is a comprehensive risk assessment process that helps a community understand its risks and estimate capability requirements. Outputs of the THIRA process can inform a variety of disaster preparedness and emergency management efforts, including emergency operations planning, mutual aid agreements, and hazard mitigation planning.

- None of the counties or municipalities participating in this multi-jurisdictional plan has completed a THIRA process. Several counties expressed interest in conducting a THIRA process to improve their understanding of risks and the resources required to prepare for those risks. Unfortunately this activity fell outside the scope and interest of this planning process.

Disaster Recovery Plan: A disaster recovery plan serves to guide the physical, social, environmental, and economic recovery and reconstruction process following a disaster. In many instances, hazard mitigation principles and practices are incorporated into local disaster recovery plans with the intent of capitalizing on opportunities to break the cycle of repetitive disaster losses. Disaster recovery plans can also lead to the preparation of disaster redevelopment policies and ordinances to be enacted following a hazard event.

- None of the counties or municipalities participating in this multi-jurisdictional plan has adopted a disaster recovery plan. The counties should consider developing a plan to guide the recovery and reconstruction process following a disaster.

Emergency Operations Plan: An emergency operations plan outlines responsibilities and the means by which resources are deployed during and following an emergency or disaster.

- Each of the nine counties participating in this multi-jurisdictional plan maintains an emergency operations plan through their respective County Emergency Management Agency. Each participating municipality is also covered by its respective county's plan.

Continuity of Operations Plan: A continuity of operations plan establishes a chain of command, line of succession, and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster event.

- Lincoln County and the City of Brookhaven are the only participating jurisdictions that have adopted a continuity of operations plan. The other counties should consider developing a plan to ensure the execution of essential functions during emergencies or disaster events.

Flood Response Plan: A flood response plan establishes procedures for responding to a flood emergency including coordinating and facilitating resources to minimize the impacts of flood.

- None of the counties or municipalities participating in this multi-jurisdictional plan has adopted a flood response plan.

Emergency Management Accreditation Program (EMAP): EMAP is the voluntary standards, assessment, and accreditation program for disaster preparedness programs. It provides emergency management programs the opportunity to be recognized for compliance with industry standards, to demonstrate accountability, and to focus attention on areas and issues where resources are needed.

- Lincoln County and the City of Brookhaven are the only participating jurisdictions that have earned EMAP accreditation.

7.3.3 General Planning

The implementation of hazard mitigation activities often involves agencies and individuals beyond the emergency management profession. Stakeholders may include local planners, public works officials, economic development specialists, and others. In many instances, concurrent local planning efforts will help to achieve or complement hazard mitigation goals, even though they are not designed as such. Therefore, the Capability Assessment Survey also asked questions regarding general planning capabilities and the degree to which hazard mitigation is integrated into other on-going planning efforts in the MEMA District 7 Region.

Comprehensive Land Use Plan: A comprehensive land use plan establishes the overall vision for what a community wants to be and serves as a guide for future governmental decision making. Typically a comprehensive plan contains sections on demographic conditions, land use, transportation elements, and community facilities. Given the broad nature of the plan and its regulatory standing in many communities, the integration of hazard mitigation measures into the comprehensive plan can enhance the likelihood of achieving risk reduction goals, objectives, and actions.

- Several counties have created and adopted a county comprehensive plan since the last update. For others, this remains an ongoing action in the Mitigation Strategy for each annex.
- Several of the municipalities participating in this multi-jurisdictional plan have also adopted municipal comprehensive plans, including the City of Natchez, City of Brookhaven, City of McComb, and Town of Woodville.

Capital Improvements Plan: A capital improvements plan guides the scheduling of spending on public improvements. A capital improvements plan can serve as an important mechanism for guiding future development away from identified hazard areas. Limiting public spending in hazardous areas is one of the most effective long-term mitigation actions available to local governments.

- Some counties and municipalities participating in this multi-jurisdictional plan have adopted capital improvements plan, as noted in each annex.

Historic Preservation Plan: A historic preservation plan is intended to preserve historic structures or districts within a community. An often overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards and the identification of ways to reduce future damages. This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of harm's way.

- None of the counties or municipalities participating in this multi-jurisdictional plan has a historic preservation plan. However, the City of Natchez and City of McComb have adopted historic preservation ordinances. The Town of Woodville has also published historic preservation guidelines.

Zoning Ordinance: Zoning represents the primary means by which land use is controlled by local

governments. As part of a community's police power, zoning is used to protect the public health, safety, and welfare of those in a given jurisdiction that maintains zoning authority. A zoning ordinance is the mechanism through which zoning is typically implemented. Since zoning regulations enable municipal governments to limit the type and density of development, a zoning ordinance can serve as a powerful tool when applied in identified hazard areas.

- None of the counties participating in this multi-jurisdictional plan has adopted a zoning ordinance.
- Several of the municipalities participating have adopted zoning ordinances, including the City of Natchez, Town of Monticello, City of Brookhaven, City of McComb, and the Town of Woodville.

Subdivision Ordinance: A subdivision ordinance is intended to regulate the development of residential, commercial, industrial, or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development.

- Lincoln County is the only participating county that has adopted a subdivision ordinance.
- Several of the participating municipalities have adopted subdivision ordinances, including the City of Natchez, Town of Monticello, City of Brookhaven, City of Magnolia, and City of McComb.

Building Codes, Permitting, and Inspections: Building codes regulate construction standards. In many communities, permits, and inspections are required for new construction. Decisions regarding the adoption of building codes (that account for hazard risk), the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community.

- Effective August 1, 2014, the State of Mississippi has adopted as a minimum any of the last three editions (2009, 2012, 2015) of the International Building Code and any additional codes as adopted by the Mississippi Building Code Council. Jurisdictions had 120 days to opt out of adoptions. Additionally, all state buildings, leased or owned, must meet the requirements set forth in the 2012 International Building Code.
- None of the counties participating in this multi-jurisdictional plan has adopted a building code.
- The following participating municipalities have adopted building codes: City of Natchez, City of Brookhaven, City of McComb, and Town of Woodville.
- The adoption and enforcement of building codes by local jurisdictions is routinely assessed through the Building Code Effectiveness Grading Schedule (BCEGS) program developed by the Insurance Services Office, Inc. (ISO). In Mississippi, the Mississippi State Rating Bureau assesses the building codes in effect in a particular community and how the community enforces its building codes with special emphasis on mitigation of losses from natural hazards. The results of BCEGS assessments are routinely provided to ISO's member private insurance companies, which in turn may offer ratings credits for new buildings constructed in communities with strong BCEGS classifications. The concept is that communities with well-enforced, up-to-date codes should experience fewer disaster-related losses and, as a result, should have lower insurance rates.

In conducting the assessment, ISO collects information related to personnel qualification and continuing education as well as the number of inspections performed per day. This type of information combined with local building codes is used to determine a grade for that jurisdiction. The grades range from 1 to

10 with a BCEGS grade of 1 representing exemplary commitment to building code enforcement and a grade of 10 indicating less than minimum recognized protection.

7.3.4 Floodplain Management

Flooding represents the greatest natural hazard facing the nation. At the same time, the tools available to reduce the impacts associated with flooding are among the most developed when compared to other hazard-specific mitigation techniques. In addition to approaches that cut across hazards such as education, outreach, and the training of local officials, the *National Flood Insurance Program* (NFIP) contains specific regulatory measures that enable government officials to determine where and how growth occurs relative to flood hazards. Participation in the NFIP is voluntary for local governments; however, program participation is strongly encouraged by FEMA as a first step for implementing and sustaining an effective hazard mitigation program. It is therefore used as part of this assessment as a key indicator for measuring local capability.

In order for a county or municipality to participate in the NFIP, they must adopt a local flood damage prevention ordinance that requires jurisdictions to follow established minimum building standards in the floodplain. These standards require that all new buildings and substantial improvements to existing buildings will be protected from damage by a 100-year flood event and that new development in the floodplain will not exacerbate existing flood problems or increase damage to other properties.

A key service provided by the NFIP is the mapping of identified flood hazard areas. Once completed, the Flood Insurance Rate Maps (FIRMs) are used to assess flood hazard risk, regulate construction practices, and set flood insurance rates. FIRMs are an important source of information to educate residents, government officials, and the private sector about the likelihood of flooding in their community.

NFIP policy and claim information for each participating jurisdiction in the MEMA District 7 Region is provided in the annexes. Each of the jurisdictions that are participating in the development of this plan that also participate in the NFIP are committed to maintaining and enforcing their floodplain management ordinances and regulating new development in floodplains. All jurisdictions that are participants in the NFIP will continue to comply with all required provisions of the program and will work to adequately comply in the future utilizing a number of strategies. For example, the jurisdictions will coordinate with MEMA and FEMA to develop maps and regulations related to special flood hazard areas within their jurisdictional boundaries and, through a consistent monitoring process, will design and improve their floodplain management program in a way that reduces the risk of flooding to people and property.

As noted above, several jurisdictions are not participants in the NFIP. The Town of Summit does not participate because it currently does not have any identified flood hazard areas within its jurisdiction, so most residents would be unlikely to purchase flood insurance. Lincoln County and Town of Meadville also do not participate in the NFIP due to a lack of capacity or resources to properly administer and maintain the program.

Community Rating System: An additional indicator of floodplain management capability is the active participation of local jurisdictions in the Community Rating System (CRS). The CRS is an incentive-based program that encourages counties and municipalities to undertake defined flood mitigation activities that go beyond the minimum requirements of the NFIP by adding extra local measures to provide protection from flooding. All of the 18 creditable CRS mitigation activities are assigned a range of point

values. As points are accumulated and reach identified thresholds, communities can apply for an improved CRS class rating. Class ratings, which range from 10 to 1, are tied to flood insurance premium reductions as shown in the table below. As class rating improves (the lower the number the better), the percent reduction in flood insurance premiums for NFIP policyholders in that community increases.

TABLE 7.1: CRS PREMIUM DISCOUNTS, BY CLASS

CRS Class	Premium Reduction in SFHA	Premium Reduction Outside the SFHA
1	45%	10%
2	40%	10%
3	35%	10%
4	30%	10%
5	25%	10%
6	20%	10%
7	15%	5%
8	10%	5%
9	5%	5%
10	0	0

Source: *Federal Emergency Management Agency, CRS Coordinator's Manual*

Community participation in the CRS is voluntary. Any community that is in full compliance with the rules and regulations of the NFIP may apply to FEMA for a CRS classification better than class 10. The CRS application process has been greatly simplified over the past several years based on community comments. Changes were made with the intent to make the CRS more user-friendly and make extensive technical assistance available for communities who request it.

- None of the counties or municipalities participating in this multi-jurisdictional plan participates in the CRS. Participation the CRS program should be considered as a mitigation action by the jurisdictions currently participating in the NFIP. The program would be beneficial to any community experiencing flood damages. ***Flood Damage Prevention Ordinance:*** A flood damage prevention ordinance establishes minimum building standards in the floodplain with the intent to minimize public and private losses due to flood conditions.

- All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. All counties and municipalities participating in this multi-jurisdictional plan - with the exception of Town of Meadville, Lincoln County, and Town of Summit - also participate in the NFIP and they all have adopted flood damage prevention regulations.

Floodplain Management Plan: A floodplain management plan (or a flood mitigation plan) provides a framework for action regarding corrective and preventative measures to reduce flood-related impacts.

- The City of Brookhaven is the only participating jurisdiction that has adopted a floodplain management plan to help prevent damages associated with flooding and flood loss.

Open Space Management Plan*:* An open space management plan is designed to preserve, protect, and restore largely undeveloped lands in their natural state and to expand or connect areas in the public domain such as parks, greenways, and other outdoor recreation areas. In many instances, open space management practices are consistent with the goals of reducing hazard losses, such as the preservation

of wetlands or other flood-prone areas in their natural state in perpetuity.

- None of the participating counties or municipalities has adopted an open space management plan.

Stormwater Management Plan: A stormwater management plan is designed to address flooding associated with stormwater runoff. The stormwater management plan is typically focused on design and construction measures that are intended to reduce the impact of more frequently occurring minor urban flooding.

- None of the participating counties has adopted a stormwater management plan or ordinance.
- The City of Brookhaven has adopted a local stormwater pollution prevention ordinance and the City of McComb has adopted a local stormwater detention ordinance.

7.3.5 Administrative and Technical Capability

The ability of a local government to develop and implement mitigation projects, policies, and programs is directly tied to its ability to direct staff time and resources for that purpose. Administrative capability can be evaluated by determining how mitigation-related activities are assigned to local departments and if there are adequate personnel resources to complete these activities. The degree of intergovernmental coordination among departments will also affect administrative capability for the implementation and success of proposed mitigation activities.
Technical capability can generally be evaluated by assessing the level of knowledge and technical expertise of local government employees, such as personnel skilled in using Geographic Information Systems (GIS) to analyze and assess community hazard vulnerability. The Capability Assessment Survey was used to capture information on administrative and technical capability through the identification of available staff and personnel resources.

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

The results of this assessment can be found in each county annex.

7.3.6 Fiscal Capability

The ability of a local government to take action is often closely associated with the amount of money available to implement policies and projects. This may take the form of outside grant funding awards or locally-based revenue and financing. The costs associated with mitigation policy and project implementation vary widely. In some cases, policies are tied primarily to staff time or administrative costs associated with the creation and monitoring of a given program. In other cases, direct expenses are linked to an actual project, such as the acquisition of flood-prone homes, which can require a

substantial commitment from local, state, and federal funding sources.

The Capability Assessment Survey was used to capture information on the region's fiscal capability through the identification of locally available financial resources.

The results of this assessment can be found in each county annex.

7.3.7 Political Capability

One of the most difficult capabilities to evaluate involves the political will of a jurisdiction to enact meaningful policies and projects designed to reduce the impact of future hazard events. Hazard mitigation may not be a local priority or may conflict with or be seen as an impediment to other goals of the community, such as growth and economic development. Therefore, the local political climate must be considered in designing mitigation strategies as it could be the most difficult hurdle to overcome in accomplishing their adoption and implementation.

The Capability Assessment Survey was used to capture information on political capability of the MEMA District 7 Region. Previous hazard mitigation plans were reviewed for general examples of local political capability, such as guiding development away from identified hazard areas, restricting public investments or capital improvements within hazard areas, or enforcing local development standards that go beyond minimum state or federal requirements (i.e., building codes, floodplain management, etc.).

- The previous hazard mitigation plans identified existing ordinances that address natural hazards or are related to hazard mitigation, such as emergency management, zoning, subdivision regulations, comprehensive land use plans, and flood damage prevention ordinances.
- During the months immediately following a disaster, local public opinion in the region is more likely to shift in support of hazard mitigation efforts.

The results of this assessment can be found in each county annex.

7.4 CONCLUSIONS ON LOCAL CAPABILITY

In order to form meaningful conclusions on the assessment of local capability, a quantitative scoring methodology was designed and applied to the results of the Capability Assessment Survey. The maximum number of points possible (one, two, or three) was assigned to each plan, ordinance, program, or resource based on its relevance to hazard mitigation. If a plan, ordinance, program, or resource was under development or administered for a municipality at the county-level, one point became the highest score possible. The maximum total number of points possible under the scoring methodology is 86, and three categories were established to classify capability level as limited (0-24 points), moderate (25-49 points), or high (50-86 points). This methodology, further described in Appendix B, attempts to assess the overall level of capability of the MEMA District 7 Region to implement hazard mitigation actions.

The overall capability to implement hazard mitigation actions varies among the participating jurisdictions. For planning and regulatory capability, the jurisdictions are in the limited range. The administrative and technical capabilities vary from limited to moderate among the jurisdictions with larger jurisdictions generally having greater staff and technical resources. All of the jurisdictions are in

the limited range for fiscal capability.

The table below shows the results of the capability assessment using the designed scoring methodology. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. This information was reviewed by all jurisdictions and each jurisdiction provided feedback on the information included in the capability assessment. Local government input was vital to identifying capabilities. According to the assessment, the average local capability score for all jurisdictions is 21.0, which falls into the limited capability ranking.

TABLE 7.2: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
ADAMS COUNTY	26	Moderate
Natchez	33	Moderate
AMITE COUNTY	23	Limited
Gloster	18	Limited
Liberty	17	Limited
FRANKLIN COUNTY	23	Limited
Bude	9	Limited
Meadville	9	Limited
Roxie	17	Limited
JEFFERSON COUNTY	24	Limited
Fayette	18	Limited
LAWRENCE COUNTY	22	Limited
Monticello	23	Limited
New Hebron	18	Limited
Silver Creek	18	Limited
LINCOLN COUNTY	24	Limited
Brookhaven	38	Moderate
PIKE COUNTY	27	Moderate
Magnolia	19	Limited
McComb	32	Moderate
Osyka	18	Limited
Summit	10	Limited
WALTHALL COUNTY	22	Limited
Tylertown	18	Limited
WILKINSON COUNTY	24	Limited
Centreville	17	Limited
Crosby	17	Limited
Woodville	24	Limited

As previously discussed, one of the reasons for conducting a Capability Assessment is to examine local capabilities to detect any existing gaps or weaknesses within ongoing government activities that could hinder proposed mitigation activities and possibly exacerbate community hazard vulnerability. These gaps or weaknesses have been identified for each jurisdiction in the tables found throughout this section. The participating jurisdictions used the Capability Assessment as part of the basis for the Mitigation Actions that are identified in Section 9; therefore, each jurisdiction addresses their ability to expand on and improve their existing capabilities through the identification of their Mitigation Actions.

7.4.1 Linking the Capability Assessment with the Risk Assessment and the Mitigation Strategy

The conclusions of the Risk Assessment and Capability Assessment serve as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, the RHMC considered not only each jurisdiction's level of hazard risk, but also their existing capability to minimize or eliminate that risk.

MITIGATION STRATEGY

This section provides the blueprint for the participating jurisdictions of the MEMA District 7 Region to follow to become less vulnerable to its identified hazards, based on the general consensus of the Regional Hazard Mitigation Council (RHMC) and the findings and conclusions of the *Capability Assessment* and *Risk Assessment*. It consists of the following five subsections:

- 8.1 Introduction
- 8.2 Mitigation Goals
- 8.3 Identification and Analysis of Mitigation Techniques
- 8.4 Selection of Mitigation Techniques for the MEMA District 7 Region
- 8.5 Plan Update Requirement

8.1 INTRODUCTION

The intent of the Mitigation Strategy is to provide comprehensive, strategic, and functional goals that the communities in the MEMA District 7 Region will use to as guiding principles for future mitigation policy and project administration. This includes an analysis of mitigation techniques available to meet those goals and reduce the impact of identified hazards.

- *Comprehensive*: The development of the strategy includes a thorough review of all hazards and identifies mitigation measures intended to not only reduce the future impacts of high-risk hazards, and to help the region achieve compatible economic, environmental, and social goals.
- *Strategic:* this ensures that all policies and projects proposed for implementation are consistent with pre-identified, long-term planning goals.
- *Functional:* each proposed mitigation action was identified by the communities, linked to established priorities, and assigned to specific departments or individuals responsible for their implementation with target completion deadlines. Funding sources are identified that can be used to assist in project implementation.

The 2023 update of this plan utilized the goals and objectives identified in the last planning process. Building off the mitigation goals and the identification, consideration, and analysis of available mitigation measures conducted in the last update. At the request of the Mississippi Emergency Management Agency, each previously identified and new action added during the 2023 update was also associated with an Objective from the 2018 State Hazard Mitigation Plan. The states goals and objectives included:

Goal 1 – Minimize loss of life, injury, and damage to property, the economy, and the environment from natural hazards
Objective 1.1 Protect critical facilities, infrastructure, and systems
Objective 1.2 Reduce the number of at-risk and repetitive loss and SRL properties

Objective 1.3 Reduce potential damage to future buildings and infrastructure
Objective 1.4 Develop and maintain hazards-related research, modeling, data, and analysis to support program and project implementation
Objective 1.5 Identify needs and appropriate projects from post disaster damage assessments
Objective 1.6 Preserve, create, and restore natural systems to serve as natural mitigation functions
Objective 1.7 Protect historic and cultural resources
Objective 1.8 Provide state and local agencies with a statewide communications network with an Interoperable, highly reliable, fast access, public safety-grade communication system for use during events that threaten the health and welfare of the citizens of Mississippi.
Objective 1.9 Promote State identified mitigation initiatives, such as saferooms, storm shelters and severe weather warning systems.

Goal 2 – Build and enhance local mitigation capabilities
Objective 2.1 Support and provide guidance for local hazard mitigation planning and Projects
Objective 2.2 Encourage the adoption, improvement, and enforcement of local codes, ordinances, and land use planning
Objective 2.3 Provide and promote technical assistance and training to local governments
Objective 2.4 Identify and provide financial incentives and funding opportunities

Goal 3 – Improve public education and awareness
Objective 3.1 Develop and improve outreach programs and materials to increase awareness to the public and private sector about risk and mitigation in Mississippi
Objective 3.2 Promote and utilize existing hazard mitigation education programs from state, federal, and nonprofit sources
Objective 3.3 Develop tailored outreach strategies for vulnerable populations, such as tourists, disabled persons, children and the elderly, non-English speakers, and low- income residents

Goal 4 – Sustain and enhance a coordinated state mitigation program
Objective 4.1 Strengthen coordination, communication, capabilities, and partnerships with levels of government, the private sector, and nonprofit organizations
Objective 4.2 Institutionalize hazard mitigation as integrated state policy
Objective 4.3 Implement, monitor, and assess the effectiveness of the mitigation strategy and promote successes

None of the Region 7 actions were applicable to Goal 4, however actions spanned all over goals.

The third and last step in designing the Mitigation Strategy is the selection and prioritization of specific mitigation actions for the communities in the MEMA District 7 Region (provided separately in Section 9: Mitigation Action Plan). Each county and participating jurisdiction has its own Mitigation Action Plan that reflects the needs and concerns of that jurisdiction. The MAP represents an unambiguous and functional plan for action and is considered to be the most essential outcome of the mitigation planning process.

The MAP includes a prioritized listing of proposed hazard mitigation actions (policies and projects) for the MEMA District 7 counties and jurisdictions to complete. Each action has accompanying information, such as those departments or individuals assigned responsibility for implementation, potential funding sources, and an estimated target date for completion. The MAP provides those departments or

individuals responsible for implementing mitigation actions with a clear roadmap that also serves as an important tool for monitoring success or progress over time. The cohesive collection of actions listed in the MAP can also serve as an easily understood menu of mitigation policies and projects for those local decision makers who want to quickly review the recommendations and proposed actions of the Regional Hazard Mitigation Plan.

In preparing each Mitigation Action Plan for the MEMA District 7 Region, officials considered the overall hazard risk and capability to mitigate the effects of hazards as recorded through the risk and capability assessment process, in addition to meeting the adopted mitigation goals and unique needs of the community.

8.1.1 Mitigation Action Prioritization

Prioritization of the proposed mitigation actions was based on the following six factors:

- Effect on overall risk to life and property
- Ease of implementation
- Political and community support
- A general economic cost/benefit review1
- Funding availability
- Continued compliance with the NFIP

The point of contact for each county helped coordinate the prioritization process by reviewing each action and working with the lead agency/department responsible to determine a priority for each action using the six factors listed above. Using these criteria, actions were classified as high, moderate, or low priority by the participating jurisdiction officials.

Only a general economic cost/benefit review was considered by the Regional Hazard Mitigation Council through the process of selecting and prioritizing mitigation actions. Mitigation actions with "high" priority were determined to be the most cost effective and most compatible with the participating jurisdictions' unique needs. Actions with a "moderate" priority were determined to be cost-effective and compatible with jurisdictional needs but may be more challenging to complete administratively or fiscally than "high" priority actions. Actions with a "low" priority were determined to be important community needs, but the community likely identified several potential challenges in terms of implementation (e.g. lack of funding, technical obstacles). A more detailed cost/benefit analysis will be applied to particular projects prior to the application for or obligation of funding, as appropriate.

8.2 MITIGATION GOALS

44 CFR Requirement
44 CFR Part 201.6(c)(3)(i): The mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

The primary goal of all local governments is to promote the public health, safety, and welfare of its citizens. In keeping with this standard, the MEMA District 7 counties and the participating municipalities

have developed six goal statements for local hazard mitigation planning in the region. In developing these goals, the project consultant reviewed the goals from the existing plan and found that generally they seemed to be in line with the region's current vision for mitigation. Table 8.1 provides a listing of all of the existing mitigation goals from the previous plan.

After reviewing the existing goals, the same six regional goals were presented to the Hazard Mitigation Council for their consideration. These proposed goals were reviewed, voted on, and accepted by the RHMC at their second meeting. Each goal, purposefully broad in nature, serves to establish parameters that were used in developing more mitigation actions. The final MEMA District 7 Regional Mitigation Goals are presented in Table 8.2. Consistent implementation of actions over time will ensure that community goals are achieved.

TABLE 8.2: MEMA DISTRICT 7 REGIONAL MITIGATION GOALS

	Goal
Goal #1	Increase the overall public awareness of natural hazards that face the region.
Goal #2	Retrofit of critical facilities and/or critical infrastructure to lower the risk of damage from natural hazards.
Goal #3	General improvement of regional or local mitigation planning and capability.
Goal #4	Support State Identified Mitigation Initiatives such as saferooms and storm shelters, severe weather warning systems for universities and colleges, and severe weather notification systems for local communities.
Goal #5	Reduce loss of life, damage and loss of property and infrastructure, economic costs, including response, recovery and disruption of economic activity.
Goal #6	Foster cooperation among all levels of governments and the private sector with respect to improving, updating, and implementing the hazard mitigation plan.

8.3 IDENTIFICATION AND ANALYSIS OF MITIGATION TECHNIQUES

44 CFR Requirement
44 CFR Part 201.6(c)(3)(ii): The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effect of each hazard, with particular emphasis on new and existing buildings and infrastructure.

In formulating the Mitigation Strategy for the MEMA District 7 Region, a wide range of activities were considered to achieve the established mitigation goals, in addition to addressing any specific hazard concerns. These activities were discussed during the MEMA District 7 Regional Hazard Mitigation Planning meetings. In general, all activities considered by the RHMC can be classified under one of the following six (6) broad categories of mitigation techniques: Prevention, Property Protection, Natural Resource Protection, Structural Projects, Emergency Services, and Public Awareness and Education. These are discussed in detail below.

8.3.1 Prevention

Preventative activities are intended to keep hazard problems from getting worse and are typically administered through government programs or regulatory actions that influence the way land is

developed and buildings are built. They are particularly effective in reducing a community's future vulnerability, especially in areas where development has not occurred, or capital improvements have not been substantial. Examples of preventative activities include:

- Planning and zoning
- Building codes
- Open space preservation
- Floodplain regulations
- Stormwater management regulations
- Drainage system maintenance
- Capital improvements programming
- Riverine/fault zone setbacks

8.3.2 Property Protection

Property protection measures involve the modification of existing buildings and structures to help them better withstand the forces of a hazard, or removal of the structures from hazardous locations. Examples include:

- Acquisition
- Relocation
- Building elevation
- Critical facilities protection
- Retrofitting (e.g., windproofing, floodproofing, seismic design techniques, etc.)
- Safe rooms, shutters, shatter-resistant glass
- Insurance

8.3.3 Natural Resource Protection

Natural resource protection activities reduce the impact of natural hazards by preserving or restoring natural areas and their protective functions. Such areas include floodplains, wetlands, steep slopes, and sand dunes. Parks, recreation, or conservation agencies and organizations often implement these protective measures. Examples include:

- Floodplain protection
- Watershed management
- Riparian buffers
- Forest and vegetation management (e.g., fire resistant landscaping, fuel breaks, etc.)
- Erosion and sediment control
- Wetland preservation and restoration
- Habitat preservation
- Slope stabilization

8.3.4 Structural Projects

Structural mitigation projects are intended to lessen the impact of a hazard by modifying the

environmental natural progression of the hazard event through construction. They are usually designed by engineers and managed or maintained by public works staff. Examples include:

- Reservoirs
- Dams/levees/dikes/floodwalls
- Diversions/detention/retention
- Channel modification
- Storm sewers

8.3.5 Emergency Services

Although not typically considered a "mitigation" technique, emergency service measures do minimize the impact of a hazard event on people and property. These commonly are actions taken immediately prior to, during, or in response to a hazard event. Examples include:

- Warning systems
- Evacuation planning and management
- Emergency response training and exercises
- Sandbagging for flood protection
- Installing temporary shutters for wind protection

8.3.6 Public Education and Awareness

Public education and awareness activities are used to advise residents, elected officials, business owners, potential property buyers, and visitors about hazards, hazardous areas, and mitigation techniques they can use to protect themselves and their property. Examples of measures to educate and inform the public include:

- Outreach projects
- Speaker series/demonstration events
- Hazard map information
- Real estate disclosure
- Library materials
- School children educational programs
- Hazard expositions

8.4 SELECTION OF MITIGATION TECHNIQUES FOR THE MEMA DISTRICT 7 REGION

In order to determine the most appropriate mitigation techniques for the communities in the MEMA District 7 Region, the RHMC members thoroughly reviewed and considered the findings of the *Capability Assessment* and *Risk Assessment* to determine the best activities for their respective communities. Other considerations included the effect of each mitigation action on overall risk to life and property, its ease of implementation, its degree of political and community support, its general cost-effectiveness, and funding availability (if necessary).

8.5 PLAN UPDATE REQUIREMENT

In keeping with FEMA requirements for plan updates, the Mitigation Actions identified in the previous MEMA District 7 plan were evaluated to determine their 2023 implementation status. Updates on the implementation status of each action are provided. The mitigation actions provided in Section 9*: Mitigation Action Plan* include the mitigation actions from the previous plan as well as any new mitigation actions proposed through the 2023 planning process.

MITIGATION ACTION PLAN

This section is a description of mitigation actions as proposed by the participating jurisdictions in MEMA District 7. It consists of the following two subsections:

- 9.1 Overview
- 9.2 Mitigation Actions

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44 CFR Requirement
44 CFR Part 201.6(c)(3)(iii): The mitigation strategy shall include an action plan describing how the actions identified in paragraph (c)(2)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction.

9.1 OVERVIEW

The Mitigation Action Plan is a list of functional and actionable steps to accomplish the community goals established in Section 8: Mitigation Strategy. This list will be maintained to reflect progress and identify new actions, as applicable according to the plan maintenance procedures established in Section 10: Plan Maintenance.

Each proposed mitigation action has been identified as an effective measure (policy or project) to reduce hazard risk for the communities in the MEMA District 7 Region. Each action is listed in conjunction with background information such as hazard(s) addressed, relative priority, potential funding sources, the designation of a lead agency or department responsible for carrying the action out, as well as a timeframe for its completion. The 2023 update of the Mitigation Plan includes status changes since the Plan was last approved. Actions that were marked as deleted in the last plan were removed during this update. Any actions deleted from this update remain in the plan with the deleted status. The intention will be to remove them during the 2028 update. The proposed actions are organized by mitigation strategy category (Prevention, Property Protection, Natural Resource Protection, Structural Projects, Emergency Services, or Public Education and Awareness).

9.2 MITIGATION ACTIONS

The mitigation actions proposed by each of the participating jurisdictions are listed in each of the 9 Plan Annexes. For the 2023 update each jurisdiction engaged in an additional Mitigation Action identification meeting to dramatically increase the number of selected actions and improve applicability to each jurisdiction. Due to the 2020 global pandemic that pulled national focus both, particularly for local emergency management, many actions were deferred due to lack of prioritization, funding, or staff time available to dedicate to the identified actions. The prioritization of previously identified actions remained largely consistent, however some actions identified for jurisdictions with minimal risk to the indicated hazard were either removed deleted or downgraded. New actions were prioritized based on funding, political and public support, and in representation of activities already underway.

PLAN MAINTENANCE

This section discusses how the MEMA District 7 Mitigation Strategy and Mitigation Action Plan will be implemented and how the Regional Hazard Mitigation Plan will be evaluated and enhanced over time. This section also discusses how the public will continue to be involved in a sustained hazard mitigation planning process. It consists of the following four subsections:

- 10.1 Monitoring and Evaluating the Previous Plan
- 10.2 Implementation and Integration
- 10.3 Monitoring, Evaluation, and Enhancement
- 10.4 Continued Public Involvement

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44 CFR Requirement

44 CFR Part201.6(c)(4)(i):
The plan shall include a plan maintenance process that includes a section describing the method and schedule of monitoring, evaluating and updating the mitigation plan within a five-year cycle.

44 CFR Part 201.6(c)(4)(ii):
The plan maintenance process shall include a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate

10.1 MONITORING AND EVALUATING THE PREVIOUS PLAN

Since the previous hazard mitigation plan was adopted in 2017, each county has pursued integration of the plan into local activities. In many instances progress was made to increase the resilience of these local communities but often not documented in planning material. The designated Task Force has been unable to meet during this last update period, due to the everyday requirements of their positions, multiple disaster declarations, and a global pandemic that altered the landscape of daily life for every American. In general, the consensus from the current planning committee is that the maintenance processes proved once again to be burdensome and inefficient. As such, revisions were agreed upon to modify the plan monitoring and evaluation process.

The RHMC will remain the entity charged with reviewing the plan, but these reviews will take place on an individual country basis, with each emergency manager charged with documenting and annotating the progress in their communities. These reviews will continue to be mainly focused on the status of mitigation actions/projects. Overall, the review team generally agreed that the plan was on course and that with the modification to the frequency of this RHMC (formerly Task Force) meetings, the monitoring and evaluating process itself would be sufficient to ensure implementation of the plan going forward. Each county will also meet annually with its municipalities in separate meetings to discuss mitigation planning and the emergency management process.

10.2 IMPLEMENTATION AND INTEGRATION

Each agency, department, or other partner participating under the MEMA District 7 Regional Hazard Mitigation Plan is responsible for implementing specific mitigation actions as prescribed in the

Mitigation Action Plan. Every proposed action listed in the Mitigation Action Plan is assigned to a specific "lead" agency or department in order to assign responsibility and accountability and increase the likelihood of subsequent implementation.

In addition to the assignment of a local lead department or agency, an implementation time period or a specific implementation date has been assigned in order to assess whether actions are being implemented in a timely fashion. The counties in the MEMA District 7 Region will seek outside funding sources to implement mitigation projects in both the pre-disaster and post-disaster environments. When applicable, potential funding sources have been identified for proposed actions listed in the Mitigation Action Plan.

The participating jurisdictions will integrate this Hazard Mitigation Plan into relevant city and county government decision-making processes or mechanisms, where feasible. This includes integrating the requirements of the Hazard Mitigation Plan into other local planning documents, processes, or mechanisms, such as comprehensive or capital improvement plans, when appropriate. The members of the MEMA District 7 Regional Hazard Mitigation Council (RHMC) will remain charged with ensuring that the goals and mitigation actions of new and updated local planning documents for their agencies or departments are consistent, or do not conflict with, the goals and actions of the Hazard Mitigation Plan, and will not contribute to increased hazard vulnerability in the MEMA District 7 Region.

Since the previous plan was adopted, each county and participating jurisdiction has worked to integrate the hazard mitigation plan into other planning mechanisms where applicable/feasible. Examples of how this integration has occurred have been documented in the Implementation Status discussion provided for each of the mitigation actions found in Section 9. Specific examples of how integration has occurred include integrating the mitigation plan into reviews and updates of:

- floodplain management ordinances;
- county emergency operations plans;
- building codes; and
- the capital improvements plan through identification of mitigation actions that require local funding.

Opportunities to further integrate the requirements of this Plan into other local planning mechanisms shall continue to be identified through future meetings of the RHMC, individual county meetings, and the annual review process described herein. Although it is recognized that there are many possible benefits to integrating components of this Plan into other local planning mechanisms, the development and maintenance of this stand-alone Regional Hazard Mitigation Plan is deemed by the MEMA District 7 RHMC to be the most effective and appropriate method to implement local hazard mitigation actions at this time.

10.3 MONITORING, EVALUATION, AND ENHANCEMENT

Periodic revisions and updates of the Hazard Mitigation Plan are required to ensure that the goals of the Plan are kept current, taking into account potential changes in hazard vulnerability and mitigation priorities. In addition, revisions may be necessary to ensure that the Plan is in full compliance with applicable federal and state regulations. Periodic evaluation of the Plan will also ensure that specific mitigation actions are being reviewed and carried out according to the Mitigation Action Plan.

The individual county emergency managers within the MEMA District 7 RHMC shall evaluate the progress attained and to revise, where needed, the activities set forth in the Plan. The findings and

recommendations of the RHMC shall be shared with interested municipal and county Council members. This will ensure that the Plan remains actionable as actions are completed and new actions are selected for implementation. MEMA will be responsible for reconvening the RHMC if region wide collaboration is needed for these reviews.

FIVE YEAR PLAN REVIEW

The Plan will be thoroughly reviewed by the RHMC every five years to determine whether there have been any significant changes in the region that may, in turn, necessitate changes in the types of mitigation actions proposed. New development or aging infrastructure in identified hazard areas, an increased exposure to hazards, an increase or decrease in capability to address hazards, and changes to federal or state legislation are examples of factors that may affect the necessary content of the Plan.

The plan review provides MEMA District 7 county officials with an opportunity to evaluate those actions that have been successful and to explore the possibility of documenting potential losses avoided due to the implementation of specific mitigation measures. The plan review also provides the opportunity to address mitigation actions that may not have been successfully implemented as assigned. MEMA will be responsible for reconvening the RHMC and helping conduct the five-year review.

During the five-year plan review process, the following questions will be considered as criteria for assessing the effectiveness and appropriateness of the Plan:

- Do the goals address current and expected conditions?
- Has the nature or magnitude of risks changed?
- Are the current resources appropriate for implementing the Plan?
- Are there implementation problems, such as technical, political, legal or coordination issues with other agencies?
- Have the outcomes occurred as expected?
- Did county departments participate in the plan implementation process as assigned?

Following the five-year review, any revisions deemed necessary will be summarized and implemented according to the reporting procedures and plan amendment process outlined herein. Upon completion of the review and update/amendment process, the MEMA District 7 Regional Hazard Mitigation Plan will be submitted to the State Hazard Mitigation Officer at MEMA for final review and approval in coordination with the Federal Emergency Management Agency (FEMA).

Because the plan update process can take several months to complete, and because Federal funding may be needed to update the plan, it is recommended that the five-year review process begin at the beginning of the third year after the plan was last approved. This will allow the participants in the MEMA District 7 Regional Hazard Mitigation Plan to organize in order to seek Federal funding if necessary and complete required plan update documentation before the plan expires at the end of the fifth year.

DISASTER DECLARATION

In past updates, a commitment was made to convene the MEMA District 7 RHMC and revise the plan. This process is unattainable and problematic at best. In the aftermath of a disaster, emergency managers are needed to respond, recover, and serve their communities, with most county emergency managers filing multiple soles. Any non-essential functions cannot be considered during this period.

REPORTING PROCEDURES

The results of the five-year review will be summarized by the RHMC in the plan update and will include an evaluation of the effectiveness of the Plan and any required or recommended changes or amendments. The results will also include an evaluation of implementation progress for each of the proposed mitigation actions, identifying reasons for delays or obstacles to their completion along with recommendations as to whether and how to continue to pursue the action.

PLAN AMENDMENT PROCESS

In general, the RHMC agreed that any minor amendments suggested by a county or participating municipality would be automatically accepted into the plan as long as the amendment only impacted that jurisdiction. However, if the amendment proposed a large-scale change to the structure of the plan or impacted other jurisdictions, the following amendment process would be followed.

Upon the initiation of the amendment process, the MEMA District 7 counties will forward information on the proposed change(s) to all interested parties including, but not limited to, all directly affected county departments, residents, and businesses. Information will also be forwarded to MEMA. This information will be disseminated in order to seek input on the proposed amendment(s) for no less than a 45-day review and comment period.

At the end of the 45-day review and comment period, the proposed amendment(s) and all comments will be forwarded to the RHMC for final consideration. The RHMC will review the proposed amendment along with the comments received from other parties, and if acceptable, the committee will submit a recommendation for the approval and adoption of changes to the Plan.

In determining whether to recommend approval or denial of a Plan amendment request, the following factors will be considered by the RHMC:

- There are errors, inaccuracies, or omissions made in the identification of issues or needs in the Plan.
- New issues or needs have been identified which are not adequately addressed in the Plan.
- There has been a change in information, data, or assumptions from those on which the Plan is based.

Upon receiving the recommendation from the RHMC, and prior to adoption of the Plan Amendment, the participating jurisdictions will hold a public hearing, if deemed necessary. The governing bodies of each participating jurisdiction will review the recommendation from the RHMC (including the factors listed above) and any oral or written comments received at the public hearing. Following that review, the governing bodies will take one of the following actions:

- Adopt the proposed amendments as presented
- Adopt the proposed amendments with modifications
- Refer the amendments request back to the RHMC for further revision
- Defer the amendment request back to the RHMC for further consideration and/or additional hearings

10.4 CONTINUED PUBLIC INVOLVEMENT

44 CFR Requirement
44 CFR Part 201.6(c)(4)(iii): The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

Public participation is an integral component to the mitigation planning process and will continue to be essential as this Plan evolves over time. As described above, significant changes or amendments to the Plan shall require a public hearing prior to any adoption procedures.

Other efforts to involve the public in the maintenance, evaluation, and revision process will be made as necessary. These efforts may include:

- Advertising meetings of the RHMC in local newspapers, public bulletin boards and/or county office buildings
- Designating willing and voluntary citizens and private sector representatives as official members of the RHMC
- Utilizing local media to update the public on any maintenance and/or periodic review activities taking place
- Utilizing the MEMA District 7 county websites to advertise any maintenance and/or periodic review activities taking place
- Keeping copies of the Plan in public libraries

Overall, the RHMC and participating counties will continue to provide outreach concerning mitigation through social media, TV, radio, and alert systems already in place and proposed through Mitigation Actions, as well as through outreach events such as local fairs or public events. In this way, the public will have continual interaction with the mitigation process and the efforts taken by local officials to implement mitigation.

ADAMS COUNTY

This annex includes jurisdiction-specific information for Adams County and its participating municipalities. It consists of the following five subsections:

- A.1 Adams County Community Profile
- A.2 Adams County Risk Assessment
- A.3 Adams County Vulnerability Assessment
- A.4 Adams County Capability Assessment
- A.5 Adams County Mitigation Strategy

A.1 ADAMS COUNTY COMMUNITY PROFILE

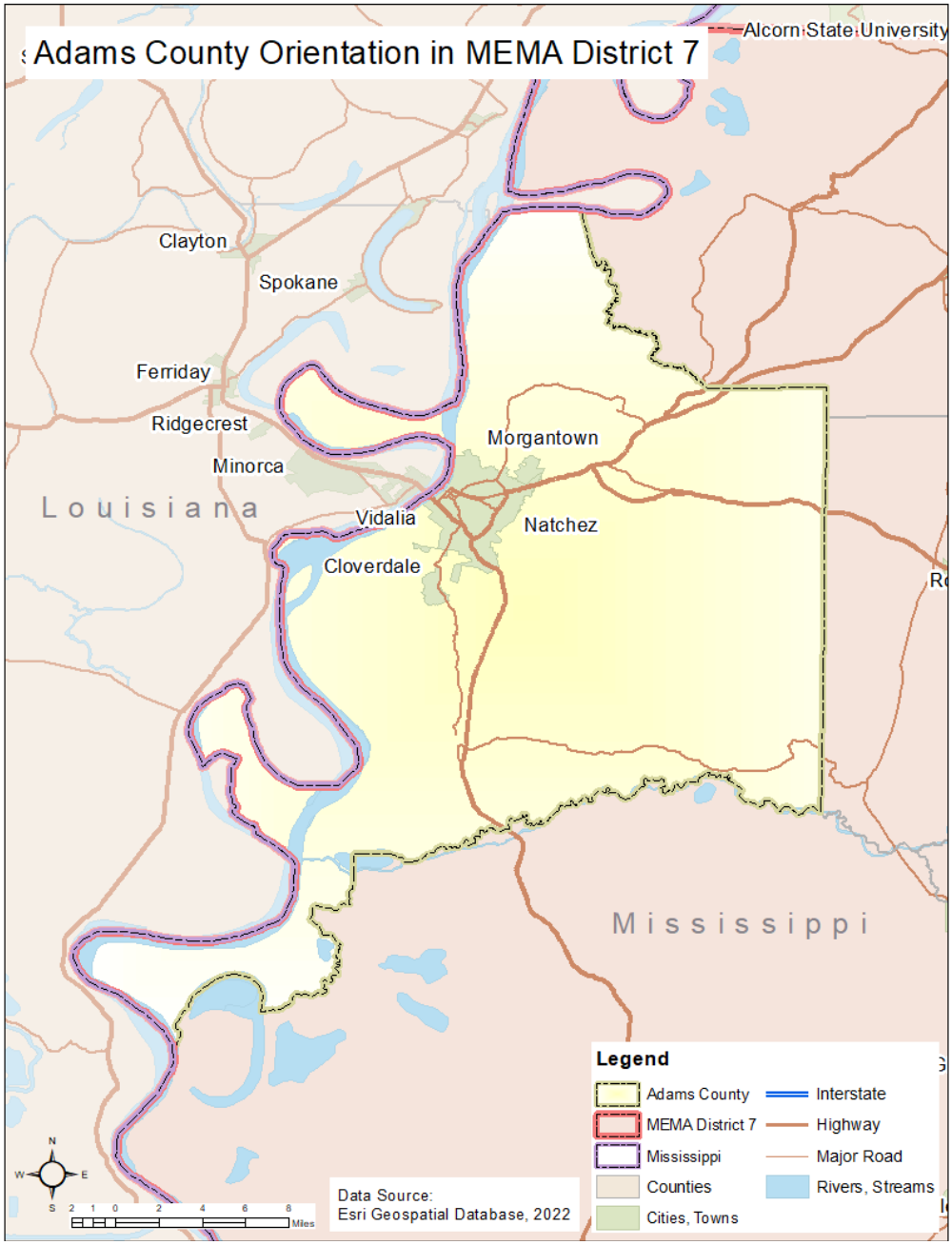
A.1.1 Geography and the Environment

Adams County is in southwestern Mississippi. It comprises one city, City of Natchez, as well as many small unincorporated communities. An orientation map is provided in the figure below.

The county is adjacent to the Mississippi River supplying diverse recreational activities. The total area of the county is 488 square miles, 25 square miles of which is water area.

Adams County enjoys four distinct seasons however, given its latitude and relative proximity to the Gulf Coast, the climate is generally hot and humid compared to the rest of the United States. Precipitation is generally highest in winter months when temperatures are moderately lower, but the likelihood of precipitation remains relatively constant throughout the year. Summers in the region can become hot with average highs in the nineties and lows in the seventies. The region is often susceptible to turbulent weather when warm, wet air from the Gulf of Mexico is pushed into the region to mix with cooler air coming down from across the continent, which can result in severe weather conditions. This is particularly true in the spring when seasons are changing, and diverse weather patterns interact.

FIGURE A.1: ADAMS COUNTY ORIENTATION MAP



A.1.2 Population and Demographics

According to the 2020 Census, Adams County has a population of 29,538. The county continues to see a decrease in population between 2010 and 2020, and the population density is 63.9 people per square mile. Population counts from the U.S. Census Bureau for 2000, 2010, and 2020 for the county and participating jurisdictions are presented below.

TABLE A.1: POPULATION COUNTS FOR ADAMS COUNTY[1]

Jurisdiction	2000 Census	2010 Census	2020 Census	% Change 2000-2020
Adams County	**34,340**	**32,297**	**29,538**	**-13.98%**
Natchez	18,534	15,792	14,520	-8.05%

Based on the 2020 Census, the median age of residents of Adams County is 39.9 years. The racial characteristics of the county are presented below. People identified as black or African American make up the majority of the population in the county, accounting for over 53% of the population.

TABLE A.2: DEMOGRAPHICS OF ADAMS COUNTY[2]

Jurisdiction	Black or African American	White	American Indian or Alaska Native	Asian	Native Hawaiian or Other Pacific Islander	Other Race	Two or More Races	Persons of Hispanic Origin[3]
Adams County	**53.7%**	**43.9%**	**0.6%**	**0.6%**	**0.0%**	**2.6%**	**1.1%**	**9.7%**
Natchez	62.9%	34.3%	0.2%	0.6%	0.0%	0.4%	1.6%	2.6%

A.1.3 Housing

According to the 2020 U.S. Census, there are 14,910 housing units in Adams County, the majority of which are single family homes or mobile homes. Housing information for the county and municipality is presented below. As shown in the table, the incorporated city has a similar percentage of seasonal housing units compared to the unincorporated county.

TABLE A.3: HOUSING CHARACTERISTICS OF ADAMS COUNTY[4]

Jurisdiction	Housing Units (2000)	Housing Units (2010)	Housing Units (2020)	Median Home Value (2016-2020)
Adams County	**15,175**	**14,656**	**14,910%**	**$94,100**
Natchez	8,479	7,932	N/A	$99,500

A.1.4 Infrastructure

TRANSPORTATION

In Adams County, U.S. Highway 61 provides access to the north and south and U.S. Highway 84 provides access to the east and west.

Natchez-Adams County Airport (Hardy-Anders Field) is a general aviation airport located in the northern portion of Adams County.

[1] United States Census Bureau, 2020 Census

[2] 2020 Census Data

[3] Persons of Hispanic Origin may be of any race, so also are included in applicable race categories.

[4] Source: United States Census Bureau, 2000, 2010, 2020 Census, 2016-2020 American Community Survey

A major freight rail line operates within Adams County. Natchez Railroad is a Class III Local railway that operates and runs east to west in the county. Business and industries rely on this line along with various other major highway routes as distribution of merchandise.

UTILITIES

Electrical power in Adams County is provided by Southwest Mississippi Electric Power Association as well as Entergy Mississippi Inc. Water and sewer service is provided by participating jurisdictions and/or community-based associations, but unincorporated areas often rely on septic systems and wells in Adams County. Adams County Water Association, Natchez Water Works, and Urban Water Cooperation.

COMMUNITY FACILITIES

There are several buildings and community facilities located throughout Adams County. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 8 fire stations, 4 police stations, and 14 schools located within the county.

There are also 1 hospital and 7 medical care facilities located in Adams County. This includes Merit Health Natchez, a 179-bed short term acute facility located in Natchez.

Several educational institutions are found in Adams County. Alcorn State University is located in Natchez and is a four-year undergraduate institution with several graduate programs. Copiah-Lincoln Community College is a two-year community college that has a location Natchez.

Museums based around the history and culture of the region are prevalent throughout the area. For example, the Natchez Museum of African American History and Culture tells the story of African American culture in the southern United States and is dedicated to exploring the societal contributions of people of African origin and descent.

Recreational opportunities exist throughout Adams County. The Homochitto National Forest comprises almost 200,000 acres of land and is partially located in Adams County. Visitors can camp, hike, hunt, and fish in the forest. In addition, St. Catherine Creek National Wildlife Refuge sits on roughly 25,000 acres and functions as a habitat for migratory waterfowl, birds, and other wildlife. This refuge is located almost completely in Adams County. Another prominent feature of the county is the Natchez Trace Parkway which begins in the City of Natchez and runs northeast to Nashville, Tennessee. This parkway commemorates the Old Natchez Trace which is an historic trail that was followed by Native Americans who were tracing bison along their migratory routes from the grazing pastures of central and western Mississippi to the salt licks of Tennessee.

The Mississippi River, which runs along the western border of the county, has played an integral part in the history of the county. The river acted as a major conduit for trade in the 19th century as plantations produced large quantities of cotton that could be easily shipped down to ports such as New Orleans. Today, the river is still an important part of the local economy as products are shipped worldwide out of the Natchez port. Apart from the Mississippi River there are multiple water-based refuges, activities, and recreational features focused on local water bodies in the region. For instance, in Adams County, the Old River, Lake St. John, and Lake Concordia all offer excellent boating opportunities. There are also numerous other small lakes, creeks, and other water bodies throughout the region that offer the outstanding outdoor recreational opportunities for which the region is known.

A.1.5 Land Use

Adams County has a blend of old and new development that contributes to physical, cultural, and economic attributes throughout the region. There is one incorporated municipality located in the county. This area is where the county's population is generally concentrated. The incorporated area is also where

many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the county generally consist of rural residential development, agricultural uses, and recreational areas. There are multiple county- and regional-based agencies that serve to coordinate growth and promote economic development. Local land use and associated regulations are further discussed in *Section 7: Capability Assessment.*

A.1.6 Employment and Industry

In Adams County, 45.1% of the population over the age of 16 was in the civilian labor force and in 2021 had an average unemployment rate of 8.2% (compared to 5.6% for the State of Mississippi)[5]. In 2020, Educational services, and health care and social assistance accounted for 24.7% of the county's workforce followed by Arts, entertainment, recreation, and accommodation and food services (15%), and Retail trade (13.5%). The median annual household in 2020 for Adams County was $30,633 compared to $46,511 in the State of Mississippi.

[5] Mississippi Department of Employment Security, Unemployment Rates, 2021. Retrieved from: https://www.mdes.ms.gov/media/8735/urate.pdf

A.2 ADAMS COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in Section 4: *Hazard Identification* as they pertain to Adams County. Each hazard profile includes a description of the hazard's location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in Section 5: *Hazard Profiles*.

FLOOD-RELATED HAZARDS

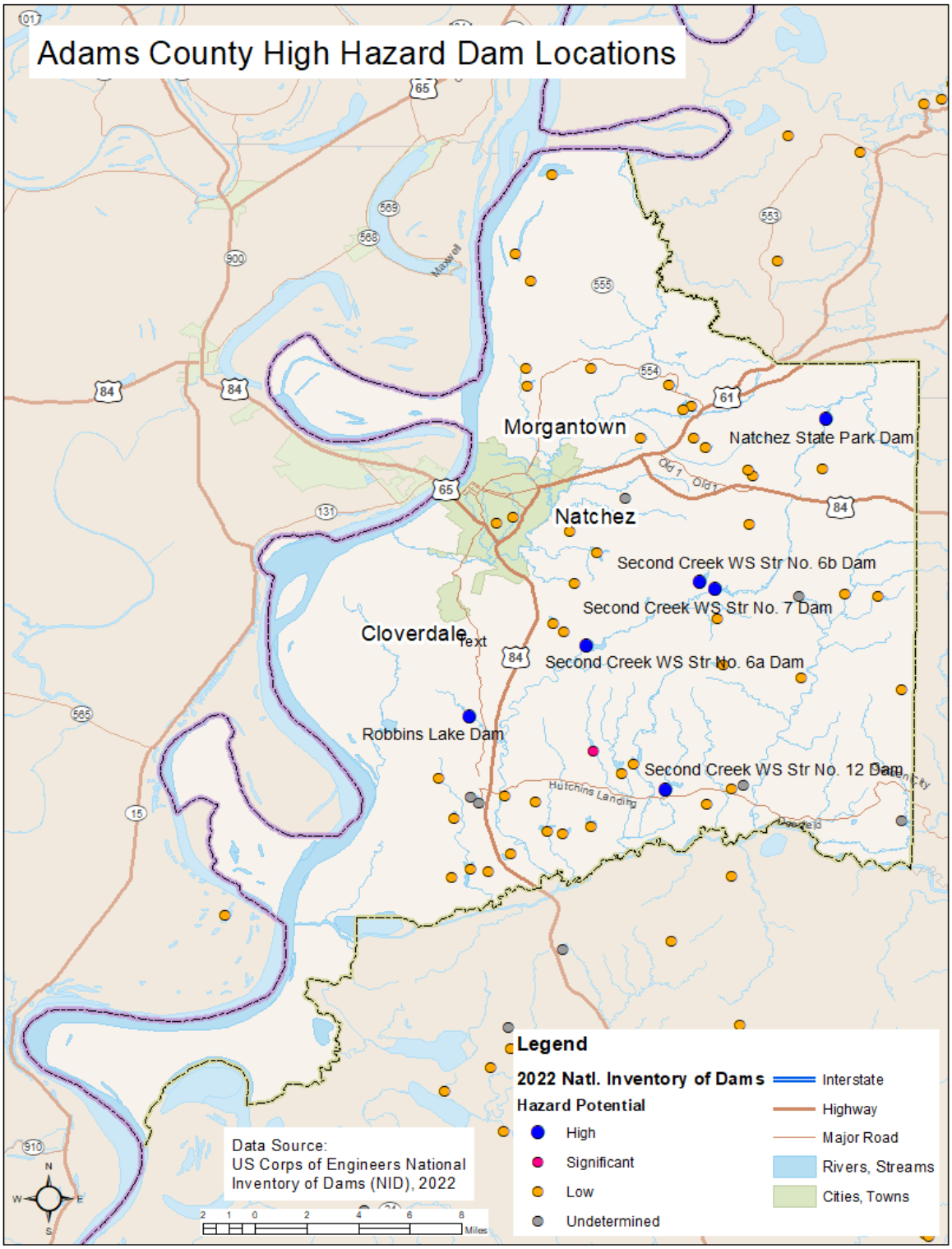
A.2.1 Dam and Levee Failure

LOCATION AND SPATIAL EXTENT

According to the U.S. Army Corps of Engineers National Inventory of Dams, there are six high hazard dams in Adams County[6]. Figure A.2 and Figure A.3 show the location of these high hazard dams as well as mapped inundation areas, and Table A.4 lists them by name.

[6] U.S. Army Corps of Engineers, National Inventory of Dams. Retrieved 11/29/2022

FIGURE A.2: ADAMS COUNTY HIGH HAZARD DAM LOCATIONS[7]



[7] Source: U.S. Army Corps of Engineers - NID

FIGURE A.3: ADAMS COUNTY DAM INUNDATION AREAS[8]

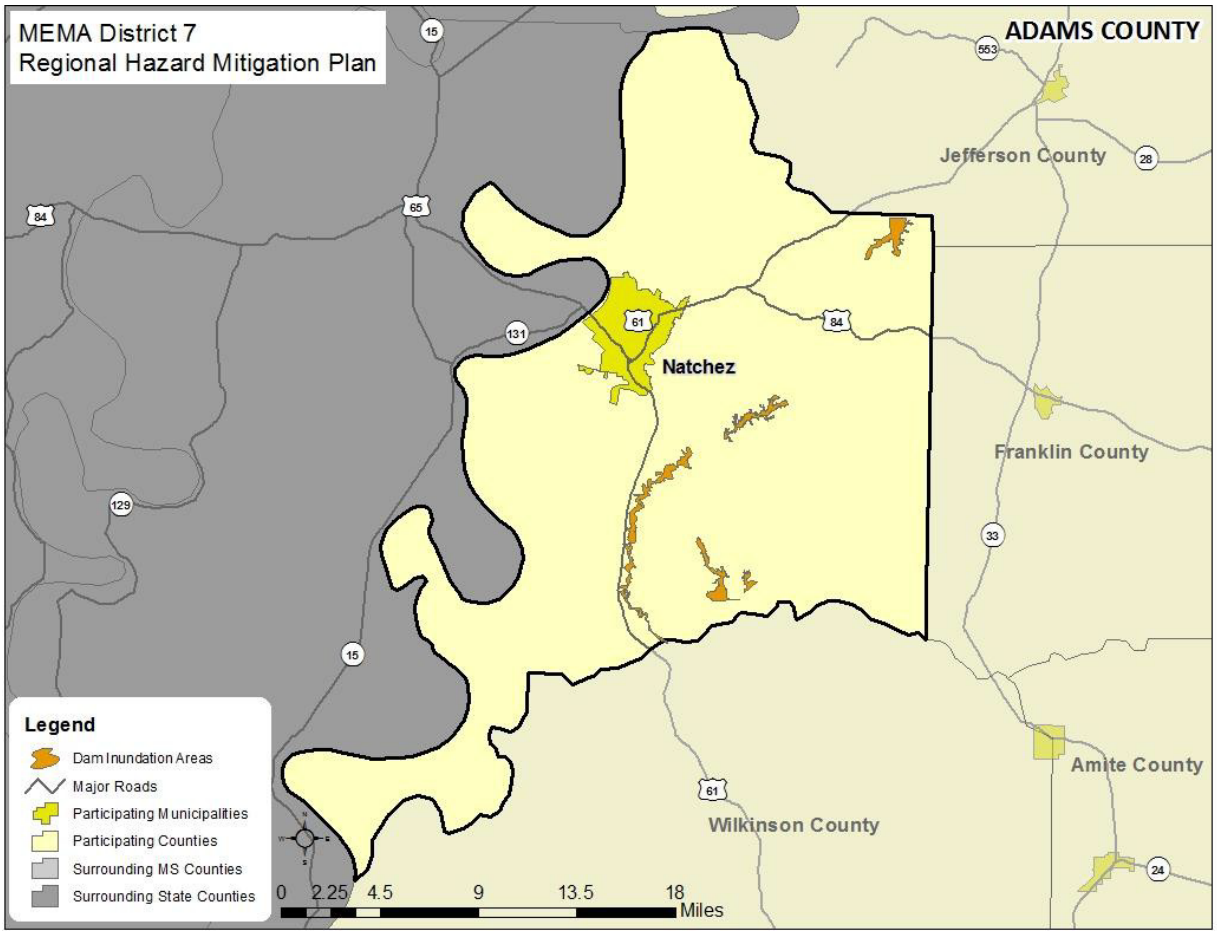


TABLE A.4: ADAMS COUNTY HIGH HAZARD DAMS[9]

Dam Name	Hazard Potential	Max Storage (ac/ft)	Dam Height (ft)	Condition
Adams County				
NATCHEZ STATE PARK DAM	High	5,671	70.0	Satisfactory
ROBBINS LAKE DAM	High	886	32.0	Unsatisfactory
SECOND CREEK WS STR NO. 12 DAM	High	1,630	31.0	Satisfactory
SECOND CREEK WS STR NO. 6A DAM	High	3,087	53.0	Fair
SECOND CREEK WS STR NO. 6B DAM	High	4,155	52.0	Fair
SECOND CREEK WS STR NO. 7 DAM	High	9,925	52.0	Fair

HISTORICAL OCCURRENCES

According to the Mississippi State Hazard Mitigation Plan, there has been two dam failures reported in Adams County. Although major damage was not reported with this event, several breach scenarios in the region could be catastrophic.

[8] Source: Mississippi Department of Environmental Quality
[9] Source: U.S. Army Corps of Engineers

TABLE A.5: ADAMS COUNTY DAM FAILURES (1982-2021)[10]

Date	County	Structure Name	Cause of Failure
January 2013	Adams	Robbins Lake Dam	Dam overtopped after a large rain event. Crest of dam was damaged, and a large hole scoured out along the edge of the crest.
April 1983	Adams	Robbins Lake Dam	Breached

PROBABILITY OF FUTURE OCCURRENCES

Given the current dam inventory and historical data, a dam breach is possible (between 1 and 10 percent annual probability) in the future. As has been demonstrated in the past, regular monitoring is necessary to prevent these events.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[11] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Adams County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[12]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop and will lead to increased strain on dam storage capacity.[13]

A.2.2 Erosion

LOCATION AND SPATIAL EXTENT

Erosion in Adams County is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in Adams County are primarily rivers/streams and reservoirs. Generally, vegetation also helps to prevent erosion in the area, but in recent years, erosion has become a growing threat to many of the participating counties and jurisdictions.

Currently, there is no regional or state-level data available on localized areas of erosion, so it is a challenge to identify particularly prone areas on a wider geographic scale. However, a few areas of concern were reported by members of the hazard mitigation council and other local sources. Locations along the Mississippi River in Adams County are known to be especially at-risk, but there are locations in many areas within the region where erosion is prominent.

For example, in Adams County, in Natchez, there have been several instances where abrupt erosion events caused property damage and loss of life due to the silt-like loess soil in the area. Some notable areas that

[10] Source: Mississippi Department of Environmental Quality

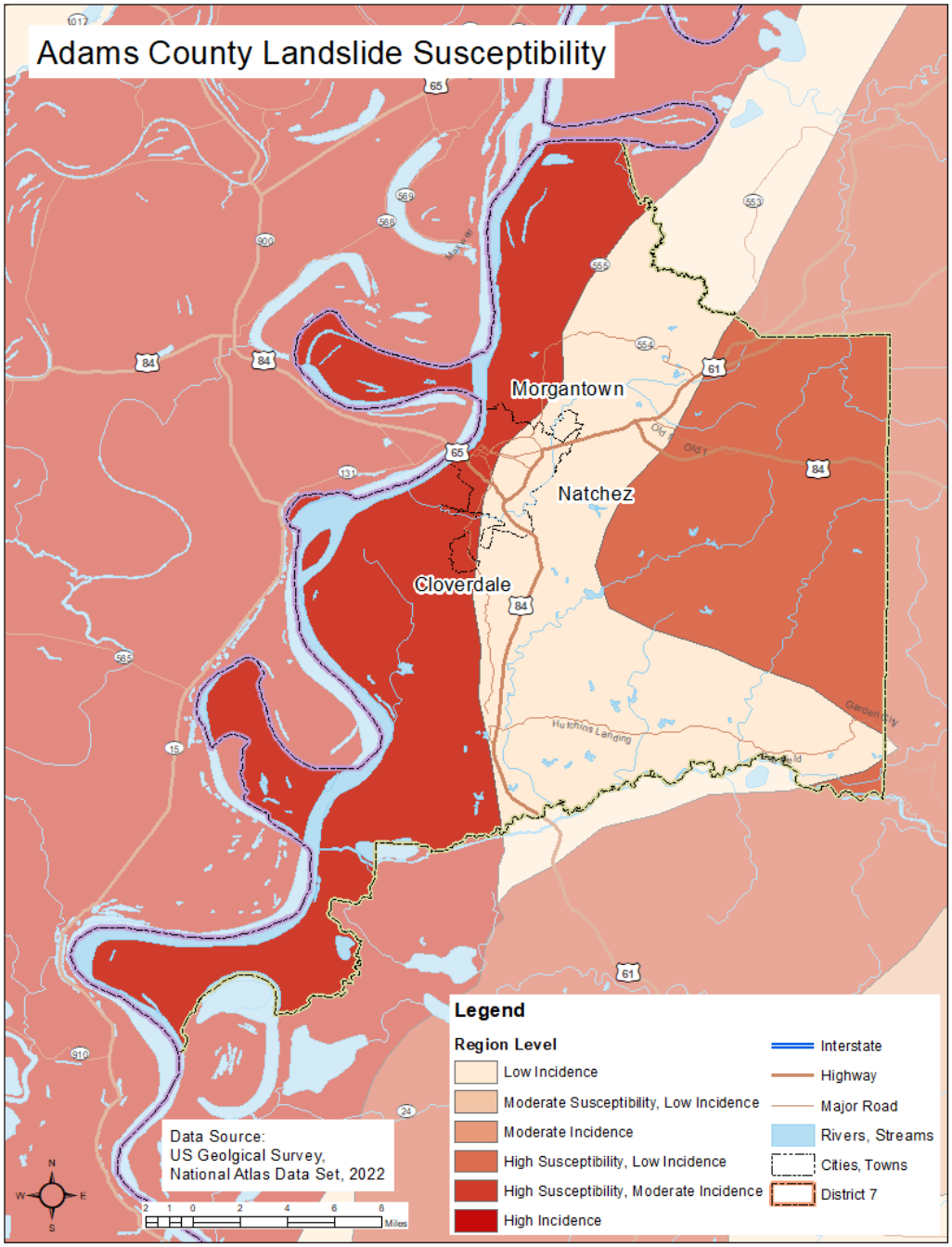
[11] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[12] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[13] Please note: there is no coastal flooding in Adams County.

were identified are along Martin Luther King Jr. Road[14] and along the railroad tracks near the Natchez-Adams County Port.[15]

FIGURE A.4: ADAMS COUNTY LANDSLIDE SUSCEPTIBILITY



[14] Madden, Cain. *County watches erosion near MLK closely.* The Natchez Democrat. February 13, 2017. http://www.natchezdemocrat.com/2017/02/13/county-watches-erosion-near-mlk-closely/

[15] Hogan, Vershal. Riverbank erosion threatens rail line. The Natchez Democrat. May 1, 2014. http://www.natchezdemocrat.com/2014/05/01/riverbank-erosion-threatens-rail-line/

HISTORICAL OCCURRENCES

Several sources were vetted to identify areas of erosion in Adams County. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. Although the locations identified above are representative of areas where erosion has taken place in the past, it is also important to note significant events that had large impacts. One major historical erosion occurrence was reported in Natchez in 1980 when a severe and sudden erosion event sent a slide of mud and debris into a bar causing more than $100,000 in damage and two deaths. Retreat in some areas has been estimated at about 30 to 50 feet over the past 120 years.[16] Further news article searches reveal other ongoing slide and erosion repairs, such as a $2.9 million project along U.S. 61 in Adams County that is expected to be complete in the summer of 2023.[17]

These incidents have caused major problems as bridges have become damaged in many instances and made it unsafe for emergency services vehicles to cross during and after storm events. This delays response times and critical life-safety support. In addition, the shutdown of roads has hurt local communities economically as trade and commerce are temporarily shut down as bridges are repaired. It has also caused disruption to daily activities for local school boards who must re-route buses around affected areas, causing additional fuel resources to be expended and increasing drive times for students.

PROBABILITY OF FUTURE OCCURRENCES

Erosion remains a natural, dynamic, and continuous process for Adams County, and it will continue to occur. The annual probability level assigned for erosion is likely (between 10 and 100 percent annually).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[18] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Adams County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[19]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones. Both additional moisture and drying conditions can impact the rate of erosion, either by increasing the sediment transfer load due to volume and rate of flooding, or by dehydrating soils, limiting compaction, and increasing wind related erosion events.

[16] Treadwell, David. Erosion Imperils Old Mississippi Mansions. Los Angeles Times. June 9, 1985. http://articles.latimes.com/1985-06-09/news/mn-9849_1_erosion-problems

[17] Mississippi Department of Transportation. Press Release 11/21/2022. Retrieved on 11/30/2022 from: https://mdot.ms.gov/portal/news_release_view/1273

[18] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[19] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

A.2.3 Flood

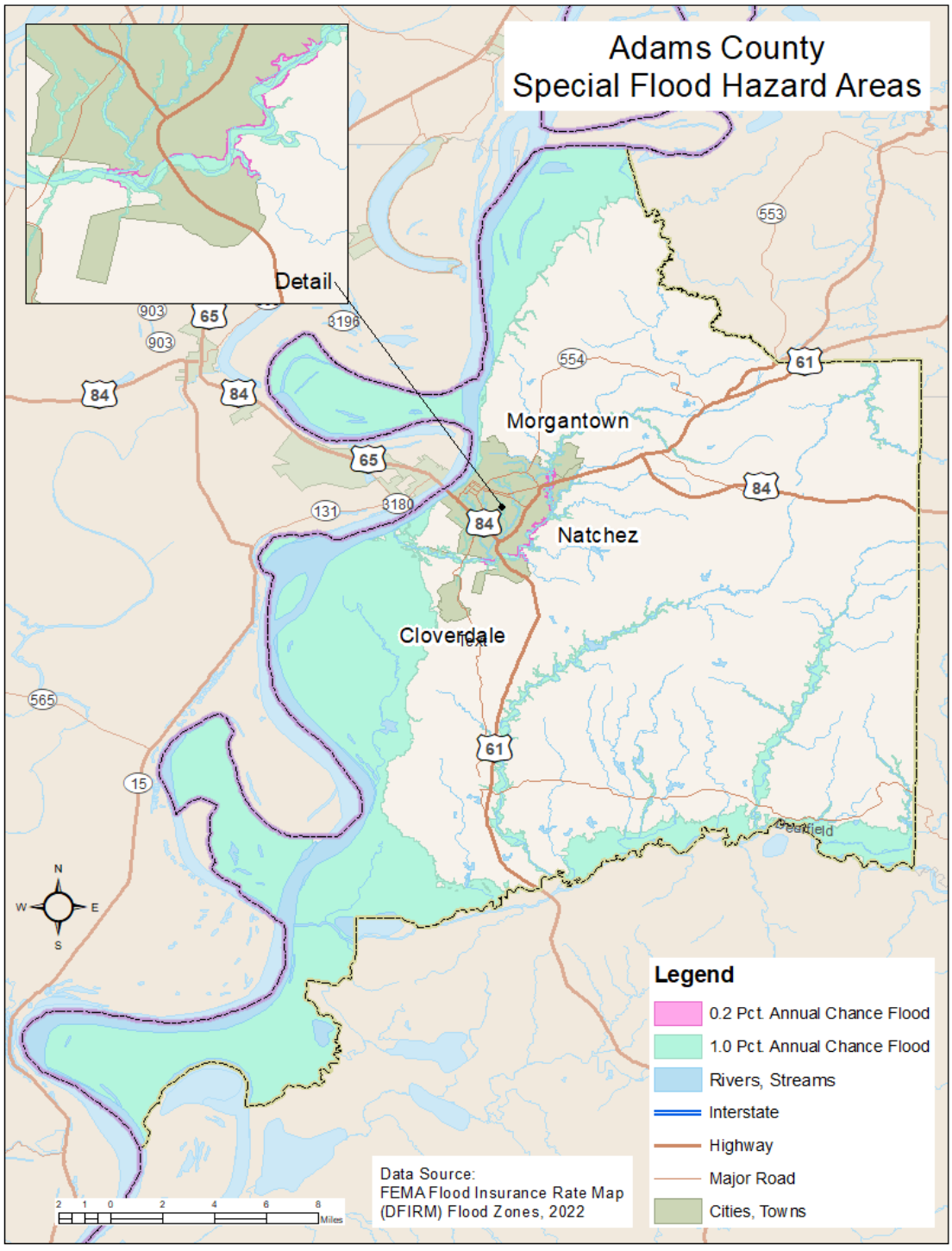
LOCATION AND SPATIAL EXTENT

There are areas in Adams County that are susceptible to flood events. Special flood hazard areas in the county were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM).[20] This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevations), and Zone X-500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 490 square miles that make up Adams County, there are 169.77 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 0.04 square miles of land in zone X-500 (0.2 percent annual change floodplain/500-year floodplain).

These flood zone values account for 34.7 percent of the total land area in Adams County. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. Figure A.4 illustrates the location and extent of currently mapped special flood hazard areas for Adams County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data.

[20] The county-level DFIRM data used for Adams County were updated in 2011.

FIGURE A.5: SPECIAL FLOOD HAZARD AREAS IN ADAMS COUNTY[21]



[21] Source: Federal Emergency Management Agency

HISTORICAL OCCURRENCES

Floods were at least partially responsible for four[22] disaster declarations in Adams County in 1974, 1991, and twice in 2011.[23] Information from the National Centers for Environmental Information was used to ascertain additional historical flood events. The National Centers for Environmental Information reported a total of 41 events in Adams County for flooding and flash flooding since 1997.[24] A summary of these events is presented in **Table A.6**. These events accounted for almost $4.23 million in property damage.

TABLE A.6: SUMMARY OF FLOOD OCCURRENCES IN ADAMS COUNTY[25]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses[26]
Natchez	14	0/0	$619,000	$24,760
Cranfield	2	0/0	$0	$0
Johnsville	1	0/0	$7,000	$280
Kingston	2	0/0	$23,000	$920
Linwood	3	0/0	$135,000	$5,400
Pine Ridge	2	0/0	$226,000	$9,040
Sibley	3	0/0	$3,045,000	$121,800
Unincorporated Area	14	0/0	$175,000	$7,000
ADAMS COUNTY TOTAL	**41**	**0/0**	**$4,230,000**	**$169,200**

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Flood Insurance Management Agency (FIMA) Flood Insurance Data Analytics, since 2019 Mississippi has had 47 floods of record with 22 closed with payment, 19 closed without payment, and 6 remaining open. A total of $545,506 has been made in payments. This FEMA dataset is the authoritative source for FEMA's public data. This product uses the Federal Emergency Management Agency's API but is not endorsed by FEMA. FEMA cannot verify the quality and/or timeliness of any data or any analysis derived there from after the data has been retrieved from FEMA.gov. This data set was last accessed on July 2, 2023, with records updated at most every 20 minutes or at least monthly, processed the first Saturday of the month at 1:00am EST.

According to FEMA flood insurance policy records as of July 2, 2023, there were 38 flood losses reported in Adams County through the National Flood Insurance Program (NFIP) since 1978, totaling almost $219,723.72 in total building and $23,494.13 in contents claims payments. A summary of these figures for the county is provided below. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought. It is likely that many additional instances of flood loss in Adams County were either uninsured or not reported.

[22] FEMA; Disaster Declarations for States and Counties. Retrieved on 11/30/2022 from: https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties

[23] A complete listing of historical disaster declarations can be found in Section 4: Hazard Identification.

[24] These flood events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1996 through November 2022. It is likely that additional occurrences have occurred and have gone unreported. As additional local data becomes available, this hazard profile will be amended.

[25] Source: National Centers for Environmental Information

[26] Annualized losses are calculated based on number of years of reportable NCEI data.

TABLE A.7: SUMMARY OF INSURED FLOOD LOSSES IN ADAMS COUNTY THROUGH 2023

Location	Current Number of Policies	Flood Losses	Claims Payments
Natchez	29	10	$137,199.98
Unincorporated Area	0	38	$219723.72
ADAMS COUNTY TOTAL	**29**	**48**	**$356,923.70**

Source: National Flood Insurance Program, OpenFEMA Data Sets

REPETITIVE LOSS PROPERTIES

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Mississippi Emergency Management Agency in 2017, there are 29 non-mitigated repetitive loss properties located in Adams County, which accounted for 72 losses and over $957,000 in claims payments under the NFIP. The average claim amount for these properties is $13,294. Of the 29 properties, 17 are single family, two are assumed condominium, and 10 are non-residential. Without mitigation, these properties will likely continue to experience flood losses. The following table presents detailed information on repetitive loss properties and NFIP claims and policies for Adams County as documented in the last plan. Updated data could not be obtained.

TABLE A.8: REPETITIVE LOSS PROPERTIES IN ADAMS COUNTY[27,28]

Location	Number of Properties	Types of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Natchez	7	6 single family; 1 other no-residential	18	$180,061	$61,659	$241,721	$13,428
Unincorporated Area	22	11 single family; 2 assumed condo; 9 other non-residential	54	$614,450	$101,011	$715,461	$13,249
Adams County Total	**29**		**72**	**$794,512**	**$162,671**	**$957,183**	**$13,294**

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in Adams County, and the probability of future occurrences will remain highly likely (100 percent annual probability). The probability of future flood events based on magnitude and according to best available data is illustrated in the figure above, which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain).

It can be inferred from the floodplain location maps, previous occurrences, and repetitive loss properties that risk varies throughout the county. For example, areas along the western border of the county have more floodplain and thus a higher risk of flood than the rest of the county. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted,

[27] National Flood Insurance Program

[28] Current data on Repetitive Loss Properties data was not available for this plan update.

particularly for repetitive loss properties.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[29] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Adams County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[30]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased *coastal, fluvial (i.e., riverine) and pluvial (i.e., rainfall) flooding.*[31] More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

FIRE-RELATED HAZARDS

A.2.4 Drought

LOCATION AND SPATIAL EXTENT

Drought typically covers a large area and cannot be confined to any geographic or political boundaries. Furthermore, it is assumed that Adams County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment but may exacerbate wildfire conditions.

HISTORICAL OCCURRENCES

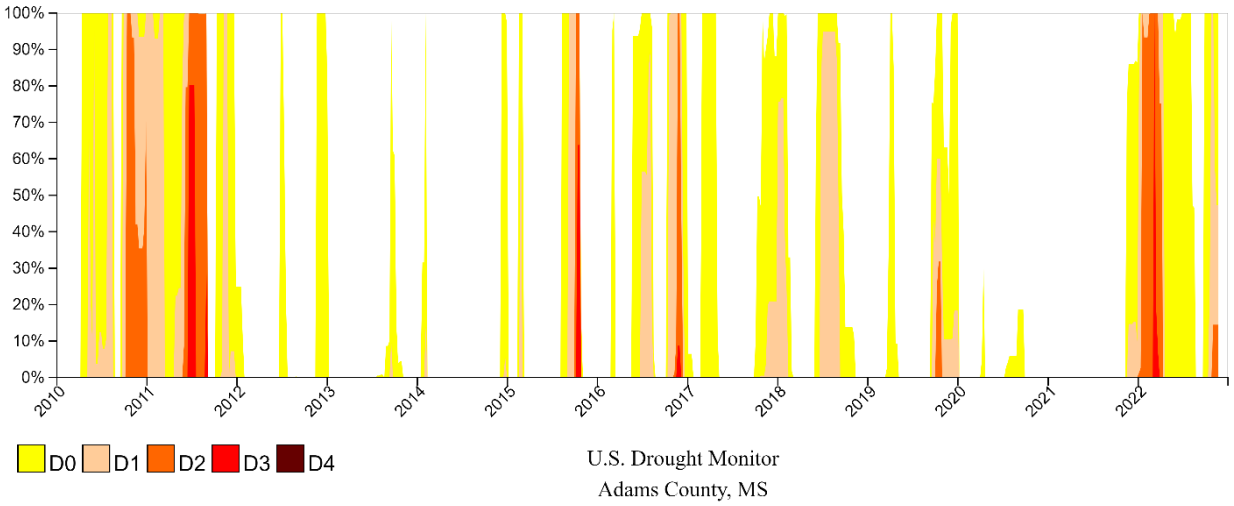
The table below shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional, but a majority of the county may be in a less severe condition.

[29] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[30] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[31] Please note: there is no coastal flooding in Adams County.

TABLE A.9: HISTORICAL DROUGHT OCCURRENCES IN ADAMS COUNTY[32]



Some additional anecdotal information was provided from the National Centers for Environmental Information on droughts in Adams County.

Summer to Fall 2006 – During a four-and-a-half-month period, from June to the middle of October, abnormally dry conditions prevailed across most of the Jackson, MS County Warning Area (CWA). Widespread drought conditions were reported across the area during this time. The U.S. Drought Monitor classified the drought as extreme (D3) over Southeast Mississippi. Drought conditions in the region peaked in intensity during early August over this area.

Summer to Fall 2010 – Very dry conditions continued across central Mississippi during most of October. There was some rain that came late in the month which provided some temporary relief. Rainfall amounts ranged from a half to two inches with locally higher amounts. Most locations were 1 to 3 inches below normal for the month. The dry stretch resulted in severe (D2) drought conditions expanding during the month with even the portions of extreme (D3) drought conditions expanding as well. Crops were put under stress under the warm and dry conditions.

Fall 2015 – The very dry conditions continued across Central Mississippi in October. The extended dry stretch resulted in an area of Severe (D2) drought developing across the area by October 6th. The drought intensified and Extreme (D3) drought conditions developed by October 13th. Approximately 25 to 50 percent of normal rainfall occurred across this area from August into mid-October. Crops were put under more stress from the dry and hot conditions.

Fall to Winter 2016 – Dry conditions continued into November, which created continued stress on crops. The drought continued to get worse across the state through the month before some relief came in the form of showers and thunderstorms near the end of November.

Fall 2021 through 2022 – Severe drought conditions persisted throughout the state, beginning in December 2021 and continuing through the calendar year 2022. Conditions escalated to extreme drought from January to March, before resolving In December. Throughout this period many counties

[32] U.S. Drought Monitor. Historical Conditions for Adams County, MS 2010 – 2022. Retrieved on 11/30/2022 from: https://www.drought.gov/states/mississippi/county/Adams

also experienced flooding events indicating that while rainfall is still occurring, the shorter, more intense bursts do not resolve the drought conditions that softer more steady rainfall would address. The beginning of 2023 saw increased rainfall and a lightening of drought conditions overall.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that Adams County has a probability level of possible (between 1 and 10 percent annual probability) for future drought events. However, the extent (or magnitude) of drought and the amount of geographic area covered by drought varies with each year. Historical information indicates that there is a much lower probability for extreme, long-lasting drought conditions.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[33] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Adams County With increasing global surface temperatures, the possibility of more *droughts* and increased frequency and intensity of storms will likely occur[34]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

According to Global Climate Change, from NASA Science [35], atmospheric conditions do not have an impact on seismic activity. However, changes in stress loads on Earth's crust from periods of drought and fluctuations in reservoir levels, and corresponding changes in the weight of reservoirs, can also change the stress loads on a local fault, triggering the quakes. MEMA District 7 is not at rick due to the lack of these features in the planning area.

A.2.5 Lightning

LOCATION AND SPATIAL EXTENT

Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of Adams County is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, there have been two recorded lightning events in Adams County since 2007.[36] These events resulted in almost $154,000 in damages, as listed in summary below.[10] Detailed information on historical lightning events can be found in the table below.

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[33] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[34] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[35] Can Climate Affect Earthquakes, Or Are the Connections Shaky? – Climate Change: Vital Signs of the Planet (nasa.gov)

[36] These lightning events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1996 through November 2022. It is certain that additional lightning events have occurred in Adams County. As additional local data becomes available, this hazard profile will be amended.

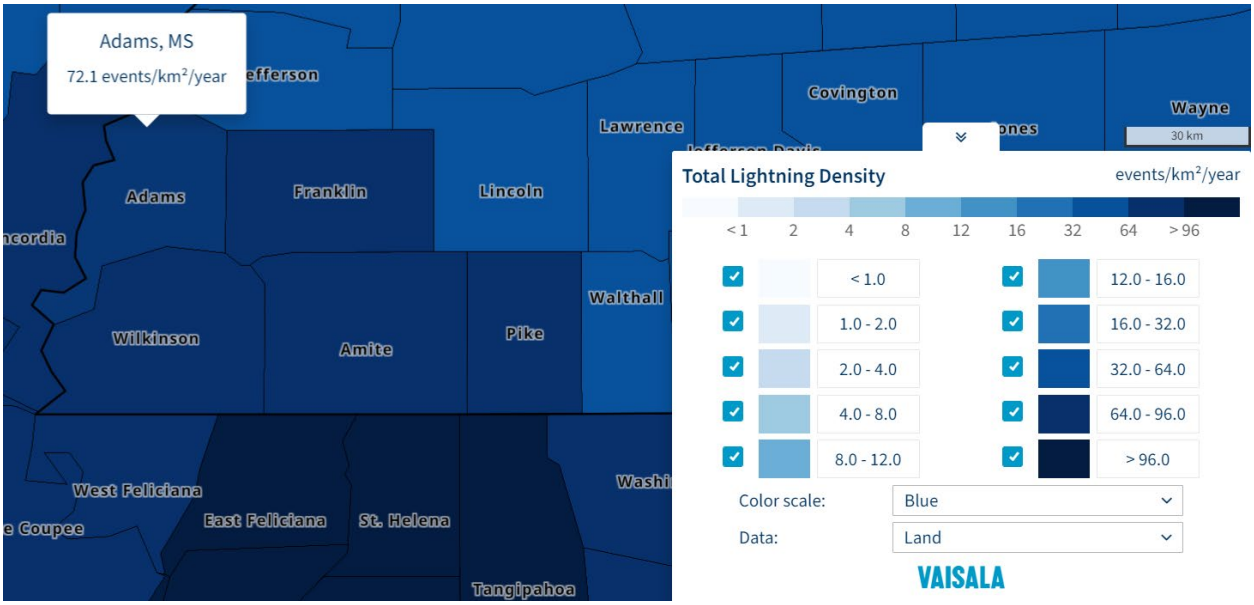
It is certain that more than two events have impacted the county. Many of the reported events are those that cause damage, and it should be expected that damages are likely much higher for this hazard than what is reported.

TABLE A.10: SUMMARY OF LIGHTNING OCCURRENCES IN ADAMS COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Natchez	1	0/0	$150,000	$5,769
Johnsville	1	0/0	$4,000	$153
ADAMS COUNTY TOTAL	**2**	**0/0**	**$154,000**	**$5,923**

Source: National Centers for Environmental Information

FIGURE A.6: VAISALA'S NLDN MAP OF LIGHTNING DENSITY[37]



PROBABILITY OF FUTURE OCCURRENCES

Although there was not a high number of historical lightning events reported in Adams County via NCEI data, it is a regular occurrence accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though not all events will cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN), Adams County is in an area of the country that experienced an average of 72.1 lightning flashes per km^2 per year between 2016 and 2021. Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damage throughout the county.

FUTURE IMPACTS OF CLIMATE CHANGE

[37] Vaisala – U.S. National Lightning Detection Network. Retrieved on 11/30/2022 from: https://interactive-lightning-map.vaisala.com/?_ga=2.229872988.1951225355.1669843590-1950342430.1669843590

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[38]. There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Adams County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *lightning strike events*.[39] As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

A.2.6 Wildfire

LOCATION AND SPATIAL EXTENT

The entire county is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the urban-wildland interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

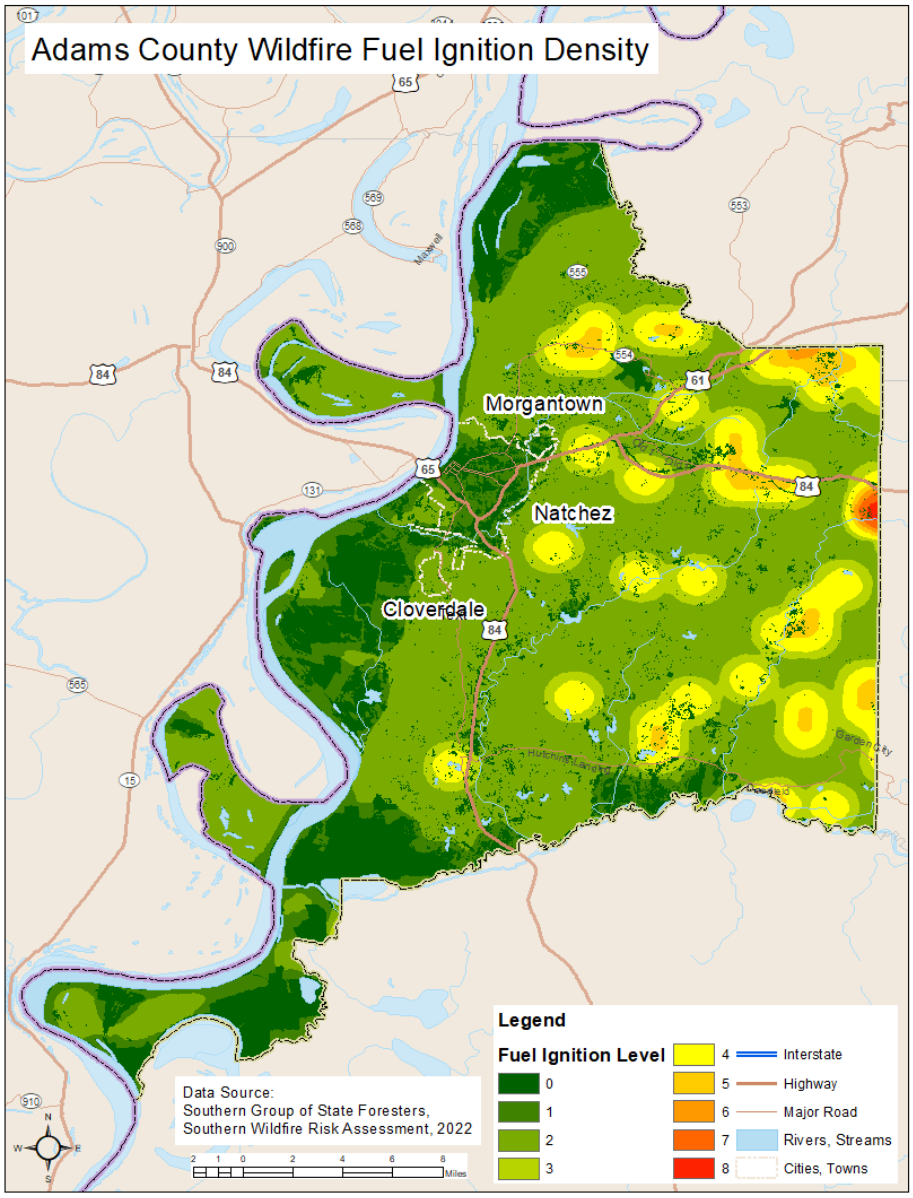
HISTORICAL OCCURRENCES

The following figure shows the Wildfire Ignition Density in Adams County based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and the likelihood of a wildfire igniting in an area. Occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map. This is measured in the number of fires per year per 1,000 acres.

[38] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[39] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

FIGURE A.7: WILDFIRE IGNITION DENSITY IN ADAMS COUNTY



Based on data from the Mississippi Forestry Commission from 2015 to 2022, Adams County experienced an average of .87 wildfires annually which burned a combined 11.62 acres per year. The data indicate that most of these fires were small to moderate in size, averaging about 39.42 acres per fire. The table immediately below provides a summary of wildfire occurrences in Adams County and the following table lists the number of reported wildfire occurrences in the county between the years 2012 and 2021.

TABLE A.11: SUMMARY TABLE OF ANNUAL WILDFIRE OCCURRENCES (2015-2022)[40]

	Adams County
Average Number of Fires per year	0.87
Average Number of Acres Burned per year	11.625
Average Number of Acres Burned per fire	39.42

TABLE A.12: HISTORICAL WILDFIRE OCCURRENCES IN ADAMS COUNTY

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Adams County										
Number of Fires	1	0	3	3	4	0	0	1	3	0
Number of Acres Burned	1	0	79	77	84	0	0	2	190	0

Source: Mississippi Forestry Commission

PROBABILITY OF FUTURE OCCURRENCES

Wildfire events will be an ongoing occurrence in Adams County. The following map shows that there is some probability a wildfire will occur throughout the county. However, the likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small but could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to Adams County for future wildfire events is possible (between 1 and 10 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

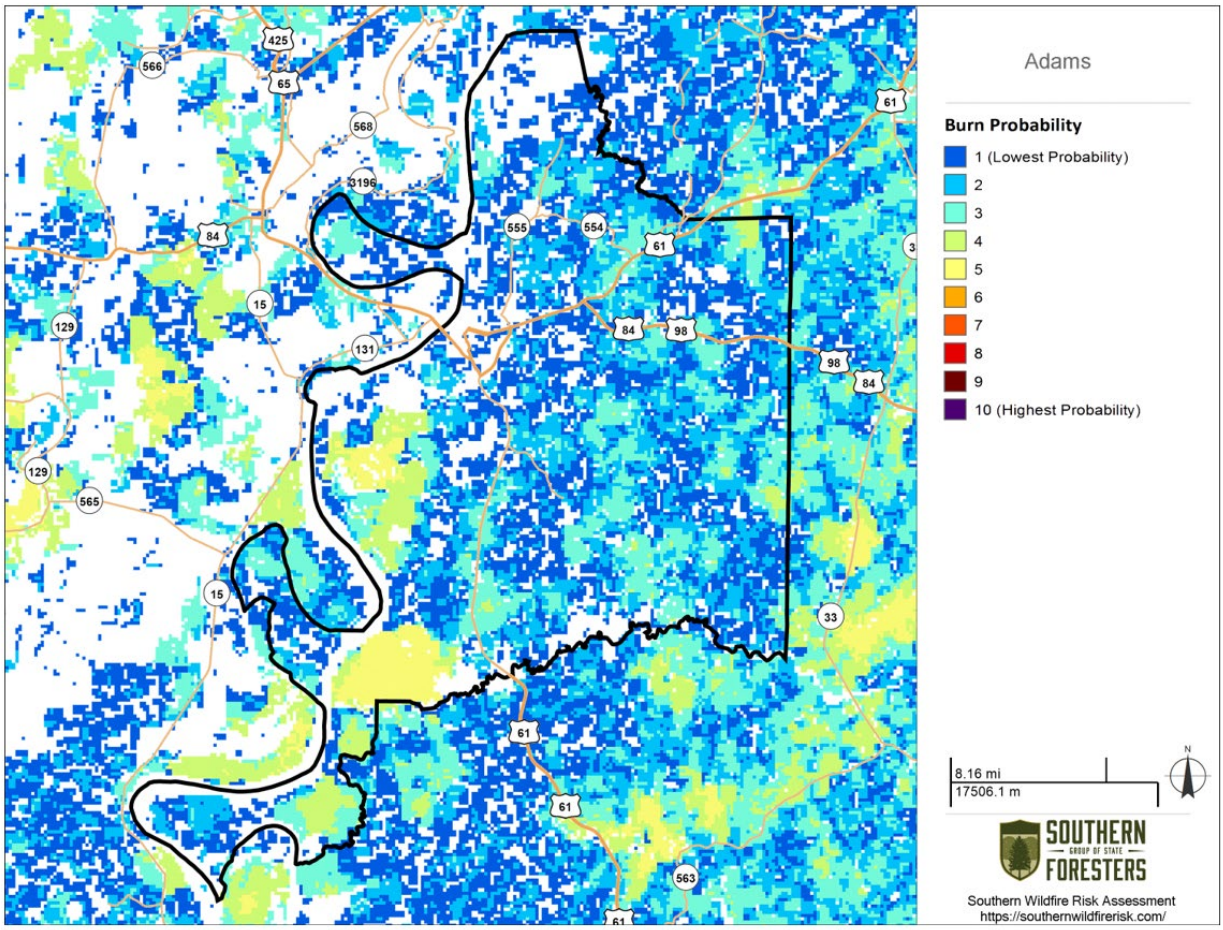
The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[41] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Adams County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency *wildfire events*.[42]

[40] Mississippi Forestry Commission – 2015 - 2022

[41] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[42] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

FIGURE A.8: BURN PROBABILITY IN ADAMS COUNTY[43]



GEOLOGIC HAZARDS

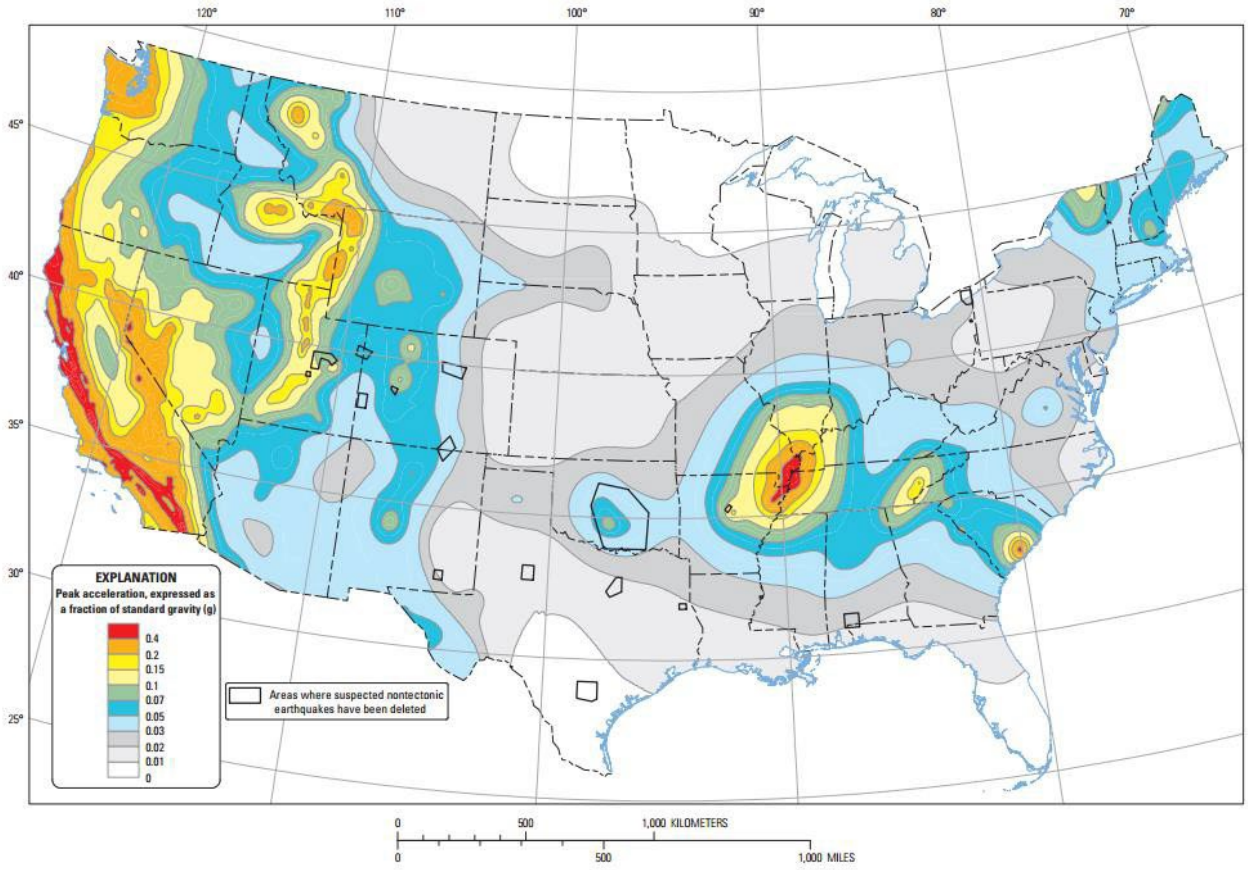
A.2.7 Earthquake

LOCATION AND SPATIAL EXTENT

The figure below shows the intensity level associated with Adams County, based on the national USGS map of peak acceleration with 10 percent probability of exceedance in 50 years. It is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Adams County lies within an approximate zone of level "0.01" to "0.03" ground acceleration. This indicates that the county exists within an area of low seismic risk.

[43] Southern Wildfire Risk Assessment

FIGURE A.9: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS[44]



Ten-percent probability of exceedance in 50 years map of peak ground acceleration

The primary source of potential damage to Adams County from an earthquake is the New Madrid Seismic Zone (NMSZ). Historically, a series of earthquakes in 1811 and 1812 demonstrated that this fault zone can produce high magnitude seismic events, sometimes on the scale of a 7.5-8.0 on the Richter scale. The biggest challenge with earthquakes that occur in this area of seismic activity is predicting the recurrence of earthquakes emanating from this zone. Although the magnitude of earthquakes from the NMSZ can be large, they occur very irregularly and infrequently. This makes it extremely difficult to project when they will occur.

It should also be noted that the State of Mississippi Hazard Mitigation Plan identifies certain areas of concern for liquefaction and lists the counties and corresponding zones within those counties that have the highest liquefaction potential. Adams County does not have any identified liquefaction potential risk.

The following figure shows the Modified Mercalli Intensity Scale. The lower numbers of the intensity scale generally deal with the way the earthquake is felt by people. The higher numbers of the scale are based on observed structural damage. Structural engineers usually contribute information for assigning intensity values of VIII or above.

[44] *United States Geological Survey, 2014*

FIGURE A.10: MODIFIED MERCALLI INTENSITY SCALE (MMI)

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest,especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

HISTORICAL OCCURRENCES

At least two earthquakes are known to have affected Adams County since 1811. The strongest of these measured a VI on the Modified Mercalli Intensity (MMI) scale. The tables below provide a summary of earthquake events reported by the National Centers for Environmental Information (formerly National Geophysical Data Center) between 1638 and 1985, and the figure presents a map showing earthquakes whose epicenters have occurred near the county between 1985 and 2023 (no earthquakes occurred within the county's boundaries during this period). The table presents a detailed occurrence of each event including the date, distance for the epicenter, magnitude and Modified Mercalli Intensity (if known).[45]

TABLE 13: SUMMARY OF SEISMIC ACTIVITY IN ADAMS COUNTY

Location	Number of Occurrences	Greatest MMI Reported	Greatest Richter Scale Reported
Natchez	2	VI	7.2
Unincorporated Area	0	--	--
ADAMS COUNTY TOTAL	**2**	**VI (strong)**	**7.2**

Source: National Centers for Environmental Information

TABLE A.14: SIGNIFICANT SEISMIC EVENTS IN ADAMS COUNTY (1638 -1985)

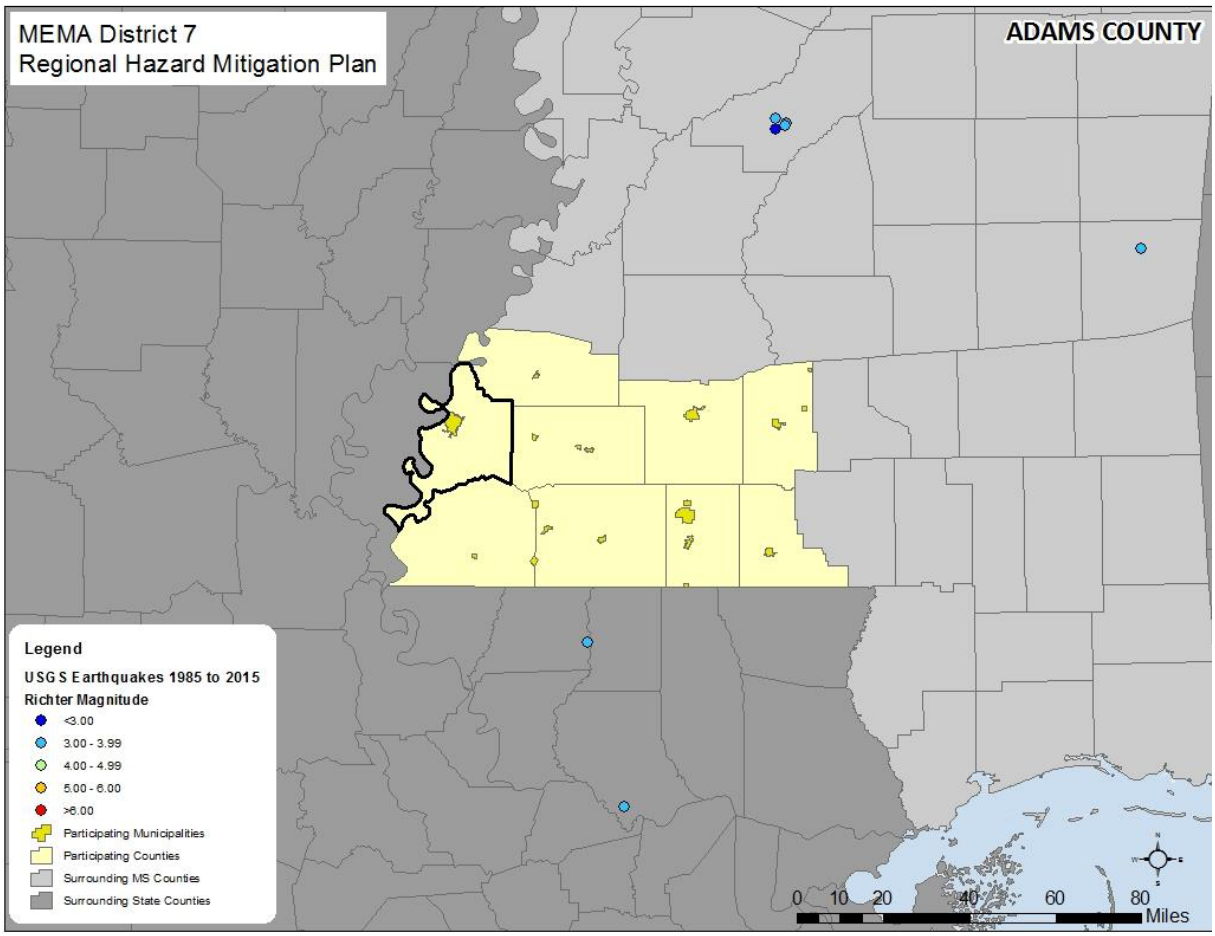
	Location	Date	Epicentral	Magnitude	MMI	

[45] Due to reporting mechanisms, not all earthquakes events were recorded during this time. Furthermore, some are missing data, such as the epicenter location, due to a lack of widely used technology. In these instances, a value of "unknown" is reported.

		Distance			
Natchez					
NATCHEZ	12/16/1811	584.0 km	7.2	VI	
NATCHEZ	9/1/1886	1,082.0 km	*Unknown*	II	
Unincorporated Area					
None reported	--	--	--	--	

Source: National Centers for Environmental Information

FIGURE A.41: HISTORIC EARTHQUAKES WITH EPICENTERS NEAR ADAMS COUNTY (1985-2023)



Source: United States Geological Survey

PROBABILITY OF FUTURE OCCURRENCES

The probability of significant, damaging earthquake events affecting Adams County is unlikely. However, it is certainly possible that future earthquakes resulting in light or moderate perceived shaking and damage will affect the county much more frequently. The annual probability level for the county is estimated to be less than 1 percent (unlikely).

TEMPERATURE & WIND-RELATED HAZARDS

A.2.8 Extreme Heat

LOCATION AND SPATIAL EXTENT

Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries. Therefore, the entire county is considered to be equally susceptible to extreme heat.

HISTORICAL OCCURRENCES

The National Centers for Environmental Information was used to determine historical heat wave occurrences in the county.

Summer of 2000 Heat Wave – Hot temperatures persisted from July to September across the South and Plains. Known as the Summer of 2000 Heat Wave, high temperatures commonly peaked over 100 degrees.

August 2005 – A "HOT" stretch of weather occurred during the middle to later part of August 2005. This "Heat Wave" covered a large portion of the south and lasted for a period of about 10 days. Each of these days had high temperatures consistently between 95 and 100 degrees, with 1 or 2 of these days reaching 100 degrees or more. Additionally, overnight lows remained warm with lower and middle 70s recorded. This is the first time since August 2000 where 100-degree temperatures were reached in this area as well as having such an extended period of "HOT" weather.

July 2006 – A small "heat wave" gripped the region during the middle of July with high temperatures ranging from the upper 90s to around 100 degrees for five days with overnight lows only reaching the middle 70s. The hottest temperatures during this period occurred from the Mississippi Delta, across northern Mississippi and then down to the Jackson Metro and toward Meridian. This area peaked between 100 and 102 degrees for at least two days during the hot five-day stretch.

August 2007 – During the first half of August, a heat wave took hold of the region and brought some of the warmest temperatures since the summer of 2000. This heat wave began around August 5th and lasted until the 16th. Between August 10th and 15th, the entire area reached 100 degrees or higher. Twenty-three record highs were also set during this time. As the temperature soared each day, high relative humidity resulted in heat index values between 105 and 112 degrees.

August 2010 – A four day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS Jackson, MS forecast area, 19 record highs were set between August 1st and 4th. On August 2nd, the 2nd warmest average temperature was recorded. The low was 78 and the high 105, this resulted in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in 3 fatalities across the forecast area.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Adams County has a probability level of likely (between 10 and 100 percent annual probability) for future heat wave events.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[46] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Adams County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *extreme heat* events[47]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

A.2.9 Hailstorm

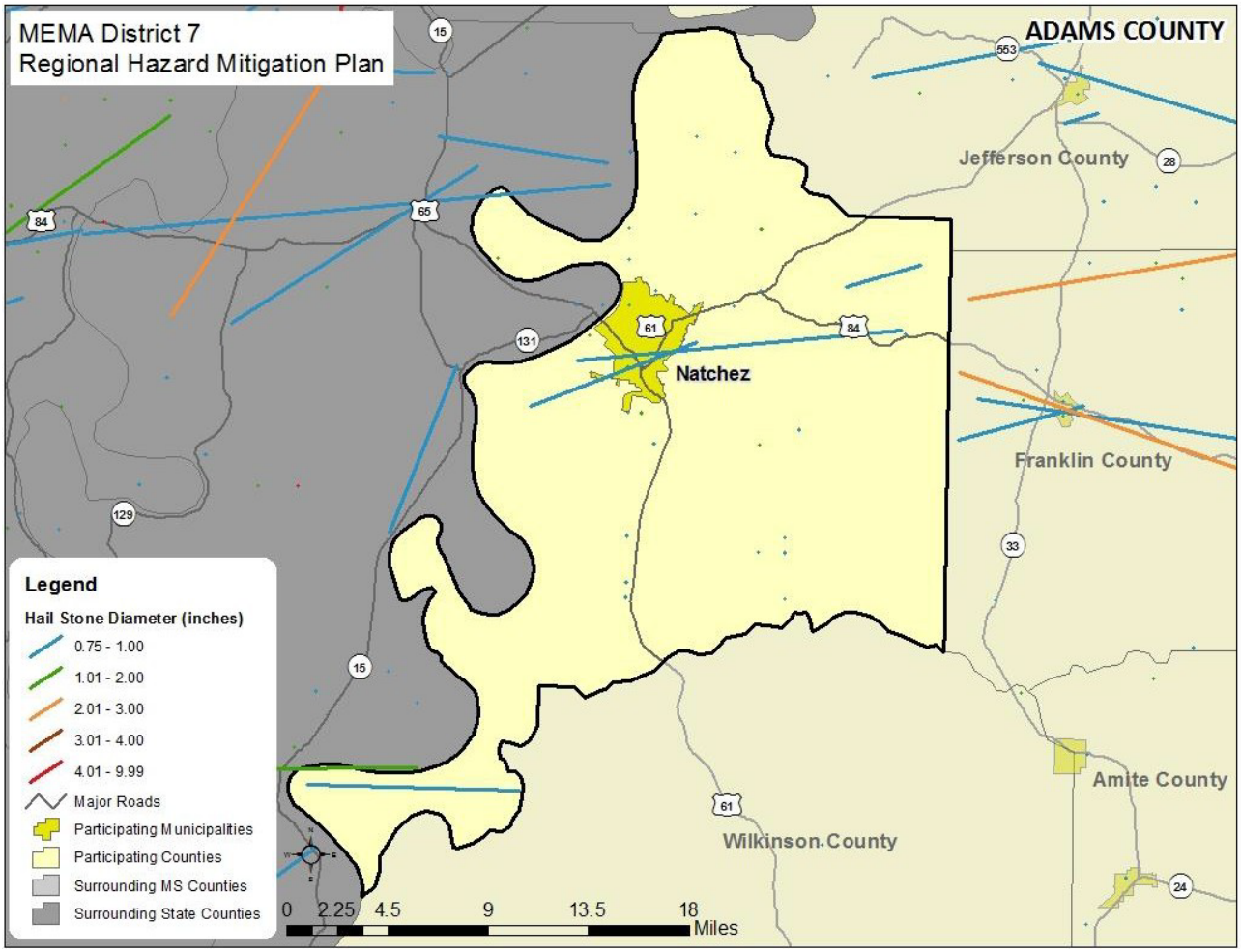
LOCATION AND SPATIAL EXTENT

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that Adams County is uniformly exposed to severe thunderstorms; therefore, all areas of the county are equally exposed to hail which may be produced by such storms. With that in mind, Figure below shows the location of hail events that have impacted the county between 1955 and 2022.

[46] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[47] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

FIGURE A.5: HAILSTORM TRACKS IN ADAMS COUNTY



Source: National Weather Service Storm Prediction Center

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, 64 recorded hailstorm events have affected Adams County since 1961.[48] The following table is a summary of the hail events in Adams County. The table below provides detailed information about the events that occurred in the county. In all, hail occurrences resulted in approximately $200,000 in property damage. Hail ranged in diameter from 0.75 inches to 2.75 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

[48] 13 These hail events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1961 through November 2022. It is likely that additional hail events have affected Adams County. As additional local data becomes available, this hazard profile will be amended.

TABLE A.15: SUMMARY OF HAIL OCCURRENCES IN ADAMS COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Cranfield	2	0/0	$0	$0
Fenwick	1	0/0	$0	$0
Kienstra	1	0/0	$0	$0
Kingston	5	0/0	$2,000	$32
Leesdale	1	0/0	$0	$0
Linwood	1	0/0	$0	$0
Natchez	17	0/0	$113,000	$1,852
Pine Ridge	4	0/0	$0	$0
Sibley	8	0/0	$2,000	$32
Stanton	2	0/0	$0	$0
Washington	3	0/0	$25,000	$409
Unincorporated Area	19	0/0	$58,000	$950
ADAMS COUNTY TOTAL	**64**	**0/0**	**$200,000**	**$3,278**

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that the probability of future hail occurrences is highly likely (100 percent annual probability). Since hail is an atmospheric hazard, it is assumed that Adams County has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[49] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Adams County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *hailstorm*[50]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

A.2.10 Hurricane and Tropical Storm

LOCATION AND SPATIAL EXTENT

Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect Adams County. All areas in Adams County are equally susceptible to hurricanes and tropical storms.

[49] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[50] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

The following table shows the different category rankings of hurricanes on the Saffir-Simson Scale. The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures. In the western North Pacific, the term "super typhoon" is used for tropical cyclones with sustained winds exceeding 150 mph. Note that all winds are using the U.S. 1-minute average.

TABLE A.16: SAFFIR-SIMPSON SCALE OF HURRICANE STRENGTH

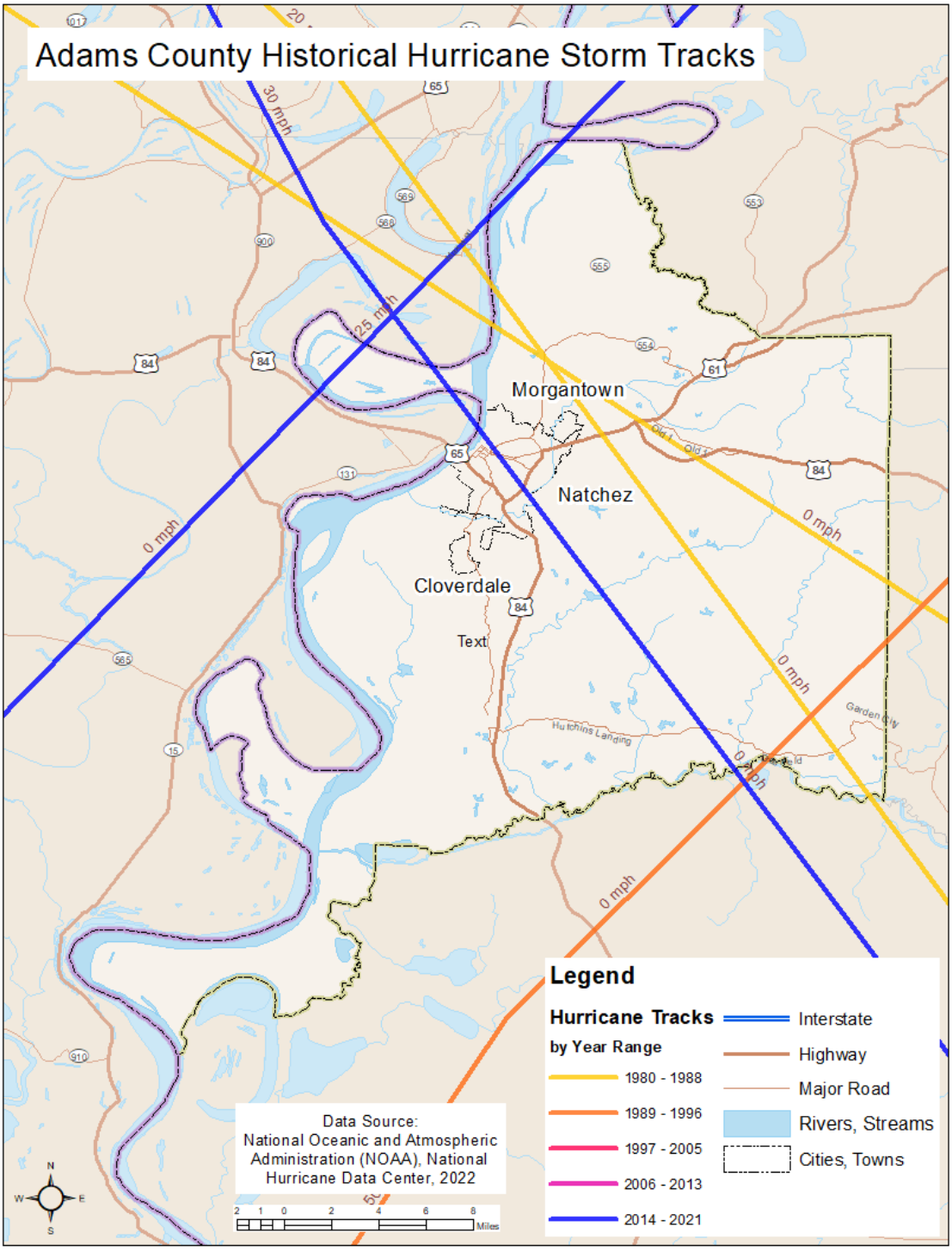
Category 1	Winds 74-95 mph (64-82 kt or 119-153 km/hr). Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
Category 2	Winds 96-110 mph (83-95 kt or 154-177 km/hr). Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
Category 3	Winds 111-129 mph (96-112 kt or 178-208 km/hr). Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
Category 4	Winds 130-156 mph (113-136 kt or 209-251 km/hr). Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
Category 5	Winds 157 mph or higher (137 kt or higher or 252 km/hr or higher). Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

HISTORICAL OCCURRENCES

According to the National Hurricane Center's historical storm track records, 56 hurricane or tropical storm/depression tracks have passed within 50 nautical miles of Adams County since 1851.

The following figure and table provides the date of occurrence, name (if applicable), maximum wind and category of the storm based on the Saffir-Simpson Scale for each event. Lesser events may still cause significant local impact in terms of rainfall and high winds. This map represents recent storm tracks since 1980.

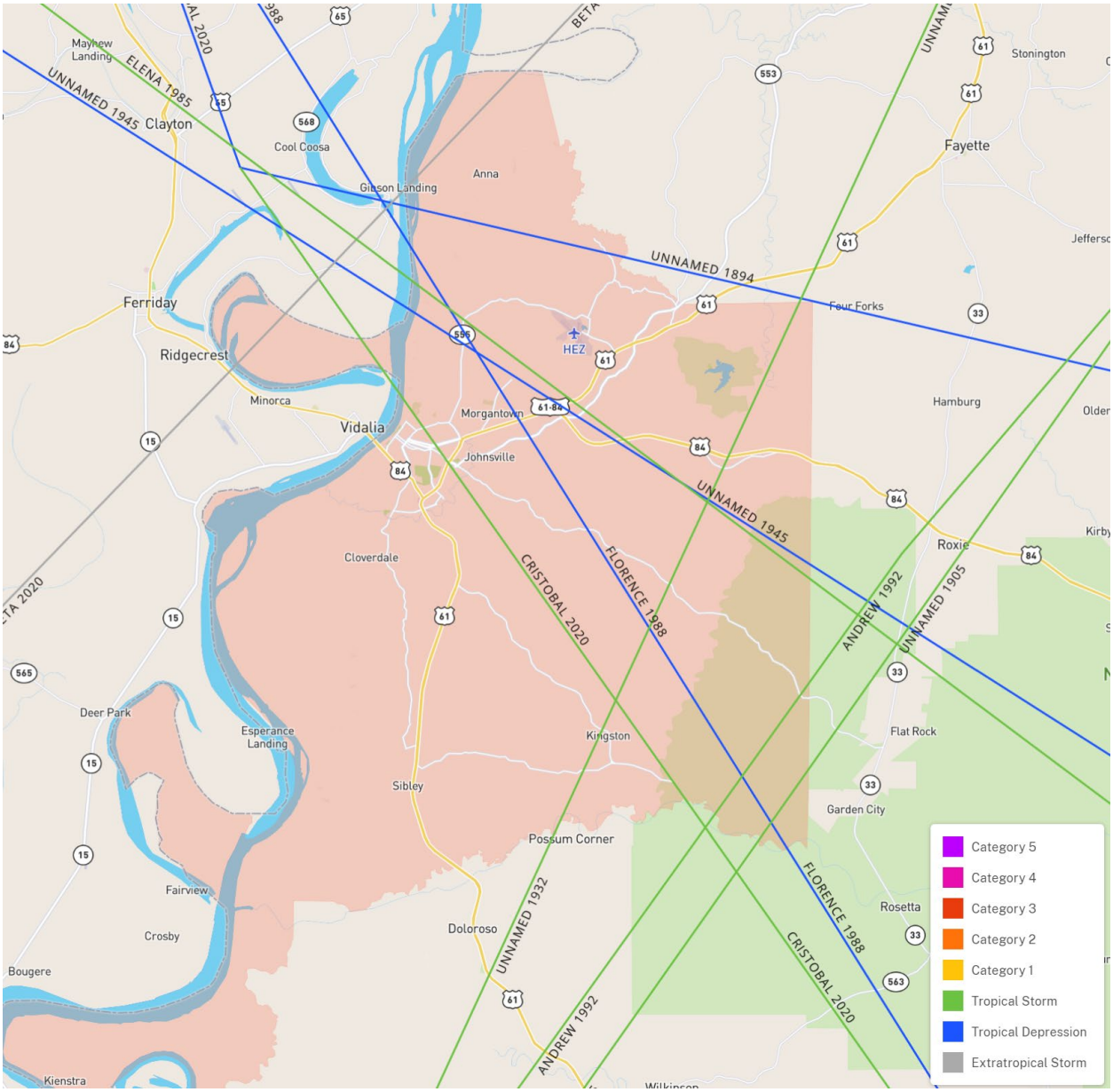
FIGURE A.63: HISTORICAL HURRICANE TRACKS THROUGH ADAMS COUNTY



Source: National Oceanic and Atmospheric Administration; National Hurricane Center

Since recordkeeping began in 1851, there have been nine hurricanes, tropical storms/depressions to track directly through Adams County.

FIGURE A.14: HISTORICAL TRACKS DIRECTLY CROSSING ADAMS COUNTY SINCE 1851[51]



Federal records indicate that there have been 11 disaster declarations made in 1965 (Hurricane Betsy), 2004 (Hurricane Ivan), 2005 (Hurricane Katrina), 2008 (Hurricane Gustav), and 2012 (Hurricane Isaac), three in 2020 (Hurricane Laura, Hurricane Sally, and Hurricane Delta), two in 2021 (Hurricane Ida) in

[51] National Oceanic and Atmospheric Administration, National Hurricane Center.

Adams County.[52] Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding.

The National Centers for Environmental Information also reported eight hurricane or tropical storm events in Adams County since 2002.[53] These storms are listed in the table below and are generally representative of storms with the greatest impact on the county over that time.

TABLE A.17: HISTORICAL HURRICANE / TROPICAL STORM OCCURRENCES IN ADAMS COUNTY

Date of Occurrence	Storm Name	Deaths/Injuries	Property Damage	Annualized Losses
10/3/2002	Hurricane Lili	0/0	$0	
8/29/2005	Hurricane Katrina	0/2	$100,000,000	
9/24/2005	Hurricane Rita	0/0	$60,000	
9/1/2008	Hurricane Gustav	0/0	$2,000,000	
8/29/2012	Hurricane Isaac	0/1	$250,000	
08/24/2020	Hurricane Laura	0/0	$40,000	
10/09/2020	Hurricane Delta	0/0	$300,000	
08/29/2021	Hurricane Ida	0/0	$75,000	
Totals		**0/3**	**$102,725,000**	**$5,286,250**

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the county. Anecdotes are available from NCEI for the major storms that have impacted the county as found below:

Hurricane Katrina – August 29, 2005

The damage from Hurricane Katrina was devastating and widespread. Damage occurred across all of the Jackson forecast area which includes 9 parishes in Northeast Louisiana, 2 counties in Southeast Arkansas and about 2/3 of Central and Southern Mississippi. As widespread as the damage was, the more concentrated and most significant damage occurred across Southeast and East-Central Mississippi. For other areas, especially those west of Natchez to Yazoo City to Grenada line, damage to trees and power lines was significant and scattered across the landscape. As you move toward Central Mississippi and along Interstate 55 the damage and impacts increase. This portion of the state sustained widespread damage to trees and power lines.

Hurricane Gustav – September 1, 2008

As the center of Gustav crossed much of southern Louisiana, tropical storm force winds extended into southern Mississippi and portions of east central Louisiana. Sustained winds were between 35 and 45 mph with higher gusts between 70 and 100 mph occurred. Tree and power line damage was extensive across these areas which resulted in widespread power outages, some of which lasted for 3 to 5 days. As Gustav slowed across central Louisiana, the outer rainbands continued to rotate across much of southern and central Mississippi. This kept those portions of Mississippi in the region which was

[52] A complete listing of historical disaster declarations can be found in Section 4: Hazard Identification.

[53] These hurricane events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1996 through November 2022. It is likely that additional occurrences have occurred and have gone unreported.

favorable for tornadoes. Over 3 days, 26 tornadoes were confirmed, all of which were in the EF0 to EF1 range.

Hurricane Isaac – August 29, 2012

Isaac moved very slowly to the north and northwest over the course of August 29th, which made for prolonged impacts. Forward motion of about 5 mph lead to tremendous flooding issues for both Louisiana and portions of Mississippi south of I-20. Around noon on August 29th, Isaac was downgraded to a Tropical Storm, but this was not much relief to the many residents who were being inundated with rain and wind. The worst of the wind was felt generally along and south of an axis from Marion County to Adams County. Numerous trees were down in Adams County, leaving many without power for several days. Eighty percent of the roads were blocked in Franklin County due to downed trees.

PROBABILITY OF FUTURE OCCURRENCES

Given the inland location of the county, Adams County will not be susceptible to many of the sub-hazards that are often associated with hurricanes and tropical storms such as storm surge. Although the probability of experiencing major impacts is somewhat less than coastal areas because of this, hurricanes and tropical storms remain a real threat to Adams County due to induced events like flooding and high wind. Based on historical evidence, the probability level of future occurrence is likely (between 10 and 100 percent annual probability). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. However, when the county is impacted, the damage could be significant, threatening lives and property throughout the planning area.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[54] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Adams County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[55]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

HURRICANE EVACUATIONS

As discussed above, the MEMA District 7 Region has been directly impacted by a number of hurricane and tropical storm events historically. However, it should be noted that the region is also susceptible to indirect effects from hurricanes and tropical storms, particularly in the form of evacuations from coastal counties. The counties within MEMA District 7 are located far enough inland that they are often the

[54] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[55] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

primary recipients of evacuees from counties that will be (or have been) impacted by major storm events.

For example, during Hurricane Katrina in 2005, thousands of evacuees made their way to counties in southwest Mississippi to take temporary refuge from the storm. Due to the severe and devastating effects of the storm, temporary sheltering within these counties was extended much longer than originally anticipated and, in some cases, the evacuees ended up staying for weeks or months. This additional population caused a major strain on resources within these relatively rural counties, as local communities with limited resources had an unexpected and immediate need to provide shelter and other life essentials such as food, water, and health care to a significant, additional number of people.

Caring for all of these evacuees was especially challenging for counties in the MEMA District 7 Region because most had been impacted themselves by the storm and were attempting to help their own citizens recover from the storm. Undoubtedly, recovering from a major disaster while simultaneously attempting to help evacuees from surrounding counties poses a number of difficulties for emergency management personnel and other local officials.

Based on Hurricane Katrina and other major hurricane events that have impacted the Gulf Coast in the past, it is likely that many of the MEMA District 7 counties will be receiver counties when it comes to evacuees. Many of these evacuees will likely come from locations in Louisiana, including New Orleans. Indeed, the State of Louisiana evacuation plan indicates that one of the primary evacuation routes from the City of New Orleans will direct evacuees north along Interstate 55, sending people through Pike County and Lincoln County. Depending on the severity of the event, officials in Louisiana may even change Interstate 55 over to a contraflow traffic pattern to enable quicker evacuations.

A.2.11 Severe Thunderstorm/High Wind

LOCATION AND SPATIAL EXTENT

A thunderstorm event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that Adams County has uniform exposure to an event and the spatial extent of an impact could be large.

The following Beaufort scale is an empirical measure for the intensity of the wind associated with windstorms.

TABLE A.18: BEAUFORT WIND SCALE

Beaufort Scale					
NUMBER	**WIND SPEED (MPH)**	**DESCRIPTION**	**WAVE HEIGHT (FT)**	**SEA CONDITIONS**	**LAND CONDITIONS**
0	<1	Calm	0	Flat.	Calm. Smoke rises vertically.
1	1-3	Light air	0.33	Ripples without crests.	Wind motion visible in smoke.
2	3-7	Light breeze	0.66	Small wavelets.	Wind felt on exposed skin. Leaves rustle.
3	8-12	Gentle breeze	2	Large wavelets.	Leaves and smaller twigs in constant motion.
4	13-17	Moderate breeze	3.3	Small waves.	Dust and loose paper rise. Small branches begin to move.
5	18-24	Fresh breeze	6.6	Moderate (1.2 m) longer waves. Some foam and spray.	Small trees sway.
6	25-30	Strong breeze	9.9	Large waves with foam crests and some spray.	Large branches in motion. Whistling heard in overhead wires. Umbrella use difficult.
7	31-38	High wind, Moderate Gale, Near Gale	13.1	Sea heaps up and foam begins to streak.	Whole trees in motion. Effort needed to walk against the wind.
8	39-46	Fresh Gale	18	Moderately high waves with breaking crests forming spindrift. Streaks of foam.	Twigs broken from trees. Cars veer on road.
9	47-54	Strong Gale	23	High waves (6-7 m) with dense foam. Wave crests start to roll over. Considerable spray.	Larger branches break off trees, and some small trees blow over. Construction/temporary signs and barricades blow over. Damage to circus tents and canopies.
10	55-63	Whole Gale/Storm	29.5	Very high waves. The sea surface is white and there is considerable tumbling.	Trees uprooted. Considerable structural damage.

Beaufort Scale					
NUMBER	**WIND SPEED (MPH)**	**DESCRIPTION**	**WAVE HEIGHT (FT)**	**SEA CONDITIONS**	**LAND CONDITIONS**
11	64-72	Violent storm	37.7	Exceptionally high waves.	Widespread vegetation and structural damage.
12	≥73	Hurricane-force	≥46	Huge waves. Sea is completely white with foam and spray. Air is filled with driving	Massive and widespread damage to structures.

HISTORICAL OCCURRENCES

Severe storms were at least partially responsible for five disaster declarations in Adams County in 1973, 1979, 1980, 1990, and 2017. According to NCEI, there have been 234 reported thunderstorms and high wind events since 1957 in Adams County. These events caused over $35 million in damages. There were also reports of eight injuries. The table below summarizes this information and presents detailed thunderstorm and high wind event reports.

TABLE A.19: HISTORICAL THUNDERSTORM / HIGH WIND OCCURRENCES IN ADAMS COUNTY[56]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Natchez	102	0/7	$33,559,600	$516,301
Cranfield	9	0/0	$42,000	$646
Fenwick	3	0/0	$43,000	$661
Foster	5	0/0	$50,000	$769
Johnsville	10	0/0	$77,000	$1,184
Kingston	14	0/1	$309,500	$4,761
Linwood	1	0/0	$15,000	$230
Pine Ridge	7	0/0	$292,000	$4,492
Shannon	3	0/0	$8,000	$123
Sibley	16	0/0	$212,500	$3,269
Stanton	5	0/0	$40,000	$615
Washington	5	0/0	$11,000	$169
Unincorporated	54	0/0	$360,400	$5,544
Adams County Total	**234**	**0/8**	**$35,020,000**	**$538,769**

[56] These thunderstorm events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1957 through November 2022.

PROBABILITY OF FUTURE OCCURRENCES

Given the high number of previous events, it is certain that thunderstorm events, including straight-line wind events, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for the entire county.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[57] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Adams County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[58]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

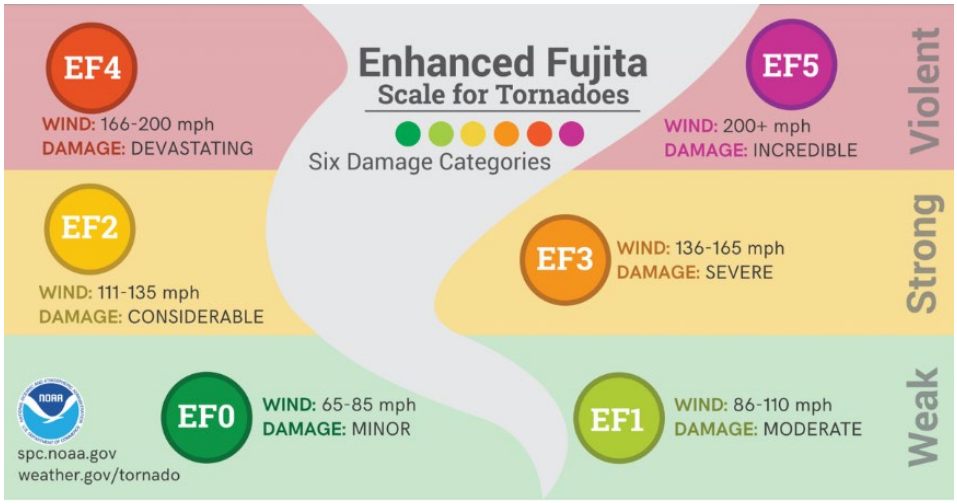
A.2.12 Tornado

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, and thus in Adams County. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random, and it is not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that Adams County is uniformly exposed to this hazard.

The following figure depicts the Enhanced-Fujita Scale of tornado intensity.

FIGURE A.75: ENHANCED-FUJITA SCALE

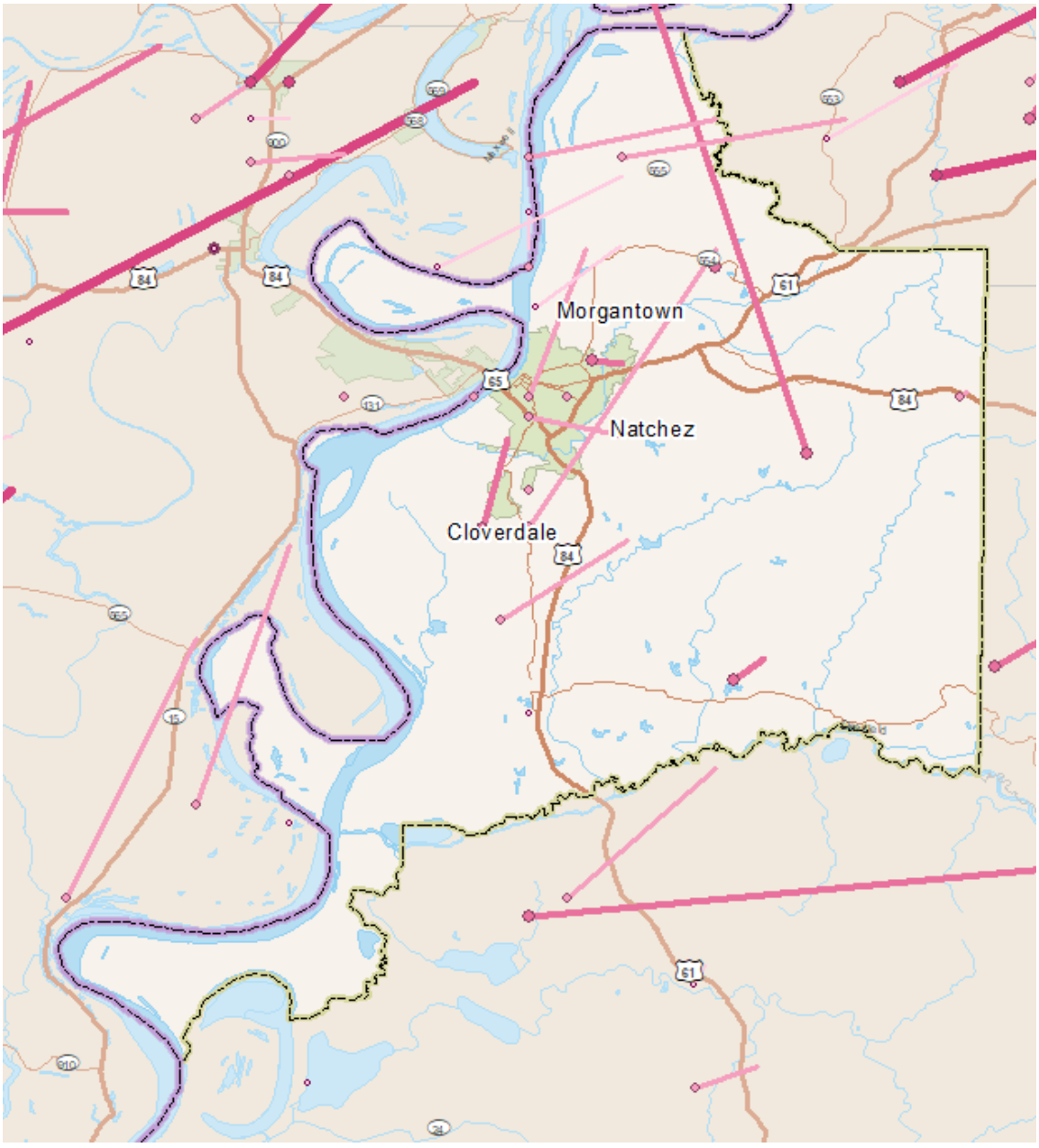


[57] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[58] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

With that in mind, the figure below shows tornado track data for many of the major tornado events that have impacted the county between 1950 and 2022. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

FIGURE A.86: HISTORICAL TORNADO TRACKS IN ADAMS COUNTY



HISTORICAL OCCURRENCES

Tornadoes were at least partially responsible for five disaster declarations in Adams County in 1973, 1979, 1980, 1990, 2009, and 2017[59]. According to the National Centers for Environmental Information, there have been a total of 19 recorded tornado events in Adams County since 1950, resulting in over $7

[59] FEMA – Disaster Declarations

million in property damages.[60] In addition, 44 injuries were reported. The magnitude of these tornadoes ranges from F0 to F2, although an F5 event is possible.

TABLE A.20: HISTORICAL TORNADO IMPACTS IN ADAMS COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Kingston	1	0/0	$125,000	$1,736
Leesdale	1	0/0	$2,000	$27
Linwood	1	0/0	$400,000	$5,555
Natchez	4	0/0	$3,121,000	$43,347
Pine Ridge	2	0/0	$25,000	$347
Sibley	2	0/0	$503,000	$6,986
Unincorporated	8	0/44	$2,830,250	$39,309
Adams County Total	**19**	**0/44**	**$7,006,250**	**$97,309**

PROBABILITY OF FUTURE OCCURRENCES

According to historical information, tornado events pose a significant threat to Adams County. The probability of future tornado occurrences affecting Adams County is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[61] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Adams County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[62]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storm systems that spawn tornadoes to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding, and enhancing the potential for increased *tornado activity*. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

[60] These tornado events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1950 through November 2022.
[61] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf
[62] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

A.2.13 Winter Storm, Freeze, and Extreme Cold

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. Adams County is not accustomed to severe winter weather conditions and seldom receives severe winter weather, even during the winter months. Events tend to be mild in nature; however, this creates a situation where even relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage due to the fact that these events are not commonplace. Given the atmospheric nature of the hazard, the entire county has uniform exposure to a winter storm.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, there have been a total of 18 recorded winter weather events in Adams County since 1996. These events resulted in more than $1.938 million in damages. Detailed information on the recorded winter storm events can be found in the table below.

TABLE A.21: SUMMARY OF WINTER STORM EVENTS IN ADAMS COUNTY[63]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Adams County	18	0/0	$1,938,000	$74,538

There have been several severe winter weather events in Adams County. The text below describes two of the major events and associated impacts on the county. Similar impacts can be expected with severe winter weather.

February 2010

Heavy snow affected a large portion of the region, especially locations across central and southern Mississippi, on Thursday night and Friday, February 11th and 12th. The heavy snow was a result of a low-pressure system that tracked eastward across the northern Gulf of Mexico, and a vigorous upper level disturbance that moved across the region while a cold air mass was in place. Light precipitation overspread the region late Thursday afternoon into the evening before becoming heavy Thursday night into early Friday morning. The snow tapered off from west to east during the midday hours Friday.

February 2011

An ice storm developed across the area on February 3rd into the early morning hours of the 4th. While this icing event was not devastating, the impact to travel was a major issue across the region. Thousands of accidents occurred from slick roads. As a result of the accidents, three fatalities occurred along with a handful of injuries. Overall, most areas received 0.25 to 0.5 inches of ice accumulation from freezing

[63] These events include extreme cold, frost, heavy snow, winter storm, ice storm and are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1996 through November 2022

rain. Additionally, some areas had a mix of precipitation with sleet accumulating. Some snow did occur, but those were just across select areas and the accumulation was mainly one inch or less.

February 2021

As an arctic air mass continued to build southward across the South on February 17th, another wave of precipitation overspread this cold air mass across much of Mississippi. The main impacts across central and southern portions of the state were from freezing rain and resulting heavy icing, but some significant accumulations of sleet and snow also occurred in areas mainly north and west of the Natchez Trace. Freezing rain continued through the evening hours, ending from west to east by the early morning of February 18th. Ice accumulated quickly in many locations and downed numerous trees, large limbs, and power lines across the affected areas. Several trees and limbs fell onto power lines, resulting in more widespread power outages as well. Some trees fell onto homes or cars, and significant amounts of ice, sleet, and snow collapsed a few gas station awnings and roofs where accumulations were greatest. In the hardest hit areas, extensive damage to trees and power lines took several months and cost several hundred thousands of dollars to clean up.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could to fire or an accumulation of toxic fumes.

PROBABILITY OF FUTURE OCCURRENCES

Winter storm events will continue to occur in Adams County. Based on historical information, the probability is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems. There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Adams County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms). However, accelerated warming in the Artic region (i.e., Arctic amplification) may also be linked with an increase in the frequency of extreme cold events across parts of Asia and North America, including in Adams County. [64]

[64] NOAA – Communication Education & Engagement. Retrieved from: https://cpo.noaa.gov/Divisions-Programs/Communication-Education-and-Engagement/CEE-News/ArtMID/8293/ArticleID/2369/Research-Links-Extreme-Cold-Weather-in-the-United-States-to-Arctic-Warming

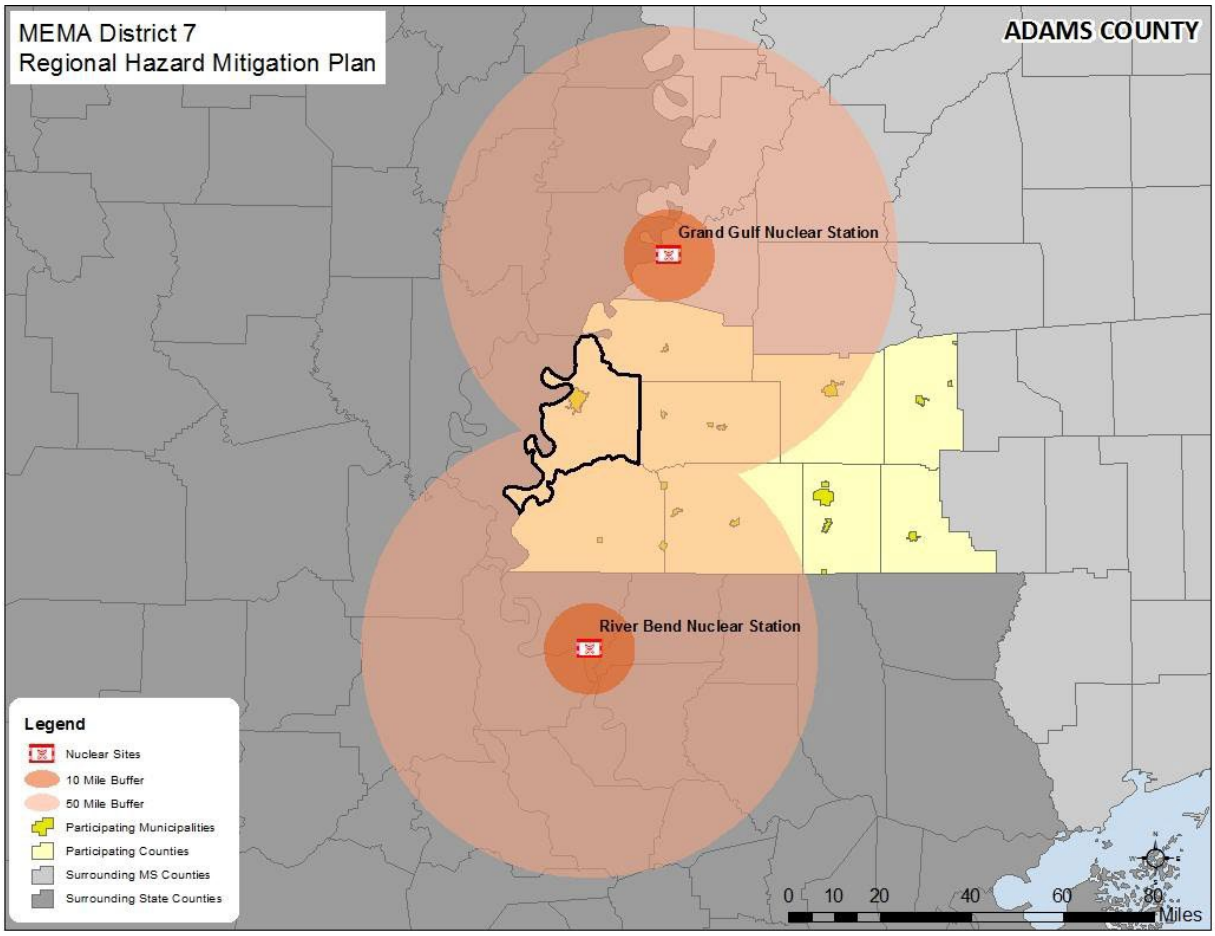
OTHER HAZARDS

A.2.14 Radiological Event

LOCATION AND SPATIAL EXTENT

The Grand Gulf Nuclear Station and River Bend Nuclear Station are both located within a 50-mile radius of the MEMA District 7 Region. The Nuclear Regulatory Commission defines two emergency planning zones around nuclear plants. Areas located within 10 miles of the station are considered to be within the zone of highest risk to a nuclear incident and this radius is the designated evacuation radius recommended by the Nuclear Regulatory Commission. Within the 10-mile zone, the primary concern is exposure to and inhalation of radioactive contamination. No part of Adams County is located in the 10-mile radius of a nuclear station. The most concerning effects in the secondary 50-mile zone are related to ingestion of food and liquids that may have been contaminated. All of Adams County is located within this 50-mile radius. The 50-mile zone is still considered to be at risk from a nuclear incident, though the impacts may be less severe than in the 10-mile zone in the following figure.

FIGURE A.17: NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN ADAMS COUNTY



HISTORICAL OCCURRENCES

Although there have been no major nuclear events at either the Grand Gulf or River Bend Nuclear Stations, there is some possibility that one could occur as there have been incidents in the past in the United States at other facilities and at facilities around the world. Additionally, a list of minor events/notifications was acquired from reports collected by the Nuclear Regulatory Commission (NRC). The NRC classifies events using the scale below. A list of events at Grand Gulf Nuclear Station and River Bend Nuclear Station can be found in the table below. It is noteworthy that all of the events were minor in magnitude and many were insignificant enough that they did not register on the classification scale.

TABLE A.22: NUCLEAR REGULATORY COMMISSION EMERGENCY CLASSIFICATION SCALE FOR EVENTS OCCURRING AT NUCLEAR POWER PLANTS

Classification	Description
Notification of Unusual Event (NOUE)	Events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs. [Note: This term is sometimes shortened to Unusual Event (UE). The terms Notification of Unusual Event, NOUE and Unusual Event are used interchangeably.]
Alert	Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life-threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the Environmental Protection Agency (EPA) protective action guides (PAGs)
Site Area Emergency	Site Area Emergency (SAE) – Events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or hostile action that results in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to, equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA PAG exposure levels beyond the site boundary.
General Emergency	Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile action that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

TABLE A.23: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT GRAND GULF NUCLEAR STATION[65]

Date	Retrieved From*	Classification	Plant	Description
8/29/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST
10/1/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF NUCLEAR STATION SECURITY OFFICER LOCKOUT
9/29/2016	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF EXTENDED PLANT SHUTDOWN TO ADDRESS OPERATIONS PERFORMANCE

TABLE A.24: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT RIVER BEND NUCLEAR STATION

Date	Retrieved From*	Classification	Plant	Description
11/26/1985	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	ECCS Initiation: Improper restoration of a level transmitter causes HPSC injection
11/27/1985	Licensee Event Report	Alert	River Bend Unit 1	Failure to Perform Surveillance Tests
3/5/1992	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	REACTOR SCRAM CAUSED BY A GENERATOR TRIP DUE TO HIGH WINDS CAUSING TRANSFORMER DAMAGE
9/15/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE IVAN

[65] Nuclear Regulatory Commission Preliminary Notification Reports (http://www.nrc.gov/reading-rm/doc-collections/event-status/prelim-notice/):

Date	Retrieved From*	Classification	Plant	Description
10/4/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	Shutdown Greater than 72 Hours
9/23/2005	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	NRC ENTERS MONITORING MODE DUE TO HURRICANE RITA
5/23/2007	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REACTOR SHUTDOWN DUE TO UNEXPECTED CHANGE IN RECIRCULATION FLOW
9/2/2008	Preliminary Notification Reports	Notification of Unusual Event/Not Applicable	River Bend Unit 1	NRC RESPONSE TO HURRICANE GUSTAV
5/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	AUGMENTED INSPECTION TEAM ONSITE AT RIVER BEND STATION
8/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST

PROBABILITY OF FUTURE OCCURRENCES

A nuclear event is a very rare occurrence in the United States due to the intense regulation of the industry. There have been minor incidents in the past, but it is considered unlikely (less than 1 percent annual probability).

RADIOLOGICAL EVACUATIONS

Like the hurricane evacuations discussed above, in many ways the MEMA District 7 Region would potentially be impacted to a greater degree by evacuations caused by a radiological event than by the event itself. Since the region is not directly located within the 10-mile evacuation area but neighboring counties are located within this zone, it is highly likely that populations from those neighboring counties will be evacuated to the counties within the MEMA District 7 Region.

Due to the severe and long-term effects of a major radiological event, temporary sheltering will be an initial concern, but the greater challenge may be in the long-term. As has happened with historical radiological accidents in other locations, the danger in the impacted area will likely extend for a very long period after the event and evacuees may be unable to return to their homes for months or years. This additional influx of population will cause a major strain on resources within these relatively rural counties in the short-term, as local communities with limited resources will have an unexpected and

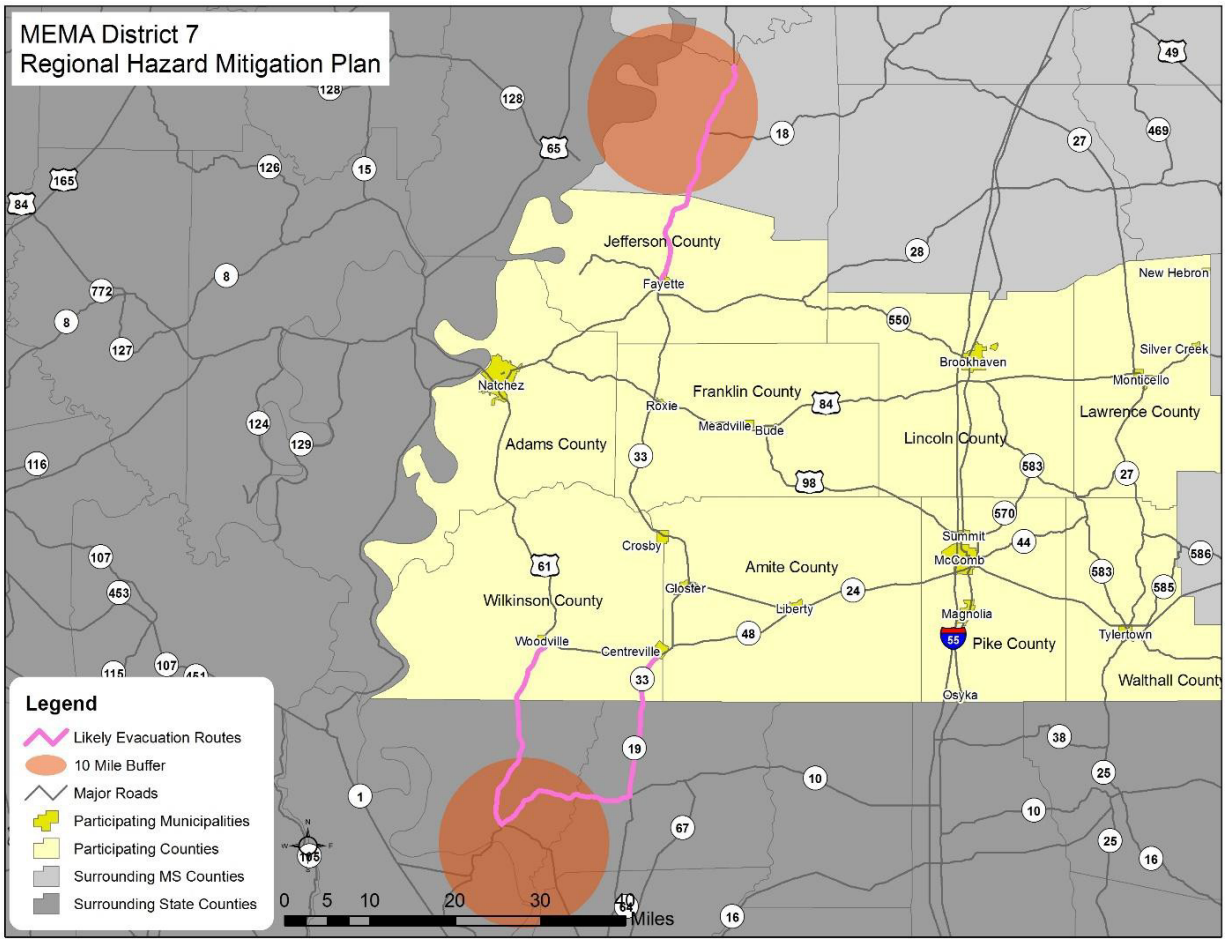
immediate need to provide shelter and other life essentials such as food, water, and health care to a significant, additional number of people. In the long-term, there may be challenges for local officials as existing infrastructure will likely be inadequate to handle larger populations.

Although there have not been any major radiological events in the region historically, hurricane evacuations (discussed above) provide a similar scenario in terms of what the region might expect. However, one additional concern that officials will need to consider in a radiological event is that evacuees may be contaminated by radioactivity. According to the Centers for Disease Control, radioactive contamination can occur when radioactive materials are released into the environment and become deposited into the air, water, surfaces, soil, plants, buildings, people or animals. This contamination can then be spread when people touch other people, surfaces, or objects. Therefore, when people evacuate a contaminated zone, they pose a potential risk of spreading the contamination to others if they are not properly treated. Local officials in MEMA District 7 may need to be prepared to set up decontamination centers along major evacuation routes to ensure that the contamination is not spread. It is also important for citizens to understand the steps they can take to reduce the risk of spreading contamination such as evacuating quickly after an event and following decontamination instructions as directed by local officials.[66]

Based on the locations of the 10-mile evacuation areas near the region, many of these evacuees will likely come from Claiborne County to the north and West Feliciana and East Feliciana Parishes to the south. The main roads for these evacuees will probably be U.S. Highway 61 and Mississippi State Highway 33 since these are the primary and most direct roads into and out of the aforementioned evacuation counties and into MEMA District 7. Depending on the severity of the event, officials may even change these roads over to a contraflow traffic pattern to enable quicker evacuations.

[66] Centers for Disease Control and Prevention. Emergency Preparedness and Response: Contamination vs. Exposure. Retrieved on September 1, 2017 from https://emergency.cdc.gov/radiation/contamination.asp

FIGURE A.18: LIKELY EVACUATION ROUTES FOR A RADIOLOGICAL EVENT IN THE MEMA DISTRICT 7 REGION



As a result of the potential for an influx of evacuees during a radiological event, it is critical for local officials in MEMA District 7 to prepare for evacuations. It is possible that thousands of additional people will be relocated, either temporarily or permanently, to MEMA District 7. Therefore, plans for additional shelters and other resources should be coordinated well in advance of future events.

A.2.15 Pandemic

LOCATION AND SPATIAL EXTENT

Pandemics are global in nature. However, they may start anywhere. Adams County chose to analyze this hazard given the agriculture in the area and potential for this kind of event to occur in any location at any time.

All populations should be considered at risk to pandemic. Buildings and infrastructure are not directly impacted by the virus/pathogen but could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings may be shutdown, at least temporarily, as a result.

Employers may initiate work from home procedures for non-essential workers in order to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

HISTORICAL OCCURRENCES

Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below.

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to 566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population.

Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10 to 50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852- 1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours. The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

1957 Asian Flu: It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

1968 Hong Kong Flu: The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020, mainly due to the speed and scale of the transmission of the disease. Prior to that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province on February 26th, 2020. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

There is a considerable amount of data on the extent of COVID-19 throughout the State of Mississippi and Adams County. The number of reported cases and deaths across the State of Mississippi and Adams County are shown in the figure below.

TABLE A.25: COVID-19 CASES AS OF 12/05/2022[67]

	Cases	Deaths
Mississippi	951,070	13,083
Adams County	8,394	152

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Adams County has a probability level of unlikely (less than 1 percent annual probability) for future pandemics events. While pandemics can have devastating impacts, they are relatively rare.

The Mississippi State Department of Health maintains a state pandemic plan which can be found here: http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf

[67] Mississippi Department of Health – COVID-19 Dashboard

A.2.16 Conclusions on Hazard Risk

The hazard profiles presented in this subsection were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled Understanding Your Risks: Identifying Hazards and Estimating Losses (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

HAZARD EXTENT

The following table describes the extent of each natural hazard identified for Adams County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

TABLE A.26: EXTENT OF ADAMS COUNTY HAZARDS

Flood Related Hazards	
Dam & Levee Failure	Dam Failure extent is defined using the Mississippi Department of Environmental Quality classifications which include Low, Significant, and High. Six dams are classified as high-hazard in Adams County.
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no official erosion rate records in Adams County but local estimates are around 0.25 to 0.50 feet per year. Some areas of erosion have been identified by local coordinators.
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 34.7 percent of the total land area in Adams County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was on the Homochitto River near Doloroso. Water reached a discharge of 134,000 cubic feet per second (recorded on May 19, 1953). The highest stream gage height was on the Mississippi River at Natchez with a height that was recorded at 61.95 feet, or 4.95 feet above the major flood stage (recorded on May 19, 2011).
Fire Related Hazards	
Drought	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. Adams County has received this ranking once since 2000.
Lightning	Adams County is in an area of the country that experienced an average of 72.1 lightning flashes per km^2 per year between 2016 and 2021. It should be noted that future lightning occurrences may exceed these figures.
Wildfire	Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2012-2021. The greatest number of fires to occur in Adams County in any year was 4 in 2016. The greatest number of

	acres to burn in the county in a single year occurred in 2020 when 190 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale or the Modified Mercalli Intensity (MMI) scale. According to data provided by the National Centers for Environmental Information, the greatest earthquake to impact Adams County had a MMI of VI (strong) and a Richter Scale magnitude of 7.2 (reported on December 16, 1811).
Temperature & Wind Related Hazards	
Extreme Heat	The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are not kept for any areas in Adams County. However, the highest recorded temperature in the region was 106°F in 2007 with heat index values recorded above 115°F.
Hailstorm	Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Adams County was 2.75 inches (reported on April 6, 1983). It should be noted that future events may exceed this.
Hurricane & Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5. The greatest classification of hurricane to impact the MEMA District 7 Region was a Category 3 storm. This occurred in 1969 with Hurricane Camille and in 2005 with Hurricane Katrina. The storm track of both storms passed just to the east of the region, but due to the size of these storms, their impact was felt across the region.
Severe Thunderstorm / High Wind	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 67-year history from the National Centers for Environmental Information, the strongest recorded wind event in Adams County was last reported on May 3, 2009 at 78 knots (approximately 90 mph). It should be noted that future events may exceed these historical occurrences.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA as well as the Fujita/Enhanced Fujita Scale. The greatest magnitude reported in Adams County was an EF2 (last reported on November 1, 2018).
Winter Storm & Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in Adams County. However, reports from NCEI of the greatest snowfall in the county has been 6 inches (reported on February 11,2010).
Other Hazards	
Radiological Event	Although there is no history of a nuclear accident at either the Grand Gulf Nuclear Station or River Bend Nuclear Station, other events across the globe and in the United States indicate that an event is possible. Since several national and international events were Level 7 events on the INES, the potential for a Level 7 event at these stations is possible.
Pandemic	The extent of a pandemic impacting the county is difficult to estimate. It could result in thousands of deaths and extreme disruption of commerce and everyday life.

PRIORITY RISK INDEX RESULTS

To draw some meaningful planning conclusions on hazard risk for Adams County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a "Priority Risk Index" (PRI). More information on the PRI and how it was calculated can be found in Section 5.17.2.

The following table summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this subsection, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

TABLE A.27: SUMMARY OF PRI RESULTS FOR ADAMS COUNTY

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Dam Failure and Levee Failure	Possible	Critical	Moderate	Less than 6 hours	Less than 6 hours	**2.6**
Erosion	Likely	Limited	Small	More than 24 hours	More than 1 week	**2.4**
Flood	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**3.2**
Fire-related Hazards						
Drought	Possible	Limited	Large	More than 24 hours	More than 1 week	**2.5**
Lightning	Highly Likely	Limited	Small	6 to 12 hours	Less than 6 hours	**2.6**
Wildfire	Possible	Limited	Small	Less than 6 hours	Less than 1 week	**2.3**
Geologic Hazards						
Earthquake	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Wind-related Hazards						
Extreme Heat	Likely	Limited	Large	More than 24 hours	More than 1 week	**2.8**
Hailstorm	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Hurricane and Tropical Storm	Likely	Catastrophic	Large	More than 24 hours	Less than 1 week	**3.3**
Severe Thunderstorm/High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Tornado	Likely	Catastrophic	Moderate	Less than 6 hours	Less than 6 hours	**3.2**
Winter Storm and Freeze	Likely	Minor	Moderate	More than 24 hours	Less than 1 week	**2.2**
Other Hazards						
Radiological Event	Unlikely	Critical	Moderate	More than 24 hours	Less than 1 week	**2.2**
Pandemic	Unlikely	Limited	Large	More than 24 hours	More than 1 week	**2.2**

A.2.17 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Adams County, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each

identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk (Table A.32). For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Adams County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately and is described in Section 6: Vulnerability Assessment and below in Section A.3. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates. In most cases, the hazards of greatest concern did not change much since the last plan update, indicating that the priorities remained relatively stable and there were few changes in priorities.

TABLE A.28: CONCLUSIONS ON HAZARD RISK FOR ADAMS COUNTY

HIGH RISK	Hurricane and Tropical Storm Tornado Flood Severe Thunderstorm/High Wind
MODERATE RISK	Extreme Heat Hailstorm Dam and Levee Failure Lightning Drought Erosion
LOW RISK	Wildfire Winter Storm and Freeze Radiological Event Earthquake Pandemic

A.3 ADAMS COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Adams County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected amount of damage caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in Section 6: Vulnerability Assessment.

A.3.1 Asset Inventory

The table below lists the estimated number of improved properties and the total value of improvements for Adams County and its participating jurisdictions (study area of vulnerability assessment). Because digital parcel data was not available for most communities, data obtained from Hazus-MH 5.1 inventory was utilized to complete the analysis.

TABLE A29: IMPROVED PROPERTY IN ADAMS COUNTY[68]

Location	Counts of Improved Properties	Total Value of Improvements
Natchez	8,332	$2,068,891
Unincorporated Area	6,329	$3,127,854,109
ADAMS COUNTY TOTAL	**14,661**	**$3,129,923,000**

The following table lists the fire stations, police stations, medical care facilities, emergency operation centers, schools, government/public buildings, transportation infrastructure, and private facilities located in Adams County according to previous plan data and Hazus-MH 5.1 data that was reviewed and updated by local officials.

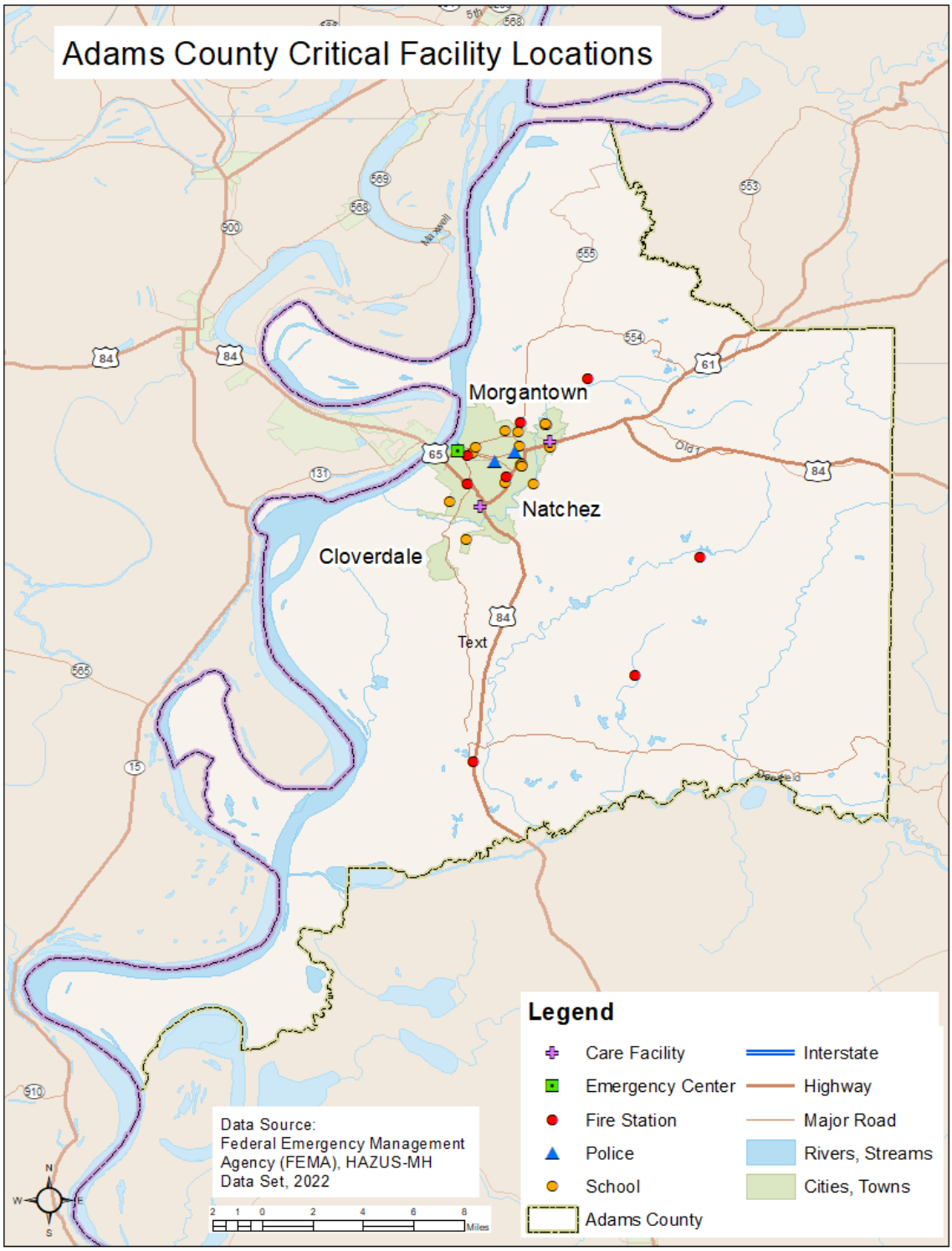
In addition, the figure below shows the locations of critical facilities in Adams County. The table at the end of this subsection, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided through Hazus which was updated, as best as possible, with local knowledge.

TABLE A.30: CRITICAL FACILITY INVENTORY IN ADAMS COUNTY

Location	Fire Stations	Police Stations	Medical Facilities	EOC	Schools	Ports
Natchez	4	2	1	1	10	1
Unincorporated	4	0	0	0	3	0
Adams County Total	**8**	**2**	**1**	**1**	**13**	**1**

[68] Hazus-MH 5.1

FIGURE A.199: CRITICAL FACILITIES IN ADAMS COUNTY[69]



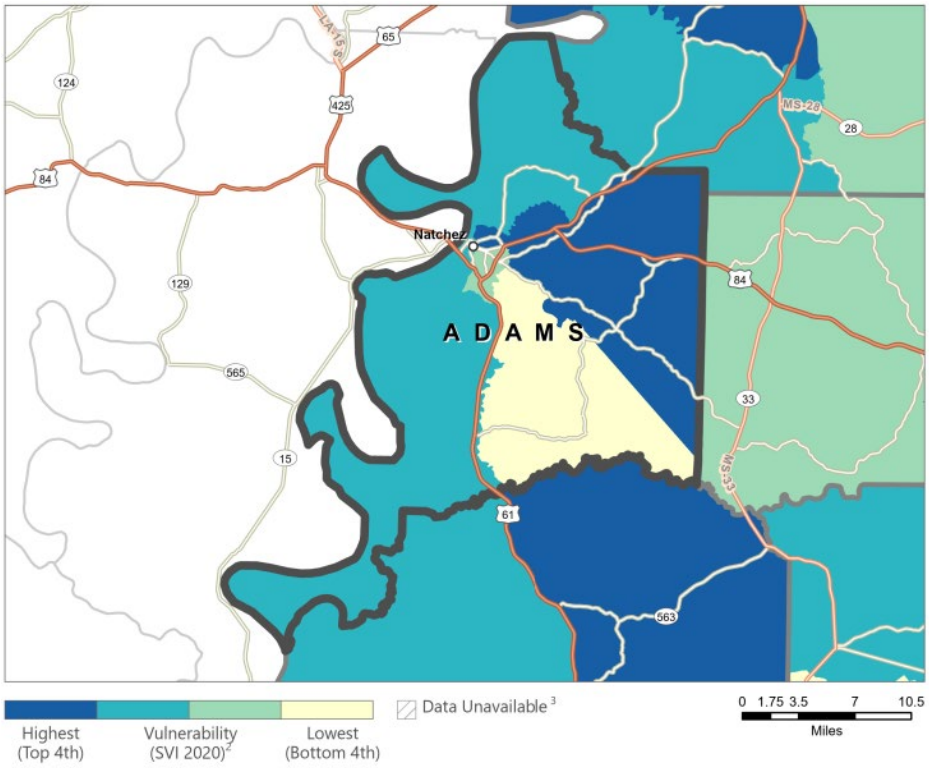
[69] Hazus-MH 5.1; Local Officials

A.3.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those segments of the resident population in Adams County that are potentially at risk for these hazards. Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss.

The CDC/ATSDR Social Vulnerability Index (CDC/ATSDR SVI) uses 16 U.S. census variables to help local officials identify communities that may need support before, during, or after disaster. See figure below for Adams County SVI score of 0.9857.

FIGURE A.20: SOCIAL VULNERABILITY INDEX IN ADAMS COUNTY[70]



The following table lists the population by jurisdiction according to U.S. Census. The total population in Adams County according to Census data was 29,538 persons. Additional population estimates are presented above in Section A.1.

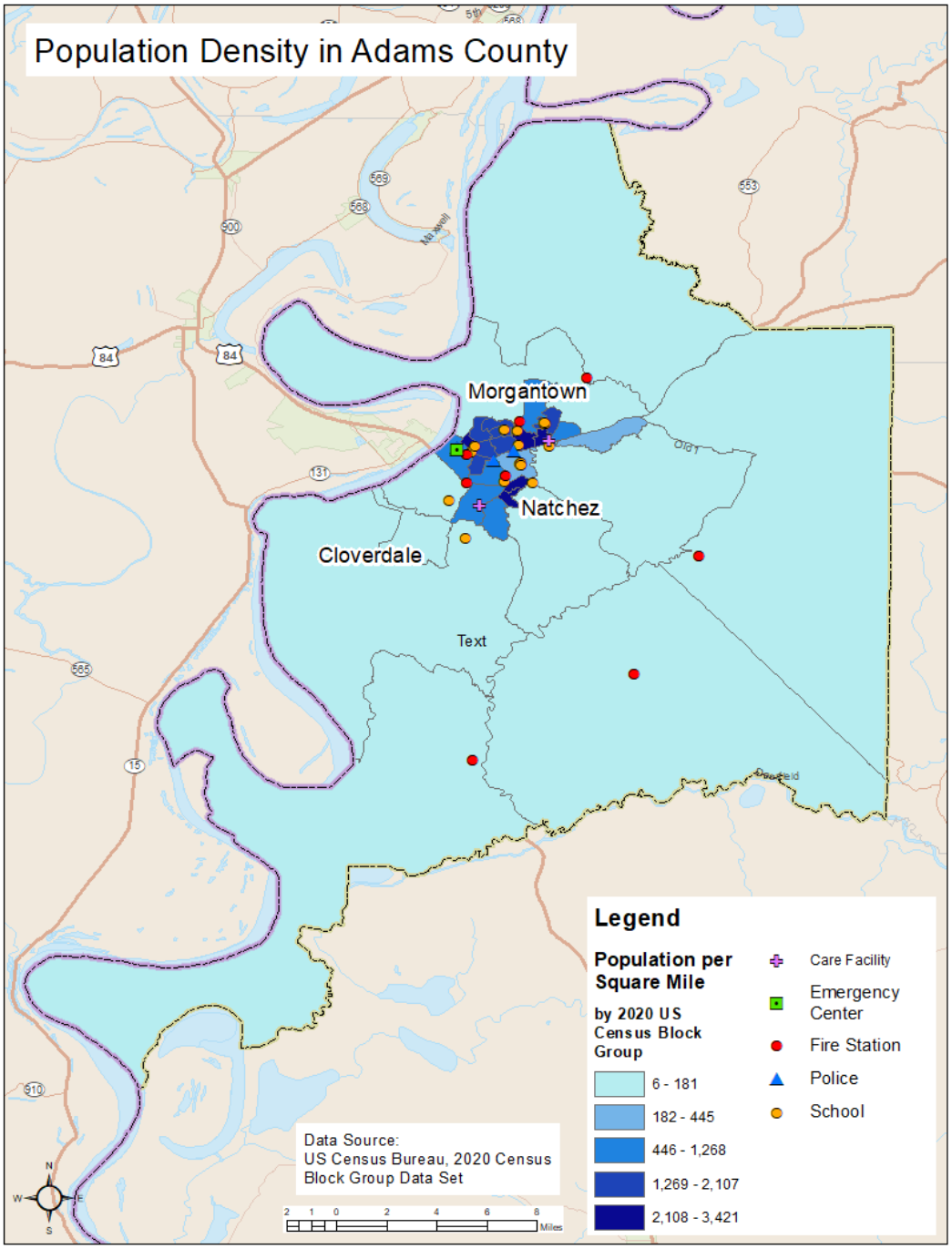
TABLE A.31: POPULATION IN ADAMS COUNTY[71]

Jurisdiction	2010 Census Population	2020 Census Population	% Change 2010-2020
Adams County	**32,297**	**29,538**	**-8.54%**
Natchez	15,792	14,520	-8.05%

[70] CDC/ATSDR Social Vulnerability Index
[71] U.S. Census 2020

In addition, the figure below illustrates the population density per acre by census block as it was reported by the U.S. Census Bureau in 2010. As can be seen in the figure, the population is spread out with concentrations in municipal areas such as Natchez.

FIGURE A.21: POPULATION DENSITY IN ADAMS COUNTY



A.3.3 Development Trends and Changes in Vulnerability

Since the previous hazard mitigation plan was approved, Adams County has experienced population loss and development. The following table shows the number of building units constructed since 2010 according to the U.S. Census American Community Survey.

TABLE A.32: BUILDING COUNTS FOR ADAMS COUNTY

Location	Total Housing Units (2021)	Units Built 2010 or Later	% Building Stock Built Post-2010
Natchez	7,852	140	1.78%
Unincorporated Area	7,014	311	4.43%
Adams County Total	**14,866**	**451**	**3.03%**

TABLE A.33: POPULATION GROWTH FOR ADAMS COUNTY

Jurisdiction	2010 Census Population	2020 Census Population	% Change 2010-2020
Natchez	15,792	14,520	-8.05%
Unincorporated Area	16,505	15,018	-9.00%
Adams County Total	**32,297**	**29,538**	**-8.54%**

Based on the data above, there has been a low rate of residential development and population growth in the county since 2010, and the county has experienced a population decline of -8.54%. However, it is notable that the unincorporated area has experienced a slightly higher rate of growth and development compared to Natchez, resulting in an increased number of people and structures that are vulnerable to the potential impacts of the identified hazards. Therefore, development and population growth have impacted the county's vulnerability since the previous local hazard mitigation plan was approved and there has been a slight increase in the overall vulnerability as well as a larger increase in certain areas and communities.

It is also important to note that as development increases in the future, greater populations and more structures and infrastructure will be exposed to potential hazards if development occurs in floodplains or other high-risk areas.

A.3.4 Vulnerability Assessment Results

As noted in Section 6: Vulnerability Assessment, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis. Those results, specific to Adams County, are presented here. All other hazards are assumed to impact the entire planning region (drought, extreme heat, hailstorm, lightning, severe thunderstorm/high wind, tornado, and winter storm) or, due to lack of data, analysis would not lead to credible results (erosion).

The hazards to be further analyzed in this subsection include dam/levee failure, flood, wildfire, earthquake, hurricane and tropical storm winds, and radiological event.

The annualized loss estimate for all hazards is presented near the end of this subsection.

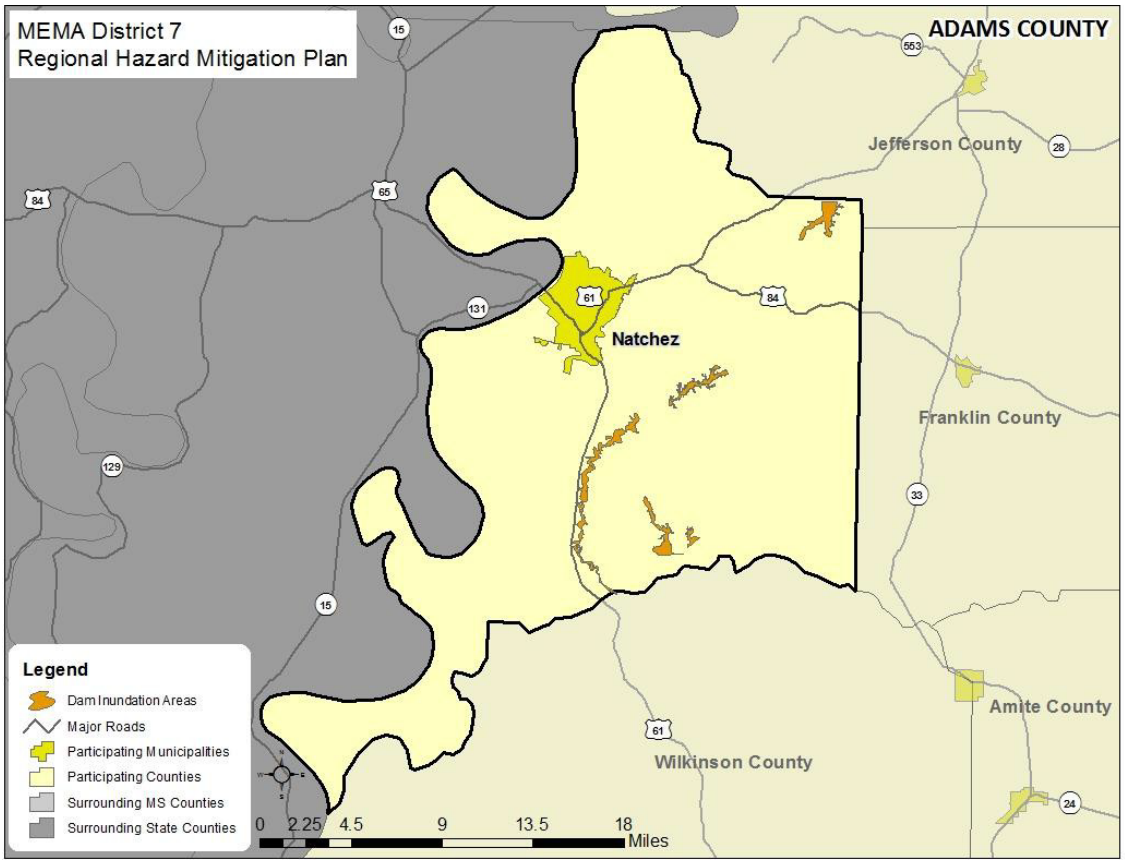
DAM/LEVEE FAILURE

To assess risk to a dam or levee failure, a GIS-based analysis[72] was used to estimate exposure to one of the areas delineated by the Mississippi Department of Environmental Quality as a potential inundation area in the event of a failure. The determination of value at-risk (exposure) was calculated using GIS analysis by summing the values for improved properties that were located within an identified inundation area. As mentioned previously, this type of inundation mapping has not been completed for every dam/levee in the region, so the results of this analysis likely underestimate the overall vulnerability to a dam or levee failure. However, the analysis is still useful as a sort of baseline minimum of property that is potentially at-risk. The identified inundation areas can be found below.

Due to a lack of digital parcel data in most counties, it was determined that an analysis using the inventory from Hazus-MH 5.1 would be used. It should be noted that this data will merely be an estimation and may not reflect actual counts or values located in dam inundation areas. Indeed, in almost all cases, this data likely overestimates the amount of property in the identified risk zones.

The table below presents the potential at-risk property. Both the number of buildings and the approximate improved value are presented.

FIGURE A.102: DAM INUNDATION AREAS IN ADAMS COUNTY[73]



[72] There was no change since the last plan update.
[73] Mississippi Department of Environmental Quality

TABLE A.34: ESTIMATE EXPOSURE OF IMPROVED PROPERTY TO THE DAM/LEVEE FAILURE HAZARD[74]

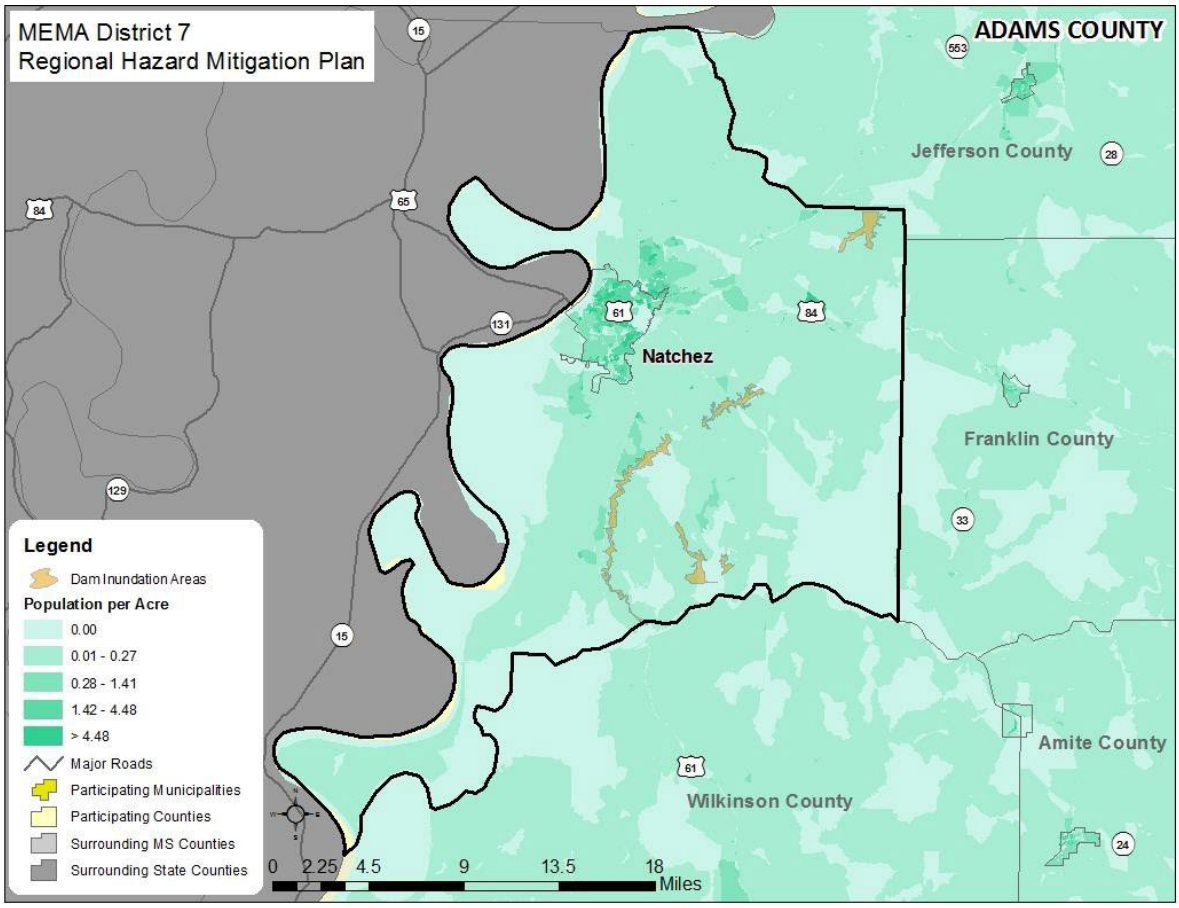
Location	Dam Inundation Area	
	Approximate Number of Improvements	Approximate Improved Value
Natchez	0	$0
Unincorporated Area	745	$121,632,000
Adams County Total	**745**	**$121,632,000**

Social Vulnerability

The figure below is presented to gain a better understanding of at-risk population by evaluating census block level population data against dam inundation areas. There are several areas of concern in the county, although it should be noted that most of the population of the county is not at risk to a dam/levee failure.

[74] Mississippi Department of Environmental Quality; Hazus 5.1

FIGURE A.23: POPULATION DENSITY NEAR DAM INUNDATION AREAS IN ADAMS COUNTY[75]



Critical Facilities

There are no critical facilities located within the identified dam inundation areas. Although there are no facilities located in the identified areas, this does not indicate that there is no risk to a dam/levee failure, especially considering not all dams have delineated inundation areas. A list of specific critical facilities and their associated risk can be found in Table A.45 at the end of this section.

In conclusion, a dam/levee failure has the potential to impact many existing and future buildings, facilities, and populations in Adams County, though structures located near or in the dam inundation areas are at highest risk. Specific vulnerabilities for Adams County assets will be greatly dependent on their individual design and the mitigation measures in place where appropriate. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates if data becomes available.

[75] Mississippi Department of Environmental Quality; United States Census Bureau

FLOOD

Historical evidence indicates that Adams County is susceptible to flood events. A total of 41 flood events have been reported by the National Centers for Environmental Information resulting in $4.23 million in property damage. On an annualized level, these damages amounted to $169,200 for Adams County.

To assess flood risk, a GIS-based analysis was used to estimate exposure to flood events using Digital Flood Insurance Rate Map (DFIRM) data in combination with improved property records for the county. The determination of value at-risk (exposure) was calculated using GIS analysis by summing the values for improved properties that were located within an identified floodplain. Due to a lack of digital parcel data in most counties, it was determined that an analysis using the inventory from Hazus-MH 5.1 would be used, though it should be noted that the data will merely be an estimation and may not reflect actual counts or values located in the floodplain. Indeed, in almost all cases, this analysis likely overestimates the amount of property at risk. Table A.39 presents the potential at-risk property. Both the number of parcels and the approximate value are presented.

TABLE A.35: ESTIMATED EXPOSURE OF IMPROVED PROPERTY TO THE FLOOD HAZARD[76]

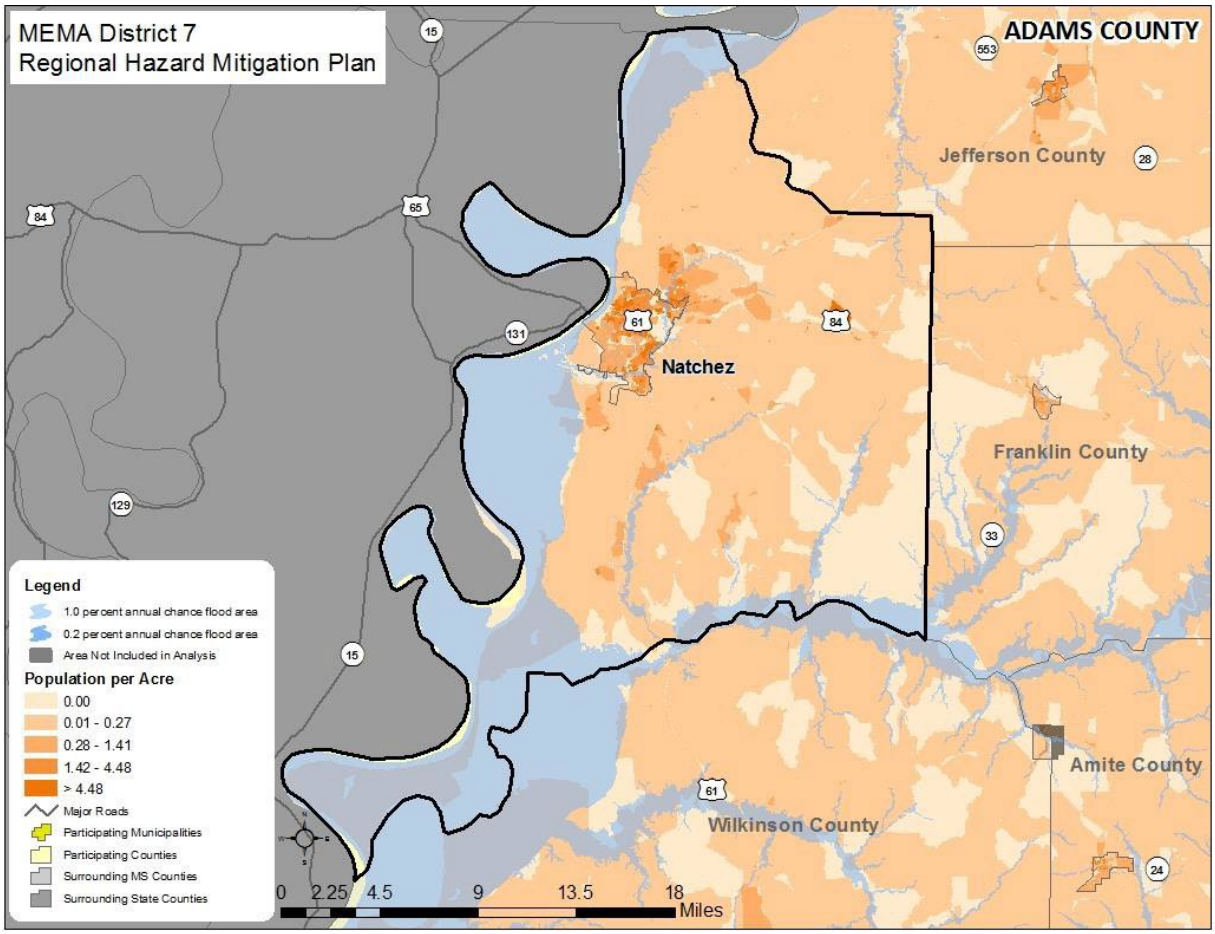
Location	1.0-percent ACF		0.2-percent ACF	
	Approx. Number of Improvements	Approx. Improved Value	Approx. Number of Improvements	Approx. Improved Value
Natchez	3,477	$864,838,000	78	$20,474,000
Unincorporated Area	2,007	$303,019,000	0	$0
Adams County Total	5,484	$1,167,857,000	78	$20,474,000

Social Vulnerability

The figure below is presented to gain a better understanding of at-risk population by evaluating census block level population data against mapped floodplains. There are areas of concern in several of the population centers. Therefore, further investigation in these areas may be warranted. As noted in Section 6.4, no building-specific data, such as building footprints, was available to determine buildings at risk.

[76] Federal Emergency Management Agency DFIRM; Hazus MH 5.1

FIGURE A.24: POPULATION DENSITY NEAR FLOODPLAINS IN ADAMS COUNTY[77]



Source: Federal Emergency Management Agency DFIRM; United States Census Bureau, 2010 Census

Critical Facilities

The critical facility analysis revealed that there are two critical facilities located in the floodplain. (Please note, as previously indicated, this analysis does not consider building elevation, which may negate risk.) Both of these facilities are transportation infrastructure located in the 1.0 percent annual chance flood zone. A list of specific critical facilities and their associated risk can be found in Table A.45 at the end of this subsection.

In conclusion, a flood has the potential to impact many existing and future buildings, facilities, and populations in Adams County, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. Such site-specific vulnerability determinations are outside the scope of this assessment but may be considered during future updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

WILDFIRE

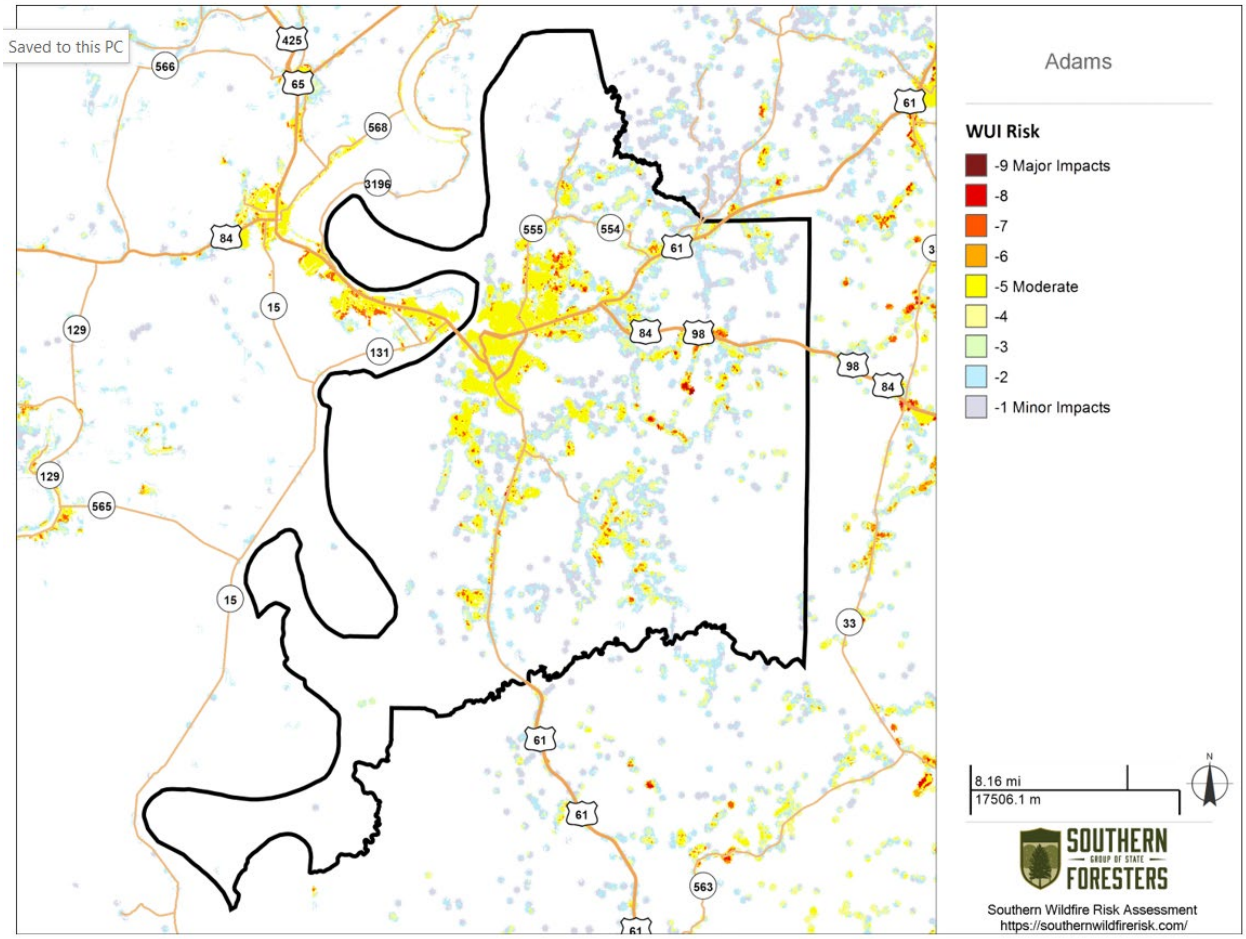
[77] Federal Emergency Management Agency DFIRM; United States Census Bureau, 2010 Census (Population density remained unchanged for this plan update.)

Although historical evidence indicates that Adams County is susceptible to wildfire events, there are few reports which include information on historic dollar losses. Therefore, it is difficult to calculate a reliable annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result in significant damage throughout the county.

To estimate exposure to wildfire, building data was obtained from Hazus-MH 5.1 which includes information that has been aggregated at the census block level and which has been deemed useful for analyzing wildfire vulnerability. However, it should be noted that the accuracy of Hazus data is somewhat lower than that of parcel data. For the critical facility analysis, areas of concern were intersected with critical facility locations.

Figure A.23 shows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). Figure A.24 shows the areas of analysis where any grid cell is less than -4. Areas with a value below -4 were chosen to be displayed as areas of risk because this showed the upper echelon of the scale and the areas at highest risk.

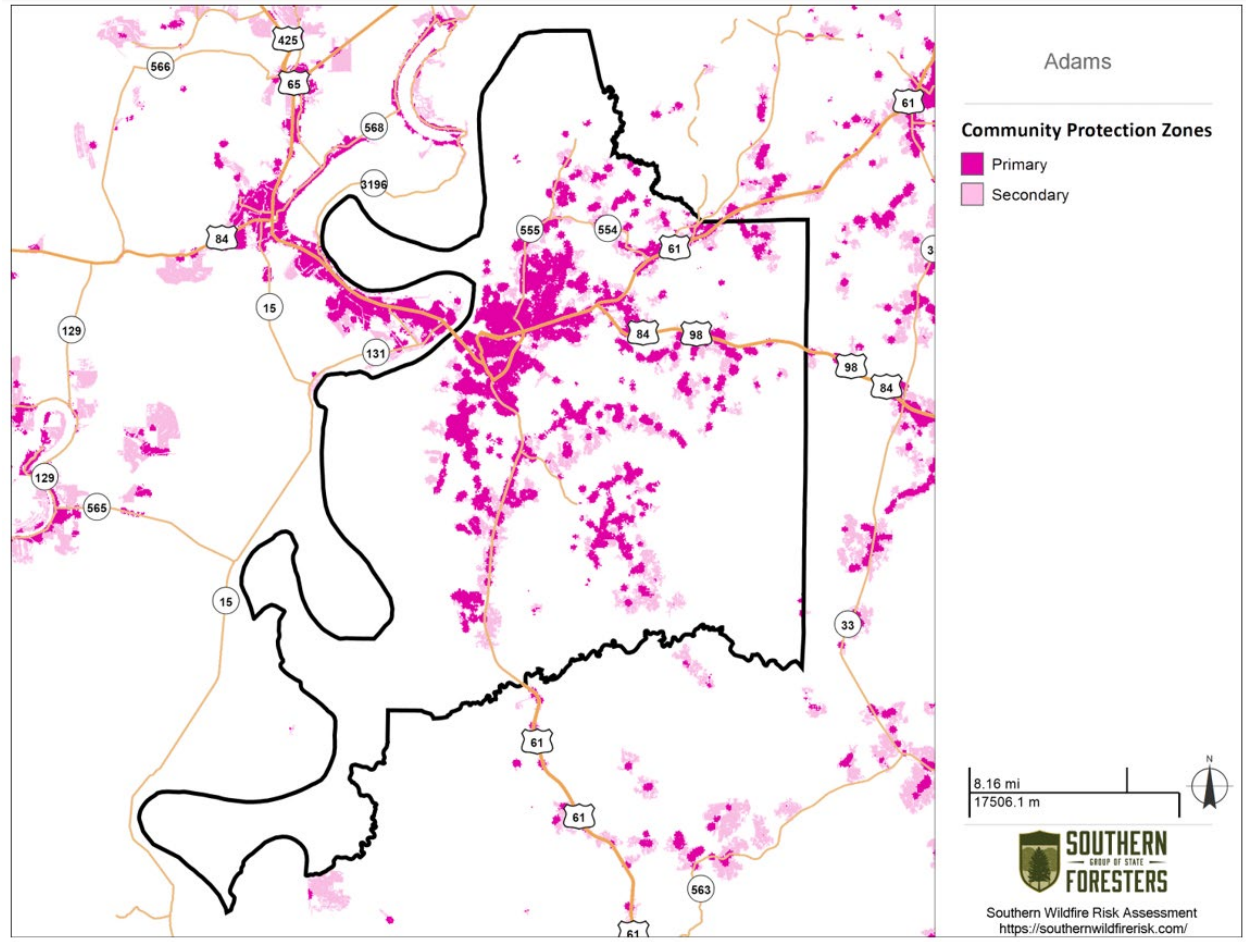
FIGURE A.25 WUI RISK INDEX AREAS IN ADAMS COUNTY [78]



Community Protection Zones (CPZ) represent those areas considered highest priority for mitigation planning activities. CPZs are based on an analysis of the Where People Live housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ.

[78] Source: Southern Wildfire Risk Assessment Data

FIGURE A.26: WILDFIRE COMMUNITY PROTECTION ZONES[79]



Social Vulnerability

Given some level of susceptibility across the entire county, it is assumed that the total population is at risk to the wildfire hazard. The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk of wildfire. For the Adams County Wildfire Risk project area, it is estimated that 31,242 people or 96.8 % percent of the total project area population (32,279) live within the WUI.[80]

Critical Facilities

The critical facility analysis revealed that there are 18 critical facilities located in wildfire areas of concern, including 5 fire stations, 3 medical care facilities, 1 police station, and 9 schools. It should be noted that several factors could impact the spread of a wildfire putting all facilities at risk. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

[79] Southern Wildfire Risk Assessment Data
[80] Southern Wildfire Risk Assessment Data

In conclusion, a wildfire event has the potential to impact many existing and future buildings, critical facilities, and populations in Adams County.

EARTHQUAKE

As the Hazus-MH model suggests below, and historical occurrences confirm, any significant earthquake activity in the area is likely to inflict minor damage to the county. Hazus-MH 5.1 estimates a total annualized loss of $5,000 which includes structural and non-structural damage to buildings, contents, and inventory throughout the county.

For the earthquake hazard vulnerability assessment, a probabilistic 100-year earthquake scenario was created at the MEMA District 7 regional level to estimate the average annualized loss for the county. The results of the analysis are generated at the census tract level within Hazus-MH and then aggregated to the county level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss. They do not include losses to business interruption, lost income, or relocation.

The geographical size of the region is 4,838.70 square miles and contains 38 census tracts. There are over 67,000 households in the region which has a total population of 174,795 people (2010 Census Bureau data). There are an estimated 82,000 buildings in the region with a total building replacement value (excluding contents) of $13.9 billion dollars. Approximately 92.00 % of the buildings (and 70.00% of the building value) are associated with residential housing.

Social Vulnerability

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodation in temporary public shelters. The model estimates 0 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 174,795) will seek temporary shelter in public shelters.

Critical Facilities

The Hazus-MH probabilistic analysis did not indicate that any critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor to moderate damage should an event occur. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in Adams County. Specific vulnerabilities for these assets will be greatly dependent on their individual design and the mitigation measures in place. Such site-specific vulnerability determinations are outside the scope of this assessment but may be considered during future updates. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While Adams County may not experience a catastrophic earthquake, localized damage is possible with a moderate to larger scale occurrence.

HURRICANE AND TROPICAL STORM

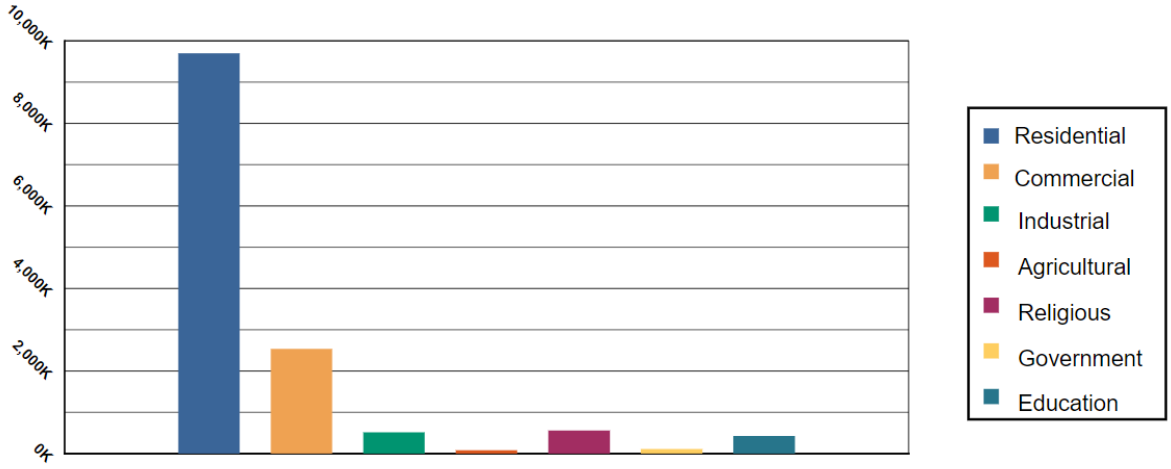
Historical evidence indicates that Adams County has significant risk to the hurricane and tropical storm hazard. There have been five disaster declarations due to hurricanes as noted in pervious sections. Several tracks have come near or traversed through the county, as shown and discussed in Section

A.2.10. Hazus- MH 5.1 estimates a total annualized loss of $258,000 which includes buildings, contents, and inventory throughout the county.

Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard. Hazus-MH 5.1 was used to determine average annualized losses31 for the county as shown below in Table A.42. Only losses to buildings, inventory, and contents are included in the results.

HAZUS was utilized to perform a 100-year hurricane simulation. Hazus estimates that there are 82,485 buildings in the region which have an aggregate total replacement value of $13 billion dollars.

FIGURE A.36: BUILDING EXPOSURE BY OCCUPANCY TYPE[81]



Social Vulnerability

Given some equal susceptibility across the entire county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard.

Critical Facilities

Given equal vulnerability across Adams County, all critical facilities are considered to be at risk. Some buildings may perform better than others in the face of such an event due to construction and age, among other factors. Determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation action for especially vulnerable structures and/or critical facilities to mitigate against the effects of the hurricane hazard. A list of specific critical facilities can be found in Table A.45 at the end of this subsection.

In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in Adams County.

[81] HAZUS 100-year Hurricane Scenario

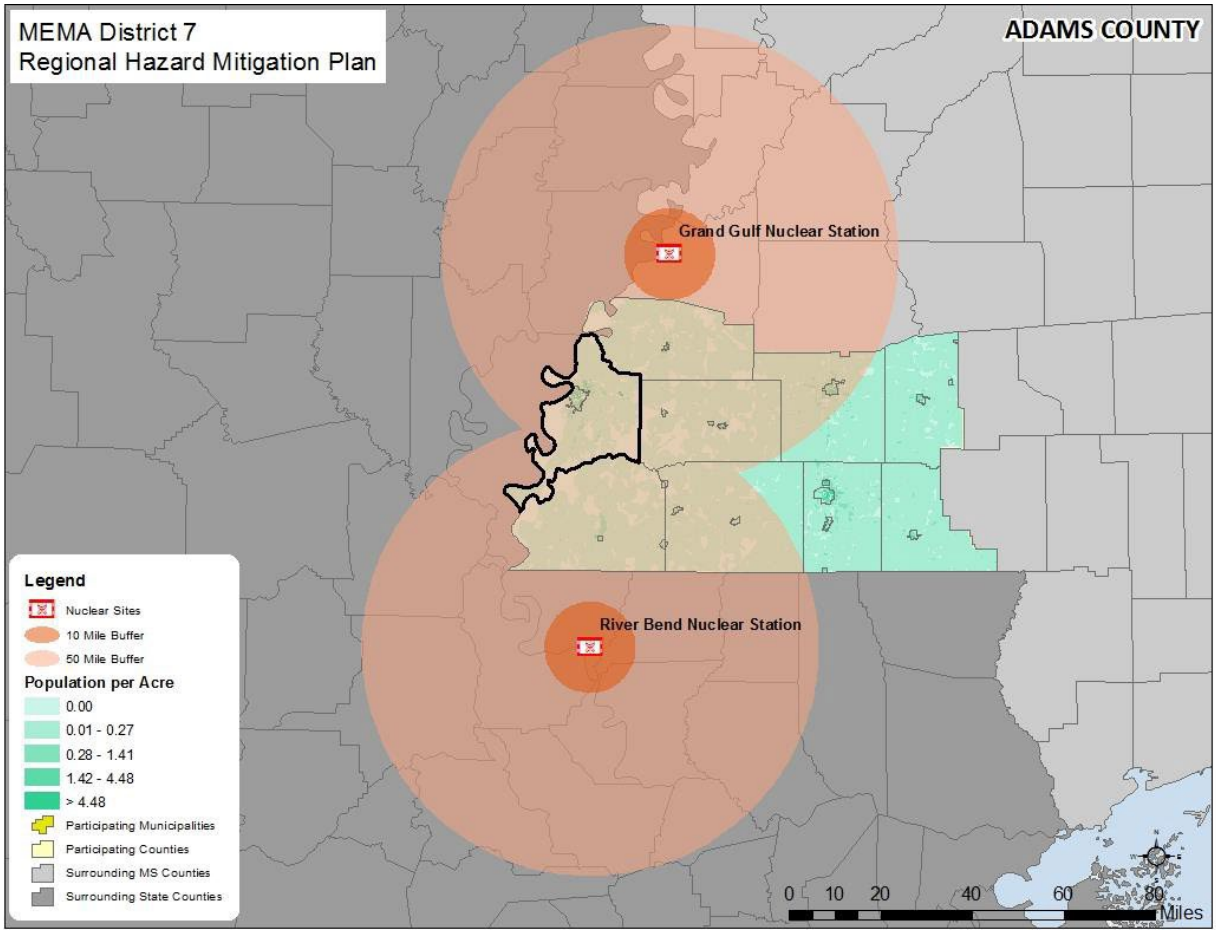
RADIOLOGICAL EVENT

The location of Grand Gulf and River Bend Nuclear Stations north and south of the region, respectively, demonstrate that the county is at some risk to the effects of a nuclear accident. Although there have not been any major events at these plants in the past, there have been major events at other nuclear stations around the country. Additionally, smaller scale incidents at both these nuclear stations have occurred.

Social Vulnerability

Since the entire county is within the 50-mile buffer area, the entire population is at high risk of a radiological event. This risk can be seen below.

FIGURE A.27: POPULATION DENSITY NEAR NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN ADAMS COUNTY[82]



Source: International Atomic Energy Agency; United States Census Bureau, 2010 Census

Critical Facilities

[82] International Atomic Energy Agency; United States Census Bureau, 2010 Census. Information remains unchanged since last plan update.

The critical facility analysis revealed that all 44 critical facilities in the county are in the 50- mile nuclear buffer area, including 1 EOC, 8 fire stations, 1 government/public building, 9 medical care facilities, 2 police stations, 2 private sector buildings, 17 schools, and 3 transportation infrastructure.
No critical facilities are in the 10-mile buffer area. A list of specific critical facilities and their associated risk can be found at the end of this section.

In conclusion, a nuclear accident has the potential to impact many existing and future buildings, facilities, and populations in Adams County.

CONCLUSIONS ON HAZARD VULNERABILITY

The table below presents a summary of annualized loss for each hazard in Adams County. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

TABLE A.367: ANNUALIZED LOSS FOR ADAMS COUNTY[83]

Event	Adams County
Flood-related Hazards	
Dam & Levee Failure	Negligible
Erosion	Negligible
Flood	$169,200
Fire-related Hazards	
Drought	Negligible
Lightning	$5,923
Wildfire	Negligible
Geologic Hazards	
Earthquake[84]	
Temperature & Wind-related Hazards	
Extreme Heat	Negligible
Hailstorms	$3,278
Hurricane & Tropical Storm	$5,286,250
Severe Thunderstorm/High Wind	$538,769
Tornado	$97,309
Winter Storm & Freeze	$74,538
Other Hazards	
Radiological Event	Negligible
Pandemic	Negligible

[83] "Negligible" is used to indicate that no records of dollar losses for the particular hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that particular type of event is not well kept.
[84] No historic losses for earthquake were recorded, so Hazus estimates for annualized loss were used.

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to atmospheric hazards including drought, lightning, extreme heat, hailstorm, hurricane and tropical storm, severe thunderstorm/high wind, tornado, and winter storm and freeze. Some buildings may be more vulnerable to these hazards based on other factors such as construction and building type. The following table shows the critical facilities vulnerable to the hazards analyzed in this section. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "X").

TABLE A.38: AT-RISK CRITICAL FACILITIES IN ADAMS COUNTY

		FLOOD-RELATED				FIRE-RELATED			GEO	WIND-RELATED						HUM	
FACILITY NAME	FACILITY TYPE	Dam and Levee Failure	Erosion	Flood – 100 yr	Flood – 500 yr	Drought	Lightning	Wildfire	Earthquake	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Severe Thunderstorm/	Tornado	Winter Storm and Freeze	Radiological Event 10-mile area	Radiological Event 50-mile area
Adams County																	
Adams County EOC	EOC		X			X	X		X	X	X	X	X	X	X		X
Foster Mound Volunteer Fire Department	Fire Station		X			X	X		X	X	X	X	X	X	X		X
Kingston Volunteer Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		X
Lake Montrose Volunteer Fire Department	Fire Station		X			X	X		X	X	X	X	X	X	X		X
Liberty Road Volunteer Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		X
Natchez Fire Department #1	Fire Station		X			X	X		X	X	X	X	X	X	X		X
Natchez Fire Department #2	Fire Station		X			X	X	X	X	X	X	X	X	X	X		X
Natchez Fire Department #3	Fire Station		X			X	X	X	X	X	X	X	X	X	X		X
Natchez Fire Department #4	Fire Station		X			X	X	X	X	X	X	X	X	X	X		X
Adams County Community Safe Room	Government/Public		X			X	X		X	X	X	X	X	X	X		X
Adams County Nursing Home	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
Doctors Pavilion	Medical Care		X			X	X		X	X	X	X	X	X	X		X
Glenburney Nursing Home	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
Jefferson Comprehensive Health	Medical Care		X			X	X		X	X	X	X	X	X	X		X
Magnolia House	Medical Care		X			X	X		X	X	X	X	X	X	X		X
Merit Health Natchez	Medical Care		X			X	X		X	X	X	X	X	X	X		X
Miss-Lou Rural Health	Medical Care		X			X	X		X	X	X	X	X	X	X		X

		FLOOD-RELATED				FIRE-RELATED			GEO	WIND-RELATED						HUM	
FACILITY NAME	FACILITY TYPE	Dam and Levee Failure	Erosion	Flood – 100 yr	Flood – 500 yr	Drought	Lightning	Wildfire	Earthquake	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Severe Thunderstorm/	Tornado	Winter Storm and Freeze	Radiological Event 10-mile area	Radiological Event 50-mile area
Natchez Rehabilitation Healthcare Center	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
Adams County Sheriff's Office	Police Station		X			X	X		X	X	X	X	X	X	X		X
Natchez Police Department	Police Station		X			X	X	X	X	X	X	X	X	X	X		X
MS River Corp	Private Sector		X			X	X		X	X	X	X	X	X	X		X
Natchez-Adams County Port Industrial Park	Private Sector		X			X	X		X	X	X	X	X	X	X		X
Adams County Christian School	School		X			X	X		X	X	X	X	X	X	X		X
Adams County Life Skills	School		X			X	X	X	X	X	X	X	X	X	X		X
Alcorn State University	School		X			X	X		X	X	X	X	X	X	X		X
Cathedral School	School		X			X	X	X	X	X	X	X	X	X	X		X
Co-Lin Community College	School		X			X	X		X	X	X	X	X	X	X		X
Fallin Career and Tech Center	School		X			X	X		X	X	X	X	X	X	X		X
McLaurin Elementary School	School		X			X	X	X	X	X	X	X	X	X	X		X
Morganton Arts Academy	School		X			X	X		X	X	X	X	X	X	X		X
Morganton Elementary School	School		X			X	X		X	X	X	X	X	X	X		X
Natchez-Adams School District	School		X			X	X	X	X	X	X	X	X	X	X		X
Natchez Freshman Academy	School		X			X	X		X	X	X	X	X	X	X		X
Natchez High School	School		X			X	X		X	X	X	X	X	X	X		X
Robert Lewis Middle School	School		X			X	X	X	X	X	X	X	X	X	X		X
West Primary School	School		X			X	X	X	X	X	X	X	X	X	X		X
Mississippi River Bridge	Transportation		X	X		X	X		X	X	X	X	X	X	X		X

		FLOOD-RELATED				FIRE-RELATED			GEO	WIND-RELATED						HUM	
FACILITY NAME	FACILITY TYPE	Dam and Levee Failure	Erosion	Flood – 100 yr	Flood – 500 yr	Drought	Lightning	Wildfire	Earthquake	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Severe Thunderstorm/	Tornado	Winter Storm and Freeze	Radiological Event 10-mile area	Radiological Event 50-mile area
Natchez-Adams County Airport (Hardy-Anders Field)	Transportation		X			X	X		X	X	X	X	X	X	X		X
Natchez-Adams County Port	Transportation		X	X		X	X		X	X	X	X	X	X	X		X

A.4 ADAMS COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Adams County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in Section 7: *Capability Assessment*.

A.4.1 Planning and Regulatory Capability

The table below provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Adams County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. A dagger (†) indicates that the given item is administered for that municipality by the county. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the MEMA District 7 Regional Hazard Mitigation Plan.

TABLE A.39: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Threat and Hazard Identification and Risk Assessment (THIRA)	Comprehensive Land Use Plan	Floodplain Management Plan/Flood Mitigation Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Emergency Management Accreditation Program (EMAP Accreditation)	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment/ Reconstruction Plan/ Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System (CRS Program)
ADAMS COUNTY	✓	✓		✓					✓		✓	✓	✓		✓		✓							✓	
Natchez	†		✓	✓					†		✓	✓	✓		†	✓	✓	✓	✓			✓	✓	✓	

A more detailed discussion on the county's planning and regulatory capabilities follows.

EMERGENCY MANAGEMENT

Hazard Mitigation Plan

Adams County has previously adopted a hazard mitigation plan. The City of Natchez was also included in this plan.

Emergency Operations Plan

Adams County maintains an emergency operations plan through its Emergency Management Agency. The City of Natchez is also covered by this plan.

GENERAL PLANNING

Comprehensive Land Use Plan
The City of Natchez and a portion of the surrounding Adams County have adopted a comprehensive plan.

Historic Preservation Plan
None of the jurisdictions in Adams County has a historic preservation plan. However, the City of Natchez has adopted a historic preservation ordinance.

Zoning Ordinance
The City of Natchez is the only jurisdiction in Adams County that has adopted a zoning ordinance.

Subdivision Ordinance
The City of Natchez is the only jurisdiction in Adams County that has adopted a subdivision ordinance.

Building Codes, Permitting, and Inspections
The City of Natchez is the only jurisdiction in Adams County that has adopted a building code.

FLOODPLAIN MANAGEMENT

The table below provides NFIP policy and claim information for each participating jurisdiction in Adams County.

TABLE A.4037: NFIP POLICY AND CLAIM INFORMATION

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force^	Closed Claims	Total Payments to Date
ADAMS COUNTY†	09/29/89	06/16/11	0	$6,322,400^	38	$219,723.72
Natchez	06/01/78	06/16/11	29	$9,803,100^	10	$137,199.98

†Includes unincorporated areas of county only
^last available data 2017
Source: NFIP Community Status information as of 7/2/2023; NFIP claims and policy information as of 7/2/2023

All jurisdictions listed above that are participants in the NFIP will continue to comply with all required provisions of the program and will work to adequately comply in the future utilizing a number of strategies. For example, the jurisdictions will coordinate with MEMA and FEMA to develop maps and regulations related to special flood hazard areas within their jurisdictional boundaries and, through a consistent monitoring process, will design and improve their floodplain management program in a way that reduces the risk of flooding to people and property.

Flood Damage Prevention Ordinance

All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. Adams County and the City of Natchez both participate in the NFIP and have adopted flood damage prevention regulations.

A.4.2 Administrative and Technical Capability

The table below provides a summary of the capability assessment results for Adams County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill. A dagger (†) indicates a county-level staff member(s) provides the specified knowledge or skill to that municipality.

TABLE A.41: RELEVANT STAFF/PERSONNEL RESOURCES

Staff/Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
ADAMS COUNTY	✓	✓		✓	✓		✓	✓	✓	✓
Natchez	✓	✓		†	✓		†	†	†	✓

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

A.4.3 Fiscal Capability

The following table provides a summary of the results for Adams County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource has previously been used to implement hazard mitigation actions. A dagger (†) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds).

TABLE A.382: RELEVANT FISCAL RESOURCES

Fiscal Tool/Resource	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes (or taxing districts)	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other: FEMA Hazard Mitigation Grants, Homeland Security Grants, USDA Rural Development Agency Grants, and US Economic Development Administration Grants
ADAMS COUNTY		†							✓	✓
Natchez		✓			✓		✓		†	✓

A.4.4 Political Capability

During the months immediately following a disaster, local public opinion in Adams County is more likely to shift in support of hazard mitigation efforts.

The table below provides a summary of the results for Adams County with regard to political capability. A checkmark (✓) indicates the expected degree of political support by local elected officials in terms of adopting/funding information.

TABLE A.393: LOCAL POLITICAL SUPPORT

Political Support	Limited	Moderate	High
ADAMS COUNTY			✓
Natchez			✓

A.4.5 Conclusions on Local Capability

The following table shows the results of the capability assessment using the designed scoring methodology described in Section 7: *Capability Assessment*. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. This information was reviewed by all jurisdictions and each jurisdiction provided feedback on the information included in the capability assessment. Local government input was vital to identifying capabilities. According to the assessment, the average local capability score for the county and its jurisdictions is 29.5, which falls into the moderate capability ranking.

TABLE A.44: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
ADAMS COUNTY	26	Moderate
Natchez	33	Moderate

A.5 ADAMS COUNTY MITIGATION STRATEGY

This subsection provides the blueprint for Adams County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and the findings and conclusions of the capability assessment and risk assessment. In addition, this strategy was developed with the State Hazard Mitigation Plan Goals and Objectives in mind. For this update, each action identifies the State Hazard Mitigation Program Objective that it relates to. Additional Information can be found in Section 8: Mitigation Strategy and Section 9: Mitigation Action Plan.

A.5.1 Mitigation Goals

Adams County developed six mitigation goals in coordination with the other participating MEMA District 7 Region jurisdictions. The regional mitigation goals are below.

TABLE A.45: MEMA DISTRICT 7 REGIONAL MITIGATION GOALS

	Goal
Goal #1	Increase the overall public awareness of natural hazards that face the region.
Goal #2	Retrofit of critical facilities and/or critical infrastructure to lower the risk of damage from natural hazards.
Goal #3	General improvement of regional or local mitigation planning and capability.
Goal #4	Support State Identified Mitigation Initiatives such as saferooms and storm shelters, severe weather warning systems for universities and colleges, and severe weather notification systems for local communities.
Goal #5	Reduce loss of life, damage and loss of property and infrastructure, economic costs, including response, recovery and disruption of economic activity.
Goal #6	Foster cooperation among all levels of governments and the private sector with respect to improving, updating, and implementing the hazard mitigation plan.

A.5.2 Mitigation Action Plan

The mitigation actions proposed by Adams County and the City of Natchez are listed in the following individual Mitigation Action Plans.

Adams County Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implement Sched.	Implementation Status (2023)
Prevention								
P-1	2.2	**Comprehensive Land Use and Long-Term Recovery Planning –** The City of Natchez and a portion of the surrounding Adams County have a Comprehensive Plan. This plan should be reviewed and updated if necessary, in light of the Hurricane Katrina and Rita disasters. The remaining portion of Adams County not covered by this plan should be included.	Hurricane or other hazard	Medium	Adams County Board of Supervisors/ City of Natchez Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2027	Ongoing project, priority reduced to medium. The Adams County Board of Supervisors/City of Natchez Board of Aldermen and Mayor recognize that comprehensive land use planning yields many benefits for both the county and city. The existence of a Comprehensive Plan enables a county or municipality to institute zoning ordinances to regulate new development and protect or upgrade existing development and it provides a solid basis to establish stronger building codes. Many of the goals of Long-Term Recovery Planning and Comprehensive Planning are one and the same. Although Natchez has adopted a Comprehensive Plan, the county has not developed a Comprehensive Plan. Therefore, this action will remain in the plan.

P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	Adams County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	Completed	Project was completed in 2020.
P-3	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist counties with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as counties develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Adams County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2025	Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.
P-5	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Adams County Board of Supervisors/ City of Natchez	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Adams County Board of Supervisors/ City of Natchez should seek to	Hurricane, Tornado or other wind	High	Adams County Board of Supervisors/ City	Homeland Security grants, USDA Rural	Completed	Project was completed in 2022.

		retrofit all essential government buildings to increase their resistance to the effects of high winds.	related hazard		of Natchez	Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds		
Natural Resource Protection								
NRP-1	1.6	**Bank Stabilization –** Prevent bank erosion through sloping or grading techniques, planting vegetation on slopes, terracing, or installing riprap boulders or geotextile fabric and prohibiting removal of natural vegetation from stream banks.	Erosion, Flood	High	Adams County Board of Supervisors/ City of Natchez Board of Aldermen and Mayor	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2026	New Action.
Structural Projects								
SP-1	1.1	**Renovate Underground Drainage Structure** – The Adams County Board of Supervisors/City of Natchez Board of Aldermen and Mayor intends to reconstruct this entire underground drainage structure to protect current structures and access to this vital area and allow for continued growth.	Flood	High	Adams County Board of Supervisors/ City of Natchez Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2027	Project was reopened after additional damage was discovered. Within the City of Natchez in the area north of Madison Street, deterioration of old underground drainage structures threatens a vital historic area of Natchez. Additionally, failure of the underground drainage structures would close streets preventing residents, businesses and emergency vehicles access during times of distress. Also, many historic sites in the immediate area which is drained by the underground structure would be

								more susceptible to flooding. The City of Natchez secured funding through the Corps of Engineers and CDBG for this project. Phase 1 and Phase 2 of the project are now completed.
SP-2	1.1	**Improve Surface Drainage –** Improve the surface drainage through a combination of culverts and enlarged drainage ditches to allow floodwaters to run off without causing problems.	Flood	High	Adams County Board of Supervisors/ City of Natchez Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2027	Storm water runoff during intense storm events is flooding the roadway and 6 homes in the Liberty Road at Passback Drive area. In addition to the obvious damage to the roadway and homes, the floodwaters on the roadway make it impassable for emergency vehicles. The county completed the above project and also received funding from the Mississippi Development Authority to also improve drainage areas on Kingston Road, Cloverdale Road and in the Pineview/Grafton Heights neighborhoods. Project work was completed but additional damage was discovered. Action would have been marked complete, except for the additional work now planned.
SP-3		**Upsize culverts –** Determine the recommended culvert diameter based on calculated design stream flow and headwater depth (headwall/diameter) ratio.	Flood	High	Adams County Board of Supervisors/ City of Natchez Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2027	New Action. Areas will be targeted based on the Roads Manager List.
SP-4	1.9	**Harden the Electrical Grid –** Adams County will encourage and support local energy providers in assessing potential risks in the electric grid and taking strategic actions to proactively mitigate those risks, harden key infrastructure, and protect utility customers from outages.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, Lightning, or other hazard	High	Adams County Board of Supervisors/ City of Natchez	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action.

			leading to loss of electrical power					
SP-5	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm	High	Adams County Board of Supervisors/ City of Natchez	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2027	New Action.
Emergency Services								
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, Lightning, or other hazard leading to loss of electrical power	High	Adams County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	Completed	Completed in 2021. Six permanent generators were installed, and two mobile generators were purchased for their water treatment facilities.
ES-3	1.8	**Improve Emergency Communications –** Purchase a satellite phone system to ensure communications capabilities are unimpeded during natural disasters even if traditional communications systems fail.	Hurricane or other hazard leading to loss of traditional communications systems	N/A	N/A	N/A	Deleted	This action does not meet the County's needs. It has been deleted.
ES-5	1.3	**Construction of new Emergency Operations Center –** The EOC should construct a new one of sufficient size to house all EOC staff and equipment, including Search and Rescue and Hazmat. The E911 dispatch center should also be housed in the new building.	Hurricane or other hazard requiring action from the EOC	High	Adams County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development	2026	This action was marked for deletion in the last update in error. The current EOC is outdated, undersized, and not ADA compliant. In its current state, it cannot support day-to-day and emergency operations.

						Administration grants, individual county general and special funds		
ES-8	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Adams County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2027	New Action.
ES-9	1.4	**Lightning Early Detection System** –A lightning warning system is a system that alerts you about potential lightning strikes at a specific location. The lightning warning system is based on measurements of electric fields. If detected, alert via the lightning alert app will notify the Adams County EMA of the coming storm.	Lightning	High	Adams County Board of Supervisors	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	New Action.

ES-10	1.1	**Cooling Shelters** – Establish procedures to establish an air-conditioned public space set up by local authorities to temporarily deal with the health effects of extreme heat weather conditions. Cooling centers provide shade, water, and restrooms; medical attention and referrals to social services may also be offered.	Extreme Heat	Moderate	Adams County Board of Supervisors	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	New Action.
ES-11	1.1	**Warming Shelters -** Establish procedures to establish a short-term emergency shelter that operates when temperatures or a combination of precipitation, wind chill, wind and temperature become dangerously inclement.	Winter Storm, Freeze, and Extreme Cold, Severe Thunderstorm/High Wind,	Low	Adams County Board of Supervisors	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	New Action.
ES-12		**Decontamination Drills -** Develop plans and procedures to be tested and practiced in exercises on a regular basis. Align with work done by with federal, state, local and international agencies to develop radiological emergency response plans and procedures.	Radiological	Low	Adams County Board of Supervisors	EPA grant programs, Individual County general and special funds	2027	New Action.

		Evacuee Assistance - Develop plans and procedures to be tested and practiced in exercises on a regular basis. Align with work done by with federal, state, local and international agencies to develop radiological emergency response plans and procedures.	Radiological	Low	Adams County Board of Supervisors	EPA grant programs, Individual County general and special funds	2027	New Action.
Public Education and Awareness								
PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	low	Adams County Board of Supervisors	Individual county general and special funds	In progress-2027	Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan. The County is interested in incorporating earthquake drills through the annual Great ShakeOut.
PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Adams County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	In progress – 2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP.
PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	Moderate	Adams County EMA, MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2027	There is a need for community outreach to both the general public and to the owners of high hazard dams concerning maintenance and Emergency Action Planning. It is important that the public and owners are aware of high hazard dams, so this action will remain in the plan.

PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	Moderate	Adams County EMA, MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2027	This remains ongoing. Emergency action plans are developed, exercised, and maintained by the individual dam owners. The MDEQ, Dam Safety Division is tasked to review the plans. Adams County will continue to support the outreach to high hazard and significant hazard dam owners, so this action will remain in the plan.
PEA-5	3.2	**Education: FireWise –** Recommend that public information and outreach workshops on the *Firewise* program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Adams County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, individual county general and special funds	2027	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in FireWise will improve communities' awareness of wildfire risk, so this action will remain in the plan.
PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	High	Adams County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.

PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	High	Adams County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Severe Thunderstorm/High Wind, Lightning	Moderate	Adams County Board of Supervisors/ City of Natchez	FEMA Hazard Mitigation grants, general and special funds	2025	New Action
PEA-9	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Adams County Board of Supervisors/ City of Natchez	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration	2024	New Action.

						(SAMHSA), general and special funds		
PEA-11	3.1	**Education: Public Outreach –** Develop a program to encourage school programs to incorporate the Great Shake Out	Earthquake	Low	Adams County Board of Supervisors/ City of Natchez	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.

City of Natchez Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implement Sched.	Implementation Status (2023)
Prevention								
P-1	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	Adams County Board of Supervisors/ City of Natchez	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	Completed	Project was completed in 2020.

P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist counties with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as counties develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Adams County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2025	Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.
P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Adams County Board of Supervisors/ City of Natchez	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
	Property Protection							
PP-1	1.1	**Elevate Lift Station –** Elevate the sanitary sewer lift station and controls by six feet.	Flood	High	City of Natchez Mayor and Board of Alderman/ Natchez Water Works	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants and Natchez Water Works	Completed	Project was completed in 2022.
PP-2	1.1	**Elevate Gravel Road** – Elevate the Gravel Road approximately five	Flood	High	City of Natchez Mayor and Board of Alderman	Homeland Security grants, USDA Rural Development	Completed	Project was completed in 2022.

		feet.				Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants and City General Fund		
Natural Resource Protection								
NRP-1	1.6	**Bank Stabilization –** Prevent bank erosion through sloping or grading techniques, planting vegetation on slopes, terracing, or installing riprap boulders or geotextile fabric and prohibiting removal of natural vegetation from stream banks.	Erosion, Flood	High	Adams County Board of Supervisors/ City of Natchez Board of Aldermen and Mayor	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, county general and special funds	2026	New Action.
Structural Projects								
SP-1	1.1	**Renovate Underground Drainage Structure** – The Adams County Board of Supervisors/City of Natchez Board of Aldermen and Mayor intends to reconstruct this entire underground drainage structure to protect current structures and access to this vital area and allow for continued growth.	Flood	High	Adams County Board of Supervisors/ City of Natchez Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2027	New Action. Not previously documented as a City Action. Project was reopened after additional damage was discovered. Within the City of Natchez in the area north of Madison Street, deterioration of old underground drainage structures threatens a vital historic area of Natchez. Additionally, failure of the underground drainage structures would close streets preventing residents, businesses and emergency vehicles access during times of distress. Also, many historic sites in the immediate area which is drained by the underground structure would be more susceptible to flooding. The City of Natchez secured funding through the Corps of Engineers and CDBG for this project. Phase 1 and Phase 2 of the project are now completed.

SP-2	1.1	**Improve Surface Drainage –** Improve the surface drainage through a combination of culverts and enlarged drainage ditches to allow floodwaters to run off without causing problems.	Flood	High	Adams County Board of Supervisors/ City of Natchez Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2027	New Action. Not previously documented as a City Action. Storm water runoff during intense storm events is flooding the roadway and 6 homes in the Liberty Road at Passback Drive area. In addition to the obvious damage to the roadway and homes, the floodwaters on the roadway make it impassable for emergency vehicles. The county completed the above project and also received funding from the Mississippi Development Authority to also improve drainage areas on Kingston Road, Cloverdale Road and in the Pineview/Grafton Heights neighborhoods. Project work was completed but additional damage was discovered. Action would have been marked complete, except for the additional work now planned.
SP-3		**Upsize culverts –** Determine the recommended culvert diameter based on calculated design stream flow and headwater depth (headwall/diameter) ratio.	Flood	High	Adams County Board of Supervisors/ City of Natchez Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2027	New Action. Areas will be targeted based on the Roads Manager List.
SP-4	1.9	**Harden the Electrical Grid –** Adams County will encourage and support local energy providers in assessing potential risks in the electric grid and taking strategic actions to proactively mitigate those risks, harden key infrastructure, and protect utility customers from outages.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, Lightning, or other hazard leading to loss of electrical power	High	Adams County Board of Supervisors/ City of Natchez	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action.

SP-5	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm	Moderate	Adams County Board of Supervisors/ City of Natchez	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2027	New Action.
Emergency Services								
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, Lightning, or other hazard leading to loss of electrical power	High	Adams County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	Completed	Completed in 2021. Six permanent generators were installed, and two mobile generators were purchased for their water treatment facilities.
ES-3	1.8	**Improve Emergency Communications –** Purchase a satellite phone system to ensure communications capabilities are unimpeded during natural disasters even if traditional communications systems fail.	Hurricane or other hazard leading to loss of traditional communications systems	N/A	N/A	N/A	Deleted	This action does not meet the County's needs. It has been deleted.
ES-5	1.9	**Safe Rooms and Community Shelters –** The city should construct and/or encourage construction of safe rooms and community shelters.	Hurricane, Tornado or other hazard requiring the use of emergency shelters	High	City of Natchez Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, city general and special funds	In progress - 2025	Although delayed, this action remains a priority for the City.

ES-6	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	City of Natchez Board of Aldermen and Mayor/ Adams County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2027	New Action.
ES-7	1.4	**Lightning Early Detection System** –A lightning warning system is a system that alerts you about potential lightning strikes at a specific location. The lightning warning system is based on measurements of electric fields. If detected, alert via the lightning alert app will notify the Pike County EMA of the coming storm.	Lightning	Moderate	City of Natchez Board of Aldermen and Mayor/ Adams County Board of Supervisors	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	New Action.

ES-8	1.1	**Cooling Shelters** – Establish procedures to establish an air-conditioned public space set up by local authorities to temporarily deal with the health effects of extreme heat weather conditions. Cooling centers provide shade, water, and restrooms; medical attention and referrals to social services may also be offered.	Extreme Heat	Moderate	City of Natchez Board of Aldermen and Mayor/ Adams County Board of Supervisors	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	New Action.
ES-9	1.1	**Warming Shelters -** Establish procedures to establish a short-term emergency shelter that operates when temperatures or a combination of precipitation, wind chill, wind and temperature become dangerously inclement.	Winter Storm, Freeze, and Extreme Cold, Severe Thunderstorm/High Wind,	Low	City of Natchez Board of Aldermen and Mayor/ Adams County Board of Supervisors	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	New Action.
ES-10		**Decontamination Drills -** Develop plans and procedures to be tested and practiced in exercises on a regular basis. Align with work done by with federal, state, local and international agencies to develop radiological emergency response plans and procedures.	Radiological	Low	City of Natchez Board of Aldermen and Mayor/ Adams County Board of Supervisors	EPA grant programs, Individual County general and special funds	2027	New Action.

		Evacuee Assistance - Develop plans and procedures to be tested and practiced in exercises on a regular basis. Align with work done by with federal, state, local and international agencies to develop radiological emergency response plans and procedures.	Radiological	Low	City of Natchez Board of Aldermen and Mayor/ Adams County Board of Supervisors	EPA grant programs, Individual County general and special funds	2027	New Action.
Public Education and Awareness								
PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Low	City of Natchez Board of Aldermen and Mayor/ Adams County Board of Supervisors	Individual county general and special funds	In progress-2027	Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan. The County is interested in incorporating earthquake drills through the annual Great ShakeOut.
PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	City of Natchez Board of Aldermen and Mayor/ Adams County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	In progress – 2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP.

PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	Moderate	City of Natchez Board of Aldermen and Mayor/ Adams County EMA, MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2027	There is a need for community outreach to both the general public and to the owners of high hazard dams concerning maintenance and Emergency Action Planning. It is important that the public and owners are aware of high hazard dams, so this action will remain in the plan.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	N/A	N/A	N/A	Deleted	This action is not applicable to the City. It has been deleted.
PEA-5	3.2	**Education: FireWise –** Recommend that public information and outreach workshops on the *Firewise* program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	City of Natchez Board of Aldermen and Mayor/ through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, individual county general and special funds	2027	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in FireWise will improve communities' awareness of wildfire risk, so this action will remain in the plan.
PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	High	City of Natchez Board of Aldermen and Mayor/ through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with county general and special funds	2027	Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.

PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	High	City of Natchez Board of Aldermen and Mayor/ through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Severe Thunderstorm/High Wind, Lightning	Moderate	Adams County Board of Supervisors/ City of Natchez	FEMA Hazard Mitigation grants, general and special funds	2025	New Action
PEA-9	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Adams County Board of Supervisors/ City of Natchez	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration	2024	New Action.

						(SAMHSA), general and special funds		
PEA-11	3.1	**Education: Public Outreach –** Develop a program to encourage school programs to incorporate the Great Shake Out	Earthquake	Low	Adams County Board of Supervisors/ City of Natchez	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.

AMITE COUNTY

This annex includes jurisdiction-specific information for Amite County and its participating municipalities. It consists of the following five subsections:

- B.1 Amite County Community Profile
- B.2 Amite County Risk Assessment
- B.3 Amite County Vulnerability Assessment
- B.4 Amite County Capability Assessment
- B.5 Amite County Mitigation Strategy

B.1 AMITE COUNTY COMMUNITY PROFILE

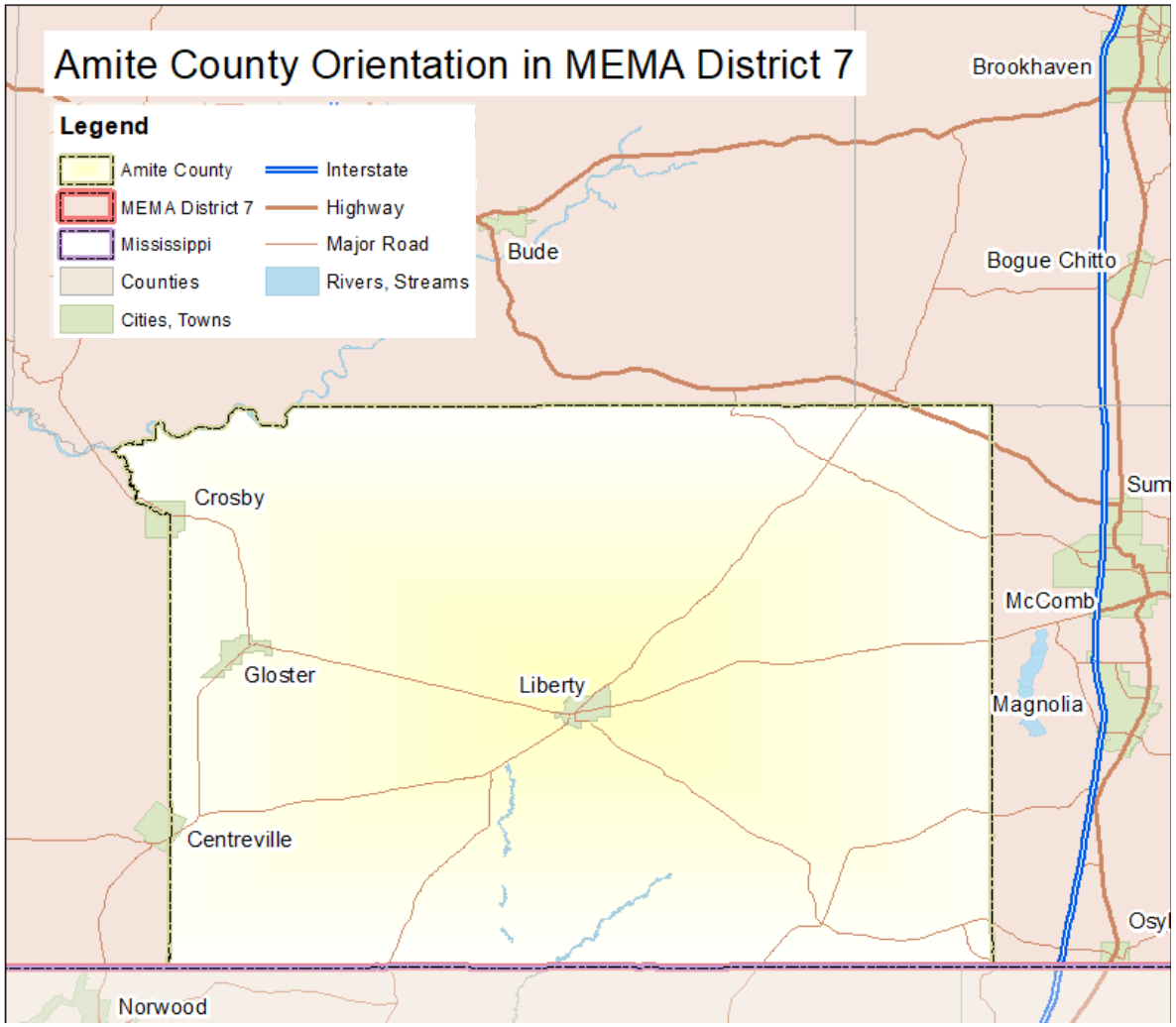
B.1.1 Geography and the Environment

Amite County is located in southwestern Mississippi. It comprises two towns, Town of Gloster and Town of Liberty, as well as many small unincorporated communities. An orientation map is provided in the figure below**.**

The county is located to the east of the Mississippi River supplying diverse recreational activities. The total area of the county is 732 square miles, 2 square miles of which is water area.

Amite County enjoys four distinct seasons but the climate in the region is generally hot and humid compared to the rest of the United States given its latitude and relative proximity to the Gulf Coast. Precipitation is generally highest in winter months when the temperatures are moderately lower, but the likelihood of precipitation remains relatively constant throughout the year. Summers in the region can become hot with average highs in the nineties and lows in the seventies. The region is also often susceptible to turbulent weather when warm, wet air from the Gulf of Mexico is pushed up into the region to mix with cooler air coming down from across the continent which can result in severe weather conditions. This is particularly true in the spring when seasons are changing, and diverse weather patterns interact.

FIGURE B.1: AMITE COUNTY ORIENTATION MAP



B.1.2 Population and Demographics

According to the 2020 Census, Amite County has a population of 12,270 people. The county continues to see a decrease in population since 2000. The population density is 16 people per square mile. Population counts from the U.S. Census Bureau for 2000, 2010, and 2020 for the county and participating jurisdictions are presented below.

TABLE B.1: POPULATION COUNTS FOR AMITE COUNTY[1]

Jurisdiction	2000 Census	2010 Census	2020 Census	% Change 2000 - 2020
Amite County	**13,599**	**13,131**	**12,270**	**-9.77%**
Gloster	1,073	960	897	-16.40%
Liberty	633	728	560	-11.53%

[1] U.S. Census Bureau

Based on the 2021 American Community Survey, the median age of residents of Amite County is 48 years. The racial characteristics of the county are presented in the table below. People identified as white make up the majority of the population in the county, accounting for 57.5% of the population.

TABLE B.2: DEMOGRAPHICS OF AMITE COUNTY[2]

Jurisdiction	White	Black or African American	American Indian or Alaska Native	Asian	Native Hawaiian or Other Pacific Islander	Other Race	Two or More Races	Persons of Hispanic Origin[3]
Amite County	**57.5%**	**40.8%**	**0.1%**	**0.1%**	**0.0%**	**0.2%**	**1.3%**	**0.1%**
Gloster	27.5%	71.9%	0.6%	0.0%	0.0%	0.0%	0.0%	0.6%
Liberty	63.1%	31.2%	0.2%	0.0%	0.0%	0.1%	5.3%	0.1%

B.1.3 Housing

According to the 2021 American Community Survey, there are 7,167 housing units in Amite County, the majority of which are single family homes or mobile homes. Housing information for the county and two municipalities is presented below.

TABLE B.3: HOUSING CHARACTERISTICS OF AMITE COUNTY[4]

Jurisdiction	Housing Units (2010)	Housing Units (2021)	Median Home Value (2017-2021)
Amite County	**6,635**	**7,167**	**$86,200**
Gloster	489	645	$81,600
Liberty	317	403	$89,100

B.1.4 Infrastructure

TRANSPORTATION

In Amite County, Mississippi Highway 33 and 24 provide access to the north and south and Mississippi Highway 48 provides access to the east and west.

Crosby Municipal Airport and McGehee Air Park Airport are both general aviation airports located in Amite County.

A major freight rail line operates within Amite County. The Gloster Southern Railroad is a Class III Local railway that operates and runs north to south along a portion of the western county border.

[2] 2021 American Community Survey

[3] Persons of Hispanic Origin may be of any race, so also are included in applicable race categories

[4] 2021 American Community Survey

UTILITIES[5]

Electrical power in Amite County is provided by Entergy Mississippi Inc., Magnolia Electric Power Association, Cooperative Energy, Southwest Mississippi Electric Power Association, and Demco Electric out of Louisiana.

Water and sewer service is provided by participating jurisdictions and/or community-based associations including Coles Community Water Association, Franklin County Water Association, Mary Springs Water Association, North Central Amite Water Association, North East Amite County Water Association, North Pike Water Association, Pine Street Water Association, Sixtown Water Association, Sunnyhill Water, and Wilk-Amite Water, but unincorporated areas often rely on septic systems and wells in Amite County.

Gas utility is provided by the City of Liberty and the Town of Gloster.

COMMUNITY FACILITIES

There are a number of buildings and community facilities located throughout Amite County. According to the data collected for the vulnerability assessment (*Section 6.4.1*), there are 9 fire stations, 3 police stations, and 7 schools located within the county.

There are also 1 hospital and 3 medical care facilities located in Amite County.

Museums based around the history and culture of the region are prevalent throughout the area. For example, the Jerry Clower Museum in Liberty chronicles the life and works of comedian Jerry Clower.

Recreational opportunities exist throughout Amite County. The Homochitto National Forest comprises almost 200,000 acres of land and is partially located in Amite County. Visitors can camp, hike, hunt, and fish in the forest.

The Mississippi River, which runs to the east of the county, has played an integral part in the history of the county. The river acted as a major conduit for trade in the 19th century as plantations produced large quantities of cotton that could be easily shipped down to ports such as New Orleans. Today, the river is still an important part of the local economy as products are shipped worldwide out of the Natchez port. Apart from the Mississippi River there are multiple water-based refuges, activities, and recreational features focused on local water bodies in the region. There are also numerous other small lakes, creeks, and other water bodies throughout the region that offer the outstanding outdoor recreational opportunities for which the region is known.

B.1.5 Land Use

Amite County has a blend of old and new development that contributes to physical, cultural, and economic attributes throughout the region. There are two incorporated municipalities located in the county. These areas are where the county's population is generally concentrated. The incorporated areas are also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the county generally consist of rural residential development, agricultural uses, and recreational areas. There are multiple county- and regional-based agencies that serve to coordinate growth and promote economic development. Local land use and associated regulations are further discussed in *Section 7: Capability Assessment*.

[5] Mississippi Public Utilities. Retrieved from: https://www.mpus.ms.gov/mpus/Amite

B.1.6 Employment and Industry

According to the U.S. Census Bureau's American Community Survey (ACS), in 2021, Amite County had an average annual employment of 10,370 workers and an average unemployment rate of 7.3[6] percent (compared to 5.3 percent for the state). In 2021, the Educational services, and health care and social assistance industry employed 22% of the county's workforce followed by Manufacturing (14%) and Transportation, Warehousing, and Utilities, (10%). The annual median household income in 2021 for Amite County was $31,367 compared to $48,716 in the state of Mississippi.[7]

[6] Mississippi Department of Employment Security. https://www.mdes.ms.gov/media/8735/urate.pdf
[7] American Community Survey 2021

B.2 AMITE COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in *Section 4: Hazard Identification* as they pertain to Amite County. Each hazard profile includes a description of the hazard's location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in *Section 5: Hazard Profiles*.

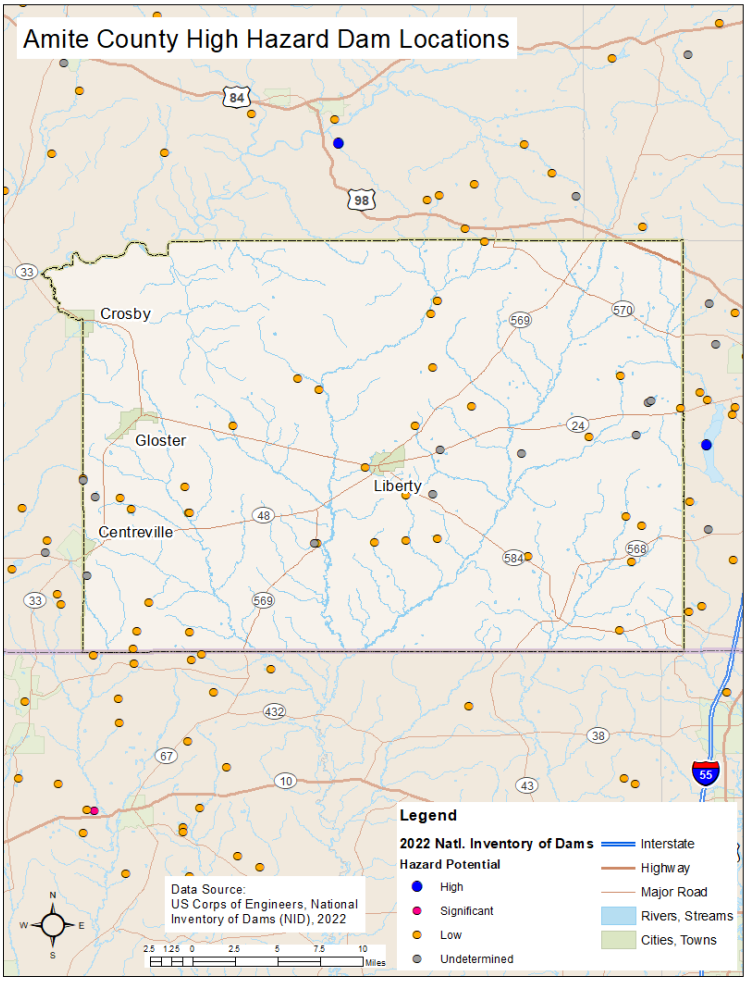
FLOOD-RELATED HAZARDS

B.2.1 Dam and Levee Failure

LOCATION AND SPATIAL EXTENT

According to the Mississippi Department of Environmental Quality, there are no high hazard dams in Amite County. The following map shows locations of dams in and around Amite County.

FIGURE B.2: AMITE COUNTY HIGH HAZARD DAM LOCATIONS[8]



[8] U.S. Army Corps of Engineers – National Inventory of Dams

HISTORICAL OCCURRENCES

According to the Mississippi State Hazard Mitigation Plan, there have been no dam failures reported in Amite County.

PROBABILITY OF FUTURE OCCURRENCES

Given the current dam inventory and historic data, a dam breach is unlikely (less than 1 percent annual probability) in the future. This hazard will not be considered a risk to the county.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[9] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Amite County. However, given the current dam inventory and lack of planned future dam projects, climate change impacts are unlikely.

B.2.2 Erosion

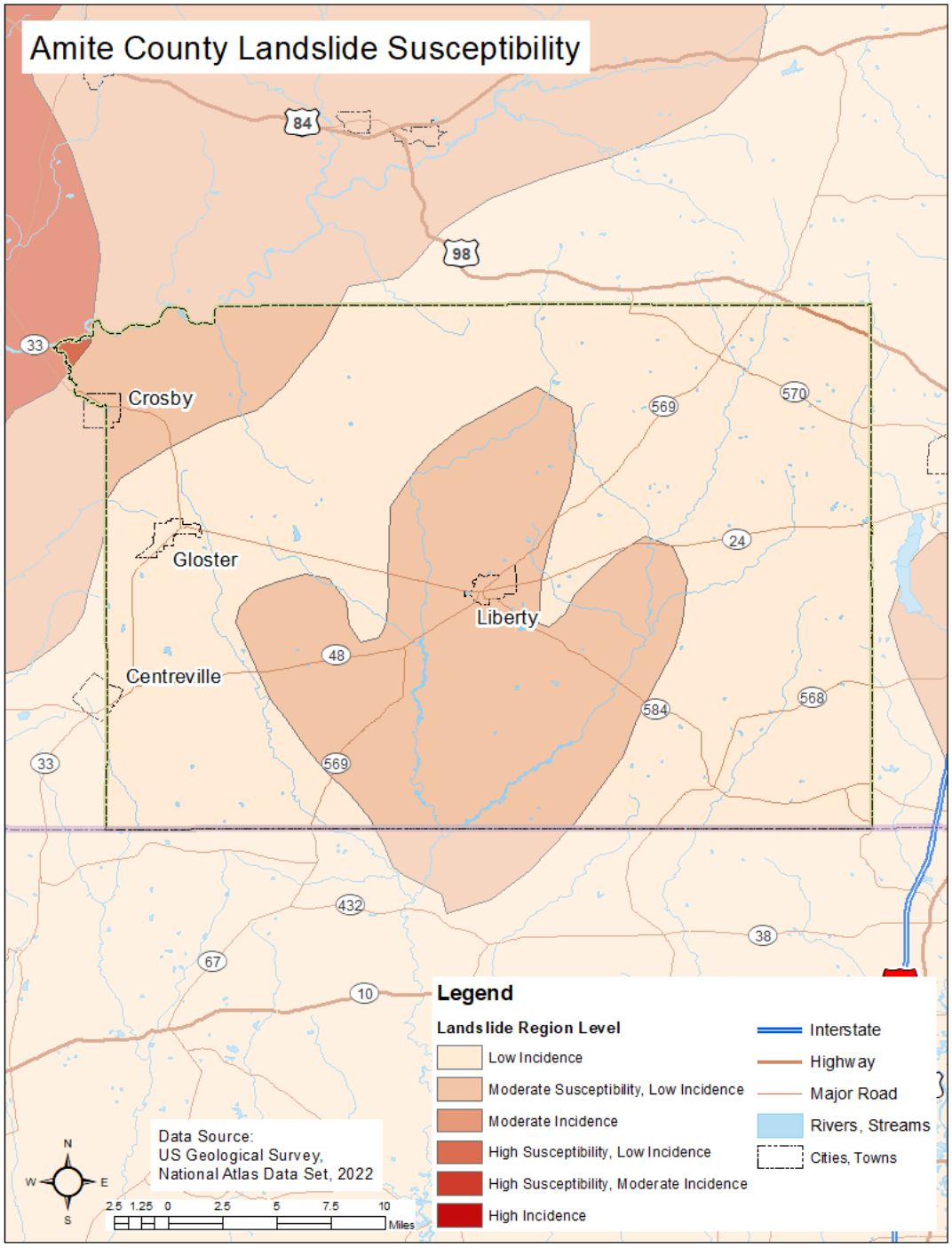
LOCATION AND SPATIAL EXTENT

Erosion in Amite County is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in Amite County are primarily rivers/streams and reservoirs. Generally, vegetation also helps to prevent erosion in the area, but in recent years, erosion has become a growing threat to many of the participating counties and jurisdictions.

Currently, there is no regional or state-level data available on localized areas of erosion, so it is a challenge to identify particularly prone areas on a wider geographic scale. However, a few areas of concern were reported by members of the hazard mitigation council and other local sources. Locations along the Mississippi River are known to be especially at-risk, but there are locations in many areas within the region where erosion is prominent. Although not comprehensive, the figure below is an effort to identify erosion hotspots in the county. These do not constitute a comprehensive analysis of soil erosion areas in the county but are simply anecdotal accounts of areas where erosion has occurred in the past.

[9] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

FIGURE B.3: AMITE COUNTY LANDSLIDE SUSCEPTIBILITY[10]



[10] Amite County Emergency Management

HISTORICAL OCCURRENCES

Several sources were vetted to identify areas of erosion in Amite County. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. The locations identified in the figure above are representative of areas where erosion has taken place in the past.

These incidents have caused major problems as bridges have become damaged in many instances and made unsafe for emergency services vehicles to cross during and after storm events. This delays response times and critical life-safety support. In addition, the shutdown of roads has hurt local communities economically as trade and commerce are temporarily shut down as bridges are repaired. It has also caused disruption to daily activities for local school boards who must re-route buses around affected areas, causing additional fuel resources to be expended and increasing drive times for students.

In 2016, a slow moving upper level low pressure system with a pool of very deep tropical moisture brought very heavy rainfall of 20 to 30 inches to parts of Southeast Louisiana and Southwest Mississippi from August 11th through August 13th. These very heavy rainfall totals led to widespread flash flooding and record river flooding across multiple parishes in Southeast Louisiana and Southwest Mississippi.

Record flooding[11] was observed in Amite/Comite River Basin, Tickfaw River Basin, Natalbany River Basin, and the Tangipahoa River Basin. The flooding led to interstate closures on both Interstate 10 and 12 for several days, and flooded thousands of homes and businesses across portions of the Baton Rouge and Hammond Metropolitan Areas. A final tally of the number of homes and businesses flooded has not been compiled but estimates range from 50,000 to 75,000 structures flooded from this event. The most widespread flooding impacted large portions of highly populated East Baton Rouge, Livingston, Ascension, and Tangipahoa Parishes.

The event also resulted in numerous water rescues and unfortunately there were 13 people killed from the flooding in the state. 12 of those deaths occurred in the Baton Rouge and Hammond areas[12]. An after effect was increased erosion due to the significant flooding.

PROBABILITY OF FUTURE OCCURRENCES

Erosion remains a natural, dynamic, and continuous process for Amite County, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annually).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[13] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Amite County. With increasing global surface temperatures, the possibility of more droughts and increased frequency

[11]The Weather Channel. Retrieved from: Over 26 Inches of Rain Triggers Record Flooding in the South, Including the Sabine River | The Weather Channel

[12] NOAA - August 2016 Record Flooding. Retrieved from: https://www.weather.gov/lix/August2016flood#:~:text=Record%20flooding%20was%20observed%20in%20Amite%2FComite%20River%20Basin%2C,of%20the%20Baton%20Rouge%20and%20Hammond%20Metropolitan%20Areas

[13] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

and intensity of storms will likely occur[14]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones. Both additional moisture and drying conditions can impact the rate of erosion, either by increasing the sediment transfer load due to volume and rate of flooding, or by dehydrating soils, limiting compaction, and increasing wind related erosion events.

B.2.3 Flood

LOCATION AND SPATIAL EXTENT

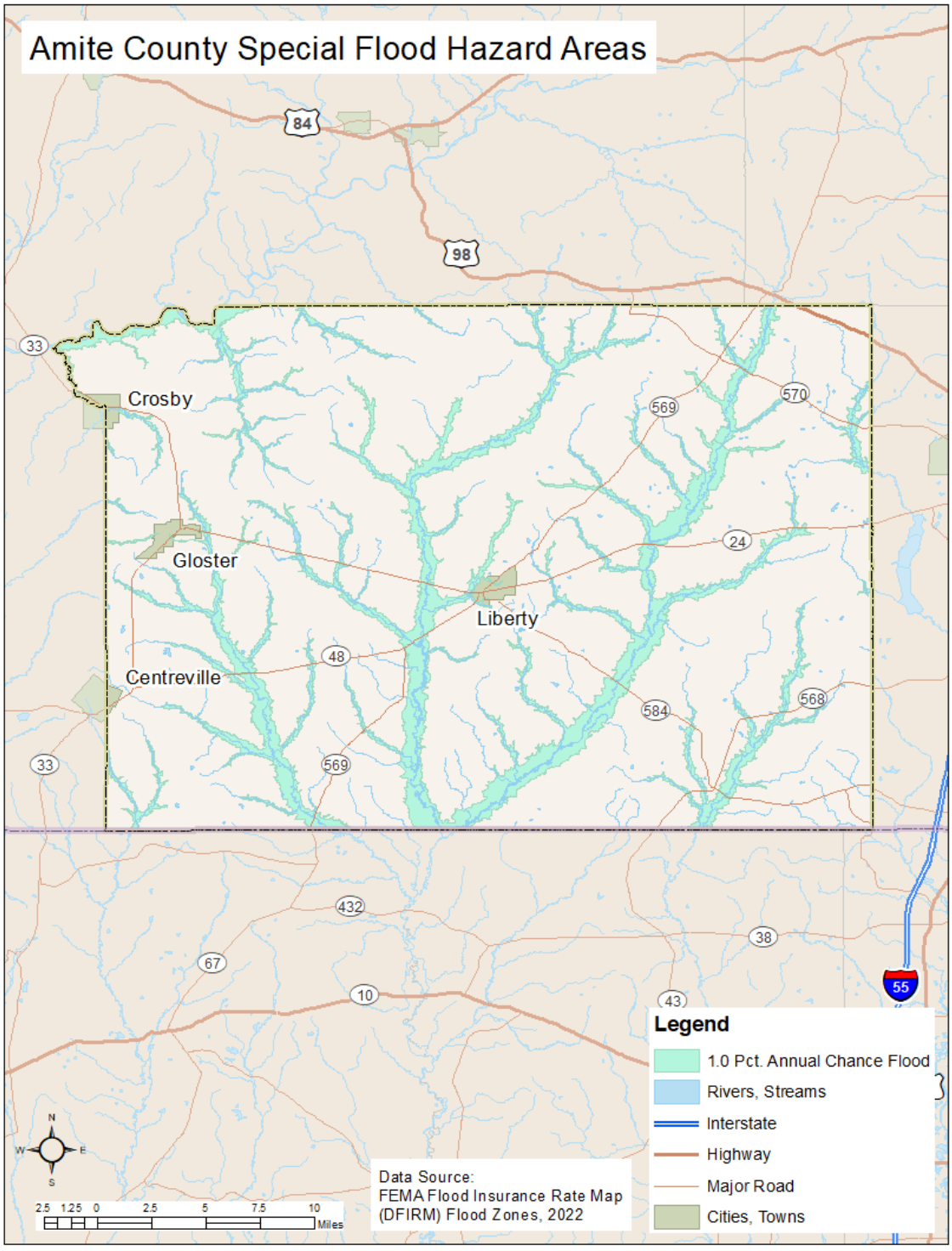
There are areas in Amite County that are susceptible to flood events. Special flood hazard areas in the county were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM).2 This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevations), and Zone X-500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 730 square miles that make up Amite County, there are 85.85 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 0.00 square miles of land in zone X-500 (0.2 percent annual change floodplain/500-year floodplain).

These flood zone values account for 11.8 percent of the total land area in Amite County. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. The figure below illustrates the location and extent of currently mapped special flood hazard areas for Amite County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data.[15]

[14] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[15] DFIRM data used for Amite County were updated in 2010.

FIGURE B.4: SPECIAL FLOOD HAZARD AREAS IN AMITE COUNTY[16]



[16] Federal Emergency Management Agency

HISTORICAL OCCURRENCES

Floods were at least partially responsible for one disaster declarations in Amite County in 1972.[17] While additional disaster declarations involved flooding events during hurricanes, those declarations are captured under Hurricane Declarations. Information from the National Centers for Environmental Information was used to ascertain additional historical flood events. The National Centers for Environmental Information reported a total of seven events in Amite County since 2002.[18] A summary of these events is presented below. These events accounted for over $690,000 in property damage. Specific information on flood events, including date, type of flooding, and deaths and injuries, can be found below.

TABLE B.4: SUMMARY OF FLOOD OCCURRENCES IN AMITE COUNTY[19]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Gloster	0	0/0	$0	$0
Liberty	1	0/0	$0	$0
Unincorporated Area	6	0/0	$690,000	$34,500
Amite County Total	**7**	0/0	**$690,000**	**$34,500**

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Flood Insurance Management Agency (FIMA) Flood Insurance Data Analytics, since 2019 Mississippi has had 47 floods of record with 22 closed with payment, 19 closed without payment, and 6 remaining open. A total of $545,506 has been made in payments. This FEMA dataset is the authoritative source for FEMA's public data. This product uses the Federal Emergency Management Agency's API but is not endorsed by FEMA. FEMA cannot verify the quality and/or timeliness of any data or any analysis derived there from after the data has been retrieved from FEMA.gov. This data set was last accessed on July 2, 2023, with records updated at most every 20 minutes or at least monthly, processed the first Saturday of the month at 1:00am EST.

According to FEMA flood insurance policy records as of July 2, 2023, there have been no flood losses reported in Amite County through the National Flood Insurance Program (NFIP) since 1978, totaling $0 in claims payments. A summary of these figures for the county is provided below. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought. It is likely that many additional instances of flood loss in Amite County were either uninsured or not reported.

[17] A complete listing of historical disaster declarations can be found in *Section 4: Hazard Identificatio*n.
[18] These flood events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1996 through November 2022. It is likely that additional occurrences have occurred and have gone unreported.
[19] Source NCEI. Annualized losses are calculated by dividing the total number of property damages by number of years of recordkeeping for the hazard.

TABLE B.5: SUMMARY OF INSURED FLOOD LOSSES IN AMITE COUNTY THROUGH 2023

Location	Number of Policies	Flood Losses	Claims Payments
Gloster	0	0	$0
Liberty	0	0	$0
Unincorporated Area	0	0	$0
Amite County Total	**0**	**0**	**$0**

Source: National Flood Insurance Program, OpenFEMA Data Sets

REPETITIVE LOSS PROPERTIES

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Mississippi Emergency Management Agency in 2017, there are three non-mitigated repetitive loss properties located in Amite County, which accounted for eight losses and more than $106,000 in claims payments under the NFIP. The average claim amount for these properties is $13,276. All three properties are single family. Without mitigation, these properties will likely continue to experience flood losses. The table below presents detailed information on repetitive loss properties and NFIP claims and policies for Amite County as documented in the last plan. Updated data could not be obtained.

TABLE B.6: REPETITIVE LOSS PROPERTIES IN AMITE COUNTY[20]

Location	Number of Properties	Type of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Gloster	0	---	0	$0	$0	$0	$0
Liberty	0	---	0	$0	$0	$0	$0
Unincorporated Area	3	3 single family	8	$83,698.33	$22,509.48	$106,207.80	$13,275.98
Amite County Total	**3**		**8**	**$83,698.33**	**$22,509.48**	**$106,207.80**	**$13,275.98**

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in Amite County, and the probability of future occurrences will remain highly likely (100 percent annual probability). The probability of future flood events based on magnitude and according to best available data is illustrated in the figure above, which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain).

It can be inferred from the floodplain location maps, previous occurrences, and repetitive loss properties that risk varies throughout the county. For example, Liberty has more floodplain and thus a higher risk of flood than Gloster. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted, particularly for repetitive loss properties.

FUTURE IMPACTS OF CLIMATE CHANGE

[20] National Flood Insurance Program

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[21] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Amite County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[22]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased *coastal, fluvial (i.e., riverine) and pluvial (i.e., rainfall) flooding.*[23] More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

FIRE-RELATED HAZARDS

B.2.4 Drought

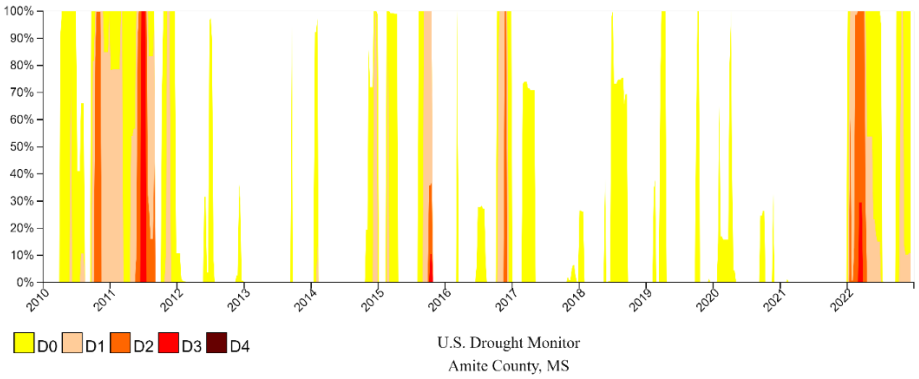
LOCATION AND SPATIAL EXTENT

Drought typically covers a large area and cannot be confined to any geographic or political boundaries. Furthermore, it is assumed that Amite County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment but may exacerbate wildfire conditions.

HISTORICAL OCCURRENCES

The table below shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional, but a majority of the county may be in a less severe condition.

FIGURE B.5: HISTORICAL DROUGHT OCCURRENCES IN AMITE COUNTY[24]



[21] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[22] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[23] Please note: there is no coastal flooding in Amite County.

[24] Abnormally Dry (D0) Moderate Drought (D1) Severe Drought (D2) Extreme Drought (D3) Exceptional Drought (D4) U.S. Drought Monitor

Some additional anecdotal information was provided from the National Centers for Environmental Information on droughts in Amite County.

Summer to Fall 2006 – During a four-and-a-half-month period, from June to the middle of October, abnormally dry conditions prevailed across most of the Jackson, MS County Warning Area (CWA). Widespread drought conditions were reported across the area during this time. The U.S. Drought Monitor classified the drought as extreme (D3) over Southeast Mississippi. Drought conditions in the region peaked in intensity during early August over this area.

Summer to Fall 2010 – Very dry conditions continued across central Mississippi during most of October. There was some rain that came late in the month which provided some temporary relief. Rainfall amounts ranged from a half to two inches with locally higher amounts. Most locations were 1 to 3 inches below normal for the month. The dry stretch resulted in severe (D2) drought conditions expanding during the month with even the portions of extreme (D3) drought conditions expanding as well. Crops were put under stress under the warm and dry conditions.

Fall 2015 – The very dry conditions continued across Central Mississippi in October. The extended dry stretch resulted in an area of Severe (D2) drought developing across the area by October 6th. The drought intensified and Extreme (D3) drought conditions developed by October 13th. Approximately 25 to 50 percent of normal rainfall occurred across this area from August into mid-October. Crops were put under more stress from the dry and hot conditions.

Fall to Winter 2016 – Dry conditions continued into November, which created continued stress on crops. The drought continued to get worse across the state through the month before some relief came in the form of showers and thunderstorms near the end of November.

Fall 2021 through 2022 – Severe drought conditions persisted throughout the state, beginning in December 2021 and continuing through the calendar year 2022. Conditions escalated to extreme drought from January to March, before resolving In December. Throughout this period many counties also experienced flooding events indicating that while rainfall is still occurring, the shorter, more intense bursts do not resolve the drought conditions that softer more steady rainfall would address. The beginning of 2023 saw increased rainfall and a lightening of drought conditions overall.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that Amite County has a probability level of possible (between 1 and 10 percent annual probability) for future drought events. However, the extent (or magnitude) of drought and the amount of geographic area covered by drought, varies with each year. Historic information indicates that there is a much lower probability for extreme, long-lasting drought conditions.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[25] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Amite County With increasing global surface temperatures, the possibility of more *droughts* and increased frequency and intensity of

[25] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

storms will likely occur[26]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

B.2.5 Lightning

LOCATION AND SPATIAL EXTENT

Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of Amite County is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, there have been four recorded lightning events in Amite County since 1999. These events resulted in $25,000 in damage, as listed in table below. It is certain that more than three events have impacted the county. Many of the reported events are those that cause damage, and it should be expected that damages are likely much higher for this hazard than what is reported.

TABLE B.7: SUMMARY OF LIGHTNING OCCURRENCES IN AMITE COUNTY[27]

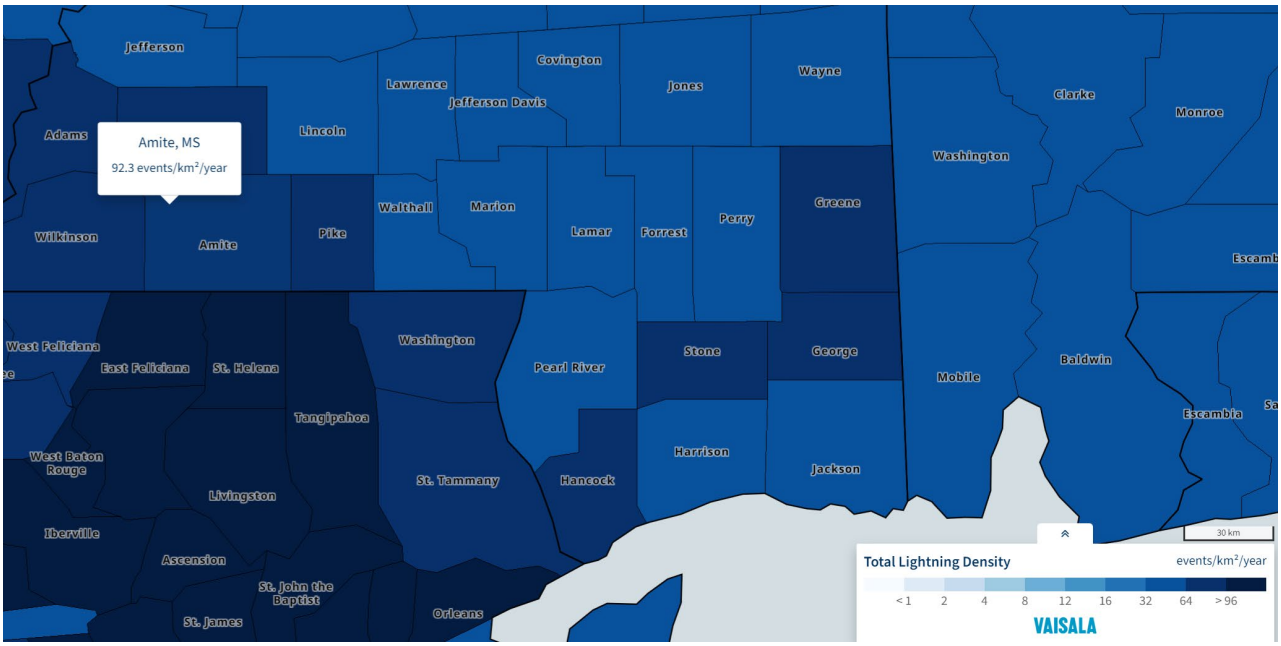
Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses[28]
Gloster	1	0/0	$5,000	$217
Liberty	2	0/0	$10,000	$434
Unincorporated Area	1	0/0	$10,000	$434
Amite County Total	**4**	0/0	**$25,000**	**$1,086**

[26] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[27] These lightning events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1996 through November 2022. It is certain that additional lightning events have occurred in Amite County.

[28] Source NCEI. Annualized losses are calculated by dividing the total number of property damages by number of years of recordkeeping for the hazard.

FIGURE B.6: VAISALA'S NLDN MAP OF LIGHTNING DENSITY[29]



PROBABILITY OF FUTURE OCCURRENCES

Although there was not a high number of historical lightning events reported in Amite County via NCEI data, it is a regular occurrence accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though not all events will cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN), Amite County experiences an average of 93.2 lightning strikes per km^2 per year. Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damage throughout the county.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[30]. There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Amite County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *lightning strike events*.[31] As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

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[29] Vaisala – U.S. National Lightning Detection Network. Retrieved on 11/30/2022 from: https://interactive-lightning-map.vaisala.com/?_ga=2.229872988.1951225355.1669843590-1950342430.1669843590

[30] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[31] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

B.2.6 Wildfire

LOCATION AND SPATIAL EXTENT

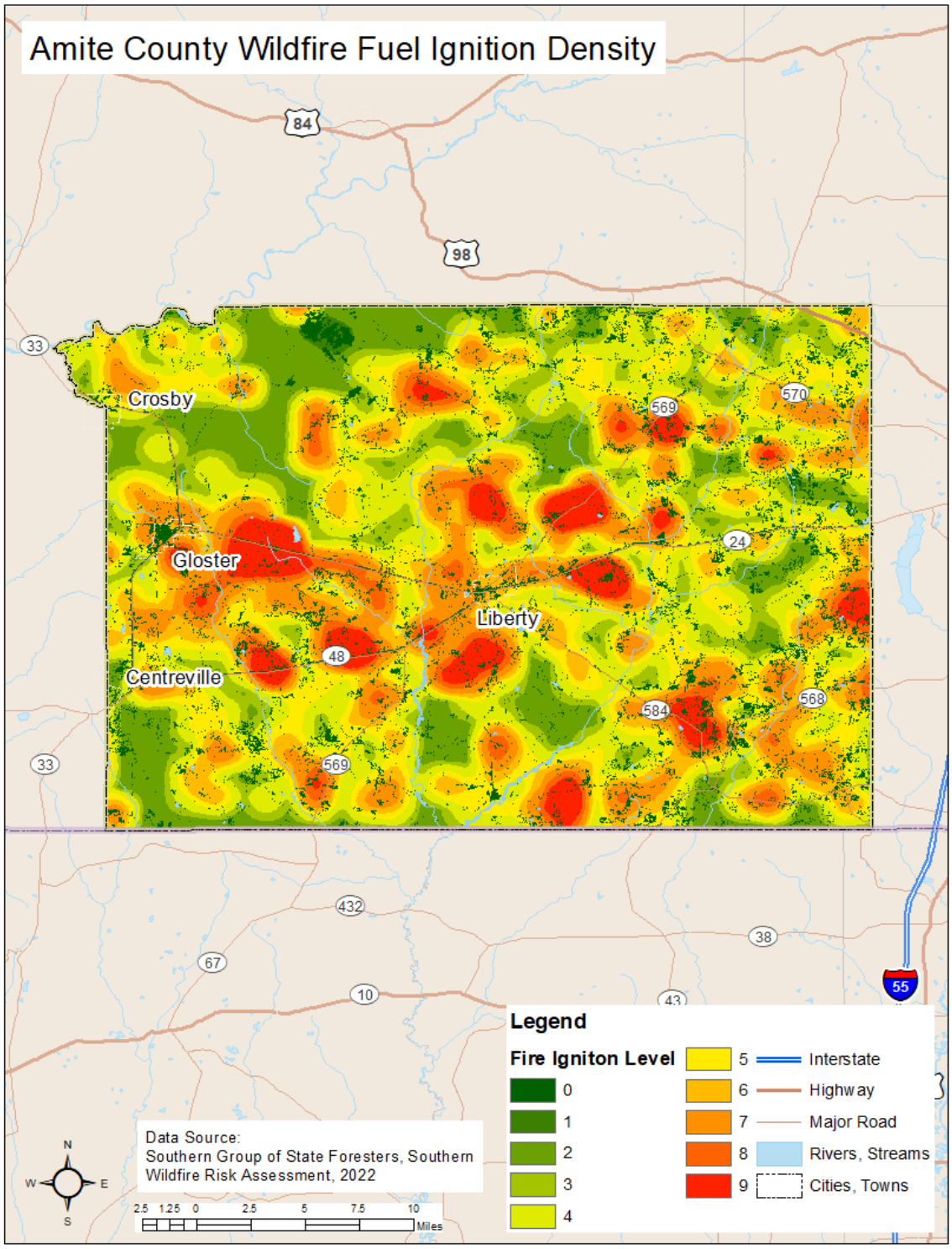
The entire county is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the urban- wildland interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

HISTORICAL OCCURRENCES

The following figure shows the Wildfire Ignition Density in Amite County based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and the likelihood of a wildfire igniting in an area. Occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map. This is measured in the number of fires per year per 1,000 acres.[32]

[32] Southern Wildfire Risk Assessment

FIGURE B.7: WILDFIRE IGNITION DENSITY IN AMITE COUNTY[33]



[33] Southern Wildfire Risk Assessment

Based on data from the Mississippi Forestry Commission from 2015 to 2022, Amite County experienced an average of 24.125 wildfires annually which burned a combined 461 acres per year. The data indicate that most of these fires were small to moderate in size, averaging about 15.9 acres per fire. The table below provides a summary of wildfire occurrences in Amite County and the following table lists the number of reported wildfire occurrences in the county between the years 2012 and 2021.

TABLE B.8: ANNUAL WILDFIRE OCCURRENCES (2015-2022)

	Amite County
Average Number of Fires Per Year	24.125
Average Number of Acres Burned Per Year	461
Average Number of Acres Burned Per Fire	15.90

TABLE B.9: HISTORICAL WILDFIRE OCCURRENCES IN AMITE COUNTY[34]

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Amite County										
Number of Fires	16	22	50	27	29	25	8	11	13	24
Number of Acres Burned	201	371	619	610	440	461	64	159	119	280

PROBABILITY OF FUTURE OCCURRENCES

Wildfire events will be an ongoing occurrence in Amite County. The data shows that there is some probability a wildfire will occur throughout the county. However, the likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small but could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to Amite County for future wildfire events is highly likely (100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

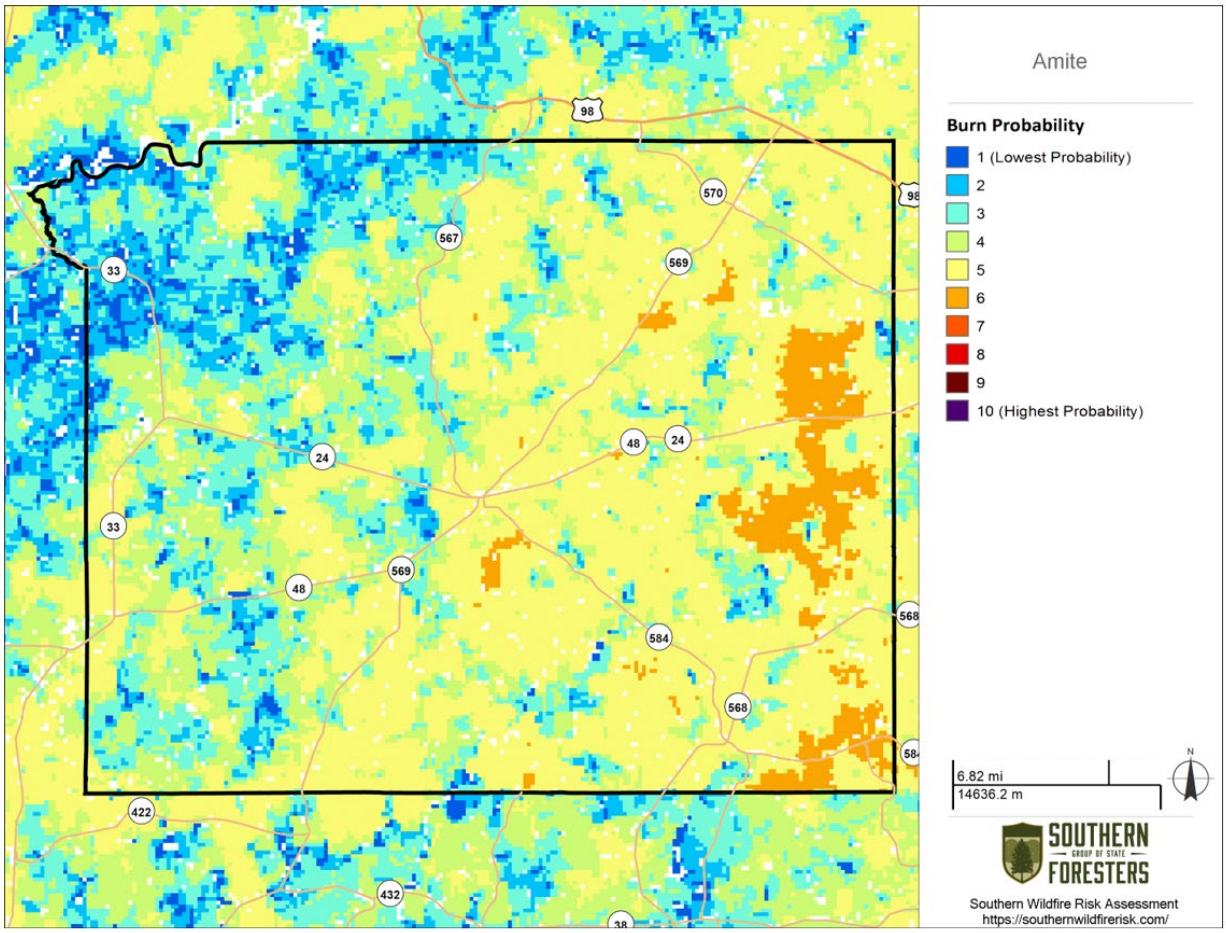
The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[35] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future

[34] Mississippi Forestry Commission

[35] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

natural hazard event frequency, intensity, and magnitude across the globe, including in Amite County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency *wildfire events*.[36]

FIGURE B.8: BURN PROBABILITY IN AMITE COUNTY



GEOLOGIC HAZARDS

B.2.7 Earthquake

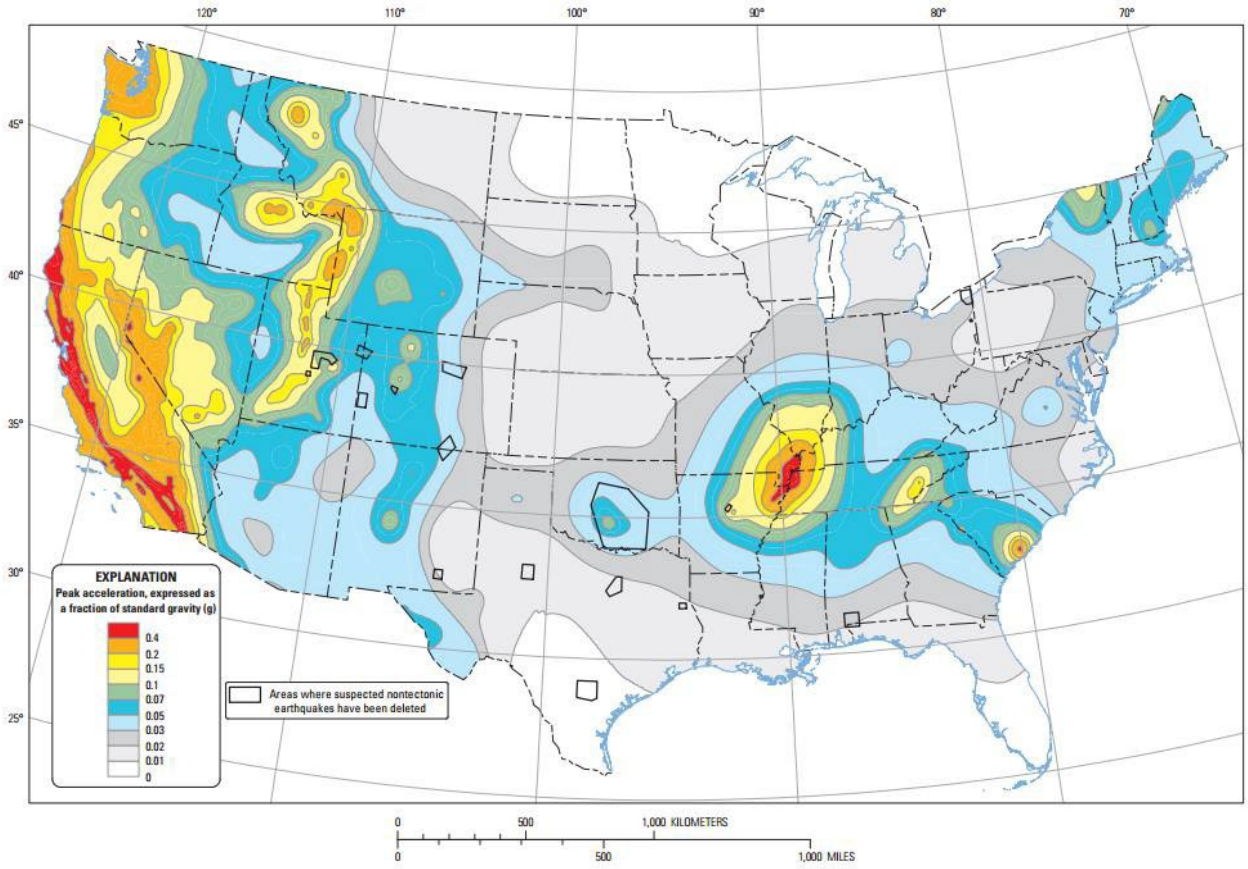
LOCATION AND SPATIAL EXTENT

The following figure shows the intensity level associated with Amite County, based on the national USGS map of peak acceleration with 10 percent probability of exceedance in 50 years. It is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving

[36] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Amite County lies within an approximate zone of level "0.01" to "0.03" ground acceleration. This indicates that the county exists within an area of low seismic risk.

FIGURE B.9: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS[37]



Ten-percent probability of exceedance in 50 years map of peak ground acceleration

The primary source of potential damage to Amite County from an earthquake is the New Madrid Seismic Zone (NMSZ). Historically, a series of earthquakes in 1811 and 1812 demonstrated that this fault zone can produce high magnitude seismic events, sometimes on the scale of a 7.5-8.0 on the Richter scale. The biggest challenge with earthquakes that occur in this area of seismic activity is predicting the recurrence of earthquakes emanating from this zone. Although the magnitude of earthquakes from the NMSZ can be large, they occur very irregularly and infrequently. This makes it extremely difficult to project when they will occur.

[37] United States Geological Survey, 2014

It should also be noted that the State of Mississippi Hazard Mitigation Plan identifies certain areas of concern for liquefaction and lists the counties and corresponding zones within those counties that have the highest liquefaction potential. Amite County does not have any identified liquefaction potential risk.

The following figure shows the Modified Mercalli Intensity Scale. The lower numbers of the intensity scale generally deal with the way the earthquake is felt by people. The higher numbers of the scale are based on observed structural damage. Structural engineers usually contribute information for assigning intensity values of VIII or above.

FIGURE B.10: MODIFIED MERCALLI INTENSITY SCALE (MMI)

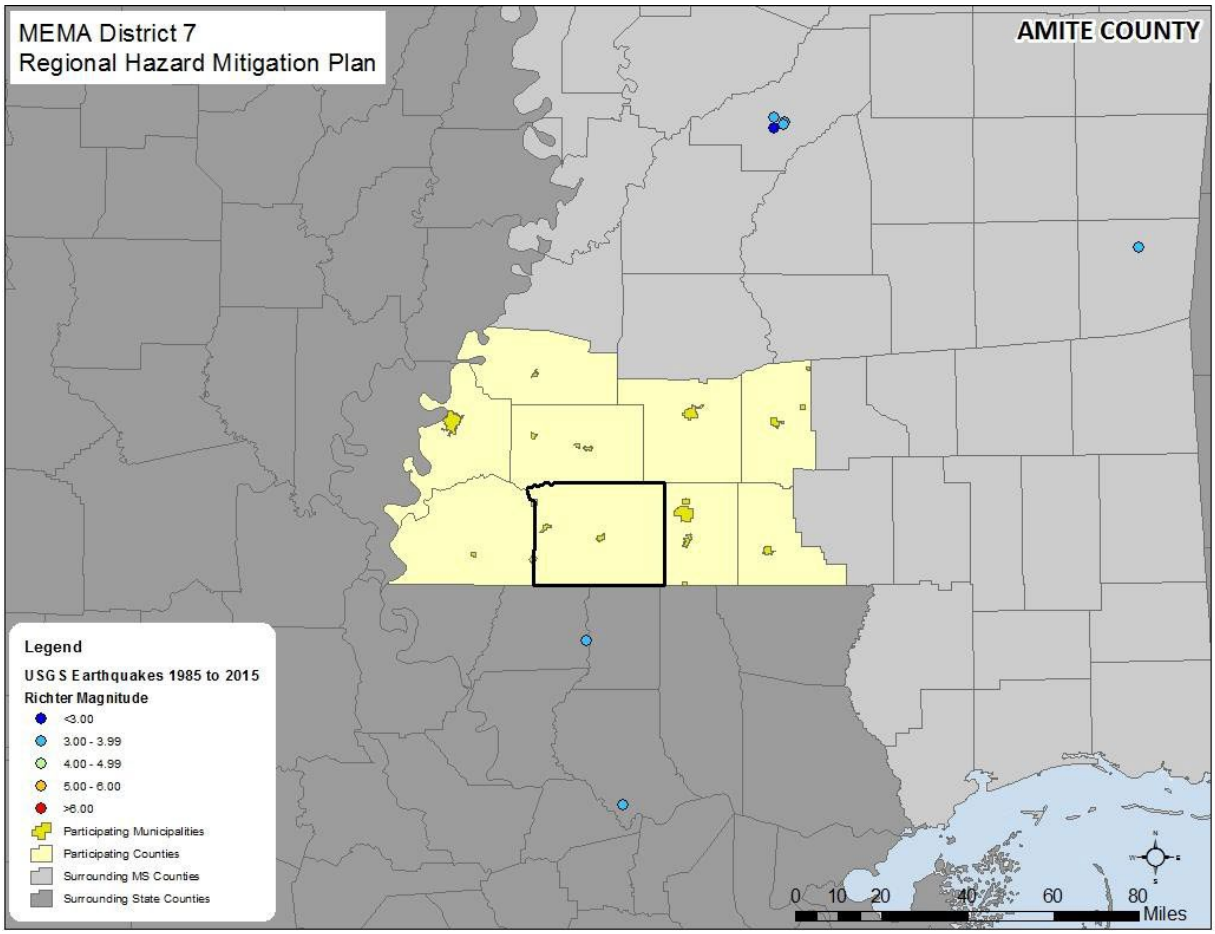
Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest,especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

HISTORICAL OCCURRENCES

No earthquakes are known to have affected Amite County since 1638. The following figure presents a map showing earthquakes whose epicenters have occurred near the county between 1985 and 2023 (no earthquakes occurred within the county's boundaries during this period). Table B.16 presents a detailed occurrence of each event including the date, distance for the epicenter, magnitude and Modified Mercalli Intensity (if known).[38]

[38] Due to reporting mechanisms, not all earthquakes events were recorded during this time. Furthermore, some are missing data, such as the epicenter location, due to a lack of widely used technology. In these instances, a value of "unknown" is reported.

FIGURE B.11: HISTORICAL EARTHQUAKES WITH EPICENTERS NEAR AMITE COUNTY (1985-2023)[39]



PROBABILITY OF FUTURE OCCURRENCES

The probability of significant, damaging earthquake events affecting Amite County is unlikely. However, it is certainly possible that future earthquakes resulting in light or moderate perceived shaking and damage will affect the county much more frequently. The annual probability level for the county is estimated to be less than 1 percent (unlikely).

[39] United States Geological Survey

TEMPERATURE & WIND-RELATED HAZARDS

B.2.8 Extreme Heat

LOCATION AND SPATIAL EXTENT

Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries. Therefore, the entire county is considered to be equally susceptible to extreme heat.

HISTORICAL OCCURRENCES

The National Centers for Environmental Information was used to determine historical heat wave occurrences in the county. No events specific to Amite County were reported, however, several events were reported elsewhere in the region. Similar events and impacts can be expected in Amite County.

Summer of 2000 Heat Wave – Hot temperatures persisted from July to September across the South and Plains. Known as the Summer of 2000 Heat Wave, high temperatures commonly peaked over 100 degrees.

August 2005 – A "HOT" stretch of weather occurred during the middle to later part of August 2005. This "Heat Wave" covered a large portion of the south and lasted for a period of about 10 days. Each of these days had high temperatures consistently between 95 and 100 degrees, with 1 or 2 of these days actually reaching 100 degrees or more. Additionally, overnight lows remained warm with lower and middle 70s recorded. This is the first time since August 2000 where 100-degree temperatures were reached in this area as well as having such an extended period of "HOT" weather.

July 2006 – A small "heat wave" gripped the region during the middle of July with high temperature ranging from the upper 90s to around 100 degrees for five days with overnight lows only reaching the middle 70s. The hottest temperatures during this period occurred from the Mississippi Delta, across northern Mississippi and then down to the Jackson Metro and toward Meridian. This area peaked between 100 and 102 degrees for at least two days during the hot five-day stretch.

August 2007 – During the first half of August, a heat wave took hold of the region and brought some of the warmest temperatures since the summer of 2000. This heat wave began around August 5th and lasted until the 16th. Between August 10th and 15th, the entire area reached 100 degrees or higher. Twenty- three record highs were also set during this time. As the temperature soared each day, high relative humidity resulted in heat index values between 105 and 112 degrees.

August 2010 – A four day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS Jackson, MS forecast area, 19 record highs were set between August 1st and 4th. On August 2nd, the 2nd warmest average temperature was recorded. The low was 78 and the high 105, this resulted in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in 3 fatalities across the forecast area.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Amite County has a probability level of likely (between 10 and 100 percent annual probability) for future heat wave events.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[40] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Amite County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *extreme heat* events[41]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

B.2.9 Hailstorm

LOCATION AND SPATIAL EXTENT

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that Amite County is uniformly exposed to severe thunderstorms; therefore, all areas of the county are equally exposed to hail which may be produced by such storms.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, 38 recorded hailstorm events have affected Amite County since 1986. The table below is a summary of the hail events in Amite County. In all, hail occurrences did not result in any reported property damage.[42] These hail events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1955 through November 2022. It is likely that additional hail events have affected Amite County.

Hail ranged in diameter from 0.75 inches to 2.0 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

TABLE B.10: SUMMARY OF HAIL OCCURRENCES IN AMITE COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Gloster	6	0/0	$0	$0
Liberty	11	0/0	$0	$0
Unincorporated Area	21	0/0	$0	$0

[40] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[41] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[42] Source National Centers for Environmental Information

Amite County Total	38	0/0	$0	$0

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that the probability of future hail occurrences is highly likely (100 percent annual probability). Since hail is an atmospheric hazard, it is assumed that Amite County has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[43] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Amite County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *hailstorm*[44]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

B.2.10 Hurricane and Tropical Storm

LOCATION AND SPATIAL EXTENT

Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect Amite County. All areas in Amite County are equally susceptible to hurricanes and tropical storms.

The following table shows the different category rankings of hurricanes on the Saffir-Simson Scale. The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures. In the western North Pacific, the term "super typhoon" is used for tropical cyclones with sustained winds exceeding 150 mph. Note that all winds are using the U.S. 1-minute average.

TABLE B.11: SAFFIR-SIMPSON SCALE OF HURRICANE STRENGTH

Category 1	Winds 74-95 mph (64-82 kt or 119-153 km/hr). Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and

[43] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[44] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

	shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
Category 2	Winds 96-110 mph (83-95 kt or 154-177 km/hr). Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
Category 3	Winds 111-129 mph (96-112 kt or 178-208 km/hr). Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
Category 4	Winds 130-156 mph (113-136 kt or 209-251 km/hr). Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
Category 5	Winds 157 mph or higher (137 kt or higher or 252 km/hr or higher). Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

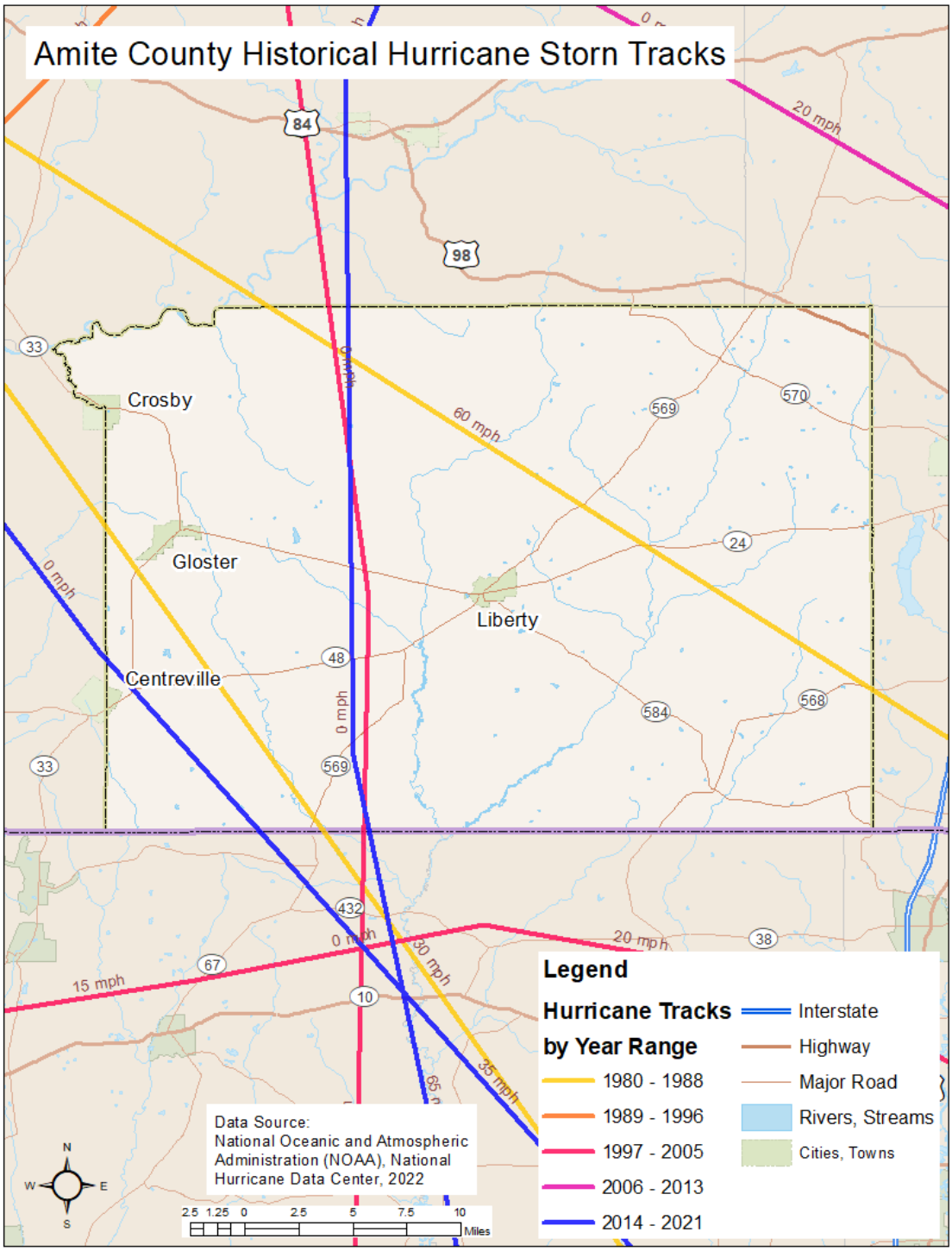
HISTORICAL OCCURRENCES

According to the National Hurricane Center's historical storm track records, 67 hurricane or tropical storm/depression tracks have passed within 50 NM of Amite County since 1854.[45]

The following figure shows hurricane storm tracks that have passed through or near Amite County since 1980.

[45] National Hurricane Center

FIGURE B.12: HISTORICAL HURRICANE STORM TRACKS WITHIN 100 MILES OF THE MEMA DISTRICT 7 REGION[46]



[46] National Oceanic and Atmospheric Administration; National Hurricane Center

Federal records indicate that eight disaster declarations were made in Amite County: 1965 (Hurricane Betsy), 1969 (Hurricane Camille), 2002 (Tropical Storm Isidore), 2004 (Hurricane Ivan), 2005 (Hurricane Katrina), 2008 (Hurricane Gustav), 2012 (Hurricane Isaac), and 2021 (Hurricane Ida). Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding.

The National Centers for Environmental Information also reported eight hurricane or tropical storm events in Amite County since 2002.

TABLE B.12: HISTORICAL HURRICANE/TROPICAL STORM OCCURRENCES IN AMITE COUNTY [47]

Date of Occurrence	Storm Name	Deaths/Injuries	Property Damage	Annualized Losses
10/3/2002	Hurricane Lili	0/0	$1,670,000	
8/29/2005	Hurricane Katrina	0/0	$73,000,000	
08/24/2008	Tropical Storm Fay	0/0	$0	
9/1/2008	Hurricane Gustav	0/0	$250,000	
09/02/2011	Tropical Storm Lee	0/0	$5,000	
8/29/2012	Hurricane Isaac	0/0	$250,000	
10/09/2020	Hurricane Delta	0/0	$500,000	
08/29/2021	Hurricane Ida	0/0	$1,000,000	
Amite County Totals		**0/0**	**$76,675,000**	**$3,833,750**

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the county. Anecdotes are available from NCEI for the major storms that have impacted the county as found below:

Hurricane Katrina – August 29, 2005

The damage from Hurricane Katrina was devastating and widespread. Damage occurred across all of the Jackson forecast area which includes 9 parishes in Northeast Louisiana, 2 counties in Southeast Arkansas and about 2/3 of Central and Southern Mississippi. As widespread as the damage was, the more concentrated and most significant damage occurred across Southeast and East-Central Mississippi. For other areas, especially those west of Natchez to Yazoo City to Grenada line, damage to trees and power lines was significant and scattered across the landscape. As you move toward Central Mississippi and along Interstate 55 the damage and impacts increase. This portion of the state sustained widespread damage to trees and power lines.

Hurricane Gustav – September 1, 2008

As the center of Gustav crossed much of southern Louisiana, tropical storm force winds extended into southern Mississippi and portions of east central Louisiana. Sustained winds were between 35 and 45 mph with higher gusts between 70 and 100 mph occurred. Tree and power line damage was extensive across these areas which resulted in widespread power outages, some of which lasted for 3 to 5 days. As Gustav slowed across central Louisiana, the outer rainbands continued to rotate across much of southern and central Mississippi. This kept those portions of Mississippi in the region which was favorable for tornadoes. Over 3 days, 26 tornadoes were confirmed, all of which were in the EF0 to EF1 range.

[47] National Centers for Environmental Information

Hurricane Isaac – August 29, 2012

Isaac moved very slowly to the north and northwest over the course of August 29th, which made for prolonged impacts. Forward motion of about 5 mph lead to tremendous flooding issues for both Louisiana and portions of Mississippi south of I-20. Around noon on August 29th, Isaac was downgraded to a Tropical Storm, but this was not much relief to the many residents who were being inundated with rain and wind. The worst of the wind was felt generally along and south of an axis from Marion County to Adams County. Numerous trees were down in Adams County, leaving many without power for several days. Eighty percent of the roads were blocked in Franklin County due to downed trees.

Hurricane Ida – August 29, 2021

The county suffered widespread tree damage with mostly minor to moderate damage to homes and other structures as Ida's center moved through the county. A few homes suffered major damage due to falling trees. Several roads, including some state highways, were blocked by downed trees or other debris. At the peak approximately 54% of the county was without power.

PROBABILITY OF FUTURE OCCURRENCES

Given the inland location of the county, Amite County will not be susceptible to many of the sub-hazards that are often associated with hurricanes and tropical storms such as storm surge. Although the probability of experiencing major impacts is somewhat less than coastal areas because of this, hurricanes and tropical storms remain a real threat to Amite County due to induced events like flooding and high wind. Based on historical evidence, the probability level of future occurrence is likely (between 10 and 100 percent annual probability). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. However, when the county is impacted, the damage could be significant, threatening lives and property throughout the planning area.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[48] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Amite County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[49]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

HURRICANE EVACUATIONS

As discussed above, the MEMA District 7 Region has been directly impacted by several hurricane and tropical storm events historically. However, it should be noted that the region is also susceptible to

[48] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[49] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

indirect effects from hurricanes and tropical storms, particularly in the form of evacuations from coastal counties. The counties within MEMA District 7 are located far enough inland that they are often the primary recipients of evacuees from counties that will be (or have been) impacted by major storm events.

For example, during Hurricane Katrina in 2005, thousands of evacuees made their way to counties in southwest Mississippi to take temporary refuge from the storm. Due to the severe and devastating effects of the storm, temporary sheltering within these counties was extended much longer than originally anticipated and, in some cases, the evacuees ended up staying for weeks or months. This additional population caused a major strain on resources within these relatively rural counties, as local communities with limited resources had an unexpected and immediate need to provide shelter and other life essentials such as food, water, and health care to a significant, additional number of people.

Caring for all these evacuees was especially challenging for counties in the MEMA District 7 Region because most had been impacted themselves by the storm and were attempting to help their own citizens recover from the storm. Undoubtedly, recovering from a major disaster while simultaneously attempting to help evacuees from surrounding counties poses a number of difficulties for emergency management personnel and other local officials.

Based on Hurricane Katrina and other major hurricane events that have impacted the Gulf Coast in the past, it is likely that many of the MEMA District 7 counties will be receiver counties when it comes to evacuees. Many of these evacuees will likely come from locations in Louisiana, including New Orleans. Indeed, the State of Louisiana evacuation plan indicates that one of the primary evacuation routes from the City of New Orleans will direct evacuees north along Interstate 55, sending people through Pike County and Lincoln County (Figure B.12). Depending on the severity of the event, officials in Louisiana may even change Interstate 55 over to a contraflow traffic pattern to enable quicker evacuations.

B.2.11 Severe Thunderstorm/High Wind

LOCATION AND SPATIAL EXTENT

A thunderstorm event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that Amite County has uniform exposure to an event and the spatial extent of an impact could be large.

The following Beaufort scale is an empirical measure for the intensity of the wind associated with windstorms.

TABLE B.13: BEAUFORT WIND SCALE

Beaufort Scale					
NUMBER	**WIND SPEED (MPH)**	**DESCRIPTION**	**WAVE HEIGHT (FT)**	**SEA CONDITIONS**	**LAND CONDITIONS**
0	<1	Calm	0	Flat.	Calm. Smoke rises vertically.
1	1-3	Light air	0.33	Ripples without crests.	Wind motion visible in smoke.
2	3-7	Light breeze	0.66	Small wavelets.	Wind felt on exposed skin. Leaves rustle.
3	8-12	Gentle breeze	2	Large wavelets.	Leaves and smaller twigs in constant motion.
4	13-17	Moderate breeze	3.3	Small waves.	Dust and loose paper rise. Small branches begin to move.
5	18-24	Fresh breeze	6.6	Moderate (1.2 m) longer waves. Some foam and spray.	Small trees sway.
6	25-30	Strong breeze	9.9	Large waves with foam crests and some spray.	Large branches in motion. Whistling heard in overhead wires. Umbrella use difficult.
7	31-38	High wind, Moderate Gale, Near Gale	13.1	Sea heaps up and foam begins to streak.	Whole trees in motion. Effort needed to walk against the wind.
8	39-46	Fresh Gale	18	Moderately high waves with breaking crests forming spindrift. Streaks of foam.	Twigs broken from trees. Cars veer on road.
9	47-54	Strong Gale	23	High waves (6-7 m) with dense foam. Wave crests start to roll over. Considerable spray.	Larger branches break off trees, and some small trees blow over. Construction/temporary signs and barricades blow over. Damage to circus tents and canopies.

Beaufort Scale					
NUMBER	**WIND SPEED (MPH)**	**DESCRIPTION**	**WAVE HEIGHT (FT)**	**SEA CONDITIONS**	**LAND CONDITIONS**
10	55-63	Whole Gale/Storm	29.5	Very high waves. The sea surface is white and there is considerable tumbling.	Trees uprooted. Considerable structural damage.
11	64-72	Violent storm	37.7	Exceptionally high waves.	Widespread vegetation and structural damage.
12	≥73	Hurricane-force	≥46	Huge waves. Sea is completely white with foam and spray. Air is filled with driving	Massive and widespread damage to structures.

HISTORICAL OCCURRENCES

Severe storms were at least partially responsible for six disaster declarations in Amite County in 1973, 1990, 2001, 2003, 2009, and 2020. According to NCEI[50], there have been 96 reported thunderstorms and high wind events since 1975 in Amite County. These events caused over $977,900 in damages. There were also reports of one injury. The following table summarizes this information.[51]

TABLE B.14: HISTORICAL THUNDERSTORM / HIGH WIND OCCURRENCES IN AMITE COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Gloster	10	0/0	$515,900	$10,976
Liberty	38	0/0	$163,900	$3,487
Unincorporated Area	48	0/1	$298,100	$6,342
Amite County	**96**	**0/1**	**$977,900**	**$20,806**

PROBABILITY OF FUTURE OCCURRENCES

Given the high number of previous events, it is certain that thunderstorm events, including straight-line wind events, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for the entire county.

FUTURE IMPACTS OF CLIMATE CHANGE

[50] National Centers for Environmental Information.

[51] These thunderstorm events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1955 through November 2022 and these high wind events are only inclusive of those reported by NCEI from 1996 through November 2022.

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[52] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Amite County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[53]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

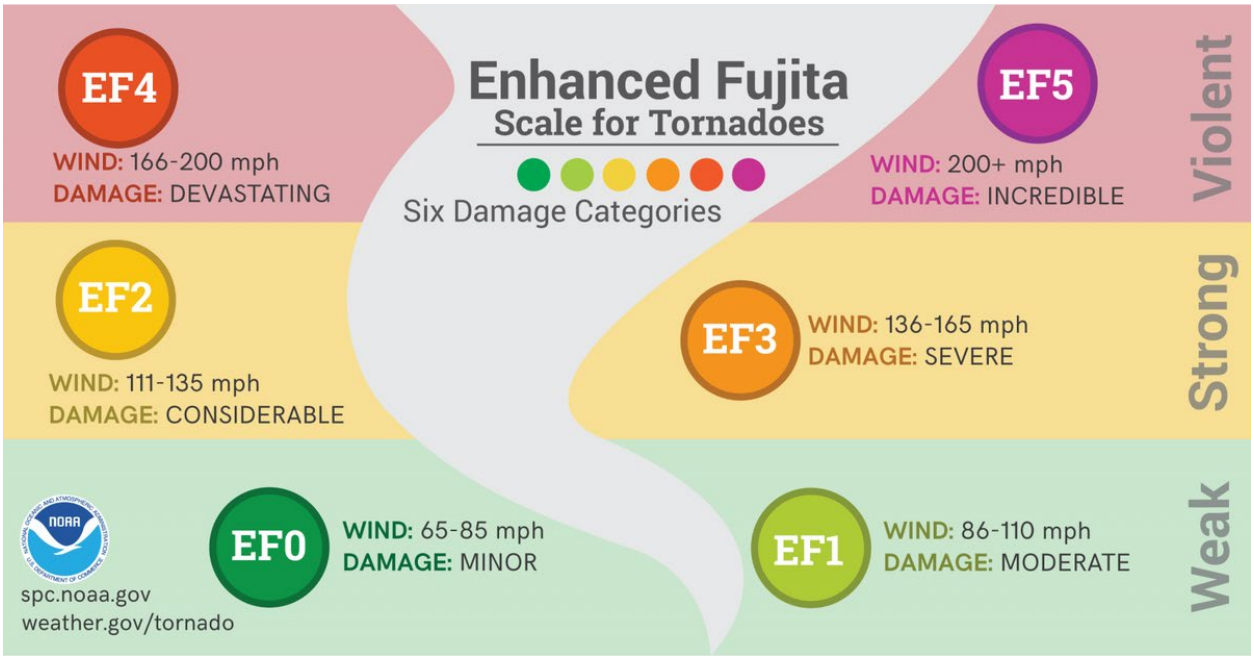
B.2.12 Tornado

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, and thus in Amite County. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random, and it is not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that Amite County is uniformly exposed to this hazard.

The following figure depicts the Enhanced-Fujita Scale of tornado intensity.

FIGURE B.13: ENHANCED-FUJITA SCALE

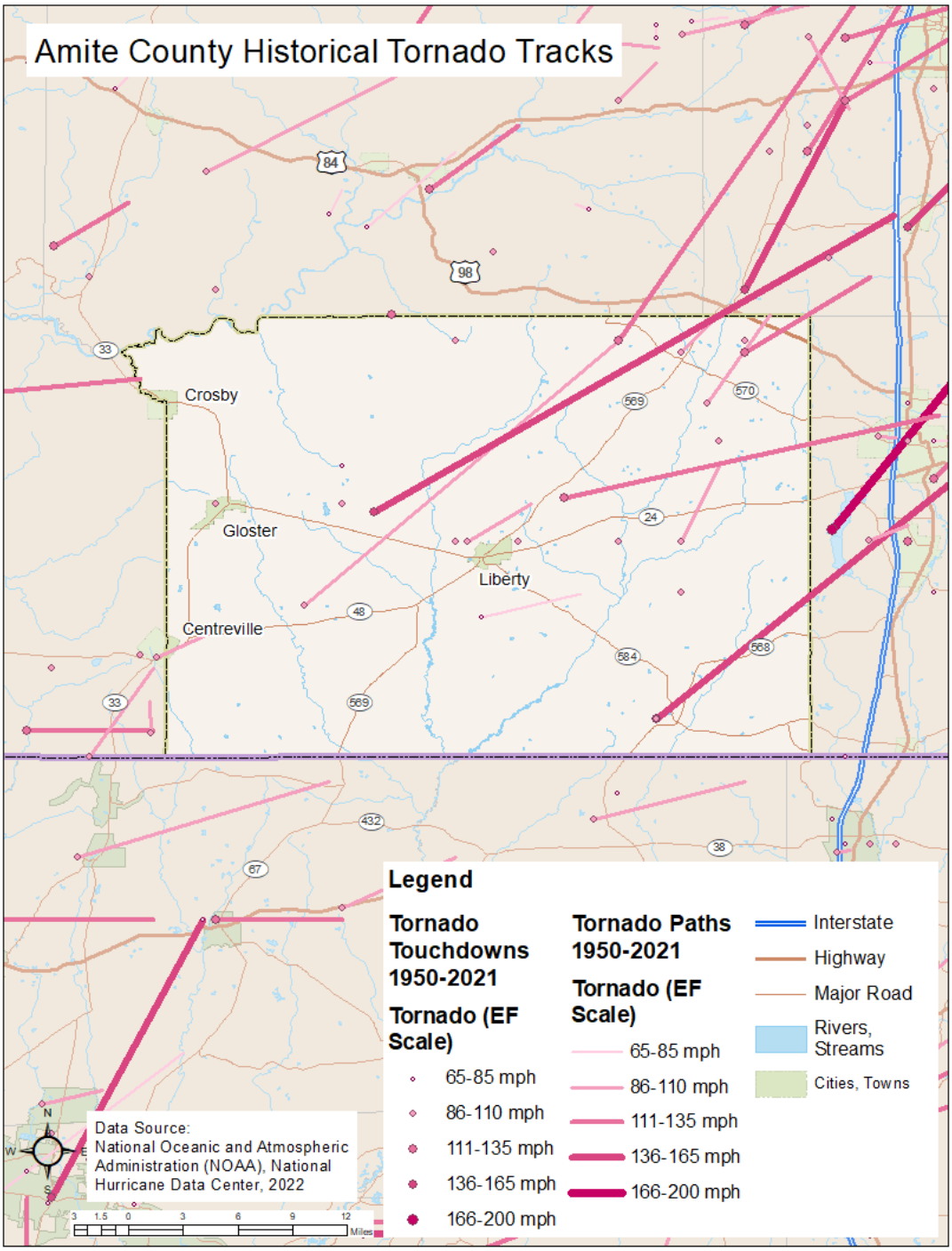


[52] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[53] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

With that in mind, the following figure shows tornado track data for many of the major tornado events that have impacted the county between 1950 and 2021. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

FIGURE B.14: HISTORICAL TORNADO TRACKS IN AMITE COUNTY [54]



[54] National Weather Service Storm Prediction Center

HISTORICAL OCCURRENCES

Tornadoes were responsible for two disaster declarations in Amite County in 1978, and 1992. According to the National Centers for Environmental Information, there have been a total of 24 recorded tornado events in Amite County since 1961, resulting in over $2.1 million in property damages. In addition, nine injuries were reported. The magnitude of these tornadoes ranges from EF0 to EF3, although an F5 event is possible. Detailed information on historic tornado events can be found in the following table.

TABLE B.15: HISTORICAL TORNADO IMPACTS IN AMITE COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Liberty	3	0/0	$165,000	$2,704
Unincorporated Areas	22	0/9	$1,982,500	$32,500
Amite County Total	**25**	**0/9**	**$2,147,500**	**$35,204**

PROBABILITY OF FUTURE OCCURRENCES

According to historical information, tornado events pose a significant threat to Amite County. The probability of future tornado occurrences affecting Amite County is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[55] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Amite County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[56]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storm systems that spawn tornadoes to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding, and enhancing the potential for increased *tornado activity*. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

[55] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[56] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

B.2.13 Winter Storm, Freeze, and Extreme Cold

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. Amite County is not accustomed to severe winter weather conditions and seldom receives severe winter weather, even during the winter months. Events tend to be mild in nature; however, this creates a situation where even relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage since these events are not commonplace. Given the atmospheric nature of the hazard, the entire county has uniform exposure to a winter storm.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, there have been a total of 12 recorded winter storm events in Amite County since 2002. These events did not result in any property damage. Detailed information on the recorded winter storm events can be found below.

TABLE B.16: SUMMARY OF WINTER STORM EVENTS IN AMITE COUNTY [57]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Amite County	12	1/0	$0	$0

There have been several severe winter weather events in Amite County. The text below describes two of the major events and associated impacts on the county. Similar impacts can be expected with severe winter weather.

February 2010

Heavy snow affected a large portion of the region, especially locations across central and southern Mississippi, on Thursday night and Friday, February 11th and 12th. The heavy snow was a result of a low-pressure system that tracked eastward across the northern Gulf of Mexico, and a vigorous upper-level disturbance that moved across the region while a cold air mass was in place. Light precipitation overspread the region late Thursday afternoon into the evening before becoming heavy Thursday night into early Friday morning. The snow tapered off from west to east during the midday hours Friday.

February 2011

An ice storm developed across the area on February 3rd into the early morning hours of the 4th. While this icing event was not devastating, the impact of travel was a major issue across the region. Thousands of accidents occurred from slick roads. As a result of the accidents, three fatalities occurred along with a handful of injuries. Overall, most areas received 0.25 to 0.5 inches of ice accumulation from freezing rain. Additionally, some areas had a mix of precipitation with sleet accumulating. Some snow did occur, but those were just across select areas and the accumulation was mainly one inch or less.

[57] These ice and winter storm events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1996 through November 2022. It is likely that additional winter storm conditions have affected Amite County.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could cause a fire or an accumulation of toxic fumes.

PROBABILITY OF FUTURE OCCURRENCES

Winter storm events will continue to occur in Amite County. Based on historical information, the probability is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems. There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Amite County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms). However, accelerated warming in the Artic region (i.e., Arctic amplification) may also be linked with an increase in the frequency of extreme cold events across parts of Asia and North America, including in Amite County. [58]

OTHER HAZARDS

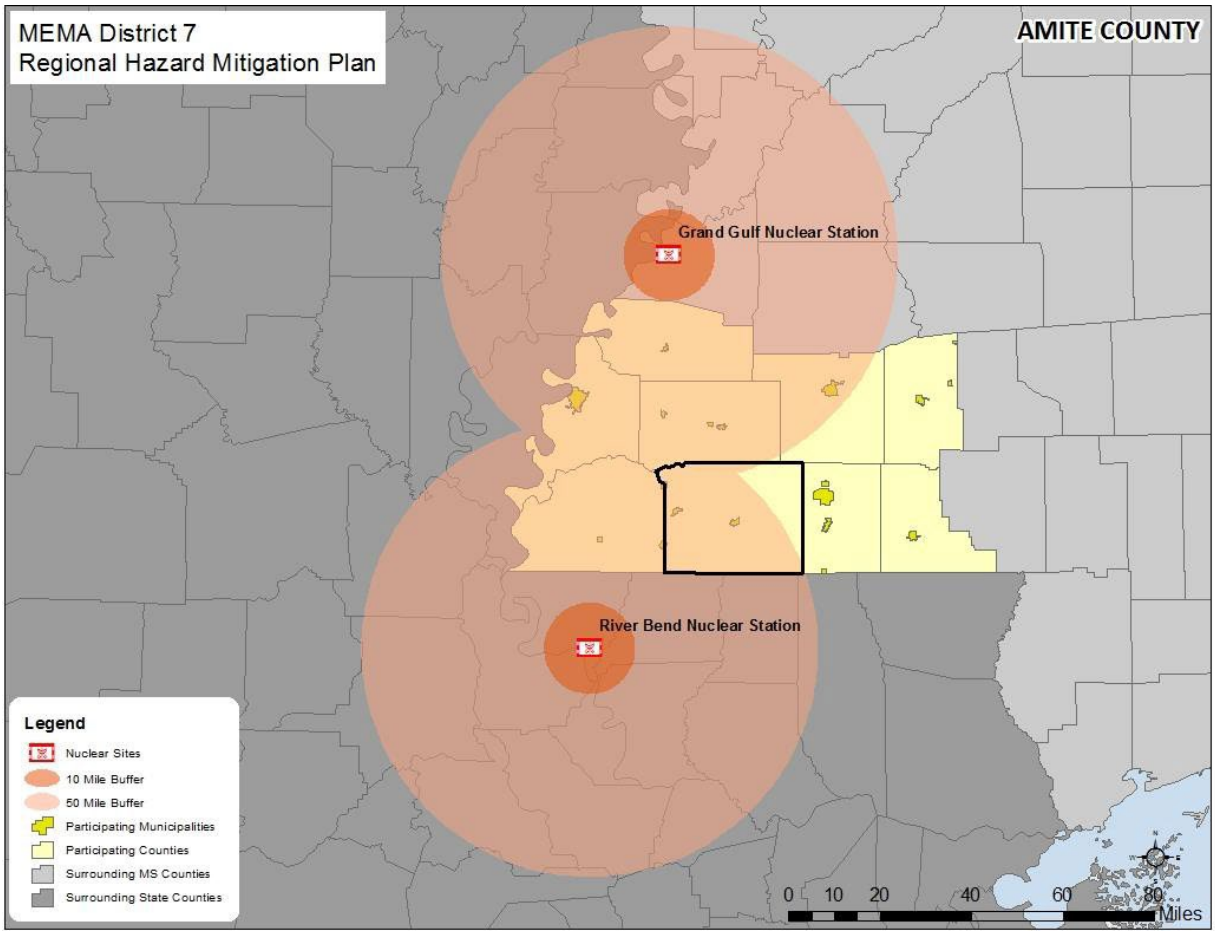
B.2.14 Radiological Event

LOCATION AND SPATIAL EXTENT

The Grand Gulf Nuclear Station and River Bend Nuclear Station are both located within a 50-mile radius of the MEMA District 7 Region. The Nuclear Regulatory Commission defines two emergency planning zones around nuclear plants. Areas located within 10 miles of the station are considered to be within the zone of highest risk to a nuclear incident and this radius is the designated evacuation radius recommended by the Nuclear Regulatory Commission. Within the 10-mile zone, the primary concern is exposure to and inhalation of radioactive contamination. No part of Amite County is in the 10-mile radius of a nuclear station. The most concerning effects in the secondary 50-mile zone are related to ingestion of food and liquids that may have been contaminated. The majority of Amite County is located within this 50-mile radius. The 50-mile zone is still considered to be at risk from a nuclear incident, though the impacts may be less severe than in the 10-mile zone (Figure B.15).

[58] NOAA – Communication Education & Engagement. Retrieved from: https://cpo.noaa.gov/Divisions-Programs/Communication-Education-and-Engagement/CEE-News/ArtMID/8293/ArticleID/2369/Research-Links-Extreme-Cold-Weather-in-the-United-States-to-Arctic-Warming

FIGURE B.15: NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN AMITE COUNTY [59]



HISTORICAL OCCURRENCES

Although there have been no major nuclear events at either the Grand Gulf or River Bend Nuclear Stations, there is some possibility that one could occur as there have been incidents in the past in the United States at other facilities and at facilities around the world. Additionally, a list of minor events/notifications was acquired from reports collected by the Nuclear Regulatory Commission (NRC). The NRC classifies events using the scale below. A list of events at Grand Gulf Nuclear Station and River Bend Nuclear Station can be found in the table below. It is noteworthy that all of the events were minor in magnitude and many were insignificant enough that they did not register on the classification scale.

[59] International Atomic Energy Agency

TABLE B.17: NUCLEAR REGULATORY COMMISSION EMERGENCY CLASSIFICATION SCALE FOR EVENTS OCCURRING AT NUCLEAR POWER PLANTS

Classification	Description
Notification of Unusual Event (NOUE)	Events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs. [Note: This term is sometimes shortened to Unusual Event (UE). The terms Notification of Unusual Event, NOUE and Unusual Event are used interchangeably.]
Alert	Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the Environmental Protection Agency (EPA) protective action guides (PAGs)
Site Area Emergency	Site Area Emergency (SAE) – Events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or hostile action that results in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to, equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA PAG exposure levels beyond the site boundary.
General Emergency	Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile action that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

TABLE B.18: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT RIVER BEND NUCLEAR STATION[60]

Date	Retrieved From*	Classification	Plant	Description
11/26/1985	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	ECCS Initiation: Improper restoration of a level transmitter causes HPSC injection

[60] Nuclear Regulatory Commission Preliminary Notification Reports (http://www.nrc.gov/reading-rm/doc-collections/event-status/prelim-notice/):

Date	Retrieved From*	Classification	Plant	Description
11/27/1985	Licensee Event Report	Alert	River Bend Unit 1	Failure to Perform Surveillance Tests
3/5/1992	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	REACTOR SCRAM CAUSED BY A GENERATOR TRIP DUE TO HIGH WINDS CAUSING TRANSFORMER DAMAGE
9/15/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE IVAN
10/4/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	Shutdown Greater than 72 Hours
9/23/2005	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	NRC ENTERS MONITORING MODE DUE TO HURRICANE RITA
5/23/2007	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REACTOR SHUTDOWN DUE TO UNEXPECTED CHANGE IN RECIRCULATION FLOW
9/2/2008	Preliminary Notification Reports	Notification of Unusual Event/Not Applicable	River Bend Unit 1	NRC RESPONSE TO HURRICANE GUSTAV
5/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	AUGMENTED INSPECTION TEAM ONSITE AT RIVER BEND STATION
8/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST

TABLE B.19: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT GRAND GULF NUCLEAR STATION

Date	Retrieved From*	Classification	Plant	Description
8/29/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST
10/1/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF NUCLEAR STATION SECURITY OFFICER LOCKOUT
9/29/2016	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF EXTENDED PLANT SHUTDOWN TO ADDRESS OPERATIONS PERFORMANCE

PROBABILITY OF FUTURE OCCURRENCES

A nuclear event is a very rare occurrence in the United States due to the intense regulation of the industry. There have been minor incidents in the past, but it is considered unlikely (less than 1 percent annual probability).

RADIOLOGICAL EVACUATIONS

Like the hurricane evacuations discussed above, in many ways the MEMA District 7 Region would potentially be impacted to a greater degree by evacuations caused by a radiological event than by the event itself. Since the region is not directly located within the 10-mile evacuation area but neighboring counties are located within this zone, it is highly likely that populations from those neighboring counties will be evacuated to the counties within the MEMA District 7 Region.

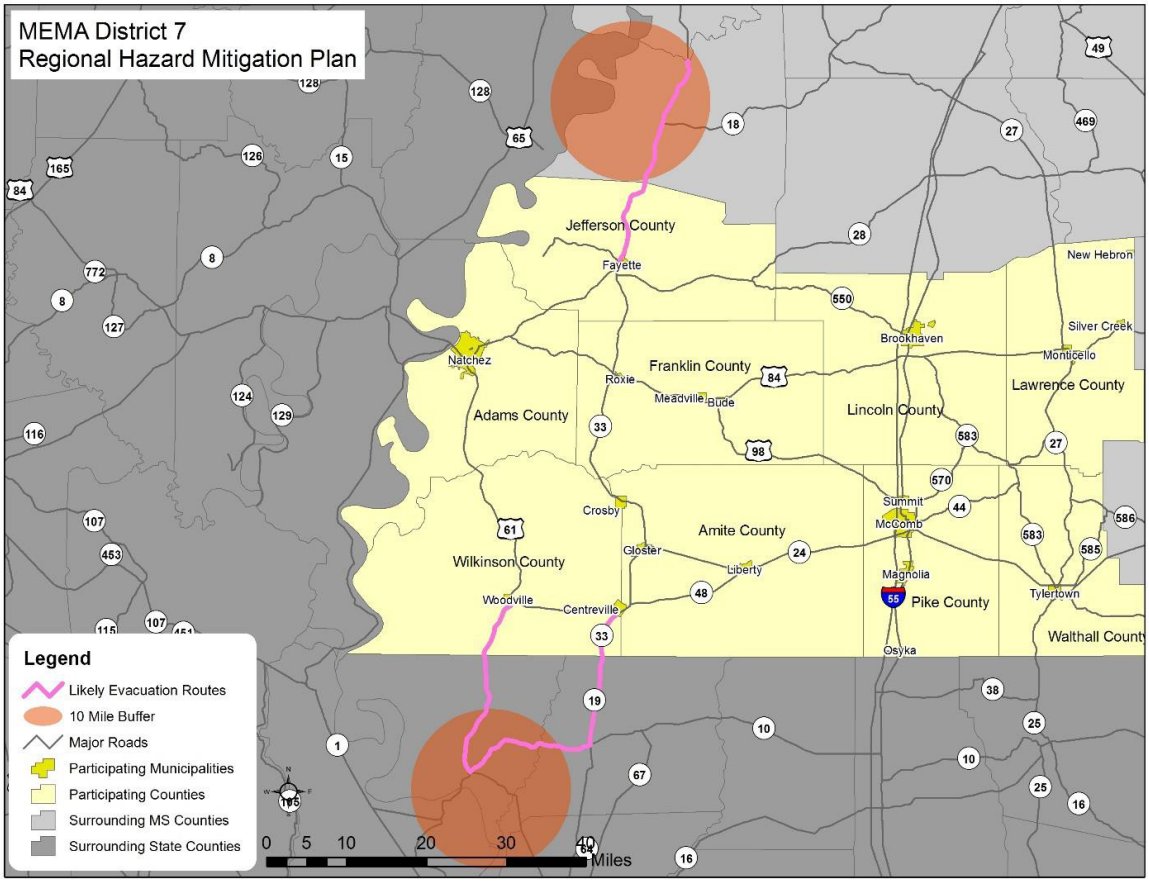
Due to the severe and long-term effects of a major radiological event, temporary sheltering will be an initial concern, but the greater challenge may be in the long-term. As has happened with historical radiological accidents in other locations, the danger in the impacted area will likely extend for a very long period after the event and evacuees may be unable to return to their homes for months or years. This additional influx of population will cause a major strain on resources within these relatively rural counties in the short-term, as local communities with limited resources will have an unexpected and immediate need to provide shelter and other life essentials such as food, water, and health care to a significant, additional number of people. In the long-term, there may be challenges for local officials as existing infrastructure will likely be inadequate to handle larger populations.

Although there have not been any major radiological events in the region historically, hurricane evacuations (discussed above) provide a similar scenario in terms of what the region might expect. However, one additional concern that officials will need to consider in a radiological event is that evacuees may be contaminated by radioactivity. According to the Centers for Disease Control, radioactive contamination can occur when radioactive materials are released into the environment and become deposited into the air, water, surfaces, soil, plants, buildings, people or animals. This contamination can then be spread when people touch other people, surfaces, or objects. Therefore, when people evacuate a contaminated zone, they pose a potential risk of spreading the contamination to others if they are not properly treated. Local officials in MEMA District 7 may need to be prepared to set up decontamination centers along major evacuation routes to ensure that the contamination is not spread. It is also important for citizens to understand the steps they can take to reduce the risk of spreading contamination such as evacuating quickly after an event and following decontamination instructions as directed by local officials.[61]

Based on the locations of the 10-mile evacuation areas near the region, many of these evacuees will likely come from Claiborne County to the north and West Feliciana and East Feliciana Parishes to the south. The main roads for these evacuees will probably be U.S. Highway 61 and Mississippi State Highway 33 since these are the primary and most direct roads into and out of the aforementioned evacuation counties and into MEMA District 7. Depending on the severity of the event, officials may even change these roads over to a contraflow traffic pattern to enable quicker evacuations.

[61] Centers for Disease Control and Prevention. Emergency Preparedness and Response: Contamination vs. Exposure. Retrieved on September 1, 2017 from https://emergency.cdc.gov/radiation/contamination.asp

FIGURE B.20: LIKELY EVACUATION ROUTES FOR A RADIOLOGICAL EVENT IN THE MEMA DISTRICT 7 REGION



As a result of the potential for an influx of evacuees during a radiological event, it is critical for local officials in MEMA District 7 to prepare for evacuations. It is possible that thousands of additional people will be relocated, either temporarily or permanently, to MEMA District 7. Therefore, plans for additional shelters and other resources should be coordinated well in advance of future events.

B.2.15 Pandemic

LOCATION AND SPATIAL EXTENT

Pandemics are global in nature. However, they may start anywhere. Amite County chose to analyze this hazard given the agriculture in the area and potential for this kind of event to occur in any location at any time.

All populations should be considered at risk to pandemic. Buildings and infrastructure are not directly impacted by the virus/pathogen but could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings may be shutdown, at least temporarily, as a result. Employers may initiate work from home procedures for non-essential workers in order to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

HISTORICAL OCCURRENCES

Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below.

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to 566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population.

Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10 to 50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852- 1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours. The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

1957 Asian Flu: It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

1968 Hong Kong Flu: The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and

those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020, mainly due to the speed and scale of the transmission of the disease. Prior to that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province on February 26th, 2020. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

There is a considerable amount of data on the extent of COVID-19 throughout the State of Mississippi and Amite County. The number of reported cases and deaths across the State of Mississippi and Amite County are shown in the figure below.

TABLE B.20: COVID-19 CASES AS OF 12/22/2022[62]

	Cases	Deaths
Mississippi	951,070	13,083
Amite County	3,779	70

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Amite County has a probability level of unlikely (less than 1 percent annual probability) for future pandemics events. While pandemics can have devastating impacts, they are relatively rare.

The Mississippi State Department of Health maintains a state pandemic plan which can be found here: http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf

B.2.16 Conclusions on Hazard Risk

The hazard profiles presented in this subsection were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled Understanding Your Risks: Identifying Hazards and Estimating Losses (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional

[62] Mississippi Department of Health – COVID-19 Dashboard: https://msdh.ms.gov/msdhsite/_static/resources/19539.pdf

and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

HAZARD EXTENT

The table below describes the extent of each natural hazard identified for Amite County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

TABLE B.211: EXTENT OF AMITE COUNTY HAZARDS

Flood Related Hazards	
Dam & Levee Failure	Dam Failure extent is defined using the Mississippi Department of Environmental Quality classifications which include Low, Significant, and High. No dams are classified as high-hazard in Amite County.
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no official erosion rate records in Amite County but local estimates are around 0.25 to 0.50 feet per year. Some areas of erosion have been identified by local coordinators.
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 11.8 percent of the total land area in Amite County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was on the East Fork Amite River near Peoria. Water reached a discharge of 34,000 cubic feet per second (recorded on January 25, 1990). The highest stream gage height was on Tanyard Creek at Liberty with a height that was recorded at 94.31 feet (recorded on April 13, 1955).
Fire Related Hazards	
Drought	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. Amite County has received this ranking once since 2000.
Lightning	Amite County is in an area of the country that experienced an average of 93.2 lightning flashes per km^2 per year between 2016 and 2021. It should be noted that future lightning occurrences may exceed these figures.
Wildfire	Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2012-2021. The greatest number of fires to occur in Almite County in any year was 50 in 2014. The greatest number of acres to burn in the county in a single year occurred in 2014 when 619 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale or the Modified Mercalli Intensity (MMI) scale. According to data provided by the National

	Centers for Environmental Information, no earthquakes were reported in Amite County.
Temperature & Wind Related Hazards	
Extreme Heat	The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are not kept for any areas in Amite County. However, the highest recorded temperature in the region was 106°F in 2007 with heat index values recorded above 115°F.
Hailstorm	Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Amite County was 2.0 inches (reported on March 31, 2005). It should be noted that future events may exceed this.
Hurricane & Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5. The greatest classification of hurricane to impact the MEMA District 7 Region was a Category 3 storm. This occurred in 1969 with Hurricane Camille and in 2005 with Hurricane Katrina. The storm track of both storms passed just to the east of the region, but due to the size of these storms, their impact was felt across the region.
Severe Thunderstorm / High Wind	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 67-year history from the National Centers for Environmental Information, the strongest recorded wind event in Amite County was reported on June 10, 2014 at 61 knots (approximately 70 mph). It should be noted that future events may exceed these historical occurrences.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA as well as the Fujita/Enhanced Fujita Scale. The greatest magnitude reported in Amite County was an F3 (reported on December 16, 2019).
Winter Storm & Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in Amite County. However, reports from NCEI of the greatest snowfall in the county has been 4 inches (reported on February 11, 2010).
Other Hazards	
Radiological Event	Although there is no history of a nuclear accident at either the Grand Gulf Nuclear Station or River Bend Nuclear Station, other events across the globe and in the United States indicate that an event is possible. Since several national and international events were Level 7 events on the INES, the potential for a Level 7 event at these stations is possible.
Pandemic	The extent of a pandemic impacting the county is difficult to estimate. It could result in thousands of deaths and extreme disruption of commerce and everyday life.

PRIORITY RISK INDEX RESULTS

In order to draw some meaningful planning conclusions on hazard risk for Amite County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a

"Priority Risk Index" (PRI). More information on the PRI and how it was calculated can be found in *Section 5.17.2*.

The table below summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this subsection, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

TABLE B.22: SUMMARY OF PRI RESULTS FOR AMITE COUNTY

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Dam Failure and Levee Failure	Unlikely	Critical	Small	Less than 6 hours	Less than 6 hours	**2.3**
Erosion	Possible	Minor	Small	More than 24 hours	More than 1 week	**1.8**
Flood	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**3.2**
Fire-related Hazards						
Drought	Possible	Limited	Large	More than 24 hours	More than 1 week	**2.5**
Lightning	Highly Likely	Limited	Small	6 to 12 hours	Less than 6 hours	**2.6**
Wildfire	Highly Likely	Limited	Moderate	Less than 6 hours	Less than 1 week	**3.1**
Geologic Hazards						
Earthquake	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Wind-related Hazards						
Extreme Heat	Likely	Limited	Large	More than 24 hours	More than 1 week	**2.8**
Hailstorm	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Hurricane and Tropical Storm	Likely	Catastrophic	Large	More than 24 hours	Less than 1 week	**3.3**
Severe Thunderstorm/High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Tornado	Likely	Catastrophic	Moderate	Less than 6 hours	Less than 6 hours	**3.2**
Winter Storm and Freeze	Likely	Minor	Moderate	More than 24 hours	Less than 1 week	**2.2**
Other Hazards						
Radiological Event	Unlikely	Limited	Moderate	More than 24 hours	Less than 1 week	**1.9**
Pandemic	Unlikely	Limited	Large	More than 24 hours	More than 1 week	**2.2**

B.2.17 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Amite County, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk (Table B.32). For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Amite County.

A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately and is described in *Section 6: Vulnerability Assessment* and below in *Section B.3*. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates. In most cases, the hazards of greatest concern did not change much since the last plan update, indicating that the priorities remained relatively stable and there were few changes in priorities.

TABLE B.22: CONCLUSIONS ON HAZARD RISK FOR AMITE COUNTY

HIGH RISK	Hurricane and Tropical Storm Tornado Flood Wildfire Severe Thunderstorm/High Wind
MODERATE RISK	Extreme Heat Hailstorm Lightning Drought
LOW RISK	Dam and Levee Failure Winter Storm and Freeze Radiological Event Erosion Earthquake Pandemic

B.3 AMITE COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Amite County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected amount of damages caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in *Section 6: Vulnerability Assessment*.

B.3.1 Asset Inventory

The table below lists the estimated number of improved properties and the total value of improvements for Amite County and its participating jurisdictions (study area of vulnerability assessment). Because digital parcel data was not available for most communities, data obtained from Hazus-MH 5.1 inventory was utilized to complete the analysis.

TABLE B.234: IMPROVED PROPERTY IN AMITE COUNTY

Location	Counts of Improved Properties	Total Value of Improvements
Gloster	716	$112,157
Liberty	453	$80,122
Unincorporated Area	5,759	$941,219,821
AMITE COUNTY TOTAL	**6,928**	**$941,412,000**

The following table lists the fire stations, police stations, medical care facilities, emergency operation centers, schools, government/public buildings, transportation infrastructure, and private facilities located in Amite County according to previous plan data and Hazus-MH 5.1 data that was reviewed and updated by local officials.

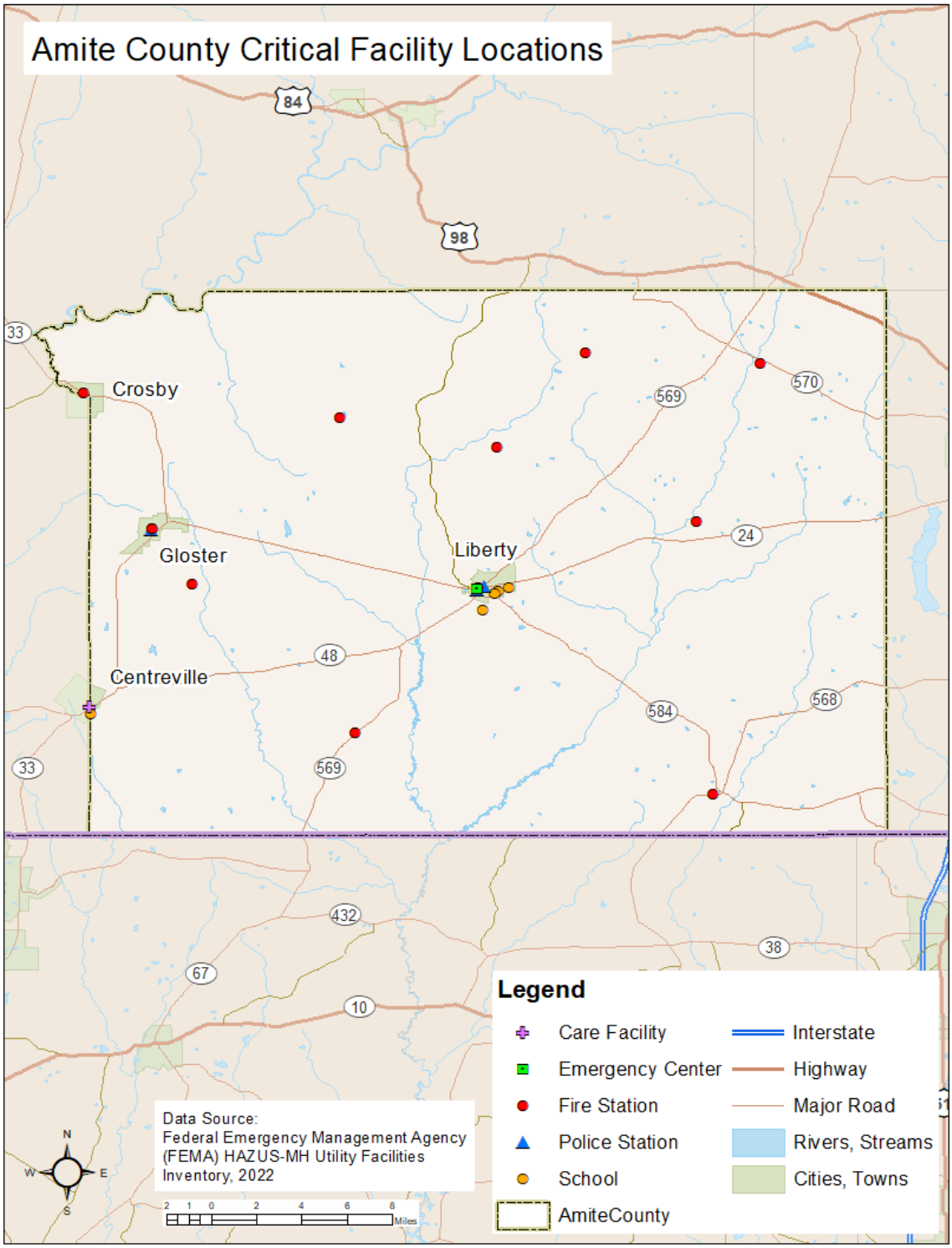
In addition, the figure below shows the locations of critical facilities in Amite County. The table at the end of this subsection, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided through Hazus which was updated, as best as possible, with local knowledge.

TABLE B.245: CRITICAL FACILITY INVENTORY IN AMITE COUNTY

Location	Fire Stations	Police Stations	Medical Facilities	EOC	Schools	Ports
Gloster	1	1	1	0	2	0
Liberty	1	2	2	1	3	0
Unincorporated	8	0	1	0	1	0
Amite County Total	**10**	**3**	**4**[63]	**1**	**6**	**0**

[63] One of these facilities is located in the part of Centreville that is located in Amite County

FIGURE B.167: CRITICAL FACILITIES IN AMITE COUNTY [64]



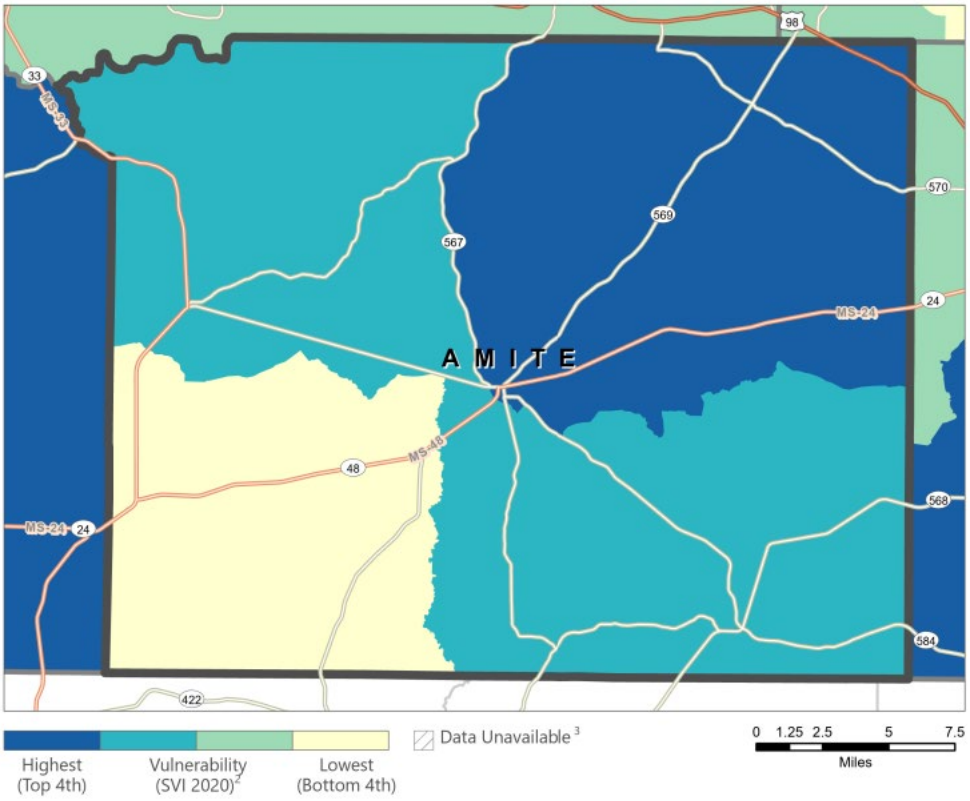
[64] HAZUS

B.3.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those segments of the resident population in Adams County that are potentially at risk for these hazards. Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss.

The CDC/ATSDR Social Vulnerability Index (CDC/ATSDR SVI) uses 16 U.S. census variables to help local officials identify communities that may need support before, during, or after disaster. See figure below for Adams County SVI score of 0.8762.

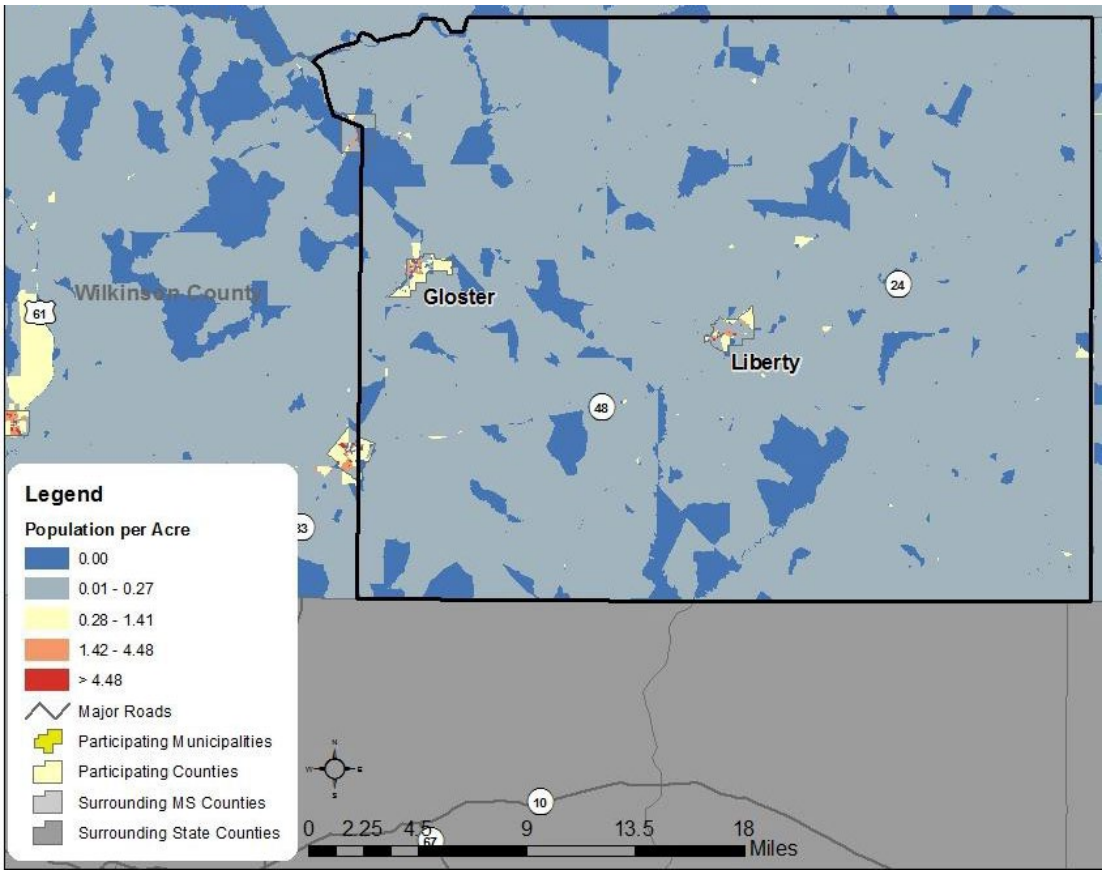
FIGURE B.18: CDC SOCIAL VULNERABILITY ASSESSMENT[65]



In addition, the figure below illustrates the population density per acre by census block as it was reported by the U.S. Census Bureau in 2020. As can be seen in the figure, the population is spread out with concentration in municipal areas such as Gloster and Liberty.

[65] CDC/ATSDR Social Vulnerability Index (SVI)

FIGURE B.19: POPULATION DENSITY IN AMITE COUNTY[66]



B.3.3 Development Trends and Changes in Vulnerability

Since the previous hazard mitigation plan was approved, Amite County has experienced limited growth and development. The following table shows the number of building units constructed since 2010 according to the U.S. Census American Community Survey.

TABLE B.26: BUILDING COUNTS FOR AMITE COUNTY[67]

Location	Total Housing Units (2021)	Units Built 2010 or Later	% Building Stock Built Post-2010
Gloster	645	18	2.8%
Liberty	403	27	6.7%
Unincorporated Area	6,230	385	6.17%
Amite County Total	**7,278**	**430**	**6.0%**

[66] U.S. Census Bureau, (HAZUS still utilizes 2010 data)

[67] American Community Survey – July 2021

TABLE B.257: POPULATION GROWTH FOR AMITE COUNTY[68]

Jurisdiction	2000 Census	2010 Census	2020 Census	% Change 2000 - 2020
Amite County	13,599	13,131	12,270	-9.77%
Gloster	1,073	960	897	-16.40%
Liberty	633	728	560	-11.53%

Based on the data above, there has been a low rate of residential development and population growth in the county since the last plan update, and the county has experienced a population decline of -9.77%. However, it is notable that Liberty along with the unincorporated areas of the county have experienced growth and development, resulting in an increased number of people and structures that are vulnerable to the potential impacts of the identified hazards. Therefore, development and population growth have impacted the county's vulnerability since the previous local hazard mitigation plan was approved and there has been a slight increase in the overall vulnerability as well as a larger increase in certain areas and communities.

It is also important to note that as development increases in the future, greater populations and more structures and infrastructure will be exposed to potential hazards if development occurs in floodplains or other high-risk areas.

B.3.4 Vulnerability Assessment Results

As noted in *Section 6: Vulnerability Assessment*, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis. Those results, specific to Amite County, are presented here. All other hazards are assumed to impact the entire planning region (drought, extreme heat, hailstorm, lightning, severe thunderstorm/high wind, tornado, and winter storm) or, due to lack of data, analysis would not lead to credible results (erosion).

The hazards to be further analyzed in this subsection include dam/levee failure, flood, wildfire, earthquake, hurricane and tropical storm winds, and radiological event.

The annualized loss estimate for all hazards is presented near the end of this subsection.

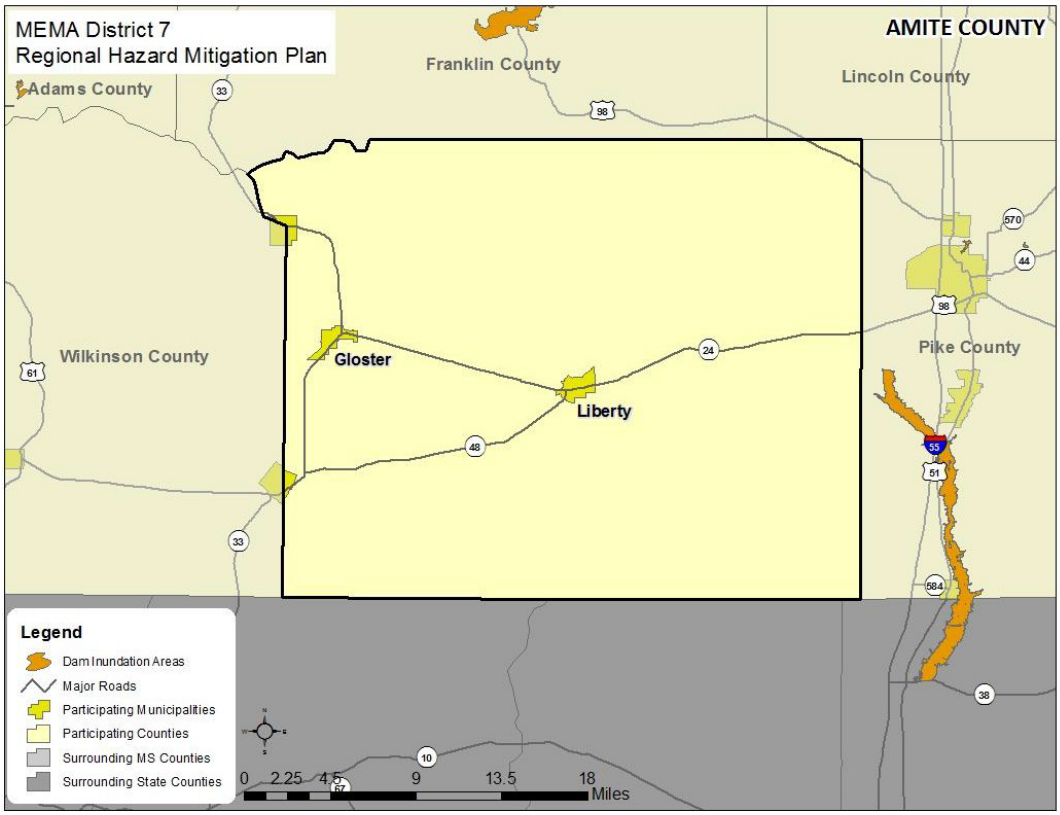
DAM/LEVEE FAILURE

To assess risk to a dam or levee failure, a GIS-based analysis was used to estimate exposure to one of the areas delineated by the Mississippi Department of Environmental Quality as a potential inundation area in the event of a failure. The determination of value at-risk (exposure) was calculated using GIS analysis by summing the values for improved properties that were located within an identified inundation area. As mentioned previously, this type of inundation mapping has not been completed for every dam/levee in the region, so the results of this analysis likely underestimate the overall vulnerability to a dam or levee failure. However, the analysis is still useful as a sort of baseline minimum of property that is potentially at-risk. The identified inundation areas can be found in the figure below.

[68] American Community Survey – July 2021

In general, building footprint and parcel data were used in this analysis. However, in some communities, due to a lack of digital parcel data, it was determined that analysis using the inventory from Hazus-MH 5.1 would be used to supplement the building/parcel data. It should be noted that this data will merely be an estimation and may not reflect actual counts or values located in dam inundation areas. Indeed, in almost all cases, this data likely overestimates the amount of property in the identified risk zones.

FIGURE B.20: DAM INUNDATION AREAS IN AMITE COUNTY[69]



Social Vulnerability

There are no areas of concern located within the county, this does not indicate that there is no risk to a dam/levee failure, especially considering not all dams have delineated inundation areas.

Critical Facilities

There are no critical facilities located within the identified dam inundation areas. Although there are no facilities located in the identified areas, this does not indicate that there is no risk to a dam/levee failure, especially considering not all dams have delineated inundation areas. A list of specific critical facilities and their associated risk can be found at the end of this section.

In conclusion, a dam/levee failure has the potential to impact existing and future buildings, facilities, and populations in Amite County, though structures located near or in the dam inundation areas are at highest risk. Specific vulnerabilities for Amite County assets will be greatly dependent on their individual design and the mitigation measures in place where appropriate. Such site-specific vulnerability

[69] Mississippi Department of Environmental Quality

determinations are outside the scope of this assessment but will be considered during future plan updates if data becomes available.

FLOOD

Historical evidence indicates that Amite County is susceptible to flood events. A total of seven flood events have been reported by the National Centers for Environmental Information resulting in $690,000 in property damage. On an annualized level, these damages amounted to $34,500 for Amite County.

To assess flood risk, a GIS-based analysis was used to estimate exposure to flood events using Digital Flood Insurance Rate Map (DFIRM) data in combination with improved property records for the county. The determination of value at-risk (exposure) was calculated using GIS analysis by summing the values for improved properties that were located within an identified floodplain. Due to a lack of digital parcel data in most counties, it was determined that an analysis using the inventory from Hazus-MH 5.1 would be used, though it should be noted that the data will merely be an estimation and may not reflect actual counts or values located in the floodplain. Indeed, in almost all cases, this analysis likely overestimates the amount of property at risk.

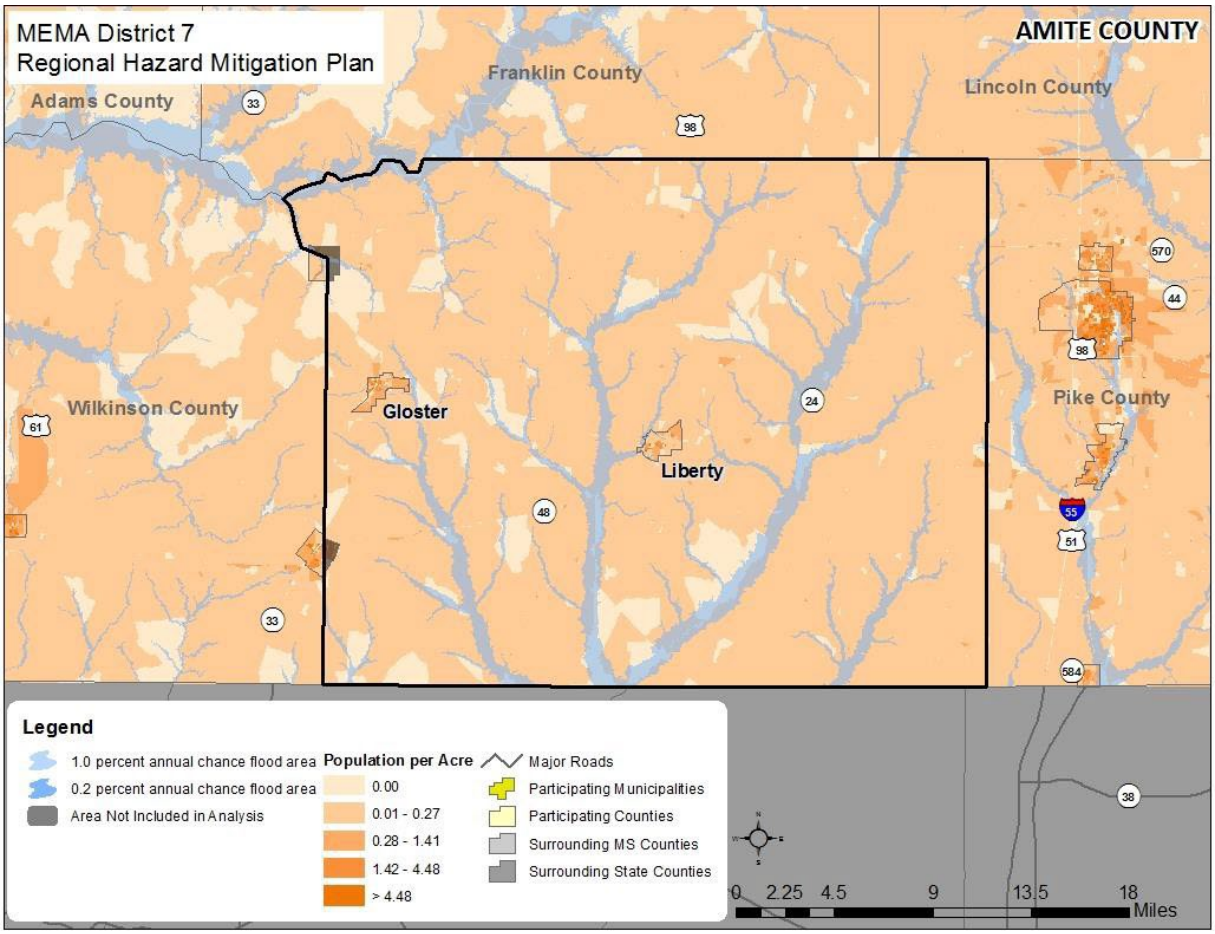
For this plan update, a HAZUS 100yr. flood scenario was performed for the study area. The geographical size of the region is approximately 732 square miles and contains 1,422 census blocks. The region contains over 5,000 households and has a total population of 13,131 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B. There are an estimated 6,928 buildings in the region with a total building replacement value (excluding contents) of 848 million dollars. Approximately 94.47% of the buildings (and 79.94% of the building value) are associated with residential housing.

HAZUS estimates that there are 6,928 buildings in the county which have an aggregate total replacement value of $848 million dollars. HAZUS estimates that about 34 buildings will be at least moderately damaged. This is over 64% of the total number of buildings in the scenario, with an estimate that no buildings would be destroyed.

Social Vulnerability

The figure below is presented to gain a better understanding of at-risk population by evaluating census block level population data against mapped floodplains. There are areas of concern in several of the population centers. Therefore, further investigation in these areas may be warranted. As noted in *Section 6.4*, no building-specific data, such as building footprints, was available to determine buildings at risk.

FIGURE B.2126: POPULATION DENSITY NEAR FLOODPLAINS IN AMITE COUNTY[70]



Critical Facilities

The critical facility analysis revealed that there are no critical facilities located in the floodplain. (Please note, as previously indicated, this analysis does not consider building elevation, which may negate risk.) A list of specific critical facilities and their associated risk can be found in Table B.45 at the end of this subsection.

In conclusion, a flood has the potential to impact many existing and future buildings, facilities, and populations in Amite County, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. Such site-specific vulnerability determinations are outside the scope of this assessment but may be considered during future updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

WILDFIRE

Although historical evidence indicates that Amite County is susceptible to wildfire events, there are few reports which include information on historic dollar losses. Therefore, it is difficult to calculate a reliable

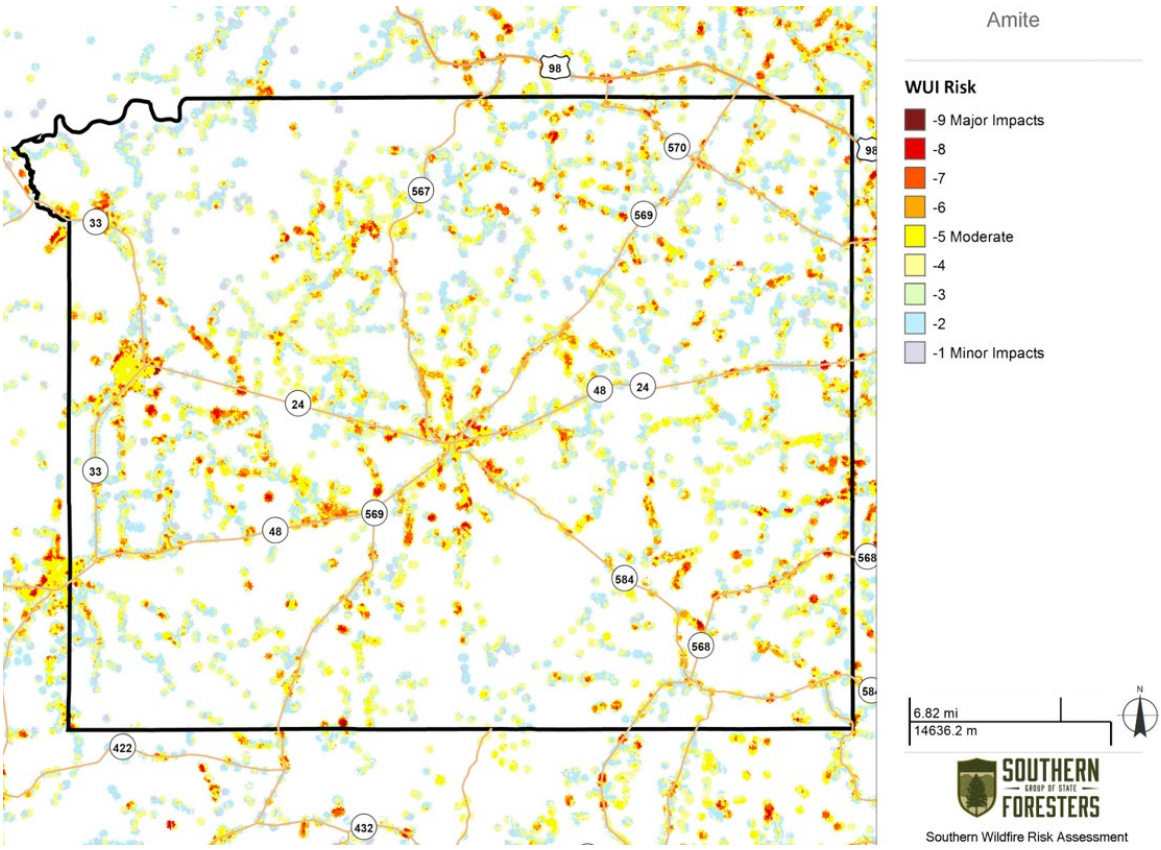
[70] Federal Emergency Management Agency DFIRM; United States Census Bureau, 2010 Census

annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result in significant damages throughout the county.

To estimate exposure to wildfire, building data was obtained from Hazus-MH 5.1 which includes information that has been aggregated at the census block level and which has been deemed useful for analyzing wildfire vulnerability. However, it should be noted that the accuracy of Hazus data is somewhat lower than that of parcel data. For the critical facility analysis, areas of concern were intersected with critical facility locations.

Figure B.19 shows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). Figure B.20 shows the areas of analysis where any grid cell is less than -4. Areas with a value below -4 were chosen to be displayed as areas of risk because this showed the upper echelon of the scale and the areas at highest risk.

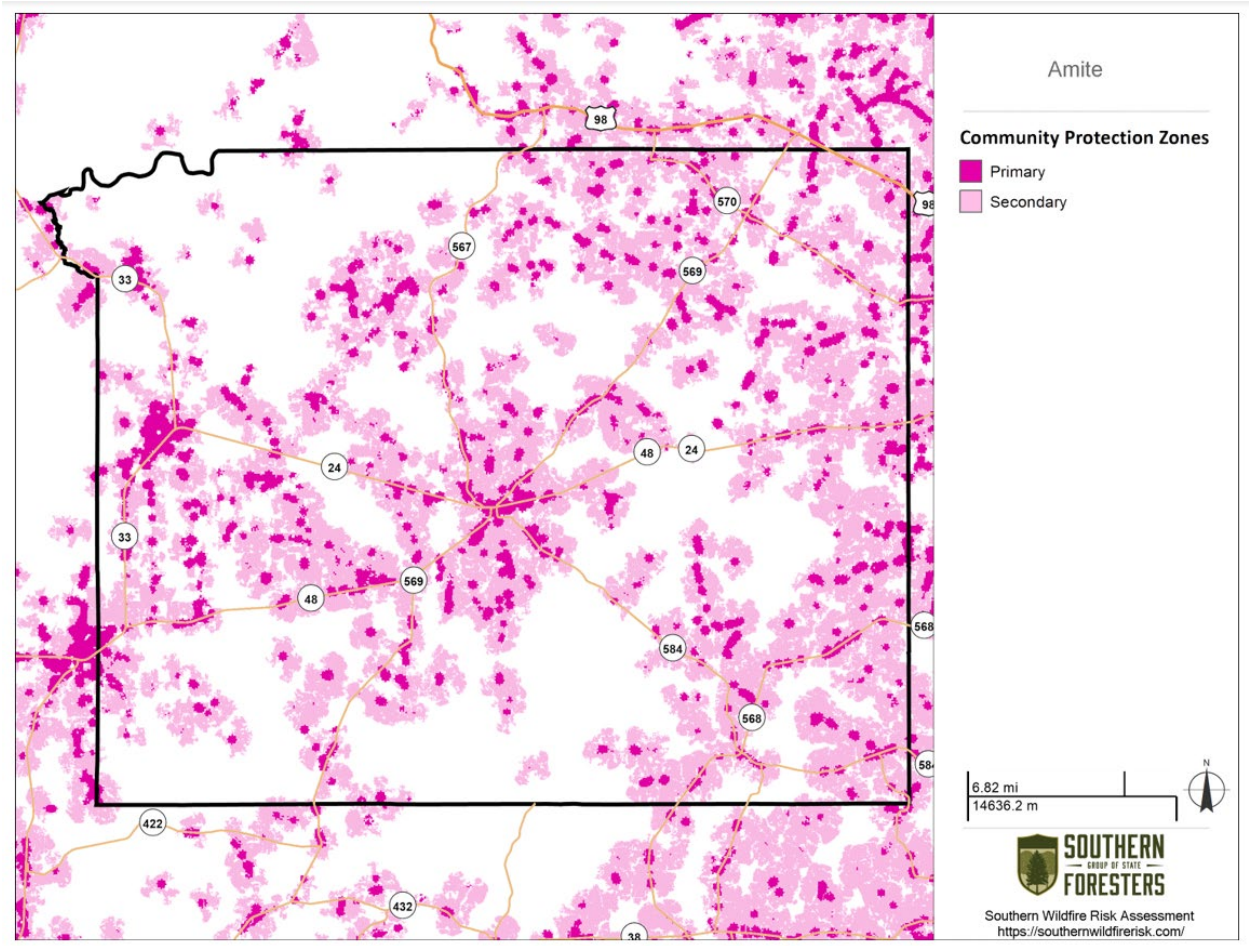
FIGURE B.2217: WUI RISK INDEX AREAS IN AMITE COUNTY [71]



[71] Southern Wildfire Risk Assessment Data

Community Protection Zones (CPZ) represent those areas considered highest priority for mitigation planning activities. CPZs are based on an analysis of the Where People Live housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ.

FIGURE B.183: WILDFIRE RISK AREAS IN AMITE COUNTY



Social Vulnerability

Given some level of susceptibility across the entire county, it is assumed that the total population is at risk to the wildfire hazard. The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk of wildfire.

Critical Facilities

The critical facility analysis revealed that there are 18 critical facilities located in wildfire areas of concern, including 5 fire stations, 3 medical care facilities, 1 police station, and 9 schools. It should be noted that several factors could impact the spread of a wildfire putting all facilities at risk. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

In conclusion, a wildfire event has the potential to impact many existing and future buildings, critical facilities, and populations in Adams County.

EARTHQUAKE

As the Hazus-MH model suggests below, and historical occurrences confirm, any significant earthquake activity in the area is likely to inflict minor damage to the county.

For the earthquake hazard vulnerability assessment, a probabilistic 100-year earthquake scenario was created at the MEMA District 7 regional level to estimate the average annualized loss for the county. The results of the analysis are generated at the census tract level within Hazus-MH and then aggregated to the county level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss. They do not include losses to business interruption, lost income, or relocation.

The geographical size of the region is 4,838.70 square miles and contains 38 census tracts. There are over 67,000 households in the region which has a total population of 174,795 people (2010 Census Bureau data). There are an estimated 82,000 buildings in the region with a total building replacement value (excluding contents) of $13.9 billion dollars. Approximately 92.00 % of the buildings (and 70.00% of the building value) are associated with residential housing.

Social Vulnerability

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodation in temporary public shelters. The model estimates 0 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 174,795) will seek temporary shelter in public shelters.

Critical Facilities

The Hazus-MH probabilistic analysis did not indicate that any critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor to moderate damage should an event occur.

In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in Amite County. Specific vulnerabilities for these assets will be greatly dependent on their individual design and the mitigation measures in place. Such site-specific vulnerability determinations are outside the scope of this assessment but may be considered during future updates. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While Amite County may not experience a catastrophic earthquake, localized damage is possible with a moderate to larger scale occurrence.

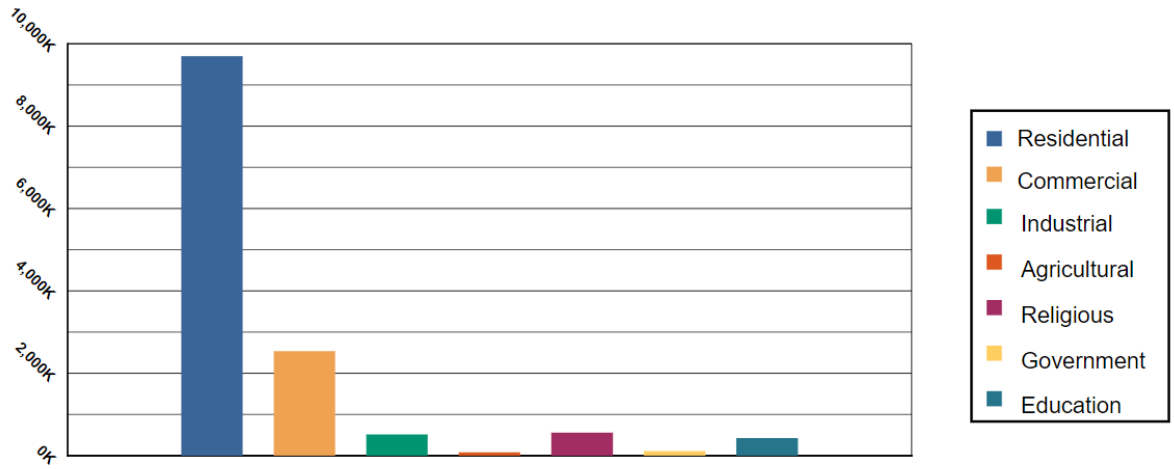
HURRICANE AND TROPICAL STORM

Historical evidence indicates that Amite County has significant risk to the hurricane and tropical storm hazard. There have been seven disaster declarations due to hurricanes as noted in pervious sections. Several tracks have come near or traversed through the county, as shown and discussed in *Section B.2.10*. Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from

these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard. Hazus-MH 5.1 was used to determine average annualized losses for the county as shown. Only losses to buildings, inventory, and contents are included in the results.

HAZUS was utilized to perform a 100-year hurricane simulation. Hazus estimates that there are 82,485 buildings in the region which have an aggregate total replacement value of $13 billion dollars.

FIGURE B.194: BUILDING EXPOSURE BY OCCUPANCY TYPE[72]



Social Vulnerability

Given some equal susceptibility across the entire county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard.

Critical Facilities

For essential facilities, there are 11 hospitals in the region with a total bed capacity of 605 beds. There are 90 schools, 74 fire stations, 32 police stations and 9 emergency operation facilities. HAZUS estimates that about 133 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 4 buildings that will be destroyed.

The total property damage losses were $71 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies, which made up over 95% of the total loss. The table below provides a summary of the losses associated with the building damage.

[72] HAZUS 100-year Hurricane Scenario

FIGURE B.205: LOSS BY TYPE[73]

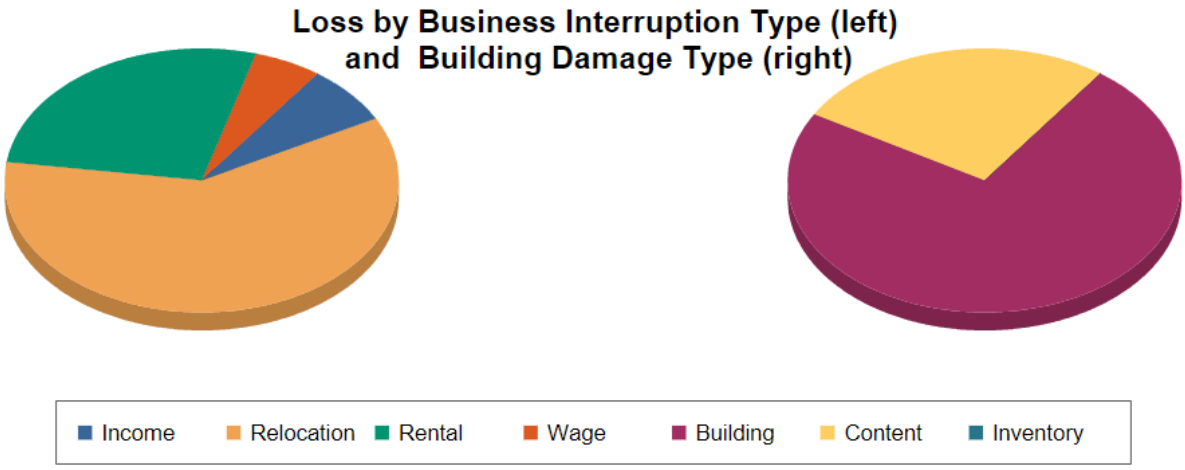
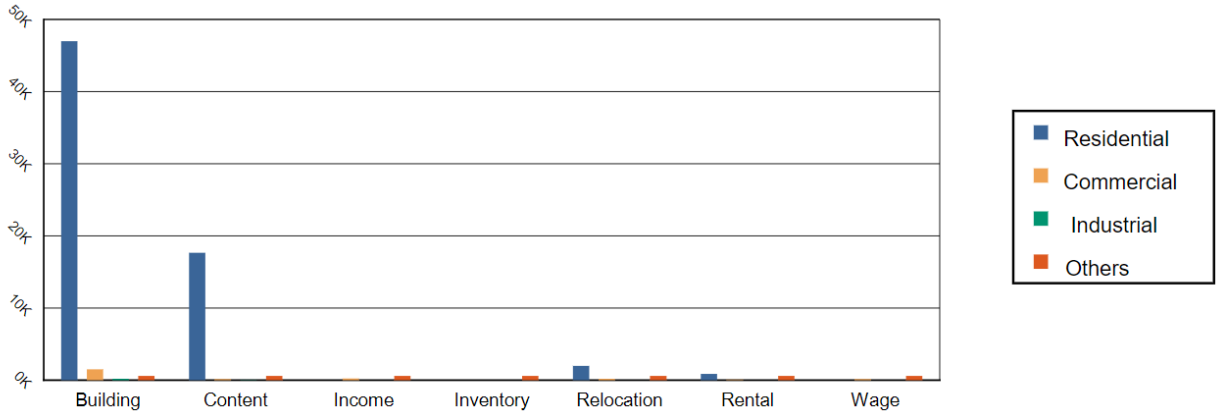


FIGURE B.216: LOSS BY GENERAL OCCUPANCY



Given equal vulnerability across Amite County, all critical facilities are at risk. Some buildings may perform better than others in the face of such an event due to construction and age, among other factors. Determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation action for especially vulnerable structures and/or critical facilities to mitigate against the effects of the hurricane hazard. A list of specific critical facilities can be found at the end of this subsection. In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in Amite County.

RADIOLOGICAL EVENT

The location of Grand Gulf and River Bend Nuclear Stations north and south of the region, respectively, demonstrate that the county is at some risk to the effects of a nuclear accident. Although there have not been any major events at these plants in the past, there have been major events at other nuclear

[73] HAZUS 100-year Hurricane Scenario

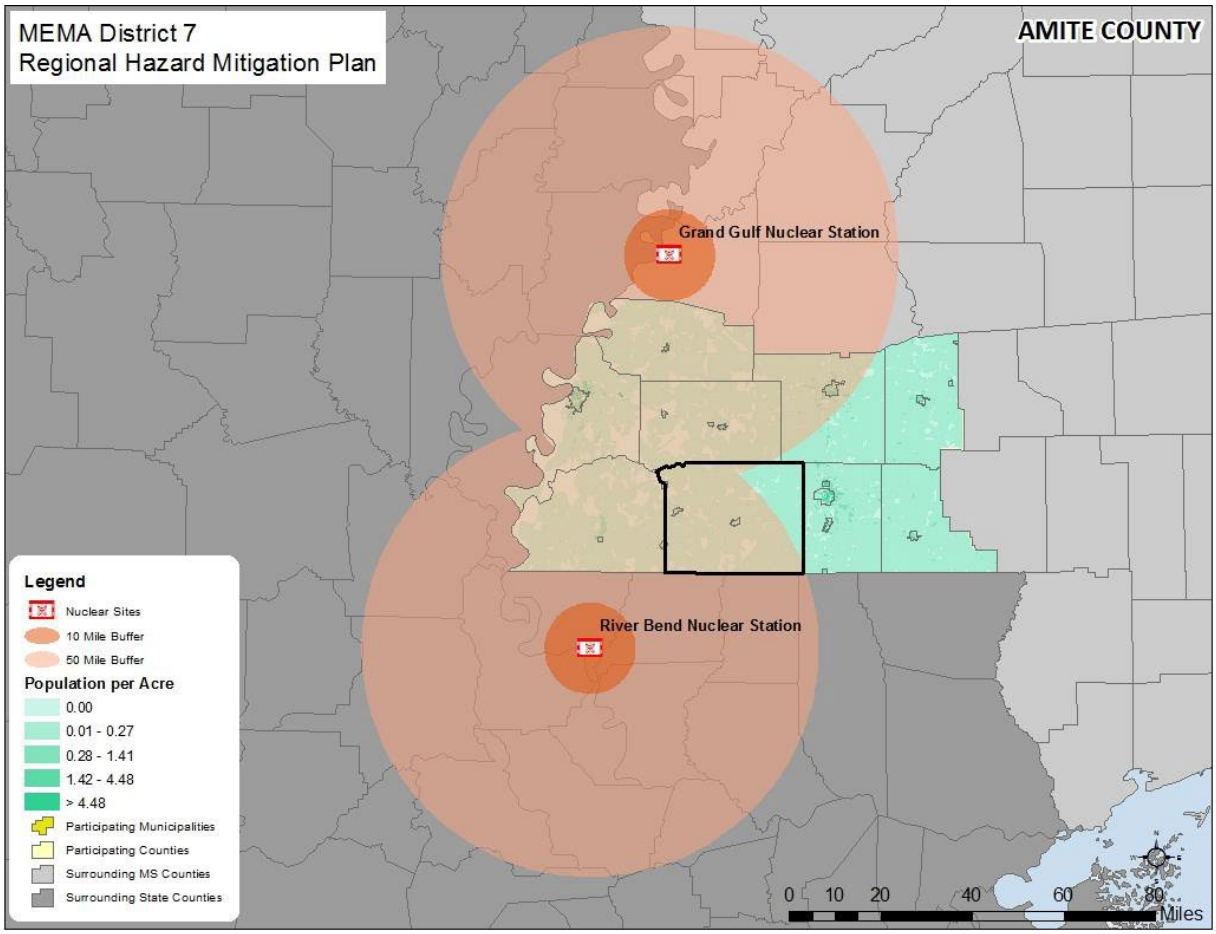
stations around the country. Additionally, smaller scale incidents at both these nuclear stations have occurred.

To assess nuclear risk, a GIS-based analysis was used to estimate exposure during a nuclear event within each of the risk zones described in *Section B.2.14*. The determination of assessed value at-risk (exposure) was calculated using GIS analysis by summing the total values for those properties that were confirmed to be located within one of the risk zones.

Social Vulnerability

Since most of the western part of county is within the 50-mile buffer area, this segment of the population is at high risk to a radiological event. However, other populations in the county may also be at some risk. This risk can be seen below.

FIGURE B.227: POPULATION DENSITY NEAR NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN AMITE COUNTY[74]



Critical Facilities

The critical facility analysis revealed that there are 28 critical facilities located in the 50-mile nuclear buffer area, including 1 EOC, 7 fire stations, 3 government/public buildings, 4 medical care facilities, 3

[74] International Atomic Energy Agency; United States Census Bureau, 2010 Census

police stations, 3 private sector buildings, and 7 schools. No critical facilities are located in the 10- mile buffer area. A list of specific critical facilities and their associated risk can be found at the end of this section.

In conclusion, a nuclear accident has the potential to impact many existing and future buildings, facilities, and populations in Amite County.

CONCLUSIONS ON HAZARD VULNERABILITY

The table below presents a summary of annualized loss for each hazard in Amite County. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

TABLE B.2827: ANNUALIZED LOSS FOR AMITE COUNTY[75]

Event	Amite County
Flood-related Hazards	
Dam & Levee Failure	Negligible
Erosion	Negligible
Flood	$34,500
Fire-related Hazards	
Drought	Negligible
Lightning	$1,086
Wildfire	Negligible
Geologic Hazards	
Earthquake[76]	
Temperature & Wind-related Hazards	
Extreme Heat	Negligible
Hailstorms	$0
Hurricane & Tropical Storm	$3,833,750
Severe Thunderstorm/High Wind	$20,806
Tornado	$35,204
Winter Storm & Freeze	$0
Other Hazards	
Radiological Event	Negligible
Pandemic	Negligible

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to atmospheric hazards including drought, lightning, extreme heat, hailstorm, hurricane and

[75] "Negligible" is used to indicate that no records of dollar losses for the hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that event is not well kept.

[76] No historic losses for earthquake were recorded, so Hazus estimates for annualized loss were used.

tropical storm, severe thunderstorm/high wind, tornado, and winter storm and freeze. Some buildings may be more vulnerable to these hazards based on other factors such as construction and building type. The following table shows the critical facilities vulnerable to the hazards analyzed in this section. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "X").

TABLE B.289: AT-RISK CRITICAL FACILITIES IN AMITE COUNTY

		FLOOD-RELATED				FIRE-RELATED			GEO	WIND-RELATED						HUM	
FACILITY NAME	FACILITY TYPE	Dam and Levee Failure	Erosion	Flood – 100 yr	Flood – 500 yr	Drought	Lightning	Wildfire	Earthquake	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Severe Thunderstorm/	Tornado	Winter Storm and Freeze	Radiological Event 10-mile area	Radiological Event 50-mile area
Amite County																	
Amite County EOC	EOC		X			X	X	X	X	X	X	X	X	X	X		X
East Central Rural Volunteer Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		X
Gillsburg Rural Volunteer Fire Department	Fire Station		X			X	X		X	X	X	X	X	X	X		X
Liberty Volunteer Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		X
Mars Hill VFD	Fire Station		X			X	X		X	X	X	X	X	X	X		
North Central Amite Volunteer Fire Department	Fire Station		X			X	X		X	X	X	X	X	X	X		X
O'neil Volunteer Fire Department	Fire Station		X			X	X		X	X	X	X	X	X	X		X
Smithdale Volunteer Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
Southwest Amite Volunteer Fire Department	Fire Station		X			X	X		X	X	X	X	X	X	X		X
Street Volunteer Fire Department	Fire Station		X			X	X		X	X	X	X	X	X	X		X
Amite County Courthouse Complex	Government/Public		X			X	X	X	X	X	X	X	X	X	X		X
Gloster Town Hall	Government/Public		X			X	X	X	X	X	X	X	X	X	X		X
Liberty Town Hall	Government/Public		X			X	X	X	X	X	X	X	X	X	X		X
Amite County Medical Services	Medical Care		X			X	X		X	X	X	X	X	X	X		X
Field Health System	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
Gloster Clinic	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
Liberty Community Living Center	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X

		FLOOD-RELATED				FIRE-RELATED			GEO	WIND-RELATED						HUM	
FACILITY NAME	FACILITY TYPE	Dam and Levee Failure	Erosion	Flood – 100 yr	Flood – 500 yr	Drought	Lightning	Wildfire	Earthquake	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Severe Thunderstorm/	Tornado	Winter Storm and Freeze	Radiological Event 10-mile area	Radiological Event 50-mile area
Amite County Law Enforcement Complex	Police Station		X			X	X	X	X	X	X	X	X	X	X		X
Gloster Police Dept	Police Station		X			X	X	X	X	X	X	X	X	X	X		X
Liberty Police Department	Police Station		X			X	X	X	X	X	X	X	X	X	X		X
Air Cruisers	Private Sector		X			X	X	X	X	X	X	X	X	X	X		X
Freedom Industries	Private Sector		X			X	X	X	X	X	X	X	X	X	X		X
Mabry Lumber Company	Private Sector		X			X	X	X	X	X	X	X	X	X	X		X
Amite County High School	School		X			X	X		X	X	X	X	X	X	X		X
Amite County Voc-Tech Complex	School		X			X	X		X	X	X	X	X	X	X		X
Amite School Center	School		X			X	X		X	X	X	X	X	X	X		X
Centreville Academy	School		X			X	X		X	X	X	X	X	X	X		X
Gloster Elementary School	School		X			X	X	X	X	X	X	X	X	X	X		X
Liberty Elementary School	School		X			X	X		X	X	X	X	X	X	X		X
Pine Hills Christian Academy	School		X			X	X	X	X	X	X	X	X	X	X		X

B.4 AMITE COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Amite County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in *Section 7: Capability Assessment.*

B.4.1 Planning and Regulatory Capability

The following table provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Amite County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. A dagger (†) indicates that the given item is administered for that municipality by the county. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the MEMA District 7 Regional Hazard Mitigation Plan.

TABLE B.290: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Threat and Hazard Identification and Risk Assessment (THIRA)	Comprehensive Land Use Plan	Floodplain Management Plan/Flood Mitigation Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Emergency Management Accreditation Program (EMAP Accreditation)	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment/ Reconstruction Plan/ Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System (CRS Program)
AMITE COUNTY	✓								✓		✓				✓		✓							✓	
Gloster									†						†		✓	✓						✓	
Liberty									†						†		✓	✓						✓	

EMERGENCY MANAGEMENT

Hazard Mitigation Plan

Amite County has previously adopted a hazard mitigation plan. The Town of Gloster and Town of Liberty were also included in this plan.

Emergency Operations Plan

Amite County maintains an Emergency Operations Plan through its Emergency Management Agency. The Town of Gloster and the Town of Liberty are also covered by this plan.

FLOODPLAIN MANAGEMENT

The table below provides NFIP policy and claim information for each participating jurisdiction in Amite County.

TABLE B.301: NFIP POLICY AND CLAIM INFORMATION[77]

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
AMITE COUNTY†	08/01/86	09/29/10	0	$0	0	$0
Gloster	06/17/86	09/29/10	0	$0	0	$0
Liberty	09/29/86	09/29/10	0	$0	0	$0

All jurisdictions listed above that are participants in the NFIP will continue to comply with all required provisions of the program and will work to adequately comply in the future utilizing a number of strategies. For example, the jurisdictions will coordinate with MEMA and FEMA to develop maps and regulations related to special flood hazard areas within their jurisdictional boundaries and, through a consistent monitoring process, will design and improve their floodplain management program in a way that reduces the risk of flooding to people and property.

Flood Damage Prevention Ordinance

All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. Amite County, Town of Gloster, and Town of Liberty all participate in the NFIP and have adopted flood damage prevention regulations.

B.4.2 Administrative and Technical Capability

The table below provides a summary of the capability assessment results for Amite County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill. A dagger (†) indicates a county-level staff member(s) provides the specified knowledge or skill to that municipality.

[77] NFIP Community Status information as of 7/2/2023; NFIP claims and policy information as of 7/2/2023

TABLE B.32: RELEVANT STAFF/PERSONNEL RESOURCES

Staff/Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human- caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to Assess the community's vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
AMITE COUNTY				✓	✓		✓	✓		
Gloster				†	✓		†	†		
Liberty				†	†		†	†		

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

B.4.3 Fiscal Capability

The next table provides a summary of the results for Amite County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource has previously been used to implement hazard mitigation actions. A dagger (†) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds).

TABLE B.313: RELEVANT FISCAL RESOURCES

Fiscal Tool/Resource	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes (or taxing districts)	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other: FEMA Hazard Mitigation Grants, Homeland Security Grants, USDA Rural Development Agency Grants, and US Economic Development Administration Grants
AMITE COUNTY		†							†	†
Gloster		†		✓	✓					†
Liberty		†		✓	✓					†

B.4.4 Political Capability

During the months immediately following a disaster, local public opinion in Amite County is more likely to shift in support of hazard mitigation efforts.

The following table provides a summary of the results for Amite County about political capability A checkmark (✓) indicates the expected degree of political support by local elected officials in terms of adopting/funding information.

TABLE B.324: LOCAL POLITICAL SUPPORT

Political Support	Limited	Moderate	High
AMITE COUNTY		✓	
Gloster		✓	
Liberty		✓	

B.4.5 Conclusions on Local Capability

The table below shows the results of the capability assessment using the designed scoring methodology described in *Section 7: Capability Assessment*. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. This information was reviewed by all jurisdictions and each jurisdiction provided feedback on

the information included in the capability assessment. Local government input was vital to identifying capabilities. According to the assessment, the average local capability score for the county and its jurisdictions is 19.3, which falls into the limited capability ranking.

TABLE B.335: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
AMITE COUNTY	23	Limited
Gloster	18	Limited
Liberty	17	Limited

B.5 AMITE COUNTY MITIGATION STRATEGY

This subsection provides the blueprint for Amite County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and the findings and conclusions of the capability assessment and risk assessment. In addition, this strategy was developed with the State Hazard Mitigation Plan Goals and Objectives in mind. For this update, each action identifies the State Hazard Mitigation Program Objective that it relates to. Additional Information can be found in *Section 8: Mitigation Strategy* and *Section 9: Mitigation Action Plan*.

B.5.1 Mitigation Goals

Amite County developed six mitigation goals in coordination with the other participating MEMA District 7 Region jurisdictions. The regional mitigation goals are presented below.

TABLE B.346: MEMA DISTRICT 7 REGIONAL MITIGATION GOALS

	Goal
Goal #1	Increase the overall public awareness of natural hazards that face the region.
Goal #2	Retrofit of critical facilities and/or critical infrastructure to lower the risk of damage from natural hazards.
Goal #3	General improvement of regional or local mitigation planning and capability.
Goal #4	Support State Identified Mitigation Initiatives such as saferooms and storm shelters, severe weather warning systems for universities and colleges, and severe weather notification systems for local communities.
Goal #5	Reduce loss of life, damage and loss of property and infrastructure, economic costs, including response, recovery and disruption of economic activity.
Goal #6	Foster cooperation among all levels of governments and the private sector with respect to improving, updating, and implementing the hazard mitigation plan.

B.5.2 Mitigation Action Plan

The mitigation actions proposed by Amite County, Town of Gloster, and Town of Liberty are listed in the following individual Mitigation Action Plans.

Amite County Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implement Sched.	Implementation Status (2023)
Prevention								
P-1	2.2	**Comprehensive Land Use and Long-Term Recovery Planning –** The Amite County Board of Supervisors/ Towns of Meadville, Bude, and Roxie should have a Comprehensive Plan developed to guide long term recovery and development.	Hurricane, erosion, and other hazards	N/A	N/A	N/A	Deleted	This action does not meet the County's needs. It has been deleted.
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	Amite County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2027	A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.

P-3	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist counties with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as counties develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Amite County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2025	Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.
P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Amite County Board of Supervisors/ Towns of Liberty and Gloster	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
P-5	1.4	**Base Level Engineering –** Collaborate with local or regional resources develop Base Level Engineering, watershed-wide engineering modeling that leverages high resolution ground elevation, automated model building techniques, and manual model review to prepare broad and accurate flood risk information for FEMA to assess its current flood hazard inventory.	Flood	High	Franklin County Board of Supervisors	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.
Property Protection								
PP-1	1.1	**Ground/Protect Critical Facilities and Equipment** – Upgrade electrical protective measures on critical facilities.	Lightning	Moderate	Amite County Board of Supervisors/ Towns of Liberty and Gloster	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action. The County has targeted the Sheriff's department for implementation of this action.

Natural Resource Protection								
NRP-1	1.6							
Structural Projects								
SP-1	1.9	**Harden the Electrical Grid –** Amite County will encourage and support local energy providers in assessing potential risks in the electric grid and taking strategic actions to proactively mitigate those risks, harden key infrastructure, and protect utility customers from outages.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, Lightning, or other hazard leading to loss of electrical power	High	Amite County Board of Supervisors/ Towns of Liberty and Gloster	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action.
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Hurricane, Winter Storm	High	Amite County Board of Supervisors/ Towns of Liberty and Gloster in collaboration with the Mississippi Emergency Management Agency	General and special funds	In progress – target completion 2027	Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. The county is in the process of becoming "storm ready" countywide including the towns, so this action will remain in the plan. This action was combined with ES-6 since they were duplicate actions.

ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, Lightning, or other hazard leading to loss of electrical power	High	Amite County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2025	This remains an ongoing project for the county. The county would like to secure standby generators for the Liberty Police Department, and the Town of Gloster needs a mobile generator for their lift stations.
ES-3	1.8	**Improve Emergency Communications –** Purchase CodeRED® or other similar product to function as a high-speed telephone communications service for emergency notifications. This system allows County officials to telephone targeted areas of a municipality or the entire County in case an emergency situation requires immediate action such as a boil-water notice, missing child or evacuation notices.	Hurricane or other hazard leading to loss of traditional communications systems	High	Amite County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2025	This action has been modified from its original identification of satellite phones, to embrace newer and more effective technology.
ES-4	1.9	**Construct New Emergency Shelter –** The county should construct a 200-person evacuation shelter. When not needed for disaster related housing, the building will serve as a Community Center and can be rented by individuals for group functions such as family reunions, weddings, or class reunions.	Hurricane, Tornado or other hazard requiring the use of emergency shelters	N/A	N/A	N/A	Deleted	This action does not meet the County's needs. It has been deleted.

ES-5	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide/citywide system.	Tornado	High	Amite County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	2027	The two municipalities with population densities have sirens, but this remains an ongoing consideration for the county should additional funding become available. Many citizens in Amite County live in rural areas and small communities. In the event of inclement weather, it is essential that they receive timely warnings. Amite County added sirens to the Town of Liberty and Gloster. additional sirens can be installed/upgraded to further improve the warning system in Amite County, so this action will remain in the plan.
ES-7	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Amite County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2027	New Action.
Public Education and Awareness								

PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	low	Amite County Board of Supervisors	Individual county general and special funds	2027	Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan. The County is interested in incorporating earthquake drills through the annual Great ShakeOut.
PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Amite County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	In progress – target completion 2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP.
PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.

PEA-5	3.2	**Education: FireWise –** Recommend that public information and outreach workshops on the *Firewise* program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Amite County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, individual county general and special funds	In progress – target completion 2027	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in FireWise will improve communities' awareness of wildfire risk, so this action will remain in the plan.
PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Amite County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The nuclear reactor remains and so does this project. It's a continued item. Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Amite County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The nuclear reactor remains and so does this project. It's a continued item. The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.

PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Severe Thunderstorm/High Wind, Lightning	Moderate	Amite County Board of Supervisors/ Towns of Liberty and Gloster	FEMA Hazard Mitigation grants, general and special funds	2025	New Action
PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Amite County Board of Supervisors/ Towns of Liberty and Gloster	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Amite County Board of Supervisors/ Towns of Liberty and Gloster	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2024	New Action.

PEA-11	3.1	**Education: Public Outreach –** Develop a program to encourage school programs to incorporate the Great Shake Out	Earthquake	Low	Amite County Board of Supervisors/ Towns of Liberty and Gloster	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.

Town of Gloster Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implement Sched.	Implementation Status (2023)
Prevention								
P-1	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include lidar with aerial photography and 100 year base flood elevations in the A Zones and any other area where base flood elevations need to be computed.	Flood	Moderate	Town of Gloster Board of Alderman and Mayor and the Amite County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2027	A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.

P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist counties with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as counties develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Town of Gloster Board of Alderman and Mayor and the Amite County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2025	Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.
P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Town of Gloster Board of Alderman and Mayor in collaboration with the Amite County Board of Supervisors	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
P-5	1.4	**Base Level Engineering –** Collaborate with local or regional resources develop Base Level Engineering, watershed-wide engineering modeling that leverages high resolution ground elevation, automated model building techniques, and manual model review to prepare broad and accurate flood risk information for FEMA to assess its current flood hazard inventory.	Flood	High	Town of Gloster Board of Alderman and Mayor in collaboration with the Amite County Board of Supervisors	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.
Property Protection								
PP-1	1.1	**Ground/Protect Critical Facilities and Equipment** – Upgrade electrical protective measures on critical facilities.	Lightning	Moderate	Town of Gloster Board of Alderman and Mayor in	FEMA Hazard Mitigation grants, individual	2025	New Action.

					collaboration with the Amite County Board of Supervisors	county general and special funds		
Natural Resource Protection								
NRP-1	1.6							
Structural Projects								
SP-1	1.9	**Harden the Electrical Grid –** Amite County will encourage and support local energy providers in assessing potential risks in the electric grid and taking strategic actions to proactively mitigate those risks, harden key infrastructure, and protect utility customers from outages.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, Lightning, or other hazard leading to loss of electrical power	High	Town of Gloster Board of Alderman and Mayor in collaboration with the Amite County Board of Supervisors	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action.
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Hurricane, Winter Storm	High	Amite County Board of Supervisors/ Towns of Liberty and Gloster in collaboration with the Mississippi Emergency Management Agency	General and special funds	In progress – target completion 2027	Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. The county is in the process of becoming "storm ready" countywide including the towns, so this action will remain in the plan. This action was combined with ES-5 since they were duplicate actions.

ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, Lightning, or other hazard leading to loss of electrical power	High	Town of Gloster Board of Alderman and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2025	Loss of electrical power to critical facilities such as water and sewer systems, law enforcement offices, and other critical facilities during a natural disaster can have a severe impact on the functioning of government to provide relief and assistance to citizens and maintain civil order. This can also cause very significant problems for private citizens who depend on municipal and rural water and sewer systems and rely on county and town governments to continue to maintain order. This situation can be especially difficult on the elderly and other special needs persons who would have a difficult time maintaining the basics for themselves without assistance. Town of Gloster will continue to purchase critical facility generators as funding permits. The next facility targeted for installation is the Police station. This action will remain in the plan.
ES-3	1.8	**Improve Emergency Communications –** Purchase CodeRED® or other similar product to function as a high-speed telephone communications service for emergency notifications. This system allows County officials to telephone targeted areas of a municipality or the entire County in case an emergency situation requires immediate action such as a boil-water notice, missing child or evacuation notices.	Hurricane or other hazard leading to loss of traditional communications systems	High	Town of Gloster Board of Alderman and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2025	This action has been modified from its original identification of satellite phones, to embrace newer and more effective technology.

ES-4	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide/citywide system.	Tornado	High	Town of Gloster Board of Alderman and Mayor	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	2027	The two municipalities with population densities have sirens, but this remains an ongoing consideration for the county should additional funding become available. Many citizens in Amite County live in rural areas and small communities. In the event of inclement weather, it is essential that they receive timely warnings. Amite County added sirens to the Town of Liberty and Gloster. additional sirens can be installed/upgraded to further improve the warning system in Amite County, so this action will remain in the plan.
ES-6	1.9	**Safe Rooms and Community Shelters –** The town should construct and/or encourage construction of safe rooms and community shelters.	Hurricane, Tornado or other hazard requiring the use of emergency shelters	High	Town of Gloster Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual city general and special funds	2027	Implementation ahs been delayed, but remains a priority for the town.
ES-7	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Town of Gloster Board of Alderman and Mayor	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration	2027	New Action.

						(SAMHSA), general and special funds		
Public Education and Awareness								
PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Low	Town of Gloster Board of Alderman and Mayor	Individual county general and special funds	2027	Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan. The County is interested in incorporating earthquake drills through the annual Great ShakeOut.
PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Town of Gloster Board of Alderman and Mayor and the Amite County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	In progress – target completion 2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP.
PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.

PEA-5	3.2	**Education: FireWise –** Recommend that public information and outreach workshops on the *Firewise* program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Town of Gloster Board of Alderman and Mayor and the Amite County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, individual county general and special funds	In progress – target completion 2027	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in FireWise will improve communities' awareness of wildfire risk, so this action will remain in the plan.
PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Town of Gloster Board of Alderman and Mayor and the Amite County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The nuclear reactor remains and so does this project. It's a continued item. Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Town of Gloster Board of Alderman and Mayor and the Amite County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The nuclear reactor remains and so does this project. It's a continued item. The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.

PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Severe Thunderstorm/High Wind, Lightning	Moderate	Amite County Board of Supervisors/ Towns of Liberty and Gloster	FEMA Hazard Mitigation grants, general and special funds	2025	New Action
PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Amite County Board of Supervisors/ Towns of Liberty and Gloster	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Amite County Board of Supervisors/ Towns of Liberty and Gloster	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2024	New Action.
PEA-11	3.1	**Education: Public Outreach –** Develop a program to encourage school programs to incorporate the Great Shake Out	Earthquake	Low	Amite County Board of Supervisors/ Towns of Liberty and Gloster	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.

Town of Liberty Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implement Sched.	Implementation Status (2023)
Prevention								
P-1	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include lidar with aerial photography and 100 year base flood elevations in the A Zones and any other area where base flood elevations need to be computed.	Flood	Moderate	Town of Liberty Board of Alderman and Mayor and the Amite County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2027	A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist counties with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as counties develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Town of Liberty Board of Alderman and Mayor and the Amite County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2025	Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.

P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Town of Liberty Board of Alderman and Mayor in collaboration with the Amite County Board of Supervisors	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
P-5	1.4	**Base Level Engineering –** Collaborate with local or regional resources develop Base Level Engineering, watershed-wide engineering modeling that leverages high resolution ground elevation, automated model building techniques, and manual model review to prepare broad and accurate flood risk information for FEMA to assess its current flood hazard inventory.	Flood	High	Town of Liberty Board of Alderman and Mayor in collaboration with the Amite County Board of Supervisors	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.
Property Protection								
PP-1	1.1	**Ground/Protect Critical Facilities and Equipment** – Upgrade electrical protective measures on critical facilities.	Lightning		Town of Liberty Board of Alderman and Mayor in collaboration with the Amite County Board of Supervisors	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action.
Natural Resource Protection								
NRP-1	1.6							
Structural Projects								
SP-1	1.9	**Harden the Electrical Grid –** Amite County will encourage and support local energy providers in assessing potential risks in the electric grid and taking strategic actions to proactively mitigate those risks, harden key infrastructure, and protect utility customers from outages.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, Lightning, or other hazard leading to loss of	High	Town of Liberty Board of Alderman and Mayor in collaboration with the Amite County Board of Supervisors	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action.

			electrical power					
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Hurricane, Winter Storm	High	Amite County Board of Supervisors/ Towns of Liberty and Liberty in collaboration with the Mississippi Emergency Management Agency	General and special funds	In progress – target completion 2027	Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. The county is in the process of becoming "storm ready" countywide including the towns, so this action will remain in the plan. This action was combined with ES-5 since they were duplicate actions.
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, Lightning, or other hazard leading to loss of electrical power	High	Town of Liberty Board of Alderman and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2025	Loss of electrical power to critical facilities such as water and sewer systems, law enforcement offices, and other critical facilities during a natural disaster can have a severe impact on the functioning of government to provide relief and assistance to citizens and maintain civil order. This can also cause very significant problems for private citizens who depend on municipal and rural water and sewer systems and rely on county and town governments to continue to maintain order. This situation can be especially difficult on the elderly and other special needs persons who would have a difficult time maintaining the basics for themselves without assistance. Town of Liberty will continue to purchase critical facility generators as

								funding permits, so this action will remain in the plan.
ES-3	1.8	**Improve Emergency Communications –** Purchase CodeRED® or other similar product to function as a high-speed telephone communications service for emergency notifications. This system allows County officials to telephone targeted areas of a municipality or the entire County in case an emergency situation requires immediate action such as a boil-water notice, missing child or evacuation notices.	Hurricane or other hazard leading to loss of traditional communications systems	High	Town of Liberty Board of Alderman and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2025	This action has been modified from its original identification of satellite phones, to embrace newer and more effective technology.
ES-4	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide/citywide system.	Tornado	High	Town of Liberty Board of Alderman and Mayor	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	2027	The two municipalities with population densities have sirens, but this remains an ongoing consideration for the county should additional funding become available. Many citizens in Amite County live in rural areas and small communities. In the event of inclement weather, it is essential that they receive timely warnings. Amite County added sirens to the Town of Liberty and Liberty. additional sirens can be installed/upgraded to further improve the warning system in Amite County, so this action will remain in the plan.
ES-6	1.9	**Safe Rooms and Community Shelters –** The town should construct and/or encourage construction of safe rooms and community shelters.	Hurricane, Tornado or other hazard requiring the use of emergency shelters	High	Town of Liberty Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual city general and special funds	2027	Implementation ahs been delayed, but remains a priority for the town.

ES-7	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Town of Liberty Board of Alderman and Mayor	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2027	New Action.
Public Education and Awareness								
PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Low	Town of Liberty Board of Alderman and Mayor	Individual county general and special funds	2027	Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan. The County is interested in incorporating earthquake drills through the annual Great ShakeOut.

PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Town of Liberty Board of Alderman and Mayor and the Amite County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	In progress – target completion 2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP.
PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-5	3.2	**Education: FireWise –** Recommend that public information and outreach workshops on the *Firewise* program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Town of Liberty Board of Alderman and Mayor and the Amite County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, individual county general and special funds	In progress – target completion 2027	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in FireWise will improve communities' awareness of wildfire risk, so this action will remain in the plan.

PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Town of Liberty Board of Alderman and Mayor and the Amite County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The nuclear reactor remains and so does this project. It's a continued item. Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Town of Liberty Board of Alderman and Mayor and the Amite County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The nuclear reactor remains and so does this project. It's a continued item. The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Severe Thunderstorm/High Wind, Lightning	Moderate	Amite County Board of Supervisors/ Towns of Liberty and Liberty	FEMA Hazard Mitigation grants, general and special funds	2025	New Action

PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Amite County Board of Supervisors/ Towns of Liberty and Gloster	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Amite County Board of Supervisors/ Towns of Liberty and Gloster	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2024	New Action.
PEA-11	3.1	**Education: Public Outreach –** Develop a program to encourage school programs to incorporate the Great Shake Out	Earthquake		Amite County Board of Supervisors/ Towns of Liberty and Gloster	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.

FRANKLIN COUNTY

This annex includes jurisdiction-specific information for Franklin County and its participating municipalities. It consists of the following five subsections:

- C.1 Franklin County Community Profile
- C.2 Franklin County Risk Assessment
- C.3 Franklin County Vulnerability Assessment
- C.4 Franklin County Capability Assessment
- C.5 Franklin County Mitigation Strategy

C.1 FRANKLIN COUNTY COMMUNITY PROFILE

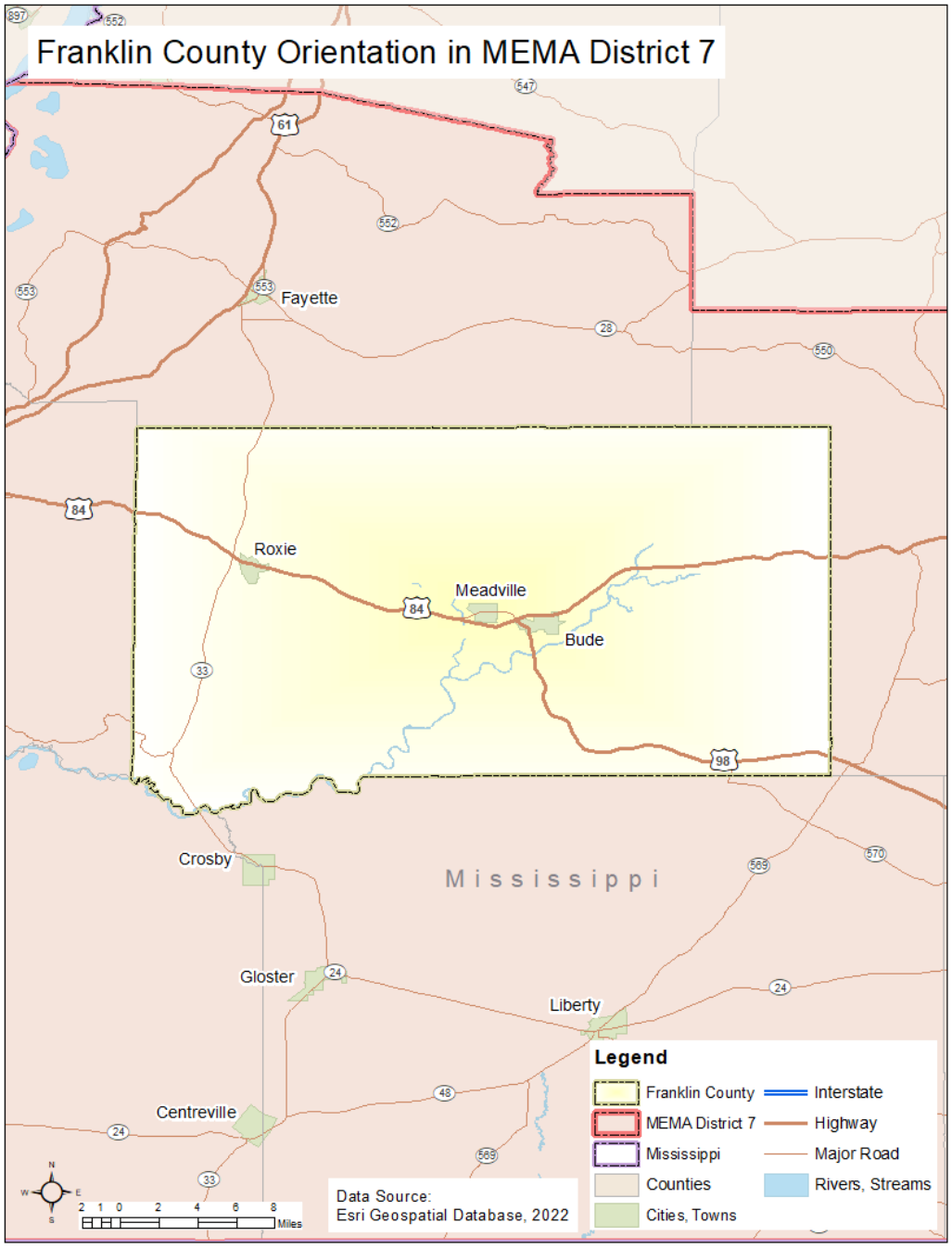
C.1.1 Geography and the Environment

Franklin County is in southwestern Mississippi. It comprises three towns, Town of Bude, Town of Meadville, and Town of Roxie, as well as many small unincorporated communities. An orientation map is provided in the figure below.

The county is located to the east of the Mississippi River supplying diverse recreational activities. The total area of the county is 567 square miles, 3 square miles of which is water area.

Franklin County enjoys four distinct seasons but the climate in the region is generally hot and humid compared to the rest of the United States given its latitude and relative proximity to the Gulf Coast. Precipitation is generally highest in winter months when the temperatures are moderately lower, but the likelihood of precipitation remains relatively constant throughout the year. Summers in the region can become fairly hot with average highs in the nineties and lows in the seventies. The region is also often susceptible to turbulent weather when warm, wet air from the Gulf of Mexico is pushed up into the region to mix with cooler air coming down from across the continent which can result in severe weather conditions. This is particularly true in the spring when seasons are changing, and diverse weather patterns interact.

FIGURE C.1: FRANKLIN COUNTY ORIENTATION MAP



C.1.2 Population and Demographics

According to the 2020 Census, Franklin County has a population of 7,675 people. The county has seen a decrease in population between 2000 and 2020, and the population density is 13 people per square mile. Population counts from the U.S. Census Bureau for 2000, 2010, and 2020 for the county and participating jurisdictions are presented below.

TABLE C.1: POPULATION COUNTY FOR FRANKLIN COUNTY[1]

Jurisdiction	2000 Census	2010 Census	2020 Census	% Change 2000 - 2020
Franklin County	8,448	8,118	7,675	-9.15%
Bude	1,037	1,063	780	-24.78
Meadville	519	449	448	-13.68%
Roxie	569	497	469	-17.57%

Based on the 2010 Census, the median age of residents of Franklin County is 42.9 years. The racial characteristics of the county are presented in Table C.2. People identified as white make up the majority of the population in the county, accounting for almost 62.4% of the population.

TABLE C.2: DEMOGRAPHICS OF FRANKLIN COUNTY[2]

Jurisdiction	White	Black or African American	American Indian or Alaska Native	Asian	Native Hawaiian or Other Pacific Islander	Other Race	Two or More Races	Persons of Hispanic Origin[3]
Franklin County	**62.4%**	**35.8%**	**0.2%**	**0.0%**	**0.0%**	**0.4%**	**1.3%**	**0.0%**
Bude	49.0%	47.7%	1.2%	0.0%	0.0%	0.0%	2.2%	0.0%
Meadville	80.9%	14.0%	0.0%	0.0%	0.0%	4.6%	0.5%	0.3%
Roxie	60.1%	39.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

C.1.3 Housing

According to the 2020 U.S. Census, there are 4,284 housing units in Franklin County, the majority of which are single family homes or mobile homes. Housing information for the county and municipalities is presented below.

TABLE C.3: HOUSING CHARACTERISTICS OF FRANKLIN COUNTY[4]

Jurisdiction	Housing Units (2010)	Housing Units (2021)	Median Home Value (2017-2021)
Franklin County	**4,154**	**4,288**	**$81,200**
Bude	525	443	$61,622
Meadville	207	195	$69,700
Roxie	215	236	$92,000

[1] *United States Census Bureau, 2020 Census*
[2] 2021 American Community Survey
[3] Persons of Hispanic Origin may be of any race, so also are included in applicable race categories
[4] 2021 American Community Survey, U.S. 2020 Census

C.1.4 Infrastructure

TRANSPORTATION

In Franklin County, U.S. Highways 84 and 98 provide access to the east and west. Mississippi Highway 33 provides access to the north and south. There are no general aviation airports located in Franklin County.

A major freight rail line operates within Franklin County. Natchez Railroad is a Class III Local railway that operates and runs east to west in the county. Business and industries rely on this line along with various other major highway routes as distribution of merchandises.

UTILITIES

Electrical power in Franklin County is provided by Entergy Mississippi Inc., Magnolia Electric Power Association, South Mississippi Electric Power Association, and Southwest Mississippi Electric Power Association.

Water and sewer service is provided by participating jurisdictions and/or community based associations, but unincorporated areas often rely on septic systems and wells in Franklin County.

COMMUNITY FACILITIES

There are a number of buildings and community facilities located throughout Franklin County. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 5 fire stations, 3 police stations (including the sheriff's department), and 1 school district with two campus – elementary and junior high.

There are also 4 medical care facilities – 2 hospitals, one clinic, and one nursing home.

Recreational opportunities exist throughout Franklin County. The Homochitto National Forest comprises almost 200,000 acres of land and is partially located in Franklin County. Visitors can camp, hike, hunt, and fish in the forest.

The Mississippi River, which runs to the east of the county, has played an integral part in the history of the county. The river acted as a major conduit for trade in the 19th century as plantations produced large quantities of cotton that could be easily shipped down to ports such as New Orleans. Today, the river is still an important part of the local economy as products are shipped worldwide out of the Natchez port. Apart from the Mississippi River there are multiple water-based refuges, activities, and recreational features focused on local water bodies in the region. For instance, as part of the Homochitto National Forest, Okhissa Lake in Franklin County offers over 1,000 acres of lake area for fishing, boating and leisure activities. There are also numerous other small lakes, creeks, and other water bodies throughout the region that offer the outstanding outdoor recreational opportunities for which the region is known.

C.1.5 Land Use

Franklin County has a blend of old and new development that contributes to physical, cultural, and economic attributes throughout the region. There are three incorporated municipalities located in the county. These areas are where the county's population is generally concentrated. The incorporated areas are also where many of the businesses, commercial uses, and institutional uses are located. Land

uses in the balance of the county generally consist of rural residential development, agricultural uses, and recreational areas. There are multiple county- and regional-based agencies that serve to coordinate growth and promote economic development. Local land use and associated regulations are further discussed in Section 7: Capability Assessment.

C.1.6 Employment and Industry

According to the U.S. Census Bureau's American Community Survey (ACS), in 2021, Franklin County had an average annual employment of 2,626 workers and an average unemployment rate of 6.8 percent (compared to 5.6 percent for the state)[5]. In 2021, the Educational services, and health care and social assistance employed 23.9 percent of the workforce followed by Agriculture, forestry, fishing, and hunting (11.9%) and Manufacturing (10.9%). The average annual median household in 2021 for Franklin County was $40,479 compared to $49,111 in the state of Mississippi.

[5] Mississippi Department of Employment Security. https://www.mdes.ms.gov/media/8735/urate.pdf

C.2 FRANKLIN COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in Section 4: Hazard Identification as they pertain to Franklin County. Each hazard profile includes a description of the hazard's location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in Section 5: Hazard Profiles.

FLOOD-RELATED HAZARDS

C.2.1 Dam and Levee Failure

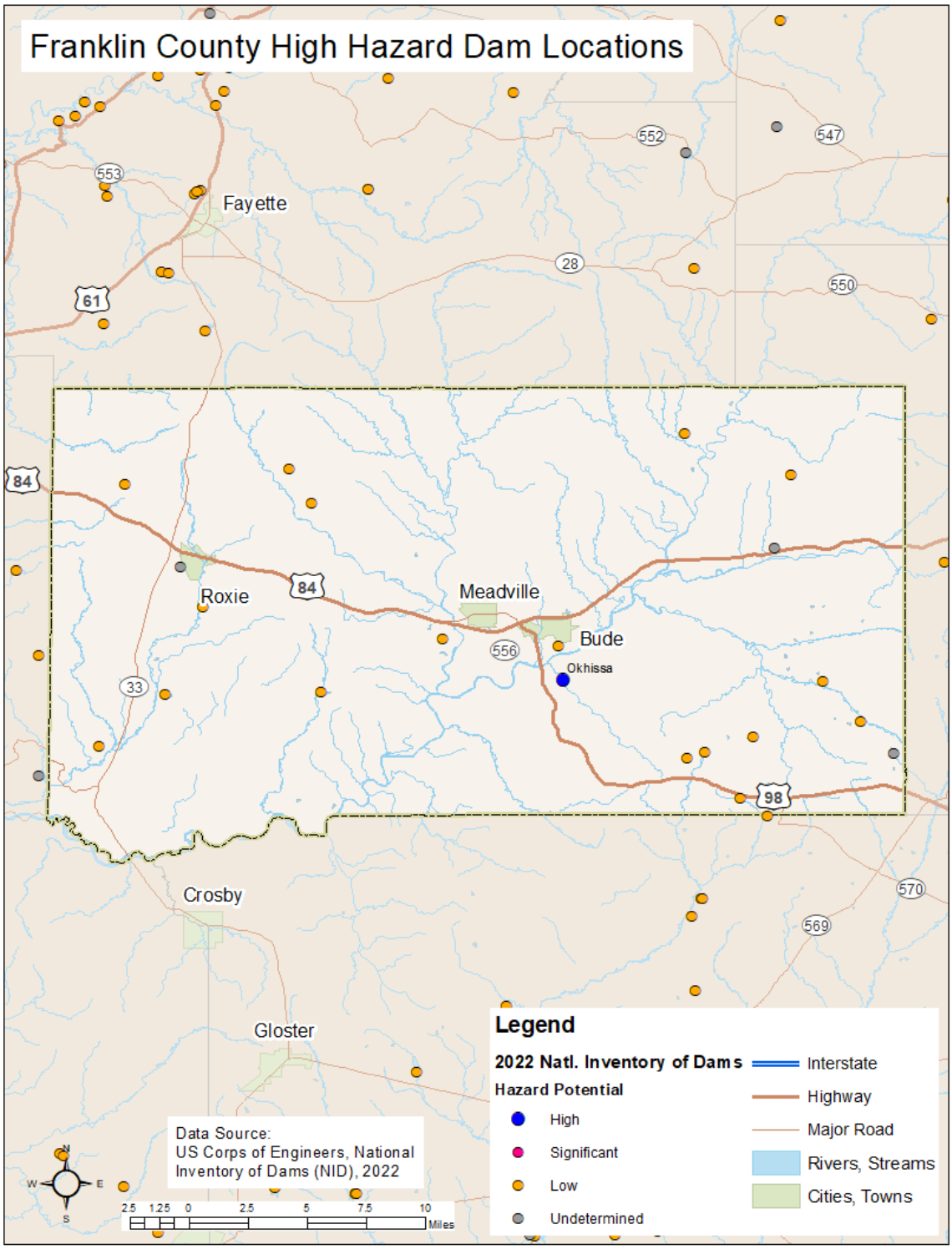
LOCATION AND SPATIAL EXTENT

According to the U.S. Army Corps of Engineers National inventory of Dams, there is one high hazard dam in Franklin County. The figures below show the location of this high hazard dam as well as mapped inundation areas.

TABLE C.4: FRANKLIN COUNTY HIGH HAZARD DAMS

Dam Name	Hazard Potential	Max Storage (ac/ft)	Dam Height (ft)
Franklin County			
LAKE OKHISSA	HIGH	44,065	98.0

FIGURE C.2: FRANKLIN COUNTY HIGH HAZARD DAM LOCATIONS[6]



[6] U.S. Army Corps of Engineers – National Inventory of Dams

HISTORICAL OCCURRENCES

According to the Mississippi State Hazard Mitigation Plan (2020)[7], there have been no dam failures reported in Franklin County. However, a breach scenario in the region could be impactful.

PROBABILITY OF FUTURE OCCURRENCES

Given the current dam inventory and historic data, a dam breach is unlikely (less than 1 percent annual probability) in the future. As has been demonstrated in the past, regular monitoring is necessary to prevent these events.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[8] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Franklin County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[9]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop and will lead to increased strain on dam storage capacity.[10]

C.2.2 Erosion / Landslide Susceptibility

LOCATION AND SPATIAL EXTENT

Erosion in Franklin County is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in Franklin County are primarily rivers/streams and reservoirs. Generally, vegetation also helps to prevent erosion in the area, but in recent years, erosion has become a growing threat to many of the participating counties and jurisdictions.

At this time, there is no regional or state-level data available on localized areas of erosion, so it is a challenge to identify particularly prone areas on a wider geographic scale. However, a few areas of concern were reported by members of the hazard mitigation council and other local sources. Locations along the Mississippi River are known to be especially at-risk, but there are locations in many areas within the region where erosion is prominent.

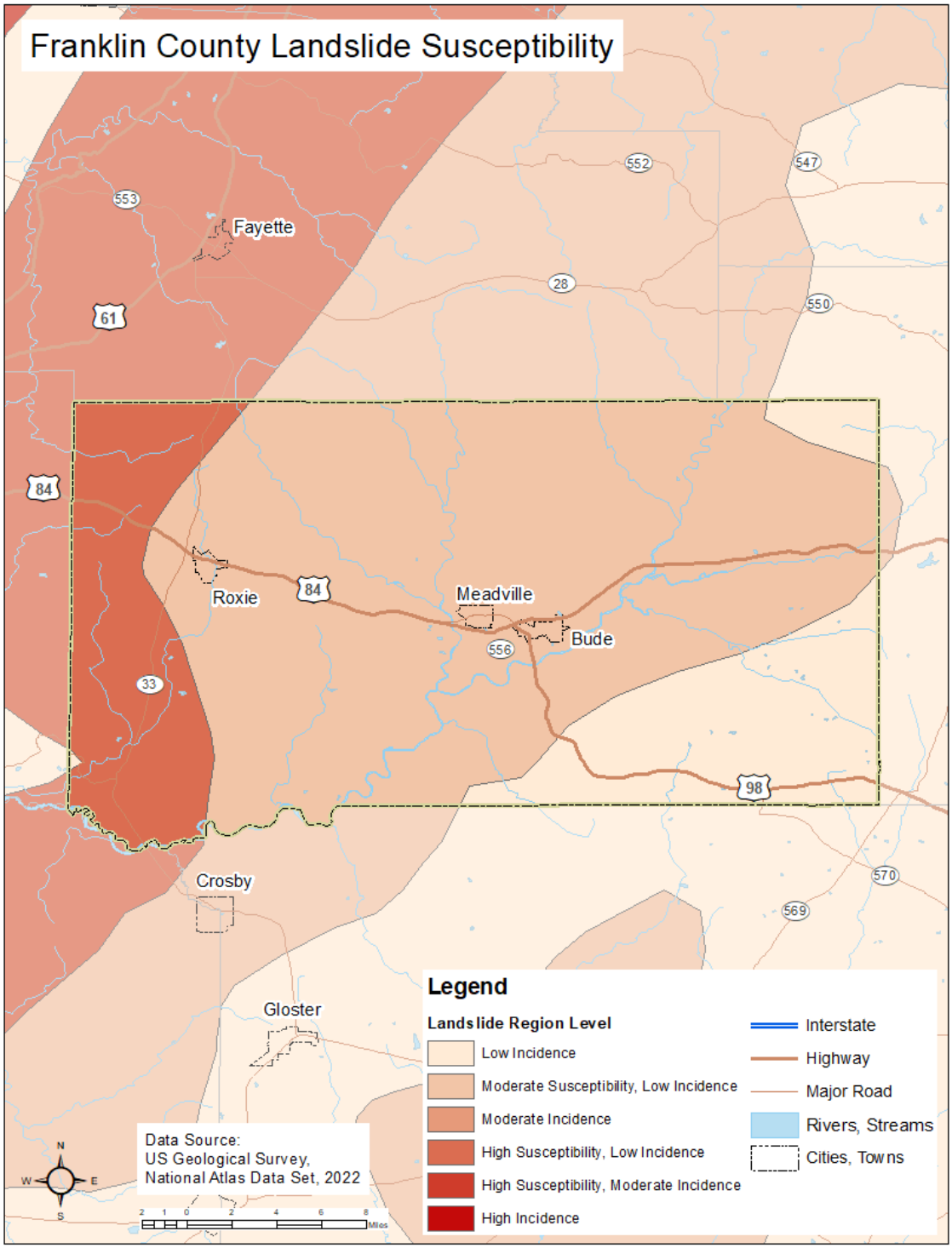
[7] Mississippi Hazard Mitigation Plan 2020 https://www.msema.org/wp-content/uploads/2022/01/State-of-Mississippi-2018-plan-update-with-Dam-Safety-FEMA-revisions-2020-07-15.pdf

[8] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[9] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[10] Please note: there is no coastal flooding in Adams County.

FIGURE C.3: FRANKLIN COUNTY LANDSLIDE SUSCEPTIBILITY[11]



[11] Franklin County Emergency Management

HISTORICAL OCCURRENCES

Several sources were vetted to identify areas of erosion in Franklin County. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. The locations identified above are representative of areas where erosion has taken place in the past.

These incidents have caused major problems as bridges have become damaged in many instances and made unsafe for emergency services vehicles to cross during and after storm events. This delays response times and critical life-safety support. In addition, the shutdown of roads has hurt local communities economically as trade and commerce are temporarily shut down as bridges are repaired. It has also caused disruption to daily activities for local school boards who must re-route buses around affected areas, causing additional fuel resources to be expended and increasing drive times for students.

PROBABILITY OF FUTURE OCCURRENCES

Erosion remains a natural, dynamic, and continuous process for Franklin County, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annually).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[12] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Franklin County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[13]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones. Both additional moisture and drying conditions can impact the rate of erosion, either by increasing the sediment transfer load due to volume and rate of flooding, or by dehydrating soils, limiting compaction, and increasing wind related erosion events.

C.2.3 Flood

LOCATION AND SPATIAL EXTENT

There are areas in Franklin County that are susceptible to flood events. Special flood hazard areas in the county were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate

Maps (DFIRM). This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevations), and Zone X-500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 563 square miles that make up Franklin County, there are 70.39 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 0.00 square miles of land in zone X-500 (0.2 percent annual change floodplain/500-year floodplain).

[12] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[13] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

These flood zone values account for 12.5 percent of the total land area in Franklin County. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. The following figure illustrates the location and extent of currently mapped special flood hazard areas for Franklin County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data.

FIGURE C.4: SPECIAL FLOOD HAZARD AREAS IN FRANKLIN COUNTY[14]

[14] FEMA – DFIRM

HISTORICAL OCCURRENCES

Floods were responsible for two disaster declarations in Franklin County in 1972, and 1974. Information from the National Centers for Environmental Information was used to ascertain additional historical flood events. The National Centers for Environmental Information reported a total of 29 events in Franklin County since 1998. A summary of these events is presented below. These events accounted for over $2.86 million in property damage. Annualized, Franklin County experiences $119,166 in losses due to flooding.

TABLE C.5: SUMMARY OF FLOOD OCCURRENCES IN FRANKLIN COUNTY[15]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Bude	7	0/0	$1,225,000	$51,041
Meadville	7	0/0	$1,036,000	$43,166
Roxie	-	0/0	$0	$0
Unincorporated Area	15	0/0	$599,000	$24,958
Franklin County Total	**29**	0/0	**$2,860,000**	**$119,166**

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Flood Insurance Management Agency (FIMA) Flood Insurance Data Analytics, since 2019 Mississippi has had 47 floods of record with 22 closed with payment, 19 closed without payment, and 6 remaining open. A total of $545,506 has been made in payments. This FEMA dataset is the authoritative source for FEMA's public data. This product uses the Federal Emergency Management Agency's API but is not endorsed by FEMA. FEMA cannot verify the quality and/or timeliness of any data or any analysis derived there from after the data has been retrieved from FEMA.gov. This data set was last accessed on July 2, 2023, with records updated at most every 20 minutes or at least monthly, processed the first Saturday of the month at 1:00am EST.

According to FEMA flood insurance policy records as of July 2, 2023, there has been no flood loss reported in Franklin County through the National Flood Insurance Program (NFIP) since 1978, totaling $0 in claims payments. A summary of these figures for the county is provided bellow. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought. It is likely that many additional instances of flood loss in Franklin County were either uninsured or not reported.

TABLE C.6: SUMMARY OF INSURED FLOOD LOSSES IN FRANKLIN COUNTY THROUGH 2023[16]

Location	Number of Policies	Flood Losses	Claims Payments
Bude	-	-	-
Meadville	-	-	-

[15] Source NCEI. Annualized losses are calculated by dividing the total number of property damages by number of years of recordkeeping for the hazard.

[16] Meadville does not participate in the NFIP. Therefore, no values are reported. Source: National Flood Insurance Program, OpenFEMA Data Sets

Roxie	0	0	$0
Unincorporated Area	0	0	$0
Franklin County Total	**0**	**0**	**$0**

REPETITIVE LOSS PROPERTIES

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Mississippi Emergency Management Agency in 2017,, there is one non-mitigated repetitive loss property located in Franklin County, which accounted for three losses and more than $18,000 in claims payments under the NFIP. The average claim amount for this property is $6,090. The property is single family. Without mitigation, this property will likely continue to experience flood losses. The table below presents detailed information on repetitive loss properties and NFIP claims and policies for Franklin County as documented in the last plan. Updated data could not be obtained.

.

TABLE C.7: REPETITIVE LOSS PROPERTIES IN FRANKLIN COUNTY[17] [18]

Location	Number of Properties	Type of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Bude	-	-	-	-	-	-	-
Meadville	-	-	-	-	-	-	-
Roxie	0	-	0	$0	$0	$0	$0
Unincorporated Area	1	1 single family	3	$18,268.81	$0	$18,268.81	$6,089.60
Franklin County Total	**1**		**3**	**$18,268.81**	**$0**	**$18,268.81**	**$6,089.60**

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in Franklin County, and the probability of future occurrences will remain highly likely (100 percent annual probability). The probability of future flood events based on magnitude and according to best available data is illustrated in the figure above, which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain).

It can be inferred from the floodplain location maps, previous occurrences, and repetitive loss properties that risk varies throughout the county. For example, areas in the southwestern and central portions of the county have more floodplain and thus a higher risk of flood than the rest of the county. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted, particularly for repetitive loss properties.

FUTURE IMPACTS OF CLIMATE CHANGE

[17] National Flood Insurance Program

[18] Meadville does not participate in the NFIP. Therefore, no values are reported. Information on Bude could not be obtained due to changes in FEMA data distribution policies.

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[19] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Franklin County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[20]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased *coastal, fluvial (i.e., riverine) and pluvial (i.e., rainfall) flooding.*[21] More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

FIRE-RELATED HAZARDS

C.2.4 Drought

LOCATION AND SPATIAL EXTENT

Drought typically covers a large area and cannot be confined to any geographic or political boundaries. Furthermore, it is assumed that Franklin County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment but may exacerbate wildfire conditions.

HISTORICAL OCCURRENCES

The table below shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional, but a majority of the county may be in a less severe condition.

[19] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[20] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[21] Please note: there is no coastal flooding in Franklin County.

FIGURE C.5: HISTORICAL DROUGHT OCCURRENCES IN FRANKLIN COUNTY[22]

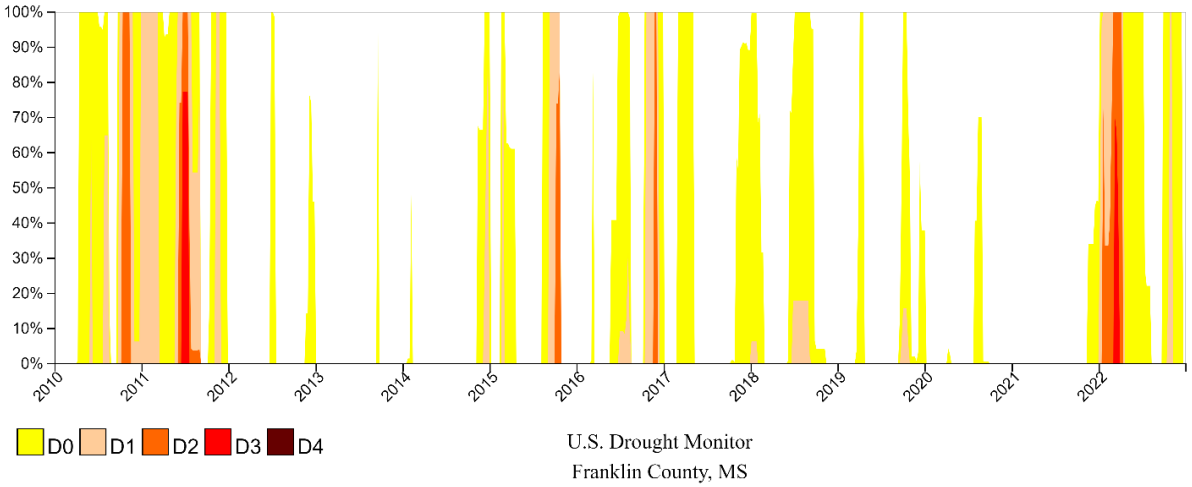


TABLE C.8: SUMMARY OF DROUGHT OCCURRENCES IN FRANKLIN COUNTY

Location	Number of Occurrences	Deaths/Injuries	Crop Damage	Annualized Property Losses
Bude	-	0/0		
Meadville	-	0/0		
Roxie	-	0/0		
Unincorporated Area	7	0/0	$1,451,000	$90,687
Franklin County Total	**7**	0/0	**$1,451,000**	**$90,687**

Some additional anecdotal information was provided from the National Centers for Environmental Information on droughts in Franklin County.

Summer to Fall 2006 – During a four-and-a-half-month period, from June to the middle of October, abnormally dry conditions prevailed across most of the Jackson, MS County Warning Area (CWA). Widespread drought conditions were reported across the area during this time period. The U.S. Drought Monitor classified the drought as extreme (D3) over Southeast Mississippi. Drought conditions in the region peaked in intensity during early August over this area.

Summer 2007 – During the month of June, the drought peaked across the region. It held firm across the same areas since May with no expansion. What did expand was the severity as by the end of June, most of Central and East-Central Mississippi was now in extreme drought (D3) with some locations across Northeast Mississippi now experiencing exceptional drought (D4). The month of June did not offer much rain as most of the forecast area saw less than 40% of the normal rainfall.

Summer to Fall 2010 – Very dry conditions continued across central Mississippi during most of October. There was some rain that came late in the month which provided some temporary relief. Rainfall

[22] Abnormally Dry (D0) Moderate Drought (D1) Severe Drought (D2) Extreme Drought (D3) Exceptional Drought (D4) U.S. Drought Monitor

amounts ranged from a half to two inches with locally higher amounts. Most locations were 1 to 3 inches below normal for the month. The dry stretch resulted in severe (D2) drought conditions to expand during the month with even the portions of extreme (D3) drought conditions expanding as well. Crops were put under stress under the warm and dry conditions.

Fall 2015 – The very dry conditions continued across Central Mississippi in October. The extended dry stretch resulted in an area of Severe (D2) drought developing across the area by October 6th. The drought intensified and Extreme (D3) drought conditions developed by October 13th. Approximately 25 to 50 percent of normal rainfall occurred across this area from August into mid-October. Crops were put under more stress from the dry and hot conditions.

Fall to Winter 2016 – Dry conditions continued into November, which created continued stress on crops. The drought continued to get worse across the state through the month before some relief came in the form of showers and thunderstorms near the end of November.

Fall 2021 through 2022 – Severe drought conditions persisted throughout the state, beginning in December 2021 and continuing through the calendar year 2022. Conditions escalated to extreme drought from January to March, before resolving In December. Throughout this period many counties also experienced flooding events indicating that while rainfall is still occurring, the shorter, more intense bursts do not resolve the drought conditions that softer more steady rainfall would address. The beginning of 2023 saw increased rainfall and a lightening of drought conditions overall.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that Franklin County has a probability level of possible (between 1 and 10 percent annual probability) for future drought events. However, the extent (or magnitude) of drought and the amount of geographic area covered by drought, varies with each year. Historical information indicates that there is a much lower probability for extreme, long-lasting drought conditions.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[23] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Franklin County With increasing global surface temperatures, the possibility of more *droughts* and increased frequency and intensity of storms will likely occur[24]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

[23] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[24] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

C.2.5 Lightning

LOCATION AND SPATIAL EXTENT

Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of Franklin County is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

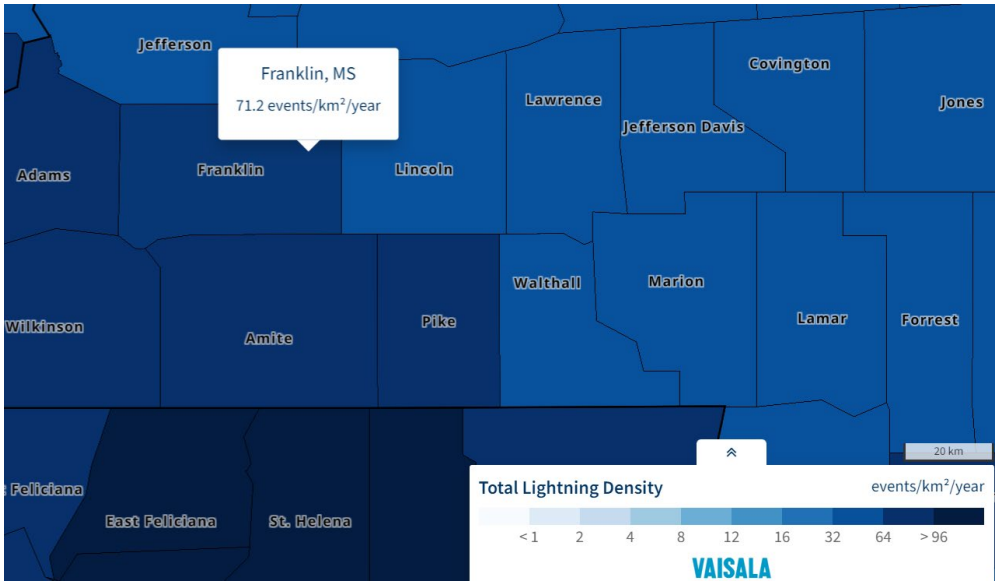
According to the National Centers for Environmental Information, there have been three recorded lightning events in Franklin County since 2002. These events resulted in $82,000 in damages, as listed below.

It is certain that more than three events have impacted the county. Many of the reported events are those that cause damage, and it should be expected that damages are likely much higher for this hazard than what is reported.

TABLE C.9: SUMMARY OF LIGHTNING OCCURRENCES IN FRANKLIN COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Bude	1	0/0	$25,000	$1.250
Meadville	1	0/0	$7,000	$350
Roxie	0	0/0	$0	$0
Unincorporated Area	1	0/0	$50,000	$2,500
Franklin County Total	**3**	**0/0**	**$82,000**	**$4,100**

FIGURE C.6: VAISALA'S NLDN MAP OF LIGHTNING DENSITY[25]



[25] Vaisala – U.S. National Lightning Detection Network. Retrieved on 11/30/2022 from: https://interactive-lightning-map.vaisala.com/?_ga=2.229872988.1951225355.1669843590-1950342430.1669843590

PROBABILITY OF FUTURE OCCURRENCES

Although there was not a high number of historical lightning events reported in Franklin County via NCEI data, it is a regular occurrence accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though not all events will cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN), Franklin County experiences an average of 71.2 lightning strikes per km^2 per year. Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damage throughout the county.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[26]. There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Franklin County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *lightning strike events*.[27] As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

C.2.6 Wildfire

LOCATION AND SPATIAL EXTENT

The entire county is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the urban- wildland interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

HISTORICAL OCCURRENCES

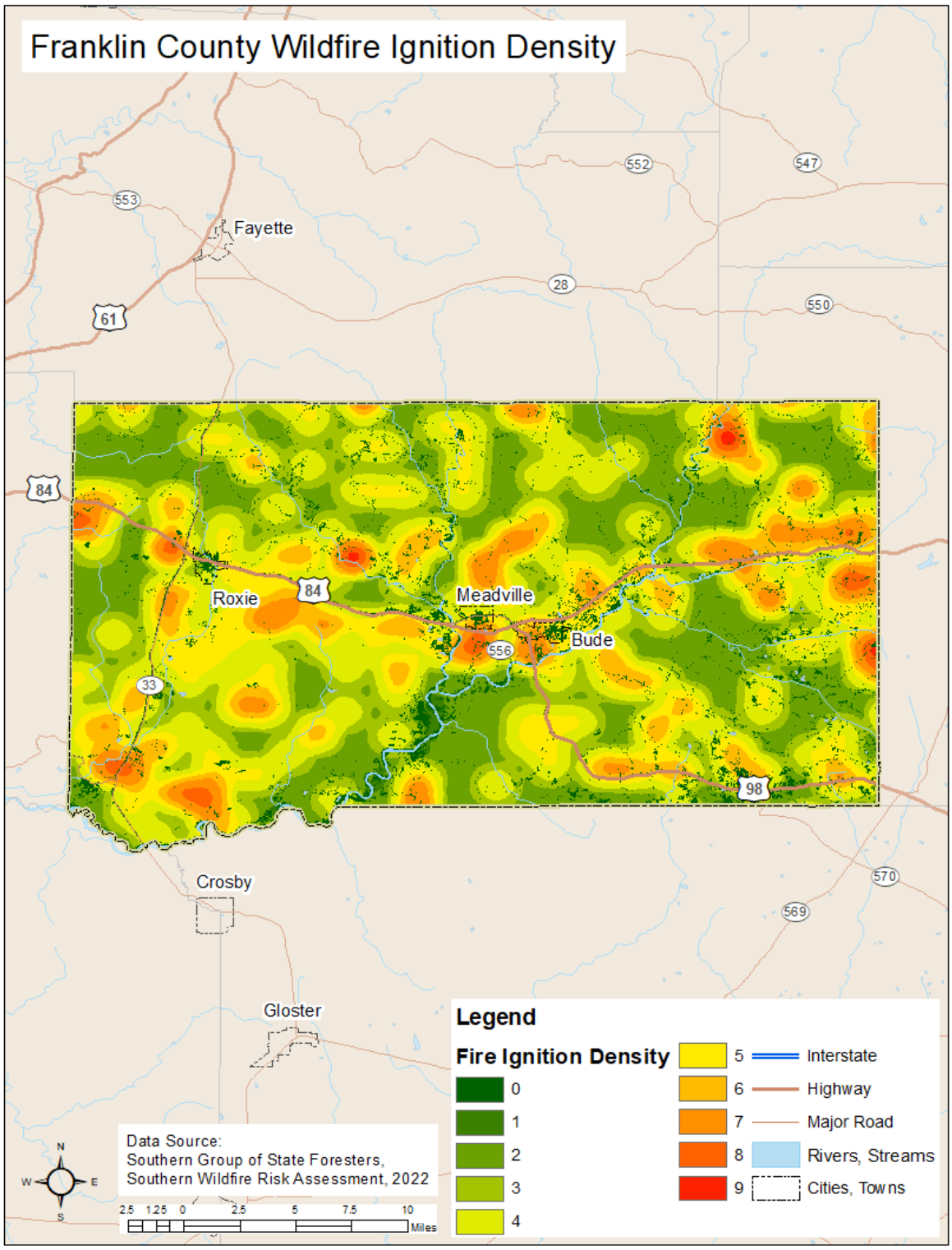
Figure below shows the Wildfire Ignition Density in Franklin County based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and the likelihood of a wildfire igniting in an area. Occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map. This is measured in the number of fires per year per 1,000 acres.[28]

[26] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[27] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[28] Southern Wildfire Risk Assessment

FIGURE C.7: WILDFIRE IGNITION DENSITY IN FRANKLIN COUNTY



Based on data from the Mississippi Forestry Commission from 2012 to 2021, Franklin County experienced an average of 14.5 wildfires annually which burned a combined 234 acres per year. The data indicate that most of these fires were small to moderate in size, averaging about 25.83 acres per fire. The tables below provide a summary of wildfire occurrences in Franklin County and the number of reported wildfire occurrences in the county between the years 2012 and 2021.

TABLE C.10: SUMMARY TABLE OF ANNUAL WILDFIRE OCCURRENCES (2015-2022)

	Franklin County
Average Number of Fires Per Year	7.125
Average Number of Acres Burned Per Year	234
Average Number of Acres Burned Per Fire	25.83

TABLE C.11: HISTORICAL WILDFIRE OCCURRENCES IN FRANKLIN COUNTY[29]

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Franklin County										
Number of Fires	9	8	3	12	5	7	4	6	2	4
Number of Acres Burned	51	33	22	183	20	125	161	147	13	138

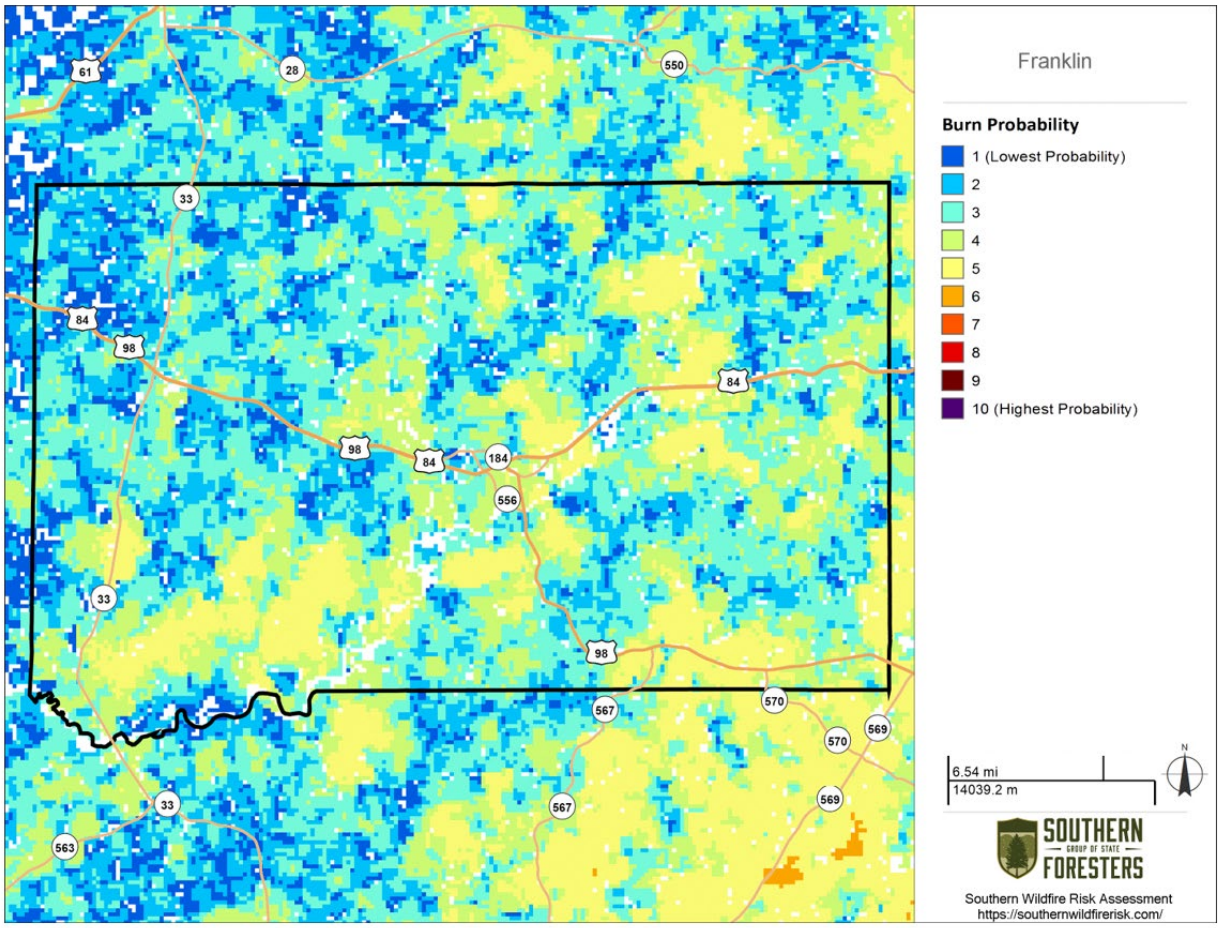
It should be noted that the Mississippi Forestry Commission provided cumulative data for 2022, but it wasn't clear what months were included and were not listed in the above figures. However, the data provided shows that 2022 was an incredibly active burn year with a report of 14 total fires, 62 acres burned per fire, and a total of 1,085 acres burned.

PROBABILITY OF FUTURE OCCURRENCES

Wildfire events will be an ongoing occurrence in Franklin County. The figure below shows that there is some probability a wildfire will occur throughout the county. However, the likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small in size but could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to Franklin County for future wildfire events is highly likely (100 percent annual probability).

[29] Mississippi Forestry Commission

FIGURE C.8: BURN PROBABILITY IN FRANKLIN COUNTY[30]



GEOLOGIC HAZARDS

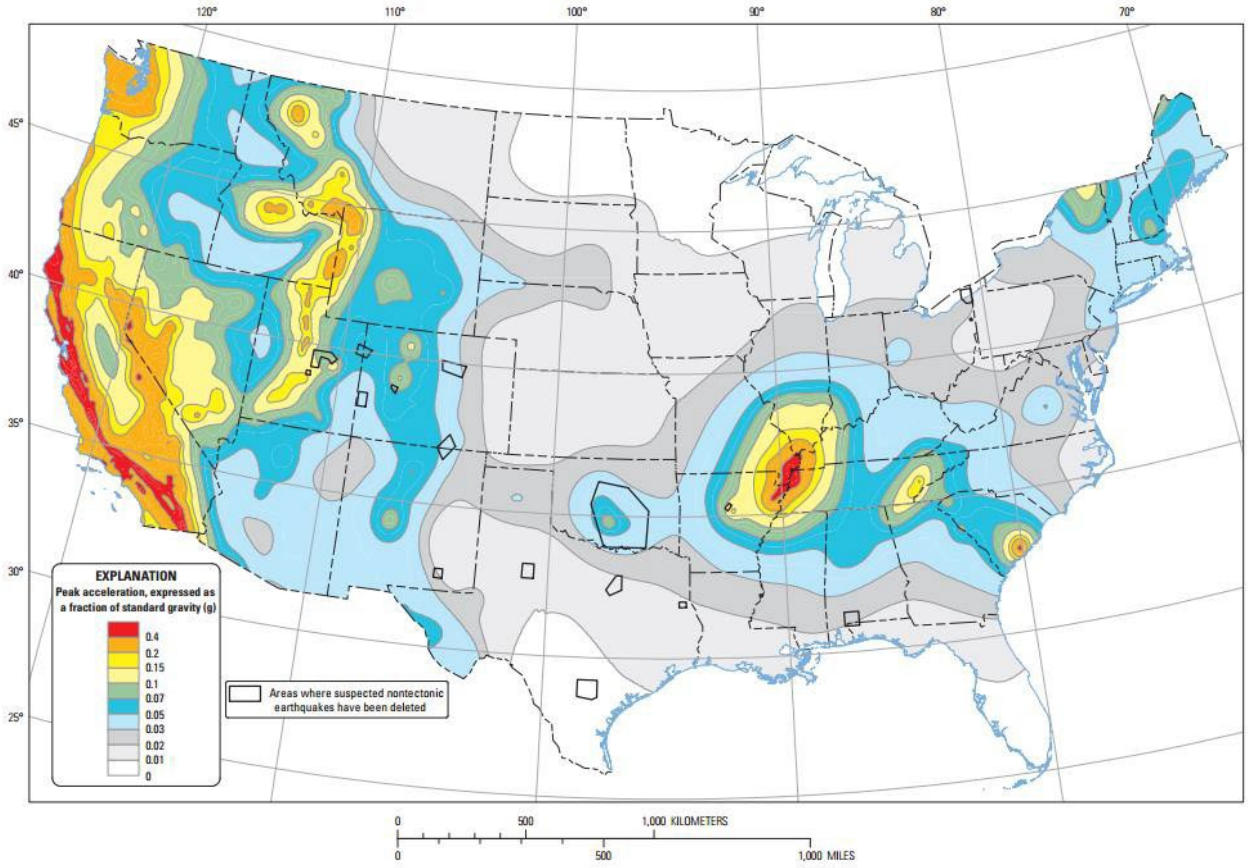
C.2.7 Earthquake

LOCATION AND SPATIAL EXTENT

The figure below shows the intensity level associated with Franklin County, based on the national USGS map of peak acceleration with 10 percent probability of exceedance in 50 years. It is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Franklin County lies within an approximate zone of level "0.01" to "0.03" ground acceleration. This indicates that the county exists within an area of low seismic risk.

[30] Southern Wildfire Risk Assessment

Figure C.9: Peak Acceleration with 10 Percent Probability of Exceedance in 50 Years[31]



Ten-percent probability of exceedance in 50 years map of peak ground acceleration

The primary source of potential damage to Franklin County from an earthquake is the New Madrid Seismic Zone (NMSZ). Historically, a series of earthquakes in 1811 and 1812 demonstrated that this fault zone can produce high magnitude seismic events, sometimes on the scale of a 7.5-8.0 on the Richter scale. The biggest challenge with earthquakes that occur in this area of seismic activity is predicting the recurrence of earthquakes emanating from this zone. Although the magnitude of earthquakes from the NMSZ can be large, they occur very irregularly and infrequently. This makes it extremely difficult to project when they will occur.

It should also be noted that the State of Mississippi Hazard Mitigation Plan identifies certain areas of concern for liquefaction and lists the counties and corresponding zones within those counties that have the highest liquefaction potential. Franklin County does not have any identified liquefaction potential risk.

The following figure shows the Modified Mercalli Intensity Scale. The lower numbers of the intensity scale generally deal with the way the earthquake is felt by people. The higher numbers of the scale are based on observed structural damage. Structural engineers usually contribute information for assigning intensity

[31] U.S. Geological Survey, 2014

values of VIII or above.

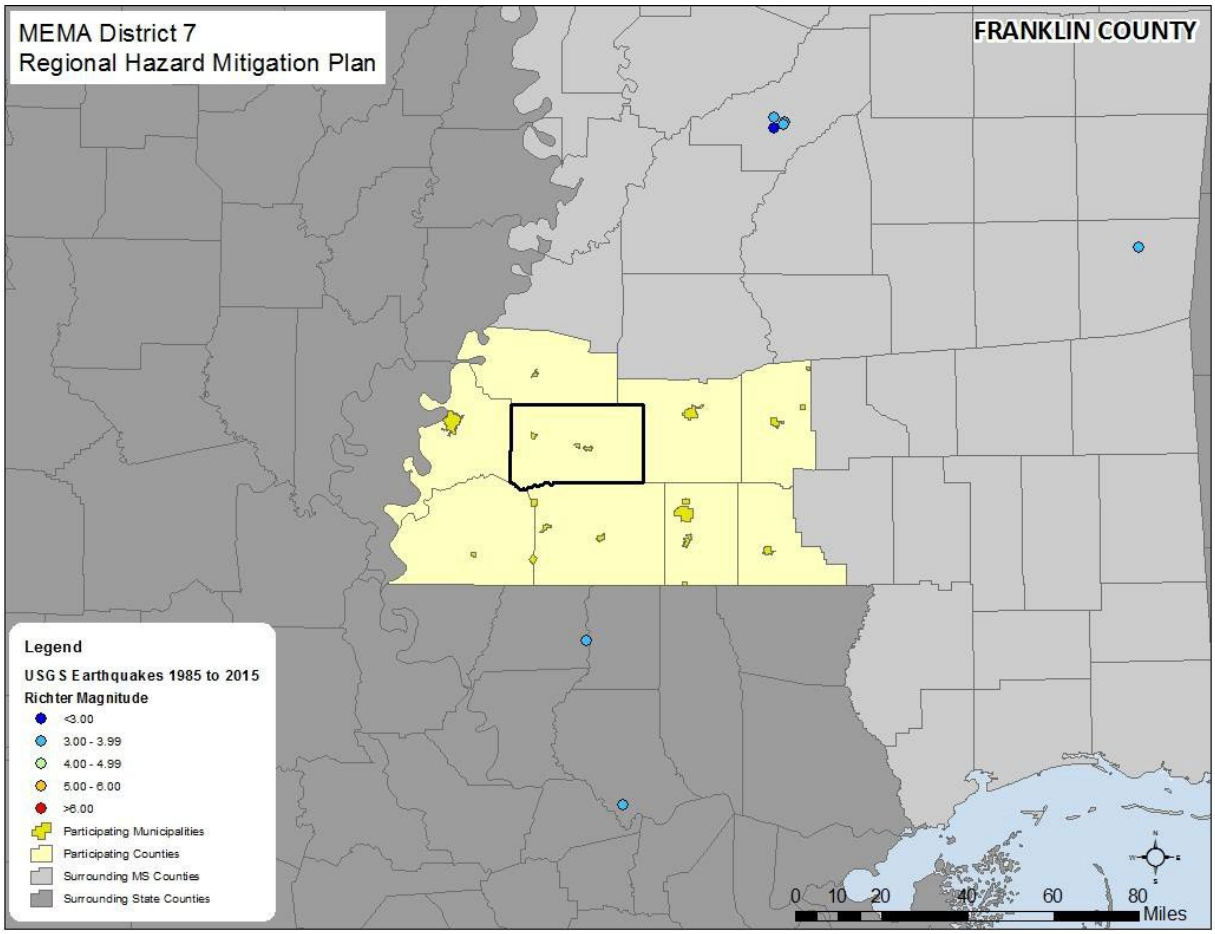
FIGURE C.10: MODIFIED MERCALLI INTENSITY SCALE (MMI)

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest,especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

HISTORICAL OCCURRENCES

No earthquakes are known to have affected Franklin County since 1638. Table C.15 provides a summary of earthquake events reported by the National Centers for Environmental Information (formerly National Geophysical Data Center) between 1638 and 1985, and Figure C.8 presents a map showing earthquakes whose epicenters have occurred near the county between 1985 and 2023 (no earthquakes occurred within the county's boundaries during this period).

FIGURE C.11: HISTORIC EARTHQUAKES WITH EPICENTERS NEAR FRANKLIN COUNTY (1985-2023)



PROBABILITY OF FUTURE OCCURRENCES

The probability of significant, damaging earthquake events affecting Franklin County is unlikely. However, it is certainly possible that future earthquakes resulting in light or moderate perceived shaking and damages will affect the county much more frequently. The annual probability level for the county is estimated to be less than 1 percent (unlikely).

TEMPERATURE & WIND-RELATED HAZARDS

C.2.8 Extreme Heat

LOCATION AND SPATIAL EXTENT

Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries. Therefore, the entire county is considered to be equally susceptible to extreme heat.

HISTORICAL OCCURRENCES

The National Centers for Environmental Information was used to determine historical heat wave occurrences in the county.

August 2005 – A "HOT" stretch of weather occurred during the middle to later part of August 2005. This "Heat Wave" covered a large portion of the south and lasted for a period of about 10 days. Each of these days had high temperatures consistently between 95 and 100 degrees, with 1 or 2 of these days actually reaching 100 degrees or more. Additionally, overnight lows remained warm with lower and middle 70s recorded. This is the first time since August 2000 where 100-degree temperatures were reached in this area as well as having such an extended period of "HOT" weather.

July 2006 – A small "heat wave" gripped the region during the middle of July with high temperatures ranging from the upper 90s to around 100 degrees for five days with overnight lows only reaching the middle 70s. The hottest temperatures during this period occurred from the Mississippi Delta, across northern Mississippi and then down to the Jackson Metro and toward Meridian. This area peaked between 100 and 102 degrees for at least two days during the hot five-day stretch.

August 2007 – During the first half of August, a heat wave took hold of the region and brought some of the warmest temperatures since the summer of 2000. This heat wave began around August 5th and lasted until the 16th. Between August 10th and 15th, the entire area reached 100 degrees or higher. Twenty- three record highs were also set during this time. As the temperature soared each day, high relative humidity resulted in heat index values between 105 and 112 degrees.

August 2010 – A four day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS Jackson, MS forecast area, 19 record highs were set between August 1st and 4th. On August 2nd, the 2nd warmest average temperature was recorded. The low was 78 and the high 105, this resulted in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in 3 fatalities across the forecast area.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Franklin County has a probability level of likely (between 10 and 100 percent annual probability) for future heat wave events.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[32] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Franklin County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *extreme heat* events[33]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

C.2.9 Hailstorm

LOCATION AND SPATIAL EXTENT

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that Franklin County is uniformly exposed to severe thunderstorms; therefore, all areas of the county are equally exposed to hail which may be produced by such storms.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, 67 recorded hailstorm events have affected Franklin County since 1969. The following table is a summary of the hail events in Franklin County. The table below provides detailed information about each event that occurred in the county. In all, hail occurrences resulted in approximately $542,100 in property damages. Hail ranged in diameter from 0.75 inches to 2.75 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

TABLE C.12: SUMMARY OF HAIL OCCURRENCES IN FRANKLIN COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Bude	14	0/0	$50,100	$945
Meadville	14	0/0	$16,000	$301
Roxie	9	0/0	$230,000	$4,339
Unincorporated Area	30	0/0	$246,000	$4.641
Franklin County Total	**67**	0/0	**$542,100**	**$10,228**

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that the probability of future hail occurrences is highly likely (100 percent annual probability). Since hail is an atmospheric hazard, it is assumed that

[32] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[33] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

Franklin County has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[34] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Franklin County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *hailstorm*[35]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

C.2.10 Hurricane and Tropical Storm

LOCATION AND SPATIAL EXTENT

Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect Franklin County. All areas in Franklin County are equally susceptible to hurricanes and tropical storms.

The following table shows the different category rankings of hurricanes on the Saffir-Simson Scale. The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures. In the western North Pacific, the term "super typhoon" is used for tropical cyclones with sustained winds exceeding 150 mph. Note that all winds are using the U.S. 1-minute average.

[34] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[35] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

TABLE C.13: SAFFIR-SIMPSON SCALE OF HURRICANE STRENGTH

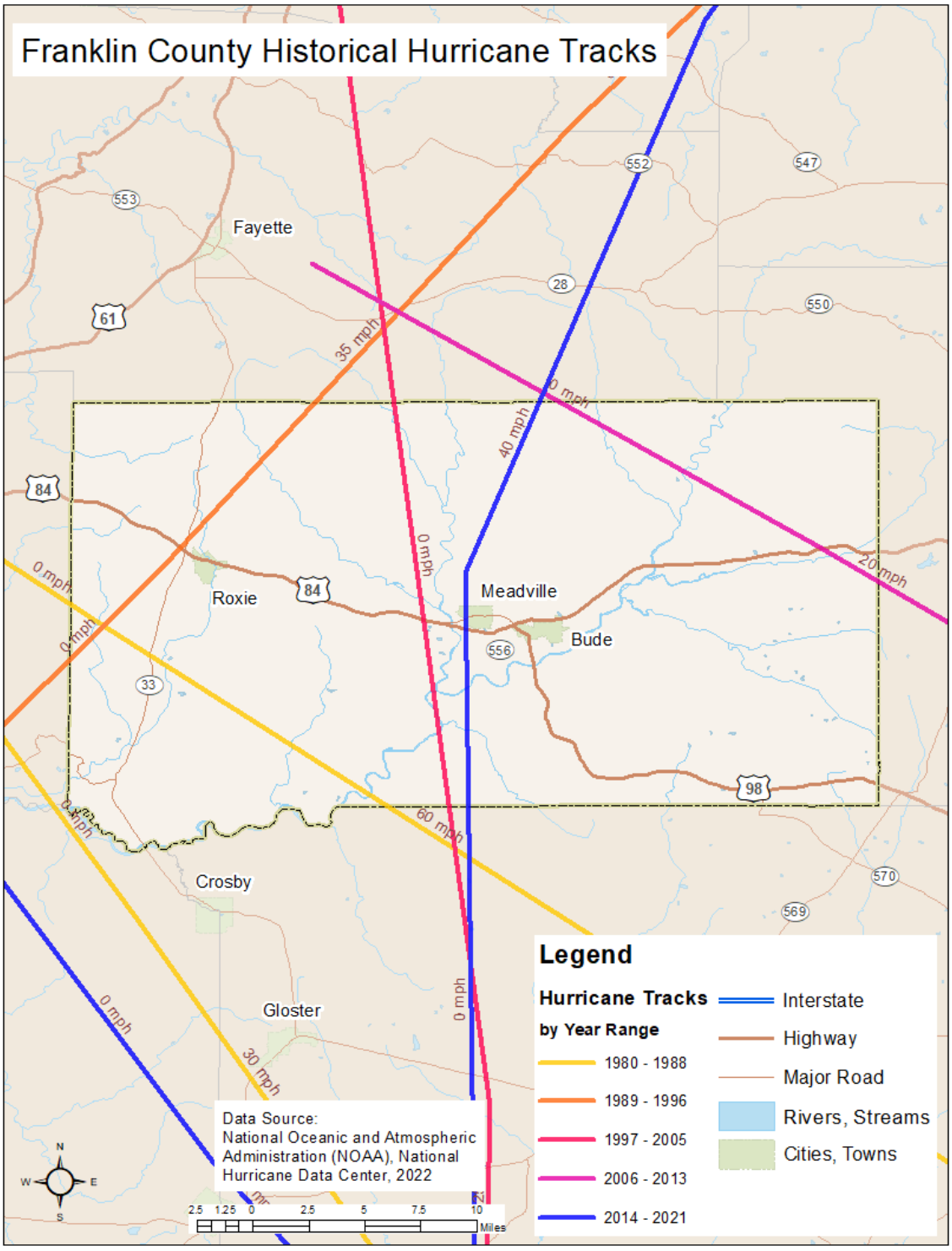
Category 1	Winds 74-95 mph (64-82 kt or 119-153 km/hr). Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
Category 2	Winds 96-110 mph (83-95 kt or 154-177 km/hr). Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
Category 3	Winds 111-129 mph (96-112 kt or 178-208 km/hr). Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
Category 4	Winds 130-156 mph (113-136 kt or 209-251 km/hr). Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
Category 5	Winds 157 mph or higher (137 kt or higher or 252 km/hr or higher). Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

HISTORICAL OCCURRENCES

According to the National Hurricane Center's historical storm track records, 114 hurricane or tropical storm/depression tracks have passed within 100 NM of the MEMA District 7 Region since 1854. This includes: 40 hurricanes, along with 74 tropical storms and tropical depressions.

Storm tracks passed directly through the region as shown in the following figure. The table below provides the date of occurrence, name (if applicable), maximum wind speed (as recorded within 100 miles of the MEMA District 7 Region) and category of the storm based on the Saffir-Simpson Scale for each event.

FIGURE C.12: HISTORICAL HURRICANE TRACKS SINCE 1980[36]



[36] National Hurricane Center

Federal records indicate that five disaster declarations were made in 1965 (Hurricane Betsy), 2004 (Hurricane Ivan), 2005 (Hurricane Katrina), 2008 (Hurricane Gustav), and 2012 (Hurricane Isaac) in Franklin County.13 Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding.

The National Centers for Environmental Information also reported five hurricane or tropical storm events in Franklin County since 2002.

TABLE C.14: HISTORICAL HURRICANE/TROPICAL STORM OCCURRENCES IN FRANKLIN COUNTY[37]

Date of Occurrence	Storm Name	Deaths/Injuries	Property Damage	Crop Damage	Annualized Losses
9/26/2002	Tropical Storm Isidore	0/0	$0	$0	
8/29/2005	Hurricane Katrina	0/0	$500,000	$25,000,000	
9/24/2005	Hurricane Rita	0/0	$40,000	$100,000	
9/1/2008	Hurricane Gustav	0/0	$600,000	$200,000	
8/28/2012	Hurricane Isaac	0/0	$300,000	$0	
10/09/2020	Hurricane Delta	0/0	$100,000	$0	
08/30/2021	Hurricane Ida	0/0	$250,000	$0	
Franklin County Totals		**0/0**	**$1,790,000**	**$25,300,000**	**$1,354,500**

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the county. Anecdotes are available from NCEI for the major storms that have impacted the county as found below:

Hurricane Katrina – August 29, 2005

The damage from Hurricane Katrina was devastating and widespread. Damage occurred across all of the Jackson forecast area which includes 9 parishes in Northeast Louisiana, 2 counties in Southeast Arkansas and about 2/3 of Central and Southern Mississippi. As widespread as the damage was, the more concentrated and most significant damage occurred across Southeast and East-Central Mississippi. For other areas, especially those west of Natchez to Yazoo City to Grenada line, damage to trees and power lines was significant and scattered across the landscape. As you move toward Central Mississippi and along Interstate 55 the damage and impacts increase. This portion of the state sustained widespread damage to trees and power lines.

Hurricane Gustav – September 1, 2008

As the center of Gustav crossed much of southern Louisiana, tropical storm force winds extended into southern Mississippi and portions of east central Louisiana. Sustained winds were between 35 and 45 mph with higher gusts between 70 and 100 mph occurred. Tree and power line damage was extensive across these areas which resulted in widespread power outages, some of which lasted for 3 to 5 days. As Gustav slowed across central Louisiana, the outer rainbands continued to rotate across much of

[37] National Centers for Environmental Information

southern and central Mississippi. This kept those portions of Mississippi in the region which was favorable for tornadoes. Over 3 days, 26 tornadoes were confirmed, all of which were in the EF0 to EF1 range.

Hurricane Isaac – August 29, 2012

Isaac moved very slowly to the north and northwest over the course of August 29th, which made for prolonged impacts. Forward motion of about 5 mph lead to tremendous flooding issues for both Louisiana and portions of Mississippi south of I-20. Around noon on August 29th, Isaac was downgraded to a Tropical Storm, but this was not much relief to the many residents who were being inundated with rain and wind. The worst of the wind was felt generally along and south of an axis from Marion County to Adams County. Numerous trees were down in Adams County, leaving many without power for several days. Eighty percent of the roads were blocked in Franklin County due to downed trees.

PROBABILITY OF FUTURE OCCURRENCES

Given the inland location of the county, Franklin County will not be susceptible to many of the sub-hazards that are often associated with hurricanes and tropical storms such as storm surge. Although the probability of experiencing major impacts is somewhat less than coastal areas because of this, hurricanes and tropical storms remain a real threat to Franklin County due to induced events like flooding and high wind. Based on historical evidence, the probability level of future occurrence is likely (between 10 and 100 percent annual probability). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. However, when the county is impacted, the damage could be significant, threatening lives and property throughout the planning area.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[38] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Franklin County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[39]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

HURRICANE EVACUATIONS

As discussed above, the MEMA District 7 Region has been directly impacted by a number of hurricanes and tropical storm events historically. However, it should be noted that the region is also susceptible to indirect effects from hurricanes and tropical storms, particularly in the form of evacuations from coastal counties. The counties within MEMA District 7 are located far enough inland that they are often the

[38] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[39] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

primary recipients of evacuees from counties that will be (or have been) impacted by major storm events.

For example, during Hurricane Katrina in 2005, thousands of evacuees made their way to counties in southwest Mississippi to take temporary refuge from the storm. Due to the severe and devastating effects of the storm, temporary sheltering within these counties was extended much longer than originally anticipated and, in some cases, the evacuees ended up staying for weeks or months. This additional population caused a major strain on resources within these relatively rural counties, as local communities with limited resources had an unexpected and immediate need to provide shelter and other life essentials such as food, water, and health care to a significant, additional number of people.

Caring for all of these evacuees was especially challenging for counties in the MEMA District 7 Region because most had been impacted themselves by the storm and were attempting to help their own citizens recover from the storm. Undoubtedly, recovering from a major disaster while simultaneously attempting to help evacuees from surrounding counties poses a number of difficulties for emergency management personnel and other local officials.

Based on Hurricane Katrina and other major hurricane events that have impacted the Gulf Coast in the past, it is likely that many of the MEMA District 7 counties will be receiver counties when it comes to evacuees. Many of these evacuees will likely come from locations in Louisiana, including New Orleans. Indeed, the State of Louisiana evacuation plan indicates that one of the primary evacuation routes from the City of New Orleans will direct evacuees north along Interstate 55, sending people through Pike County and Lincoln County. Depending on the severity of the event, officials in Louisiana may even change Interstate 55 over to a contraflow traffic pattern to enable quicker evacuations.

C.2.11 Severe Thunderstorm/High Wind

LOCATION AND SPATIAL EXTENT

A thunderstorm event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that Franklin County has uniform exposure to an event and the spatial extent of an impact could be large.

TABLE C.15: BEAUFORT WIND SCALE

Beaufort Scale					
NUMBER	**WIND SPEED (MPH)**	**DESCRIPTION**	**WAVE HEIGHT (FT)**	**SEA CONDITIONS**	**LAND CONDITIONS**
0	<1	Calm	0	Flat.	Calm. Smoke rises vertically.
1	1-3	Light air	0.33	Ripples without crests.	Wind motion visible in smoke.
2	3-7	Light breeze	0.66	Small wavelets.	Wind felt on exposed skin. Leaves rustle.
3	8-12	Gentle breeze	2	Large wavelets.	Leaves and smaller twigs in constant motion.
4	13-17	Moderate breeze	3.3	Small waves.	Dust and loose paper rise. Small branches begin to move.
5	18-24	Fresh breeze	6.6	Moderate (1.2 m) longer waves. Some foam and spray.	Small trees sway.
6	25-30	Strong breeze	9.9	Large waves with foam crests and some spray.	Large branches in motion. Whistling heard in overhead wires. Umbrella use difficult.
7	31-38	High wind, Moderate Gale, Near Gale	13.1	Sea heaps up and foam begins to streak.	Whole trees in motion. Effort needed to walk against the wind.
8	39-46	Fresh Gale	18	Moderately high waves with breaking crests forming spindrift. Streaks of foam.	Twigs broken from trees. Cars veer on road.
9	47-54	Strong Gale	23	High waves (6-7 m) with dense foam. Wave crests start to roll over. Considerable spray.	Larger branches break off trees, and some small trees blow over. Construction/temporary signs and barricades blow over. Damage to circus tents and canopies.

Beaufort Scale					
NUMBER	**WIND SPEED (MPH)**	**DESCRIPTION**	**WAVE HEIGHT (FT)**	**SEA CONDITIONS**	**LAND CONDITIONS**
10	55-63	Whole Gale/Storm	29.5	Very high waves. The sea surface is white and there is considerable tumbling.	Trees uprooted. Considerable structural damage.
11	64-72	Violent storm	37.7	Exceptionally high waves.	Widespread vegetation and structural damage.
12	≥73	Hurricane-force	≥46	Huge waves. Sea is completely white with foam and spray. Air is filled with driving	Massive and widespread damage to structures.

HISTORICAL OCCURRENCES

Severe storms were at least partially responsible for four disaster declarations in Franklin County in 1973, 1983, 2001, and 2003. According to NCEI, there have been 131 reported thunderstorms and high wind events since 1970 in Franklin County. These events caused over $2.86 million in damage.

TABLE C.16: SUMMARY OF HIGH WIND AND THUNDERSTORM EVENTS IN FRANKLIN COUNTY[40]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Bude	16	0/0	$108,000	$2,076
Meadville	26	0/0	$717,500	$13,798
Roxie	23	0/0	$1,347,000	$25,903
Unincorporated Area		0/0	$693,000	$13,326
Franklin County Total	**131**	**0/0**	**$2,865,000**	**$55,096**

PROBABILITY OF FUTURE OCCURRENCES

Given the high number of previous events, it is certain that thunderstorm events, including straight-line wind events, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for the entire county.

[40] These thunderstorm events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1955 through November 2022 and these high wind events are only inclusive of those reported by NCEI from 1996 through November 2022. It is likely that additional thunderstorm and high wind events have occurred in Franklin County.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[41] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Franklin County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[42]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

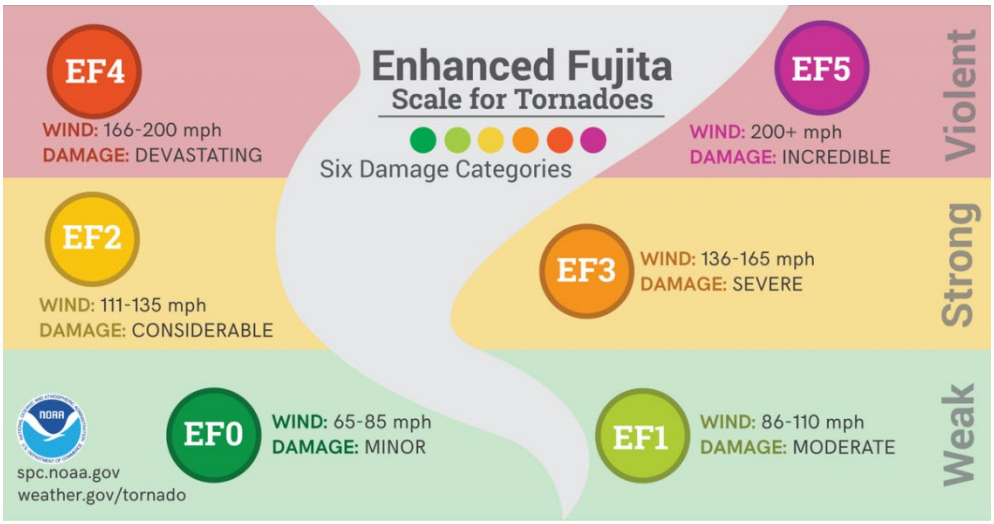
C.2.12 Tornado

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, and thus in Franklin County. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random, and it is not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that Franklin County is uniformly exposed to this hazard. With that in mind, the map below shows tornado track data for many of the major tornado events that have impacted the county between 1980 and 2022. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

The following figure depicts the Enhanced-Fujita Scale of tornado intensity.

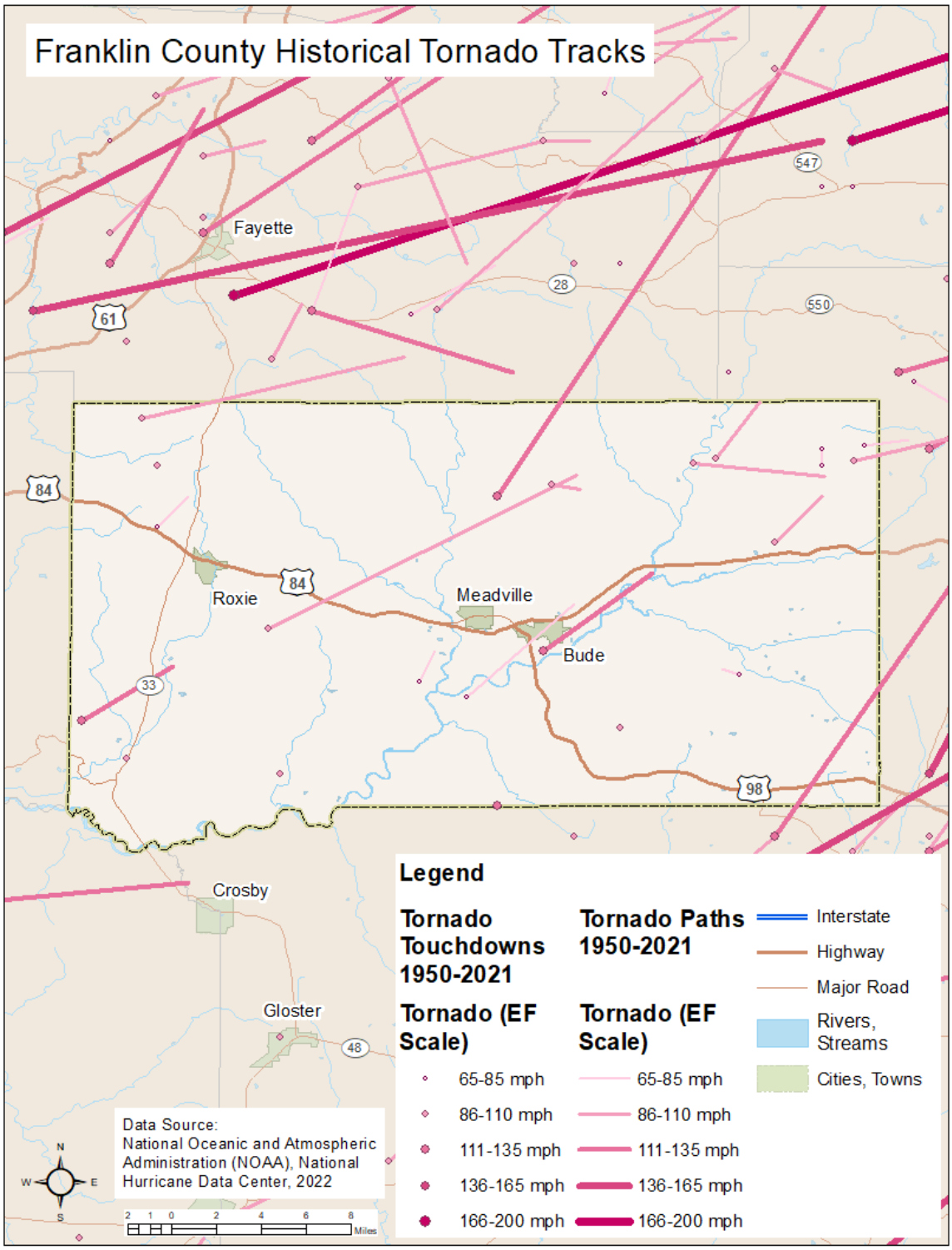
FIGURE C.13: ENHANCED-FUJITA SCALE



[41] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[42] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

FIGURE C.14: HISTORICAL TORNADO TRACKS IN FRANKLIN COUNTY[43]



[43] National Weather Service Storm prediction Center

HISTORICAL OCCURRENCES

Tornadoes were at least partially responsible for four disaster declarations in Franklin County in 1973, 1983, 2001, and 2003. According to the National Centers for Environmental Information, there have been a total of 19 recorded tornado events in Franklin County since 1972, resulting in over $4.04 million in property damages. In addition, seven injuries were reported. The magnitude of these tornadoes ranges from EF0 to EF2, although an F5 event is possible.

TABLE C.17: SUMMARY OF TORNADO OCCURRENCES IN FRANKLIN COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Bude	-	-	-	-
Meadville	2	0/0	$100,000	$2,000
Roxie	1	0/0	$0	$0
Unincorporated Area	16	0/7	$3,940,000	$78,800
Franklin County Total	**19**	**0/7**	**$4,040,000**	**$80,800**

PROBABILITY OF FUTURE OCCURRENCES

According to historical information, tornado events pose a significant threat to Franklin County. The probability of future tornado occurrences affecting Franklin County is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[44] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Franklin County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[45]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storm systems that spawn tornadoes to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding, and enhancing the potential for increased *tornado activity*. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

[44] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[45] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

C.2.13 Winter Storm, Freeze and Extreme Cold

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. Franklin County is not accustomed to severe winter weather conditions and seldom receives severe winter weather, even during the winter months. Events tend to be mild in nature; however, this creates a situation where even relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage due to the fact that these events are not commonplace. Given the atmospheric nature of the hazard, the entire county has uniform exposure to a winter storm.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, there have been a total of seven recorded winter storm events in Franklin County since 1996. These events resulted in almost $750,000 in damage.

TABLE C.18: SUMMARY OF WINTER STORM EVENTS IN FRANKLIN COUNTY[46]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Franklin County	7	0/0	$750,000	$28,846

There have been several severe winter weather events in Franklin County. The text below describes two of the major events and associated impacts on the county. Similar impacts can be expected with severe winter weather.

February 2010

Heavy snow affected a large portion of the region, especially locations across central and southern Mississippi, on Thursday night and Friday, February 11th and 12th. The heavy snow was a result of a low pressure system that tracked eastward across the northern Gulf of Mexico, and a vigorous upper level disturbance that moved across the region while a cold air mass was in place. Light precipitation overspread the region late Thursday afternoon into the evening before becoming heavy Thursday night into early Friday morning. The snow tapered off from west to east during the midday hours Friday.

February 2011

An ice storm developed across the area on February 3rd into the early morning hours of the 4th. While this icing event was not devastating, the impact to travel was a major issue across the region. Thousands of accidents occurred from slick roads. As a result of the accidents, three fatalities occurred along with a handful of injuries. Overall, most areas received 0.25 to 0.5 inches of ice accumulation from freezing

[46] These ice and winter storm events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1996 through November 2022. It is likely that additional winter storm conditions have affected Franklin County.

rain. Additionally, some areas had a mix of precipitation with sleet accumulating. Some snow did occur, but those were just across select areas and the accumulation was mainly one inch or less.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could lead to fire or an accumulation of toxic fumes.

PROBABILITY OF FUTURE OCCURRENCES

Winter storm events will continue to occur in Franklin County. Based on historical information, the probability is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems. There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Franklin County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms). However, accelerated warming in the Artic region (i.e., Arctic amplification) may also be linked with an increase in the frequency of extreme cold events across parts of Asia and North America, including in Franklin County. [47]

OTHER HAZARDS

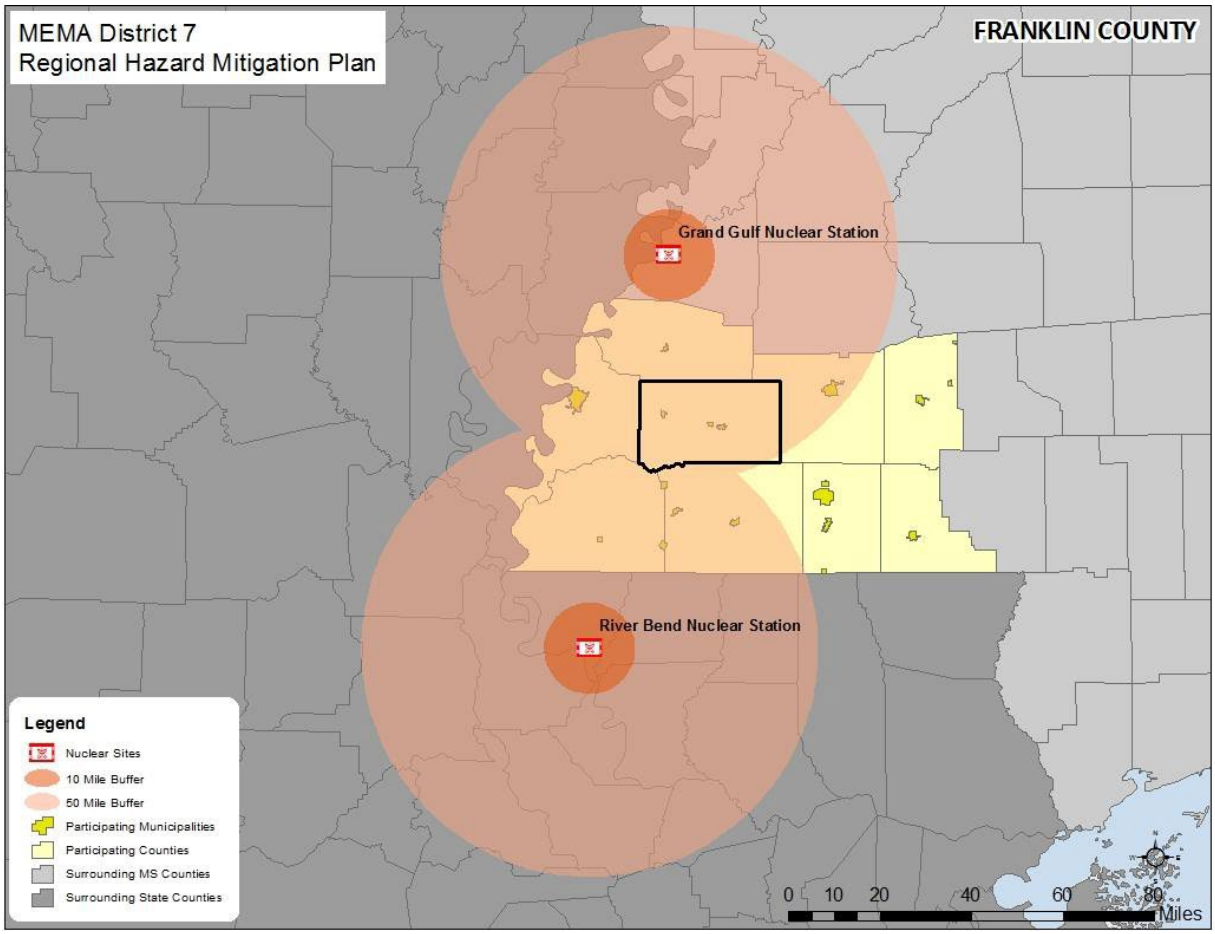
C.2.14 Radiological Event

LOCATION AND SPATIAL EXTENT

The Grand Gulf Nuclear Station and River Bend Nuclear Station are both located within a 50-mile radius of the MEMA District 7 Region. The Nuclear Regulatory Commission defines two emergency planning zones around nuclear plants. Areas located within 10 miles of the station are considered to be within the zone of highest risk to a nuclear incident and this radius is the designated evacuation radius recommended by the Nuclear Regulatory Commission. Within the 10-mile zone, the primary concern is exposure to and inhalation of radioactive contamination. No part of Franklin County is located in the 10-mile radius of a nuclear station. The most concerning effects in the secondary 50-mile zone are related to ingestion of food and liquids that may have been contaminated. Nearly all of Franklin County is located within this 50- mile radius. The 50-mile zone is still considered to be at risk from a nuclear incident, though the impacts may be less severe than in the 10-mile zone (Figure C.14).

[47] NOAA – Communication Education & Engagement. Retrieved from: https://cpo.noaa.gov/Divisions-Programs/Communication-Education-and-Engagement/CEE-News/ArtMID/8293/ArticleID/2369/Research-Links-Extreme-Cold-Weather-in-the-United-States-to-Arctic-Warming

FIGURE C.15: NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN FRANKLIN COUNTY[48]



HISTORICAL OCCURRENCES

Although there have been no major nuclear events at either the Grand Gulf or River Bend Nuclear Stations, there is some possibility that one could occur as there have been incidents in the past in the United States at other facilities and at facilities around the world. Additionally, a list of minor events/notifications was acquired from reports collected by the Nuclear Regulatory Commission (NRC). The NRC classifies events using the scale below. A list of events at Grand Gulf Nuclear Station and River Bend Nuclear Station can be found in the table below. It is noteworthy that all of the events were minor in magnitude, and many were insignificant enough that they did not register on the classification scale.

[48] International Atomic Energy Agency

TABLE C.19: NUCLEAR REGULATORY COMMISSION EMERGENCY CLASSIFICATION SCALE FOR EVENTS OCCURRING AT NUCLEAR POWER PLANTS

Classification	Description
Notification of Unusual Event (NOUE)	Events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs. [Note: This term is sometimes shortened to Unusual Event (UE). The terms Notification of Unusual Event, NOUE and Unusual Event are used interchangeably.
Alert	Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life-threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the Environmental Protection Agency (EPA) protective action guides (PAGs)
Site Area Emergency	Site Area Emergency (SAE) – Events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or hostile action that results in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to, equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA PAG exposure levels beyond the site boundary.
General Emergency	Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile action that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

TABLE C.20: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT RIVER BEND NUCLEAR STATION[49]

Date	Retrieved From*	Classification	Plant	Description
11/26/1985	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	ECCS Initiation: Improper restoration of a level transmitter causes HPSC injection
11/27/1985	Licensee Event Report	Alert	River Bend Unit 1	Failure to Perform Surveillance Tests

[49] Nuclear Regulatory Commission Preliminary Notification Reports (http://www.nrc.gov/reading-rm/doc-collections/event-status/prelim-notice/):

Date	Retrieved From*	Classification	Plant	Description
3/5/1992	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	REACTOR SCRAM CAUSED BY A GENERATOR TRIP DUE TO HIGH WINDS CAUSING TRANSFORMER DAMAGE
9/15/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE IVAN
10/4/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	Shutdown Greater than 72 Hours
9/23/2005	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	NRC ENTERS MONITORING MODE DUE TO HURRICANE RITA
5/23/2007	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REACTOR SHUTDOWN DUE TO UNEXPECTED CHANGE IN RECIRCULATION FLOW
9/2/2008	Preliminary Notification Reports	Notification of Unusual Event/Not Applicable	River Bend Unit 1	NRC RESPONSE TO HURRICANE GUSTAV
5/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	AUGMENTED INSPECTION TEAM ONSITE AT RIVER BEND STATION
8/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST

TABLE C.21: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT GRAND GULF NUCLEAR STATION

Date	Retrieved From*	Classification	Plant	Description
8/29/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST
10/1/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF NUCLEAR STATION SECURITY OFFICER LOCKOUT
9/29/2016	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF EXTENDED PLANT SHUTDOWN TO ADDRESS OPERATIONS PERFORMANCE

PROBABILITY OF FUTURE OCCURRENCES

A nuclear event is a very rare occurrence in the United States due to the intense regulation of the industry. There have been minor incidents in the past, but it is considered unlikely (less than 1 percent annual probability).

RADIOLOGICAL EVACUATIONS

Like the hurricane evacuations discussed above, in many ways the MEMA District 7 Region would potentially be impacted to a greater degree by evacuations caused by a radiological event than by the event itself. Since the region is not directly located within the 10-mile evacuation area but neighboring counties are located within this zone, it is highly likely that populations from those neighboring counties will be evacuated to the counties within the MEMA District 7 Region.

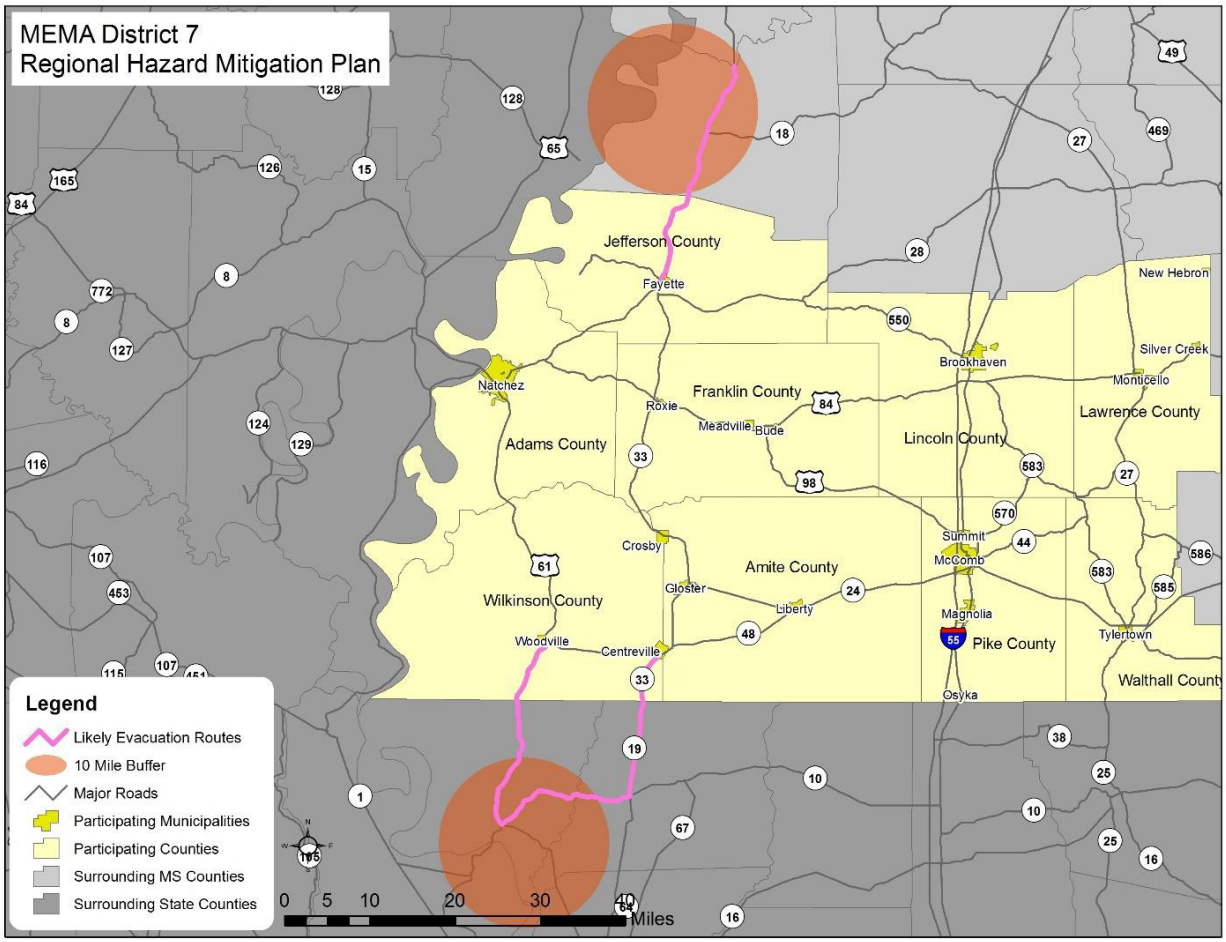
Due to the severe and long-term effects of a major radiological event, temporary sheltering will be an initial concern, but the greater challenge may be in the long-term. As has happened with historical radiological accidents in other locations, the danger in the impacted area will likely extend for a very long period after the event and evacuees may be unable to return to their homes for months or years. This additional influx of population will cause a major strain on resources within these relatively rural counties in the short-term, as local communities with limited resources will have an unexpected and immediate need to provide shelter and other life essentials such as food, water, and health care to a significant, additional number of people. In the long-term, there may be challenges for local officials as existing infrastructure will likely be inadequate to handle larger populations.

Although there have not been any major radiological events in the region historically, hurricane evacuations (discussed above) provide a similar scenario in terms of what the region might expect. However, one additional concern that officials will need to consider in a radiological event is that evacuees may be contaminated by radioactivity. According to the Centers for Disease Control, radioactive contamination can occur when radioactive materials are released into the environment and become deposited into the air, water, surfaces, soil, plants, buildings, people or animals. This contamination can then be spread when people touch other people, surfaces, or objects. Therefore, when people evacuate a contaminated zone, they pose a potential risk of spreading the contamination to others if they are not properly treated. Local officials in MEMA District 7 may need to be prepared to set up decontamination centers along major evacuation routes to ensure that the contamination is not spread. It is also important for citizens to understand the steps they can take to reduce the risk of spreading contamination such as evacuating quickly after an event and following decontamination instructions as directed by local officials.[50]

Based on the locations of the 10-mile evacuation areas near the region, many of these evacuees will likely come from Claiborne County to the north and West Feliciana and East Feliciana Parishes to the south. The main roads for these evacuees will probably be U.S. Highway 61 and Mississippi State Highway 33 since these are the primary and most direct roads into and out of the aforementioned evacuation counties and into MEMA District 7. Depending on the severity of the event, officials may even change these roads over to a contraflow traffic pattern to enable quicker evacuations.

[50] Centers for Disease Control and Prevention. Emergency Preparedness and Response: Contamination vs. Exposure. Retrieved on September 1, 2017 from https://emergency.cdc.gov/radiation/contamination.asp

FIGURE C.16: LIKELY EVACUATION ROUTES FOR A RADIOLOGICAL EVENT IN THE MEMA DISTRICT 7 REGION



As a result of the potential for an influx of evacuees during a radiological event, it is critical for local officials in MEMA District 7 to prepare for evacuations. It is possible that thousands of additional people will be relocated, either temporarily or permanently, to MEMA District 7. Therefore, plans for additional shelters and other resources should be coordinated well in advance of future events.

C.2.15 Pandemic

LOCATION AND SPATIAL EXTENT

Pandemics are global in nature. However, they may start anywhere. Franklin County chose to analyze this hazard given the agriculture in the area and potential for this kind of event to occur in any location at any time.

All populations should be considered at risk to pandemic. Buildings and infrastructure are not directly impacted by the virus/pathogen but could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings may be shutdown, at least temporarily, as a result. Employers may initiate work from home procedures for non-essential workers in order to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

HISTORICAL OCCURRENCES

Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below.

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to 566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population.

Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10 to 50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852- 1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours. The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

1957 Asian Flu: It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

1968 Hong Kong Flu: The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020, mainly due to the speed and scale of the transmission of the disease. Prior to that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province on February 26th, 2020. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

There is a considerable amount of data on the extent of COVID-19 throughout the State of Mississippi and Franklin County. The number of reported cases and deaths across the State of Mississippi and Franklin County are shown in the figure below.

TABLE C.22: COVID-19 CASES AS OF 1/05/2023[51]

	Cases	Deaths
Mississippi	960,923	13,112
Franklin County	2,280	39

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Franklin County has a probability level of unlikely (less than 1 percent annual probability) for future pandemics events. While pandemics can have devastating impacts, they are relatively rare.

The Mississippi State Department of Health maintains a state pandemic plan which can be found here: http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf

[51] Mississippi Department of Health – COVID-19 Dashboard: https://msdh.ms.gov/msdhsite/_static/resources/19539.pdf

C.2.16 Conclusions on Hazard Risk

The hazard profiles presented in this subsection were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled Understanding Your Risks: Identifying Hazards and Estimating Losses (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

HAZARD EXTENT

The table below describes the extent of each natural hazard identified for Franklin County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

TABLE C.23: EXTENT OF FRANKLIN COUNTY HAZARDS

Flood Related Hazards	
Dam & Levee Failure	Dam Failure extent is defined using the Mississippi Department of Environmental Quality classifications which include Low, Significant, and High. One dam is classified as high-hazard in Franklin County.
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no official erosion rate records in Franklin County but local estimates are around 0.25 to 0.50 feet per year. Some areas of erosion have been identified by local coordinators.
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 12.5 percent of the total land area in Franklin County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was on the Homochitto River at Rosetta. Water reached a discharge of 150,000 cubic feet per second (recorded on April 13, 1974). The highest stream gage height was on McCall Creek near Lucien with a height that was recorded at 92.70 feet (recorded on April 13, 1974). Additional peak discharge readings, historic crest heights, and the corresponding flood categories (where available) are in the table below.
Fire Related Hazards	
Drought	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. Franklin County has received this ranking once since 2000.
Lightning	Franklin County is in an area of the country that experienced an average of 71.2 lightning flashes per km^2 per year between 2016 and 2021. It should be noted that future lightning occurrences may exceed these figures.
Wildfire	Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2012-2021. The greatest number of fires to occur in Franklin County in any year was 17 in 2022. The greatest number of

	acres to burn in the county in a single year occurred in 2022 when 1,085 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale or the Modified Mercalli Intensity (MMI) scale. According to data provided by the National Centers for Environmental Information, no earthquakes were reported in Franklin County.
Temperature & Wind Related Hazards	
Extreme Heat	The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are not kept for any areas in Franklin County. However, the highest recorded temperature in the region was 106°F in 2007 with heat index values recorded above 115°F.
Hailstorm	Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Franklin County was 2.75 inches (last reported on March 17, 2016). It should be noted that future events may exceed this.
Hurricane & Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5. The greatest classification of hurricane to impact the MEMA District 7 Region was a Category 3 storm. This occurred in 1969 with Hurricane Camille and in 2005 with Hurricane Katrina. The storm track of both storms passed just to the east of the region, but due to the size of these storms, their impact was felt across the region.
Severe Thunderstorm / High Wind	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 67-year history from the National Centers for Environmental Information, the strongest recorded wind event in Franklin County was reported on May 3, 2009 at 78 knots (approximately 90 mph). It should be noted that future events may exceed these historical occurrences.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA as well as the Fujita/Enhanced Fujita Scale. The greatest magnitude reported in Franklin County was an F2 (last reported on April 5, 1983).
Winter Storm & Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in Franklin County. However, reports from NCEI of the greatest snowfall in the county has been 6.5 inches (reported on February 11, 2010).
Other Hazards	
Radiological Event	Although there is no history of a nuclear accident at either the Grand Gulf Nuclear Station or River Bend Nuclear Station, other events across the globe and in the United States indicate that an event is possible. Since several national and international events were Level 7 events on the INES, the potential for a Level 7 event at these stations is possible.
Pandemic	The extent of a pandemic impacting the county is difficult to estimate. It could result in thousands of deaths and extreme disruption of commerce and everyday life.

PRIORITY RISK INDEX RESULTS

To draw some meaningful planning conclusions on hazard risk for Franklin County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a "Priority Risk Index" (PRI). More information on the PRI and how it was calculated can be found in Section 5.17.2.

The table below summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this subsection, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

TABLE C.24: SUMMARY OF PRI RESULTS FOR FRANKLIN COUNTY

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Dam Failure and Levee Failure	Unlikely	Critical	Moderate	Less than 6 hours	Less than 6 hours	**2.3**
Erosion	Possible	Minor	Small	More than 24 hours	More than 1 week	**1.8**
Flood	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**3.2**
Fire-related Hazards						
Drought	Possible	Limited	Large	More than 24 hours	More than 1 week	**2.5**
Lightning	Highly Likely	Limited	Small	6 to 12 hours	Less than 6 hours	**2.6**
Wildfire	Highly Likely	Limited	Small	Less than 6 hours	Less than 1 week	**2.9**
Geologic Hazards						
Earthquake	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Wind-related Hazards						
Extreme Heat	Likely	Limited	Large	More than 24 hours	More than 1 week	**2.8**
Hailstorm	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Hurricane and Tropical Storm	Likely	Catastrophic	Large	More than 24 hours	Less than 1 week	**3.3**
Severe Thunderstorm/High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Tornado	Likely	Catastrophic	Moderate	Less than 6 hours	Less than 6 hours	**3.2**
Winter Storm and Freeze	Likely	Minor	Moderate	More than 24 hours	Less than 1 week	**2.2**
Human-caused Hazards						
Radiological Event	Unlikely	Critical	Moderate	More than 24 hours	Less than 1 week	**2.2**
Pandemic	Unlikely	Limited	Large	More than 24 hours	More than 1 week	**2.2**

C.2.17 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Franklin County, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk. For purposes

of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Franklin County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately and is described in Section 6: Vulnerability Assessment and below in Section C.3. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future updates. In most cases, the hazards of greatest concern did not change much since the last plan update, indicating that the priorities remained relatively stable and there were few changes in priorities.

TABLE C.25: CONCLUSIONS ON HAZARD RISK FOR FRANKLIN COUNTY

HIGH RISK	Hurricane and Tropical Storm Tornado Flood Severe Thunderstorm/High Wind Wildfire
MODERATE RISK	Extreme Heat Hailstorm Lightning Drought Dam and Levee Failure
LOW RISK	Winter Storm and Freeze Radiological Event Erosion Earthquake Pandemic

C.3 FRANKLIN COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Franklin County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected amount of damages caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in Section 6: Vulnerability Assessment.

C.3.1 Asset Inventory

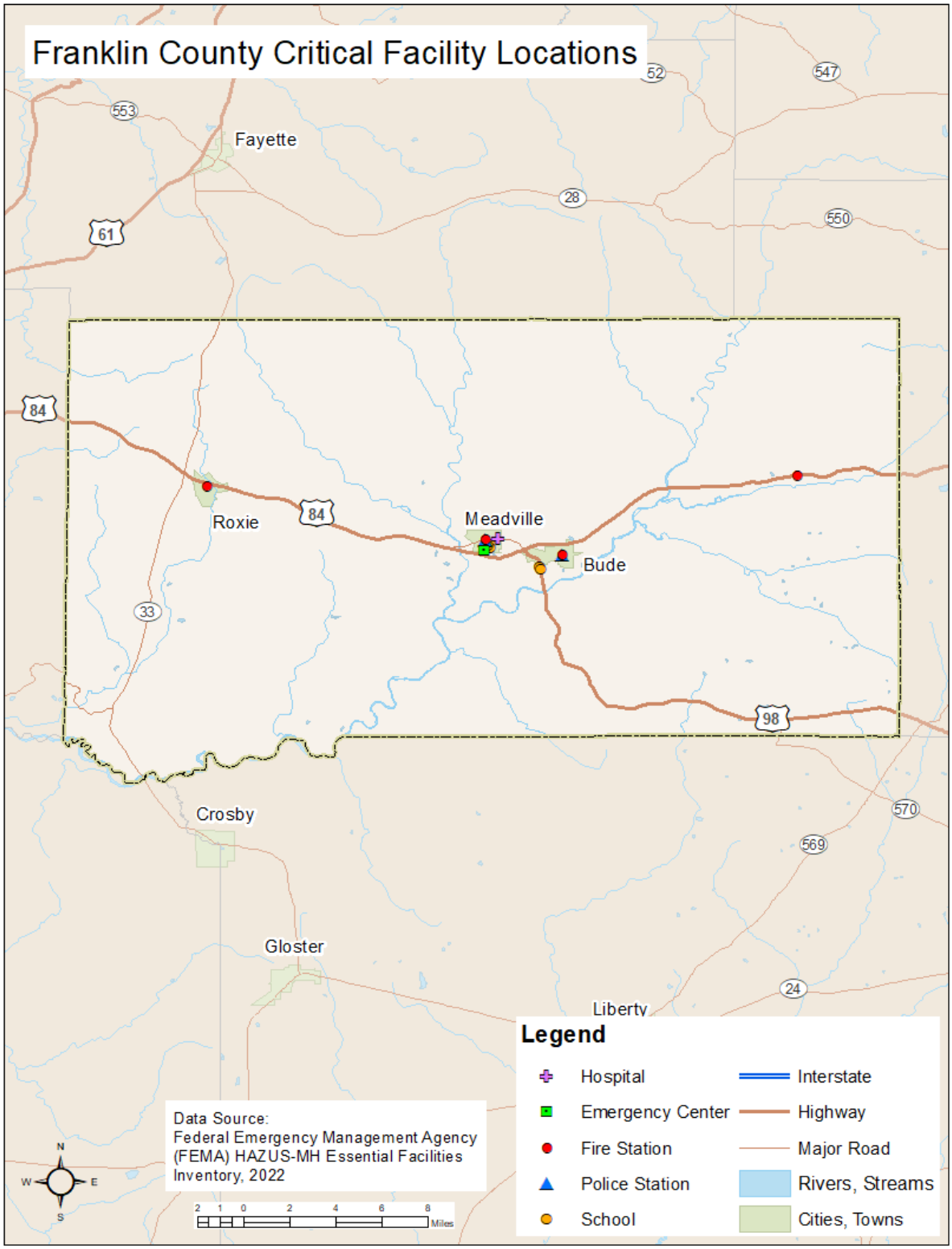
The following table lists the fire stations, police stations, medical care facilities, emergency operation centers, schools, government/public buildings, transportation infrastructure, and private facilities located in Franklin County according to previous plan data and Hazus-MH 5.1 data that was reviewed and updated by local officials.

In addition, the figure below shows the locations of critical facilities in Franklin County. The table at the end of this subsection shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided through Hazus which was updated, as best as possible, with local knowledge.

TABLE C.26: CRITICAL FACILITY INVENTORY IN FRANKLIN COUNTY

Location	Fire Stations	Police Stations	Medical Facilities	EOC	Schools	Ports
Bude	1	1	1	0	1	
Meadville	1	2	3	1	1	
Roxie	1	0	0	0	0	
Unincorporated	2	0	0	0	0	
Franklin County Total	**5**	**3**	**4**	**1**	**2**	

FIGURE C.167: CRITICAL FACILITY LOCATIONS IN FRANKLIN COUNTY



C.3.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those segments of the resident population in Adams County that are potentially at risk for these hazards. Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss.

The CDC/ATSDR Social Vulnerability Index (CDC/ATSDR SVI) uses 16 U.S. census variables to help local officials identify communities that may need support before, during, or after disaster. See figure below for Franklin County SVI score of 0.5595.

FIGURE C.178: SOCIAL VULNERABILITY INDEX IN FRANKLIN COUNTY[52]

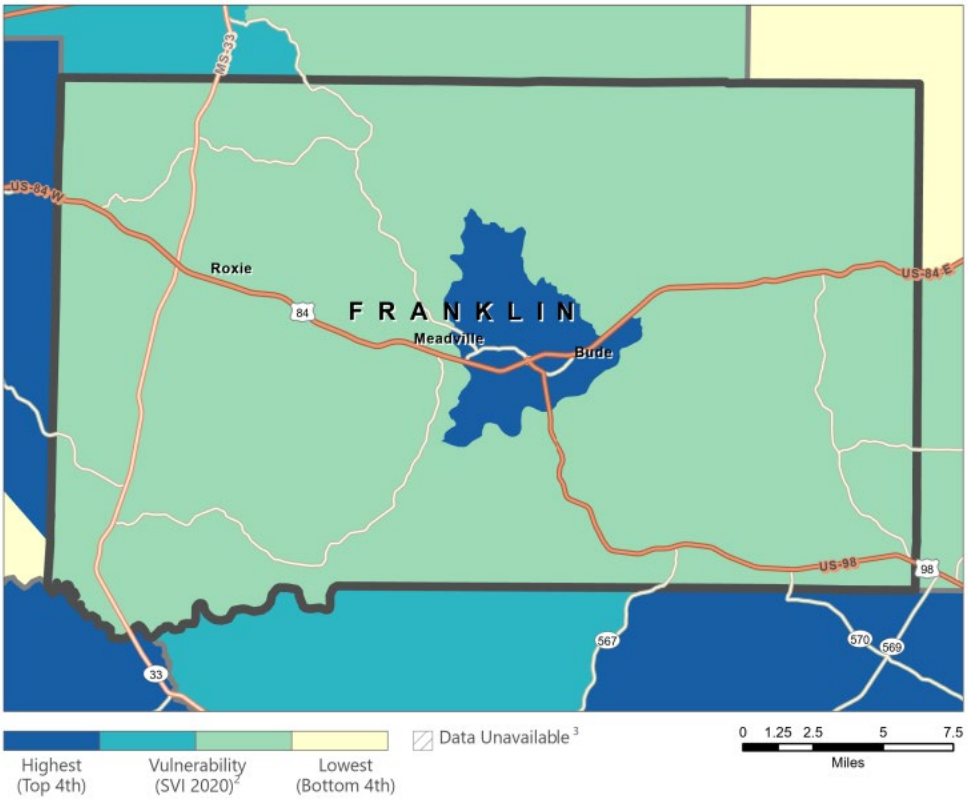


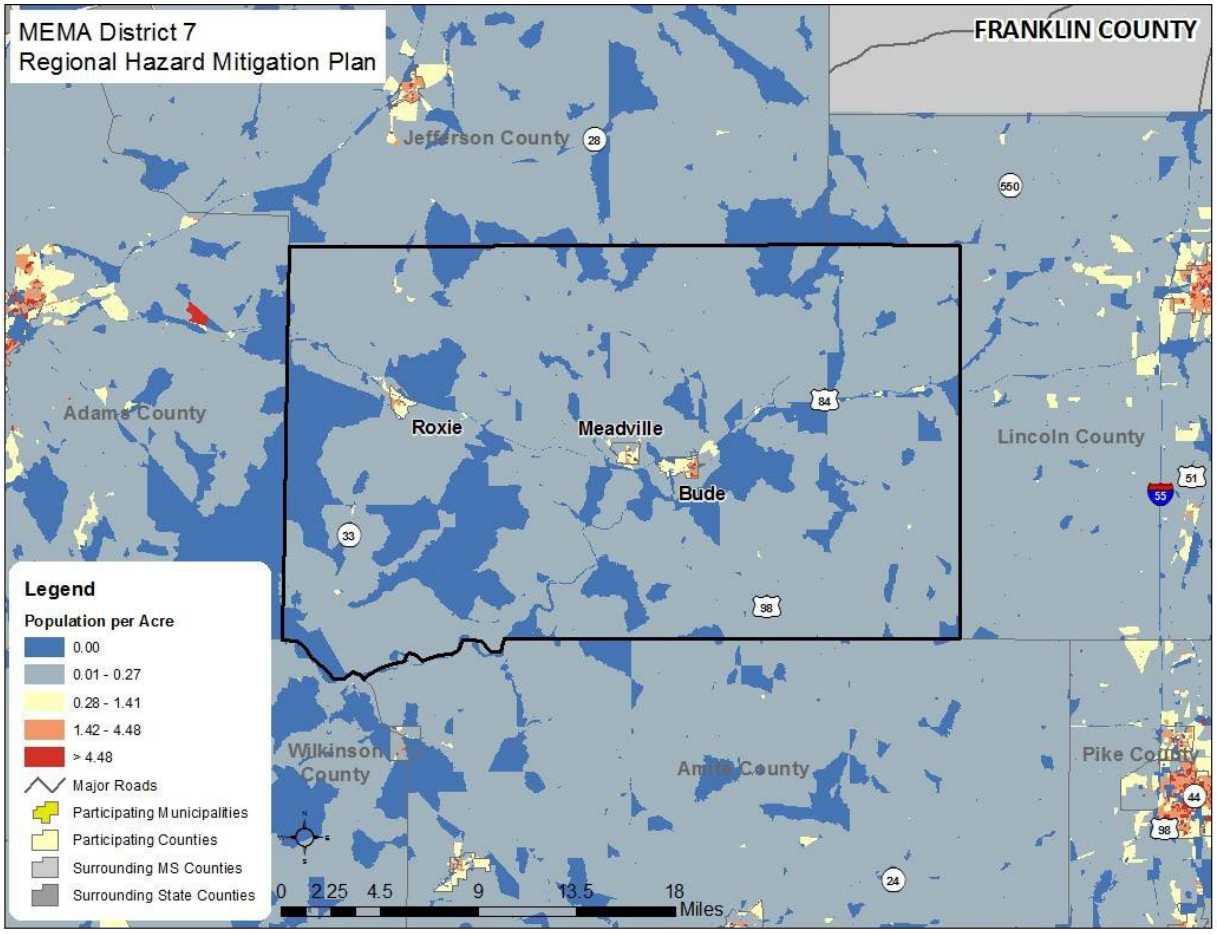
TABLE C.27: TOTAL POPULATION IN FRANKLIN COUNTY

Jurisdiction	2000 Census	2010 Census	2020 Census	% Change 2000 – 2020
Franklin County	8,448	8,118	7,675	-9.15%
Bude	1,037	1,063	780	-24.78
Meadville	519	449	448	-13.68%
Roxie	569	497	469	-17.57%

[52] CDC/ATSDR Social Vulnerability Index

In addition, the figure below illustrates the population density per acre by census block as it was reported by the U.S. Census Bureau in 2010. As can be seen in the figure, the population is spread out with concentrations in municipal areas such as Bude, Meadville, and Roxie.

FIGURE C.19: POPULATION DENSITY IN FRANKLIN COUNTY



C.3.3 Development Trends and Changes in Vulnerability

Since the previous hazard mitigation plan was approved, Franklin County has experienced limited growth and development. The table below shows the number of building units constructed since 2010 according to the U.S. Census American Community Survey.

TABLE C.228: BUILDING COUNTS FOR FRANKLIN COUNTY

Location	Total Housing Units (2021)	Units Built 2010 or Later	% Building Stock Built Post-2010
Bude	662	12	1.8%
Meadville	319	5	1.6%
Roxie	276	2	0.7%
Unincorporated Area	3,673	278	7.5%
Franklin County Total	**4,268**	**297**	**7.0%**

Based on the data above, there has been a low rate of residential development and population growth in the county since 2000, and the county has experienced a population decline. However, it is notable that the unincorporate areas of Franklin County has experienced a higher rate of growth and development compared to the rest of the county, resulting in an increased number of people and structures that are vulnerable to the potential impacts of the identified hazards. Therefore, development and population growth have impacted the county's vulnerability since the previous local hazard mitigation plan was approved and there has been a slight increase in the overall vulnerability as well as a larger increase in certain areas and communities.

It is also important to note that as development increases in the future, greater populations and more structures and infrastructure will be exposed to potential hazards if development occurs in floodplains or other high-risk areas.

C.3.4 Vulnerability Assessment Results

As noted in Section 6: Vulnerability Assessment, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis. Those results, specific to Franklin County, are presented here. All other hazards are assumed to impact the entire planning region (drought, extreme heat, hailstorm, lightning, severe thunderstorm/high wind, tornado, and winter storm) or due to lack of data, analysis would not lead to credible results (erosion).

The hazards to be further analyzed in this subsection include: dam/levee failure, flood, wildfire, earthquake, hurricane and tropical storm winds, and radiological event.

The annualized loss estimate for all hazards is presented near the end of this subsection.

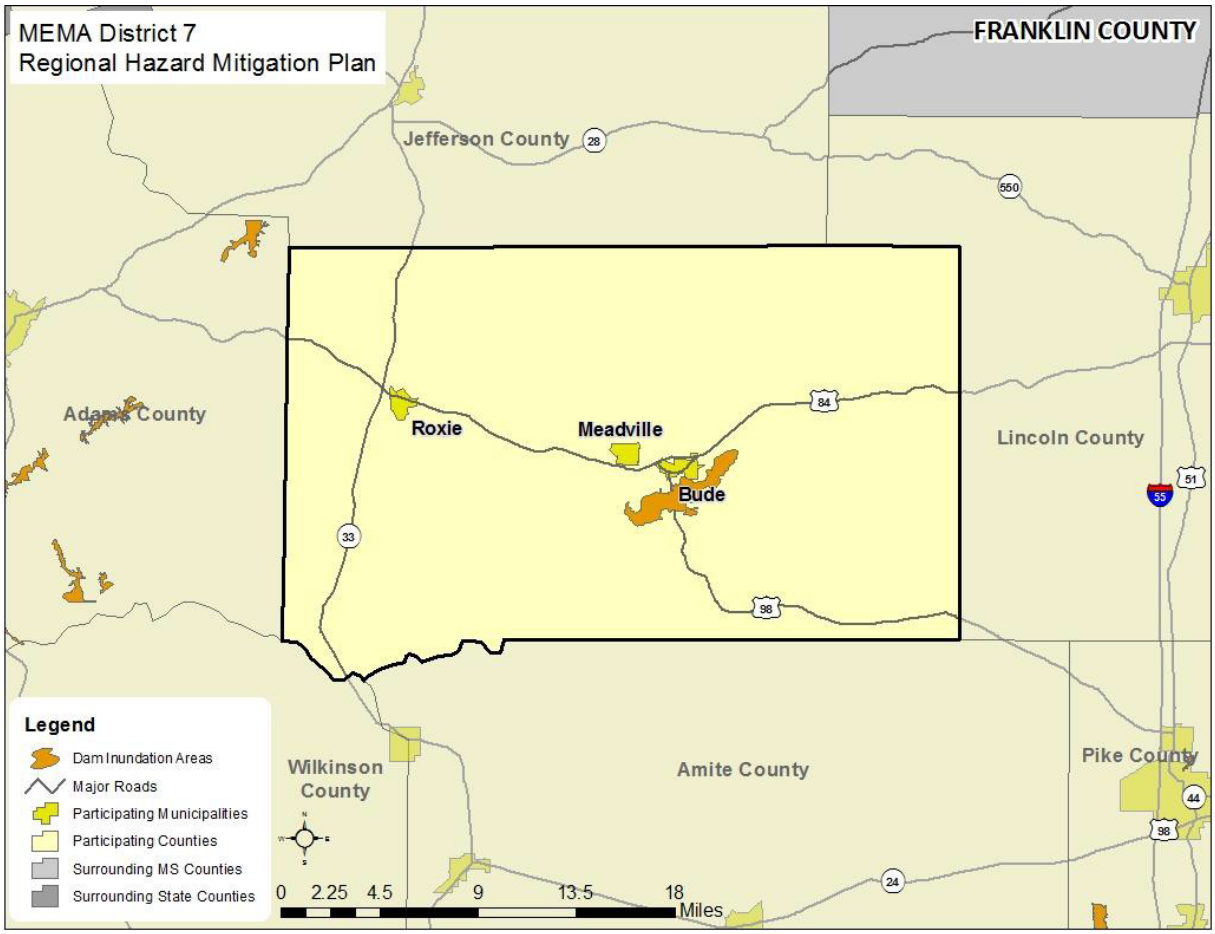
DAM/LEVEE FAILURE

In order to assess risk to a dam or levee failure, a GIS-based analysis was used to estimate exposure to one of the areas delineated by the Mississippi Department of Environmental Quality as a potential inundation area in the event of a failure. The determination of value at-risk (exposure) was calculated using GIS analysis by summing the values for improved properties that were located within an identified inundation area. As mentioned previously, this type of inundation mapping has not been completed for every dam/levee in the region, so the results of this analysis likely underestimate the overall vulnerability to a dam or levee failure. However, the analysis is still useful as a sort of baseline minimum of property that is potentially at-risk. The identified inundation areas can be found in the figure below.

In general, building footprint and parcel data were used in this analysis. However, in some communities, due to a lack of digital parcel data, it was determined that analysis using the inventory from Hazus-MH 5.1 would be used to supplement the building/parcel data. It should be noted that this data will merely be an estimation and may not reflect actual counts or values located in dam inundation areas. Indeed, in almost all cases, this data likely overestimates the amount of property in the identified risk zones.

The following table presents the potential at-risk property. Both the number of buildings and the approximate improved value are presented.

FIGURE C.20: DAM INUNDATION AREAS IN FRANKLIN COUNTY[53] [54]



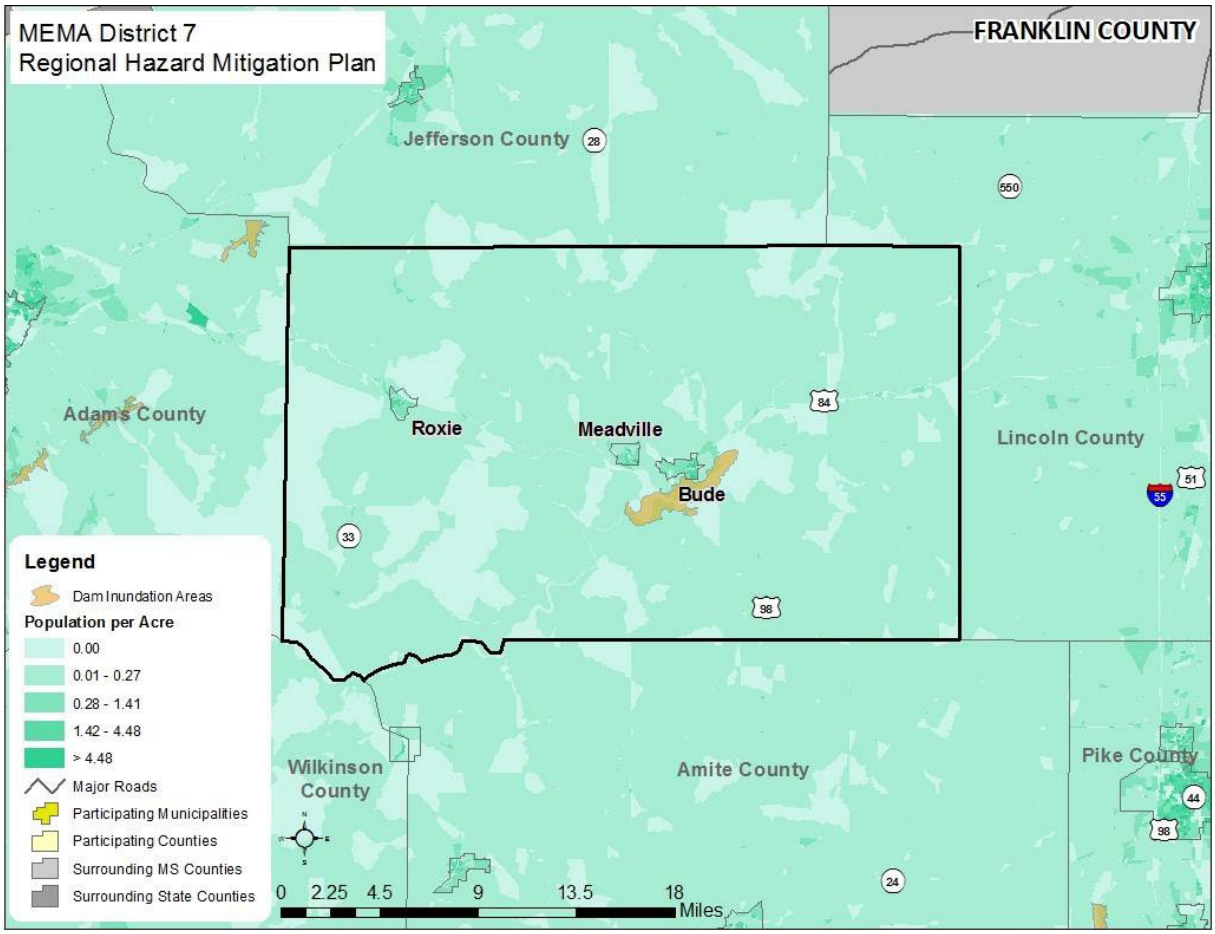
Social Vulnerability

The following figure is presented to gain a better understanding of at-risk population by evaluating census block level population data against dam inundation areas. There are several areas of concern in the county, although it should be noted that most of the population of the county is not at risk to a dam/levee failure.

[53] Mississippi Department of Environmental Quality.

[54] This information remains unchanged since the last plan update.

FIGURE C.21: POPULATION DENSITY NEAR DAM INUNDATION AREAS IN FRANKLIN COUNTY



Critical Facilities

There are no critical facilities located within the identified dam inundation areas. Although there are no facilities located in the identified areas, this does not indicate that there is no risk to a dam/levee failure, especially considering not all dams have delineated inundation areas. A list of specific critical facilities and their associated risk can be found in Table C.45 at the end of this section.

In conclusion, a dam/levee failure has the potential to impact many existing and future buildings, facilities, and populations in Franklin County, though structures located near or in the dam inundation areas are at highest risk. Specific vulnerabilities for Franklin County assets will be greatly dependent on their individual design and the mitigation measures in place where appropriate. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates if data becomes available.

FLOOD

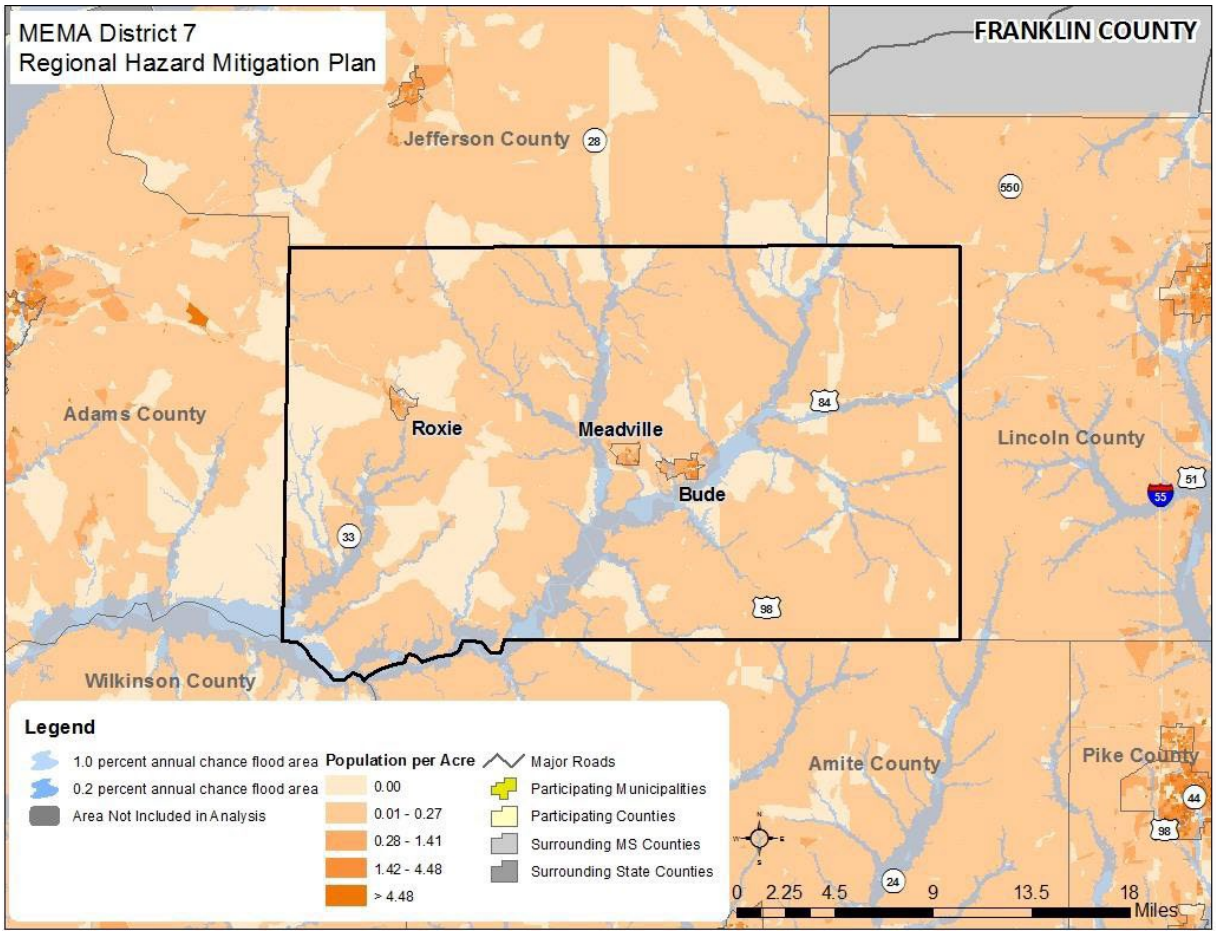
Historical evidence indicates that Franklin County is susceptible to flood events. A total of 29 flood events have been reported by the National Centers for Environmental Information resulting in $2.86 million in property damage. On an annualized level, these damages amounted to $119,166 for Franklin County.

To assess flood risk, a GIS-based analysis was used to estimate exposure to flood events using Digital Flood Insurance Rate Map (DFIRM) data in combination with improved property records for the county. The determination of value at-risk (exposure) was calculated using GIS analysis by summing the values for improved properties that were located within an identified floodplain. Due to a lack of digital parcel data in most counties, it was determined that an analysis using the inventory from Hazus-MH 5.1 would be used, though it should be noted that the data will merely be an estimation and may not reflect actual counts or values located in the floodplain. Indeed, in almost all cases, this analysis likely overestimates the amount of property at risk. The table below presents the potential at-risk property. Both the number of parcels and the approximate value are presented.

For this plan update, a HAZUS 100yr. flood scenario was performed for the study area. The geographical size of the region is approximately 567 square miles and contains 1,247 census blocks. The region contains over 3,000 households and has a total population of 8,118 people (2010 Census Bureau data). There are an estimated 6,928 buildings in the region with a total building replacement value (excluding contents) of 848 million dollars. Approximately 94.47% of the buildings (and 79.94% of the building value) are associated with residential housing.

HAZUS estimates that there are 4,237 buildings in the county which have an aggregate total replacement value of $577 million dollars. HAZUS estimates that about 157 buildings will be at least moderately damaged. This is over 51% of the total number of buildings in the scenario, with an estimate that 41 buildings would be completely destroyed.

FIGURE C.22: POPULATION DENSITY NEAR FLOODPLAINS IN FRANKLIN COUNTY[55]



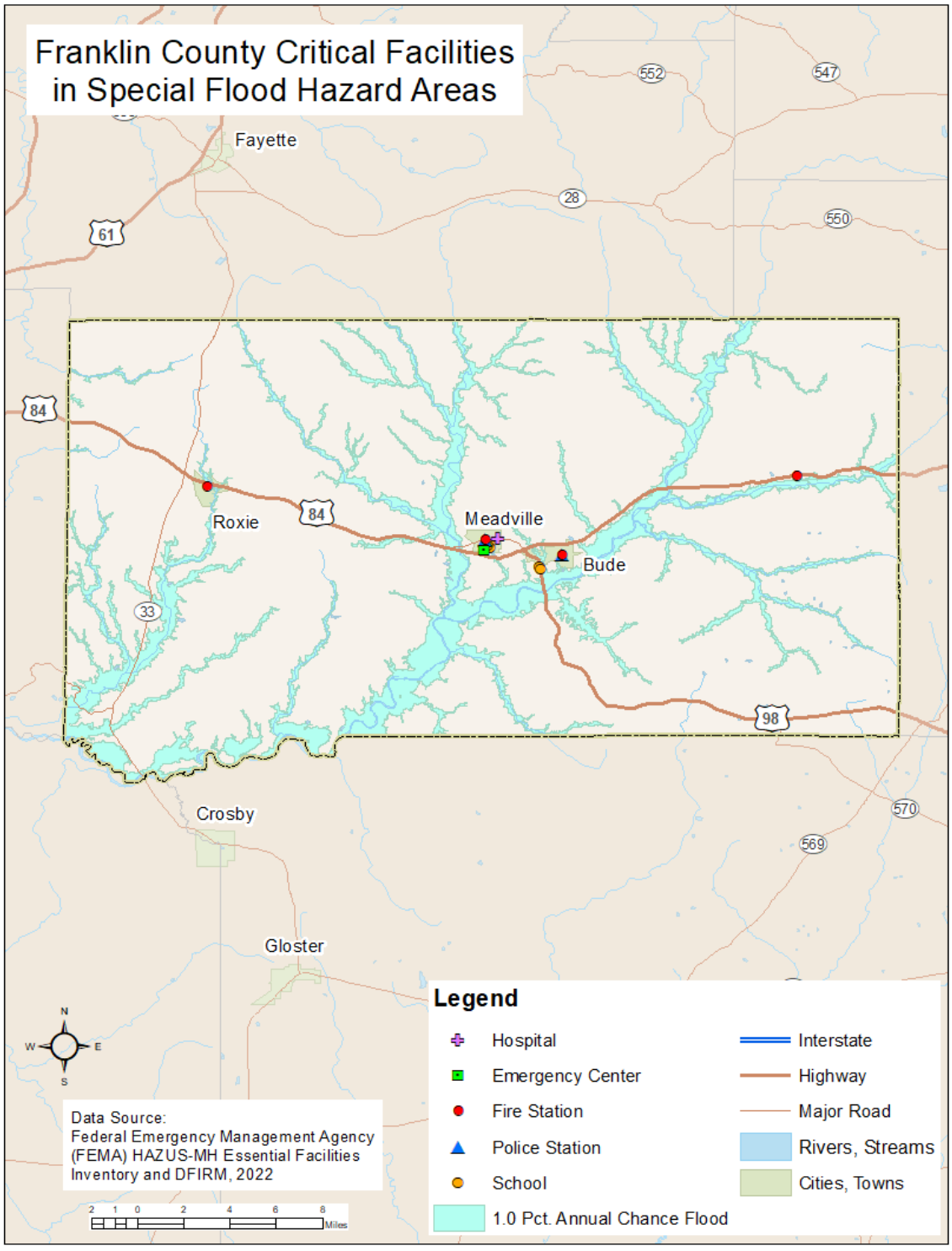
Critical Facilities

The critical facility analysis revealed that there is one critical facility located in the floodplain. (Please note, as previously indicated, this analysis does not consider building elevation, which may negate risk.) This facility is a fire station located in the 1.0 percent annual chance flood zone. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

The figure below shows critical facilities relative location near Special Flood Hazard Areas.

[55] Federal Emergency Management Agency DFIRM; United States Census Bureau, 2010 Census

FIGURE C.23 CRITICAL FACILITIES NEAR SFHA[56]



[56] FEMA - DFIRM

In conclusion, a flood has the potential to impact many existing and future buildings, facilities, and populations in Franklin County, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. Such site-specific vulnerability determinations are outside the scope of this assessment but may be considered during future plan updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

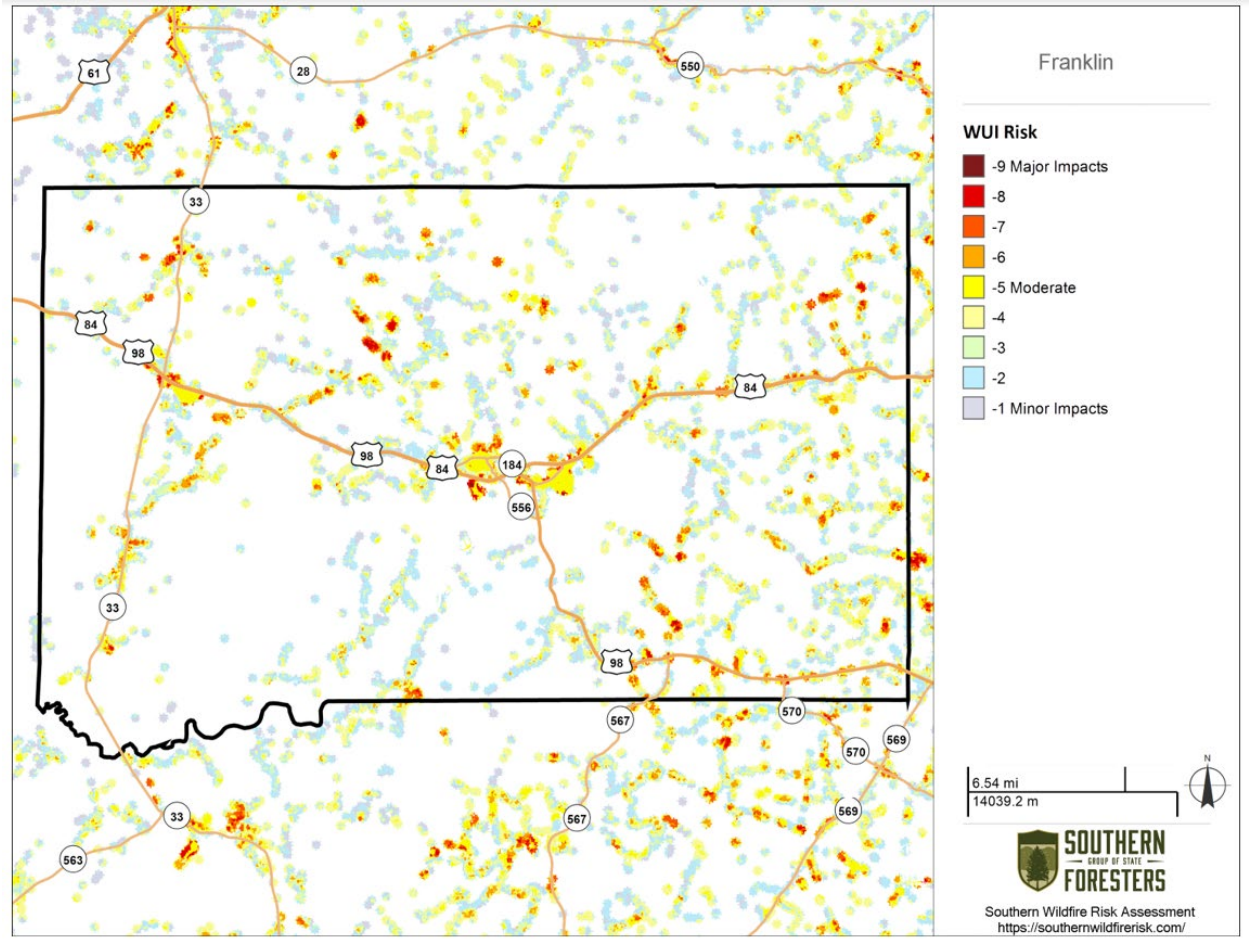
WILDFIRE

Although historical evidence indicates that Franklin County is susceptible to wildfire events, there are few reports which include information on historic dollar losses. Therefore, it is difficult to calculate a reliable annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result in significant damages throughout the county.

To estimate exposure to wildfire, building data was obtained from Hazus-MH 5.1 which includes information that has been aggregated at the census block level and which has been deemed useful for analyzing wildfire vulnerability. However, it should be noted that the accuracy of Hazus data is somewhat lower than that of parcel data. For the critical facility analysis, areas of concern were intersected with critical facility locations.

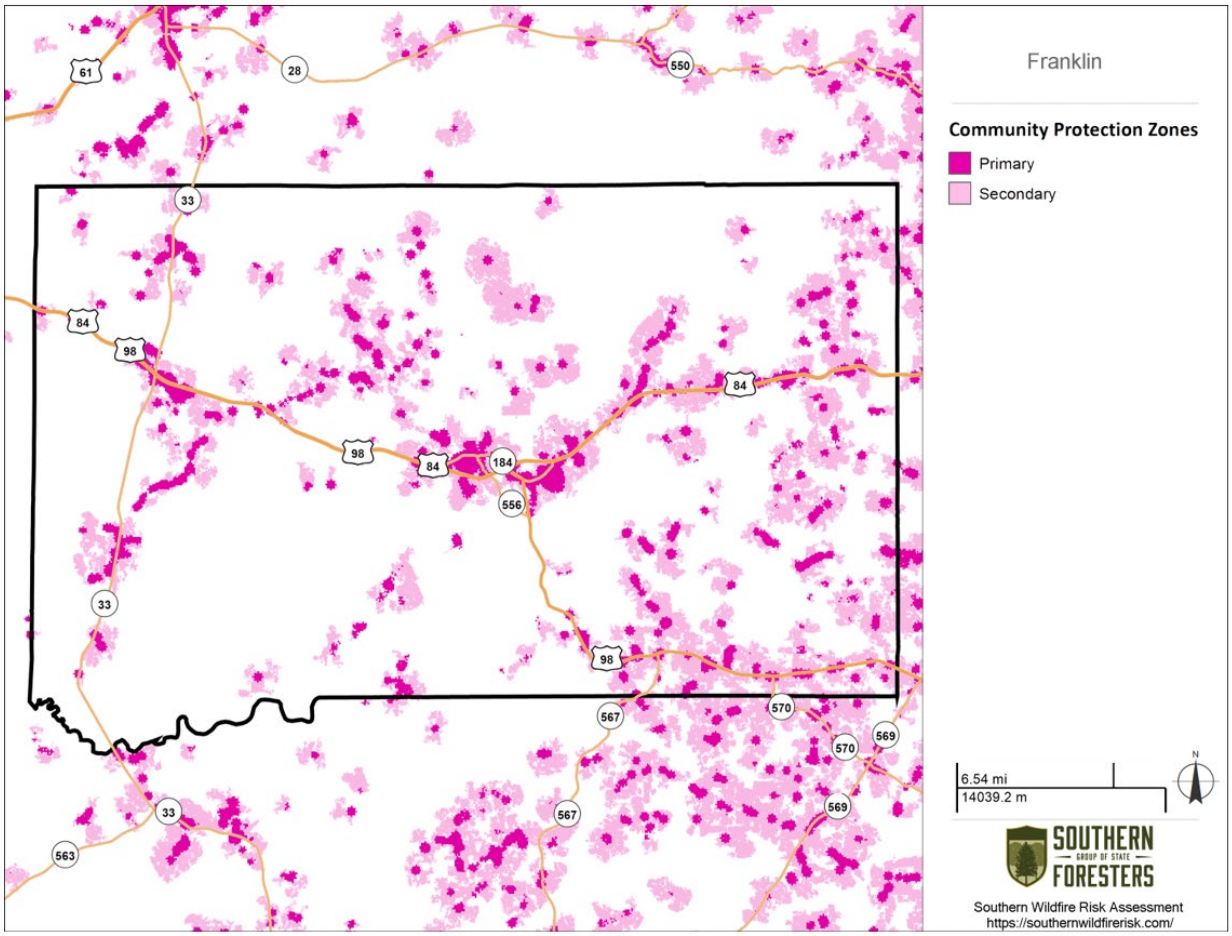
Figure C.22 shows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). Figure C.23 shows the areas of analysis where any grid cell is less than -4. Areas with a value below -4 were chosen to be displayed as areas of risk because this showed the upper echelon of the scale and the areas at highest risk.

FIGURE C.24: WUI RISK INDEX AREAS IN FRANKLIN COUNTY[57]



[57] Southern Wildfire Risk Assessment Data 2022

FIGURE C.25: COMMUNITY PROTECTION ZONES IN FRANKLIN COUNTY[58]



Social Vulnerability

Given some level of susceptibility across the entire county, it is assumed that the total population is at risk to the wildfire hazard. The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire. For the Franklin project area, it is estimated that 8,107 people or 99.9 % percent of the total project area population (8,113) live within the WUI.

Critical Facilities

The critical facility analysis revealed that there are 11 critical facilities located in wildfire areas of concern, including 1 EOC, 1 fire station, 3 medical care facilities, 3 police stations, 1 private sector building, and 2 schools. It should be noted that several factors could impact the spread of a wildfire, putting all facilities at risk. A list of specific critical facilities and their associated risk can be at the end of this subsection.

[58] Southern Wildfire Risk Assessment Data - 2022

In conclusion, a wildfire event has the potential to impact many existing and future buildings, critical facilities, and populations in Franklin County.

EARTHQUAKE

As the Hazus-MH model suggests below, and historical occurrences confirm, any significant earthquake activity in the area is likely to inflict minor damage to the county.

For the earthquake hazard vulnerability assessment, a probabilistic 100-year earthquake scenario was created at the MEMA District 7 regional level to estimate the average annualized loss for the county. The results of the analysis are generated at the census tract level within Hazus-MH and then aggregated to the county level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss. They do not include losses to business interruption, lost income, or relocation.

The geographical size of the region is 4,838.70 square miles and contains 38 census tracts. There are over 67,000 households in the region which has a total population of 174,795 people (2010 Census Bureau data). There are an estimated 82,000 buildings in the region with a total building replacement value (excluding contents) of $13.9 billion dollars. Approximately 92.00 % of the buildings (and 70.00% of the building value) are associated with residential housing.

Social Vulnerability

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodation in temporary public shelters. The model estimates 0 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 174,795) will seek temporary shelter in public shelters.

Critical Facilities

The Hazus-MH probabilistic analysis did not indicate that any critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor to moderate damage should an event occur.

In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in Franklin County. Specific vulnerabilities for these assets will be greatly dependent on their individual design and the mitigation measures in place. Such site-specific vulnerability determinations are outside the scope of this assessment but may be considered during future updates. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While Franklin County may not experience a catastrophic earthquake, localized damage is possible with a moderate to larger scale occurrence.

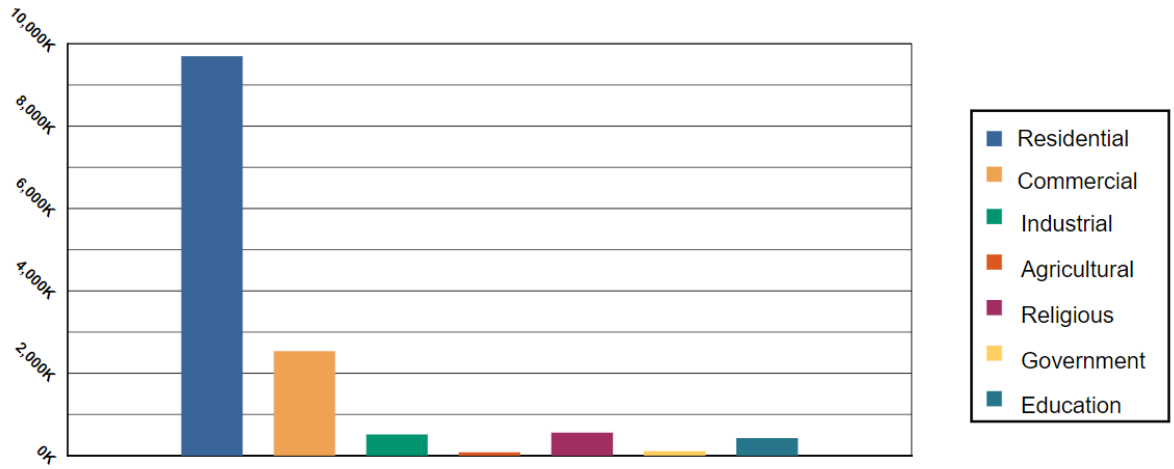
HURRICANE AND TROPICAL STORM

Historical evidence indicates that Franklin County has significant risk to the hurricane and tropical storm hazard. There have been seven disaster declarations due to hurricanes as noted in pervious sections. Several tracks have come near or traversed through the county, as shown and discussed in Section C.2.10. Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is

not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard. Hazus-MH 5.1 was used to determine average annualized losses for the county as shown. Only losses to buildings, inventory, and contents are included in the results.

HAZUS was utilized to perform a 100-year hurricane simulation for MEMA District 7 Region. Hazus estimates that there are 82,485 buildings in the region which have an aggregate total replacement value of $13 billion dollars.

FIGURE C.26: BUILDING EXPOSURE BY OCCUPANCY TYPE[59]



Social Vulnerability

Given some equal susceptibility across the entire county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard.

Critical Facilities

For essential facilities, there are 11 hospitals in the region with a total bed capacity of 605 beds. There are 90 schools, 74 fire stations, 32 police stations and 9 emergency operation facilities. HAZUS estimates that about 133 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 4 buildings that will be destroyed.

The total property damage losses were $71 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies, which made up over 95% of the total loss. The table below provides a summary of the losses associated with the building damage.

[59] HAZUS 100-year Hurricane Scenario

FIGURE C.27: LOSS BY TYPE[60]

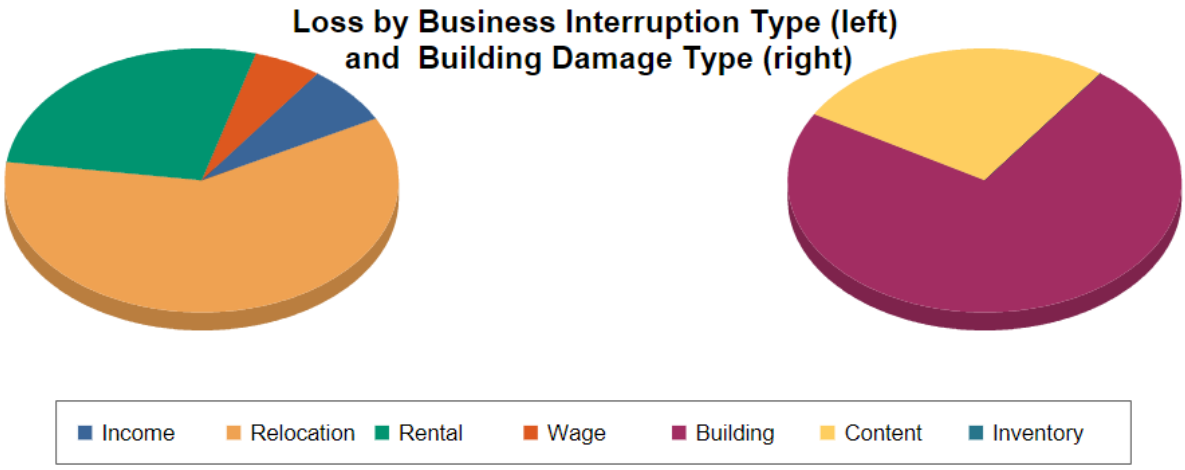
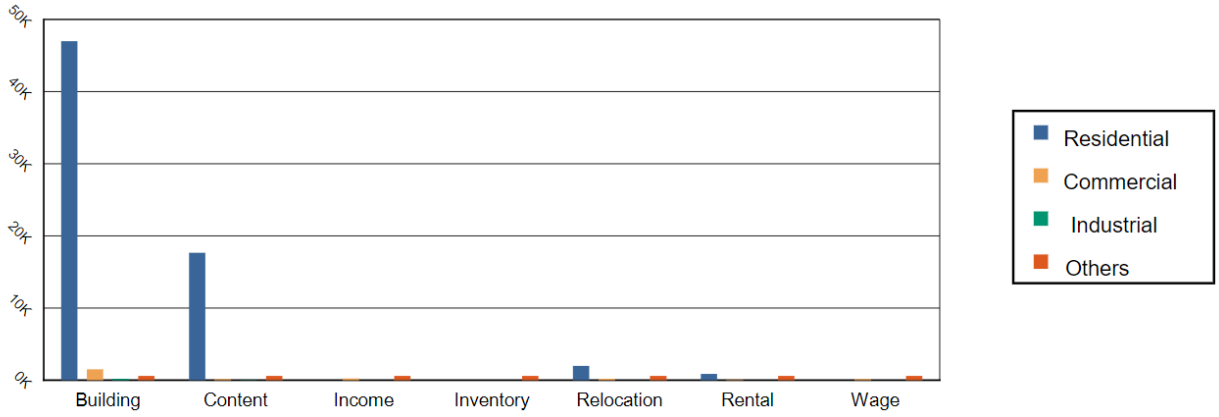


FIGURE C.28: LOSS BY GENERAL OCCUPANCY



Given equal vulnerability across Franklin County, all critical facilities are at risk. Some buildings may perform better than others in the face of such an event due to construction and age, among other factors. Determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation action for especially vulnerable structures and/or critical facilities to mitigate against the effects of the hurricane hazard. A list of specific critical facilities can be found at the end of this subsection. In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in Franklin County.

RADIOLOGICAL EVENT

The location of Grand Gulf and River Bend Nuclear Stations north and south of the region, respectively, demonstrate that the county is at some risk to the effects of a nuclear accident. Although there have not been any major events at these plants in the past, there have been major events at other nuclear

[60] HAZUS 100-year Hurricane Scenario

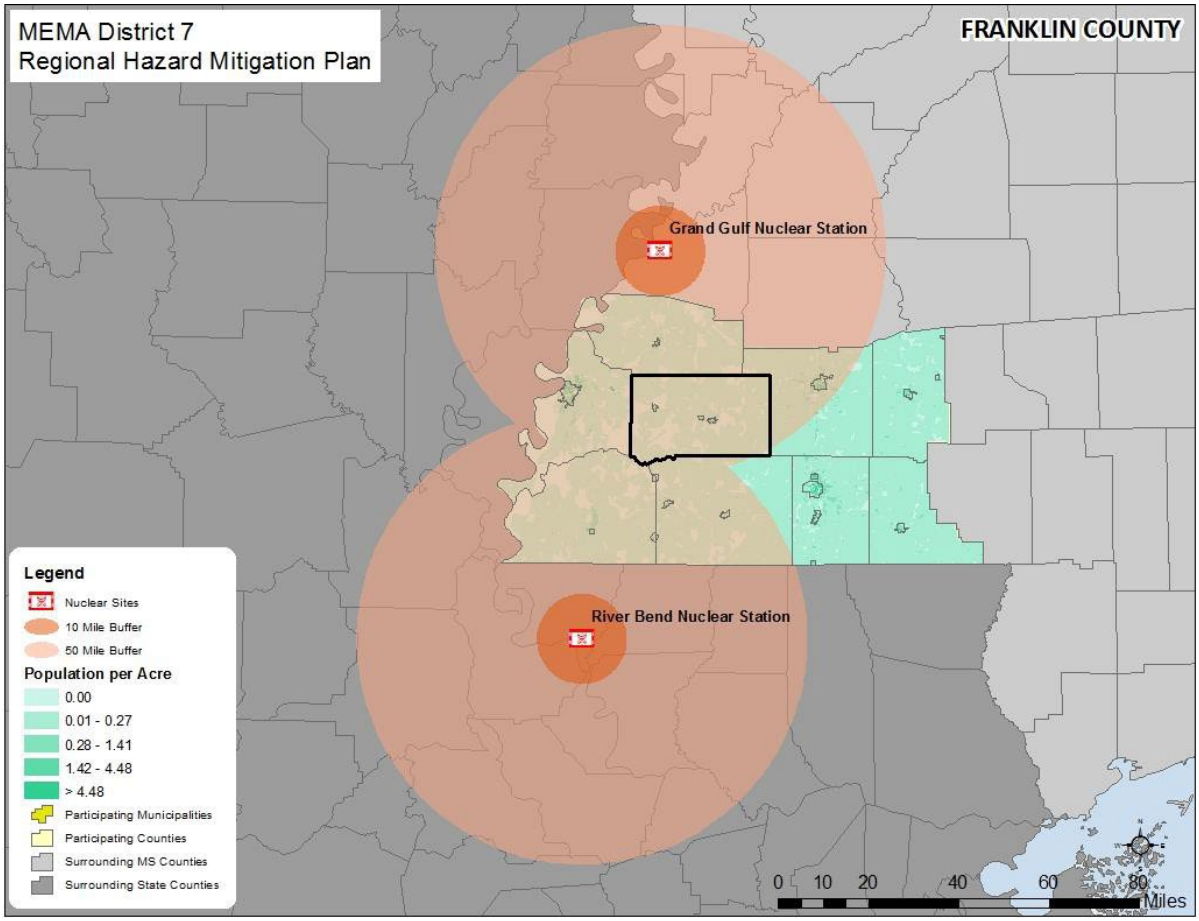
stations around the country. Additionally, smaller scale incidents at both these nuclear stations have occurred.

To assess nuclear risk, a GIS-based analysis was used to estimate exposure during a nuclear event within each of the risk zones described in Section C.2.14. The determination of assessed value at-risk (exposure) was calculated using GIS analysis by summing the total values for those properties that were confirmed to be located within one of the risk zones.

Social Vulnerability

Since most of the western part of county is within the 50-mile buffer area, this segment of the population is at high risk to a radiological event. However, other populations in the county may also be at some risk. This risk can be seen below.

FIGURE C.29: POPULATION DENSITY NEAR NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN FRANKLIN COUNTY[61]



Critical Facilities

The critical facility analysis revealed that all 14 critical facilities in the county are located in the 50- mile nuclear buffer area, including 1 EOC, 2 fire stations, 4 medical care facilities, 3 police stations, 1 private

[61] International Atomic Energy Agency; United States Census Bureau, 2010 Census

sector building, and 3 schools. No critical facilities are in the 10-mile buffer area. A list of specific critical facilities and their associated risk can be found at the end of this section.

In conclusion, a nuclear accident has the potential to impact many existing and future buildings, facilities, and populations in Franklin County.

CONCLUSIONS ON HAZARD VULNERABILITY

The table below presents a summary of annualized loss for each hazard in Franklin County. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

TABLE C.29: ANNUALIZED LOSS FOR FRANKLIN COUNTY[62]

Event	Franklin County
Flood-related Hazards	
Dam & Levee Failure	Negligible
Erosion	Negligible
Flood	$119,166
Fire-related Hazards	
Drought	Negligible
Lightning	$4,100
Wildfire	Negligible
Geologic Hazards	
Earthquake[63]	$20,000
Temperature & Wind-related Hazards	
Extreme Heat	Negligible
Hailstorms	$10,228
Hurricane & Tropical Storm	$1,354,500
Severe Thunderstorm/High Wind	$55,096
Tornado	$80,800
Winter Storm & Freeze	$28,846
Other Hazards	
Radiological Event	Negligible
Pandemic	Negligible

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to atmospheric hazards including drought, lightning, extreme heat, hailstorm, hurricane and tropical storm, severe thunderstorm/high wind, tornado, and winter storm and freeze. Some buildings

[62] "Negligible" is used to indicate that no records of dollar losses for the hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that event is not well kept.

[63] No historic losses for earthquake were recorded, so Hazus estimates were used.

may be more vulnerable to these hazards based on other factors such as construction and building type. The following table shows the critical facilities vulnerable to the hazards analyzed in this section. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an “X”).

TABLE C.30: AT-RISK CRITICAL FACILITIES IN FRANKLIN COUNTY

		FLOOD-RELATED				FIRE-RELATED			GEO	WIND-RELATED							HUM	
FACILITY NAME	FACILITY TYPE	Dam and Levee Failure	Erosion	Flood – 100 yr	Flood – 500 yr	Drought	Lightning	Wildfire	Earthquake	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Severe Thunderstorm/	Tornado	Winter Storm and Freeze		Radiological Event 10-mile area	Radiological Event 50-mile area
Franklin County																		
Franklin County EOC	EOC		X			X	X	X	X	X	X	X	X	X	X			X
Roxie Volunteer Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X			X
Bude Volunteer Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X			X
District 5 Volunteer Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X			X
East Franklin Rural Volunteer Fire Department	Fire Station		X	X		X	X		X	X	X	X	X	X	X			X
Meadville Volunteer Fire Department District	Fire Station		X			X	X	X	X	X	X	X	X	X	X			X
Bude Rural Health Clinic	Medical Care		X			X	X	X	X	X	X	X	X	X	X			X
Family Medical Group of Meadville	Medical Care		X			X	X	X	X	X	X	X	X	X	X			X
Franklin County Hospital	Medical Care		X			X	X	X	X	X	X	X	X	X	X			X
Meadville Convalescent Nursing Home	Medical Care		X			X	X		X	X	X	X	X	X	X			X
Bude Police Dept	Police Station		X			X	X	X	X	X	X	X	X	X	X			X
Franklin County Sheriff	Police Station		X			X	X	X	X	X	X	X	X	X	X			X
Meadville Police Dept	Police Station		X			X	X	X	X	X	X	X	X	X	X			X
American Railcar	Private Sector		X			X	X	X	X	X	X	X	X	X	X			X
Franklin County Elementary School	School		X			X	X		X	X	X	X	X	X	X			X
Franklin County High School	School		X			X	X	X	X	X	X	X	X	X	X			X
Franklin County Jr High School	School		X			X	X	X	X	X	X	X	X	X	X			X

C.4 FRANKLIN COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Franklin County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in Section 7: Capability Assessment.

C.4.1 Planning and Regulatory Capability

Table C.46 provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Franklin County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. A dagger (†) indicates that the given item is administered for that municipality by the county. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the MEMA District 7 Regional Hazard Mitigation Plan.

TABLE C.31: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Threat and Hazard Identification and Risk Assessment (THIRA)	Comprehensive Land Use Plan	Floodplain Management Plan/Flood Mitigation Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Emergency Management Accreditation Program (EMAP Accreditation)	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment/ Reconstruction Plan/ Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System (CRS Program)
FRANKLIN COUNTY	✓								✓						✓		✓							✓	
Bude	†								†						†		✓							✓	
Meadville	†								†						†										
Roxie	†								†						†		✓							✓	

A more detailed discussion on the county's planning and regulatory capabilities follows.

EMERGENCY MANAGEMENT

Hazard Mitigation Plan

Franklin County has previously adopted a hazard mitigation plan. The Town of Bude, Town of Meadville, and Town of Roxie were also included in this plan.

Emergency Operations Plan

Franklin County maintains an Emergency Operations Plan through its Emergency Management Agency. The Town of Bude, Town of Meadville, and Town of Roxie are also covered by this plan.

FLOODPLAIN MANAGEMENT

The following table provides NFIP policy and claim information for each participating jurisdiction in Franklin County.

TABLE C.32: NFIP POLICY AND CLAIM INFORMATION[64]

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
FRANKLIN COUNTY†	12/13/12	01/06/10(M)	0	$0	0	$0
Bude	09/01/86	01/06/10(M)	0	$0	0	$0
Meadville*	--	--	--	--	--	--
Roxie	06/17/86	01/06/10(M)	0	$0	0	$0

All jurisdictions listed above that are participants in the NFIP will continue to comply with all required provisions of the program and will work to adequately comply in the future utilizing a number of strategies. For example, the jurisdictions will coordinate with MEMA and FEMA to develop maps and regulations related to special flood hazard areas within their jurisdictional boundaries and, through a consistent monitoring process, will design and improve their floodplain management program in a way that reduces the risk of flooding to people and property.

As noted above, several jurisdictions are not participants in the NFIP. The Town of Bude and Town of Meadville do not participate in the NFIP due to a lack of capacity or resources to properly administer and maintain the program.

Flood Damage Prevention Ordinance

All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. Franklin County and the Town of Roxie both participate in the NFIP and have adopted flood damage prevention regulations.

C.4.2 Administrative and Technical Capability

The following table provides a summary of the capability assessment results for Franklin County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff

[64] †Includes unincorporated areas of county only

*Community does not participate in the NFIP

(M) – No Elevation Determined, All Zone A, C and X *Source: NFIP Community Status information as of 7/2/2023; NFIP claims and policy information as of 7/2/2023*

member(s) in that jurisdiction with the specified knowledge or skill. A dagger (†) indicates a county-level staff member(s) provides the specified knowledge or skill to that municipality.

TABLE C.233: RELEVANT STAFF/PERSONNEL RESOURCES

Staff/Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
FRANKLIN COUNTY				✓	✓		✓	✓		
Bude				†	†		†	†		
Meadville				†			†	†		
Roxie				†	✓		†	†		

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

C.4.3 Fiscal Capability

The following table provides a summary of the results for Franklin County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource has previously been used to implement hazard mitigation actions. A dagger (†) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds).

TABLE C.244: RELEVANT FISCAL RESOURCES

Fiscal Tool/Resource	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes (or taxing districts)	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other: FEMA Hazard Mitigation Grants, Homeland Security Grants, USDA Rural Development Agency Grants, and US Economic Development Administration Grants
FRANKLIN COUNTY		†							✓	†
Bude		†								†
Meadville		†								†
Roxie		†								†

C.4.4 Political Capability

During the months immediately following the disaster, local public opinion in Franklin County is more likely to shift in support of hazard mitigation efforts.

The next table provides a summary of the results for Franklin County with regard to political capability. A checkmark (✓) indicates the expected degree of political support by local elected officials in terms of adopting/funding information.

TABLE C.35: LOCAL POLITICAL SUPPORT

Political Support	Limited	Moderate	High
FRANKLIN COUNTY		✓	
Bude	✓		
Meadville	✓		
Roxie		✓	

C.5 FRANKLIN COUNTY MITIGATION STRATEGY

This subsection provides the blueprint for Franklin County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and

the findings and conclusions of the capability assessment and risk assessment. In addition, this strategy was developed with the State Hazard Mitigation Plan Goals and Objectives in mind. For this update, each action identifies the State Hazard Mitigation Program Objective that it relates to. Additional Information can be found in Section 8: Mitigation Strategy and Section 9: Mitigation Action Plan.

C.5.1 Mitigation Goals

Franklin County developed six mitigation goals in coordination with the other participating MEMA District 7 Region jurisdictions. The regional mitigation goals are presented below.

TABLE C.36: MEMA DISTRICT 7 REGIONAL MITIGATION GOALS

	Goal
Goal #1	Increase the overall public awareness of natural hazards that face the region.
Goal #2	Retrofit of critical facilities and/or critical infrastructure to lower the risk of damage from natural hazards.
Goal #3	General improvement of regional or local mitigation planning and capability.
Goal #4	Support State Identified Mitigation Initiatives such as saferooms and storm shelters, severe weather warning systems for universities and colleges, and severe weather notification systems for local communities.
Goal #5	Reduce loss of life, damage and loss of property and infrastructure, economic costs, including response, recovery and disruption of economic activity.
Goal #6	Foster cooperation among all levels of governments and the private sector with respect to improving, updating, and implementing the hazard mitigation plan.

C.5.2 Mitigation Action Plan

The mitigation actions proposed by Franklin County, Town of Bude, Town of Meadville, and Town of Roxie are listed in the following individual Mitigation Action Plans.

Franklin County Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implement Sched.	Implementation Status (2023)
Prevention								
P-1	2.2	**Comprehensive Land Use and Long-Term Recovery Planning –** The Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie should have a Comprehensive Plan developed to guide long term recovery and development.	Hurricane, erosion, and other hazards	High	Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2025	While the county hasn't been able to make much progress with this item, it remains an item of interest. The Franklin County Board of Supervisors/Towns of Meadville, Bude, and Roxie recognize that comprehensive land use planning yields many benefits for both the county and towns. The existence of a Comprehensive Plan enables a county or municipality to institute zoning ordinances to regulate new development and protect or upgrade existing development and it provides a solid basis to establish stronger building codes. Many of the goals of Long-Term Recovery Planning and Comprehensive Planning are one and the same. The county and towns have not developed a Comprehensive Plan. Therefore, this action will remain in the plan.
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	Franklin County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2025	The county remains committed in having updated flood hazard maps completed. A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.

P-3	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist counties with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as counties develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Franklin County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2025	Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.
P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
P-5	1.4	**Base Level Engineering –** Collaborate with local or regional resources develop Base Level Engineering, watershed-wide engineering modeling that leverages high resolution ground elevation, automated model building techniques, and manual model review to prepare broad and accurate flood risk information for FEMA to assess its current flood hazard inventory.	Flood	High	Franklin County Board of Supervisors	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation	2025	The county wishes to retrofit the Franklin County Courthouse for wind resistant because that is the current location of the EOC. Also, the wind retrofitting should be performed on the county owned Franklin County Memorial Hospital. The Franklin County Board of

						grants, US Economic Development Administration grants, individual county general and special funds		Supervisors/Towns of Meadville, Bude, and Roxie recognize that damage to public buildings from wind is a serious hazard affecting the ability of government to function during and after disasters. Roof and structural damage and loss of electrical service in county/city government buildings due to high winds can render these buildings at least temporarily unusable and can potentially cause disruptions in government services. Retrofits of essential government buildings have not been completed. Therefore, this action will remain in the plan to lessen potential wind damage to those structures.
PP-2	1.1	**Ground/Protect Critical Facilities and Equipment** – Upgrade electrical protective measures on critical facilities.	Lightning	Moderate	Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action. The County has targeted the Sheriff's department for implementation of this action.
Natural Resource Protection								
NRP-1	1.6							
Structural Projects								
SP-1	1.1	**Bridge Redesign or Retrofit** Partridge Lane in Bude has a bridge that requires an upgrade for protection from flood waters.	Flood	High	Franklin County EMA in collaboration with the Town of Bude	FEMA Hazard Mitigation grants, general and special funds	2024	New Action.
SP-2	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm	High	Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2027	New Action.
Emergency Services								

ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Hurricane, Winter Storm	High	Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie in collaboration with the Mississippi Emergency Management Agency	General and special funds	In progress – target completion 2027	The county has made some progress towards becoming StormReady but wish for this item to remain in the plan as more funding becomes available. Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. The county is in the process of becoming "storm ready" countywide including the towns, so this action will remain in the plan. This action was combined with ES-7 since they were duplicate actions.
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, Lightning, or other hazard leading to loss of electrical power	High	Franklin County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	The county has made progress previously by adding some emergency standby generators. However, they remain in constant need to upgrades and replacement. The county needs to replace the generator at Emergency Management's office, and at the county district barn. There are additional locations in need of standby generators. The County has targeted the local schools that function as storm shelters for generator installation due to the frequency of lightning induced power outages during times when the utilizing the space as a shelter is necessary.
ES-3	1.8	**Improve Emergency Communications –** Purchase CodeRED® or other similar product to function as a high-speed telephone communications service for emergency notifications. This system allows County officials to telephone targeted areas of a	Hurricane or other hazard leading to loss of traditional communications systems	High	Franklin County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants,	2025	This action has been modified from its original identification of satellite phones, to embrace newer and more effective technology.

		municipality or the entire County in case an emergency situation requires immediate action such as a boil-water notice, missing child or evacuation notices.				US Economic Development Administration grants, general and special funds		
ES-4	1.9	**Construct New Emergency Shelter –** The county should construct a 200-person evacuation shelter. When not needed for disaster related housing, the building will serve as a Community Center and can be rented by individuals for group functions such as family reunions, weddings, or class reunions.	Hurricane, Tornado or other hazard requiring the use of emergency shelters	High	Franklin County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2025	The county has identified Meadville as a location in need for an emergency shelter. There is continued interest in pursuing this. The Franklin County Board of Supervisors recognize the need to have modern, safe emergency shelters for county/city/town residents and evacuees from other areas during times of disaster. Currently a combination of schools, churches, and other government buildings are used. This works acceptably for short-term use, but for longer term needs as were seen in the Hurricane Katrina disaster, the presence of evacuees in these facilities for more than a few days caused a disruption in the facility's designed function. Since a new emergency shelter has not been constructed in Franklin County, this action will remain in the plan.
ES-5	1.1	**Renovate Emergency Operations Center –** The EOC should secure and renovate another building or construct a new one of sufficient size to house all EOC staff and equipment.	Hurricane or other hazard requiring action from the EOC	High	Franklin County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	The county has performed some renovations and upgrades, but there are still more upgrades necessary to improve operations. The Franklin County Emergency Operations Center (EOC) is currently housed in inadequate space requiring staff and equipment to be quartered at several locations in the county. This severely hampers the EOC's ability to perform its functions during times of emergency. Staff and equipment should be housed at one location to maximize efficiency and minimize response time. This action will remain in the plan to improve the EOC's functions.

ES-6	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide/citywide system.	Tornado	High	Franklin County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	2027	Many citizens in Franklin County live in rural areas and small communities. In the event of inclement weather, it is essential that they receive timely warnings. The county currently has 5 weather sirens in addition to the sirens located within the municipalities. Additional sirens can be installed/upgraded to further improve the warning system in Franklin County, so this action will remain in the plan.
ES-7	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Franklin County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2027	New Action.
Public Education and Awareness								
PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Low	Franklin County Board of Supervisors	Individual county general and special funds	2027	Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan. The County is interested in incorporating earthquake drills through the annual Great ShakeOut.

PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Franklin County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2024	This remains an ongoing project for the county. Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP.
PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	Moderate	Franklin County EMA,MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2024	There is a need for community outreach to both the general public and to the owners of high hazard dams concerning maintenance and Emergency Action Planning. It is important that the public and owners are aware of high hazard dams, so this action will remain in the plan.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	Moderate	Franklin County EMA,MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2024	This remains ongoing. Emergency action plans are developed, exercised, and maintained by the individual dam owners. The MDEQ, Dam Safety Division is tasked to review the plans. Franklin County will continue to support the outreach to high hazard and significant hazard dam owners, so this action will remain in the plan.
PEA-5	3.2	**Education: FireWise –** Recommend that public information and outreach workshops on the *Firewise* program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Franklin County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, individual county general and special funds	2027	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan.

PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Los	Franklin County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The nuclear reactor remains and so does this project. It's a continued item. Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Franklin County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The nuclear reactor remains and so does this project. It's a continued item. The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie	FEMA Hazard Mitigation grants, general and special funds	2025	New Action

PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2024	New Action.
PEA-11	3.1	**Education: Public Outreach –** Develop a program to encourage school programs to incorporate the Great Shake Out	Earthquake	Low	Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.

Town of Bude Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implement Sched.	Implementation Status (2023)
Prevention								
P-1	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	Town of Bude Board of Aldermen and Mayor and Franklin County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2025	The county is taking lead int his effort and remains committed in having updated flood hazard maps completed. A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist counties with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as counties develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Town of Bude Board of Aldermen and Mayor and Franklin County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2025	Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.

P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Town of Bude Board of Aldermen and Mayor and Franklin County Board of Supervisors	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
P-5	1.4	**Base Level Engineering –** Collaborate with local or regional resources develop Base Level Engineering, watershed-wide engineering modeling that leverages high resolution ground elevation, automated model building techniques, and manual model review to prepare broad and accurate flood risk information for FEMA to assess its current flood hazard inventory.	Flood	High	Town of Bude Board of Aldermen and Mayor and Franklin County Board of Supervisors	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Town of Bude Board of Aldermen and Mayor and Franklin County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2025	The Franklin County Board of Supervisors/Towns of Meadville, Bude, and Roxie recognize that damage to public buildings from wind is a serious hazard affecting the ability of government to function during and after disasters. Roof and structural damage and loss of electrical service in county/city government buildings due to high winds can render these buildings at least temporarily unusable and can potentially cause disruptions in government services. Retrofits of essential government buildings have not been completed. Therefore, this action will remain in the plan to lessen potential wind damage to those structures.
PP-2	1.1	**Ground/Protect Critical Facilities and Equipment** – Upgrade electrical protective	Lightning	Moderate	Town of Bude Board of	FEMA Hazard Mitigation	2025	New Action.

		measures on critical facilities.			Aldermen and Mayor and Franklin County Board of Supervisors	grants, individual county general and special funds		
Natural Resource Protection								
NRP-1	1.6							
Structural Projects								
SP-1	1.1	**Bridge Redesign or Retrofit** Partridge Lane in Bude has a bridge that requires an upgrade for protection from flood waters.	Flood	High	Franklin County EMA in collaboration with the Town of Bude	FEMA Hazard Mitigation grants, general and special funds	2024	New Action.
SP-2	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm	High	Town of Bude Board of Aldermen and Mayor and Franklin County Board of Supervisors	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2027	New Action.
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Hurricane, Winter Storm	High	Town of Bude Board of Aldermen and Mayor and Franklin County Board of Supervisors in collaboration with the Mississippi Emergency Management Agency	General and special funds	In progress – target completion 2027	The county has made some progress towards becoming StormReady but wish for this item to remain in the plan as more funding becomes available. Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. The county is in the process of becoming “storm ready” countywide including the towns, so this action will remain in the plan. This action was combined with ES-7 since they were duplicate actions.

ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, Lightning, or other hazard leading to loss of electrical power	High	Town of Bude Board of Aldermen and Mayor and Franklin County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	Loss of electrical power to critical facilities such as water and sewer systems, law enforcement offices, and other critical facilities during a natural disaster can have a severe impact on the functioning of government to provide relief and assistance to citizens and maintain civil order. This can also cause very significant problems for private citizens who depend on municipal and rural water and sewer systems and rely on county and town governments to continue to maintain order. This situation can be especially difficult on the elderly and other special needs persons who would have a difficult time maintaining the basics for themselves without assistance. Town of Bude will continue to purchase critical facility generators as funding permits, so this action will remain in the plan.
ES-3	1.8	**Improve Emergency Communications –** Purchase CodeRED® or other similar product to function as a high-speed telephone communications service for emergency notifications. This system allows County officials to telephone targeted areas of a municipality or the entire County in case an emergency situation requires immediate action such as a boil-water notice, missing child or evacuation notices.	Hurricane or other hazard leading to loss of traditional communications systems	High	Town of Bude Board of Aldermen and Mayor and the Franklin County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2025	This action has been modified from its original identification of satellite phones, to embrace newer and more effective technology.
ES-4	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide/citywide system.	Tornado	High	Town of Bude / Franklin County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	2027	Many citizens in Franklin County live in rural areas and small communities. In the event of inclement weather, it is essential that they receive timely warnings. The county currently has 5 weather sirens in addition to the sirens located within the municipalities. Additional sirens can be innstalled/upgraded to further improve the warning system in Franklin County, so this action will remain in the plan.

ES-6	1.9	**Safe Rooms and Community Shelters –** The city should construct and/or encourage construction of safe rooms and community shelters.	Hurricane, Tornado or other hazard requiring the use of emergency shelters	High	Town of Bude Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual city general and special funds	2026	New Action.
ES-7	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Town of Bude Board of Aldermen and Mayor and the Franklin County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2027	New Action.
Public Education and Awareness								

PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Low	Town of Bude Board of Aldermen and Mayor and the Franklin County Board of Supervisors	Individual county general and special funds	2027	Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan. The Town is interested in incorporating earthquake drills through the annual Great ShakeOut.
PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Town of Bude Board of Aldermen and Mayor and the Franklin County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2024	This remains an ongoing project for the county. Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP.
PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	Moderate	Town of Bude Board of Aldermen and Mayor and the Franklin County EMA,MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2024	There is a need for community outreach to both the general public and to the owners of high hazard dams concerning maintenance and Emergency Action Planning. It is important that the public and owners are aware of high hazard dams, so this action will remain in the plan.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	Moderate	Town of Bude Board of Aldermen and Mayor and the Franklin County EMA,MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2024	This remains ongoing. Emergency action plans are developed, exercised, and maintained by the individual dam owners. The MDEQ, Dam Safety Division is tasked to review the plans. Franklin County will continue to support the outreach to high hazard and significant hazard dam owners, so this action will remain in the plan.

PEA-5	3.2	**Education: FireWise –** Recommend that public information and outreach workshops on the *Firewise* program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Town of Bude Board of Aldermen and Mayor and Franklin County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, individual county general and special funds	2027	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan.
PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Town of Bude Board of Aldermen and Mayor and Franklin County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The nuclear reactor remains and so does this project. It's a continued item. Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Town of Bude Board of Aldermen and Mayor and Franklin County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The nuclear reactor remains and so does this project. It's a continued item. The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.

PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie	FEMA Hazard Mitigation grants, general and special funds	2025	New Action
PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2024	New Action.
PEA-11	3.1	**Education: Public Outreach –** Develop a program to encourage school programs to incorporate the Great Shake Out	Earthquake	Low	Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.

Town of Meadville Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implement Sched.	Implementation Status (2023)
Prevention								
P-1	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	Town of Meadville Board of Aldermen and Mayor and Franklin County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2025	The county is taking lead in this effort and remains committed in having updated flood hazard maps completed. A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist counties with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as counties develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Town of Meadville Board of Aldermen and Mayor and Franklin County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2025	Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.

P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Town of Meadville Board of Aldermen and Mayor and Franklin County Board of Supervisors	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
P-5	1.4	**Base Level Engineering –** Collaborate with local or regional resources develop Base Level Engineering, watershed-wide engineering modeling that leverages high resolution ground elevation, automated model building techniques, and manual model review to prepare broad and accurate flood risk information for FEMA to assess its current flood hazard inventory.	Flood	High	Town of Meadville Board of Aldermen and Mayor and Franklin County Board of Supervisors	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Town of Meadville Board of Aldermen and Mayor and Franklin County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2025	The Franklin County Board of Supervisors/Towns of Meadville, Bude, and Roxie recognize that damage to public buildings from wind is a serious hazard affecting the ability of government to function during and after disasters. Roof and structural damage and loss of electrical service in county/city government buildings due to high winds can render these buildings at least temporarily unusable and can potentially cause disruptions in government services. Retrofits of essential government buildings have not been completed. Therefore, this action will remain in the plan to lessen potential wind damage to those structures.
PP-2	1.1	**Ground/Protect Critical Facilities and Equipment** – Upgrade electrical protective	Lightning	Moderate	Town of Meadville Board	FEMA Hazard Mitigation	2025	New Action.

		measures on critical facilities.			of Aldermen and Mayor and Franklin County Board of Supervisors	grants, individual county general and special funds		
Natural Resource Protection								
NRP-1	1.6							
Structural Projects								
SP-1	1.1	**Drainage Improvements –** The Town of Meadville intends to implement flood control measures in this area to protect current property and encourage future growth.	Flood	High	Town of Meadville, Franklin County	FEMA Hazard Mitigation Grant, Town of Meadville General Fund	In progress – target completion 2024	Flash flooding within the Town of Meadville in the Williams Street area has caused flooding of roadways and property. This flooding causes damage to the roadways and can prevent access to emergency vehicles during times of distress, so this action will remain in the plan.
SP-2	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm	High	Town of Meadville Board of Aldermen and Mayor and Franklin County Board of Supervisors	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2027	New Action.
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities	Hurricane, Winter Storm	High	Town of Meadville Board of Aldermen and Mayor and Franklin County Board of Supervisors in collaboration with the Mississippi Emergency Management Agency	General and special funds	In progress – target completion 2027	The county has made some progress towards becoming StormReady but wish for this item to remain in the plan as more funding becomes available. Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. The county is in the process of becoming "storm ready" countywide including the towns, so this action will remain in the plan. This action was combined with ES-7 since they were duplicate actions.

		develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.						
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, Lightning, or other hazard leading to loss of electrical power	High	Town of Meadville Board of Aldermen and Mayor and Franklin County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	Loss of electrical power to critical facilities such as water and sewer systems, law enforcement offices, and other critical facilities during a natural disaster can have a severe impact on the functioning of government to provide relief and assistance to citizens and maintain civil order. This can also cause very significant problems for private citizens who depend on municipal and rural water and sewer systems and rely on county and town governments to continue to maintain order. This situation can be especially difficult on the elderly and other special needs persons who would have a difficult time maintaining the basics for themselves without assistance. Town of Meadville will continue to purchase critical facility generators as funding permits, so this action will remain in the plan.
ES-3	1.8	**Improve Emergency Communications –** Purchase CodeRED® or other similar product to function as a high-speed telephone communications service for emergency notifications. This system allows County officials to telephone targeted areas of a municipality or the entire County in case an emergency situation requires immediate action such as a boil-water notice, missing child or evacuation notices.	Hurricane or other hazard leading to loss of traditional communications systems	High	Town of Meadville Board of Aldermen and Mayor and the Franklin County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2025	This action has been modified from its original identification of satellite phones, to embrace newer and more effective technology.

ES-4	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide/citywide system.	Tornado	High	Town of Meadville / Franklin County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	2027	Many citizens in Franklin County live in rural areas and small communities. In the event of inclement weather, it is essential that they receive timely warnings. The county currently has 5 weather sirens in addition to the sirens located within the municipalities. Additional sirens can be innstalled/upgraded to further improve the warning system in Franklin County, so this action will remain in the plan.
ES-6	1.9	**Safe Rooms and Community Shelters –** The city should construct and/or encourage construction of safe rooms and community shelters.	Hurricane, Tornado or other hazard requiring the use of emergency shelters	High	Town of Meadville Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual city general and special funds	2026	New Action.
ES-7	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Town of Meadville Board of Aldermen and Mayor and the Franklin County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2027	New Action.
Public Education and Awareness								

PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Low	Town of Meadville Board of Aldermen and Mayor and the Franklin County Board of Supervisors	Individual county general and special funds	2027	Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan. The Town is interested in incorporating earthquake drills through the annual Great ShakeOut.
PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Town of Meadville Board of Aldermen and Mayor and the Franklin County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2024	This remains an ongoing project for the county. Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP.
PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	Moderate	Town of Meadville Board of Aldermen and Mayor and the Franklin County EMA,MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2024	There is a need for community outreach to both the general public and to the owners of high hazard dams concerning maintenance and Emergency Action Planning. It is important that the public and owners are aware of high hazard dams, so this action will remain in the plan.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	Moderate	Town of Meadville Board of Aldermen and Mayor and the Franklin County EMA,MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2024	This remains ongoing. Emergency action plans are developed, exercised, and maintained by the individual dam owners. The MDEQ, Dam Safety Division is tasked to review the plans. Franklin County will continue to support the outreach to high hazard and significant hazard dam owners, so this action will remain in the plan.

PEA-5	3.2	**Education: FireWise –** Recommend that public information and outreach workshops on the *Firewise* program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Town of Meadville Board of Aldermen and Mayor and Franklin County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, individual county general and special funds	2027	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan.
PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Town of Meadville Board of Aldermen and Mayor and Franklin County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The nuclear reactor remains and so does this project. It's a continued item. Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Town of Meadville Board of Aldermen and Mayor and Franklin County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The nuclear reactor remains and so does this project. It's a continued item. The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.

PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Franklin County Board of Supervisors/ Towns of Bude, Meadville, and Roxie	FEMA Hazard Mitigation grants, general and special funds	2025	New Action
PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Franklin County Board of Supervisors/ Towns of Bude, Meadville, and Roxie	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Franklin County Board of Supervisors/ Towns of Bude, Meadville, and Roxie	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2024	New Action.
PEA-11	3.1	**Education: Public Outreach –** Develop a program to encourage school programs to incorporate the Great Shake Out	Earthquake	Low	Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.

Town of Roxie Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implement Sched.	Implementation Status (2023)
Prevention								
P-1	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	Town of Roxie Board of Aldermen and Mayor and Franklin County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2025	The county is taking lead in this effort and remains committed in having updated flood hazard maps completed. A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist counties with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as counties develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Town of Roxie Board of Aldermen and Mayor and Franklin County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2025	Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.

P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Town of Roxie Board of Aldermen and Mayor and Franklin County Board of Supervisors	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
P-5	1.4	**Base Level Engineering –** Collaborate with local or regional resources develop Base Level Engineering, watershed-wide engineering modeling that leverages high resolution ground elevation, automated model building techniques, and manual model review to prepare broad and accurate flood risk information for FEMA to assess its current flood hazard inventory.	Flood	High	Town of Roxie Board of Aldermen and Mayor and Franklin County Board of Supervisors	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Town of Roxie Board of Aldermen and Mayor and Franklin County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2025	The Franklin County Board of Supervisors/Towns of Meadville, Bude, and Roxie recognize that damage to public buildings from wind is a serious hazard affecting the ability of government to function during and after disasters. Roof and structural damage and loss of electrical service in county/city government buildings due to high winds can render these buildings at least temporarily unusable and can potentially cause disruptions in government services. Retrofits of essential government buildings have not been completed. Therefore, this action will remain in the plan to lessen potential wind damage to those structures.
PP-2	1.1	**Ground/Protect Critical Facilities and Equipment** – Upgrade electrical protective	Lightning	Moderate	Town of Roxie Board of	FEMA Hazard Mitigation	2025	New Action.

		measures on critical facilities.			Aldermen and Mayor and Franklin County Board of Supervisors	grants, individual county general and special funds		
Natural Resource Protection								
NRP-1	1.6							
Structural Projects								
SP-1	1.1	**Drainage Improvements –** The Town of Roxie is currently completing a drainage project and intends to continue implementing flood control measures.	Flood	High	Town of Roxie, Franklin County	FEMA Hazard Mitigation Grant, Community Development Block Grant, Town of Roxie General Fund	2026	Flash flooding within the Town of Roxie has caused flooding of roadways and property. This flooding causes damage to the roadways and can prevent access to emergency vehicles during times of distress, so this action will remain in the plan.
SP-2	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm	High	Town of Roxie Board of Aldermen and Mayor and Franklin County Board of Supervisors	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2027	New Action.
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe	Hurricane, Winter Storm	High	Town of Roxie Board of Aldermen and Mayor and Franklin County Board of Supervisors in collaboration with the Mississippi Emergency Management Agency	General and special funds	In progress – target completion 2027	The county has made some progress towards becoming StormReady but wish for this item to remain in the plan as more funding becomes available. Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. The county is in the process of becoming “storm ready” countywide including the towns, so this action will remain in the plan. This action was combined with ES-7 since they were duplicate actions.

		weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.						
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, Lightning, or other hazard leading to loss of electrical power	High	Town of Roxie Board of Aldermen and Mayor and Franklin County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	Loss of electrical power to critical facilities such as water and sewer systems, law enforcement offices, and other critical facilities during a natural disaster can have a severe impact on the functioning of government to provide relief and assistance to citizens and maintain civil order. This can also cause very significant problems for private citizens who depend on municipal and rural water and sewer systems and rely on county and town governments to continue to maintain order. This situation can be especially difficult on the elderly and other special needs persons who would have a difficult time maintaining the basics for themselves without assistance. Town of Roxie will continue to purchase critical facility generators as funding permits, so this action will remain in the plan.
ES-3	1.8	**Improve Emergency Communications –** Purchase CodeRED® or other similar product to function as a high-speed telephone communications service for emergency notifications. This system allows County officials to telephone targeted areas of a municipality or the entire County in case an emergency situation requires immediate action such as a boil-water notice, missing child or evacuation notices.	Hurricane or other hazard leading to loss of traditional communications systems	High	Town of Roxie Board of Aldermen and Mayor and the Franklin County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2025	This action has been modified from its original identification of satellite phones, to embrace newer and more effective technology.
ES-4	1.1	**Construct Volunteer Fire Department/Emergency Evacuation Center –** The town should construct a 50-person evacuation shelter. The Volunteer Fire Department could be housed in the same facility.	Hurricane, Tornado or other hazard requiring the use of emergency shelters	High	Town of Roxie Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic	2026	The Town of Roxie Board of Aldermen and Mayor recognize the need to have modern, safe emergency shelters for county/town residents and evacuees from other areas during times of disaster. Currently a combination of schools, churches, and other

						Development Administration grants, individual town general and special funds		government buildings are used. This works acceptably for short-term use, but for longer term needs as were seen in the Hurricane Katrina disaster, the presence of evacuees in these facilities for more than a few days caused a disruption in the facility's designed function. Also, the current facilities for the Volunteer Fire Department are inadequate. More space is needed to store equipment. Since a new emergency shelter has not been constructed in the Town of Roxie, this action will remain in the plan.
ES-5	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide/citywide system.	Tornado	High	Town of Roxie / Franklin County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	2027	Many citizens in Franklin County live in rural areas and small communities. In the event of inclement weather, it is essential that they receive timely warnings. The county currently has 5 weather sirens in addition to the sirens located within the municipalities. Additional sirens can be innstalled/upgraded to further improve the warning system in Franklin County, so this action will remain in the plan.
ES-7	1.9	**Safe Rooms and Community Shelters –** The city should construct and/or encourage construction of safe rooms and community shelters.	Hurricane, Tornado or other hazard requiring the use of emergency shelters	High	Town of Roxie Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual city general and special funds	2026	New Action.

ES-8	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Town of Roxie Board of Aldermen and Mayor and the Franklin County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2027	New Action.
Public Education and Awareness								
PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Low	Town of Roxie Board of Aldermen and Mayor and the Franklin County Board of Supervisors	Individual county general and special funds	2027	Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan. The Town is interested in incorporating earthquake drills through the annual Great ShakeOut.
PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Town of Roxie Board of Aldermen and Mayor and the Franklin County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2024	This remains an ongoing project for the county. Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP.

PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	Moderate	Town of Roxie Board of Aldermen and Mayor and the Franklin County EMA,MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2024	There is a need for community outreach to both the general public and to the owners of high hazard dams concerning maintenance and Emergency Action Planning. It is important that the public and owners are aware of high hazard dams, so this action will remain in the plan.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	Moderate	Town of Roxie Board of Aldermen and Mayor and the Franklin County EMA,MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2024	This remains ongoing. Emergency action plans are developed, exercised, and maintained by the individual dam owners. The MDEQ, Dam Safety Division is tasked to review the plans. Franklin County will continue to support the outreach to high hazard and significant hazard dam owners, so this action will remain in the plan.
PEA-5	3.2	**Education: FireWise –** Recommend that public information and outreach workshops on the *Firewise* program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Town of Roxie Board of Aldermen and Mayor and Franklin County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, individual county general and special funds	2027	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan.

PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Town of Roxie Board of Aldermen and Mayor and Franklin County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The nuclear reactor remains and so does this project. It's a continued item. Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Town of Roxie Board of Aldermen and Mayor and Franklin County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The nuclear reactor remains and so does this project. It's a continued item. The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Franklin County Board of Supervisors/ Towns of Bude, Meadville, and Roxie	FEMA Hazard Mitigation grants, general and special funds	2025	New Action

PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Franklin County Board of Supervisors/ Towns of Bude, Meadville, and Roxie	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Franklin County Board of Supervisors/ Towns of Bude, Meadville, and Roxie	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2024	New Action.
PEA-11	3.1	**Education: Public Outreach –** Develop a program to encourage school programs to incorporate the Great Shake Out	Earthquake	Low	Franklin County Board of Supervisors/ Towns of Meadville, Bude, and Roxie	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.

JEFFERSON COUNTY

This annex includes jurisdiction-specific information for Jefferson County and its participating municipalities. It consists of the following five subsections:

- D.1 Jefferson County Community Profile
- D.2 Jefferson County Risk Assessment
- D.3 Jefferson County Vulnerability Assessment
- D.4 Jefferson County Capability Assessment
- D.5 Jefferson County Mitigation Strategy

D.1 JEFFERSON COUNTY COMMUNITY PROFILE

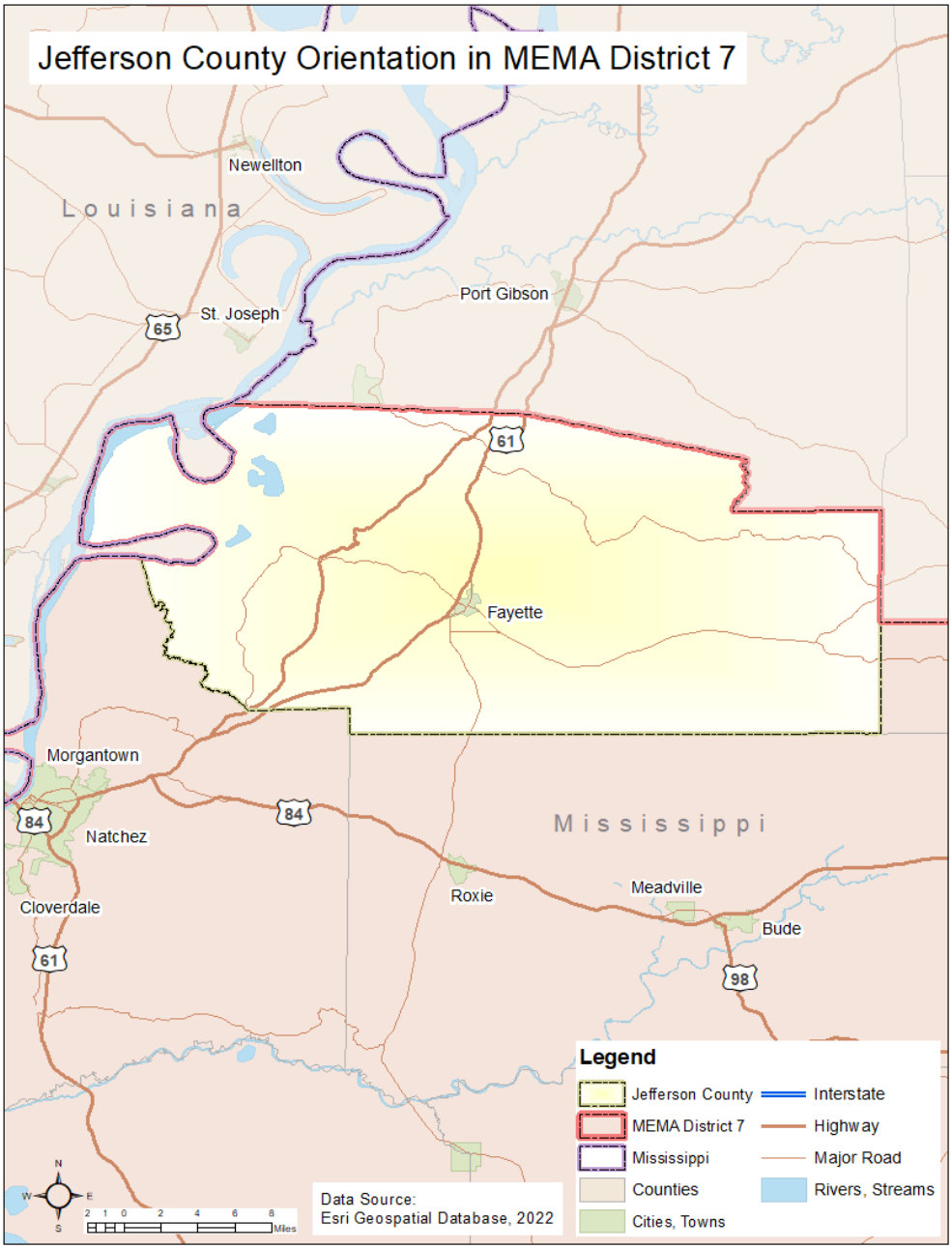
D.1.1 Geography and the Environment

Jefferson County is in southwestern Mississippi. It comprises one city, City of Fayette, as well as many small unincorporated communities. An orientation map is provided in the figure below.

The county is located adjacent to the Mississippi River supplying diverse recreational activities. The total area of the county is 527 square miles, 7 square miles of which is water area.

Jefferson County enjoys four distinct seasons but the climate in the region is generally hot and humid compared to the rest of the United States given its latitude and relative proximity to the Gulf Coast. Precipitation is generally highest in winter months when the temperatures are moderately lower, but the likelihood of precipitation remains relatively constant throughout the year. Summers in the region can become hot with average highs in the nineties and lows in the seventies. The region is also often susceptible to turbulent weather when warm, wet air from the Gulf of Mexico is pushed up into the region to mix with cooler air coming down from across the continent which can result in severe weather conditions. This is particularly true in the spring when seasons are changing, and diverse weather patterns interact.

FIGURE D.1: JEFFERSON COUNTY ORIENTATION MAP



D.1.2 Population and Demographics

According to the 2020 Census, Jefferson County has a population of 7,260 people. The county has seen a significant decrease in population between 2000 and 2020, and the population density is 13.7 people per square mile. Population counts from the U.S. Census Bureau for 2000, 2010, and 2020 for the county and participating jurisdictions are presented below.

TABLE D.1: POPULATION COUNTS FOR JEFFERSON COUNTY [1]

Jurisdiction	2000 Census	2010 Census	2020 Census	% Change 2000 - 2020
Jefferson County	9,740	7,726	7,260	-25.46%
Fayette	2,242	1,614	1,445	-35.54%

Based on the 2021 American Community Survey, the median age of residents of Jefferson County is 40.5 years. The racial characteristics of the county are presented below. People identified as black or African American make up the majority of the population in the county, accounting for 86.1% of the population.

TABLE D.2: DEMOGRAPHICS OF JEFFERSON COUNTY [2]

Jurisdiction	Black or African American	White	American Indian or Alaska Native	Asian	Native Hawaiian or Other Pacific Islander	Other Race	Two or More Races	Persons of Hispanic Origin[3]
Jefferson County	**86.1%**	**13.6%**	**3.1%**	**0.9%**	**0.0%**	**2.3%**	**0.8%**	**5.4%**
Fayette	99.3%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%

D.1.3 Housing

According to the 2010 U.S. Census, there are 3,673 housing units in Jefferson County, the majority of which are single family homes or mobile homes. Housing information for the county and municipality is presented in Table D.3. As shown in the table, the incorporated city has a lower percentage of seasonal housing units compared to the unincorporated county.

TABLE D.3: HOUSING CHARACTERISTICS OF JEFFERSON COUNTY [4]

Jurisdiction	Housing Units (2010)	Housing Units (2021)	Median Home Value (2017-2021)
Jefferson County	3,673	3,395	$64,800
Fayette	750	739	$68,500

D.1.4 Infrastructure

TRANSPORTATION

[1] U.S. Census Bureau
[2] 2021 American Community Survey
[3] Persons of Hispanic Origin may be of any race, so also are included in applicable race categories
[4] 2021 American Community Survey, U.S. 2020 Census

In Jefferson County, U.S. Highway 61 and Mississippi Highway 33 provide access to the north and south. Mississippi Highway 28 provides access to the east and west.

There are no general aviation airports located in Jefferson County. No railroads operate within Jefferson County.

UTILITIES[5]

Electrical power in Jefferson County is provided by Entergy Mississippi Inc. and Southwest Mississippi Electric Power Association.

Water and sewer service is provided by participating jurisdictions and/or community-based associations including Cannonsburg-Church Hill Water, Lorman Water Works, McNair-Stampley Waterworks, Pattison Community Water, Union Church Waterworks, and Westside Water, but unincorporated areas often rely on septic systems and wells in Jefferson County. Adams County Water Association also serves portions of Jefferson County. Gas service is also provided by Mississippi River Gas.

COMMUNITY FACILITIES

There are several buildings and community facilities located throughout Jefferson County. According to the data collected for the vulnerability assessment (Section 6.4.1), there is 2 fire stations, 2 police stations, and 2 school located within the county.

There are also 2 hospitals and medical care facilities located in Jefferson County. This includes Jefferson County Hospital, a 30-bed short term acute facility located in Fayette, and Jefferson County Comprehensive Health Center in Fayette.

Recreational opportunities exist throughout Jefferson County. The Homochitto National Forest comprises almost 200,000 acres of land and is partially located in Jefferson County. Visitors can camp, hike, hunt, and fish in the forest. Another prominent feature of the region is the Natchez Trace Parkway which begins in the City of Natchez and runs northeast through Jefferson County on to Nashville, Tennessee. This parkway commemorates the Old Natchez Trace which is an historic trail that was followed by Native Americans who were tracing bison along their migratory routes from the grazing pastures of central and western Mississippi to the salt licks of Tennessee.

The Mississippi River, which runs along the western border of the county, has played an integral part in the history of the county. The river acted as a major conduit for trade in the 19th century as plantations produced large quantities of cotton that could be easily shipped down to ports such as New Orleans. Today, the river is still an important part of the local economy as products are shipped worldwide out of the Natchez port. Apart from the Mississippi River there are multiple water-based refuges, activities, and recreational features focused on local water bodies in the region. There are also numerous other small lakes, creeks, and other water bodies throughout the region that offer the outstanding outdoor recreational opportunities for which the region is known.

D.1.5 Land Use

[5] Mississippi Public Utilities. Retrieved from: https://www.mpus.ms.gov/mpus/Jefferson

Jefferson County has a blend of old and new development that contributes to physical, cultural, and economic attributes throughout the region. There is one incorporated municipality located in the county. This area is where the county's population is generally concentrated. The incorporated area is also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the county generally consist of rural residential development, agricultural uses, and recreational areas. There are multiple county- and regional-based agencies that serve to coordinate growth and promote economic development. Local land use and associated regulations are further discussed in Section 7: Capability Assessment.

D.1.6 Employment and Industry

According to the U.S. Census Bureau's American Community Survey (ACS), in 2021, Jefferson County had an average annual employment of 2,469 workers and an average unemployment rate of 16.7[6] percent (compared to 5.6 percent for the state). In 2021, the Educational services, health care and social assistance industry employed 50.6 percent of the workforce. Arts, entertainment, and recreation, and accommodation and food services was the second largest industry, employing 11.6 percent of workers, and Wholesale trade followed behind (5.3%). The average annual median household in 2015 for Jefferson County was $29,205 compared to $49,111 in the state of Mississippi.

[6] Mississippi Department of Employment Security. https://www.mdes.ms.gov/media/8735/urate.pdf

D.2 JEFFERSON COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in Section 4: Hazard Identification as they pertain to Jefferson County. Each hazard profile includes a description of the hazard's location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in Section 5: Hazard Profiles.

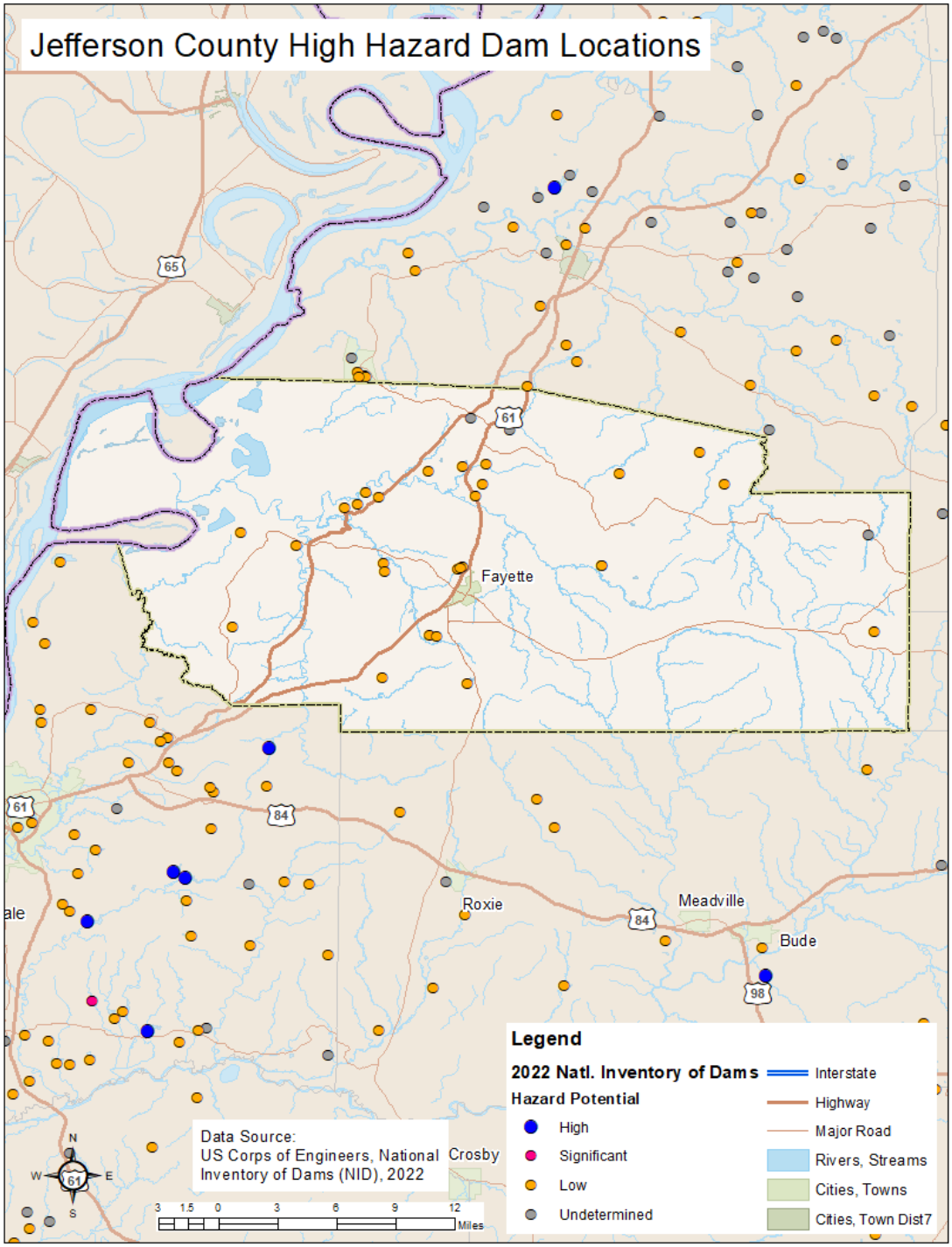
FLOOD-RELATED HAZARDS

D.2.1 Dam and Levee Failure

LOCATION AND SPATIAL EXTENT

According to the U.S. Army Corps of Engineers National inventory of Dams, there are no high hazard dams in Jefferson County. The following figures show the location of high hazard dams as well as mapped inundation areas located nearby.

FIGURE D.2: JEFFERSON COUNTY HIGH HAZARD DAM LOCATIONS[7]



[7] U.S. Army Corps of Engineers – National Inventory of Dams

HISTORICAL OCCURRENCES

According to the Mississippi State Hazard Mitigation Plan, there have been no dam failures reported in Jefferson County.

PROBABILITY OF FUTURE OCCURRENCES

Given the current dam inventory and historic data, a dam breach is unlikely (less than 1 percent annual probability) in the future. As has been demonstrated in the past, regular monitoring is necessary to prevent these events.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[8] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Jefferson County. However, given the current dam inventory and lack of planned future dam projects, climate change impacts are unlikely.

D.2.2 Erosion / Landslide Susceptibility

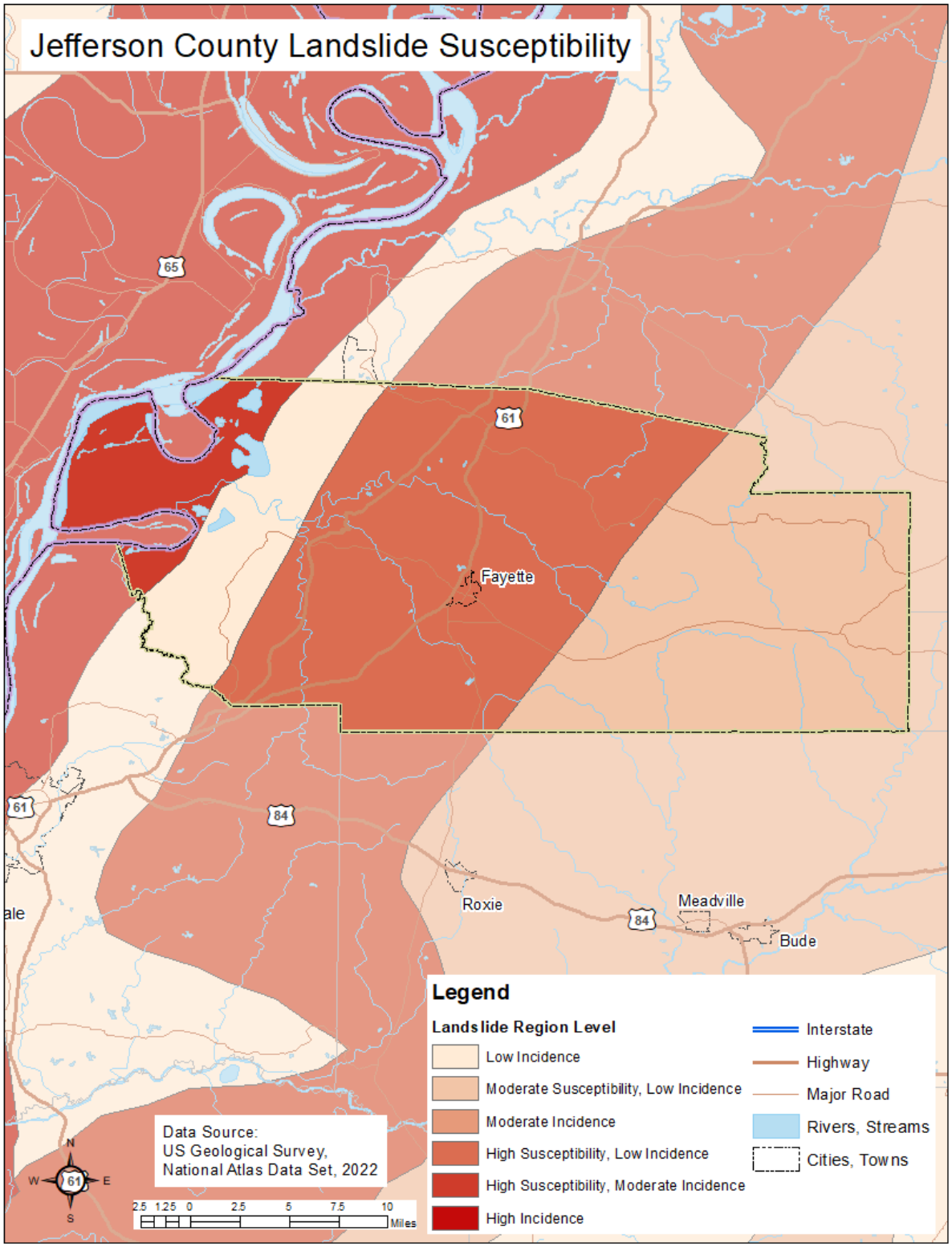
LOCATION AND SPATIAL EXTENT

Erosion in Jefferson County is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in Jefferson County are primarily rivers/streams and reservoirs. Generally, vegetation also helps to prevent erosion in the area, but in recent years, erosion has become a growing threat to many of the participating counties and jurisdictions.

At this time, there is no regional or state-level data available on localized areas of erosion, so it is a challenge to identify particularly prone areas on a wider geographic scale. However, a few areas of concern were reported by members of the hazard mitigation council and other local sources. Locations along the Mississippi River in Jefferson County are known to be especially at-risk, but there are locations in many areas within the region where erosion is prominent.

[8] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

FIGURE D.3: LANDSLIDE SUSCEPTIBILITY IN JEFFERSON COUNTY



HISTORICAL OCCURRENCES

Several sources were vetted to identify areas of erosion in Jefferson County. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. The locations identified above are representative of areas where erosion has taken place in the past.

These incidents have caused major problems as bridges have become damaged in many instances and made unsafe for emergency services vehicles to cross during and after storm events. This delays response times and critical life-safety support. In addition, the shutdown of roads has hurt local communities economically as trade and commerce are temporarily shut down as bridges are repaired. It has also caused disruption to daily activities for local school boards who must re-route buses around affected areas, causing additional fuel resources to be expended and increasing drive times for students.

PROBABILITY OF FUTURE OCCURRENCES

Erosion remains a natural, dynamic, and continuous process for Jefferson County, and it will continue to occur. The annual probability level assigned for erosion is likely (between 10 and 100 percent annually).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[9] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Jefferson County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[10]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones. Both additional moisture and drying conditions can impact the rate of erosion, either by increasing the sediment transfer load due to volume and rate of flooding, or by dehydrating soils, limiting compaction, and increasing wind related erosion events.

D.2.3 Flood

LOCATION AND SPATIAL EXTENT

There are areas in Jefferson County that are susceptible to flood events. Special flood hazard areas in the county were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM). This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevations), and Zone X-500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 526 square miles that make up Jefferson County, there are 67.77 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and

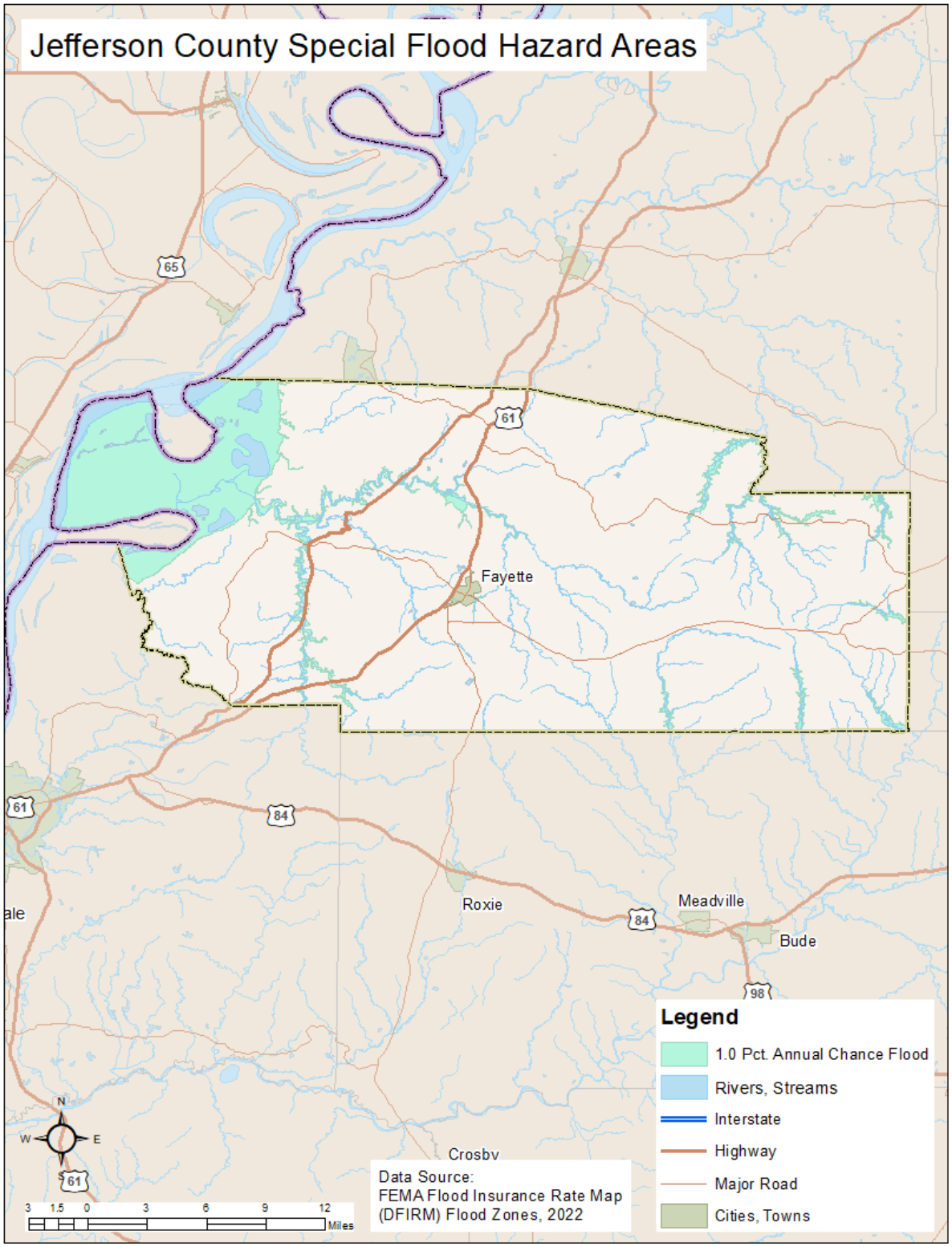
[9] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[10] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

less than 0.01 square miles of land in zone X-500 (0.2 percent annual change floodplain/500-year floodplain).

These flood zone values account for 12.9 percent of the total land area in Jefferson County. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. The figure below illustrates the location and extent of currently mapped special flood hazard areas for Jefferson County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data.

FIGURE D.4: SPECIAL FLOOD HAZARD AREAS IN JEFFERSON COUNTY



HISTORICAL OCCURRENCES

Floods were at least partially responsible for three disaster declarations in Jefferson County in 1974 and two in 2011. Information from the National Centers for Environmental Information was used to ascertain additional historical flood events. The National Centers for Environmental Information reported a total of 18 events in Jefferson County since 1997. A summary of these events is presented in Table D.6. These events accounted for over $3.86 million in property damage. Specific information on flood events, including date, type of flooding, and deaths and injuries, can be found below.

TABLE D.4: SUMMARY OF FLOOD OCCURRENCES IN JEFFERSON COUNTY[11]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Fayette	4	0/0	$60,000	$2,400
Unincorporated Area	14	0/0	$3,805,000	$152,200
Jefferson County Total	**18**	**0/0**	**$3,865,000**	**$154,600**

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Flood Insurance Management Agency (FIMA) Flood Insurance Data Analytics, since 2019 Mississippi has had 47 floods of record with 22 closed with payment, 19 closed without payment, and 6 remaining open. A total of $545,506 has been made in payments. This FEMA dataset is the authoritative source for FEMA's public data. This product uses the Federal Emergency Management Agency's API but is not endorsed by FEMA. FEMA cannot verify the quality and/or timeliness of any data or any analysis derived there from after the data has been retrieved from FEMA.gov. This data set was last accessed on July 2, 2023, with records updated at most every 20 minutes or at least monthly, processed the first Saturday of the month at 1:00am EST.

According to FEMA flood insurance policy records as of July 2, 2023, there have been 28 flood losses reported in Jefferson County through the National Flood Insurance Program (NFIP) since 1978, totaling $342,311.55 in total building and $22,344.77 in contents claims payments. A summary of these figures for the county is provided below. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought. It is likely that many additional instances of flood loss in Jefferson County were either uninsured or not reported.

TABLE D.5: SUMMARY OF INSURED FLOOD LOSSES IN JEFFERSON COUNTY[12]

Location	Number of Policies	Flood Losses	Claims Payments
Fayette	0	0	$0.00
Unincorporated Area	1	28	$364,656.32
Jefferson County Total	**1**	**28**	**$364,656.32**

[11] Source NCEI. Annualized losses are calculated by dividing the total number of property damages by number of years of recordkeeping for the hazard.

[12] *Source: National Flood Insurance Program, OpenFEMA Data Sets*.

REPETITIVE LOSS PROPERTIES

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Mississippi Emergency Management Agency in 2017, there are 12 non-mitigated repetitive loss properties located in Jefferson County, which accounted for 40 losses and more than $459,000 in claims payments under the NFIP. The average claim amount for these properties is $11,477. Of the 12 properties, 7 are single family and 5 are other non-residential. Without mitigation, these properties will likely continue to experience flood losses. The following table presents detailed information on repetitive loss properties and NFIP claims and policies for Jefferson County as documented in the last plan. Updated data could not be obtained.

TABLE D.6: REPETITIVE LOSS PROPERTIES IN JEFFERSON COUNTY [13]

Location	Number of Properties	Type of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Fayette	0	-	0	$0.00	$0.00	$0.00	$0.00
Unincorporated Area	12	7 single family; 5 non-residential	40	$393,999.99	$65,064.66	$459,064.65	$11,476.62
Jefferson County Total	**12**		**40**	**$393,999.99**	**$65,064.66**	**$459,064.65**	**$11,476.62**

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in Jefferson County, and the probability of future occurrences will remain highly likely (100 percent annual probability). The probability of future flood events based on magnitude and according to best available data is illustrated in the figure above, which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain).

It can be inferred from the floodplain location maps, previous occurrences, and repetitive loss properties that risk varies throughout the county. For example, areas in the northwestern portion of the county have more floodplain and thus a higher risk of flood than the rest of the county. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted, particularly for repetitive loss properties.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[14] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Jefferson County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of

[13] National Flood Insurance Program. Current data on Repetitive Loss Properties data was not available for this plan update.

[14] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

storms will likely occur[15]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased *coastal, fluvial (i.e., riverine) and pluvial (i.e., rainfall) flooding.*[16] More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

[15] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[16] Please note: there is no coastal flooding in Jefferson County.

FIRE-RELATED HAZARDS

D.2.4 Drought

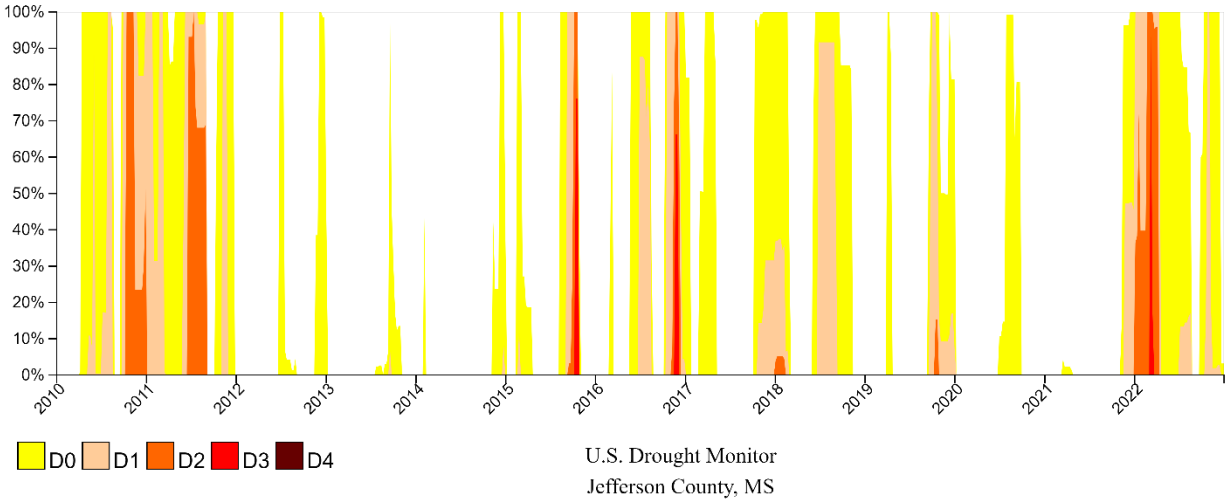
LOCATION AND SPATIAL EXTENT

Drought typically covers a large area and cannot be confined to any geographic or political boundaries. Furthermore, it is assumed that Jefferson County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment but may exacerbate wildfire conditions.

HISTORICAL OCCURRENCES

The table below shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional, but a majority of the county may be in a less severe condition.

FIGURE D.5: HISTORICAL DROUGHT OCCURRENCES IN JEFFERSON COUNTY



Some additional anecdotal information was provided from the National Centers for Environmental Information on droughts in Jefferson County.

Summer to Fall 2006 – During a four and a half month period, from June to the middle of October, abnormally dry conditions prevailed across most of the Jackson, MS County Warning Area (CWA). Widespread drought conditions were reported across the area during this time period. The U.S. Drought Monitor classified the drought as extreme (D3) over Southeast Mississippi. Drought conditions in the region peaked in intensity during early August over this area.

Summer 2007 – During the month of June, the drought peaked across the region. It held firm across the same areas since May with no expansion. What did expand was the severity as by the end of June, most of Central and East-Central Mississippi was now in extreme drought (D3) with some locations across

Northeast Mississippi now experiencing exceptional drought (D4). The month of June did not offer much rain as most of the forecast area saw less than 40% of the normal rainfall.

Summer to Fall 2010 – Very dry conditions continued across central Mississippi during most of October. There were some rains that came late in the month which provided some temporary relief. Rainfall amounts ranged from a half to two inches with locally higher amounts. Most locations were 1 to 3 inches below normal for the month. The dry stretch resulted in severe (D2) drought conditions to expand during the month with even the portions of extreme (D3) drought conditions expanding as well. Crops were put under stress under the warm and dry conditions.

Fall 2015 – The very dry conditions continued across Central Mississippi in October. The extended dry stretch resulted in an area of Severe (D2) drought developing across the area by October 6th. The drought intensified and Extreme (D3) drought conditions developed by October 13th. Approximately 25 to 50 percent of normal rainfall occurred across this area from August into mid-October. Crops were put under more stress from the dry and hot conditions.

Fall to Winter 2016 – Dry conditions continued into November, which created continued stress on crops. The drought continued to get worse across the state through the month before some relief came in the form of showers and thunderstorms near the end of November.

Fall 2021 through 2022 – Severe drought conditions persisted throughout the state, beginning in December 2021 and continuing through the calendar year 2022. Conditions escalated to extreme drought from January to March, before resolving In December. Throughout this period many counties also experienced flooding events indicating that while rainfall is still occurring, the shorter, more intense bursts do not resolve the drought conditions that softer more steady rainfall would address. The beginning of 2023 saw increased rainfall and a lightening of drought conditions overall.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that Jefferson County has a probability level of possible (between 1 and 10 percent annual probability) for future drought events. However, the extent (or magnitude) of drought and the amount of geographic area covered by drought, varies with each year. Historical information indicates that there is a much lower probability for extreme, long-lasting drought conditions. This data confirms the county's opinion that drought is not a significant enough hazard to warrant documenting actions and profiling in full.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[17] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Jefferson County With increasing global surface temperatures, the possibility of more *droughts* and increased frequency and intensity of storms will likely occur[18]. As more water vapor evaporates into the atmosphere, it will become fuel for

[17] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[18] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

D.2.5 Lightning

LOCATION AND SPATIAL EXTENT

Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of Jefferson County is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

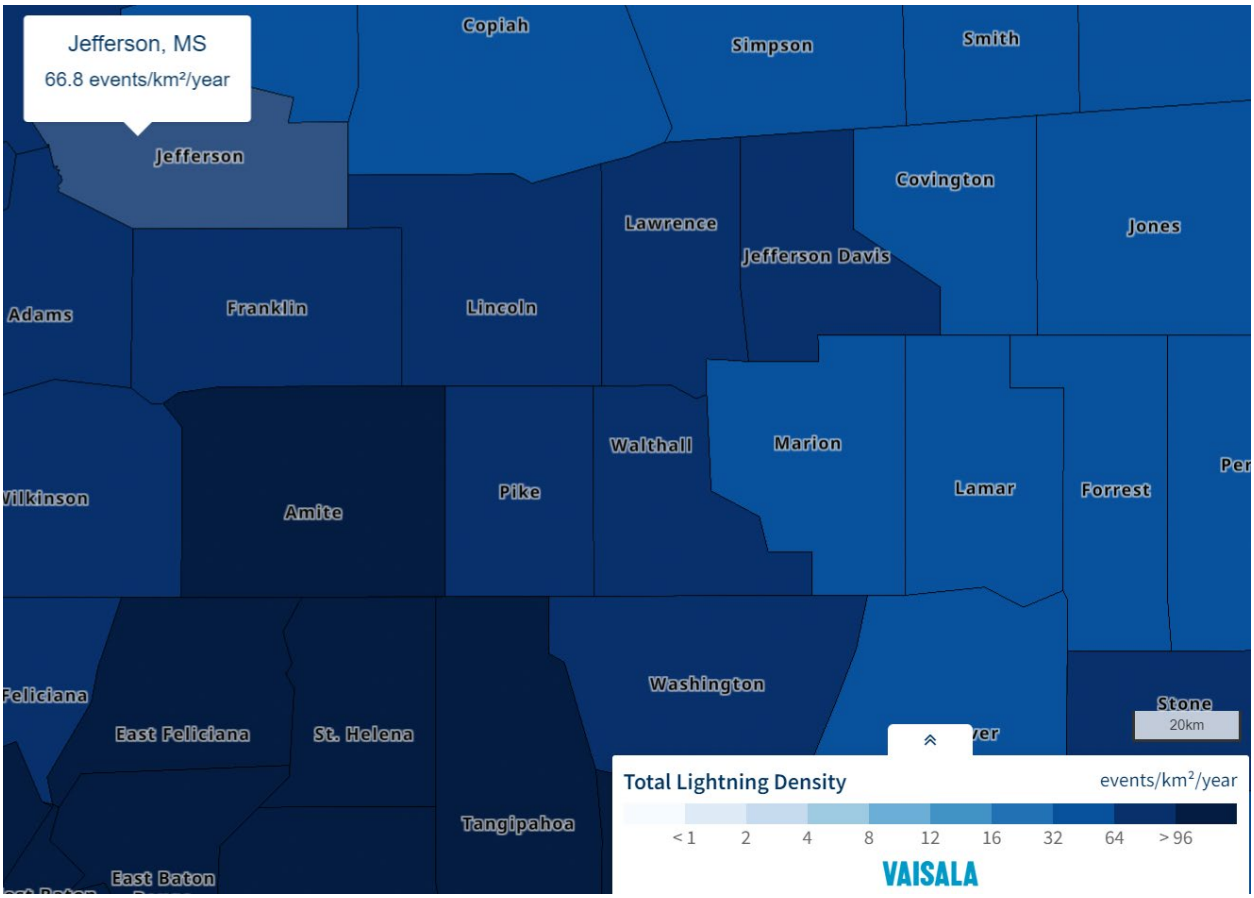
According to the National Centers for Environmental Information, there has been one recorded lightning event in Jefferson County since 2015. This event resulted in over $10,000 in damages, as listed in summary below.

It is certain that more than one event has impacted the county. Many of the reported events are those that cause damage, and it should be expected that damages are likely much higher for this hazard than what is reported.

TABLE D.7: SUMMARY OF LIGHTNING OCCURRENCES IN JEFFERSON COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Fayette	1	0/0	$10,000	$1,428
Unincorporated Area	0	0/0	$0	$0
Jefferson County Total	**1**	0/0	**$10,000**	**$1,428**

FIGURE D.6: VAISALA'S NLDN MAP OF LIGHTNING DENSITY[19]



PROBABILITY OF FUTURE OCCURRENCES

Although there was not a high number of historical lightning events reported in Jefferson County via NCEI data, it is a regular occurrence accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though not all events will cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN), Jefferson experiences an average of 66.8 lightning strikes per km^2 per year. Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the county.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[20]. There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Jefferson County. With increasing global surface temperatures, the possibility of more droughts and increased

[19] Vaisala – U.S. National Lightning Detection Network. Retrieved on 11/30/2022 from: https://interactive-lightning-map.vaisala.com/?_ga=2.229872988.1951225355.1669843590-1950342430.1669843590

[20] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

frequency and intensity of storms will likely occur, increasing the frequency of *lightning strike events*.[21] As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

D.2.6 Wildfire

LOCATION AND SPATIAL EXTENT

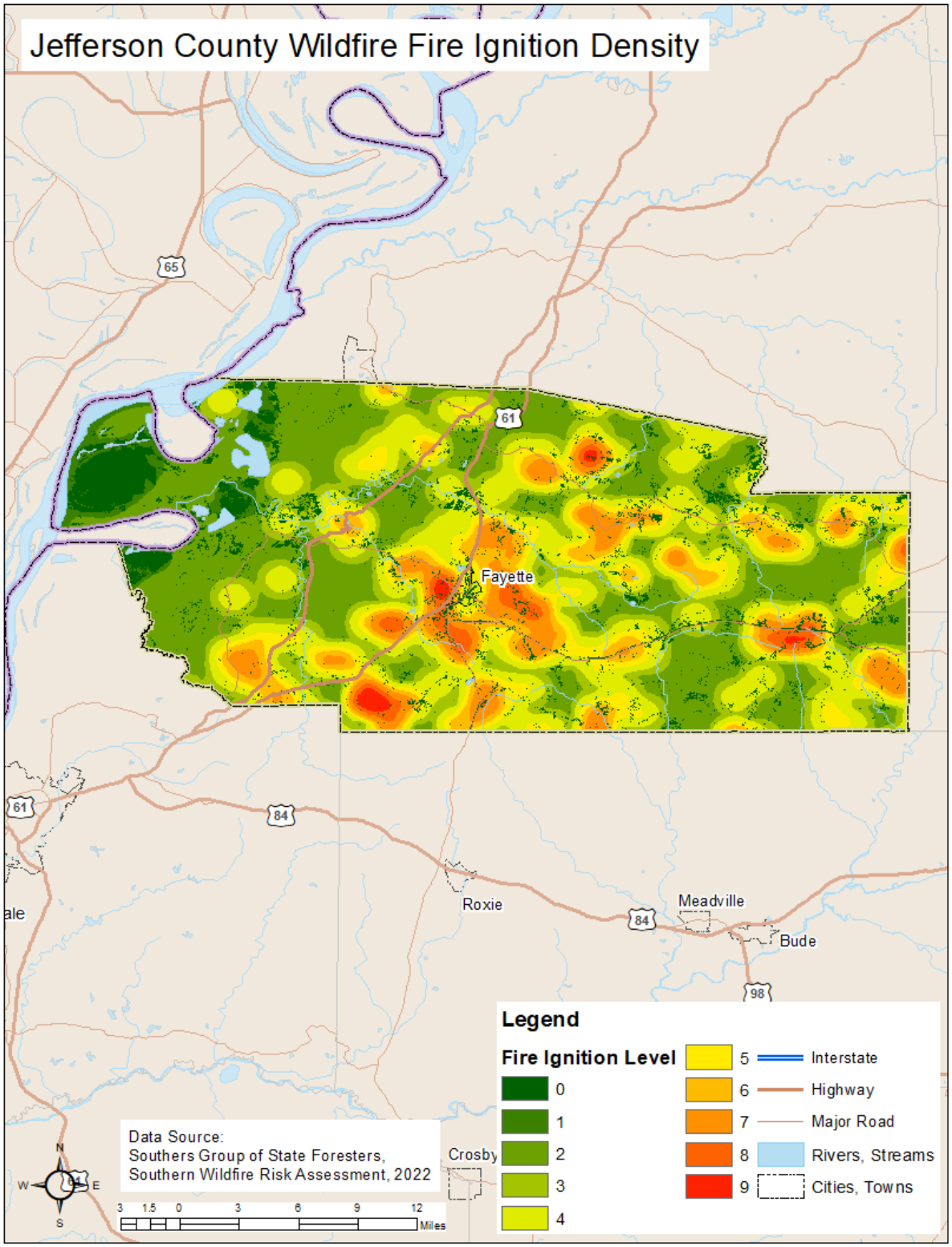
The entire county is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the urban- wildland interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

HISTORICAL OCCURRENCES

The following figure shows the Wildfire Ignition Density in Jefferson County based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and the likelihood of a wildfire igniting in an area. Occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map. This is measured in the number of fires per year per 1,000 acres.

[21] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

FIGURE D.7: WILDFIRE IGNITION DENSITY IN JEFFERSON COUNTY



Based on data from the Mississippi Forestry Commission from 2015 to 2021, Jefferson County experienced an average of 6.62 wildfires annually which burned a combined 108.5 acres per year. The data indicate that most of these fires were small to moderate in size, averaging about 15.455 acres per fire. The following tables provides a summary of wildfire occurrences in Jefferson County and lists the number of reported wildfire occurrences in the county between the years 2012 and 2021.

TABLE C.8: SUMMARY TABLE OF ANNUAL WILDFIRE OCCURRENCES (2015-2022)

	Jefferson County
Average Number of Fires Per Year	6.62
Average Number of Acres Burned Per Year	108.5
Average Number of Acres Burned Per Fire	15.45

TABLE C.9: HISTORICAL WILDFIRE OCCURRENCES IN JEFFERSON COUNTY[22]

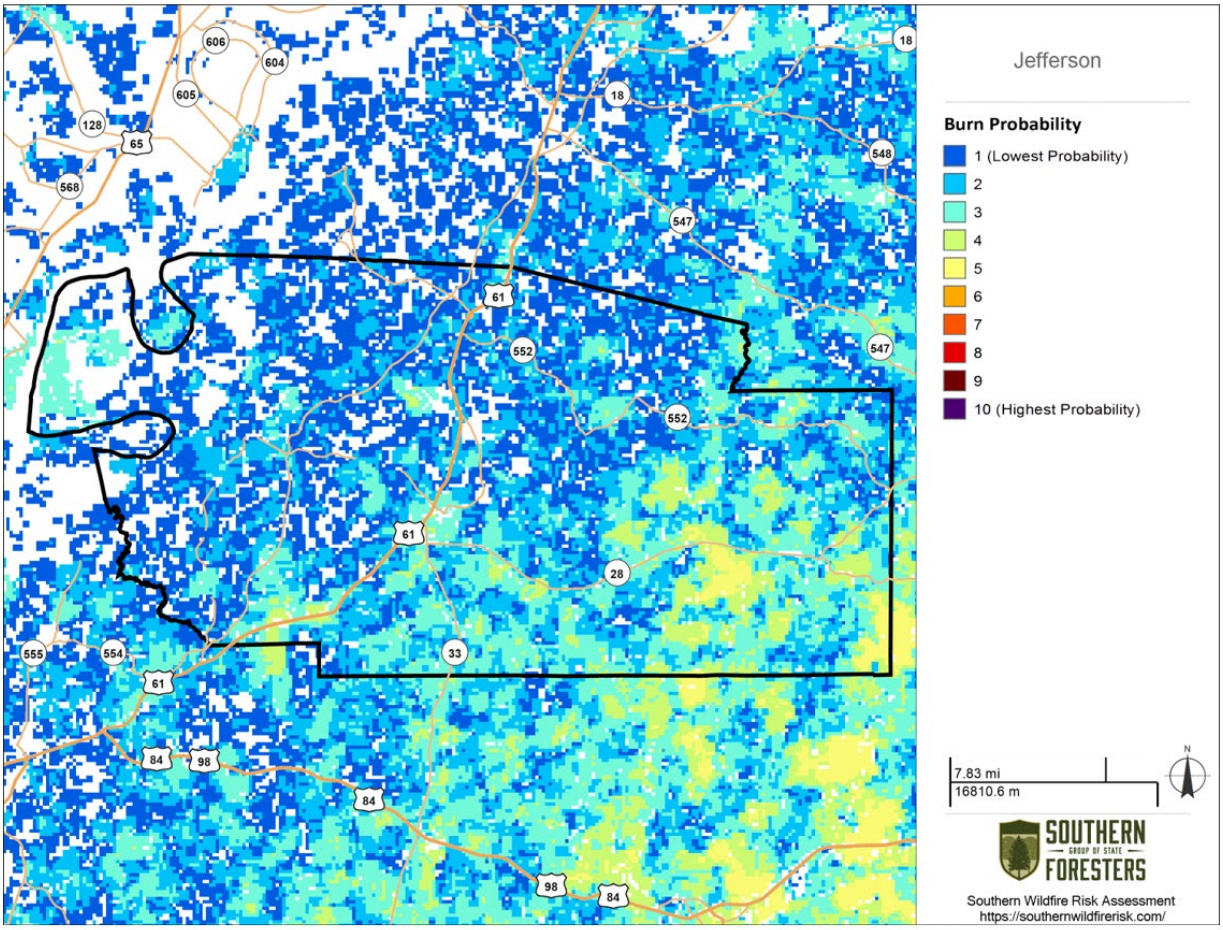
Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Jefferson County										
Number of Fires	10	16	13	7	8	3	9	7	1	5
Number of Acres Burned	29	187	365	47	245	87	208	117	1	32

PROBABILITY OF FUTURE OCCURRENCES

Wildfire events will be an ongoing occurrence in Jefferson County. The figure below shows that there is some probability a wildfire will occur throughout the county. However, the likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small in size but could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to Jefferson County for future wildfire events is possible (between 1 and 10 percent annual probability).

[22] Mississippi Forestry Commission

FIGURE D.8: BURN PROBABILITY IN JEFFERSON COUNTY



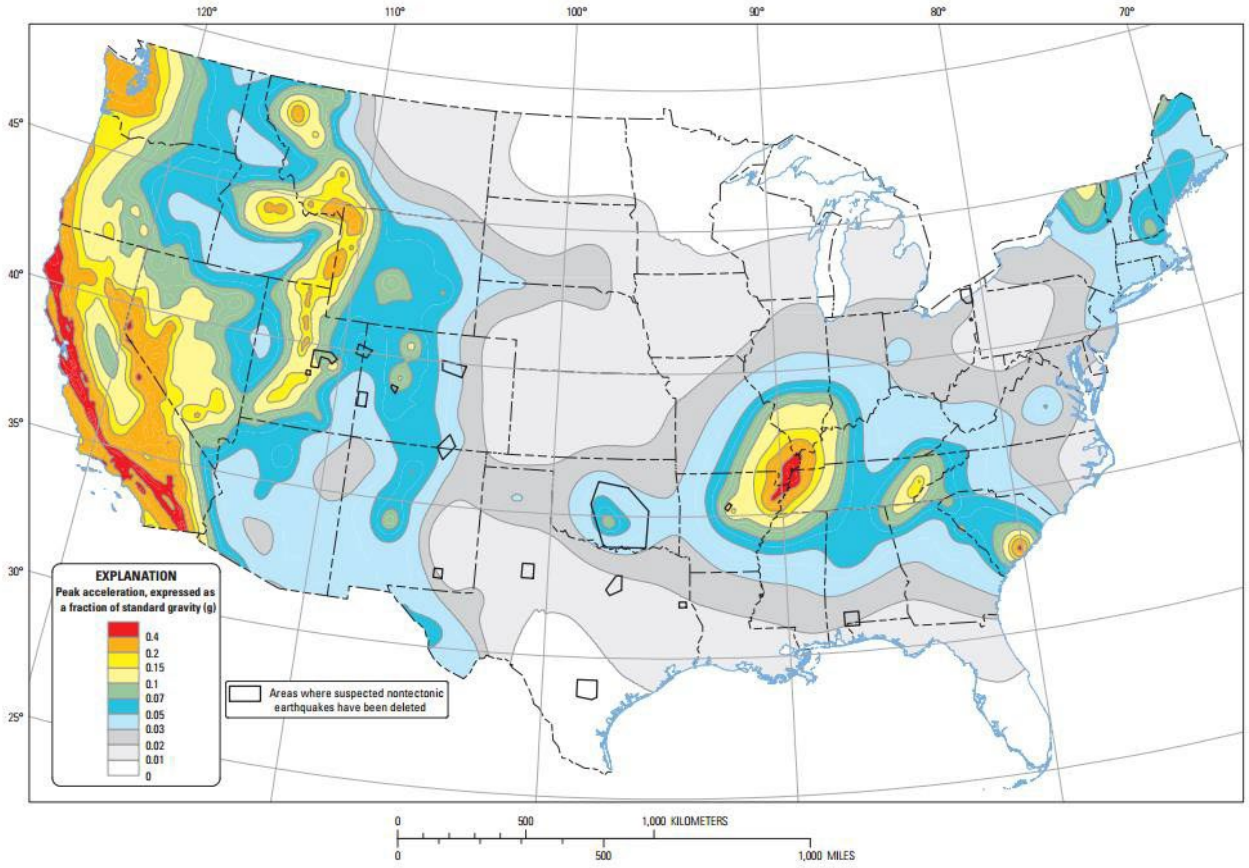
GEOLOGIC HAZARDS

D.2.7 Earthquake

LOCATION AND SPATIAL EXTENT

The figure below shows the intensity level associated with Jefferson County, based on the national USGS map of peak acceleration with 10 percent probability of exceedance in 50 years. It is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Jefferson County lies within an approximate zone of level "0.02" to "0.03" ground acceleration. This indicates that the county exists within an area of low seismic risk.

FIGURE D.9: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS[23]



Ten-percent probability of exceedance in 50 years map of peak ground acceleration

The primary source of potential damage to Jefferson County from an earthquake is the New Madrid Seismic Zone (NMSZ). Historically, a series of earthquakes in 1811 and 1812 demonstrated that this fault zone can produce high magnitude seismic events, sometimes on the scale of a 7.5-8.0 on the Richter scale. The biggest challenge with earthquakes that occur in this area of seismic activity is predicting the recurrence of earthquakes emanating from this zone. Although the magnitude of earthquakes from the NMSZ can be large, they occur very irregularly and infrequently. This makes it extremely difficult to project when they will occur.

It should also be noted that the State of Mississippi Hazard Mitigation Plan identifies certain areas of concern for liquefaction and lists the counties and corresponding zones within those counties that have the highest liquefaction potential. Jefferson County does not have any identified liquefaction potential risk.

The following figure shows the Modified Mercalli Intensity Scale. The lower numbers of the intensity scale generally deal with the way the earthquake is felt by people. The higher numbers of the scale are based on observed structural damage. Structural engineers usually contribute information for assigning intensity values of VIII or above.

[23] U.S. Geological Survey, 2014

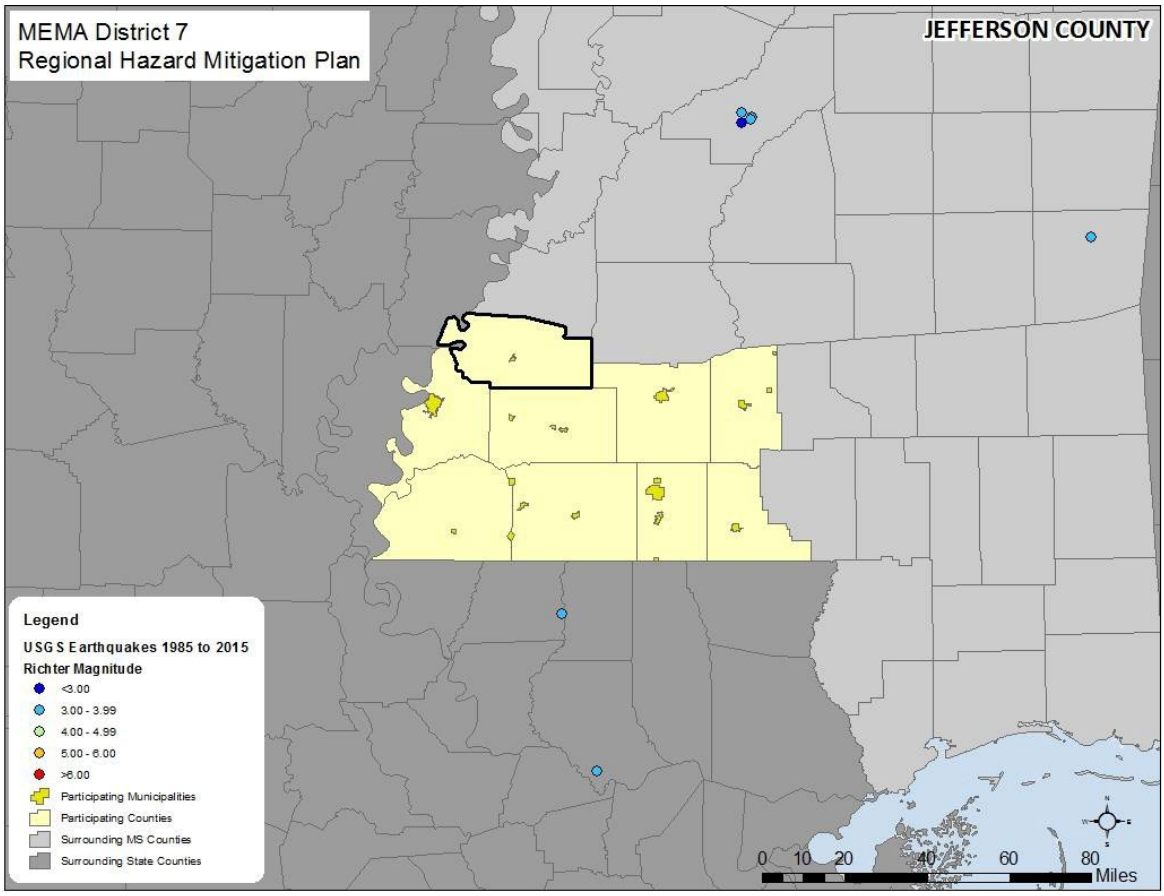
FIGURE D.10: MODIFIED MERCALLI INTENSITY SCALE (MMI)

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest,especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

HISTORICAL OCCURRENCES

No earthquakes are known to have affected Jefferson County since 1638. The figure below presents a map showing earthquakes whose epicenters have occurred near the county between 1985 and 2023 (no earthquakes occurred within the county's boundaries during this period).

FIGURE D.11: HISTORICAL EARTHQUAKES WITH EPICENTERS NEAR JEFFERSON COUNTY (1985-2023)



PROBABILITY OF FUTURE OCCURRENCES

The probability of significant, damaging earthquake events affecting Jefferson County is unlikely. However, it is certainly possible that future earthquakes resulting in light or moderate perceived shaking and damages will affect the county much more frequently. The annual probability level for the county is estimated to be less than 1 percent (unlikely).

TEMPERATURE & WIND-RELATED HAZARDS

D.2.8 Extreme Heat

LOCATION AND SPATIAL EXTENT

Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries. Therefore, the entire county is equally susceptible to extreme heat.

HISTORICAL OCCURRENCES

The National Centers for Environmental Information was used to determine historical heat wave occurrences in the county.

August 2005 – A "HOT" stretch of weather occurred during the middle to later part of August 2005. This "Heat Wave" covered a large portion of the south and lasted for a period of about 10 days. Each of these days had high temperatures consistently between 95 and 100 degrees, with 1 or 2 of these days actually reaching 100 degrees or more. Additionally, overnight lows remained warm with lower and middle 70s recorded. This is the first time since August 2000 where 100-degree temperatures were reached in this area as well as having such an extended period of "HOT" weather.

July 2006 – A small "heat wave" gripped the region during the middle of July with high temperature ranging from the upper 90s to around 100 degrees for five days with overnight lows only reaching the middle 70s. The hottest temperatures during this period occurred from the Mississippi Delta, across northern Mississippi and then down to the Jackson Metro and toward Meridian. This area peaked between 100 and 102 degrees for at least two days during the hot five day stretch.

August 2007 – During the first half of August, a heat wave took hold of the region and brought some of the warmest temperatures since the summer of 2000. This heat wave began around August 5th and lasted until the 16th. Between August 10th and 15th, the entire area reached 100 degrees or higher. Twenty- three record highs were also set during this time. As the temperature soared each day, high relative humidity resulted in heat index values between 105 and 112 degrees.

August 2010 – A four day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS Jackson, MS forecast area, 19 record highs were set between August 1st and 4th. On August 2nd, the 2nd warmest average temperature was recorded. The low was 78 and the high 105, this resulted in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in 3 fatalities across the forecast area.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Jefferson County has a probability level of likely (between 10 and 100 percent annual probability) for future heat wave events.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[24] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Jefferson County. With increasing global surface temperatures, the possibility of more droughts and increased

[24] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

frequency and intensity of storms will likely occur, increasing the frequency of *extreme heat* events[25]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

D.2.9 Hailstorm

LOCATION AND SPATIAL EXTENT

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that Jefferson County is uniformly exposed to severe thunderstorms; therefore, all areas of the county are equally exposed to hail which may be produced by such storms.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, 59 recorded hailstorm events have affected Jefferson County since 1969. Table below is a summary of the hail events in Jefferson County. The table below provides detailed information about each event that occurred in the county. In all, hail occurrences resulted in approximately $243,000 in property damages. Hail ranged in diameter from 0.75 inches to 2.75 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

TABLE D.10: SUMMARY OF HAIL OCCURRENCES IN JEFFERSON COUNTY [26]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Fayette	16	0/0	$1,000	$18
Unincorporated Area	50	0/0	$242,000	$4,566
Jefferson County Total	**66**	**0/0**	**$243,000**	**$4,584**

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that the probability of future hail occurrences is highly likely (100 percent annual probability). Since hail is an atmospheric hazard, it is assumed that Jefferson County has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county. Therefore, this hazard is considered to be of minimal risk with minimal ability to mitigate, and will not be profiled fully.

FUTURE IMPACTS OF CLIMATE CHANGE

[25] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[26] These hail events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1955 through November 2022. It is likely that additional hail events have affected Jefferson County

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[27] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Jefferson County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *hailstorm*[28]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

D.2.10 Hurricane and Tropical Storm

LOCATION AND SPATIAL EXTENT

Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect Jefferson County. All areas in Jefferson County are equally susceptible to hurricanes and tropical storms.

[27] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[28] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

TABLE D.11: SAFFIR-SIMPSON SCALE OF HURRICANE STRENGTH

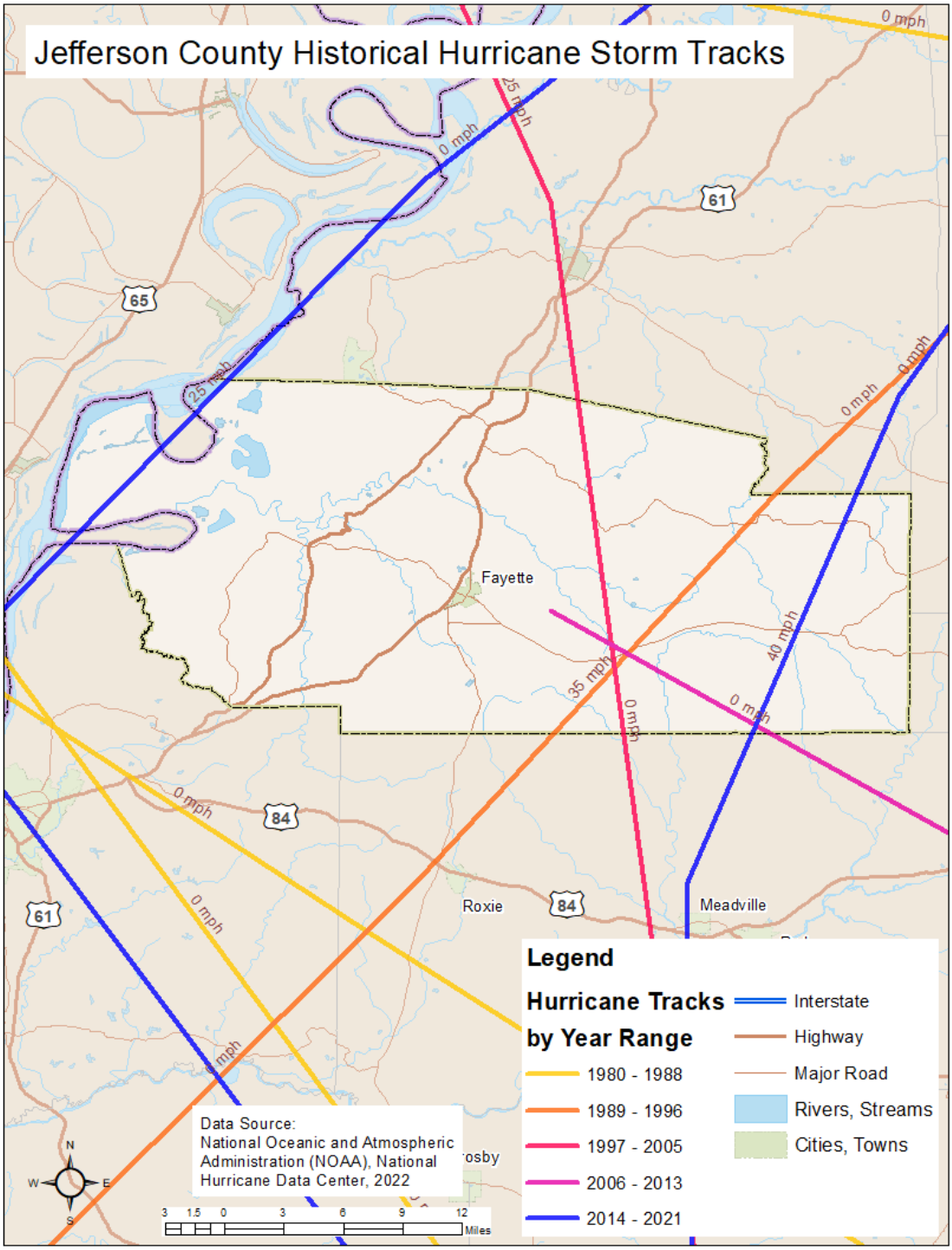
Category 1	Winds 74-95 mph (64-82 kt or 119-153 km/hr). Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
Category 2	Winds 96-110 mph (83-95 kt or 154-177 km/hr). Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
Category 3	Winds 111-129 mph (96-112 kt or 178-208 km/hr). Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
Category 4	Winds 130-156 mph (113-136 kt or 209-251 km/hr). Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
Category 5	Winds 157 mph or higher (137 kt or higher or 252 km/hr or higher). Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

HISTORICAL OCCURRENCES

According to the National Hurricane Center's historical storm track records, 107 hurricane or tropical storm/depression tracks have passed within 100 miles of the MEMA District 7 Region since 1854. This includes: 35 hurricanes, and 72 tropical storms tropical depressions.

Storm tracks passed directly through the region as shown in the following figure. The table below provides the date of occurrence, name (if applicable), maximum wind speed (as recorded within 100 miles of the MEMA District 7 Region) and category of the storm based on the Saffir-Simpson Scale for each event.

FIGURE D.12: HISTORICAL HURRICANE TRACKS SINCE 1980[29]



[29] National Hurricane Center

Federal records indicate that six disaster declarations were made in 1965 (Hurricane Betsy), 2004 (Hurricane Ivan), 2005 (Hurricane Katrina), 2008 (Hurricane Gustav), and 2012 (Hurricane Isaac), and 2021 (Hurricane Ida) in Jefferson County. Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding.

The National Centers for Environmental Information also reported four hurricane or tropical storm events in Jefferson County since 2005.

TABLE D.12: HISTORICAL HURRICANE/TROPICAL STORM OCCURRENCES IN JEFFERSON COUNTY[30]

Date of Occurrence	Storm Name	Deaths/Injuries	Property Damage	Crop Damage	Annualized Losses
8/29/2005	Hurricane Katrina	0/0	$20,000,000	$25,000,000	
9/24/2005	Hurricane Rita	0/0	$40,000	$200,000	
9/1/2008	Hurricane Gustav	0/0	$300,000	$200,000	
8/28/2012	Hurricane Isaac	0/0	$100,000	$0	
10/09/2020	Hurricane Delta	0/0	$100,000	$0	
08/30/2021	Hurricane Ida	0/0	$100,000	$0	
Jefferson County Totals		**0/0**	**$20,640,000**	**$25,400,000**	**$2,708,235**

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the county. Anecdotes are available from NCEI for the major storms that have impacted the county as found below:

Hurricane Katrina – August 29, 2005

The damage from Hurricane Katrina was devastating and widespread. Damage occurred across all of the Jackson forecast area which includes 9 parishes in Northeast Louisiana, 2 counties in Southeast Arkansas and about 2/3 of Central and Southern Mississippi. As widespread as the damage was, the more concentrated and most significant damage occurred across Southeast and East-Central Mississippi. For other areas, especially those west of Natchez to Yazoo City to Grenada line, damage to trees and power lines was significant and scattered across the landscape. As you move toward Central Mississippi and along Interstate 55 the damage and impacts increase. This portion of the state sustained widespread damage to trees and power lines.

Hurricane Gustav – September 1, 2008

As the center of Gustav crossed much of southern Louisiana, tropical storm force winds extended into southern Mississippi and portions of east central Louisiana. Sustained winds were between 35 and 45 mph with higher gusts between 70 and 100 mph occurred. Tree and power line damage was extensive across these areas which resulted in widespread power outages, some of which lasted for 3 to 5 days. As Gustav slowed across central Louisiana, the outer rainbands continued to rotate across much of southern and central Mississippi. This kept those portions of Mississippi in the region which was

[30] National Centers for Environmental Information

favorable for tornadoes. Over 3 days, 26 tornadoes were confirmed, all of which were in the EF0 to EF1 range.

Hurricane Isaac – August 29, 2012

Isaac moved very slowly to the north and northwest over the course of August 29th, which made for prolonged impacts. Forward motion of about 5 mph lead to tremendous flooding issues for both Louisiana and portions of Mississippi south of I-20. Around noon on August 29th, Isaac was downgraded to a Tropical Storm, but this was not much relief to the many residents who were being inundated with rain and wind. The worst of the wind was felt generally along and south of an axis from Marion County to Adams County. Numerous trees were down in Adams County, leaving many without power for several days. Eighty percent of the roads were blocked in Franklin County due to downed trees.

PROBABILITY OF FUTURE OCCURRENCES

Given the inland location of the county, Jefferson County will not be susceptible to many of the sub-hazards that are often associated with hurricanes and tropical storms such as storm surge. Although the probability of experiencing major impacts is somewhat less than coastal areas because of this, hurricanes and tropical storms remain a real threat to Jefferson County due to induced events like flooding and high wind. Based on historical evidence, the probability level of future occurrence is likely (between 10 and 100 percent annual probability). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. However, when the county is impacted, the damage could be significant, threatening lives and property throughout the planning area.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[31] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Jefferson County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[32]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

HURRICANE EVACUATIONS

As discussed above, the MEMA District 7 Region has been directly impacted by a number of hurricane and tropical storm events historically. However, it should be noted that the region is also susceptible to indirect effects from hurricanes and tropical storms, particularly in the form of evacuations from coastal counties. The counties within MEMA District 7 are located far enough inland that they are often the

[31] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[32] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

primary recipients of evacuees from counties that will be (or have been) impacted by major storm events.

For example, during Hurricane Katrina in 2005, thousands of evacuees made their way to counties in southwest Mississippi to take temporary refuge from the storm. Due to the severe and devastating effects of the storm, temporary sheltering within these counties was extended much longer than originally anticipated and, in some cases, the evacuees ended up staying for weeks or months. This additional population caused a major strain on resources within these relatively rural counties, as local communities with limited resources had an unexpected and immediate need to provide shelter and other life essentials such as food, water, and health care to a significant, additional number of people.

Caring for all of these evacuees was especially challenging for counties in the MEMA District 7 Region because most had been impacted themselves by the storm and were attempting to help their own citizens recover from the storm. Undoubtedly, recovering from a major disaster while simultaneously attempting to help evacuees from surrounding counties poses a number of difficulties for emergency management personnel and other local officials.

Based on Hurricane Katrina and other major hurricane events that have impacted the Gulf Coast in the past, it is likely that many of the MEMA District 7 counties will be receiver counties when it comes to evacuees. Many of these evacuees will likely come from locations in Louisiana, including New Orleans. Indeed, the State of Louisiana evacuation plan indicates that one of the primary evacuation routes from the City of New Orleans will direct evacuees north along Interstate 55, sending people through Pike County and Lincoln County.

D.2.11 Severe Thunderstorm/High Wind

LOCATION AND SPATIAL EXTENT

A thunderstorm event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that Jefferson County has uniform exposure to an event and the spatial extent of an impact could be large.

TABLE D.13: BEAUFORT WIND SCALE

Beaufort Scale					
NUMBER	**WIND SPEED (MPH)**	**DESCRIPTION**	**WAVE HEIGHT (FT)**	**SEA CONDITIONS**	**LAND CONDITIONS**
0	<1	Calm	0	Flat.	Calm. Smoke rises vertically.
1	1-3	Light air	0.33	Ripples without crests.	Wind motion visible in smoke.

Beaufort Scale					
NUMBER	**WIND SPEED (MPH)**	**DESCRIPTION**	**WAVE HEIGHT (FT)**	**SEA CONDITIONS**	**LAND CONDITIONS**
2	3-7	Light breeze	0.66	Small wavelets.	Wind felt on exposed skin. Leaves rustle.
3	8-12	Gentle breeze	2	Large wavelets.	Leaves and smaller twigs in constant motion.
4	13-17	Moderate breeze	3.3	Small waves.	Dust and loose paper rise. Small branches begin to move.
5	18-24	Fresh breeze	6.6	Moderate (1.2 m) longer waves. Some foam and spray.	Small trees sway.
6	25-30	Strong breeze	9.9	Large waves with foam crests and some spray.	Large branches in motion. Whistling heard in overhead wires. Umbrella use difficult.
7	31-38	High wind, Moderate Gale, Near Gale	13.1	Sea heaps up and foam begins to streak.	Whole trees in motion. Effort needed to walk against the wind.
8	39-46	Fresh Gale	18	Moderately high waves with breaking crests forming spindrift. Streaks of foam.	Twigs broken from trees. Cars veer on road.
9	47-54	Strong Gale	23	High waves (6-7 m) with dense foam. Wave crests start to roll over. Considerable spray.	Larger branches break off trees, and some small trees blow over. Construction/temporary signs and barricades blow over. Damage to circus tents and canopies.
10	55-63	Whole Gale/Storm	29.5	Very high waves. The sea surface is white and there is considerable tumbling.	Trees uprooted. Considerable structural damage.
11	64-72	Violent storm	37.7	Exceptionally high waves.	Widespread vegetation and structural damage.

Beaufort Scale					
NUMBER	WIND SPEED (MPH)	DESCRIPTION	WAVE HEIGHT (FT)	SEA CONDITIONS	LAND CONDITIONS
12	≥73	Hurricane-force	≥46	Huge waves. Sea is completely white with foam and spray. Air is filled with driving	Massive and widespread damage to structures.

HISTORICAL OCCURRENCES

Severe storms were at least partially responsible for four disaster declarations in Jefferson County in 1979, 1983, 2003, and 2017. According to NCEI, there have been 140 reported thunderstorms and high wind events since 1988 in Jefferson County. These events caused over $1.62 million in damages. There were also reports of five injuries. The following table summarizes this information.

TABLE D.14: SUMMARY OF THUNDERSTORM/HIGH WIND OCCURRENCES IN JEFFERSON COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Fayette	35	0/0	$826,000	$24,294
Unincorporated Area	105	0/5	$797,000	$23,441
Jefferson County Total	**140**	**0/5**	**$1,623,000**	**$47,735**

PROBABILITY OF FUTURE OCCURRENCES

Given the high number of previous events, it is certain that thunderstorm events, including straight-line wind events, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for the entire county.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[33] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Jefferson County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[34]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean

[33] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[34] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

D.2.12 Tornado

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, and thus in Jefferson County. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random, and it is not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that Jefferson County is uniformly exposed to this hazard. With that in mind, the following figure shows tornado track data for many of the major tornado events that have impacted the county between 1950 and 2021. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

The following figure depicts the Enhanced-Fujita Scale of tornado intensity.

FIGURE D.13: ENHANCED-FUJITA SCALE

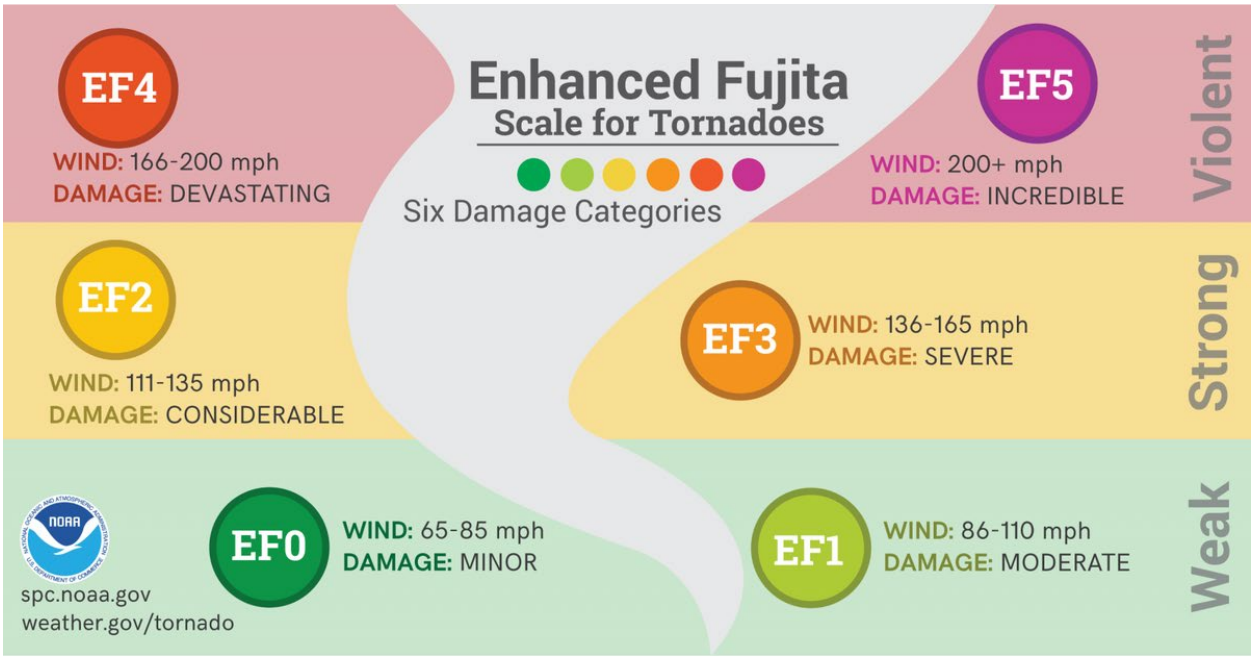
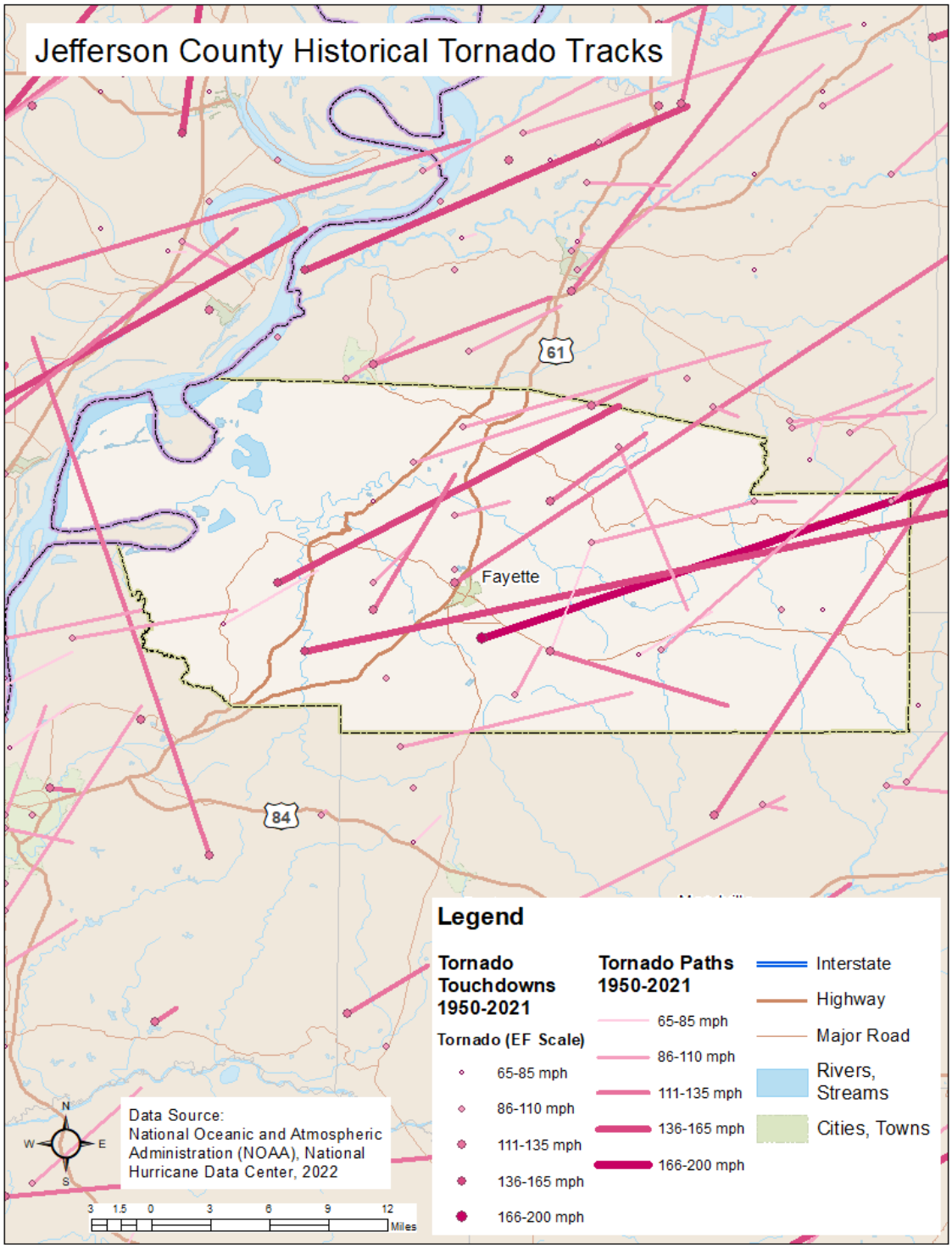


FIGURE D.14: HISTORICAL TORNADO TRACKS IN JEFFERSON COUNTY[35]



[35] National Weather Service Storm prediction Center

HISTORICAL OCCURRENCES

Tornadoes were at least partially responsible for five disaster declarations in Jefferson County in 1973, 1979, 1983, 2003, and 2017. According to the National Centers for Environmental Information, there have been a total of 28 recorded tornado events in Jefferson County since 1950, resulting in over $2.8 million in property damages. In addition, one injury was reported. The magnitude of these tornadoes ranges from EF0 to EF4, although an F5 event is possible.

TABLE D.15: SUMMARY OF TORNADO OCCURRENCES IN JEFFERSON COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Fayette	7	0/0	$713,000	$9,902
Unincorporated Area	21	0/1	$2,103,000	$29,209
Jefferson County Total	**28**	**0/1**	**$2,816,000**	**$39,111**

PROBABILITY OF FUTURE OCCURRENCES

According to historical information, tornado events pose a significant threat to Jefferson County. The probability of future tornado occurrences affecting Jefferson County is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[36] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Jefferson County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[37]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storm systems that spawn tornadoes to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding, and enhancing the potential for increased *tornado activity*. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

[36] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[37] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

D.2.13 Winter Storm, Freeze, and Extreme Cold

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. Jefferson County is not accustomed to severe winter weather conditions and seldom receives severe winter weather, even during the winter months. Events tend to be mild in nature; however, this creates a situation where even relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage due to the fact that these events are not commonplace. Given the atmospheric nature of the hazard, the entire county has uniform exposure to a winter storm.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, there have been a total of nine recorded winter storm events in Jefferson County since 1996. These events resulted in over $800,000 in damages.

TABLE D.16: SUMMARY OF WINTER STORM EVENTS IN JEFFERSON COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Fayette	0	0/0	$0	$0
Unincorporated Area	9		$800,000	
Jefferson County Total	**9**	**0/0**	**$800,000**	

An ice storm developed across the area on February 3, 2021 into the early morning hours of the 4th. While this icing event was not devastating, the impact to travel was a major issue across the region. Thousands of accidents occurred from slick roads. As a result of the accidents, three fatalities occurred along with a handful of injuries. Overall, most areas received 0.25 to 0.5 inches of ice accumulation from freezing rain. Additionally, some areas had a mix of precipitation with sleet accumulating. Some snow did occur, but those were just across select areas and the accumulation was mainly one inch or less.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could start a fire or lead to an accumulation of toxic fumes.

PROBABILITY OF FUTURE OCCURRENCES

Winter storm events will continue to occur in Jefferson County. Based on historical information, the probability is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems. There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Jefferson County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms). However, accelerated warming in the Artic region (i.e., Arctic amplification) may also be linked with an increase in the frequency of extreme cold events across parts of Asia and North America, including in Jefferson County. [38]

OTHER HAZARDS

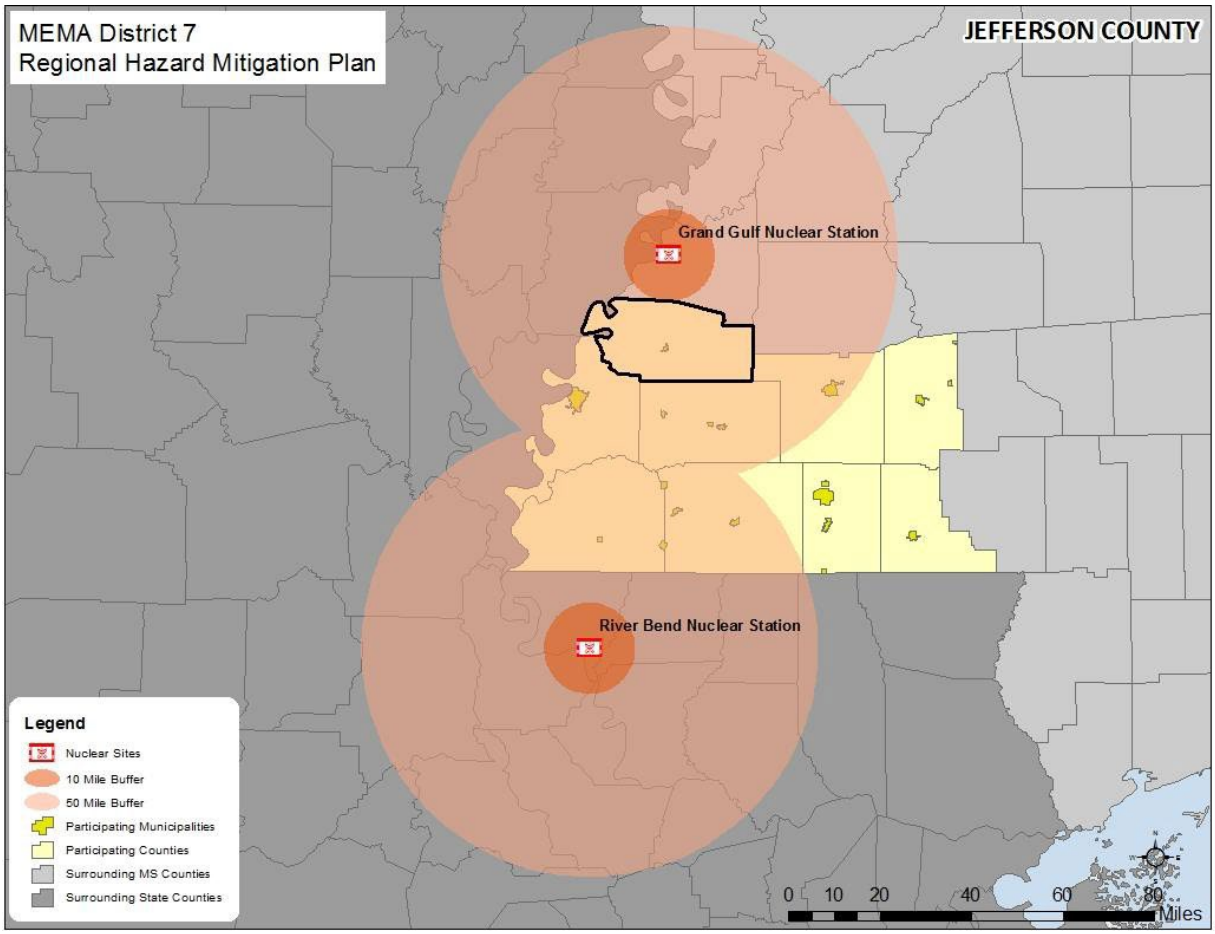
D.2.14 Radiological Event

LOCATION AND SPATIAL EXTENT

The Grand Gulf Nuclear Station and River Bend Nuclear Station are both located within a 50-mile radius of the MEMA District 7 Region. The Nuclear Regulatory Commission defines two emergency planning zones around nuclear plants. Areas located within 10 miles of the station are considered to be within the zone of highest risk to a nuclear incident and this radius is the designated evacuation radius recommended by the Nuclear Regulatory Commission. Within the 10-mile zone, the primary concern is exposure to and inhalation of radioactive contamination. The very northern part of Jefferson County is located on the edge of the 10-mile radius of the Grand Gulf Nuclear Station, although no part of the county is located within this zone. The most concerning effects in the secondary 50-mile zone are related to ingestion of food and liquids that may have been contaminated. All of Jefferson County is located within this 50- mile radius. The 50-mile zone is still considered to be at risk from a nuclear incident, though the impacts may be less severe than in the 10-mile zone.

[38] NOAA – Communication Education & Engagement. Retrieved from: https://cpo.noaa.gov/Divisions-Programs/Communication-Education-and-Engagement/CEE-News/ArtMID/8293/ArticleID/2369/Research-Links-Extreme-Cold-Weather-in-the-United-States-to-Arctic-Warming

FIGURE D.15: NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN JEFFERSON COUNTY [39]



HISTORICAL OCCURRENCES

Although there have been no major nuclear events at either the Grand Gulf or River Bend Nuclear Stations, there is some possibility that one could occur as there have been incidents in the past in the United States at other facilities and at facilities around the world. Additionally, a list of minor events/notifications was acquired from reports collected by the Nuclear Regulatory Commission (NRC). The NRC classifies events using the scale below. A list of events at Grand Gulf Nuclear Station and River Bend Nuclear Station can be found in the table below. It is noteworthy that all of the events were minor in magnitude, and many were insignificant enough that they did not register on the classification scale.

[39] International Atomic Energy Agency

TABLE D.17: NUCLEAR REGULATORY COMMISSION EMERGENCY CLASSIFICATION SCALE FOR EVENTS OCCURRING AT NUCLEAR POWER PLANTS

Classification	Description
Notification of Unusual Event (NOUE)	Events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs. [Note: This term is sometimes shortened to Unusual Event (UE). The terms Notification of Unusual Event, NOUE and Unusual Event are used interchangeably.]
Alert	Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the Environmental Protection Agency (EPA) protective action guides (PAGs)
Site Area Emergency	Site Area Emergency (SAE) – Events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or hostile action that results in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to, equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA PAG exposure levels beyond the site boundary.
General Emergency	Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile action that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

TABLE D.18: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT RIVER BEND NUCLEAR STATION [40]

Date	Retrieved From*	Classification	Plant	Description
11/26/1985	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	ECCS Initiation: Improper restoration of a level transmitter causes HPSC injection

[40] Nuclear Regulatory Commission Preliminary Notification Reports (http://www.nrc.gov/reading-rm/doc-collections/event-status/prelim-notice/):

Date	Retrieved From*	Classification	Plant	Description
11/27/1985	Licensee Event Report	Alert	River Bend Unit 1	Failure to Perform Surveillance Tests
3/5/1992	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	REACTOR SCRAM CAUSED BY A GENERATOR TRIP DUE TO HIGH WINDS CAUSING TRANSFORMER DAMAGE
9/15/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE IVAN
10/4/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	Shutdown Greater than 72 Hours
9/23/2005	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	NRC ENTERS MONITORING MODE DUE TO HURRICANE RITA
5/23/2007	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REACTOR SHUTDOWN DUE TO UNEXPECTED CHANGE IN RECIRCULATION FLOW
9/2/2008	Preliminary Notification Reports	Notification of Unusual Event/Not Applicable	River Bend Unit 1	NRC RESPONSE TO HURRICANE GUSTAV
5/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	AUGMENTED INSPECTION TEAM ONSITE AT RIVER BEND STATION
8/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST

TABLE D.19: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT GRAND GULF NUCLEAR STATION

Date	Retrieved From*	Classification	Plant	Description
8/29/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST
10/1/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF NUCLEAR STATION SECURITY OFFICER LOCKOUT
9/29/2016	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF EXTENDED PLANT SHUTDOWN TO ADDRESS OPERATIONS PERFORMANCE

PROBABILITY OF FUTURE OCCURRENCES

A nuclear event is a very rare occurrence in the United States due to the intense regulation of the industry. There have been minor incidents in the past, but it is considered unlikely (less than 1 percent annual probability).

RADIOLOGICAL EVACUATIONS

Like the hurricane evacuations discussed above, in many ways the MEMA District 7 Region would potentially be impacted to a greater degree by evacuations caused by a radiological event than by the event itself. Since the region is not directly located within the 10-mile evacuation area but neighboring counties are located within this zone, it is highly likely that populations from those neighboring counties will be evacuated to the counties within the MEMA District 7 Region.

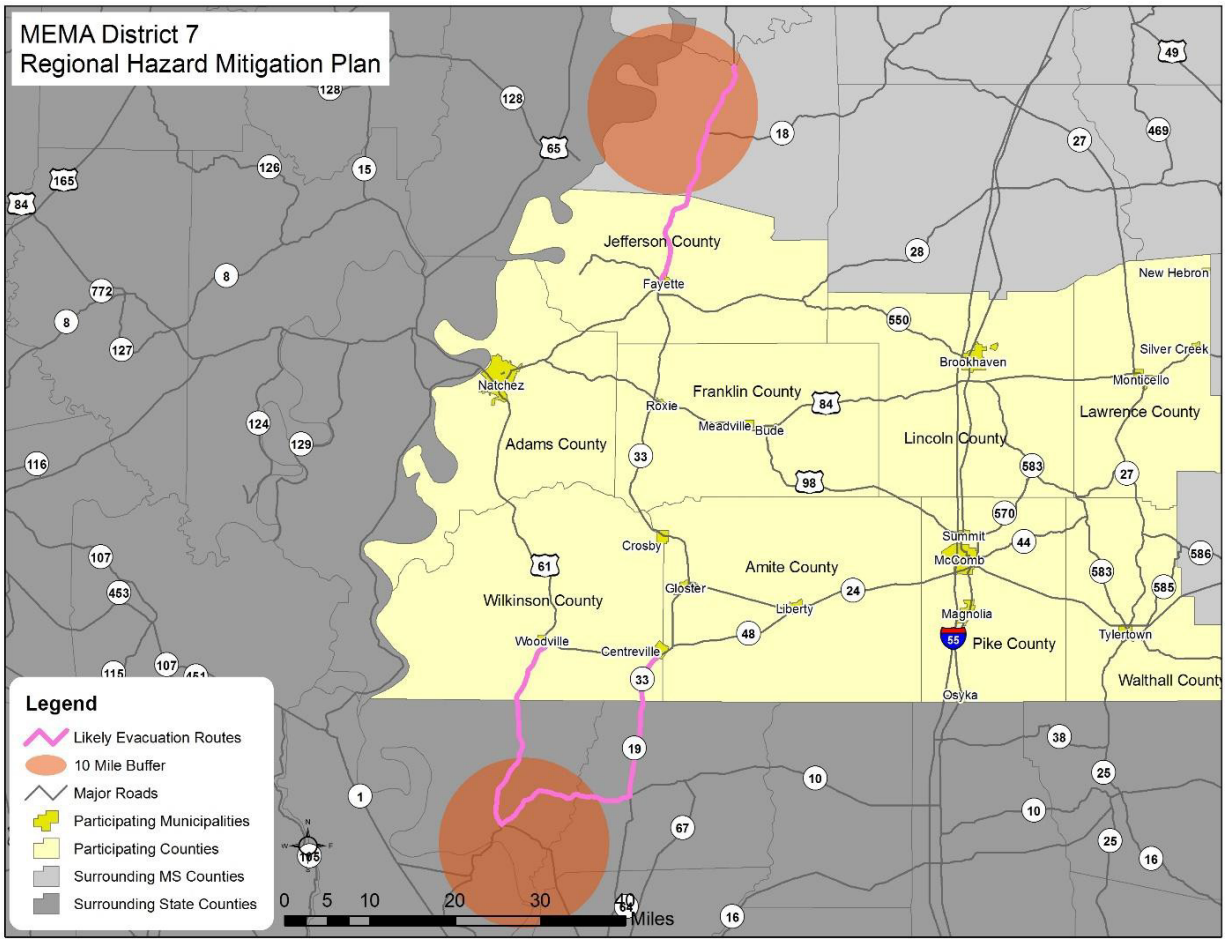
Due to the severe and long-term effects of a major radiological event, temporary sheltering will be an initial concern, but the greater challenge may be in the long-term. As has happened with historical radiological accidents in other locations, the danger in the impacted area will likely extend for a very long period after the event and evacuees may be unable to return to their homes for months or years. This additional influx of population will cause a major strain on resources within these relatively rural counties in the short-term, as local communities with limited resources will have an unexpected and immediate need to provide shelter and other life essentials such as food, water, and health care to a significant, additional number of people. In the long-term, there may be challenges for local officials as existing infrastructure will likely be inadequate to handle larger populations.

Although there have not been any major radiological events in the region historically, hurricane evacuations (discussed above) provide a similar scenario in terms of what the region might expect. However, one additional concern that officials will need to consider in a radiological event is that evacuees may be contaminated by radioactivity. According to the Centers for Disease Control, radioactive contamination can occur when radioactive materials are released into the environment and become deposited into the air, water, surfaces, soil, plants, buildings, people or animals. This contamination can then be spread when people touch other people, surfaces, or objects. Therefore, when people evacuate a contaminated zone, they pose a potential risk of spreading the contamination to others if they are not properly treated. Local officials in MEMA District 7 may need to be prepared to set up decontamination centers along major evacuation routes to ensure that the contamination is not spread. It is also important for citizens to understand the steps they can take to reduce the risk of spreading contamination such as evacuating quickly after an event and following decontamination instructions as directed by local officials.[41]

Based on the locations of the 10-mile evacuation areas near the region, many of these evacuees will likely come from Claiborne County to the north and West Feliciana and East Feliciana Parishes to the south. The main roads for these evacuees will probably be U.S. Highway 61 and Mississippi State Highway 33 since these are the primary and most direct roads into and out of the aforementioned evacuation counties and into MEMA District 7. Depending on the severity of the event, officials may even change these roads over to a contraflow traffic pattern to enable quicker evacuations.

[41] Centers for Disease Control and Prevention. Emergency Preparedness and Response: Contamination vs. Exposure. Retrieved on September 1, 2017 from https://emergency.cdc.gov/radiation/contamination.asp

FIGURE D.166: LIKELY EVACUATION ROUTES FOR A RADIOLOGICAL EVENT IN THE MEMA DISTRICT 7 REGION



As a result of the potential for an influx of evacuees during a radiological event, it is critical for local officials in MEMA District 7 to prepare for evacuations. It is possible that thousands of additional people will be relocated, either temporarily or permanently, to MEMA District 7. Therefore, plans for additional shelters and other resources should be coordinated well in advance of future events.

D.2.15 Pandemic

LOCATION AND SPATIAL EXTENT

Pandemics are global in nature. However, they may start anywhere. Jefferson County chose to analyze this hazard given the agriculture in the area and potential for this kind of event to occur in any location at any time.

All populations should be considered at risk to pandemic. Buildings and infrastructure are not directly impacted by the virus/pathogen but could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings may be shutdown, at least temporarily, as a result. Employers may initiate work from home procedures for non-essential workers in order to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

HISTORICAL OCCURRENCES

Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below.

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to 566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population.

Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10 to 50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852- 1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours. The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

1957 Asian Flu: It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

1968 Hong Kong Flu: The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020, mainly due to the speed and scale of the transmission of the disease. Prior to that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province on February 26th, 2020. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

There is a considerable amount of data on the extent of COVID-19 throughout the State of Mississippi and Jefferson County. The number of reported cases and deaths across the State of Mississippi and Jefferson County are shown in the figure below.

TABLE D.20: COVID-19 CASES AS OF 1/05/2023[42]

	Cases	Deaths
Mississippi	960,923	13,112
Jefferson County	1,766	39

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Jefferson County has a probability level of unlikely (less than 1 percent annual probability) for future pandemics events. While pandemics can have devastating impacts, they are relatively rare.

The Mississippi State Department of Health maintains a state pandemic plan which can be found here: http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf

[42] Mississippi Department of Health – COVID-19 Dashboard: https://msdh.ms.gov/msdhsite/_static/resources/19539.pdf

D.2.16 Conclusions on Hazard Risk

The hazard profiles presented in this subsection were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled Understanding Your Risks: Identifying Hazards and Estimating Losses (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

HAZARD EXTENT

The table below describes the extent of each natural hazard identified for Jefferson County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

TABLE D.21: EXTENT OF JEFFERSON COUNTY HAZARDS

Flood Related Hazards	
Dam & Levee Failure	Dam Failure extent is defined using the Mississippi Department of Environmental Quality classifications which include Low, Significant, and High. No dams are classified as high-hazard in Jefferson County.
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no official erosion rate records in Jefferson County but local estimates are around 0.25 to 0.50 feet per year. Some areas of erosion have been identified by local coordinators.
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 12.9 percent of the total land area in Jefferson County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was on Coles Creek near Fayette. Water reached a discharge of 75,000 cubic feet per second (recorded on April 12, 1974). The highest stream gage height was on North Fork Coles Creek near Church Hill with a height that was recorded at 39.62 feet (recorded on March 2, 2001). Additional peak discharge readings, historic crest heights, and the corresponding flood categories (where available) are in the table below.
Fire Related Hazards	
Drought	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. Jefferson County has received this ranking once over the 17-year reporting period. Due to the minimal impact from this ranking during the evaluation period, the impact is deemed negligible at this time.

Lightning	Jefferson County is in an area of the country that experienced an average of 66.8 lightning flashes per km^2 per year between 2016 and 2021. It should be noted that future lightning occurrences may exceed these figures.
Wildfire	Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2012-2021. The greatest number of fires to occur in Jefferson County in any year was 16 in 2023. The greatest number of acres to burn in the county in a single year occurred in 2014 when 365 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale or the Modified Mercalli Intensity (MMI) scale. According to data provided by the National Centers for Environmental Information, no earthquakes were reported in Jefferson County.
Temperature & Wind Related Hazards	
Extreme Heat	The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are not kept for any areas in Jefferson County. However, the highest recorded temperature in the region was 106°F in 2007 with heat index values recorded above 115°F.
Hailstorm	Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Jefferson County was 2.75 inches (last reported on April 11, 2008). It should be noted that future events may exceed this, however the risk is not sufficient to warrant additional action at this time.
Hurricane & Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5. The greatest classification of hurricane to impact the MEMA District 7 Region was a Category 3 storm. This occurred in 1969 with Hurricane Camille and in 2005 with Hurricane Katrina. The storm track of both storms passed just to the east of the region, but due to the size of these storms, their impact was felt across the region.
Severe Thunderstorm / High Wind	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 67-year history from the National Centers for Environmental Information, the strongest recorded wind event in Jefferson County was last reported on May 3, 2009 at 70 knots (approximately 81 mph). It should be noted that future events may exceed these historical occurrences.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA as well as the Fujita/Enhanced Fujita Scale. The greatest magnitude reported in Jefferson County was an F4 (reported on January 23, 1969).
Winter Storm & Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in Jefferson County. However, reports from NCEI of the greatest snowfall in the county has been 6 inches (reported on February 11, 2010).
Other Hazards	
Radiological Event	Although there is no history of a nuclear accident at either the Grand Gulf Nuclear Station or River Bend Nuclear Station, other events across the globe

	and in the United States in particular indicate that an event is possible. Since several national and international events were Level 7 events on the INES, the potential for a Level 7 event at these stations is possible national and international events were Level 7 events on the INES, the potential for a Level 7 event at these stations is possible.
Pandemic	The extent of a pandemic impacting the county is difficult to estimate. It could result in thousands of deaths and extreme disruption of commerce and everyday life.

PRIORITY RISK INDEX RESULTS

To draw some meaningful planning conclusions on hazard risk for Jefferson County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a "Priority Risk Index" (PRI). More information on the PRI and how it was calculated can be found in Section 5.17.2.

The table below summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this subsection, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

TABLE D.22: SUMMARY OF PRI RESULTS FOR JEFFERSON COUNTY

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Dam Failure and Levee Failure	Unlikely	Critical	Moderate	Less than 6 hours	Less than 6 hours	**2.3**
Erosion	Likely	Minor	Small	More than 24 hours	More than 1 week	**2.1**
Flood	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**3.2**
Fire-related Hazards						
Drought	Possible	Limited	Large	More than 24 hours	More than 1 week	**2.5**
Lightning	Highly Likely	Limited	Small	6 to 12 hours	Less than 6 hours	**2.6**
Wildfire	Possible	Limited	Small	Less than 6 hours	Less than 1 week	**2.3**
Geologic Hazards						
Earthquake	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Wind-related Hazards						
Extreme Heat	Likely	Limited	Large	More than 24 hours	More than 1 week	**2.8**
Hailstorm	Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Hurricane and Tropical Storm	Likely	Catastrophic	Large	More than 24 hours	Less than 1 week	**3.3**
Severe Thunderstorm/High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Tornado	Likely	Catastrophic	Moderate	Less than 6 hours	Less than 6 hours	**3.2**
Winter Storm and Freeze	Likely	Minor	Moderate	More than 24 hours	Less than 1 week	**2.2**
Human-caused Hazards						
Radiological Event	Unlikely	Critical	Moderate	More than 24 hours	Less than 1 week	**2.2**
Pandemic	Unlikely	Limited	Large	More than 24 hours	More than 1 week	**2.2**

D.2.17 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Jefferson County, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk (Table D.32). For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Jefferson County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately and is described in Section 6: Vulnerability Assessment and below in Section D.3. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates. In most cases, the hazards of greatest concern did not change much since the last plan update, indicating that the priorities remained relatively stable and there were few changes in priorities.

TABLE D.23: CONCLUSIONS ON HAZARD RISK FOR JEFFERSON COUNTY

HIGH RISK	Hurricane and Tropical Storm Tornado Flood Severe Thunderstorm/High Wind
MODERATE RISK	Extreme Heat Lightning Wildfire
LOW RISK	Winter Storm and Freeze Event Erosion Earthquake Pandemic Drought Hailstorm Dam and Levee Failure Radiological

D.3 JEFFERSON COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Jefferson County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected amount of damages caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in Section 6: Vulnerability Assessment.

D.3.1 Asset Inventory

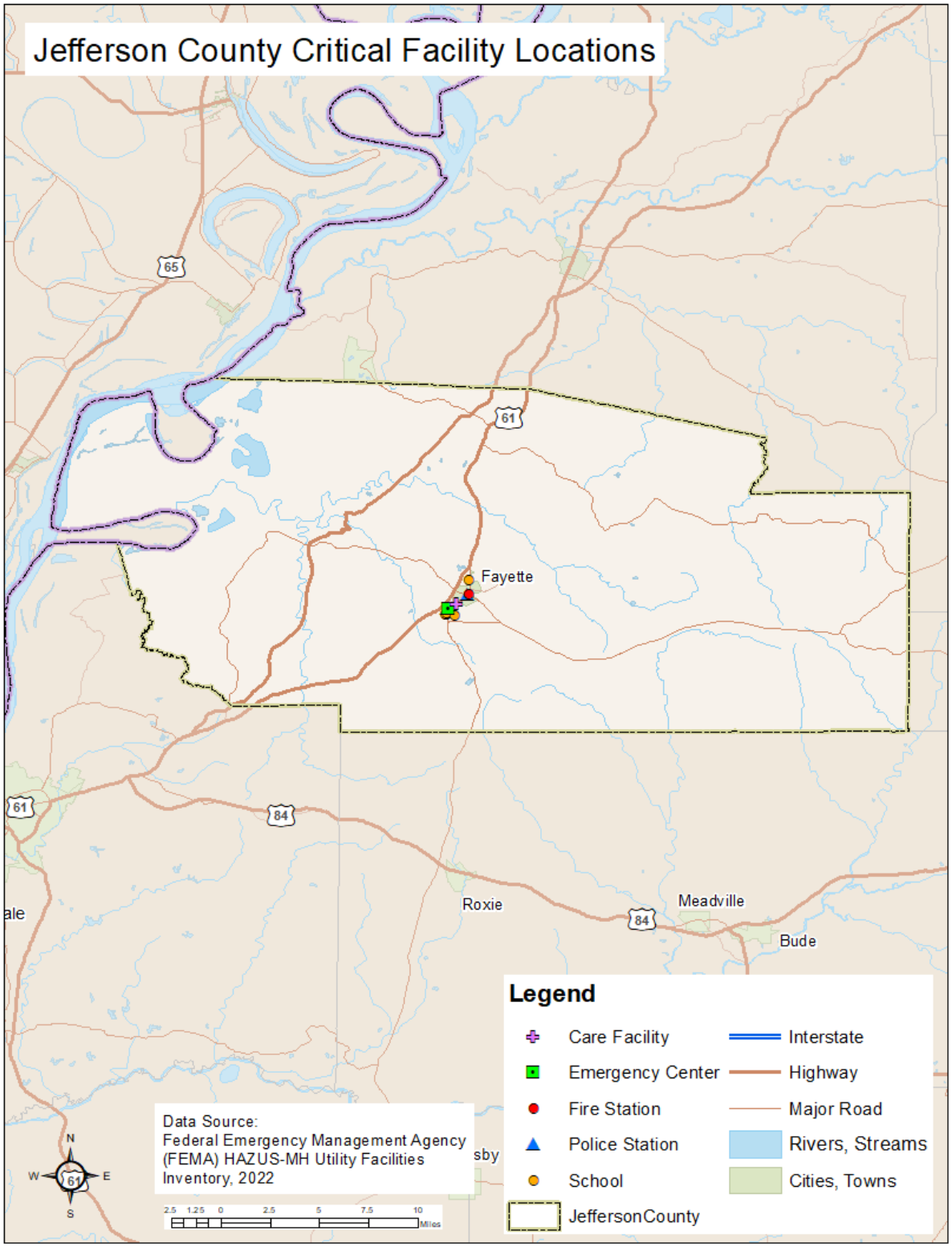
The table below lists the fire stations, police stations, medical care facilities, emergency operation centers, schools, government/public buildings, transportation infrastructure, and private facilities located in Jefferson County according to previous plan data and Hazus-MH 5.1 data that was reviewed and updated by local officials.

The following map shows the locations of critical facilities in Jefferson County. At the end of this subsection, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided through Hazus which was updated, as best as possible, with local knowledge.

TABLE D.24: CRITICAL FACILITY INVENTORY IN JEFFERSON COUNTY

Location	Fire Stations	Police Stations	Medical Facilities	EOC	Schools	Ports
Fayette	1	2	2	1	2	
Unincorporated	5	0	0	0	0	0
Jefferson County Total	**6**	**2**	**2**	**1**	**2**	**0**

FIGURE D.17: CRITICAL FACILITY LOCATIONS IN JEFFERSON COUNTY

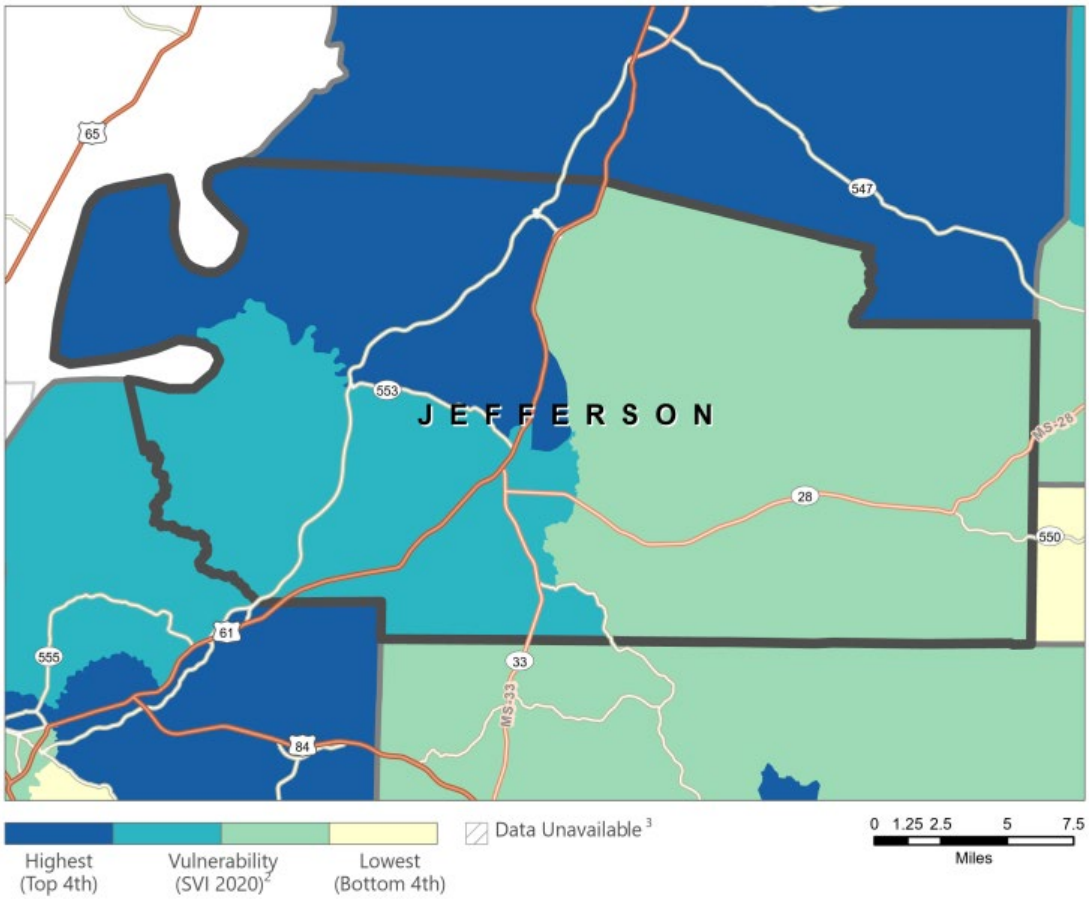


D.3.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those segments of the resident population in Adams County that are potentially at risk for these hazards. Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss.

The CDC/ATSDR Social Vulnerability Index (CDC/ATSDR SVI) uses 16 U.S. census variables to help local officials identify communities that may need support before, during, or after disaster. See figure below for Jefferson County SVI score of 0.7769.

FIGURE D.188: SOCIAL VULNERABILITY INDEX IN JEFFERSON COUNTY[43]



The following table lists the population by jurisdiction according to U.S. Census. The total population in Jefferson County according to Census data was 7,260 persons. Additional population estimates are presented above in Section D.1.

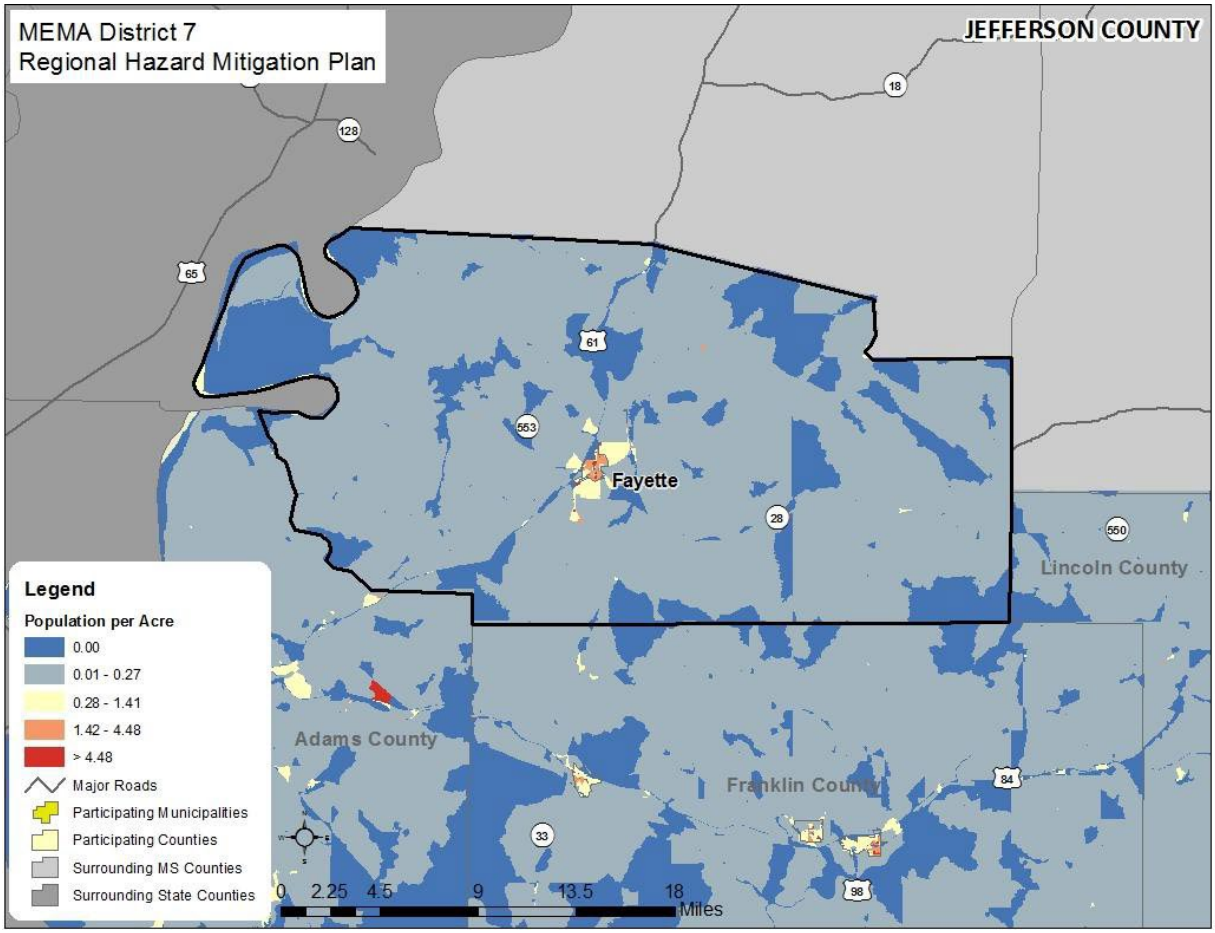
[43] CDC/ATSDR Social Vulnerability Index

TABLE A.25: POPULATION IN JEFFERSON COUNTY[44]

Jurisdiction	2000 Census	2010 Census	2020 Census	% Change 2000 - 2020
Jefferson County	9,740	7,726	7,260	-25.46%
Fayette	2,242	1,614	1,445	-35.54%

In addition, the map below illustrates the population density per acre by census block as it was reported by the U.S. Census Bureau in 2010. As can be seen in the figure, the population is spread out with concentrations in municipal areas such as Fayette.

FIGURE D.19: POPULATION DENSITY IN JEFFERSON COUNTY



D.3.3 Development Trends and Changes in Vulnerability

Since the previous hazard mitigation plan was approved, Jefferson County has experienced limited growth and development. The table below shows the number of building units constructed since 2010 according to the U.S. Census American Community Survey.

TABLE D.26: BUILDING COUNTS FOR JEFFERSON COUNTY

[44] U.S. Census 2020

Location	Total Housing Units (2021)	Units Built 2010 or Later	% Building Stock Built Post-2010
Fayette	561	12	2.1%
Unincorporated Area	1,851	67	3.6%
Jefferson County Total	2,412	**79**	**3.3%**

Based on the data above, there has been a low rate of residential development and significant population decline in the county since 2000. However, it is notable that the unincorporated area has experienced a slightly higher rate of development compared to the rest of the county, resulting in an increased number of structures that are vulnerable to the potential impacts of the identified hazards. Therefore, development has impacted the county's vulnerability since the previous local hazard mitigation plan was approved and there has been a slight increase in the overall vulnerability as well as a larger increase in certain areas and communities.

It is also important to note that as development increases in the future, greater populations and more structures and infrastructure will be exposed to potential hazards if development occurs in the floodplains or other high-risk areas.

Vulnerability Assessment Results

As noted in *Section 6: Vulnerability Assessment*, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis. Those results, specific to Jefferson County, are presented here. All other hazards are assumed to impact the entire planning region (drought, extreme heat, hailstorm, lightning, severe thunderstorm/high wind, tornado, and winter storm) or, due to lack of data, analysis would not lead to credible results (erosion). The total county exposure, and thus risk to these hazards, was presented in Table D.33.

The hazards to be further analyzed in this subsection include dam/levee failure, flood, wildfire, earthquake, hurricane and tropical storm winds, and radiological event.

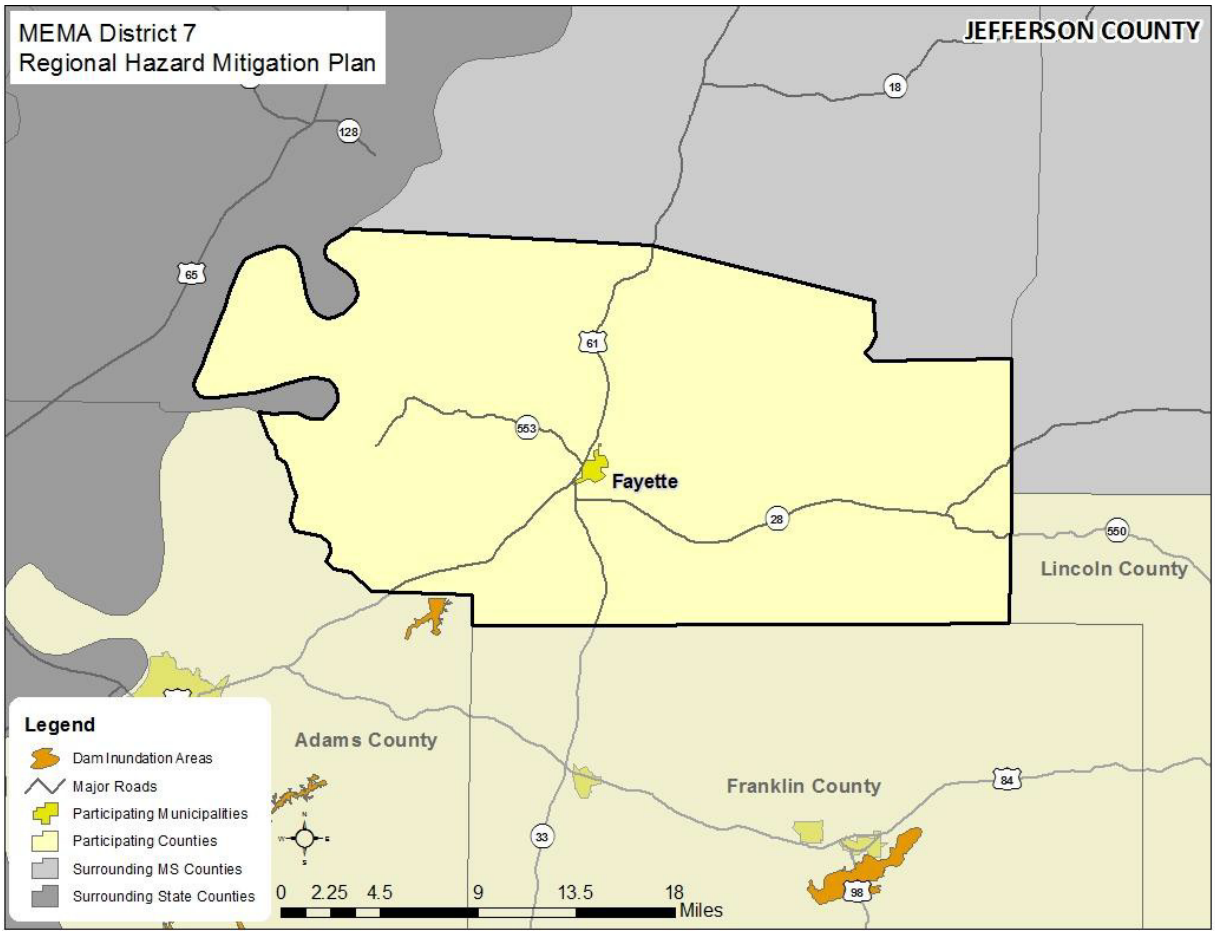
The annualized loss estimate for all hazards is presented near the end of this subsection.

DAM/LEVEE FAILURE

To assess the risk to a dam or levee failure, a GIS-based analysis was used to estimate exposure to one of the areas delineated by the Mississippi Department of Environmental Quality as a potential inundation area in the event of a failure. The determination of value at-risk (exposure) was calculated using GIS analysis by summing the values for improved properties that were located within an identified inundation area. As mentioned previously, this type of inundation mapping has not been completed for every dam/levee in the region, so the results of this analysis likely underestimate the overall vulnerability to a dam or levee failure. However, the analysis is still useful as a sort of baseline minimum of property that is potentially at-risk. The identified inundation areas can be found below.

According to the map below, there are no dam inundation areas in Jefferson County.

FIGURE D.20: DAM INUNDATION AREAS IN JEFFERSON COUNTY[45]

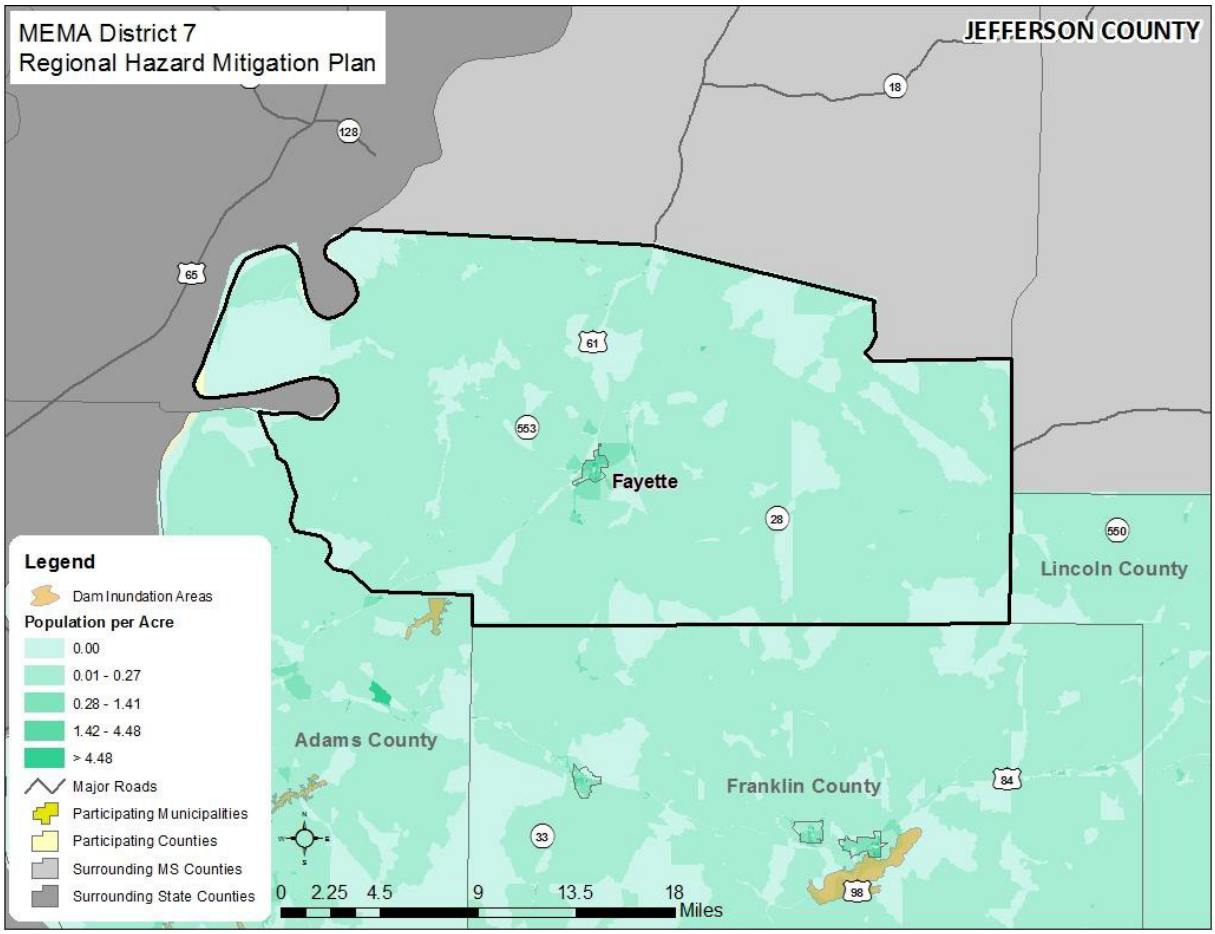


Social Vulnerability

The following figure is presented to gain a better understanding of at-risk population by evaluating census block level population data against dam inundation areas. Although there are no areas of concern located within the county, this does not indicate that there is no risk to a dam/levee failure, especially considering not all dams have delineated inundation areas.

[45] *Mississippi Department of Environmental Quality; United States Census Bureau, 2010 Census*

FIGURE D.21: POPULATION DENSITY NEAR DAM INUNDATION AREAS IN JEFFERSON COUNTY[46]



Critical Facilities

There are no critical facilities located within the identified dam inundation areas. Although there are no facilities located in the identified areas, this does not indicate that there is no risk to a dam/levee failure, especially considering not all dams have delineated inundation areas. A list of specific critical facilities and their associated risk can be found at the end of this section.

In conclusion, a dam/levee failure has the potential to impact existing and future buildings, facilities, and populations in Jefferson County, though structures located near or in the dam inundation areas are at highest risk. Specific vulnerabilities for Jefferson County assets will be greatly dependent on their individual design and the mitigation measures in place where appropriate. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future updates if data becomes available.

[46] *Mississippi Department of Environmental Quality; United States Census Bureau, 2010 Census*

FLOOD

Historical evidence indicates that Jefferson County is susceptible to flood events. A total of 18 flood events have been reported by the National Centers for Environmental information resulting in $3.86 million in property damage. On an annualized level, these damages amounted to $154,600 for Jefferson County.

To assess flood risk, a GIS-based analysis was used to estimate exposure to flood events using Digital Flood Insurance Rate Map (DFIRM) data in combination with improved property records for the county. The determination of value at-risk (exposure) was calculated using GIS analysis by summing the values for improved properties that were located within an identified floodplain. Due to a lack of digital parcel data in most counties, it was determined that an analysis using the inventory from Hazus-MH 5.1 would be used, though it should be noted that the data will merely be an estimation and may not reflect actual counts or values located in the floodplain. Indeed, in almost all cases, this analysis likely overestimates the amount of property at risk. The table below presents the potential at-risk property. Both the number of parcels and the approximate value are presented.

TABLE D.27: ESTIMATED EXPOSURE OF IMPROVED PROPERTY TO THE FLOOD HAZARD[47]

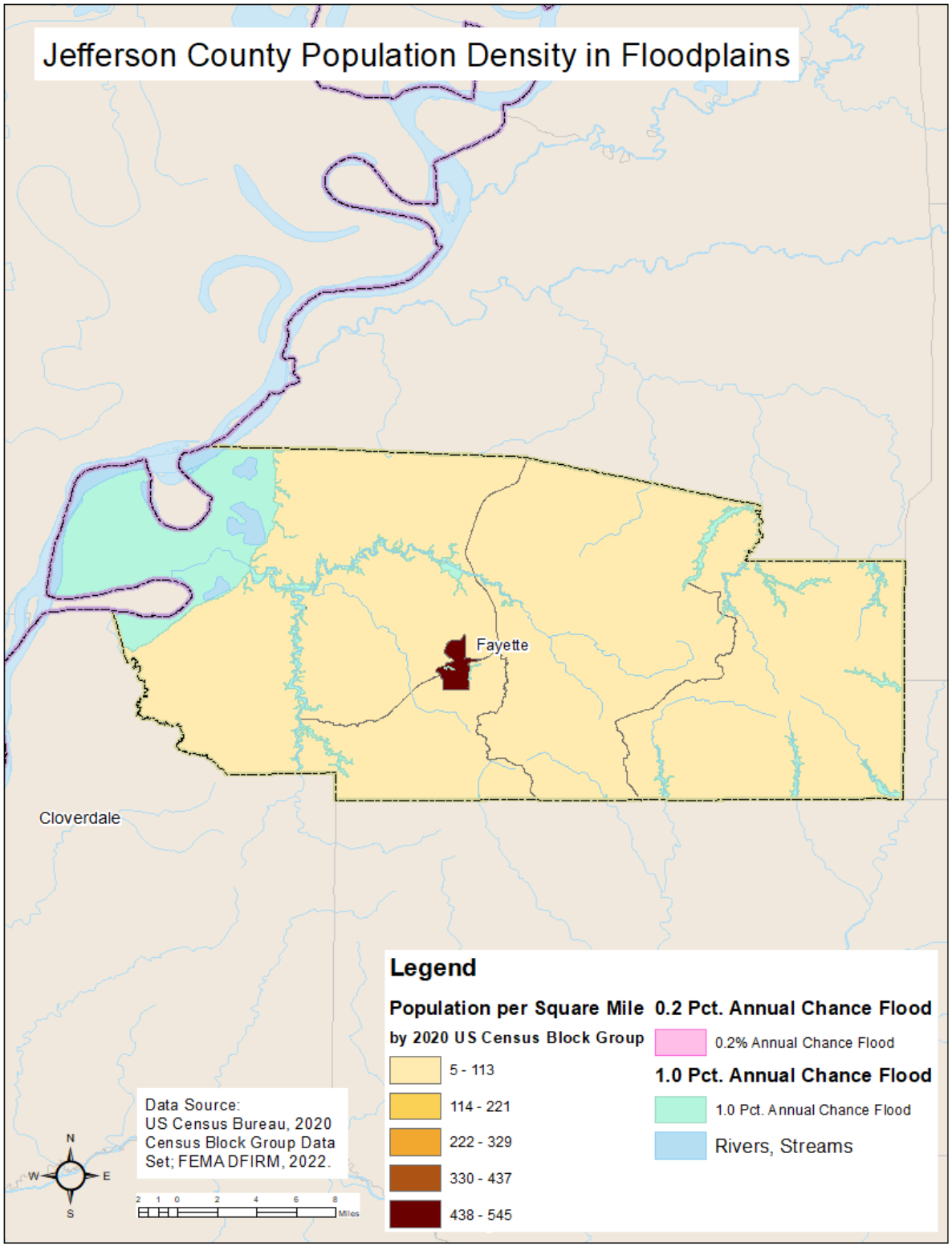
Location	1.0-percent ACF		0.2-percent ACF	
	Approx. Number of Improvements	Approx. Number of Improvements	Approx. Number of Improvements	Approx. Number of Improvements
Fayette	125	$27,894,000	0	$0
Unincorporated Area	873	$118,868,000	0	$0
JEFFERSON COUNTY TOTAL	**998**	**$146,762,000**	**0**	**$0**

Social Vulnerability

The figure below is presented to gain a better understanding of at-risk population by evaluating census block level population data against mapped floodplains. There are areas of concern in several of the population centers. Therefore, further investigation in these areas may be warranted.

[47] As noted in Section 6.4, no building-specific data, such as building footprints, was available to determine buildings at risk. As a result of this data limitation, at-risk census block building counts and values of the structures were used. This information remains unchanged since the last plan update.

FIGURE D.22: POPULATION DENSITY NEAR FLOODPLAINS IN JEFFERSON COUNTY

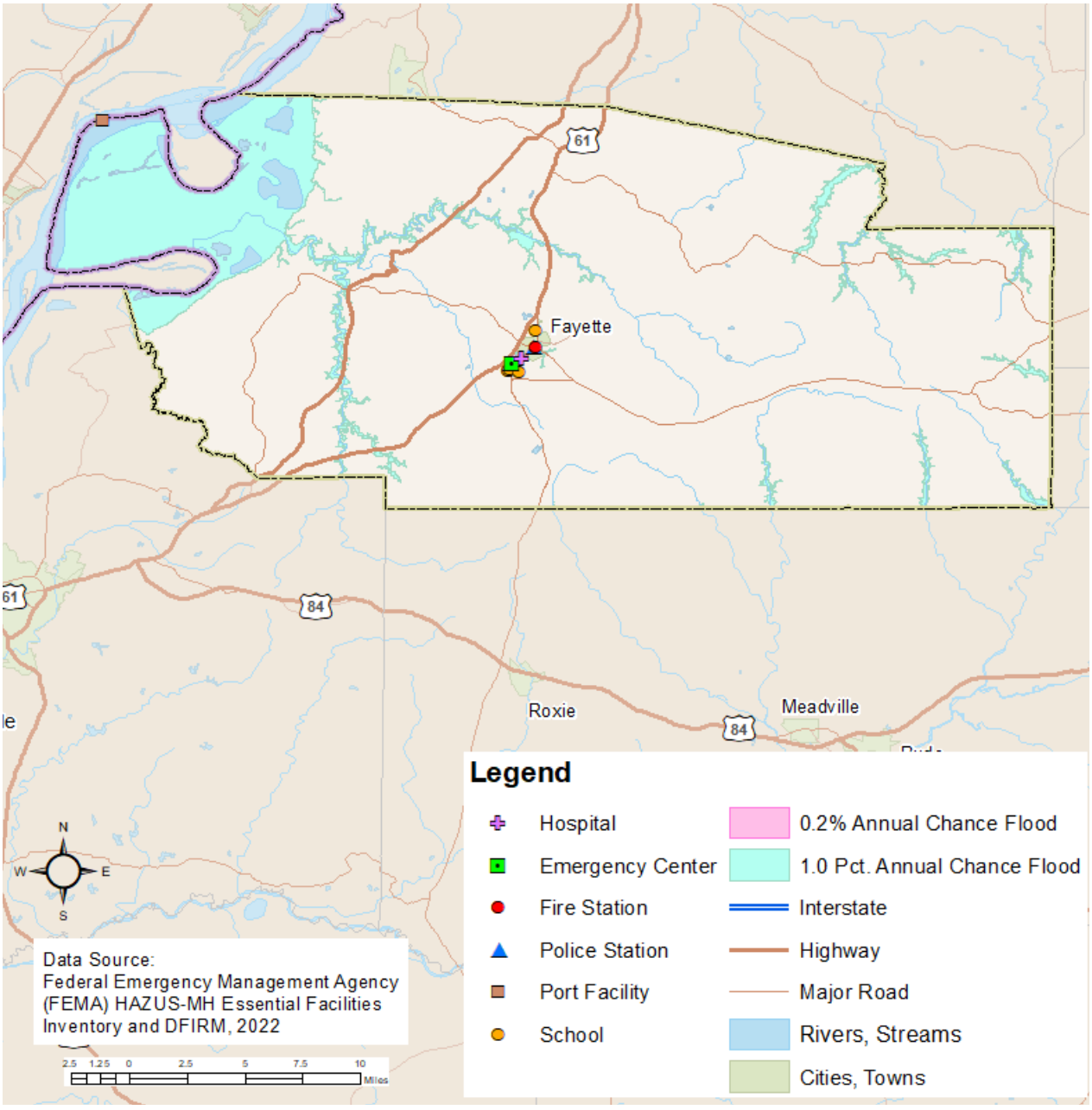


Critical Facilities

The critical facility analysis revealed that there are no critical facilities located in the floodplain. (Please note, as previously indicated, this analysis does not consider building elevation, which may negate risk.) A list of specific critical facilities and their associated risk can be found at the end of this subsection.

The figure below shows critical facilities relative location near Special Flood Hazard Areas.

FIGURE D.193: CRITICAL FACILITIES NEAR THE SFHA[48]



[48] FEMA - DFIRM

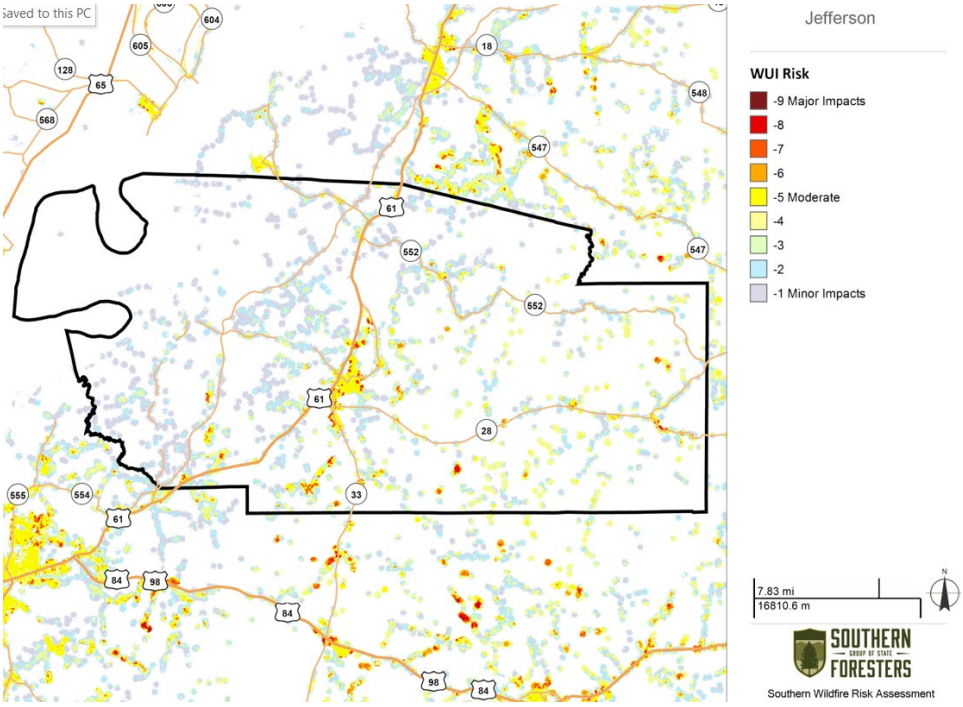
WILDFIRE

Although historical evidence indicates that Jefferson County is susceptible to wildfire events, there are few reports which include information on historic dollar losses. Therefore, it is difficult to calculate a reliable annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result in significant damages throughout the county.

To estimate exposure to wildfire, building data was obtained from Hazus-MH 5.1 which includes information that has been aggregated at the census block level and which has been deemed useful for analyzing wildfire vulnerability. However, it should be noted that the accuracy of Hazus data is somewhat lower than that of parcel data. For the critical facility analysis, areas of concern were intersected with critical facility locations.

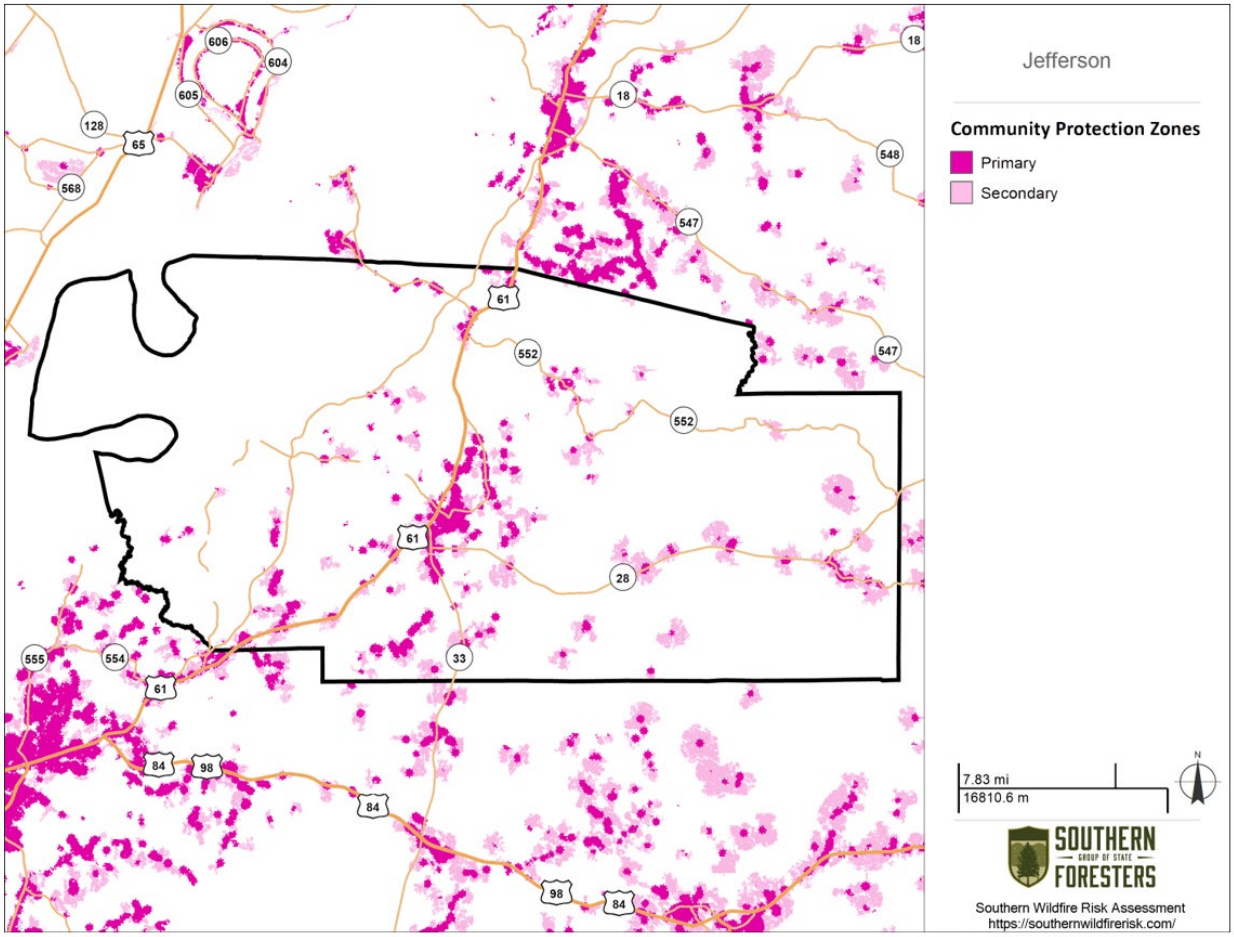
Figure C.22 shows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). Figure C.23 shows the areas of analysis where any grid cell is less than -4. Areas with a value below -4 were chosen to be displayed as areas of risk because this showed the upper echelon of the scale and the areas at highest risk.

FIGURE D.204: WUI RISK INDEX AREAS IN JEFFERSON COUNTY[49]



[49] Southern Wildfire Risk Assessment Data 2022

FIGURE D.25: COMMUNITY PROTECTION ZONES IN JEFFERSON COUNTY[50]



Social Vulnerability

Given some level of susceptibility across the entire county, it is assumed that the total population is at risk to the wildfire hazard. The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire.

For the Jefferson project area, it is estimated that 7,714 people or 99.8 % percent of the total project area population (7,726) live within the WUI.

Critical Facilities

The critical facility analysis revealed that there are 6 critical facilities located in wildfire areas of concern, including 1 EOC, 1 fire station, 2 medical care facilities, 1 police station, and 1 school. It should be noted, that several factors could impact the spread of a wildfire putting all facilities at risk. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

[50] Southern Wildfire Risk Assessment Data - 2022

In conclusion, a wildfire event has the potential to impact many existing and future buildings, critical facilities, and populations in Jefferson County.

EARTHQUAKE

As the Hazus-MH model suggests below, and historical occurrences confirm, any significant earthquake activity in the area is likely to inflict minor damage to the county.

For the earthquake hazard vulnerability assessment, a probabilistic 100-year earthquake scenario was created at the MEMA District 7 regional level to estimate the average annualized loss for the county. The results of the analysis are generated at the census tract level within Hazus-MH and then aggregated to the county level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss. They do not include losses to business interruption, lost income, or relocation.

The geographical size of the region is 4,838.70 square miles and contains 38 census tracts. There are over 67,000 households in the region which has a total population of 174,795 people (2010 Census Bureau data). There are an estimated 82,000 buildings in the region with a total building replacement value (excluding contents) of $13.9 billion dollars. Approximately 92.00 % of the buildings (and 70.00% of the building value) are associated with residential housing.

Social Vulnerability

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodation in temporary public shelters. The model estimates 0 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 174,795) will seek temporary shelter in public shelters.

Critical Facilities

The Hazus-MH probabilistic analysis did not indicate that any critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor to moderate damage should an event occur.

In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in Jefferson County. Specific vulnerabilities for these assets will be greatly dependent on their individual design and the mitigation measures in place. Such site-specific vulnerability determinations are outside the scope of this assessment but may be considered during future updates. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While Jefferson County may not experience a catastrophic earthquake, localized damage is possible with a moderate to larger scale occurrence.

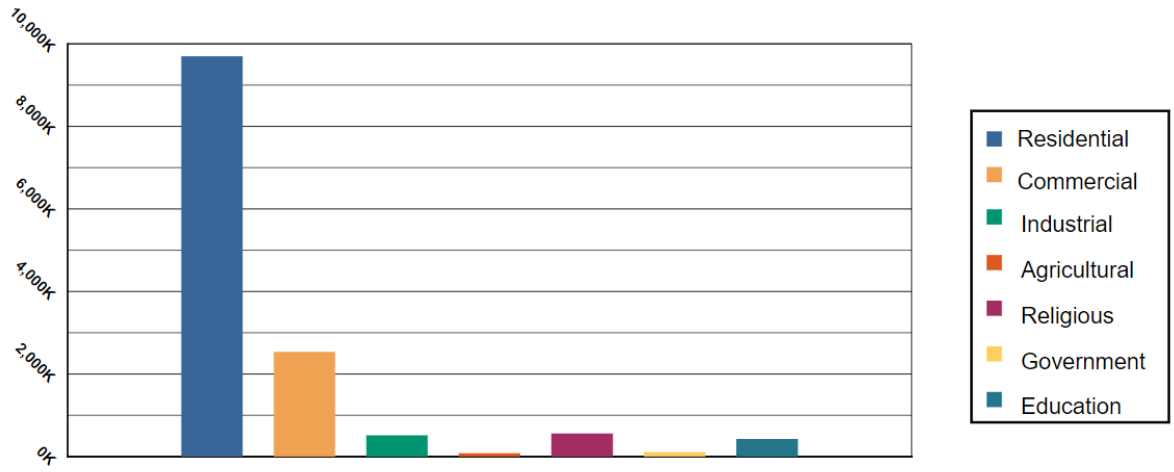
HURRICANE AND TROPICAL STORM

Historical evidence indicates that Jefferson County has significant risk to the hurricane and tropical storm hazard. There have been seven disaster declarations due to hurricanes as noted in pervious sections. Several tracks have come near or traversed through the county, as shown and discussed in Section D.2.10. Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses

from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard. Hazus-MH 5.1 was used to determine average annualized losses for the county as shown. Only losses to buildings, inventory, and contents are included in the results.

HAZUS was utilized to perform a 100-year hurricane simulation for MEMA District 7 Region. Hazus estimates that there are 82,485 buildings in the region which have an aggregate total replacement value of $13 billion dollars.

FIGURE C.2621: BUILDING EXPOSURE BY OCCUPANCY TYPE [51]



Social Vulnerability

Given some equal susceptibility across the entire county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard.

Critical Facilities

For essential facilities, there are 11 hospitals in the region with a total bed capacity of 605 beds. There are 90 schools, 74 fire stations, 32 police stations and 9 emergency operation facilities. HAZUS estimates that about 133 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 4 buildings that will be destroyed.

The total property damage losses were $71 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies, which made up over 95% of the total loss. The table below provides a summary of the losses associated with the building damage.

[51] HAZUS 100-year Hurricane Scenario

FIGURE C.2722: LOSS BY TYPE[52]

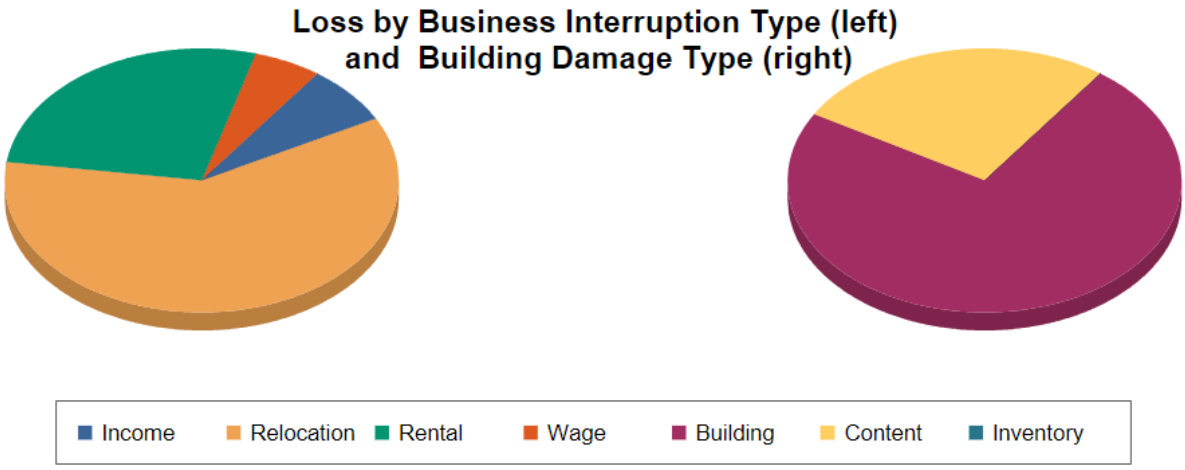
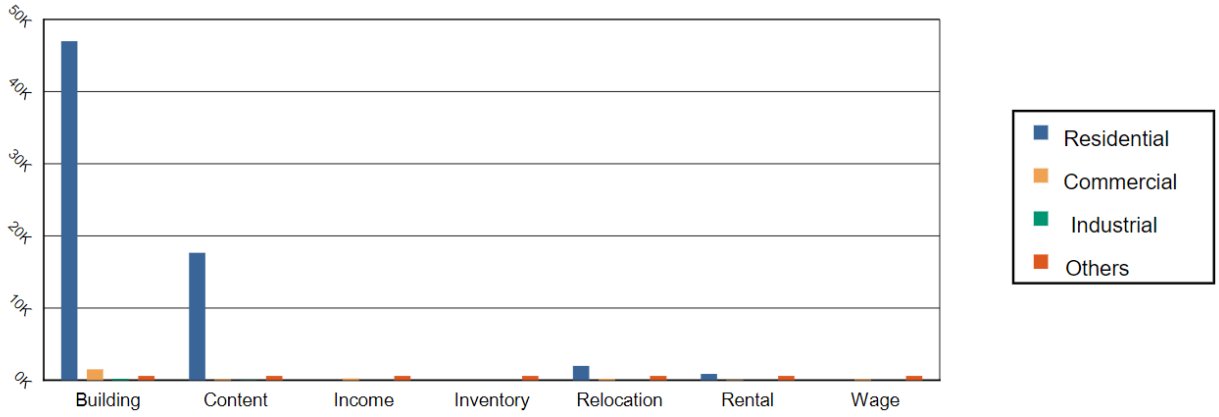


FIGURE C.2823: LOSS BY GENERAL OCCUPANCY



Given equal vulnerability across Jefferson County, all critical facilities are at risk. Some buildings may perform better than others in the face of such an event due to construction and age, among other factors. Determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation action for especially vulnerable structures and/or critical facilities to mitigate against the effects of the hurricane hazard. A list of specific critical facilities can be found at the end of this subsection. In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in Jefferson County.

RADIOLOGICAL EVENT

The location of Grand Gulf and River Bend Nuclear Stations north and south of the region, respectively, demonstrate that the county is at risk to the effects of a nuclear accident. Although there have not been

[52] HAZUS 100-year Hurricane Scenario

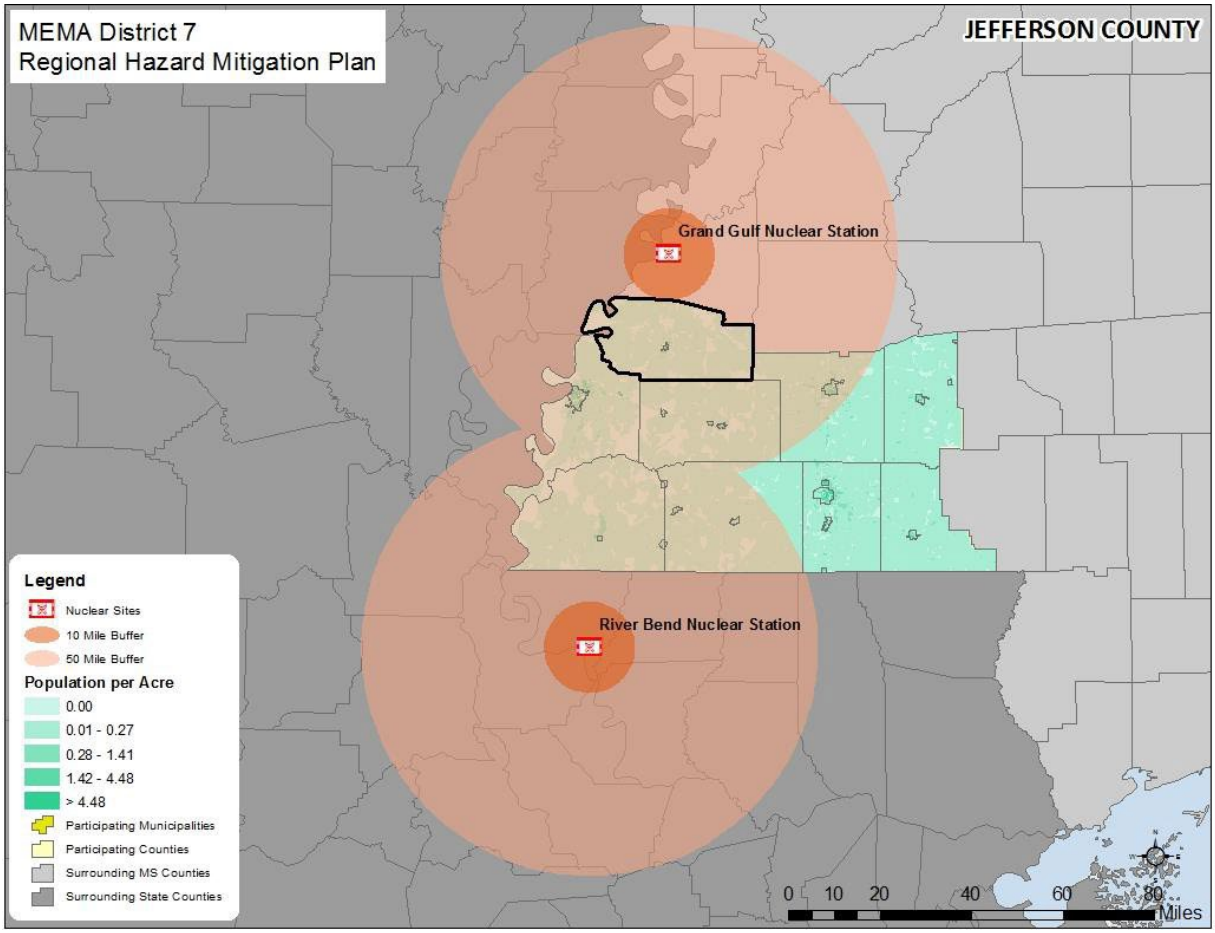
any major events at these plants in the past, there have been major events at other nuclear stations around the country. Additionally, smaller scale incidents at both these nuclear stations have occurred.

To assess nuclear risk, a GIS-based analysis was used to estimate exposure during a nuclear event within each of the risk zones described in Section D.2.14.

Social Vulnerability

Since the entire county is within the 50-mile buffer area, the entire population is considered to be at high risk to a radiological event.

FIGURE D.29: POPULATION DENSITY NEAR NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN JEFFERSON COUNTY



Critical Facilities

The critical facility analysis revealed that all 7 critical facilities in the county are located in the 50-mile nuclear buffer area, including 1 EOC, 1 fire station, 2 medical care facilities, 2 police stations, and 1 school. No critical facilities are in the 10-mile buffer area. A list of specific critical facilities and their associated risk can be found at the end of this section.

CONCLUSIONS ON HAZARD VULNERABILITY

The table below presents a summary of annualized loss for each hazard in Jefferson County. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

TABLE D.28: ANNUALIZED LOSS FOR JEFFERSON COUNTY[53]

Event	Jefferson County
Flood-related Hazards	
Dam & Levee Failure	Negligible
Erosion	Negligible
Flood	$154,600
Fire-related Hazards	
Drought	Negligible
Lightning	$1,428
Wildfire	Negligible
Geologic Hazards	
Earthquake[54]	
Temperature & Wind-related Hazards	
Extreme Heat	Negligible
Hailstorms	$4,584
Hurricane & Tropical Storm	$2,708,235
Severe Thunderstorm/High Wind	$47,735
Tornado	$39,111
Winter Storm & Freeze	$800,000
Other Hazards	
Radiological Event	Negligible
Pandemic	Negligible

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to atmospheric hazards including drought, lightning, extreme heat, hailstorm, hurricane and tropical storm, severe thunderstorm/high wind, tornado, and winter storm and freeze. Some buildings may be more vulnerable to these hazards based on other factors such as construction and building type. The following table shows the critical facilities vulnerable to the hazards analyzed in this section. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "X").

[53] "Negligible" is used to indicate that no records of dollar losses for the hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that event is not well kept.

[54] No historic losses for earthquake were recorded, so Hazus estimates were used.

TABLE D.29: AT-RISK CRITICAL FACILITIES IN JEFFERSON COUNTY

		FLOOD-RELATED				FIRE-RELATED			GEO	WIND-RELATED						HUM	
FACILITY NAME	FACILITY TYPE	Dam and Levee Failure	Erosion	Flood – 100 yr	Flood – 500 yr	Drought	Lightning	Wildfire	Earthquake	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Severe Thunderstorm/	Tornado	Winter Storm and Freeze	Radiological Event 10-mile area	Radiological Event 50-mile area
Jefferson County																	
Jefferson County EOC	EOC		X			X	X	X	X	X	X	X	X	X	X		X
Fayette Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		X
Red Lick/Lorman Volunteer Fire Department	VFD Station		X			X	X	X	X	X	X	X	X	X	X		X
Jefferson County Hospital	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
Jefferson County Nursing Home	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
Fayette Police Dept	Police Station		X			X	X	X	X	X	X	X	X	X	X		X
Jefferson County Sheriff	Police Station		X			X	X		X	X	X	X	X	X	X		X
Jefferson County Elementary School	School																
Jefferson County High School	School		X			X	X	X	X	X	X	X	X	X	X		X

D.4 JEFFERSON COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Jefferson County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in Section 7: Capability Assessment.

D.4.1 Planning and Regulatory Capability

The table below provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Jefferson County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. A dagger (†) indicates that the given item is administered for that municipality by the county. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the MEMA District 7 Regional Hazard Mitigation Plan.

TABLE D.30: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Threat and Hazard Identification and Risk Assessment (THIRA)	Comprehensive Land Use Plan	Floodplain Management Plan/Flood Mitigation Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Emergency Management Accreditation Program (EMAP Accreditation)	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment/ Reconstruction Plan/ Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System (CRS Program)
JEFFERSON COUNTY	✓		✓						✓						✓		✓							✓	
Fayette	†		†						†						†		✓	*				*		✓	

A more detailed discussion on the county's planning and regulatory capabilities follows.

EMERGENCY MANAGEMENT

Hazard Mitigation Plan

Jefferson County has previously adopted a hazard mitigation plan. The City of Fayette was also included in this plan.

Emergency Operations Plan

Jefferson County maintains an Emergency Operations Plan through its Emergency Management Agency. The City of Fayette is also covered by this plan.

GENERAL PLANNING

Comprehensive Land Use Plan

Jefferson County has adopted a county comprehensive plan. This plan also includes the City of Fayette.

FLOODPLAIN MANAGEMENT

The following table provides NFIP policy and claim information for each participating jurisdiction in Jefferson County.

TABLE D.31 NFIP POLICY AND CLAIM INFORMATION[55]

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
JEFFERSON COUNTY†	07/03/90	09/29/10	1	$1,750,000	28	$364,656.32
Fayette	09/29/10	09/29/10	0	$0	0	$0

All jurisdictions listed above that are participants in the NFIP will continue to comply with all required provisions of the program and will work to adequately comply in the future utilizing a number of strategies. For example, the jurisdictions will coordinate with MEMA and FEMA to develop maps and regulations related to special flood hazard areas within their jurisdictional boundaries and, through a consistent monitoring process, will design and improve their floodplain management program in a way that reduces the risk of flooding to people and property.

Flood Damage Prevention Ordinance

All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. Jefferson County and the City of Fayette both participate in the NFIP and have adopted flood damage prevention regulations.

D.4.2 Administrative and Technical Capability

The following table provides a summary of the capability assessment results for Jefferson County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill. A dagger (†) indicates a county-level staff member(s) provides the specified knowledge or skill to that municipality.

[55] †Includes unincorporated areas of county only
Source: NFIP Community Status information as of 7/2/2023; NFIP claims and policy information as of 7/2/2023

TABLE D.32: RELEVANT STAFF/PERSONNEL RESOURCES

Staff/Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
JEFFERSON COUNTY				✓	✓		✓	✓		
Fayette				†	✓		†	†		

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

D.4.3 Fiscal Capability

The following table provides a summary of the results for Jefferson County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource has previously been used to implement hazard mitigation actions. A dagger (†) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds).

TABLE D.33: RELEVANT FISCAL RESOURCES

Fiscal Tool/Resource	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes (or taxing districts)	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other: HMGP, PDM, HMA, NFIP, SBA, Homeland Security Grants, and other Federal sources, etc.
JEFFERSON COUNTY		†								†
Fayette		†								†

D.4.4 Political Capability

During the months immediately following a disaster, local public opinion in Jefferson County is more likely to shift in support of hazard mitigation efforts.

The table below provides a summary of the results for Jefferson County with regard to political capability. A checkmark (✓) indicates the expected degree of political support by local elected officials in terms of adopting/funding information.

TABLE D.34: LOCAL POLITICAL SUPPORT

Political Support	Limited	Moderate	High
JEFFERSON COUNTY		✓	
Fayette		✓	

D.4.5 Conclusions on Local Capability

The table below shows the results of the capability assessment using the designed scoring methodology described in Section 7: Capability Assessment. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. This information was reviewed by all jurisdictions and each jurisdiction provided feedback on the information included in the capability assessment. Local government input was vital to identifying capabilities. According to the assessment, the average local capability score for the county and its jurisdictions is 21.0, which falls into the limited capability ranking.

TABLE D.35: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
JEFFERSON COUNTY	24	Limited
Fayette	18	Limited

D.5 JEFFERSON COUNTY MITIGATION STRATEGY

This subsection provides the blueprint for Jefferson County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and the findings and conclusions of the capability assessment and risk assessment. In addition, this strategy was developed with the State Hazard Mitigation Plan Goals and Objectives in mind. For this update, each action identifies the State Hazard Mitigation Program Objective that it relates to. Additional Information can be found in Section 8: Mitigation Strategy and Section 9: Mitigation Action Plan.

D.5.1 Mitigation Goals

Jefferson County developed six mitigation goals in coordination with the other participating MEMA District 7 Region jurisdictions. The regional mitigation goals are presented below.

TABLE D.36: MEMA DISTRICT 7 REGIONAL MITIGATION GOALS

	Goal
Goal #1	Increase the overall public awareness of natural hazards that face the region.
Goal #2	Retrofit of critical facilities and/or critical infrastructure to lower the risk of damage from natural hazards.
Goal #3	General improvement of regional or local mitigation planning and capability.
Goal #4	Support State Identified Mitigation Initiatives such as saferooms and storm shelters, severe weather warning systems for universities and colleges, and severe weather notification systems for local communities.
Goal #5	Reduce loss of life, damage and loss of property and infrastructure, economic costs, including response, recovery and disruption of economic activity.
Goal #6	Foster cooperation among all levels of governments and the private sector with respect to improving, updating, and implementing the hazard mitigation plan.

D.5.2 Mitigation Action Plan

The mitigation actions proposed by Jefferson County and the City of Fayette are listed in the following individual Mitigation Action Plans.

Jefferson County Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implm. Sched.	Implementation Status (2023)
Prevention								
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	Jefferson County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2027	A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.
P-3	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist cities with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as cities develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Jefferson County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2027	Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.

P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Jefferson County Board of Supervisors/ City of Fayette Board of Alderman and Mayor	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Jefferson County Board of Supervisors/City of Fayette Board of Alderman and Mayor should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Jefferson County Board of Supervisors/ City of Fayette Board of Alderman and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2027	The Jefferson County Board of Supervisors/City of Fayette Board of Alderman and Mayor recognize that damage to public buildings from wind is a serious hazard affecting the ability of government to function during and after disasters. Roof and structural damage and loss of electrical service in county/city government buildings due to high winds can render these buildings at least temporarily unusable and can potentially cause disruptions in government services. Retrofits of essential government buildings have not been completed. Therefore, this action will remain in the plan to lessen potential wind damage to those structures.
PP-2	1.1	**Ground/Protect Critical Facilities and Equipment** – The Jefferson County Board of Supervisors will seek to upgrade electrical protective measures on critical facilities.	Lightning	Moderate	Jefferson County Board of Supervisors	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action. There are two sites identified for project implementation, 1) the County Sherriff's department, and 2) the administrative building for the County.
Natural Resource Protection								
NRP-1	1.6	**Bank Stabilization Along Riverbanks –** The Jefferson County Board of Supervisors/ City of	Flood, Erosion	High	Jefferson County Board of	Homeland Security grants,	2027	New Action.

		Fayette Board of Alderman and Mayor plan to embark on a bank stabilization project to shore up the riverbank in this area and prevent further damage.			Supervisors/ City of Fayette Board of Alderman and Mayor	USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county/city general and special funds		
Structural Projects								
SP-1	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm	High	Jefferson County Board of Supervisors/ City of Fayette Board of Alderman and Mayor	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	In progress - 2024	New Action. There are currently bank stabilization and 14 active erosion projects underway in coordination with the Emergency USDA Natural Resource Conservation Services.
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning	Hurricane, Winter Storm	High	Jefferson County Board of Supervisors/ City of Fayette Board of Alderman and Mayor in collaboration with the Mississippi Emergency Management Agency	General and special funds	In progress – 2027	Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. Jefferson County is in the process of filing the necessary paperwork to become "storm ready," so this action will remain in the plan. This action was combined with ES-9 since they were duplicate actions.

		and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.						
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, or other hazard leading to loss of electrical power	High	Jefferson County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	In progress – target completion 2027	This project remains ongoing and of significant interest to Jefferson County. Most importantly, a standby generator for the Jefferson County Courthouse. A sub-grant application was in development at the time of the plan update seeking funding for this project.
ES-3	1.8	**Improve Emergency Communications –** Purchase CodeRED® or other similar product to function as a high-speed telephone communications service for emergency notifications. This system allows County officials to telephone targeted areas of a municipality or the entire County in case an emergency situation requires immediate action such as a boil-water notice, missing child or evacuation notices.	Hurricane or other hazard leading to loss of traditional communications systems	High	Jefferson County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2025	This action has been modified from its original identification of satellite phones, to embrace newer and more effective technology.
ES-4	1.9	**Construct New Emergency Shelter –** The county should construct a 200-person evacuation shelter. When not needed for disaster related housing, the building will serve as a Community Center and can be rented by individuals for group functions such as family reunions, weddings, or class reunions.	Hurricane, Earthquake, Tornado or other hazard requiring the use of emergency shelters.	High	Jefferson County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2024	This remains in process, currently awaiting response from FEMA. The Jefferson County Board of Supervisors recognize the need to have modern, safe emergency shelters for county/city residents and evacuees from other areas during times of disaster. Currently a combination of schools, churches, and other government buildings are used. This works acceptably for short-term use, but for longer term needs as were seen in the

								Hurricane Katrina disaster, the presence of evacuees in these facilities for more than a few days caused a disruption in the facility's designed function. Since a new emergency shelter has not been constructed in Jefferson County, this action will remain in the plan.
ES-5	1.1	**Renovate Emergency Operations Center –** The EOC should secure and renovate another building or construct a new one of sufficient size to house all EOC staff and equipment.	Hurricane or other hazard requiring action from the EOC	NA	NA	NA	Deleted	The county has determined this is no longer an effective priority.
ES-6	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide system.	Tornado	High	Jefferson County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	In progress - 2024	This remains an ongoing project. There are currently two sirens. Many citizens in Jefferson County live in rural areas and small communities. In the event of inclement weather, it is essential that they receive timely warnings. The county has installed 1 new siren since 2005. Additional sirens should be installed, so this action will remain in the plan.
ES-7	1.1	**Improve Emergency Evacuation Routes –** Jefferson County sees the need to improve the condition of the evacuation routes including upgrading bridges where needed.	Radiological, wildfire, earthquake	High	Jefferson County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation grants, individual county general and special funds	In progress - 2024	The county remains in ongoing discussion about this project. Grand Gulf Nuclear Power Station is located in western Claiborne County. Part of the ten-mile Plume Emergency Planning Zone is in Jefferson County. The county is completely within the 50-mile Ingestion Emergency Planning Zone. Adequate warning systems and timely evacuation are the citizens only defense in the event of a release of contaminants from the facility. Also, if a release of radiological pollutants were to occur at Grand Gulf, many evacuees would come to or through Jefferson County. Therefore, this action will remain in the plan.
ES-8	1.1	**Upgrade Emergency Treatment Facilities –** Upgrade facilities, equipment, and training so that the hospital will be better able to	Radiological	High	Jefferson County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation	In progress - 2024	Grand Gulf Nuclear Power Station is located in western Claiborne County. Part of the ten-mile Plume Emergency

		respond to and treat patients suffering from radiological related illnesses.				grants, individual county general and special funds		Planning Zone is in Jefferson County. The county is completely within the 50-mile Ingestion Emergency Planning Zone. In the event of a release of radiological contaminants from Grand Gulf, many persons evacuating to or through Jefferson County as well as many county residents may need emergency medical treatment for radiological related illnesses. The Jefferson County Hospital has no facilities, equipment, or trained personnel to handle this type of emergency. Therefore, this action will remain in the plan.
ES-9	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Jefferson County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), individual city general and special funds	2027	New Action.
ES-5	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already	Tornado	Low	Jefferson County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	The County will not currently pursue this action, but are considering it under future	New Action.

		been installed**,** they should be upgraded and incorporated into the countywide/citywide system.					conditions.	
Public Education and Awareness								
PEA-1		**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Moderate	Jefferson County Board of Supervisors	N/A	Continuous/ongoing	Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan. The County conducts earthquake drills every year through the Great ShakeOut.
PEA-2		**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Jefferson County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP. There is continued interest within the county, but additional funding is needed to support this activity.
PEA-4	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-5	3.1	**Education: FireWise** – Recommend that public information and outreach workshops on the Firewise program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials,	Wildfire	High	Jefferson County Board of Supervisors through collaboration with the Southwest Mississippi	Mississippi Forestry Commission, general and special funds	2026	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their

		vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.			Planning and Development District, Inc.			risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan.
PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Jefferson County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	In progress - 2027	The county continues these discussions. Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Jefferson County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	In progress - 2027	This remains an ongoing project. The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the	Extreme Heat, Winter Storm, Freeze, and	Moderate	Jefferson County Board of Supervisors	FEMA Hazard Mitigation grants, individual city	2025	New Action

		potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning			general and special funds		
PEA-7	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Jefferson County Board of Supervisors	FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual city general and special funds	2026	New Action.
PEA-8	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Jefferson County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), individual city general and special funds	2024	New Action.
PEA-9	3.1	**Education: Public Outreach –** Develop a program to teach school aged children	Extreme Heat	Moderate	Jefferson County Board of	FEMA Hazard Mitigation grants,	2026	New Action.

		about the dangers of high heat and how to mitigate it and stay safe.			Supervisors	individual city general and special funds		

City of Fayette Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implm. Sched.	Implementation Status (2023)
Prevention								
P-1	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	City of Fayette Board of Aldermen and Mayor in collaboration with the Jefferson County Board of Supervisors and the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2023	A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.

P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist cities with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as cities develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	City of Fayette Board of Aldermen and Mayor in collaboration with the Jefferson County Board of Supervisors and the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2027	Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.
P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	City of Fayette Board of Aldermen and Mayor in collaboration with the Jefferson County Board of Supervisors	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Jefferson County Board of Supervisors/City of Fayette Board of Alderman and Mayor should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	City of Fayette Board of Alderman and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual	2027	The City of Fayette Board of Alderman and Mayor recognize that damage to public buildings from wind is a serious hazard affecting the ability of government to function during and after disasters. Roof and structural damage and loss of electrical service in county/city government buildings due to high winds can render these buildings at least temporarily unusable and can potentially cause disruptions in government services. Retrofits of essential government buildings have

						county general and special funds		not been completed. Therefore, this action will remain in the plan to lessen potential wind damage to those structures.
PP-2	1.1	**Ground/Protect Critical Facilities and Equipment** – The Jefferson County Board of Supervisors will seek to upgrade electrical protective measures on critical facilities.	Lightning	Moderate	City of Fayette Board of Aldermen and Mayor	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action.
Natural Resource Protection								
NRP-1	1.6	**Bank Stabilization Along Riverbanks –** The City of Fayette Board of Aldermen and Mayor plan to embark on a bank stabilization project to shore up the riverbank in this area and prevent further damage.	Flood, Erosion	High	Jefferson County Board of Supervisors/ City of Fayette Board of Alderman and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county/city general and special funds	2027	New Action.
Structural Projects								
SP-1	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm	High	Jefferson County Board of Supervisors/ City of Fayette Board of Alderman and Mayor	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	In progress - 2024	New Action. There are currently bank stabilization and 14 active erosion projects underway in coordination with the Emergency USDA Natural Resource Conservation Services.
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather	Hurricane, Winter Storm	High	Jefferson County Board of Supervisors/ City	General and special funds	In progress – target completion	Communities lack the skills and education needed to survive severe weather, before and during an event.

		operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.			of Fayette Board of Alderman and Mayor in collaboration with the Mississippi Emergency Management Agency		2027	Local emergency managers need to strengthen their hazardous weather operations. Jefferson County is in the process of filing the necessary paperwork to become "storm ready," so this action will remain in the plan. This action was combined with ES-9 since they were duplicate actions.
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, or other hazard leading to loss of electrical power	High	City of Fayette Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	In progress – target completion 2027	This project remains ongoing and of significant interest to the City of Fayette.
ES-3	1.8	**Improve Emergency Communications –** Purchase CodeRED® or other similar product to function as a high-speed telephone communications service for emergency notifications. This system allows County officials to telephone targeted areas of a municipality or the entire County in case an emergency situation requires immediate action such as a boil-water notice, missing child or evacuation notices.	Hurricane or other hazard leading to loss of traditional communications systems	High	City of Fayette Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general	2025	This action has been modified from its original identification of satellite phones, to embrace newer and more effective technology.

						and special funds		
ES-5	1.1	**Improve Emergency Evacuation Routes –** Jefferson County sees the need to improve the condition of the evacuation routes including upgrading bridges where needed.	Radiological, wildfire, earthquake	High	Jefferson County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation grants, individual county general and special funds	In progress - 2024	The county remains in ongoing discussion about this project. Grand Gulf Nuclear Power Station is located in western Claiborne County. Part of the ten-mile Plume Emergency Planning Zone is in Jefferson County. The county is completely within the 50-mile Ingestion Emergency Planning Zone. Adequate warning systems and timely evacuation are the citizens only defense in the event of a release of contaminants from the facility. Also, if a release of radiological pollutants were to occur at Grand Gulf, many evacuees would come to or through Jefferson County. Therefore, this action will remain in the plan.
ES-7	1.9	**Safe Rooms and Community Shelters –** The city should construct and/or encourage construction of safe rooms and community shelters.	Hurricane, Tornado or other hazard requiring the use of emergency shelters	High	City of Fayette Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual city general and special funds	2025	Implementation has been delayed due to focus on the pandemic since the last plan update.
ES-8	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide	Tornado	High	Jefferson County Board of Supervisors/ City of Fayette Board of Aldermen and Mayor	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	In progress - 2024	This remains an ongoing project. There are currently two sirens. Many citizens in Jefferson County live in rural areas and small communities. In the event of inclement weather, it is essential that they receive timely warnings. The county has installed 1 new siren since 2005. Additional sirens should be

		system.						installed, so this action will remain in the plan.
ES-9	1.1	**Upgrade Emergency Treatment Facilities –** Upgrade facilities, equipment, and training so that the hospital will be better able to respond to and treat patients suffering from radiological related illnesses.	Radiological	Low	City of Fayette Board of Aldermen and Mayor	Homeland Security grants, FEMA Hazard Mitigation grants, individual county general and special funds	In progress - 2024	Grand Gulf Nuclear Power Station is located in western Claiborne County. Part of the ten-mile Plume Emergency Planning Zone is in Jefferson County. The county is completely within the 50-mile Ingestion Emergency Planning Zone. In the event of a release of radiological contaminants from Grand Gulf, many persons evacuating to or through Jefferson County as well as many county residents may need emergency medical treatment for radiological related illnesses. The Jefferson County Hospital has no facilities, equipment, or trained personnel to handle this type of emergency. Therefore, this action will remain in the plan.
ES-10	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	City of Fayette Board of Aldermen and Mayor	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), individual city general and special funds	2027	New Action.
Public Education and Awareness								

PEA-2		**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	City of Fayette Board of Aldermen and Mayor and Jefferson County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP. There is continued interest within the county, but additional funding is needed to support this activity.
PEA-4	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the city.
PEA-5	3.1	**Education: FireWise** – Recommend that public information and outreach workshops on the Firewise program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	City of Fayette Board of Aldermen and Mayor and Jefferson County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, general and special funds	2026	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan.
PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a	Radiological	Low	City of Fayette Board of Aldermen and Mayor and Jefferson County Board of Supervisors through	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency	In progress - 2027	The county continues these discussions. Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore,

		release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.			collaboration with the Southwest Mississippi Planning and Development District, Inc.	Management Performance Grant, or other similar program in combination with individual county general and special funds		this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	City of Fayette Board of Aldermen and Mayor andJefferson County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	In progress - 2027	This remains an ongoing project. The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	City of Fayette Board of Aldermen and Mayor	FEMA Hazard Mitigation grants, individual city general and special funds	2025	New Action
PEA-7	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	City of Fayette Board of Aldermen and Mayor and Jefferson County Board of	FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual	2026	New Action.

					Supervisors	city general and special funds		
PEA-8	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic		City of Fayette Board of Aldermen and Mayor and Jefferson County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), individual city general and special funds	2024	New Action.
PEA-9	3.1	**Education: Public Outreach –** Develop a program to teach school aged children about the dangers of high heat and how to mitigate it and stay safe.	Extreme Heat		City of Fayette Board of Aldermen and Mayor and Jefferson County Board of Supervisors	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.

LAWRENCE COUNTY

This annex includes jurisdiction-specific information for Lawrence County and its participating municipalities. It consists of the following five subsections:

- E.1 Lawrence County Community Profile
- E.2 Lawrence County Risk Assessment
- E.3 Lawrence County Vulnerability Assessment
- E.4 Lawrence County Capability Assessment
- E.5 Lawrence County Mitigation Strategy

E.1 LAWRENCE COUNTY COMMUNITY PROFILE

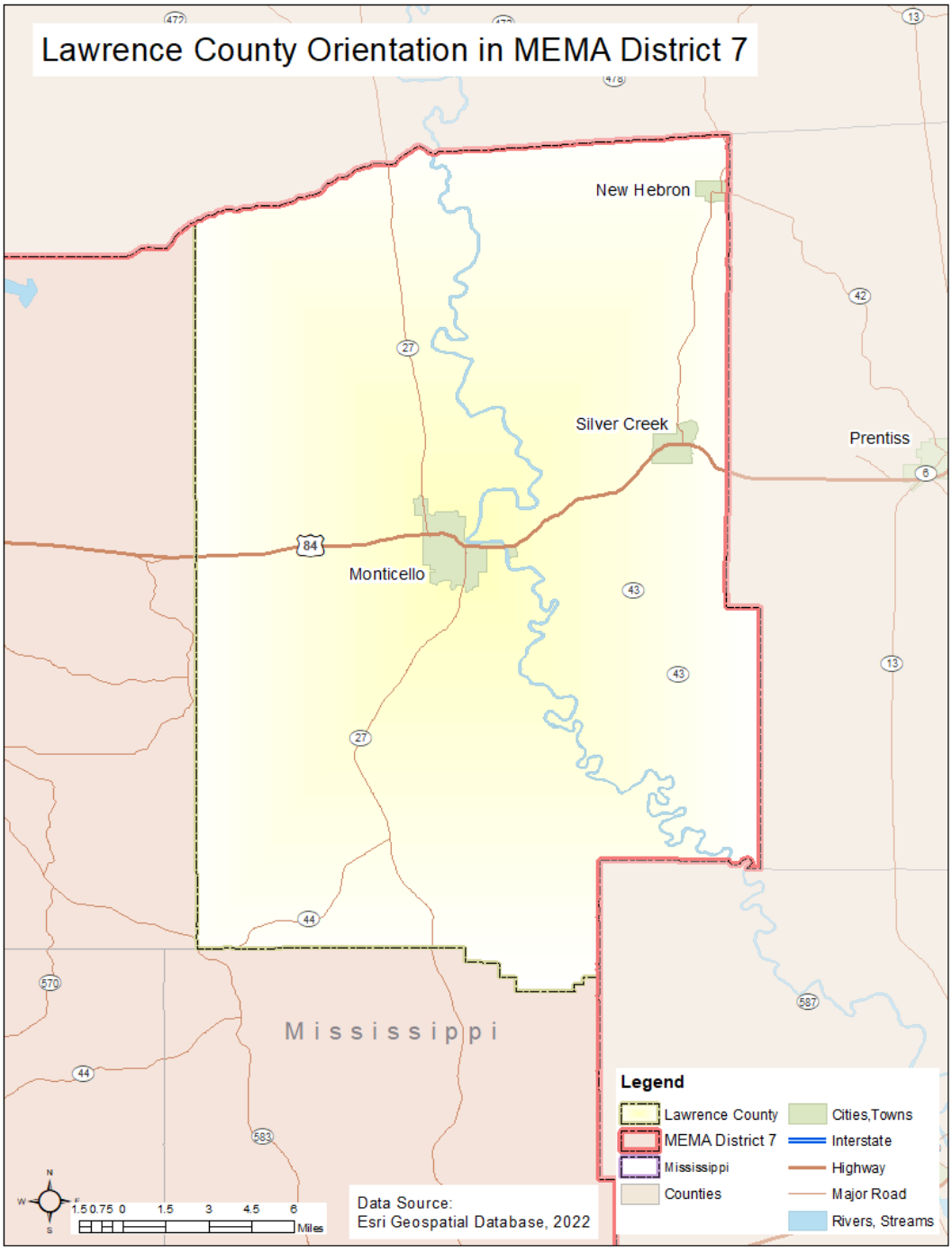
E.1.1 Geography and the Environment

Lawrence County is located in southwestern Mississippi. It comprises three towns, Town of Monticello, Town of New Hebron, and Town of Silver Creek, as well as many small unincorporated communities. The county is located to the east of the Mississippi River and is bisected by the Pearl River, supplying diverse recreational activities. An orientation map is provided in the figure below.

The total area of the county is 436 square miles, 5 square miles of which is water area.

Lawrence County enjoys four distinct seasons but the climate in the region is generally hot and humid compared to the rest of the United States given its latitude and relative proximity to the Gulf Coast. Precipitation is generally highest in winter months when the temperatures are moderately lower, but the likelihood of precipitation remains relatively constant throughout the year. Summers in the region can become fairly hot with average highs in the nineties and lows in the seventies. The region is also often susceptible to turbulent weather when warm, wet air from the Gulf of Mexico is pushed up into the region to mix with cooler air coming down from across the continent which can result in severe weather conditions. This is particularly true in the spring when seasons are changing and diverse weather patterns interact.

FIGURE E.1: LAWRENCE COUNTY ORIENTATION MAP



E.1.2 Population and Demographics

According to the 2020 Census, Lawrence County has a population of 12,016. The county continues to see a decrease in population since 2000, and the population density is 27.9 people per square mile. Population counts from the U.S. Census Bureau for 2000, 2010, and 2020 for the county and participating jurisdictions are presented in the table below.

TABLE E.1: POPULATION COUNTS FOR LAWRENCE COUNTY[1]

Jurisdiction	2000 Census Population	2010 Census Population	2020 Census Population	% Change 2000-2020
Lawrence County	**13,258**	**12,929**	**12,016**	**-7.06%**
Monticello	1,766	1,571	1,441	-18.40
New Hebron	447	447	386	-13.65
Silver Creek	217	210	175	-19.35

Based on the 2020 Census, the median age of residents of Lawrence County is 40.6 years. The racial characteristics of the county are presented in the table below. People identified as white make up the majority of the population in the county, accounting for 65.4% of the population.

TABLE E.2: DEMOGRAPHICS OF LAWRENCE COUNTY[2]

Jurisdiction	White	Black or African American	American Indian or Alaska Native	Asian	Native Hawaiian or Other Pacific Islander	Two or More Races	Persons of Hispanic Origin*
Lawrence County	**65.4%**	**32.6%**	**0.3%**	**0.5%**	**Z****	**1.2%**	**2.3%**
Monticello	61.3%	31.8%	2.3%	1.5%	0.0%	3.1%	0.0%
New Hebron	61.1%	36.0%	0.0%	0.0%	0.0%	2.9%	2.6%
Silver Creek	70.3%	26.5%	2.2%	0.0%	0.0%	1.1%	0.5%

* Persons of Hispanic Origin may be of any race, so also are included in applicable race categories.

** Value greater than zero but less than half unit of measure shown.

E.1.3 Housing

According to the 2021 U.S. Census, there are 5,757 housing units in Lawrence County, the majority of which are single family homes or mobile homes. Housing information for the county and municipality is presented in the table below.

TABLE E.3: HOUSING CHARACTERISTICS OF LAWRENCE COUNTY[3] [4] [5]

Jurisdiction	Housing Units (2000)	Housing Units (2010)	Housing Units (2021)	Median Home Value (2017-2021)
Lawrence County	**5,688**	**6,019**	**5,762**	**$100,400**
Monticello	754	742	808	$104,800

[1] *Source: United States Census Bureau, 2020 Census.*

[2] *Sources: United States Census Bureau, 2020 Census; American Community Survey, 2017-2021.*

[3] Sources: United States Census Bureau, 2000 Census, 2010 Census, and 2020 Census.

[4] United States Census. American Community Survey 5-Year Estimates. 2021. Retrieved on 01/12/2023 from: https://data.census.gov/table?q=median+housing+value+monticello+mississippi+new+hebron+mississippi+silver+creek+mississippi.

[5] United States Census. American Community Survey 5-Year Estimates. 2021. Retrieved on 01/12/2023 from: https://data.census.gov/table?q=median+housing+value+lawrence+county+mississippi.

New Hebron	205	207	228	$92,800
Silver Creek	96	104	65	$72,500

E.1.4 Infrastructure

TRANSPORTATION

In Lawrence County, U.S. Highway 84 provides access to the east and west and Mississippi Highway 27 provides access to the north and south.

Clay Airport is a general aviation airport centrally located in Lawrence County.

A major freight rail line operates within Lawrence County. Canadian National Railway is a Class I railway that operates and runs east to west and north to south in the county. Business and industries rely on this line along with various other major highway routes as distribution of merchandises.

UTILITIES

Electrical power in Lawrence County is provided by Entergy Mississippi Inc., Magnolia Electric Power Association, Pearl River Valley Electric Power Association, South Mississippi Electric Power Association, and Southern Pine Electric Power Association.

Water and sewer service is provided by participating jurisdictions and/or community-based associations, but unincorporated areas often rely on septic systems and wells in Lawrence County.

COMMUNITY FACILITIES

There are a number of buildings and community facilities located throughout Lawrence County. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 12 fire stations, 3 police stations (Town of Monticello, New Hebron, Silver Creek-Night watchman), and 6 schools located within the county (22 enrolled-new school for gifted children).

There are also 1 hospital with 3 medical care facilities located in Lawrence County.

The Pearl River, which runs through the county, has played an integral part in the history of the county. The river acted as a conduit for trade in the 19th century as plantations produced large quantities of cotton that could be shipped down to ports such as New Orleans. Apart from the Pearl River there are multiple water-based refuges, activities, and recreational features focused on local water bodies in the region. There are also numerous other small lakes, creeks, and other water bodies throughout the region that offer the outstanding outdoor recreational opportunities for which the region is known.

E.1.5 Land Use

Lawrence County has a blend of old and new development that contributes to physical, cultural, and economic attributes throughout the region. There are three incorporated municipalities located in the county. These areas are where the county's population is generally concentrated. The incorporated areas are also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the county generally consist of rural residential development, agricultural uses, and recreational areas. There are multiple county- and regional-based agencies that serve to coordinate growth and promote economic development. Local land use and associated regulations are further discussed in *Section 7: Capability Assessment.*

E.1.6 Employment and Industry

According to the Federal Reserve Bank's economic online database (i.e., Federal Reserve Economic Data, or FRED), in 2021, Lawrence County had an average annual employment of 4,294 workers and an average unemployment rate of 6.9% (compared to 5.6% for the state).[6] [7] [8] [9] In 2021, the educational services, health care and social assistance industry employed 22.5% of the county's workforce, followed by Manufacturing (14.8%), and then Retail Trade (12.4%).[10] The median household income in 2021 for Lawrence County was $39,443, compared to $49,111 for the state of Mississippi.[11]

Major employers include the Hood Industries – a sawmill in Silver Creek, the Delta Wood yard on Mill Road, and the papermill - Georga pacific (500 employees), which constitutes the county's largest employer with nearly 500 employees. All industries dependent on available land space, weather conditions, and water availability.

[6] Federal Reserve Bank of St. Louis. Federal Reserve Economic Data (FRED). Retrieved on 01/12/2023 from https://fred.stlouisfed.org/categories/28755

[7] Federal Reserve Bank of St. Louis. Federal Reserve Economic Data (FRED). Retrieved on 01/12/2023 from https://fred.stlouisfed.org/series/LAUCN280770000000005A.

[8] Federal Reserve Bank of St. Louis. Federal Reserve Economic Data (FRED). Retrieved on 01/12/2023 from https://fred.stlouisfed.org/series/LAUCN281570000000003A.

[9] Federal Reserve Bank of St. Louis. Federal Reserve Economic Data (FRED). Retrieved on 01/12/2023 from https://fred.stlouisfed.org/series/LAUST2800000000000003A.

[10] United States Census Bureau. American Community Survey 5-Year Estimates. 2021. Retrieved on 01/12/2023 from: https://data.census.gov/table?q=average+annual+employment+lawrence+county+mississippi+mississippi&tid=ACSDP5Y2021.DP03.

[11] United States Census Bureau. American Community Survey 5-Year Estimates. 2021. Retrieved on 01/12/2023 from: https://data.census.gov/table?q=average+annual+employment+lawrence+county+mississippi+mississippi&tid=ACSDP5Y2021.DP03.

E.2 LAWRENCE COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in Section 4: *Hazard Identification* as they pertain to Lawrence County. Each hazard profile includes a description of the hazard's location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in Section 5: *Hazard Profiles*.

FLOOD-RELATED HAZARDS

E.2.1 Dam and Levee Failure

LOCATION AND SPATIAL EXTENT

According to the Mississippi Department of Environmental Quality, there are no high hazard dams in Lawrence County.[12] This means that there are no direct actions that the county or participating jurisdictions can take to reduce the possibility of future dam failure events. However, there is one high hazard dam located outside of the county whose failure would potentially have impacts within Lawrence County. The area impacted by the failure of this dam would precisely reach those areas also impacted in the event of a 500 year flood event. The two figures below show the location of these high hazard dams as well as mapped inundation areas located nearby.

[12] The list of high hazard dams obtained from the Mississippi Department of Environmental Quality was reviewed and amended by local officials to the best of their knowledge.

FIGURE E.2: LAWRENCE COUNTY HIGH HAZARD DAM LOCATIONS

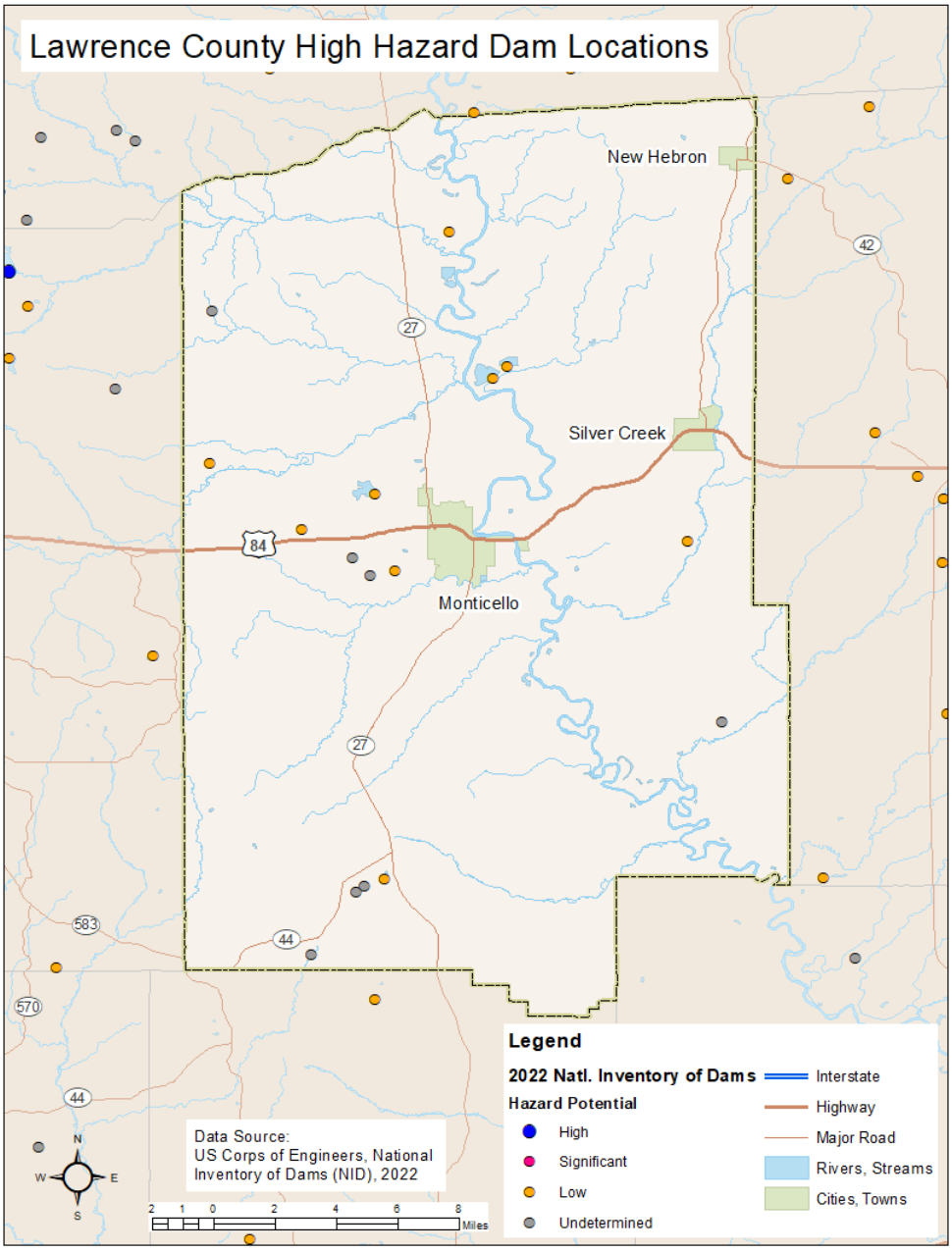


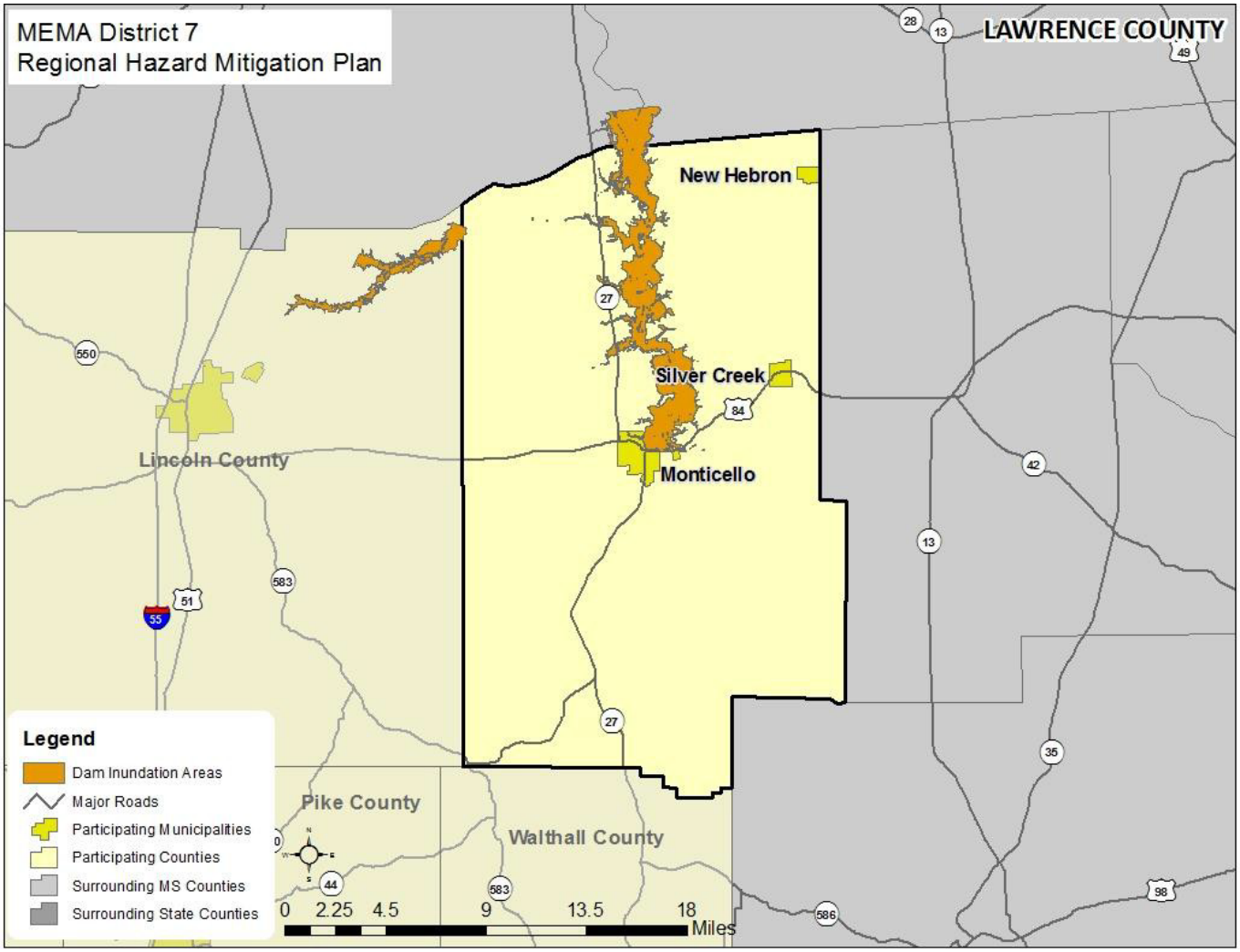
TABLE E.4 LAWRENCE COUNTY HIGH HAZARD DAMS[13]

Dam Name	Hazard Potential	Max Storage (ac/ft)	Dam Height (ft)
Lawrence County			
ROSS BARNETT RESERVOIR DAM*	High	540,000	64.0

*Although not located within the region, inundation mapping indicates that a failure of this dam would potentially have impacts within Lawrence County

[13] *Sources: U.S. Army Corps of Engineers; Mississippi Department of Environmental Quality*

FIGURE E.3: LAWRENCE COUNTY DAM INUNDATION AREAS[14]



HISTORICAL OCCURRENCES

The District 5 Hazard Mitigation Plan reports that flash flooding associated with the Barnett Reservoir West occurred on July 23, 2011 causing $300,000 worth of property damage to Rankin County. However, the plan indicates that there is no record of any significant damages, fatalities, or injuries associated with a dam failure in District 5. Ross Barnett Reservoir Dam is not indicated in the County's Dam Failure Events list covering 2010-2023 however, in February 2016 the Piney Woods Lake Dam overtopped, causing large slide on the downstream slope at an area between the left abutment and the middle of the dam. Outside of this reference, no mention is made to the potential failure of High Hazard Dams within Rankin County.

Due to the fact that there are no high hazard dams in Lawrence County, there have been no dam failures reported in Lawrence County. According to the Mississippi State Hazard Mitigation Plan, an upstream breach scenario in the region could be impactful.

[14] *Source: Mississippi Department of Environmental Quality*

While the inundation area map suggests that Lawrence County would be subjected to significant flooding in the event of an upstream dam failure, this area is already known to flood regularly, and impacts would be felt by no more than a dozen residential properties, already familiar with these kinds of flood events. In fact, the inundation area overlaps near precisely with the 500-year flood zone along the Pearl River. All homeowners in this area, through aware of the risk, have indicated that they have no intention of leaving the area.

PROBABILITY OF FUTURE OCCURRENCES

Given the current dam inventory, historic data, and minimal impact, this hazard will not be assessed further.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[15] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lawrence County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[16]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop and will lead to increased strain on dam storage capacity.[17]

E.2.2 Erosion

LOCATION AND SPATIAL EXTENT

Erosion in Lawrence County is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in Lawrence County are primarily rivers/streams and reservoirs. For example, Lawrence County is situated completely within the Pearl River Basin, an 8,700-square-mile watershed found in central and southern Mississippi.[18] The basin drains all or parts of 24 counties in Mississippi and three parishes in Louisiana.[19]

Generally, vegetation helps to prevent erosion in the area, but in recent years, erosion has become a growing threat to many of the participating counties and jurisdictions in Mississippi, including Lawrence County. In the Pearl River Basin, erosion has occurred due to cow grazing near streams and unprotected clear cuts of forests. [20]

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[15] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[16] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[17] Please note: there is no coastal flooding in Adams County.

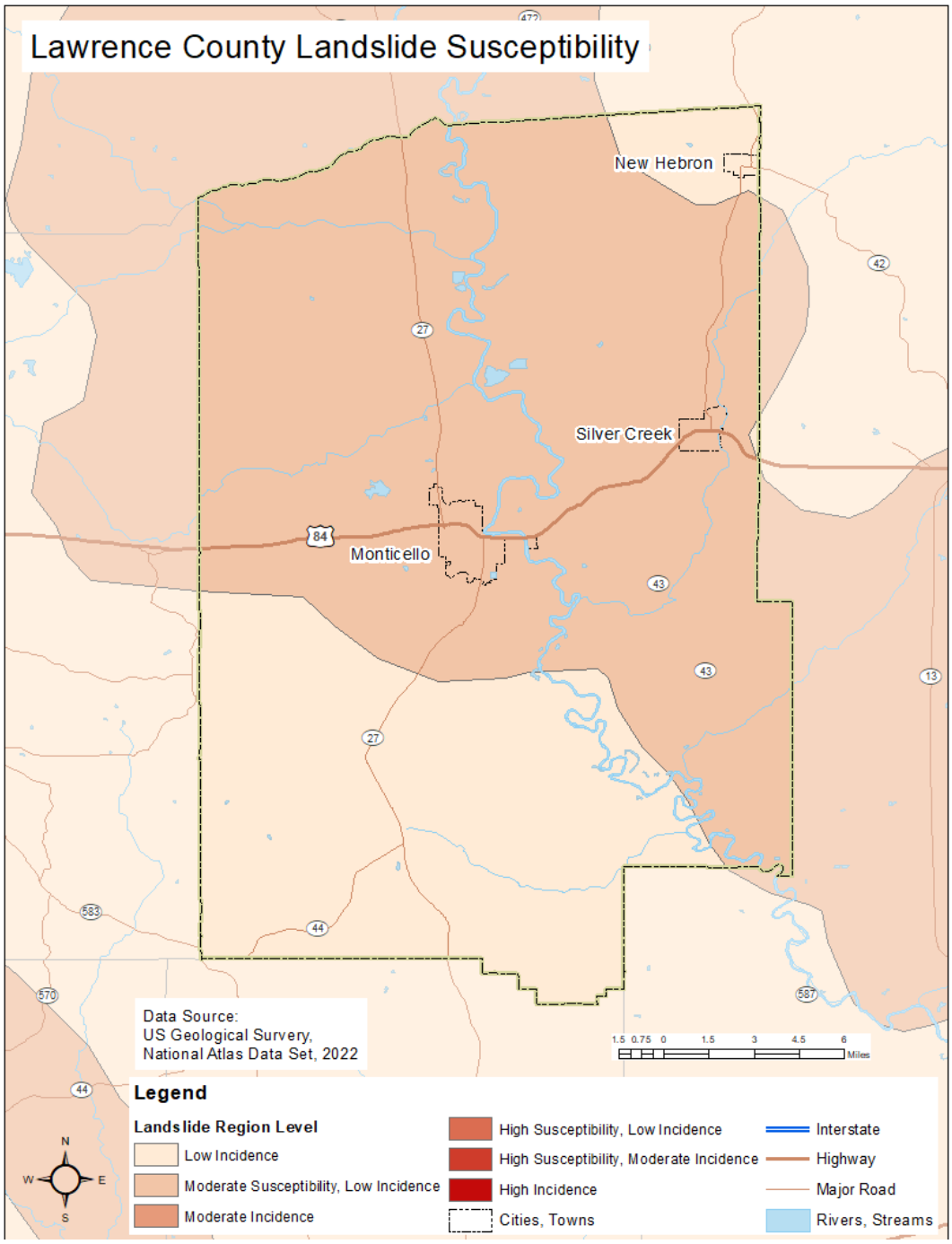
[18] *Citizen's Guide to Water Quality in the Pearl River Basin.* 2008. Mississippi Department of Environmental Quality. Retrieved on 01.01.2023 from https://www.mdeq.ms.gov/wp-content/uploads/2008/09/Pearl-River-Basin_Final_pr.pdf.

[19] *Citizen's Guide to Water Quality in the Pearl River Basin.* 2008. Mississippi Department of Environmental Quality. Retrieved on 01.01.2023 from https://www.mdeq.ms.gov/wp-content/uploads/2008/09/Pearl-River-Basin_Final_pr.pdf.

[20] *Citizen's Guide to Water Quality in the Pearl River Basin.* 2008. Mississippi Department of Environmental Quality. Retrieved on 01.01.2023 from https://www.mdeq.ms.gov/wp-content/uploads/2008/09/Pearl-River-Basin_Final_pr.pdf.

Currently, there are no regional or state-level data available on localized areas of erosion, so it is a challenge to identify particularly prone areas on a wider geographic scale. However, a few areas of concern were reported by members of the hazard mitigation council and other local sources. Locations within the Pearl River Basin are known to be especially at-risk, but there are locations in many areas within the region where erosion is prominent.

FIGURE E.4: LAWRENCE COUNTY LANDSLIDE SUSCEPTIBILITY



HISTORICAL OCCURRENCES

Several sources were vetted to identify areas of erosion in Lawrence County. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. The locations identified above are representative of areas where erosion has taken place in the past.

These incidents have caused major problems, as bridges have become damaged in many instances and made unsafe for emergency services vehicles to cross during and after storm events. This delays response times and critical life-safety support. In addition, the shutdown of roads has hurt local communities economically as trade and commerce are temporarily shut down as bridges are repaired. It has also caused disruption to daily activities for local school boards who must re-route buses around affected areas, causing additional fuel resources to be expended and increasing drive times for students.

Loss of taxable property. Potential for impacts on bridges and some housing stock. Major river overruns – gravel and concrete.

PROBABILITY OF FUTURE OCCURRENCES

Erosion remains a natural, dynamic, and continuous process for Lawrence County, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annually).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[21] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lawrence County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[22]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones. Both additional moisture and drying conditions can impact the rate of erosion, either by increasing the sediment transfer load due to volume and rate of flooding, or by dehydrating soils, limiting compaction, and increasing wind related erosion events.

E.2.3 Flood

LOCATION AND SPATIAL EXTENT

There are areas in Lawrence County that are susceptible to flood events. Special flood hazard areas in the county were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate

Maps (DFIRM). This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevations), and Zone X-500 (0.2-percent annual chance floodplain). According to

[21] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

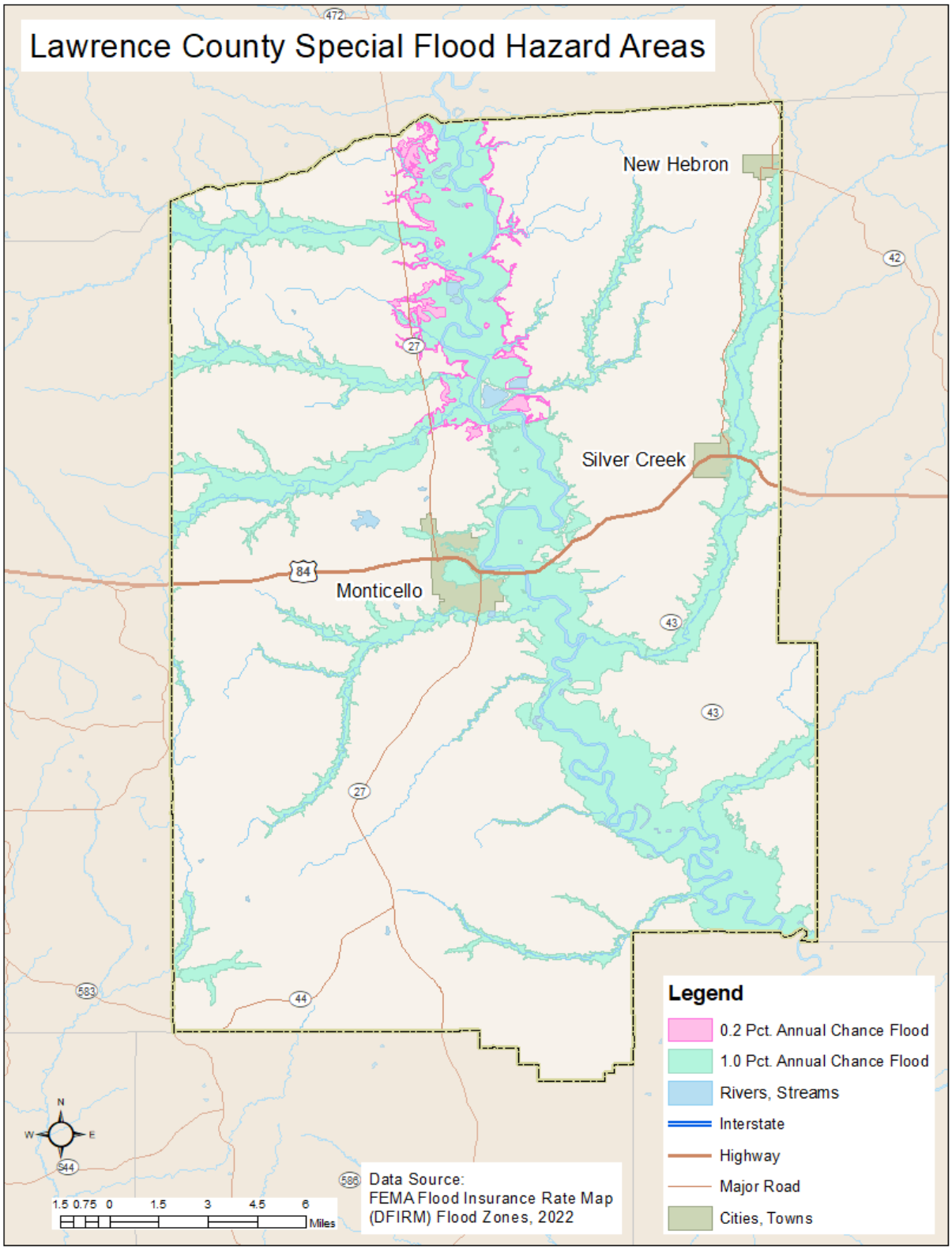
[22] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

GIS analysis, of the 442 square miles that make up Lawrence County, there are 89.92 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 2.72 square miles of land in zone X-500 (0.2 percent annual change floodplain/500-year floodplain).

These flood zone values account for 21.0 percent of the total land area in Lawrence County. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. The figure below illustrates the location and extent of currently mapped special flood hazard areas for Lawrence County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data[23].

[23] DFIRM data used for Jefferson County was updated in 2011.

FIGURE E.5: SPECIAL FLOOD HAZARD AREAS IN LAWRENCE COUNTY



HISTORICAL OCCURRENCES

Floods were at least partially responsible for 9 disaster declarations in Lawrence County in 1972, 1973, 1974, 1979, 1990, 2003, 2009, 2016 and 2020.[3] While additional disaster declarations involved flooding events during hurricanes, those declarations were captured under Hurricane Declarations.

Information from the National Centers for Environmental Information was used to ascertain additional historical flood events. The National Centers for Environmental Information reported a total of 32 events in Lawrence County since 1997.[24] A summary of these events is presented below. These events accounted for over $2,360,000 in property damage. Specific information on flood occurrences in Lawrence County can be found below.

TABLE E.5: SUMMARY OF FLOOD OCCURRENCES IN LAWRENCE COUNTY[25]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Monticello	11	0/0	$76,000	$3,040
New Hebron	2	0/0	$60,000	$2,400
Silver Creek	1	0/0	$50,000	$2,000
Unincorporated Area	18	0/0	$2,174,000	$86,960
LAWRENCE COUNTY TOTAL	**32**	**0/0**	**$2,360,000**	**$94,400**

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Flood Insurance Management Agency (FIMA) Flood Insurance Data Analytics, since 2019 Mississippi has had 47 floods of record with 22 closed with payment, 19 closed without payment, and 6 remaining open. A total of $545,506 has been made in payments. This FEMA dataset is the authoritative source for FEMA's public data. This product uses the Federal Emergency Management Agency's API but is not endorsed by FEMA. FEMA cannot verify the quality and/or timeliness of any data or any analysis derived there from after the data has been retrieved from FEMA.gov. This data set was last accessed on July 2, 2023, with records updated at most every 20 minutes or at least monthly, processed the first Saturday of the month at 1:00am EST.

According to FEMA flood insurance policy records as of July 2, 2023, there have been 9 flood losses reported in Lawrence County through the National Flood Insurance Program (NFIP) since 1978, totaling $125,215.93 in total building and $39,803.38 in contents claims payments. A summary of these figures for the county is provided in the table below. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought. It is likely that many additional instances of flood loss in Lawrence County were either uninsured or not reported.

[24] These flood events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1997 through November 2022. It is likely that additional occurrences have occurred and have gone unreported.

[25] Source NCEI. Annualized losses are calculated by dividing the total number of property damages by number of years of recordkeeping for the hazard.

TABLE E.6: SUMMARY OF INSURED FLOOD LOSSES IN LAWRENCE COUNTY THROUGH 2023[26]

Location	Number of Policies	Flood Losses	Claims Payments
Monticello	0	0	$0
New Hebron	0	0	$0
Silver Creek	0	0	$0
Unincorporated Area	6	9	$165,019.31
LAWRENCE COUNTY TOTAL	**6**	**9**	$165,019.31

REPETITIVE LOSS PROPERTIES

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Mississippi Emergency Management Agency in 2017, there are 4 non-mitigated repetitive loss properties located in Lawrence County, which have accounted for 19 losses and $378, 751.10 in claims payments under the NFIP. The average claim amount for these properties is $19,934.27. Of the 4 properties, all are single family. Without mitigation, these properties will likely continue to experience flood losses. The table below presents detailed information on repetitive loss properties and NFIP claims and policies for Lawrence County as documented in the last plan. Updated data could not be obtained.

TABLE E.7: REPETITIVE LOSS PROPERTIES IN LAWRENCE COUNTY[27,28]

Location	Number of Properties	Types of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Monticello	0	--	0	$0.00	$0.00	$0.00	$0.00
New Hebron	0	--	0	$0.00	$0.00	$0.00	$0.00
Silver Creek	0	--	0	$0.00	$0.00	$0.00	$0.00
Unincorporated Area	4	4 single-family	19	$281,282.44	$97,468.64	$378,751.10	$19,934.27
Lawrence County Total	**4**		**19**	**$281,282.44**	**$97,468.64**	**$378,751.10**	**$19,934.27**

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in Lawrence County, and the probability of future occurrences will remain highly likely (100 percent annual probability). The probability of future flood events based on magnitude and according to best available data is illustrated in the figure above, which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain).

Information from the floodplain location maps, previous occurrences, and repetitive loss properties indicates that flood risk varies throughout the county. For example, areas in the southwestern corner and central portion of the county contain more floodplains and therefore have a higher risk of flooding

[26] National Flood Insurance Program. National Flood Insurance Program. *Policy and Loss Data by Geography (HUDEX)*, 10.13.2022. Retrieved on 01/05/2023 from https://nfipservices.floodsmart.gov/sites/default/files/PolicyandLossDatabyGeography.xlsx.

[27] National Flood Insurance Program

[28] Current data on Repetitive Loss Properties data was not available for this plan update.

than the rest of the county. In addition, the proposed "One Lake" project near Byram may limit downstream flooding, which currently equates to a normal 0.2% flood event, which is within the response effort capacity of the County Emergency Management agency.

Flooding is not the greatest concern, but it will continue to occur and cause damage within the county. Therefore, mitigation actions may be warranted, especially for repetitive loss properties.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[29] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lawrence County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[30] As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased *coastal, fluvial (i.e., riverine) and pluvial (i.e., rainfall) flooding.*[31] More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

FIRE-RELATED HAZARDS

E.2.4 Drought

LOCATION AND SPATIAL EXTENT

Drought is a non-spatial hazard that typically covers a large area and cannot be confined to any geographic or political boundaries. As a result, it is assumed that all areas within Lawrence County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage directly to the built environment but may exacerbate wildfire conditions.

HISTORICAL OCCURRENCES

According to the U.S. Drought Monitor, Lawrence County had drought levels of Severe or worse in 4 of the last 13 years (January 2010-December 2022). The table below shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional, but a majority of the county may actually be in a less severe condition.

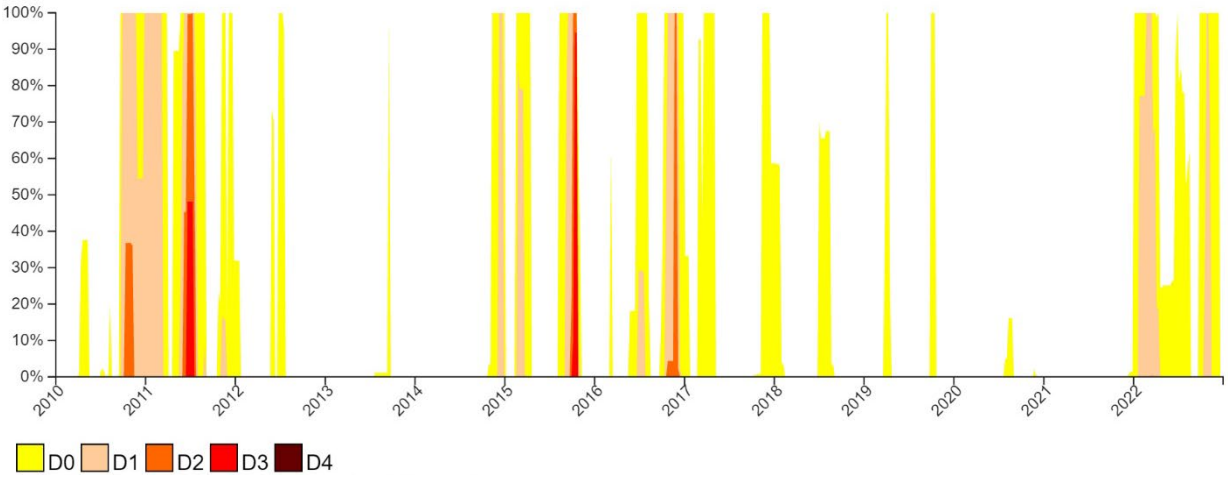
TABLE E.8: HISTORICAL DROUGHT OCCURRENCES IN LAWRENCE COUNTY[32]

[29] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[30] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[31] Please note: there is no coastal flooding in Lawrence County.

[32] U.S. Drought Monitor. Historical Conditions for Lawrence County, MS 2010 – 2022. Retrieved on 01/01/2023 from: https://www.drought.gov/states/mississippi/county/Lawrence



Some additional anecdotal information was provided from the National Centers for Environmental Information on droughts in Lawrence County.

Summer to Fall 2006 – During a four and a half month period, from June to the middle of October, abnormally dry conditions prevailed across most of the Jackson, MS County Warning Area (CWA). Widespread drought conditions were reported across the area during this time period. The U.S. Drought Monitor classified the drought as extreme (D3) over Southeast Mississippi. Drought conditions in the region peaked in intensity during early August over this area.

Summer 2007 – During the month of June, the drought peaked across the region. It held firm across the same areas since May with no expansion. What did expand was the severity as by the end of June, most of Central and East-Central Mississippi was now in extreme drought (D3) with some locations across Northeast Mississippi now experiencing exceptional drought (D4). The month of June did not offer much rain as most of the forecast area saw less than 40% of the normal rainfall.

Summer to Fall 2010 – Very dry conditions continued across central Mississippi during most of October. There were some rains that came late in the month which provided some temporary relief. Rainfall amounts ranged from a half to two inches with locally higher amounts. Most locations were 1 to 3 inches below normal for the month. The dry stretch resulted in severe (D2) drought conditions to expand during the month with even the portions of extreme (D3) drought conditions expanding as well. Crops were put under stress under the warm and dry conditions.

Fall 2015 – The very dry conditions continued across Central Mississippi in October. The extended dry stretch resulted in an area of Severe (D2) drought developing across the area by October 6th. The drought intensified and Extreme (D3) drought conditions developed by October 13th. Approximately 25 to 50 percent of normal rainfall occurred across this area from August into mid-October. Crops were put under more stress from the dry and hot conditions.

Fall to Winter 2016 – Dry conditions continued into November, which created continued stress on crops. The drought continued to get worse across the state through the month before some relief came in the form of showers and thunderstorms near the end of November.

Fall 2021 through 2022 – Severe drought conditions persisted throughout the state, beginning in December 2021 and continuing through the calendar year 2022. Conditions escalated to extreme

drought from January to March, before resolving In December. Throughout this period many counties also experienced flooding events indicating that while rainfall is still occurring, the shorter, more intense bursts do not resolve the drought conditions that softer more steady rainfall would address. The beginning of 2023 saw increased rainfall and a lightening of drought conditions overall.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that Lawrence County has a probability level of possible (between 1 and 10 percent annual probability) for future drought events. However, the extent (or magnitude) of drought and the amount of geographic area covered by drought, varies each year. Historic information indicates that there is a much lower probability for extreme, long-lasting drought conditions in Lawrence County.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[33] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lawrence County. With increasing global surface temperatures, the possibility of more *droughts* and increased frequency and intensity of storms will likely occur.[34] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

E.2.5 Lightning

LOCATION AND SPATIAL EXTENT

Lightning occurs randomly; therefore, it is impossible to predict where and with what frequency it will strike. It is assumed that all of Lawrence County is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, there have been 3 recorded lightning events that have affected Lawrence County since 1950, depicted in the table below. In 2003 a lightning strike impacted a tower located at the Sherriff's office cause $24,000 in damages. In January 2023, the county expended $42,000 due to several days of power outages following a lightning strike. A similar instance occurred in February 2023, and power outages lasted for 6 days. According to the National Lightning Detection Network (NLDN) displayed in the figure below, there are 63.4 lightning events per square kilometer per year in Lawrence County.[35] As a result, it is likely that lightning events have more generated property damage in Lawrence County than has been reported.

[33] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

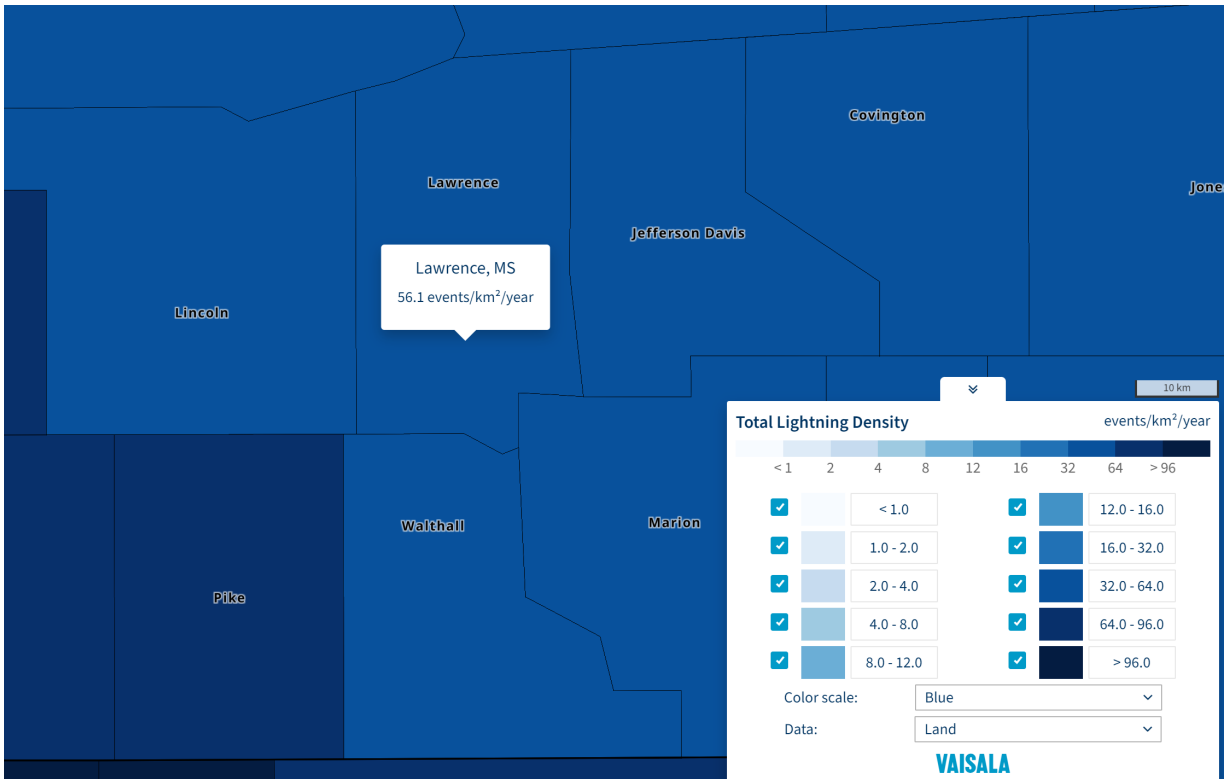
[34] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[35] Vaisala – U.S. National Lightning Detection Network. Retrieved on 01/02/2023 from: https://interactive-lightning-map.vaisala.com/?_ga=2.142433206.529238712.1672682694-816443770.1672682579

TABLE E.9: SUMMARY OF LIGHTNING OCCURRENCES IN LAWRENCE COUNTY[36]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Monticello	1	0/0	$20,000	$1,250
New Hebron	0	0/0	$0	$0
Silver Creek	0	0/0	$0	$0
Unincorporated Area	2	0/0	$138,000	$8,625
LAWRENCE COUNTY TOTAL	**3**	**0/0**	**$158,000**	**$9,875**

FIGURE E.6: VAISALA'S NLDN MAP OF LIGHTNING DENSITY – LAWRENCE COUNTY[37]



PROBABILITY OF FUTURE OCCURRENCES

Although there have been no historical lightning events reported in Lawrence County via National Centers for Environmental Information data, lightning events are regular occurrences in the region that threaten both life and property. It is expected that future lightning events will happen on an annual basis in Lawrence County, and will continue to threaten life and cause minor property damage throughout the region. Therefore, the probability of future lightning events in Lawrence County is highly likely (100 percent annual probability).

[36] *Source: National Centers for Environmental Information.*

[37] Vaisala – U.S. National Lightning Detection Network. Retrieved on 01/02/2023 from: https://interactive-lightning-map.vaisala.com/?_ga=2.142433206.529238712.1672682694-816443770.1672682579

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[38] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lawrence County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *lightning strike events*.[39] As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

E.2.6 Wildfire

LOCATION AND SPATIAL EXTENT

The entire Lawrence County area is at risk to a wildfire occurrence, and locations near the urban-wildland interface – where populations abut formerly undeveloped areas – are particularly susceptible to wildfire hazards. Drought conditions and high levels of fuel on the forest floor may make a wildfire more likely. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

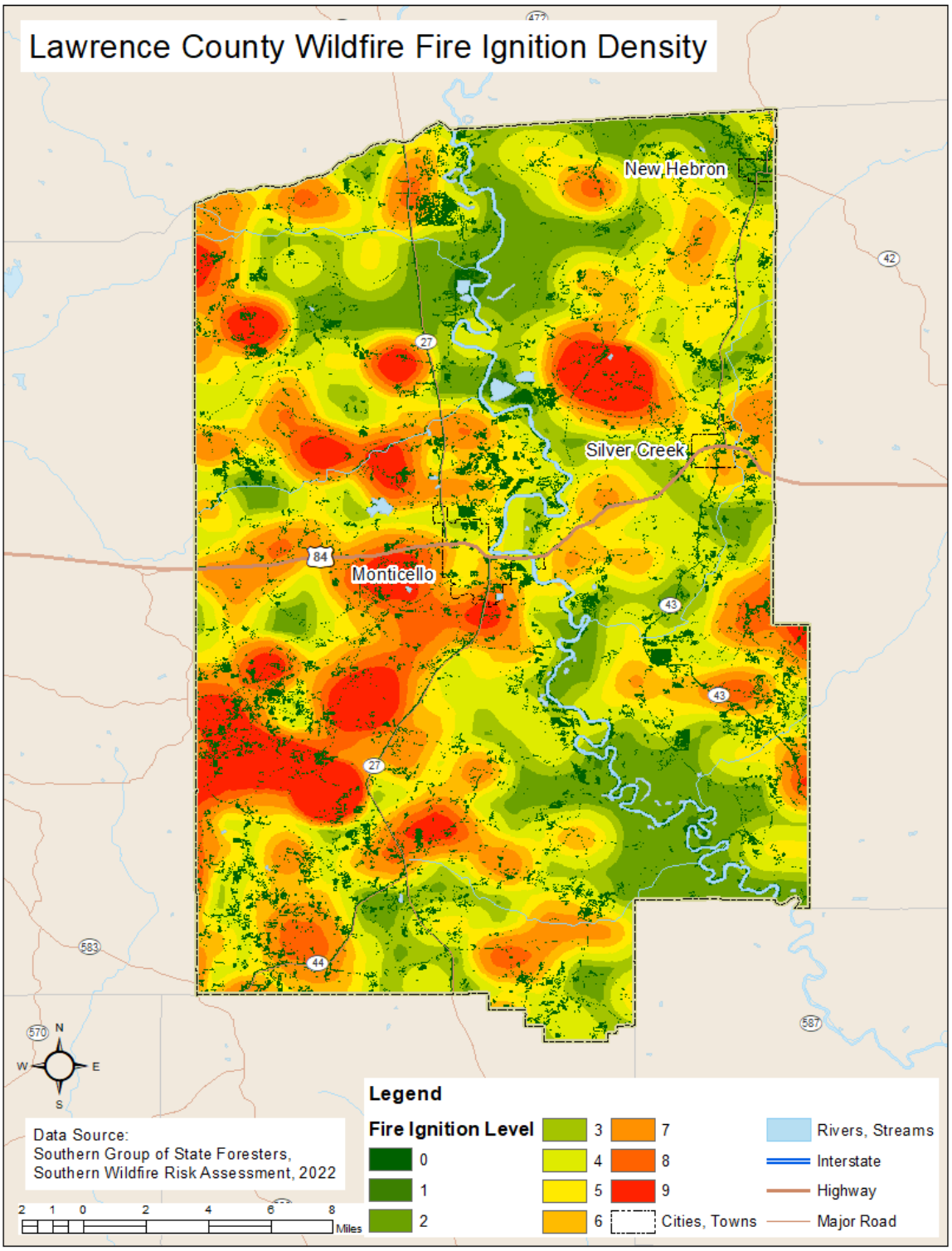
HISTORICAL OCCURRENCES

The map below shows Wildfire Ignition Density across Lawrence County and is based on data from the Southern Wildfire Risk Assessment. This map provides information on historic locations of wildfire ignitions and shows the likelihood of a wildfire igniting in a particular area. Wildfire occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map and is measured in the number of fires per year per 1,000 acres.[8]

[38] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[39] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

FIGURE E.7: WILDFIRE IGNITION DENSITY IN LAWRENCE COUNTY



Based on data from the Mississippi Forestry Commission, Lawrence County experienced an annual average of 17.75 wildfires per year from 2015 to 2022; these wildfires burned a combined 222.75 acres per year during that period. The data indicate that most of these fires were small to moderate in size, averaging about 9.20 acres per fire. The tables below provide a summary of wildfire occurrences in Lawrence County from 2015 to 2022, and lists the number of reported wildfire occurrences in the county between the years 2012 and 2022.

TABLE E.10: SUMMARY TABLE OF ANNUAL WILDFIRE OCCURRENCES (2015-2022)[40]

	Lawrence County
Average Number of Fires Per Year	17.75
Average Number of Acres Burned Per Year	222.75
Average Number of Acres Burned Per Fire	9.20

TABLE E.11: HISTORICAL WILDFIRE OCCURRENCES IN LAWRENCE COUNTY (2012-2022)[41]

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Lawrence County												
Number of Fires	20	11	24	21	23	13	9	18	4	13	41	197
Number of Acres Burned	219	129	483	136	144	90	61	200	22	57	1,072	2,613

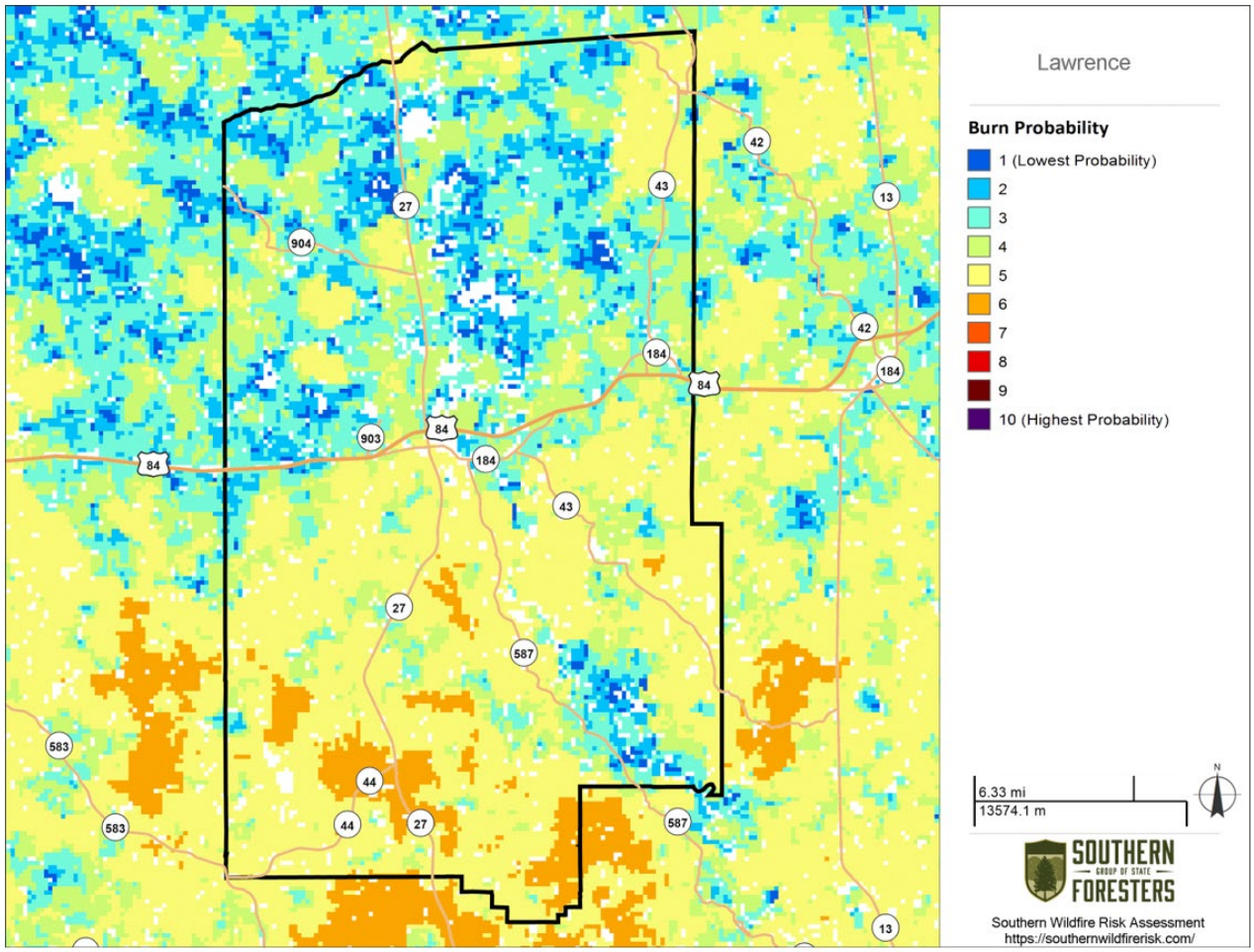
PROBABILITY OF FUTURE OCCURRENCES

The figure below shows there is some probability a wildfire will occur in Lawrence County, and that wildfire events will be an ongoing occurrence in the county. The likelihood of wildfire events will increase during drought cycles and abnormally dry conditions. While wildfires are likely to stay small in size, their areal coverage could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. Highly developed areas will be less susceptible to wildfires, unless they are located near the urban-wildland interface. The risk of wildfire losses will vary based on the assets that exist in different parts of the county. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate, compared to rural, mainly forested areas. The probability assigned to Lawrence County for future wildfire events is highly likely (100 percent annual probability).

[40] *Mississippi Forestry Commission – 2015 - 2022*

[41] *Mississippi Forestry Commission*

FIGURE E.8: BURN PROBABILITY IN LAWRENCE COUNTY



FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[42] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lawrence County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency *wildfire events*.[43]

[42] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf.

[43] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

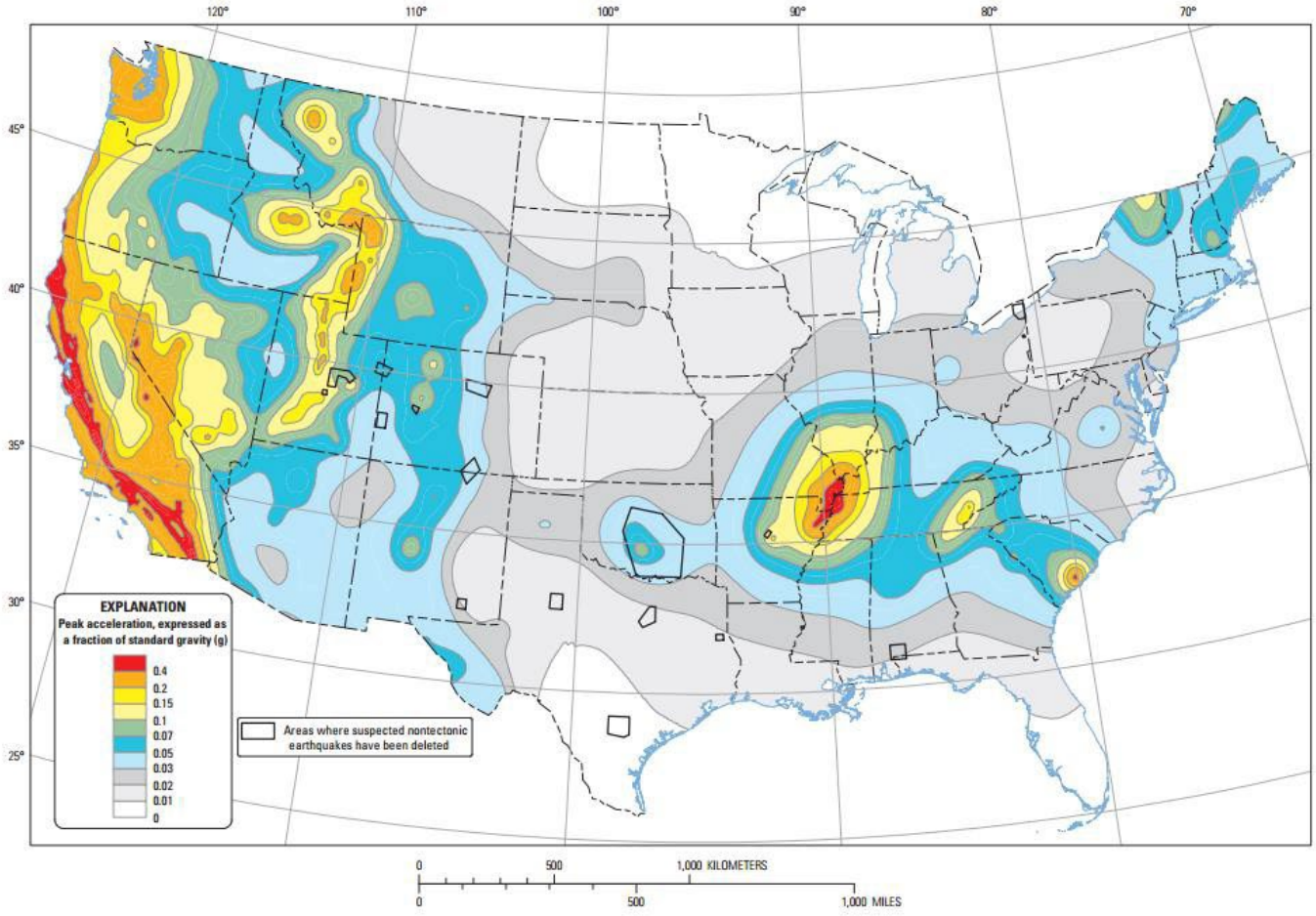
GEOLOGIC HAZARDS

E.2.7 Earthquake

LOCATION AND SPATIAL EXTENT

The figure below is a map that shows the probability that ground motion will reach a certain level during an earthquake in different parts of the U.S., as indicated by data peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Lawrence County lies within an approximate zone of level "0.01" to "0.03" ground acceleration. This indicates that the county exists within an area of low seismic risk.

FIGURE E.9: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS[44]



Ten-percent probability of exceedance in 50 years map of peak ground acceleration

[44] United States Geological Survey, 2014

The primary source of potential damage to Lawrence County from an earthquake is the New Madrid Seismic Zone (NMSZ). Historically, a series of earthquakes in 1811 and 1812 demonstrated that this fault zone can produce high magnitude seismic events, sometimes on the scale of a 7.5-8.0 on the Richter scale. The biggest challenge with earthquakes that occur in this area of seismic activity is predicting the recurrence of earthquakes emanating from the NMSZ. Although the magnitude of earthquakes from the NMSZ can be large, they occur very irregularly and infrequently. This makes it extremely difficult to predict when they will occur.

It should also be noted that the State of Mississippi Hazard Mitigation Plan identifies certain areas of concern for liquefaction and lists the counties and corresponding zones within those counties that have the highest liquefaction potential. Lawrence County does not have any identified liquefaction potential risk.

The following figure shows the Modified Mercalli Intensity Scale. The lower numbers of the intensity scale generally deal with the way the earthquake is felt by people. The higher numbers of the scale are based on observed structural damage. Structural engineers usually contribute information for assigning intensity values of VIII or above.

FIGURE E.10: MODIFIED MERCALLI INTENSITY SCALE (MMI)

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest,especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

HISTORICAL OCCURRENCES

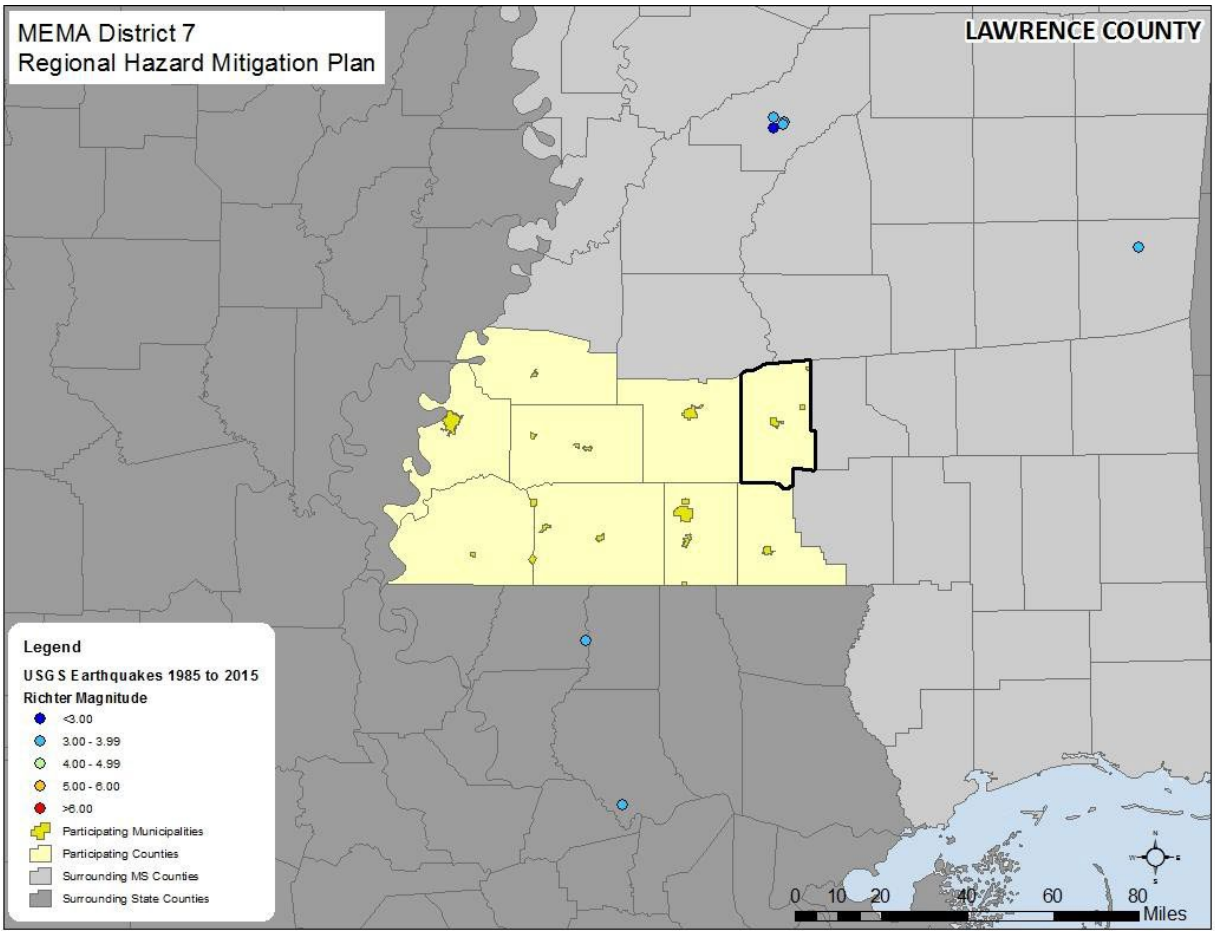
No earthquakes are known to have affected Lawrence County since 1638. The tables below provides a summary of earthquake events reported by the National Centers for Environmental Information (formerly National Geophysical Data Center) between 1638 and 1985, and the figure presents a map showing earthquakes whose epicenters have occurred near the county between 1985 and 2023 (no earthquakes occurred within the county's boundaries during this period). The table presents a detailed

occurrence of each event including the date, distance for the epicenter, magnitude, and Modified Mercalli Intensity (if known).[45]

TABLE E.12: SUMMARY OF SEISMIC ACTIVITY IN LAWRENCE COUNTY[46]

Location	Number of Occurrences	Greatest MMI Reported	Greatest Richter Scale Reported
Monticello	0	--	--
New Hebron	0	--	--
Silver Creek	0	--	--
Unincorporated Area	0	--	--
LAWRENCE COUNTY TOTAL	**0**	**--**	**--**

FIGURE E.11: HISTORIC EARTHQUAKES WITH EPICENTERS NEAR LAWRENCE COUNTY (1985-2023)[47]



[45] Due to reporting mechanisms, not all earthquake events were recorded during this time. Furthermore, some are missing data, such as the epicenter location, due to a lack of widely used technology. In these instances, a value of "unknown" is reported.

[46] *Source: National Centers for Environmental Information*

[47] *Source: United States Geological Survey*

TABLE E.13: SIGNIFICANT SEISMIC EVENTS IN LAWRENCE COUNTY (1638 -1985)[48]

Location	Date	Epicentral Distance	Magnitude	MMI
Monticello				
None reported	--	--	--	--
New Hebron				
None reported	--	--	--	--
Silver Creek				
None reported	--	--	--	--
Unincorporated Area				
None reported	--	--	--	--

PROBABILITY OF FUTURE OCCURRENCES

The probability of significant, damaging earthquake events affecting Lawrence County is unlikely. However, it is possible that future earthquakes resulting in light or moderate perceived shaking and damages will affect the county more frequently. The annual probability level for the county is estimated to be less than 1 percent (unlikely).

TEMPERATURE & WIND RELATED HAZARDS

E.2.8 Extreme Heat

LOCATION AND SPATIAL EXTENT

Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries. Therefore, the entire county is equally susceptible to extreme heat.

HISTORICAL OCCURRENCES

Information from the National Centers for Environmental Information was used to determine historical extreme heat occurrences in Lawrence County. While no extreme heat events were reported in the county, several events were reported in the surrounding region.

Summer of 2000 Heat Wave – Hot temperatures persisted from July to September across the South and Plains. Known as the Summer of 2000 Heat Wave, high temperatures commonly peaked over 100 degrees.

August 2005 – A "HOT" stretch of weather occurred during the middle to later part of August 2005. This "Heat Wave" covered a large portion of the south and lasted for a period of about 10 days. Each of these days had high temperatures consistently between 95 and 100 degrees, with 1 or 2 of these days reaching 100 degrees or more. Additionally, overnight lows remained warm with lower and middle 70s recorded. This is the first time since August 2000 where 100-degree temperatures were reached in this area as well as having such an extended period of "HOT" weather.

[48] Source: National Centers for Environmental Information.

July 2006 – A small "heat wave" gripped the region during the middle of July with high temperature ranging from the upper 90s to around 100 degrees for five days with overnight lows only reaching the middle 70s. The hottest temperatures during this period occurred from the Mississippi Delta, across northern Mississippi and then down to the Jackson Metro and toward Meridian. This area peaked between 100 and 102 degrees for at least two days during the hot five-day stretch.

August 2007 – During the first half of August, a heat wave took hold of the region and brought some of the warmest temperatures since the summer of 2000. This heat wave began around August 5th and lasted until the 16th. Between August 10th and 15th, the entire area reached 100 degrees or higher. Twenty- three record highs were also set during this time. As the temperature soared each day, high relative humidity's resulted in heat index values between 105 and 112 degrees.

August 2010 – A four day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS Jackson, MS forecast area, 19 record highs were set between August 1st and 4th. On August 2nd, the 2nd warmest average temperature was recorded. The low was 78 and the high 105, this resulted in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in 3 fatalities across the forecast area.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Lawrence County has a probability level of likely (between 10 and 100 percent annual probability) for future extreme heat events.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[49] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lawrence County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *extreme heat* events.[50] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

E.2.9 Hailstorm

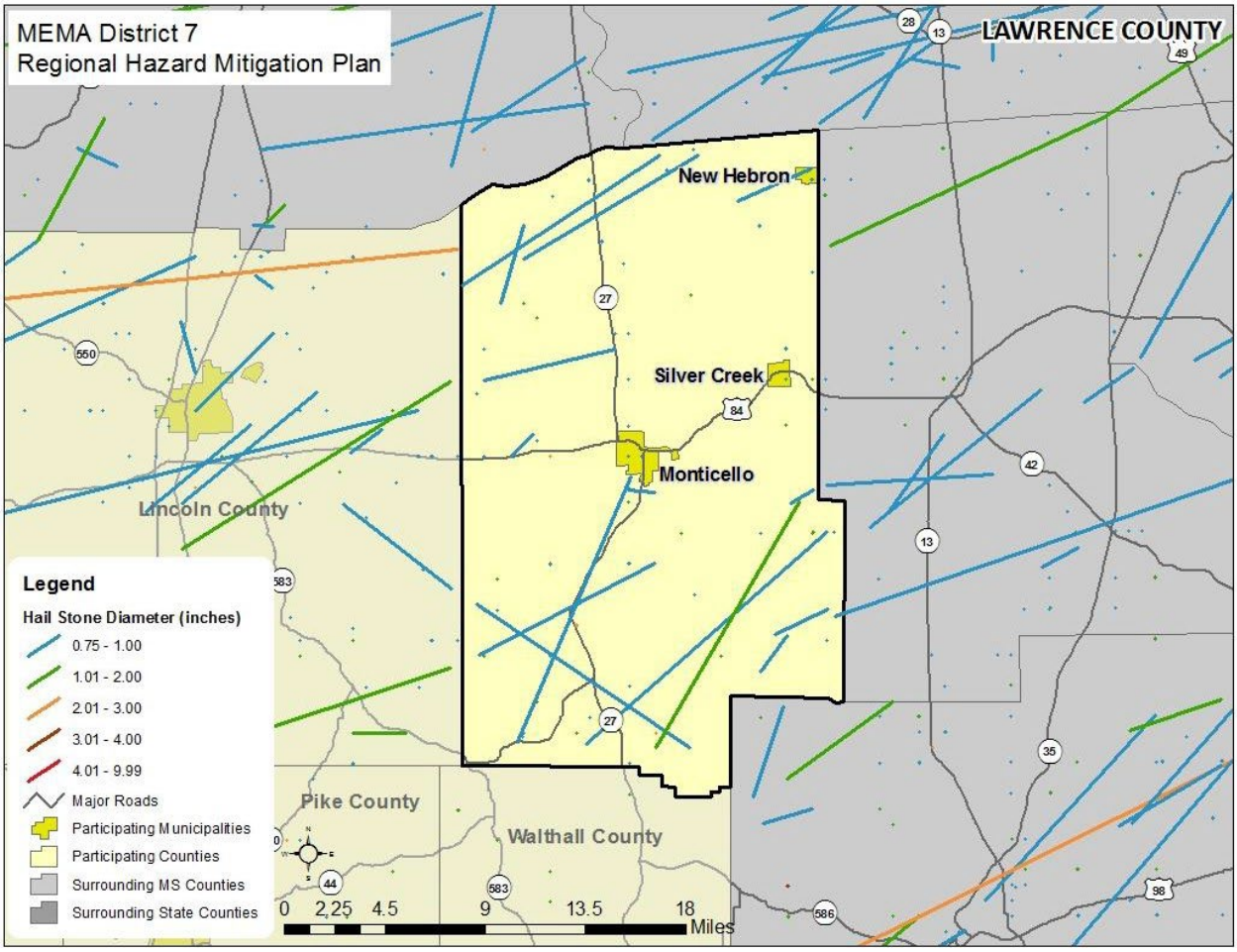
LOCATION AND SPATIAL EXTENT

[49] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[50] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide with those of thunderstorms. As a result, because all areas of Lawrence County are uniformly exposed to severe thunderstorms, all areas of the county are uniformly exposed to hail which may be produced by such storms. **Figure E.11** shows the location of hail events that have impacted Lawrence County between 1955 and 2015.

Figure E.12: Hailstorm Tracks in Lawrence County[51]



According to the National Centers for Environmental Information, 102 recorded hailstorm events have affected Lawrence County since 1963.[52] The table below is a summary of the hail events in Lawrence County. In all, hail occurrences resulted in approximately $436,000 in property damage. Hail ranged in diameter from 0.75 inches to 2.75 inches.

It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

[51] *Source: National Weather Service Storm Prediction Center*

[52] These hail events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1963 through November 2022. It is likely that additional hail events have affected Lawrence County. As additional local data becomes available, this hazard profile will be amended.

TABLE E.14: SUMMARY OF HAIL OCCURRENCES IN LAWRENCE COUNTY[53]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Monticello	22	0/0	$116,000	$2,148
New Hebron	4	0/0	$0	$0
Silver Creek	6	0/0	$6,000	$111
Unincorporated Area	70	0/0	$314,000	$5,815
LAWRENCE COUNTY TOTALS	**102**	**0/0**	**$436,000**	**$8,074**

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that the probability of future hailstorm occurrences in Lawrence County is highly likely (100 percent annual probability). It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[54] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lawrence County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *hailstorm.*[55] As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

E.2.10 Hurricane and Tropical Storm

LOCATION AND SPATIAL EXTENT

Hurricanes and tropical storms threaten the Atlantic Ocean and Gulf of Mexico seaboards of the United States, causing substantial damage due to high winds and flooding. While coastal areas are most directly exposed to the brunt of landfalling storms, the storms' impacts are often felt in places hundreds of miles inland, including in Lawrence County. All areas in Lawrence County are equally susceptible to hurricane and tropical storms.

The following table shows the different category rankings of hurricanes on the Saffir-Simson Scale. The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures. In the western North Pacific,

[53] Source: National Centers for Environmental Prediction

[54] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf.

[55] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

the term "super typhoon" is used for tropical cyclones with sustained winds exceeding 150 mph. Note that all winds are using the U.S. 1-minute average.

TABLE E.15: SAFFIR-SIMPSON SCALE OF HURRICANE STRENGTH

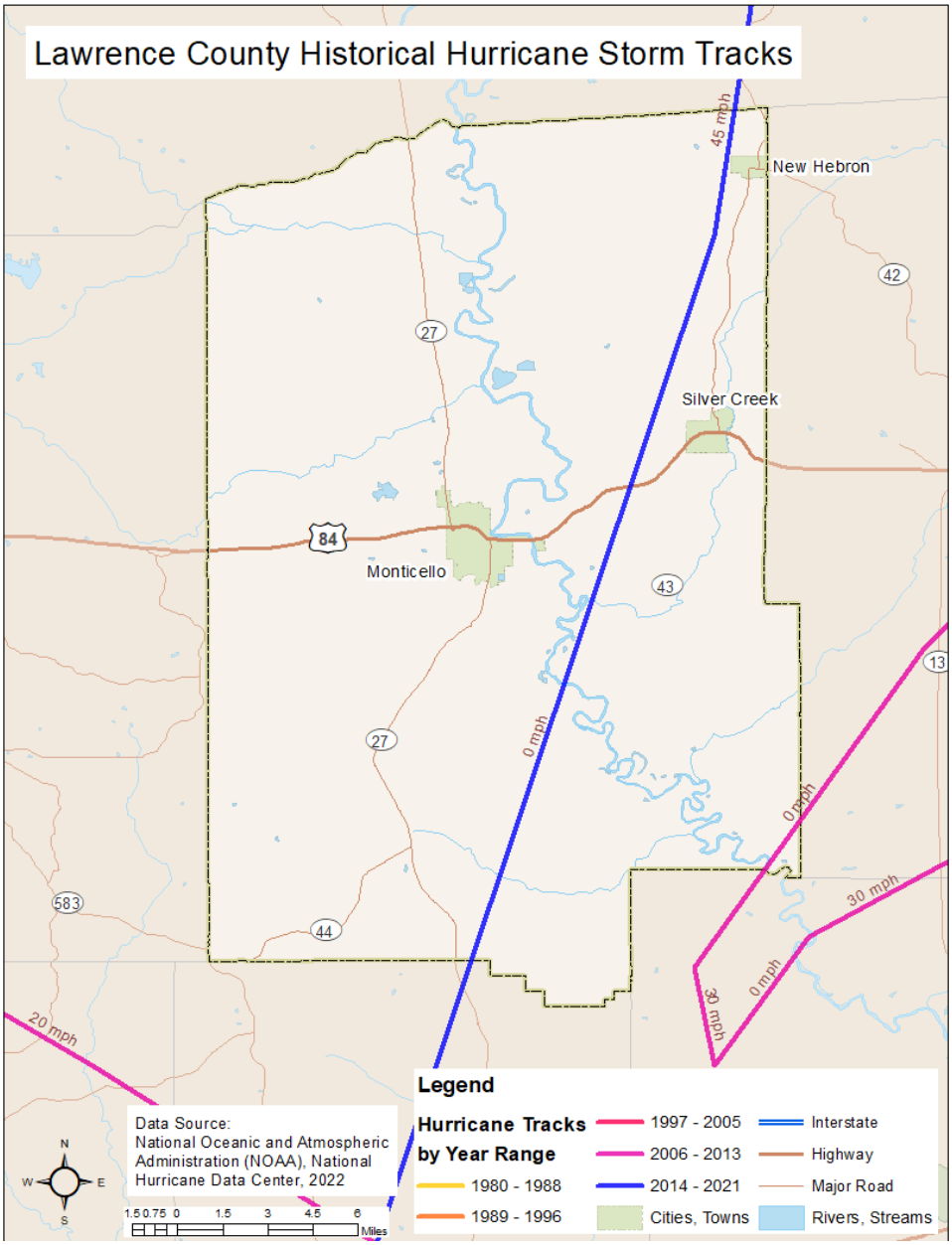
Category 1	Winds 74-95 mph (64-82 kt or 119-153 km/hr). Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
Category 2	Winds 96-110 mph (83-95 kt or 154-177 km/hr). Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
Category 3	Winds 111-129 mph (96-112 kt or 178-208 km/hr). Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
Category 4	Winds 130-156 mph (113-136 kt or 209-251 km/hr). Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
Category 5	Winds 157 mph or higher (137 kt or higher or 252 km/hr or higher). Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

HISTORICAL OCCURRENCES

According to the National Hurricane Center's historical storm track records, 65 hurricane or tropical storm/depression tracks have passed within 50 NM of Lawrence County since 1855.[56] The following figure shows hurricane storm tracks that have passed through or near Lawrence County since 1980.

[56] National Oceanic and Atmospheric Administration. Office for Coastal Management. Retrieved on 01/07/2023 from https://coast.noaa.gov/hurricanes

FIGURE E.13: LAWRENCE COUNTY HISTORICAL STORM TRACKS



Federal records indicate that 6 major disaster declarations were made in Lawrence County: 1969 (Hurricane Camille), 2004 (Hurricane Ivan), 2005 (Hurricane Katrina), 2008 (Hurricane Gustav), 2012 (Hurricane Isaac), and 2021 (Hurricane Ida).[57] [58] Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding.

The National Centers for Environmental Information also reported 5 hurricane or tropical storm events

[57] Federal Emergency Management Agency. Disaster Declarations for States and Counties. 2023. Retrieved on 01/05/2023 from https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties

[58] Federal Emergency Management Agency. Historical Flood Risk and Costs. 2023. Retrieved on 01/05/2023 from https://www.fema.gov/data-visualization/historical-flood-risk-and-costs.

in Lawrence County since 2005.

TABLE E.16: HISTORICAL HURRICANE / TROPICAL STORM OCCURRENCES IN LAWRENCE COUNTY[59]

Date of Occurrence	Storm Name	Deaths/Injuries	Property Damage	Annualized Losses
8/29/2005	Hurricane Katrina	0/0	$100,000,000	
9/24/2005	Hurricane Rita	0/0	$10,000	
9/1/2008	Hurricane Gustav	0/0	$400,000	
8/29/2012	Hurricane Isaac	0/0	$200,000	
8/29/2021	Hurricane Ida	0/0	$75,000	
Totals			**$100,685,000**	**$5,922,647**

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the county. Anecdotes are available from NCEI for the major storms that have impacted the county as found below:

Hurricane Katrina – August 29, 2005
The damage from Hurricane Katrina was devastating and widespread. Damage occurred across all of the Jackson forecast area which includes 9 parishes in Northeast Louisiana, 2 counties in Southeast Arkansas and about 2/3 of Central and Southern Mississippi. As widespread as the damage was, the more concentrated and most significant damage occurred across Southeast and East-Central Mississippi. For other areas, especially the areas west of Natchez to Yazoo City to Grenada line, damage to trees and power lines was significant and scattered across the landscape. As you move toward Central Mississippi and along Interstate 55 the damage and impacts increase. This portion of the state sustained widespread damage to trees and power lines.

Hurricane Gustav – September 1, 2008
As the center of Gustav crossed much of southern Louisiana, tropical storm force winds extended into southern Mississippi and portions of east central Louisiana. Sustained winds were between 35 and 45 mph with higher gusts between 70 and 100 mph occurred. Tree and power line damage was extensive across these areas which resulted in widespread power outages, some of which lasted for 3 to 5 days. As Gustav slowed across central Louisiana, the outer rainbands continued to rotate across much of southern and central Mississippi. This kept those portions of Mississippi in the region which was favorable for tornadoes. Over 3 days, 26 tornadoes were confirmed, all of which were in the EF0 to EF1 range.

Hurricane Isaac – August 29, 2012
Isaac moved very slowly to the north and northwest over the course of August 29th, which made for prolonged impacts. Forward motion of about 5 mph led to tremendous flooding issues for both Louisiana and portions of Mississippi south of I-20. Around noon on August 29th, Isaac was downgraded to a Tropical Storm, but this was not much relief to the many residents who were being inundated with rain and wind. The worst of the wind was felt generally along and south of an axis from Marion County to Adams County. Numerous trees were down in Adams County, leaving many without power for several days. Eighty percent of the roads were blocked in Franklin County due to downed trees.

Hurricane Ida – August 29, 2021
The county suffered minor to moderate damage to trees and homes across the county. While most

[59] National Centers for Environmental Information

structural damage was exterior, some homes did suffer major damage due to falling trees. At the peak approximately 50% of the county was without power.

PROBABILITY OF FUTURE OCCURRENCES

Due to Lawrence County's inland location, the county does not experience hurricane sub-hazards such as storm surge. However, the county is – and will continue to be – susceptible to flooding and high wind events caused by hurricanes and tropical storms. As a result, the probability level of future hurricane and tropical storm occurrence is likely (between 10 and 100 percent annual probability). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. However, when the county is impacted, the damage could be significant, threatening lives and property throughout the planning area.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[60] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lawrence County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[61] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

HURRICANE EVACUATIONS

As discussed above, the MEMA District 7 Region has been directly impacted by a number of hurricane and tropical storm events. However, the region is also susceptible to indirect effects from hurricanes and tropical storms, particularly in the form of evacuations from coastal counties. The counties within MEMA District 7 are located far enough inland that they are often the primary recipients of evacuees from counties that have been (or will be) impacted by major storm events.

For example, during Hurricane Katrina in 2005, thousands of evacuees made their way to counties in southwest Mississippi to take temporary refuge from the storm. Due to the severe and devastating effects of the storm, temporary sheltering within these counties was extended much longer than originally anticipated; in some cases, the evacuees ended up staying in shelters for weeks or months. This additional population caused a major strain on resources within these relatively rural counties. Local communities with limited resources had an unexpected and immediate need to provide shelter and other life essentials such as food, water, and health care to a significant number of evacuees.

[60] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf.
[61] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters.

Caring for evacuees was especially challenging for counties in the MEMA District 7 Region because most of these counties had been impacted themselves by the storm and were attempting to help their own citizens recover from the storm. Recovering from a major disaster while simultaneously attempting to help evacuees from surrounding counties posed difficulties for MEMA District 7 Region emergency management personnel and other local officials.

Based on Hurricane Katrina and other major hurricane events that have impacted the Gulf Coast in the past, it is likely that many of the MEMA District 7 counties will be receiver counties when it comes to evacuees. Many of these evacuees will likely come from locations in Louisiana, including New Orleans. Indeed, the State of Louisiana evacuation plan indicates that one of the primary evacuation routes from the City of New Orleans will direct evacuees north along Interstate 55, sending people through Pike County and Lincoln County. Depending on the severity of a storm event, officials in Louisiana may even change Interstate 55 over to a contraflow traffic pattern to enable quicker evacuations.

E.2.11 Severe Thunderstorm/High Wind

LOCATION AND SPATIAL EXTENT

A severe thunderstorm/high wind event is an atmospheric hazard that has no geographic boundaries and that can occur in all regions of the United States. However, severe thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that Lawrence County has uniform exposure to a severe thunderstorm/high wind event and the spatial extent of a storm's impact could be large.

The following Beaufort scale is an empirical measure for the intensity of the wind associated with windstorms.

TABLE E.17: BEAUFORT WIND SCALE

Beaufort Scale					
NUMBER	WIND SPEED (MPH)	DESCRIPTION	WAVE HEIGHT (FT)	SEA CONDITIONS	LAND CONDITIONS
0	<1	Calm	0	Flat.	Calm. Smoke rises vertically.
1	1-3	Light air	0.33	Ripples without crests.	Wind motion visible in smoke.
2	3-7	Light breeze	0.66	Small wavelets.	Wind felt on exposed skin. Leaves rustle.
3	8-12	Gentle breeze	2	Large wavelets.	Leaves and smaller twigs in constant motion.
4	13-17	Moderate breeze	3.3	Small waves.	Dust and loose paper rise. Small branches begin to move.

Beaufort Scale					
NUMBER	**WIND SPEED (MPH)**	**DESCRIPTION**	**WAVE HEIGHT (FT)**	**SEA CONDITIONS**	**LAND CONDITIONS**
5	18-24	Fresh breeze	6.6	Moderate (1.2 m) longer waves. Some foam and spray.	Small trees sway.
6	25-30	Strong breeze	9.9	Large waves with foam crests and some spray.	Large branches in motion. Whistling heard in overhead wires. Umbrella use difficult.
7	31-38	High wind, Moderate Gale, Near Gale	13.1	Sea heaps up and foam begins to streak.	Whole trees in motion. Effort needed to walk against the wind.
8	39-46	Fresh Gale	18	Moderately high waves with breaking crests forming spindrift. Streaks of foam.	Twigs broken from trees. Cars veer on road.
9	47-54	Strong Gale	23	High waves (6-7 m) with dense foam. Wave crests start to roll over. Considerable spray.	Larger branches break off trees, and some small trees blow over. Construction/temporary signs and barricades blow over. Damage to circus tents and canopies.
10	55-63	Whole Gale/Storm	29.5	Very high waves. The sea surface is white and there is considerable tumbling.	Trees uprooted. Considerable structural damage.
11	64-72	Violent storm	37.7	Exceptionally high waves.	Widespread vegetation and structural damage.
12	≥73	Hurricane-force	≥46	Huge waves. Sea is completely white with foam and spray. Air is filled with driving spray, reduced visibility.	Massive and widespread damage to structures.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, 208 recorded Thunderstorm / High Wind events have affected Lawrence County since 1957.[62] The following table is a summary of the Thunderstorm / High Wind events in Lawrence County. In all, Thunderstorm / High Wind occurrences resulted in approximately $2,120,000 in property damage. It should be noted that Thunderstorm / High Wind events may cause substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

TABLE E.18: HISTORICAL THUNDERSTORM / HIGH WIND OCCURRENCES IN LAWRENCE COUNTY[63]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Monticello	50	0/0	$705,500	$10,854
New Hebron	21	0/0	$146,000	$2,246
Silver Creek	9	0/0	$48,000	$738
Unincorporated Area	128	0/0	$1,220,500	$18,777
Lawrence County Total	**208**	**0/0**	**$2,120,000**	**$32,615**

PROBABILITY OF FUTURE OCCURRENCES

Given the high number of previous events, it is certain that severe thunderstorm/ high wind events, including straight-line wind events, will occur in the future, with a highly likely probability level (100 percent annual probability) for the entire county.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[64] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lawrence County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[65] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful *severe thunderstorm/high wind events* to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

[62] These Thunderstorm / High Wind events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1957 through November 2022. It is likely that additional Thunderstorm / High Wind events have affected Lawrence County. As additional local data becomes available, this hazard profile will be amended.

[63] These thunderstorm events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1957 through November 2022.

[64] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[65] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

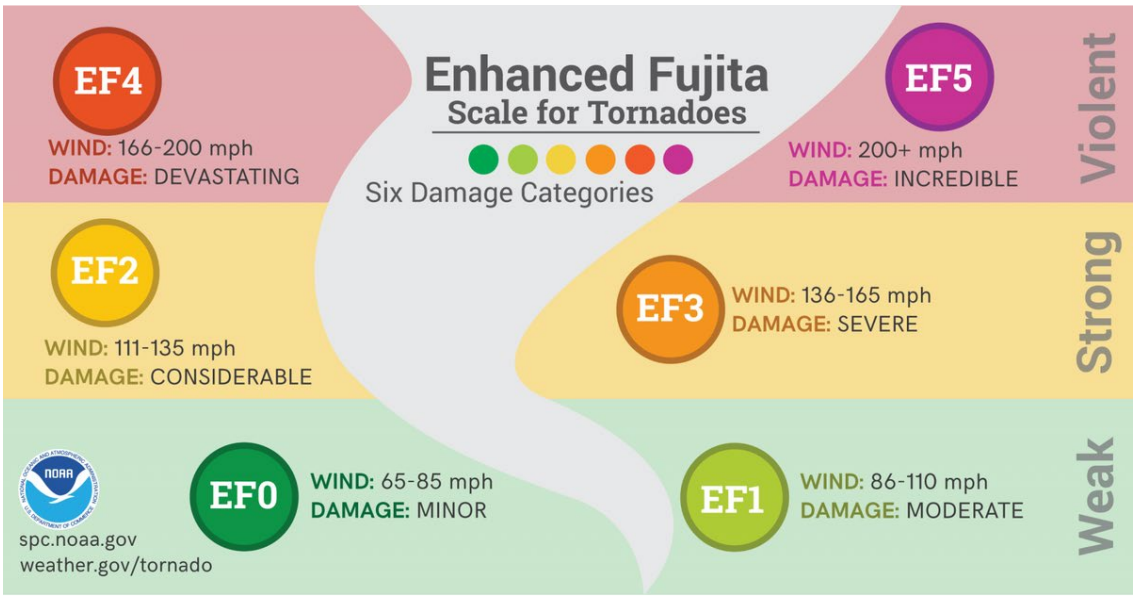
E.2.12 TORNADO

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, including in Lawrence County. Tornadoes typically impact a relatively small area, but damage may be extensive. Tornado event locations are completely random, though the County's experience if that they have chronically impacted the Southeast corner of the county. It is not possible to definitively determine whether some areas are more susceptible to future occurrences than other areas to tornado strikes. Therefore, it is assumed that Lawrence County is uniformly exposed to the tornado hazard.

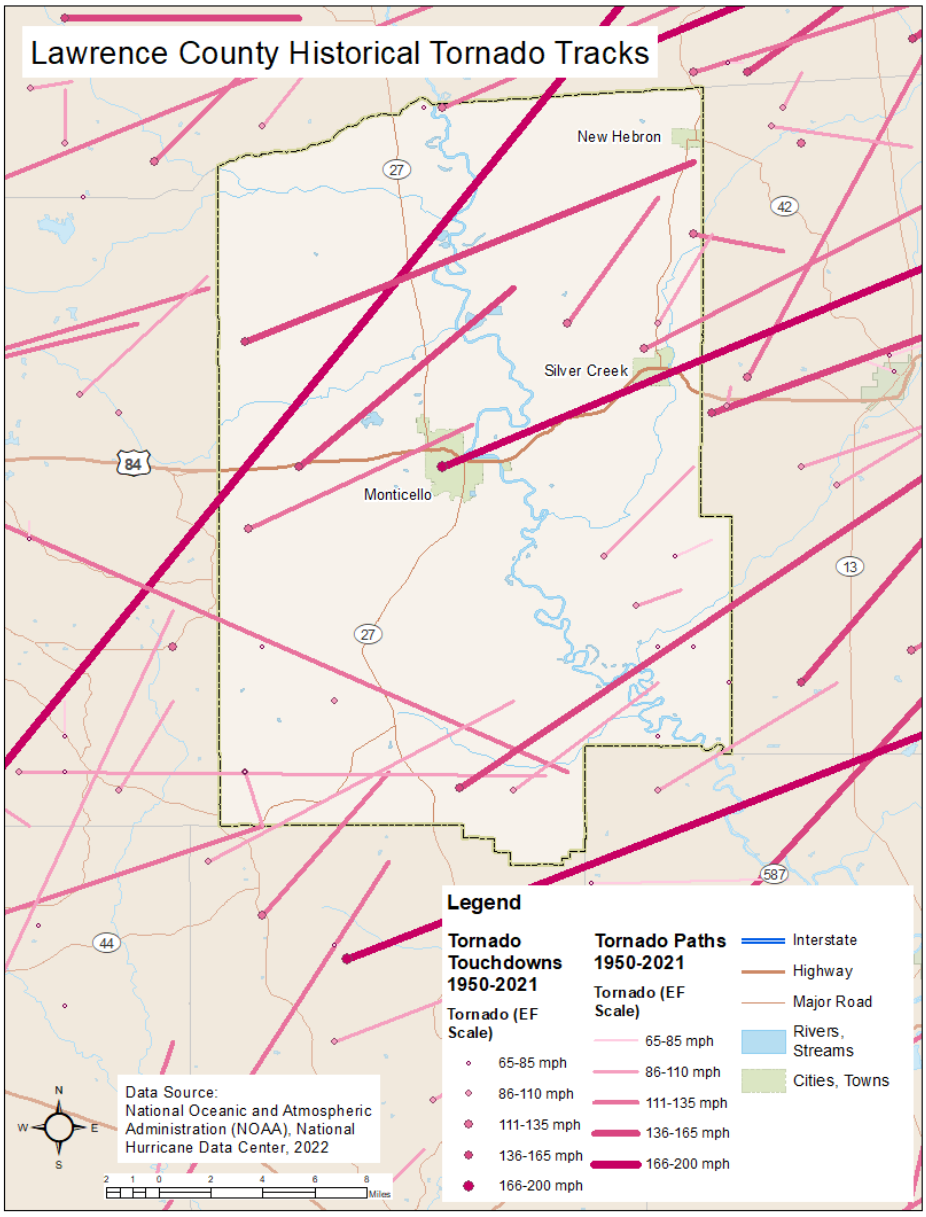
The following figure depicts the Enhanced-Fujita Scale of tornado intensity.

FIGURE E.14: ENHANCED-FUJITA SCALE



With that in mind, the figure below shows tornado track data for many of the major tornado events that have impacted the county between 1950 and 2021. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

FIGURE E.15: LAWRENCE COUNTY HISTORICAL TORNADO TRACKS



HISTORICAL OCCURRENCES

Tornadoes were at least partially responsible for 7 disaster declarations in Lawrence County in 1980, 1983, 1990, 2001, 2003, 2009, and 2020.[66] According to the National Centers for Environmental Information, 29 recorded tornado events have affected Lawrence County since 1968.[67] The following table is a summary of the tornado events in Lawrence County. In all, tornado occurrences resulted in approximately

[66] FEMA – Disaster Declarations. Retrieved on 01/01/2023 from https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties

[67] These tornado events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1968 through November 2022.

$506,224,000 in property damage. In addition, 55 injuries and 6 deaths were reported.

Severe Storms, Tornadoes, Straight-line Winds, and Flooding – April 2020 A major disaster declaration was made following severe storms impacting the southern border of Lawrence County. During this storm, a tornado occurred and resulted in the death of the Emergency Management Deputy.

TABLE E.19: HISTORICAL TORNADO IMPACTS IN LAWRENCE COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Monticello	1	0/0	$50,000	$926
New Hebron	0	0/0	$0	$0
Silver Creek	1	0/0	$80,000	$1,481
Unincorporated Area	27	4/52	$506,094,000	$9,372,111
LAWRENCE COUNTY TOTAL	**29**	**6/55**	**$506,224,000**	**$9,374,519**

PROBABILITY OF FUTURE OCCURRENCES

According to historical information, tornado events pose a significant threat to Lawrence County. The probability of future tornado occurrences affecting Lawrence County is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[68] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lawrence County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[69] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storm systems that spawn tornadoes to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding, and enhancing the potential for increased *tornado activity*. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

E.2.13 Winter Storm, Freeze, and Extreme Cold

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm, freeze, and extreme cold events. Some ice and winter storms may be large enough to affect several states, while others might

[68] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf
[69] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters.

affect limited, localized areas. The degree of exposure to this hazard typically depends on the normal, expected severity of local winter weather. Lawrence County is not accustomed to severe winter weather conditions and seldom receives severe winter weather, even during the winter months. While winter storm events tend to be mild in nature, relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage because these events are not commonplace in the region. Given the atmospheric nature of the hazard, the entire county has uniform exposure to winter storm, freeze, and extreme cold events.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, 14 recorded winter storm events have affected Lawrence County since 2008.[70] The following table is a summary of the winter storm events in Lawrence County. In all, winter storm occurrences resulted in approximately $1,755,000 in property damage.

TABLE E.20: SUMMARY OF WINTER STORM EVENTS IN LAWRENCE COUNTY[71]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Lawrence County	14	0/1	$1,755,000	$125,357

There have been several severe winter weather hazard events in Lawrence County. The text below describes three of the major events and associated impacts on the county. Similar impacts can be expected with severe winter weather.

February 2010
Heavy snow affected a large portion of the region – especially locations across central and southern Mississippi – February 11th and February 12th. The heavy snow was a result of a low pressure system that tracked eastward across the northern Gulf of Mexico, and a vigorous upper level disturbance that moved across the region while a cold air mass was in place. Light precipitation overspread the region late Thursday afternoon into the evening before becoming heavy Thursday night into early Friday morning. The snow tapered off from west to east during the midday hours Friday.

February 2011
An ice storm developed across the area on February 3rd into the early morning hours of the 4th. While this icing event was not devastating, the impact to travel was a major issue across the region. Thousands of accidents occurred from slick roads. As a result of the accidents, three fatalities occurred along with a handful of injuries. Overall, most areas received 0.25 to 0.5 inches of ice accumulation from freezing rain. Additionally, some areas had a mix of precipitation with sleet accumulating. Some snow did occur, but those were just across select areas and the accumulation was mainly one inch or less.

February 2021
As an arctic air mass continued to build southward across the South on February 17th, another wave of precipitation overspread this cold air mass across much of Mississippi. The main impacts across central

[70] Winter storm events include Cold/Wind Chill, Extreme Cold/Wind Chill, Frost/Freeze, Heavy Snow, Ice Storm, Winter Storm, and Winter Weather events.
[71] These events include extreme cold, frost, heavy snow, winter storm, ice storm and are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 2008 through November 2022.

and southern portions of the state were from freezing rain and resulting heavy icing, but some significant accumulations of sleet and snow also occurred in areas mainly north and west of the Natchez Trace. Freezing rain continued through the evening hours, ending from west to east by the early morning of February 18th. Ice accumulated quickly in many locations and downed numerous trees, large limbs, and power lines across the affected areas. Several trees and limbs fell onto power lines, resulting in more widespread power outages as well. Some trees fell onto homes or cars, and significant amounts of ice, sleet, and snow collapsed a few gas station awnings and roofs where accumulations were greatest. In the hardest hit areas, extensive damage to trees and power lines took several months and cost several hundreds of thousands of dollars to clean up.

Winter storm, freeze, and extreme cold events throughout the planning area have several negative impacts including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could cause a fire or an accumulation of toxic fumes.

PROBABILITY OF FUTURE OCCURRENCES

Winter storm, freeze, and extreme cold events will continue to occur in Lawrence County. Based on historical information, the probability is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[72] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lawrence County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[73] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms). However, accelerated warming in the Artic region (i.e., Arctic amplification) may also be linked with an increase in the frequency of *winter storm, freeze, and extreme cold events* across parts of Asia and North America, including in Lawrence County. [74]

OTHER HAZARDS

E.2.14 Radiological Event

LOCATION AND SPATIAL EXTENT

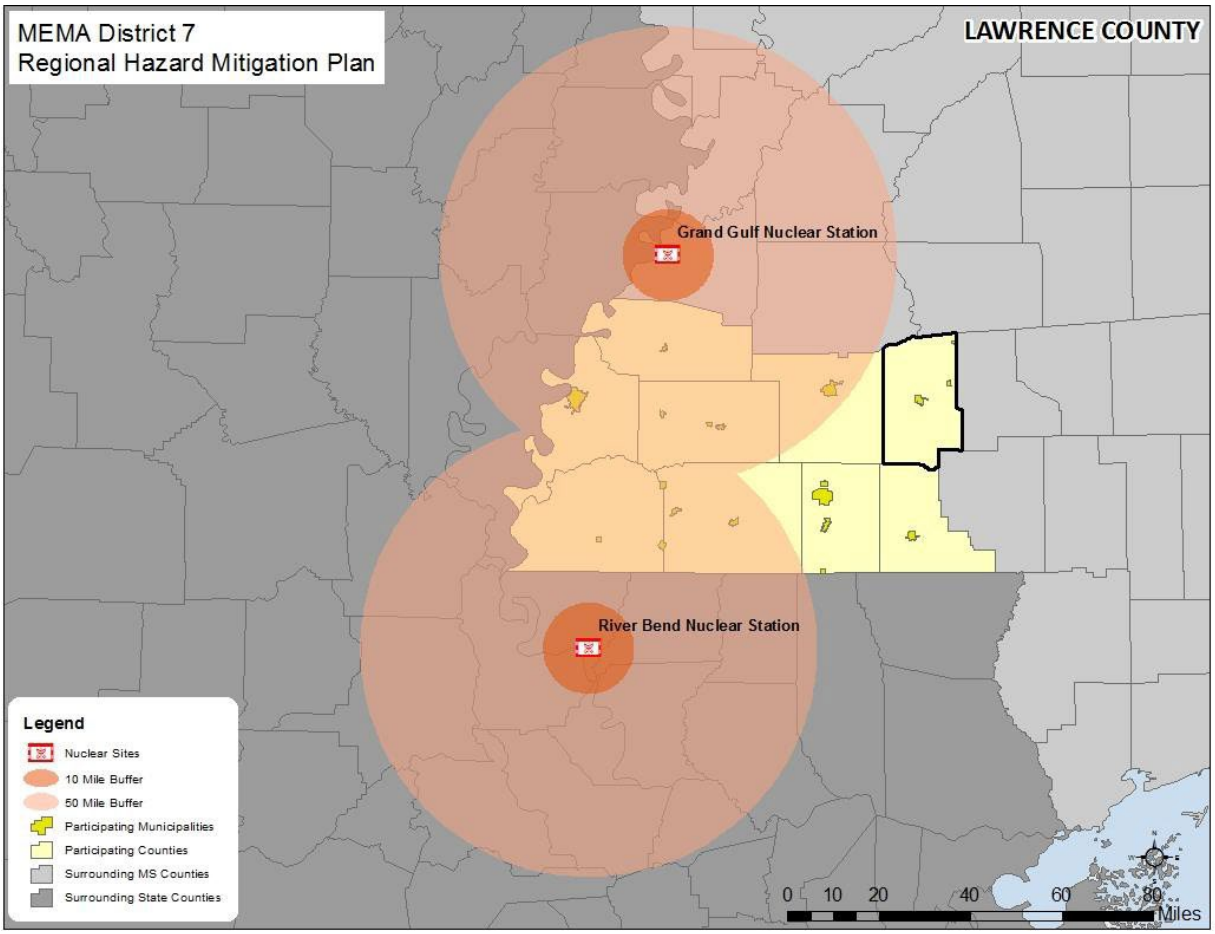
[72] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[73] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters.

[74] NOAA – Communication Education & Engagement. Retrieved from: https://cpo.noaa.gov/Divisions-Programs/Communication-Education-and-Engagement/CEE-News/ArtMID/8293/ArticleID/2369/Research-Links-Extreme-Cold-Weather-in-the-United-States-to-Arctic-Warming.

The Nuclear Regulatory Commission (NRC) defines two emergency planning zones around nuclear plants: 10-mile zones and 50-mile zones. Areas located within a 10-mile radius of a nuclear station (i.e., 10-mile zones) are at highest risk of exposure to and inhalation of radioactive contamination; as a result, this radius is the designated evacuation radius recommended by the Nuclear Regulatory Commission when nuclear incidents occur. Areas outside within the secondary 50-mile radius (i.e., 50-mile zones) are still considered to be at risk of radioactive contamination, but the risks and impacts (i.e., ingestion of contaminated food and liquids) may be less severe than areas within the 10-mile radius. While no part of Lawrence County is located inside either the 10-mile or 50-mile radius of a nuclear station, other parts of the MEMA District 7 region are located within 50-miles of 2 nuclear stations: the Grand Gulf Nuclear Station and the River Bend Nuclear Station.

Figure E.16: Nuclear Power Plant Incident Hazard Zones in Lawrence County[75]



HISTORICAL OCCURRENCES

Several minor events/notifications have been reported at both the Grand Gulf and River Bend Nuclear Stations. These incidents have been classified by the NRC using the scale found in the table below. All of these events were minor in magnitude, and many were insignificant enough that they did not register on the classification scale. A list of events at Grand Gulf Nuclear Station and a list of events at River Bend

[75] Source: International Atomic Energy Agency.

Nuclear Station can be found in the tables below. There have been no major nuclear events at either the Grand Gulf or River Bend Nuclear Stations.

TABLE E.21: NUCLEAR REGULATORY COMMISSION EMERGENCY CLASSIFICATION SCALE FOR EVENTS OCCURRING AT NUCLEAR POWER PLANTS

Classification	Description
Notification of Unusual Event (NOUE)	Events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs. [Note: This term is sometimes shortened to Unusual Event (UE). The terms Notification of Unusual Event, NOUE and Unusual Event are used interchangeably.
Alert	Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the Environmental Protection Agency (EPA) protective action guides (PAGs)
Site Area Emergency	Site Area Emergency (SAE) – Events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or hostile action that results in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to, equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA PAG exposure levels beyond the site boundary.
General Emergency	Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile action that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

TABLE E.22: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT GRAND GULF NUCLEAR STATION [76] [77]

Date	Retrieved From*	Classification	Plant	Description

[76] Nuclear Regulatory Commission Preliminary Notification Reports: http://www.nrc.gov/reading-rm/doc-collections/event-status/prelim-notice/.

[77] Nuclear Regulatory Commission Licensee Event Reports: https://lersearch.inl.gov/Entry.aspx.

8/29/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST
10/1/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF NUCLEAR STATION SECURITY OFFICER LOCKOUT
9/29/2016	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF EXTENDED PLANT SHUTDOWN TO ADDRESS OPERATIONS PERFORMANCE

TABLE E.23: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT RIVER BEND NUCLEAR STATION [78] [79]

Date	Retrieved From*	Classification	Plant	Description
11/26/1985	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	ECCS Initiation: Improper restoration of a level transmitter causes HPSC injection
11/27/1985	Licensee Event Report	Alert	River Bend Unit 1	Failure to Perform Surveillance Tests
3/5/1992	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	REACTOR SCRAM CAUSED BY A GENERATOR TRIP DUE TO HIGH WINDS CAUSING TRANSFORMER DAMAGE
9/15/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE IVAN
10/4/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	Shutdown Greater than 72 Hours
9/23/2005	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	NRC ENTERS MONITORING MODE DUE TO HURRICANE RITA
5/23/2007	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REACTOR SHUTDOWN DUE TO UNEXPECTED CHANGE IN RECIRCULATION FLOW
9/2/2008	Preliminary Notification Reports	Notification of Unusual Event/Not Applicable	River Bend Unit 1	NRC RESPONSE TO HURRICANE GUSTAV

[78] Nuclear Regulatory Commission Preliminary Notification Reports: http://www.nrc.gov/reading-rm/doc-collections/event-status/prelim-notice/.
[79] Nuclear Regulatory Commission Licensee Event Reports: https://lersearch.inl.gov/Entry.aspx.

Date	Retrieved From*	Classification	Plant	Description
5/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	AUGMENTED INSPECTION TEAM ONSITE AT RIVER BEND STATION
8/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST

PROBABILITY OF FUTURE OCCURRENCES

A radiological event at a nuclear station is a very rare occurrence in the United States due to the intense regulation of the nuclear power industry. While there have been minor incidents at both the Grand Gulf or River Bend Nuclear Stations, a radiological event it is considered unlikely (less than 1 percent annual probability).

RADIOLOGICAL EVACUATIONS

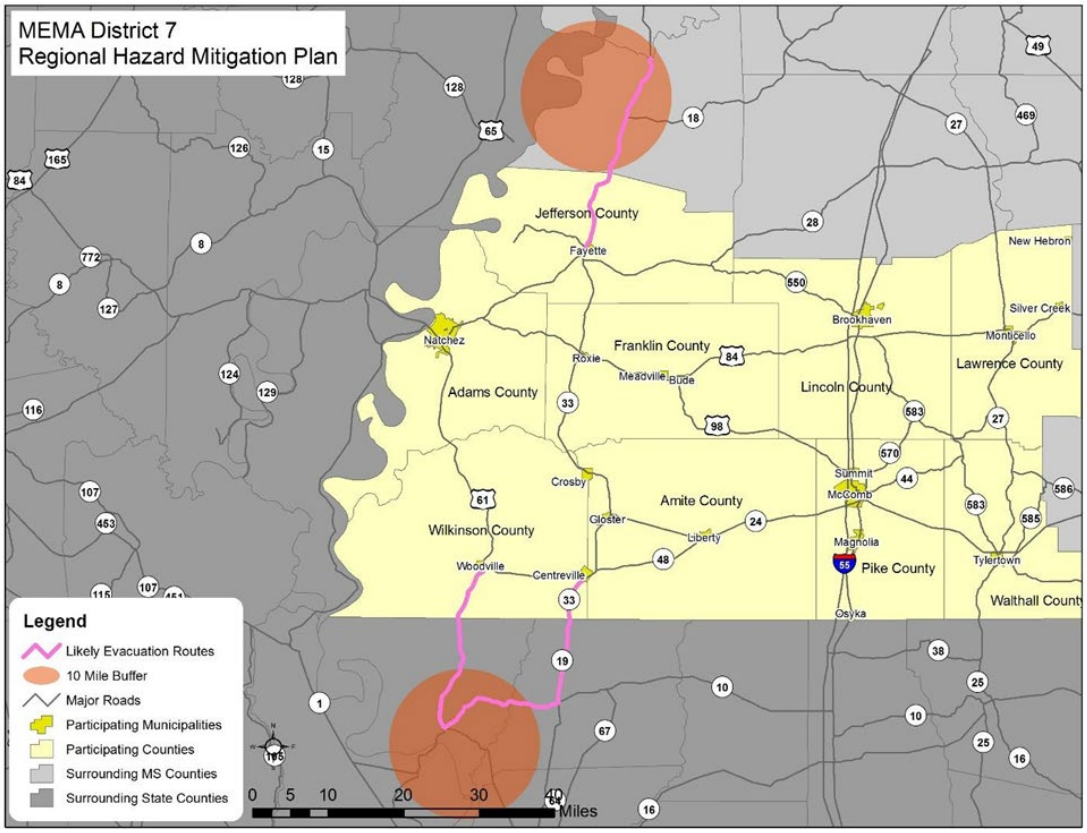
Like the hurricane evacuations discussed above, the MEMA District 7 Region would potentially be impacted to a greater degree by evacuations caused by a radiological event than by the event itself. Counties immediately adjacent to the region are located within a 10-mile radius of a nuclear facility and, in the aftermath of a radiological incident – populations from those counties may be evacuated to the MEMA District 7 Region.

Due to the severe and long-term effects of a major radiological event, temporary sheltering will be an initial concern, but the greater challenge may be in the long-term. As has happened with historical radiological accidents in other locations, the danger in the impacted area will likely extend for a very long period after the event, and evacuees may be unable to return to their homes for months or years. This additional influx of population will cause a major strain on resources within these relatively rural counties in the short-term, as local communities with limited resources will have an unexpected and immediate need to provide shelter and other life essentials such as food, water, and health care to a significant, additional number of people. In the long-term, there may be challenges for local officials as existing infrastructure will likely be inadequate to handle larger populations.

Although there have not been any major radiological events in the region historically, hurricane evacuations (discussed above) provide a similar scenario in terms of what the region might expect. However, one additional concern that officials will need to consider in a radiological event is that evacuees may be contaminated by radioactivity. According to the Centers for Disease Control, radioactive contamination can occur when radioactive materials are released into the environment and become deposited into the air, water, surfaces, soil, plants, buildings, people, or animals. This contamination can then be spread when people touch other people, surfaces, or objects. Therefore, when people evacuate a contaminated zone, they pose a potential risk of spreading the contamination to others if they are not properly treated. Local officials in MEMA District 7 may need to be prepared to set up decontamination centers along major evacuation routes to ensure that the contamination is not spread. It is also important for citizens to understand the steps they can take to reduce the risk of spreading contamination such as evacuating quickly after an event and following decontamination instructions as directed by local officials.[24]

Based on the locations of the 10-mile evacuation areas near the region, many of these evacuees will likely come from Claiborne County to the north and West Feliciana and East Feliciana Parishes to the south. The main roads for these evacuees will probably be U.S. Highway 61 and Mississippi State Highway 33 since these are the primary and most direct roads into and out of the evacuation counties and into MEMA District 7 (see the figure below). Depending on the severity of the event, officials may even change these roads over to a contraflow traffic pattern to enable quicker evacuations.

Figure E.17: Likely Evacuation Routes for a Radiological Event in the MEMA District 7 Region



As a result of the potential for an influx of evacuees during a radiological event, it is critical for local officials in the MEMA District 7 region to prepare for evacuations. It is possible that thousands of evacuees will be relocated, either temporarily or permanently, to MEMA District 7. Therefore, plans for identifying shelters and other resources should be coordinated well in advance of future events.

E.2.15 Pandemic

LOCATION AND SPATIAL EXTENT

Pandemics are global in nature. However, they may start anywhere. Lawrence County chose to analyze this hazard given the agriculture in the area and potential for this kind of event to occur in any location at any time.

All populations should be considered at risk to pandemic. Buildings and infrastructure are not directly impacted by the virus/pathogen but could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings may be shutdown, at least temporarily, as a result. Employers may initiate work from home procedures for non-essential workers in order to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

HISTORICAL OCCURRENCES

Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below.

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to 566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population.

Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10 to 50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852- 1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours. The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

1957 Asian Flu: It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

1968 Hong Kong Flu: The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020, mainly due to the speed and scale of the transmission of the disease. Prior to that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province on February 26th, 2020. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

There is a considerable amount of data on the extent of COVID-19 throughout the State of Mississippi and Lawrence County. The number of reported cases and deaths across the State of Mississippi and Lawrence County are shown in the figure below.

TABLE E.24: COVID-19 CASES AS OF 01/02/2023[80] [81]

	Cases	Deaths
Mississippi	943,402	13,051
Lawrence County	4,364	57

[80] Mississippi Department of Health – COVID-19 Totals by County. Retrieved on 01/05/2023 from https://msdh.ms.gov/msdhsite/_static/14,0,420,884.html

[81] Mississippi Department of Health – COVID-19 Totals by County. Retrieved on 01/05/2023 from https://msdh.ms.gov/msdhsite/_static/resources/19550.pdf

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS, and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Lawrence County has a probability level of unlikely (less than 1 percent annual probability) for future pandemics events. While pandemics can have devastating impacts, they are relatively rare.

The Mississippi State Department of Health maintains a state pandemic plan which can be found at: http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf.

E.2.16 Conclusions on Hazard Risk

The hazard profiles presented in this subsection were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

HAZARD EXTENT

The following table describes the extent of each natural hazard identified for Lawrence County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

TABLE E.25: EXTENT OF LAWRENCE COUNTY HAZARDS

Flood Related Hazards	
Dam & Levee Failure	Dam Failure extent is defined using the Mississippi Department of Environmental Quality classifications which include Low, Significant, and High. No dams are classified as high-hazard in Lawrence County. The inundation mapping places flooding from upstream high hazard dams exactly matches the expected flooding area for the 500-year floodplain. Therefor, there is no increased risk perceived by the communities within Lawrence County. All areas are known already to flood.
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no official erosion rate records in Lawrence County but local estimates are around 0.25 to 0.50 feet per year. Some areas of erosion have been identified by local coordinators.
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 21.0 percent of the total land area in Lawrence County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was on the Pearl River near Monticello. Water reached a discharge of 122,000 cubic feet per second (recorded on April 20, 1979). The highest stream gage

	height was also on the Pearl River near Monticello with a height that was recorded at 34.08 feet, or 1.08 feet above the major flood stage (recorded on April 20, 1979).
Fire Related Hazards	
Drought	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. Lawrence County has received this ranking once over the 17-year reporting period.
Lightning	According to the Vaisala's flash density map, Lawrence County is located in an area that experiences 12 to 20 lightning flashes per square mile per year. It should be noted that future lightning occurrences may exceed these figures.
Wildfire	Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2007-2016. The greatest number of fires to occur in Lawrence County in any year was 55 in 2007. The greatest number of acres to burn in the county in a single year occurred in 2007 when 562 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale or the Modified Mercalli Intensity (MMI) scale. According to data provided by the National Centers for Environmental Information, no earthquakes were reported in Lawrence County.
Temperature & Wind Related Hazards	
Extreme Heat	The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are not kept for any areas in Lawrence County. However, the highest recorded temperature in the region was 106°F in 2007 with heat index values recorded above 115°F.
Hailstorm	Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Lawrence County was 2.75 inches (last reported on March 18, 2013). It should be noted that future events may exceed this.
Hurricane & Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5. The greatest classification of hurricane to impact the MEMA District 7 Region was a Category 3 storm. This occurred in 1969 with Hurricane Camille and in 2005 with Hurricane Katrina. The storm track of both storms passed just to the east of the region, but due to the size of these storms, their impact was felt across the region.
Severe Thunderstorm / High Wind	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 67-year history from the National Climatic Data Center, the strongest recorded wind event in Lawrence County was reported on January 7, 2005 at 75 knots (approximately 86 mph). It should be noted that future events may exceed these historical occurrences.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA as well as the Fujita/Enhanced Fujita Scale. The greatest magnitude reported in Lawrence County was an F4 (last reported on April 18, 1978).
Winter Storm & Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in Lawrence County. However, reports from NCDC of the greatest snowfall in the county has been 8 to 10 inches (reported on December 11, 2008).
Other Hazards	
Radiological Event	Although there is no history of a nuclear accident at either the Grand Gulf Nuclear Station or River Bend Nuclear Station, other events across the globe and in the United States in particular indicate that an event is possible. Since several national and

	international events were Level 7 events on the INES, the potential for a Level 7 event at these stations is possible.
Pandemic	The extent of a pandemic impacting the county is difficult to estimate. It could result in thousands of deaths and extreme disruption of commerce and everyday life.

PRIORITY RISK INDEX RESULTS

To draw some meaningful planning conclusions on hazard risk for Lawrence County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a "Priority Risk Index" (PRI). More information on the PRI and how it was calculated can be found in Section 5.17.2.

The following table summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this subsection, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

TABLE E.26: SUMMARY OF PRI RESULTS FOR LAWRENCE COUNTY

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Dam Failure and Levee Failure	Possible	Minor	Moderate	Less than 6 hours	Less than 6 hours	**2.6**
Erosion	Possible	Minor	Small	More than 24 hours	More than 1 week	**1.8**
Flood	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**3.2**
Fire-related Hazards						
Drought	Possible	Limited	Large	More than 24 hours	More than 1 week	**2.5**
Lightning	Highly Likely	Limited	Small	6 to 12 hours	Less than 6 hours	**2.6**
Wildfire	Highly Likely	Limited	Small	Less than 6 hours	Less than 1 week	**2.9**
Geologic Hazards						
Earthquake	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Temperature & Wind-related Hazards						
Extreme Heat	Likely	Limited	Large	More than 24 hours	More than 1 week	**2.8**
Hailstorm	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Hurricane and Tropical Storm	Likely	Catastrophic	Large	More than 24 hours	Less than 1 week	**3.3**
Severe Thunderstorm/High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Tornado	Likely	Catastrophic	Moderate	Less than 6 hours	Less than 6 hours	**3.2**
Winter Storm and Freeze	Likely	Minor	Moderate	More than 24 hours	Less than 1 week	**2.2**
Other Hazards						
Radiological Event	Unlikely	Minor	Moderate	More than 24 hours	Less than 1 week	**1.6**
Pandemic	Unlikely	Limited	Large	More than 24 hours	More than 1 week	**2.2**

E.2.17 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Lawrence County, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each identified hazard in the table below according to three categories: High Risk, Moderate Risk, and Low Risk. For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Lawrence County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately, and is described in Section 6: *Vulnerability Assessment* and below in Section E.3. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates. In most cases, the hazards of greatest concern did not change much since the last plan update, indicating that the priorities remained relatively stable and there were few changes in priorities.

TABLE E.27: CONCLUSIONS ON HAZARD RISK FOR LAWRENCE COUNTY

HIGH RISK	Hurricane and Tropical Storm Tornado Flood Severe Thunderstorm/High Wind Wildfire
MODERATE RISK	Extreme Heat Hailstorm Lightning Drought
LOW RISK	Winter Storm and Freeze Erosion Radiological Event Earthquake Dam and Levee Failure Pandemic

E.3 LAWRENCE COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Lawrence County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected amount of damage caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in Section 6: Vulnerability Assessment.

E.3.1 Asset Inventory

The table below lists the estimated number of improved properties and the total value of improvements for Lawrence County and its participating jurisdictions (study area of vulnerability assessment). Because digital parcel data was not available for most communities, data obtained from Hazus-MH 5.1 inventory was utilized to complete the analysis.

TABLE E.28: IMPROVED PROPERTY IN LAWRENCE COUNTY[82]

Location	Counts of Improved Properties	Total Value of Improvements
Monticello	862	$219,887
New Hebron	262	$53,898
Silver Creek	139	$19,344
Unincorporated Area	4,977	$1,063,380,871
LAWRENCE COUNTY TOTAL	**6,240**	**$1,063,674,000**

In addition, the following table lists the inventory of critical facilities (i.e., fire stations, police stations, medical care facilities, emergency operation centers, schools, and ports) located in Lawrence County, according to previous plan data and Hazus-MH 5.1 data that was reviewed and updated by local officials.

TABLE E.29: CRITICAL FACILITY INVENTORY IN LAWRENCE COUNTY[83]

Location	Fire Stations	Police Stations	Medical Facilities	EOC	Schools	Ports
Monticello	1	2	2	1	4	0
New Hebron	1	1	0	0	1	0
Silver Creek	2	0	0	0	0	0
Unincorporated Area	8	0	0	0	1	0
LAWRENCE COUNTY TOTAL	**12**	**3**	**2**	**1**	**6**	**0**

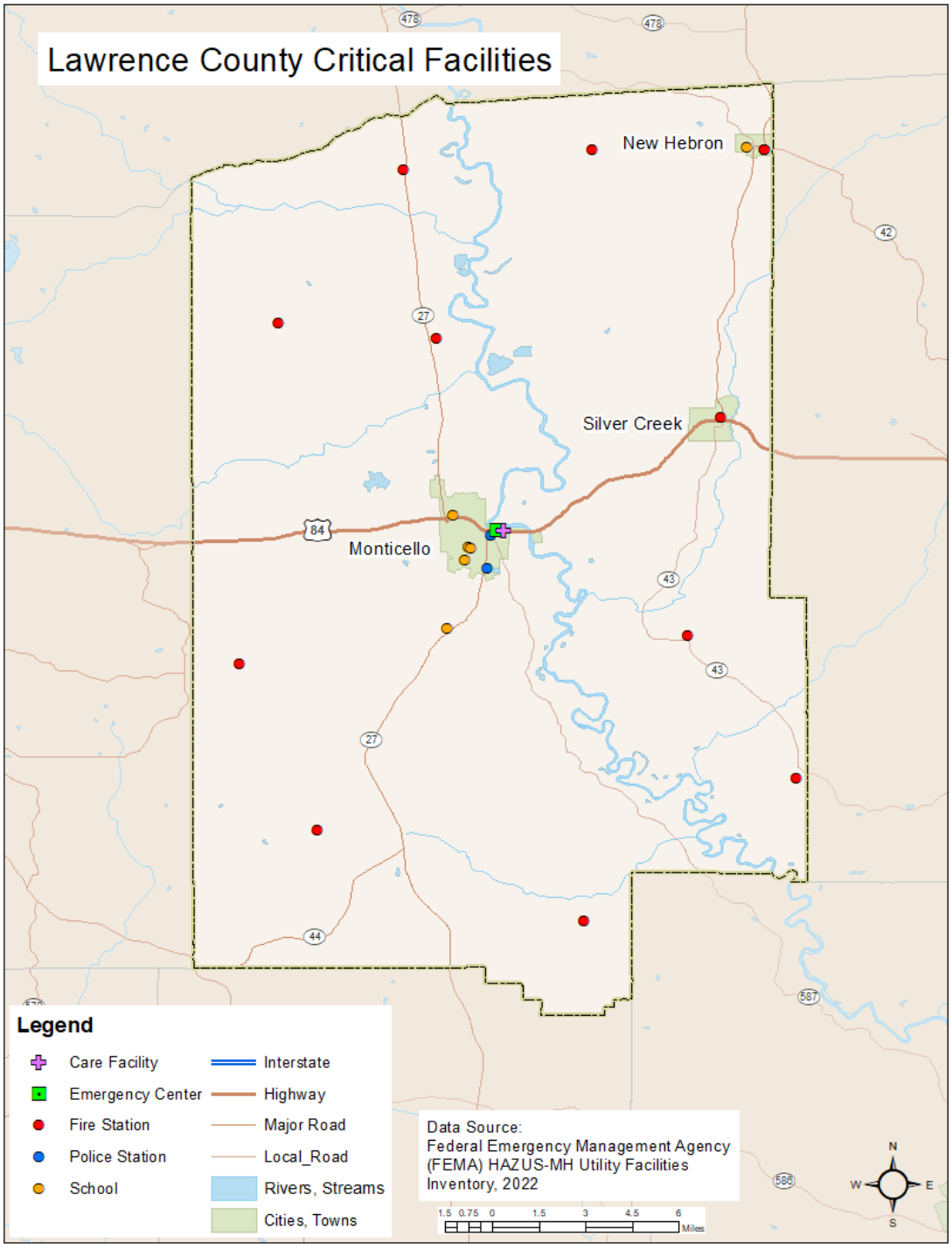
The figure below shows the locations of critical facilities in Lawrence County. The table at the end of this subsection, shows a complete list of the critical facilities by name, as well as the hazards that affect each

[82] Hazus-MH 5.1

[83] *Sources: Hazus-MH 5.1; Local Officials*

facility. As noted previously, this list is not all-inclusive and only includes information provided through Hazus which was updated, as best as possible, with local knowledge.

Figure E.18: Critical Facility Locations in Lawrence County

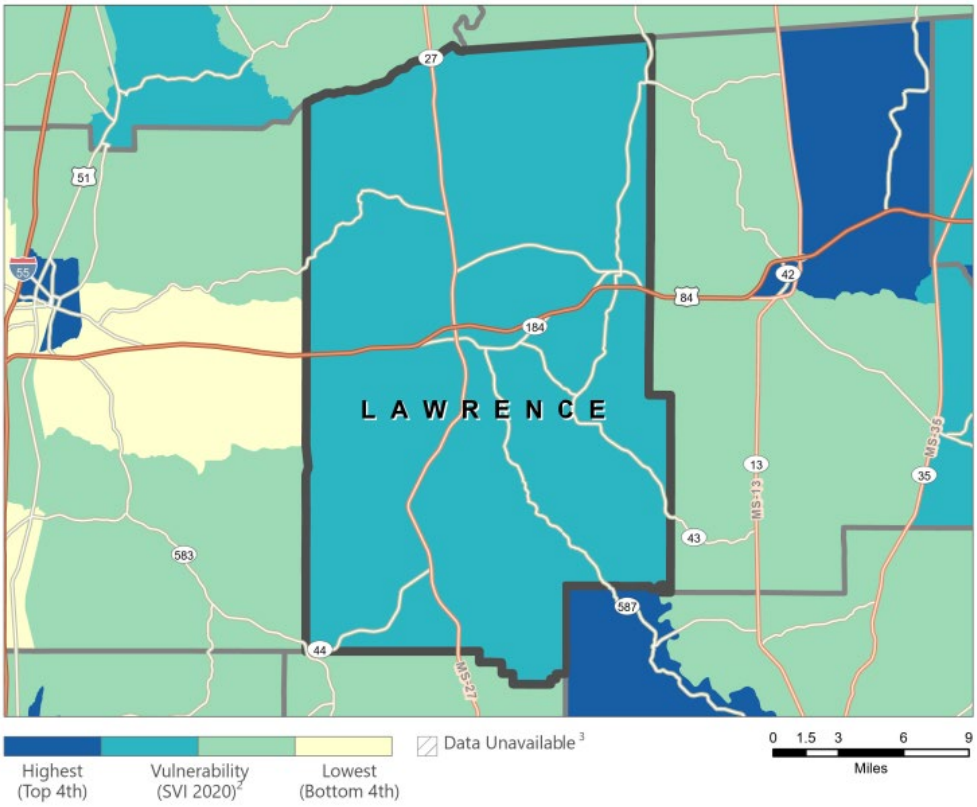


E.3.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those segments of the resident population in Adams County that are potentially at risk for these hazards. Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss.

The CDC/ATSDR Social Vulnerability Index (CDC/ATSDR SVI) uses 16 U.S. census variables to help local officials identify communities that may need support before, during, or after disaster. See figure below for Lawrence County SVI score of 0.7775.

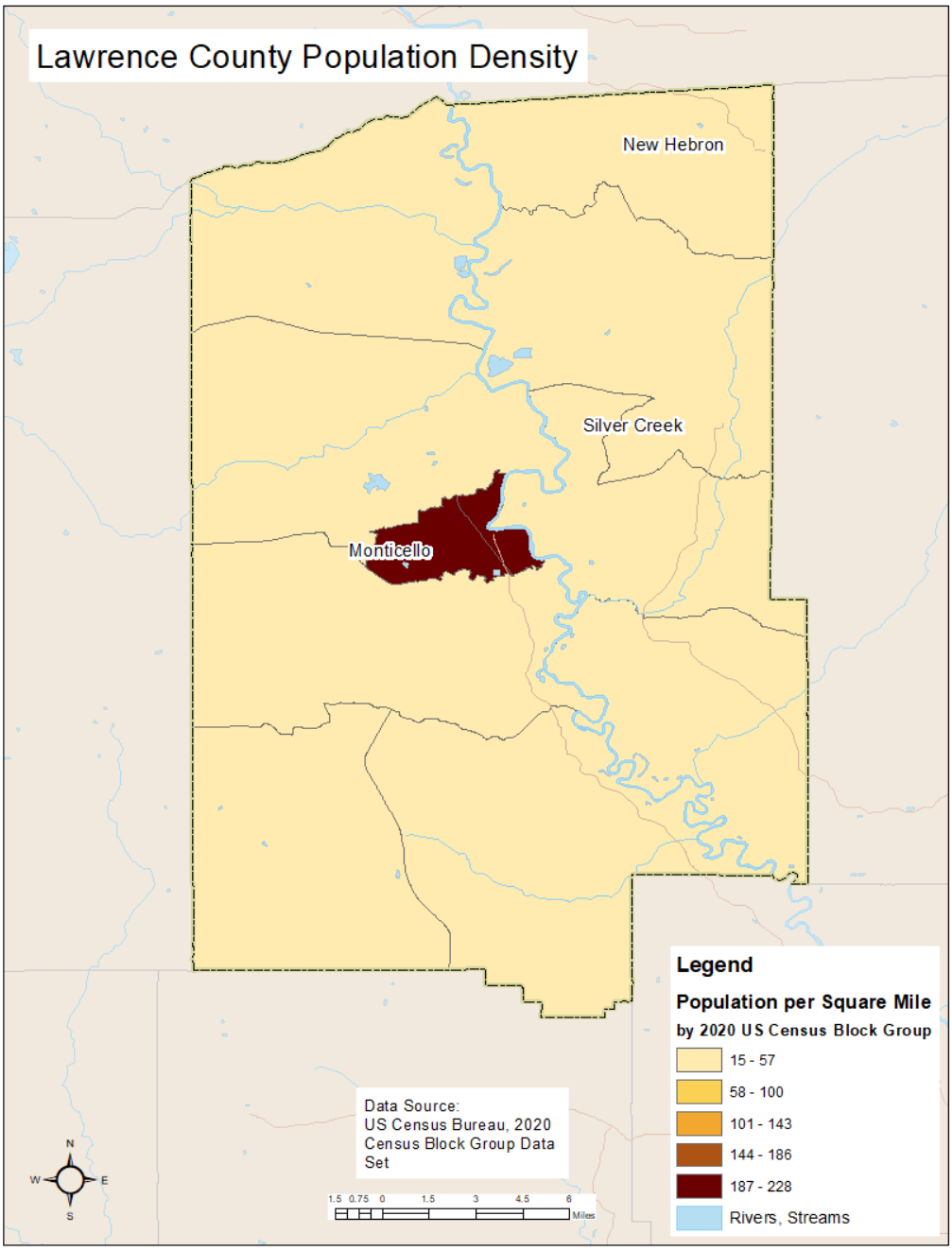
FIGURE E.19: CDC SOCIAL VULNERABILITY ASSESSMENT[84]



In addition, the figure below illustrates the population density per acre by census block as it was reported by the U.S. Census Bureau in 2020. As can be seen in the figure, the population is spread out with concentrations in municipal areas such as Monticello.

[84] CDC/ATSDR Social Vulnerability Index (SVI)

Figure E.20: Population Density in Lawrence County



E.3.3 Development Trends and Changes in Vulnerability

Since the previous hazard mitigation plan was approved, Lawrence County has experienced population decline since the 2010 and very little housing development. The following table shows the number of building units constructed since 2010 according to the U.S. Census American Community Survey.

TABLE E.30 BUILDING COUNTS FOR LAWRENCE COUNTY[85] [86] [87]

Location	Total Housing Units (2021)	Units Built 2010 or Later	% Building Stock Built Post-2010
Monticello	808	66	8.17%
New Hebron	228	21	9.2%
Silver Creek	65	-39	-60%
Lawrence County Total	**5,762**	**48**	**0.83%**

TABLE E.31: POPULATION DECLINE FOR LAWRENCE COUNTY

Jurisdiction	2000 Census	2010 Census	2020 Census	% Change 2000 - 2020
Lawrence County	13,258	12,929	12,016	-9.37%
Monticello	1,726	1,571	1,441	-16.51%
New Hebron	447	447	386	-13.65%
Silver Creek	209	210	175	-16.27%
Unincorporated Area	10,876	10,701	10,014	-7.93%

Since 2000, the county has experienced a population decline. However, unincorporated areas of the county have experienced a higher rate of development than incorporated areas, resulting in an increased number of structures that are vulnerable to the potential impacts of the identified hazards. This increased development has led to a slight increase in the county's vulnerability, with larger increases in vulnerability in certain areas and communities. If development continues to increase in the future, more of the county's population and infrastructure will be exposed to potential hazards, especially if that development occurs in high-risk areas such as floodplains.

E.3.4 Vulnerability Assessment Results

As noted in Section 6: *Vulnerability Assessment*, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis. Those analyses, specific to Lawrence County, are presented here. Almost all other hazards are assumed to impact the entire planning region (drought, extreme heat, hailstorm, lightning, severe thunderstorm/high wind, tornado, and winter storm/freeze/extreme cold), while the remaining hazard (erosion) is not analyzed due to lack of data.

The hazards analyzed in this subsection include dam/levee failure, flood, wildfire, earthquake, hurricane and tropical storm winds, and radiological event.

The annualized loss estimate for all hazards is presented near the end of this subsection.

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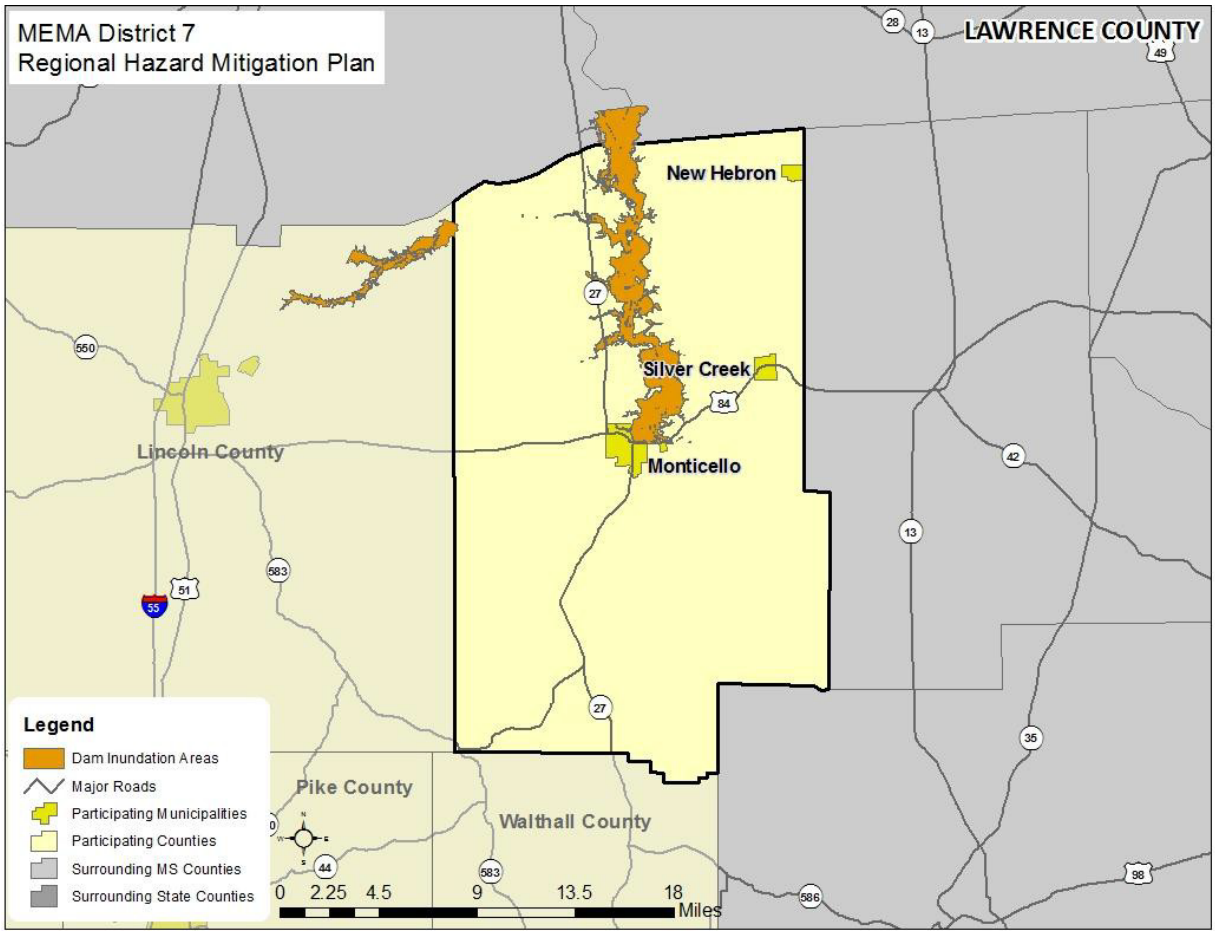
[85] Sources: United States Census Bureau, 2000 Census, 2010 Census, and 2020 Census.
[86] United States Census. American Community Survey 5-Year Estimates. 2021. Retrieved on 01/12/2023 from: https://data.census.gov/table?q=median+housing+value+monticello+mississippi+new+hebron+mississippi+silver+creek+mississippi.
[87] United States Census. American Community Survey 5-Year Estimates. 2021. Retrieved on 01/12/2023 from: https://data.census.gov/table?q=median+housing+value+lawrence+county+mississippi.

DAM/LEVEE FAILURE

To assess risk to a dam or levee failure, a GIS-based analyses have been used to estimate exposure of Lawrence County to areas delineated by the Mississippi Department of Environmental Quality as a potential inundation area. The determination of value at-risk (exposure) has been calculated by summing the values for improved properties located within an identified inundation area. Because this type of inundation mapping has not been completed for every dam/levee in the region, the results of this analysis likely underestimate the overall vulnerability to a dam or levee failure. However, this analysis is still useful as a baseline minimum for property that is potentially at-risk. The figure below shows identified potential inundation areas within and adjacent to Lawrence County.

In general, building footprint and parcel data are used in this analysis. However, due to a lack of digital building and parcel information for some communities, inventory data from HAZUS-MH 5.1 have been used to supplement local building and parcel data. However, HAZAUS-MH 5.1 data reflect estimations of building inventory and may not reflect actual counts or values located in dam inundation areas. It is likely that these data overestimate the amount of property in the identified dam inundation risk zones.

FIGURE E.21: DAM INUNDATION AREAS IN LAWRENCE COUNTY[88]



[88] *Source: Mississippi Department of Environmental Quality*

Social Vulnerability
Although there are no dam inundation areas of concern located within the county, this does not indicate that there is no risk to a dam/levee failure, especially considering not all dams or levees have delineated inundation areas.

Critical Facilities
There are no critical facilities located within the identified dam inundation areas. A list of specific critical facilities and their associated risk can be found in the table at the end of this section. Future vulnerabilities of Lawrence County assets to dam/levee failure will be greatly dependent on individual dam/levee design and associated the mitigation measures therein. While site-specific vulnerability determinations are outside the scope of this assessment, they will be considered during future plan updates if data become available.

FLOOD

Historical evidence indicates that Lawrence County is susceptible to flood events. A total of six flood events have been reported by the National Centers for Environmental Information resulting in $1.26 million in property damage. On an annualized level, these damages amounted to $50,400 for Lawrence County.

In order to assess flood risk, a GIS-based analysis has been used to estimate exposure to flood events using Digital Flood Insurance Rate Map (DFIRM) data in combination with improved property records for the county. The determination of value at-risk (exposure) is calculated using GIS analysis by summing the values for improved properties that were located within an identified floodplain.

Due to a lack of digital building and parcel information for some communities, inventory data from HAZUS-MH 5.1 have been used to supplement local building and parcel data. However, HAZUS-MH 5.1 data reflect estimations of building inventory and may not reflect actual counts or values of buildings and parcels located in floodplains. It is likely that these data overestimate the amount of property in the floodplains.

For this plan update, a HAZUS 100yr. flood scenario was performed for the study area. The geographical size of the Lawrence County is approximately 436 square miles and contains 842 census blocks. The region contains 4,439 households and has a total population of 12,929 people (2010 Census Bureau data).[89] [90]

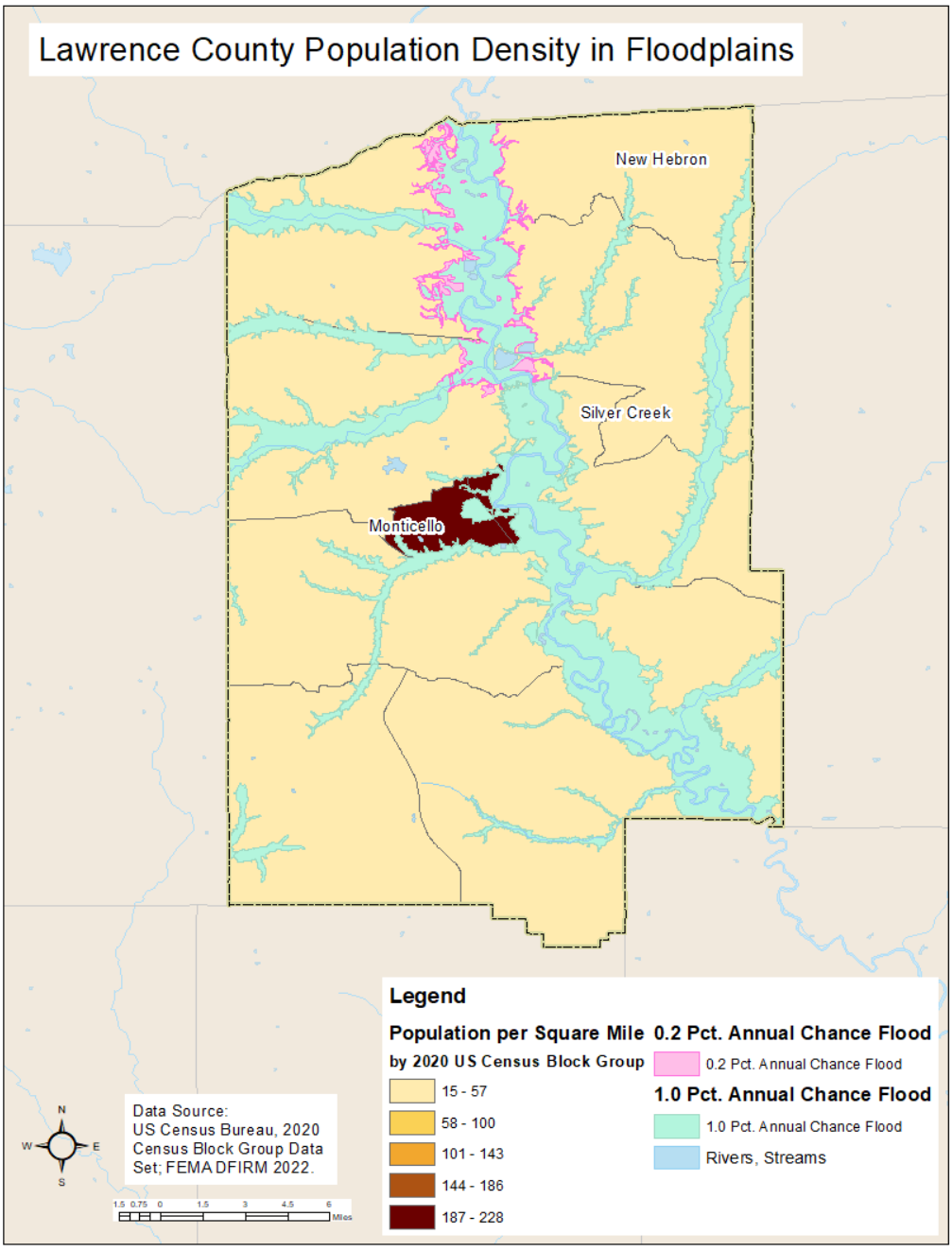
There are an estimated 6,240 buildings in the region with a total building replacement value (excluding contents) of $957 million. Approximately 94.07% of the buildings (and 74.54% of the building value) are associated with residential housing. HAZUS estimates that about 133 buildings will be at least moderately damaged. This is over 57% of the total number of buildings in the scenario, with an estimate that 6 buildings would be destroyed.

[89] United States Census Bureau. 2020 Census.
[90] United States Census Bureau. 2021 American Community Survey 5-Year Estimates. Retrieved on 01/09/2023 from https://data.census.gov/table?q=Lawrence+County+Mississippi+households+&g=0500000US28147&tid=ACSST5Y2021.S1101.

Social Vulnerability

The map below shows populations in Lawrence County that are at risk of flooding, using census block level population data and floodplain location data. There are numerous areas of concern in Lawrence County, especially in several of the county's population centers. Therefore, further investigation in these areas may be warranted. As noted in Section 6.4, no building-specific data, such as building footprints, were available to determine buildings at risk.

Figure E.22: Lawrence County Population Density in Floodplains



Critical Facilities

There are no critical facilities in Lawrence County that are located in a floodplain. (Please note: this analysis does not consider building elevation, which may negate risk.) A list of specific critical facilities and their associated risk can be found in the table at the end of this subsection.

A flood has the potential to impact many existing and future buildings, facilities, and populations in Lawrence County, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures have a reduced risk. While site-specific vulnerability determinations are outside the scope of this assessment, they may be added to future plan updates. Such determinations may include identifying areas subject to repetitive flooding for potential mitigation actions.

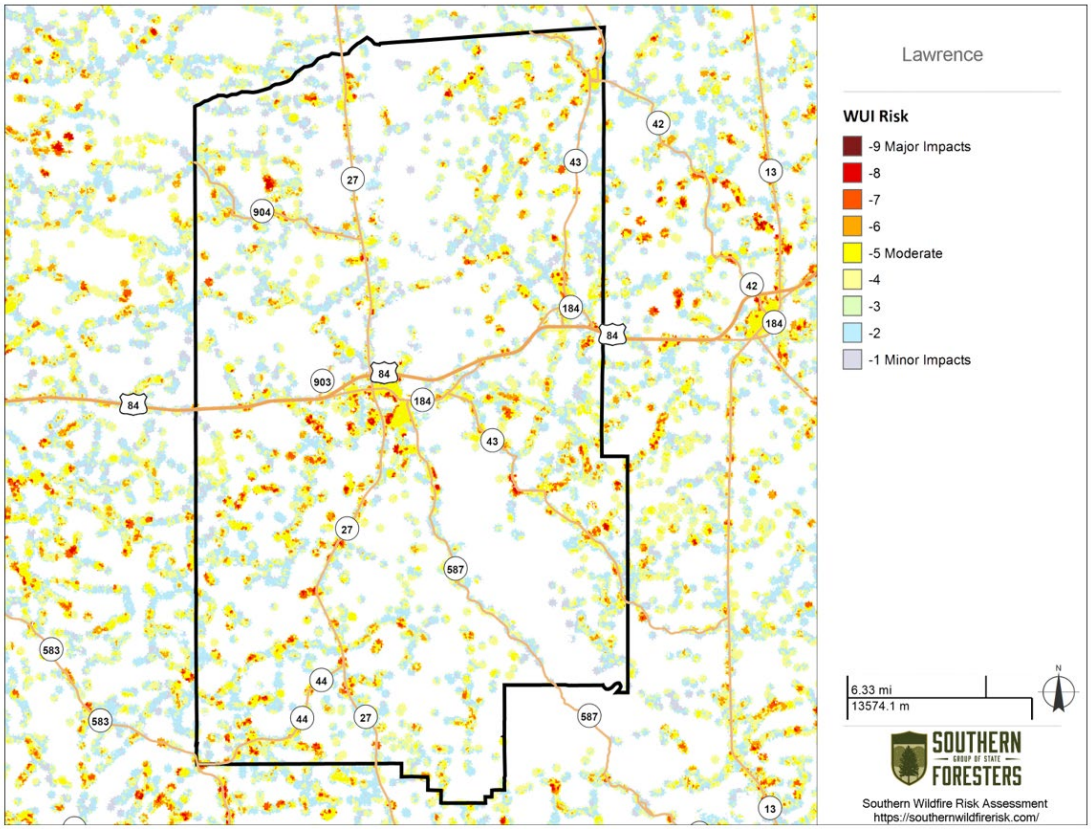
WILDFIRE

Although historical evidence indicates that Lawrence County is susceptible to wildfire events, there are few reports which include information on historic dollar losses. Therefore, it is difficult to calculate a reliable annualized loss figure. While annualized wildfire losses in Lawrence County are considered negligible, a single wildfire event could result in significant damages throughout the county.

To estimate potential exposure of Lawrence County areas to wildfire, HAZUS-MH 5.1 aggregated census-block-level building and parcel data were combined with Wildland Urban Interface Risk Index (WUIRI) data to determine wildfire vulnerability. For the critical facility analysis, locations of critical facilities within wildfire risk areas were identified.

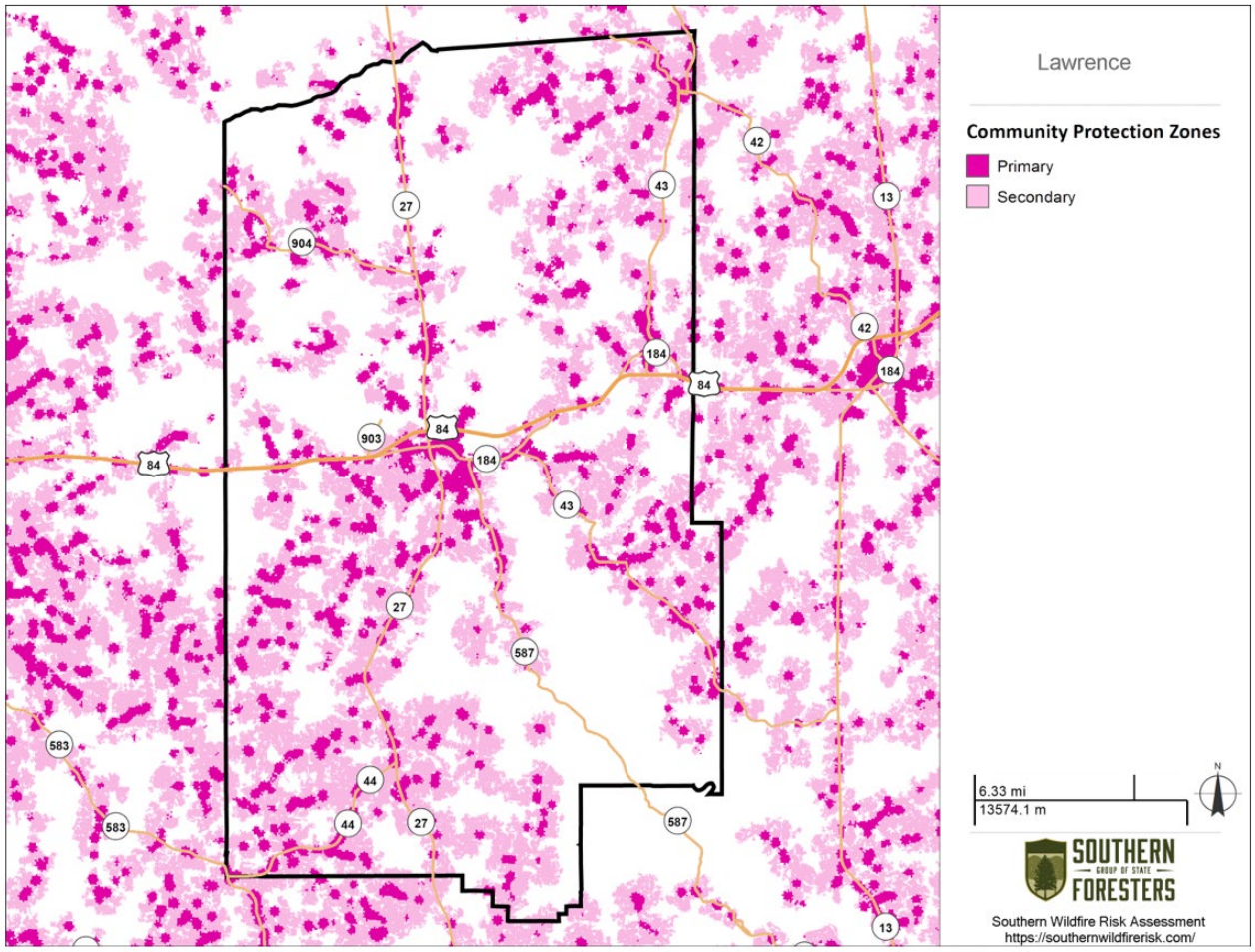
The figure below shows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). For the purposes of identifying wildfire risk vulnerability, areas in Lawrence County with a WUI Risk Value below -4 have been chosen as areas of risk because their WUI values represent the upper echelon of the scale and the areas at highest risk.

Figure E.23: Wildland Urban Interface Risk Index (WUIRI) in Lawrence County



The figure below shows Community Protection Zones (CPZ) in Lawrence County. Community Protection Zones represent those areas considered highest priority for mitigation planning activities. CPZs are based on an analysis of the "Where People Live" housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ. As in the figure above, for the purposes of identifying wildfire risk vulnerability, areas in Lawrence County with a WUI Risk Value below -4 have been chosen as areas of risk because their WUI values represent the upper echelon of the scale and the areas at highest risk.

Figure E.24: WILDFIRE RISK AREAS IN LAWRENCE COUNTY



Social Vulnerability

Given some level of susceptibility across the entire county, it is assumed that the total population is at risk to the wildfire hazard. The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk of wildfire. For the Lawrence County Wildfire Risk project area, it is estimated that 12,918 people or 99.6 % percent of the total project area population (12,968) live within the WUI.

Critical Facilities

The critical facility analysis revealed that there are 23 critical facilities in Lawrence County located in wildfire risk areas, including 1 Emergency Operation Center (EOC), 8 fire stations, 2 medical care facilities, 3 police stations, 2 private sector buildings, and 6 schools. A list of specific critical facilities and their associated risk can be found in the table at the end of this subsection.

The wildfire hazard has the potential to impact existing and future buildings, critical facilities, and populations in Lawrence County. Structures at highest risk to this hazard are located in close proximity to wildfire risk areas.

EARTHQUAKE

For the earthquake hazard vulnerability assessment, a probabilistic scenario was created at the MEMA District 7 regional level to estimate the average annualized loss for the region on a county by county basis. The results of the analysis are generated at the census tract level within Hazus-MH and then aggregated to the county level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss. They do not include losses to business interruption, lost income, or relocation.

As the Hazus-MH model suggests, and historical occurrences confirm, any significant earthquake activity in the area is likely to inflict minor damage to the planning area. Hazus-MH 5.1 estimates a total annualized loss of $105,000 for the entire MEMA District 7 region; this loss estimate includes structural and non-structural damage to buildings, contents, and inventory throughout the planning area. The Hazus-MH estimate of total annualized loss for Lawrence County is $8,000, including an annualized estimate of $2,000 for structural damage to buildings alone.

Social Vulnerability
It can be assumed that all existing and future populations are at risk to the earthquake hazard.

Critical Facilities
The Hazus-MH probabilistic analysis did not indicate that any critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor to moderate damage should an event occur. A list of specific critical facilities and their associated risk can be found in the table at the end of this section.

An earthquake has the potential to impact all existing and future buildings, facilities, and populations in Lawrence County. Specific vulnerabilities for these assets will be greatly dependent on their individual design and the mitigation measures in place. Such site-specific vulnerability determinations are outside the scope of this assessment but may be considered during future plan updates. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While Lawrence County may not experience a catastrophic earthquake, localized damage is possible with a moderate to larger scale occurrence.

HURRICANE AND TROPICAL STORM

Historical evidence indicates that Lawrence County has significant risk to the hurricane and tropical storm hazard. There have been 6 major disaster declarations in Lawrence County due to hurricanes, and several tracks have come near or traversed through the county. (See Section E.2.10 above for reference.)

Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard.

Hazus-MH 5.1 has been used to determine average annualized losses for counties within MEMA District Region. For Lawrence County, Hazus-MH 5.1 estimates an estimated annualized loss of $335,000 from the hurricane wind hazard; this estimate includes only building damage, contents damage, and inventory loss.

Social Vulnerability
Given some equal susceptibility across the entire county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard.

Critical Facilities
All critical facilities in Lawrence County are considered to be at equal risk and vulnerability to the hurricane and tropical storm hazard. Some of these facilities may perform better than others in a hurricane/tropical storm event due to building construction and age, among other factors. A list of specific critical facilities can be found in the table at the end of this subsection.

RADIOLOGICAL EVENT

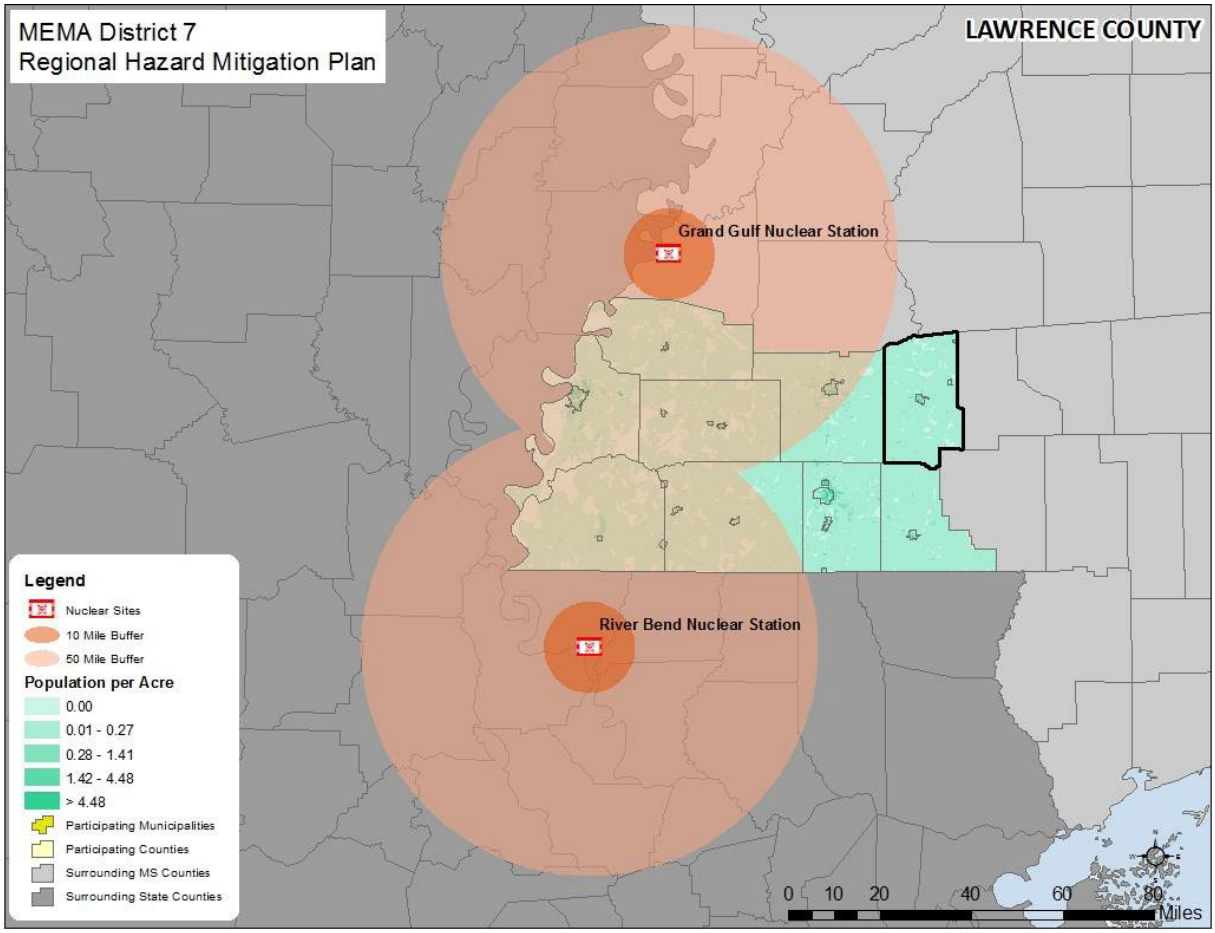
The location of Grand Gulf and River Bend Nuclear Stations north and south of the region, respectively, demonstrate that Lawrence County is at some risk to the effects of a nuclear accident. Although there have not been any major events at these plants in the past, there have been major events at other nuclear stations around the country. Additionally, smaller scale incidents at Grand Gulf and River Bend Nuclear Stations have occurred.

In order to assess nuclear risk, a GIS-based analysis was used to estimate improved property exposure to a nuclear event within each of the risk zones (i.e., 10-mile zones and 50-mile zones) described in Section E.2.14. The determination of assessed value at-risk (exposure) was calculated using GIS analysis by summing the total values for properties that were confirmed to be located within one of the risk zones.

Social Vulnerability
No portion of Lawrence County is located within either the 10 - or 50- mile buffer area. However, the county is located close enough to both nuclear stations that its entire population may be at some risk to a radiological event. This risk can be seen in the figure below**.**

Critical Facilities
The critical facility analysis revealed that there are no Lawrence County critical facilities located in either the 10-mile or 50-mile nuclear buffer areas. However, the county is located close enough to both 50-mile buffer areas that critical facilities may be at some nuclear risk. A list of specific critical facilities and their associated risk can be found in the table at the end of this section.

FIGURE E.25: POPULATION DENSITY NEAR NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN LAWRENCE COUNTY



CONCLUSIONS ON HAZARD VULNERABILITY

The table below presents a summary of annualized loss for each hazard in Lawence County. Due to the reporting of hazard damages primarily at the county level, it is difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss has been determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

TABLE E.32: ANNUALIZED LOSS FOR LAWRENCE COUNTY[91]

Event	Lawrence County
Flood-related Hazards	
Dam & Levee Failure	Negligible
Erosion	Negligible
Flood	$94,400
Fire-related Hazards	
Drought	$3,125 (Property)/ $146,938 (Crop)
Lightning	$9,875
Wildfire	Negligible
Geologic Hazards	
Earthquake[92]	$2,000
Temperature & Wind-related Hazards	
Extreme Heat	Negligible
Hailstorms	$8,074
Hurricane & Tropical Storm	$5,922,647
Severe Thunderstorm/High Wind	$32,615
Tornado	$9,374,519
Winter Storm & Freeze	$125,357
Other Hazards	
Radiological Event	Negligible
Pandemic	Negligible

All existing and future populations and buildings (including critical facilities) in Lawrence County are vulnerable to a wide variety of hazards. Some buildings may be more vulnerable to these hazards based on factors such as construction and building type. The following table shows the critical facilities vulnerable to the hazards analyzed in this section. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "X").

[91] "Negligible" is used to indicate that no records of dollar losses for the particular hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that particular type of event is not well kept.

[92] No historic losses for earthquake were recorded, so Hazus estimates for annualized loss were used.

TABLE E.33: AT-RISK CRITICAL FACILITIES IN LAWRENCE COUNTY

		FLOOD-RELATED				FIRE-RELATED			GEO	WIND-RELATED						HUM	
FACILITY NAME	FACILITY TYPE	Dam and Levee Failure	Erosion	Flood – 100 yr	Flood – 500 yr	Drought	Lightning	Wildfire	Earthquake	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Severe Thunderstorm/	Tornado	Winter Storm and Freeze	Radiological Event 10-mile area	Radiological Event 50-mile area
Lawrence County																	
Lawrence County EOC	EOC		X			X	X	X	X	X	X	X	X	X	X		
Arm Volunteer Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
Center Fire Department	Fire Station		X			X	X		X	X	X	X	X	X	X		
Monticello Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
New Hebron Volunteer Fire Rescue	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
North Pleasant Hill Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
Oakvale Fire Department	Fire Station		X			X	X		X	X	X	X	X	X	X		
Oma Fire Department	Fire Station		X			X	X		X	X	X	X	X	X	X		
Silver Creek Fire & Rescue	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
Sontag Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
Tilton Fire Department	Fire Station		X			X	X		X	X	X	X	X	X	X		
Topeka Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
Wanilla Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
Lawrence County Courthouse	Government/Public		X			X	X	X	X	X	X	X	X	X	X		
Lawrence County Hospital	Medical Care		X			X	X	X	X	X	X	X	X	X	X		
Lawrence County Nursing Center	Medical Care		X			X	X	X	X	X	X	X	X	X	X		
Lawrence County Sheriff's Ofc / Jail	Law Enforcement Complex		X			X	X	X	X	X	X	X	X	X	X		

		FLOOD-RELATED				FIRE-RELATED			GEO	WIND-RELATED						HUM	
FACILITY NAME	FACILITY TYPE	Dam and Levee Failure	Erosion	Flood – 100 yr	Flood – 500 yr	Drought	Lightning	Wildfire	Earthquake	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Severe Thunderstorm/	Tornado	Winter Storm and Freeze	Radiological Event 10-mile area	Radiological Event 50-mile area
Monticello Police Dept	Police Station		X			X	X	X	X	X	X	X	X	X	X		
New Hebron Police Dept	Police Station		X			X	X	X	X	X	X	X	X	X	X		
Georgia-Pacific Corp	Private Sector		X			X	X		X	X	X	X	X	X	X		
Kellwood	Private Sector		X			X	X	X	X	X	X	X	X	X	X		
Monticello Hardwood Inc	Private Sector		X			X	X	X	X	X	X	X	X	X	X		
Screening Systems Int.	Private Sector		X			X	X		X	X	X	X	X	X	X		
Lawrence County High School	School		X			X	X	X	X	X	X	X	X	X	X		
Lawrence County Voc-Tech Center	School		X			X	X	X	X	X	X	X	X	X	X		
Monticello Elementary School	School		X			X	X	X	X	X	X	X	X	X	X		
New Hebron Attendance Center	School		X			X	X	X	X	X	X	X	X	X	X		
Paige Middle School	School		X			X	X	X	X	X	X	X	X	X	X		
Topeka-Tilton Attendance Center	School		X			X	X	X	X	X	X	X	X	X	X		

E.4 LAWRENCE COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Lawrence County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in Section 7: *Capability Assessment*.

E.4.1 Planning and Regulatory Capability

The table below provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Lawrence County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. A dagger (†) indicates that the given item is administered for that municipality by the county. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the MEMA District 7 Regional Hazard Mitigation Plan.

TABLE E.34: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Threat and Hazard Identification and Risk Assessment (THIRA)	Comprehensive Land Use Plan	Floodplain Management Plan/Flood Mitigation Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Emergency Management Accreditation Program (EMAP Accreditation)	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment/ Reconstruction Plan/ Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System (CRS Program)
LAWRENCE COUNTY	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓		✓		✓							✓	
Monticello	†	†	✓	✓	✓	✓		†	†	✓	✓				†		✓	✓	✓			✓	✓	✓	
New Hebron	†	†	✓	✓		✓		†	†	✓	✓				†		✓							✓	
Silver Creek	†	†		✓				†	†	✓	✓				†		✓							✓	

A more detailed discussion on the county's planning and regulatory capabilities follows.

EMERGENCY MANAGEMENT

Hazard Mitigation Plan

Lawrence County has previously adopted a hazard mitigation plan. The Town of Monticello, Town of New Hebron, and Town of Silver Creek were also included in this plan.

Emergency Operations Plan

Lawrence County maintains an emergency operations plan through its Emergency Management Agency. The Town of Monticello, Town of New Hebron, and Town of Silver Creek are also covered by this plan.

GENERAL PLANNING

Zoning Ordinance
The Town of Monticello is the only jurisdiction in Lawrence County that has adopted a zoning ordinance.
Subdivision Ordinance
The Town of Monticello is the only jurisdiction in Lawrence County that has adopted a subdivision ordinance.

FLOODPLAIN MANAGEMENT

The table below provides NFIP policy and claim information for each participating jurisdiction in Lawrence County. Additional information on insured flood losses in Lawrence County can be found above, in **Section E.2.3.**.

TABLE E.35: NFIP POLICY AND CLAIM INFORMATION

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force^	Closed Claims	Total Payments to Date
LAWRENCE COUNTY†	09/15/89	06/02/11	9	$6,992,300^	9	$327,839
Monticello	04/02/86	06/02/11	0	$0	0	$136,891
New Hebron	08/05/85	06/02/11(M)	0	$0	0	$250
Silver Creek	06/02/11	06/02/11(M)	0	$0	0	$0

†Includes unincorporated areas of county only
^last available data 2017
(M) – No Elevation Determined, All Zone A, C and X
Source: NFIP Community Status information as of 7/2/2023; NFIP claims and policy information as of 7/2/2023

All jurisdictions listed above that are participants in the NFIP will continue to comply with all required provisions of the program and will work to adequately comply in the future utilizing a number of strategies. For example, the jurisdictions will coordinate with MEMA and FEMA to develop maps and regulations related to special flood hazard areas within their jurisdictional boundaries and, through a consistent monitoring process, will design and improve their floodplain management program in a way that reduces the risk of flooding to people and property.

Flood Damage Prevention Ordinance
All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. Lawrence County, Town of Monticello, Town of New Hebron, and Town of Silver Creek all participate in the NFIP and have adopted flood damage prevention regulations.

E.4.2 Administrative and Technical Capability

The table below provides a summary of the capability assessment results for Lawrence County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill. A dagger (†) indicates a county-level staff member(s) provides the specified knowledge or skill to that municipality.

TABLE E.36: RELEVANT STAFF/PERSONNEL RESOURCES

Staff/Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
LAWRENCE COUNTY	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Monticello		✓	✓	†	✓	†	†	†	†	
New Hebron				†	✓	†	†	†	†	
Silver Creek				†	✓	†	†	†	†	

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

E.4.3 Fiscal Capability

The table below provides a summary of the results for Lawrence County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource has previously been used to implement hazard mitigation actions. A dagger (†) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds).

TABLE E.37: RELEVANT FISCAL RESOURCES

Fiscal Tool/Resource	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes (or taxing	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental	Other: FEMA Hazard Mitigation Grants, Homeland Security Grants, USDA Rural Development Agency Grants, and US Economic Development Administration Grants
LAWRENCE COUNTY		†								†
Monticello		†			✓					†
New Hebron		†			✓					†
Silver Creek		†			✓					†

E.4.4 Political Capability

During the months immediately following a disaster, local public opinion in Lawrence County is more likely to shift in support of hazard mitigation efforts.

The table below provides a summary of the results for Lawrence County with regard to political capability. A checkmark (✓) indicates the expected degree of political support by local elected officials in terms of adopting/funding information.

TABLE E.38: LOCAL POLITICAL SUPPORT

Political Support	Limited	Moderate	High
LAWRENCE COUNTY			✓
Monticello			✓
New Hebron		✓	
Silver Creek		✓	

E.4.5 Conclusions on Local Capability

The table below shows the results of the capability assessment using the designed scoring methodology described in Section 7: *Capability Assessment*. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. This information was reviewed by all jurisdictions and each jurisdiction provided feedback on the information included in the capability assessment. Local government input was vital to identifying capabilities. According to the assessment, the average local capability score for the county and its jurisdictions is 20.3, which falls into the limited capability ranking.

TABLE E.39: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
LAWRENCE COUNTY	22	Limited
Monticello	23	Limited
New Hebron	18	Limited
Silver Creek	18	Limited

E.5 LAWRENCE COUNTY MITIGATION STRATEGY

This subsection provides the blueprint for Lawrence County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and the findings and conclusions of the capability assessment and risk assessment. In addition, this strategy was developed with the State Hazard Mitigation Plan Goals and Objectives in mind. For this update, each action identifies the State Hazard Mitigation Program Objective that it relates to. Additional Information can be found in Section 8: *Mitigation Strategy* and Section 9: *Mitigation Action Plan*.

This subsection provides the blueprint for Lawrence County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and the findings and conclusions of the capability assessment and risk assessment. Additional Information can be found in Section 8: *Mitigation Strategy* and Section 9: *Mitigation Action Plan*.

E.5.1 Mitigation Goals

Lawrence County developed six mitigation goals in coordination with the other participating MEMA District 7 Region jurisdictions. The regional mitigation goals are presented in the table below.

TABLE E.40: MEMA DISTRICT 7 REGIONAL MITIGATION GOALS

	Goal
Goal #1	Increase the overall public awareness of natural hazards that face the region.
Goal #2	Retrofit of critical facilities and/or critical infrastructure to lower the risk of damage from natural hazards.
Goal #3	General improvement of regional or local mitigation planning and capability.
Goal #4	Support State Identified Mitigation Initiatives such as saferooms and storm shelters, severe weather warning systems for universities and colleges, and severe weather notification systems for local communities.
Goal #5	Reduce loss of life, damage and loss of property and infrastructure, economic costs, including response, recovery and disruption of economic activity.
Goal #6	Foster cooperation among all levels of governments and the private sector with respect to improving, updating, and implementing the hazard mitigation plan.

E.5.2 Mitigation Action Plan

The mitigation actions proposed by Lawrence County, Town of Monticello, Town of New Hebron, Town of Silver Creek are listed in the following individual Mitigation Action Plans.

Lawrence County Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implement Sched.	Implementation Status (2023)
Prevention								
P-1	2.2	**Comprehensive Land Use and Long-Term Recovery Planning –** The Lawrence County Board of Supervisors/Towns of Monticello, Silver Creek, and New Hebron should have a Comprehensive Plan developed to guide long term recovery and development.	Hurricane or other hazard	High	Lawrence County Board of Supervisors/ Towns of Monticello, Silver Creek, and New Hebron	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	Completed 2023	The Comprehensive Emergency Management Plan went into effect Jan 2023 – the update schedule is every 5 years
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	Lawrence County Board of Supervisors and the County Tax Assessor's Office	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2023	A detailed flood hazard risk assessment for properties found within local jurisdictions with digital maps of features is under development in association with the County tax assessor's office, crisis trackers

P-3	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist counties with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as counties develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Lawrence County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2023	Detailed tornado and wildfire hazard assessment for properties found within local jurisdictions with digital maps of features is under development in association with the County tax assessor's office, crisis trackers
P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Lawrence County Board of Supervisors/ Towns of Monticello, Silver Creek, and New Hebron	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
P-5	1.4	**Monitor Drought Conditions -** Identify local drought indicators (precipitation, temperature, surface water levels, soil moisture, etc.) and establish a regular schedule to monitor and report conditions.	Drought	Moderate	Lawrence County Board of Supervisors/ Towns of Monticello, Silver Creek, and New Hebron	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action

P-6	1.4	**Conduct A Drought Economic Impact Analysis -** Gather water and climate data. Collect information on businesses that depend on water availability. (Farming, ranching, logging, etc.). Analyze the community's economic stability in relation to water availability. Quantify economic losses based on how the community and its water sources have been impacted by droughts in the past.	Drought	Moderate	Lawrence County Board of Supervisors/ Towns of Monticello, Silver Creek, and New Hebron	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Lawrence County Board of Supervisors/Towns of Monticello, Silver Creek, and New Hebron should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Lawrence County Board of Supervisors/ Towns of Monticello, Silver Creek, and New Hebron	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress – 2024	Lawrence County Board of Supervisors/ Towns of Monticello, Silver Creek, and New Hebron recognize that damage to public buildings from wind is a serious hazard affecting the ability of government to function during and after disasters. Roof and structural damage and loss of electrical service in county/city government buildings due to high winds can render these buildings at least temporarily unusable and can potentially cause disruptions in government services. Retrofits to the Lawrence County Courthouse has begun, however permitting requirements from the local historical society must be addressed. Because this action is in progress with target completion by 2024, this action will remain in the plan.
PP-2	1.1	**Ground/Protect Critical Facilities and Equipment** – Upgrade electrical protective measures on critical facilities.	Lightning	Moderate	Lawrence County Board of Supervisors/ Towns of Monticello, Silver Creek, and New Hebron	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action
Natural Resource Protection								
NRP-1	1.6	**Bank Stabilization –** Prevent bank erosion	Erosion, Flood	Moderate	Lawrence County	FEMA Hazard	2023 and	New Action

		through sloping or grading techniques, planting vegetation on slopes, terracing, or installing riprap boulders or geotextile fabric and prohibiting removal of natural vegetation from stream banks.			Board of Supervisors/ Towns of Monticello, Silver Creek, and New Hebron	Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	ongoing	
Structural Projects								
SP-1	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm	High	Lawrence County Board of Supervisors/ Towns of Monticello, Silver Creek, and New Hebron	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2027	New Action.
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our	Hurricane, Winter Storm	High	Lawrence County Board of Supervisors/ Towns of Monticello, Silver Creek, and New Hebron in collaboration with the Mississippi Emergency Management Agency	General and special funds	In progress – target completion 2024	Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. The county is in the process of becoming "storm ready" countywide including the towns, so this action will remain in the plan. This action was combined with ES-6 since they were duplicate actions.

		Natchez or Meadville offices.						
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, or other hazard leading to loss of electrical power	High	Lawrence County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - partial completion, 5 generators are listed as portable. 2 new generators for care facilities in Monticello are targeted by 2025	Loss of electrical power to critical facilities such as water and sewer systems, law enforcement offices, and other critical facilities during a natural disaster can have a severe impact on the functioning of government to provide relief and assistance to citizens and maintain civil order. This can also cause very significant problems for private citizens who depend on municipal and rural water and sewer systems and rely on county and city governments to continue to maintain order. This situation can be especially difficult on the elderly and other special needs persons who would have a difficult time maintaining the basics for themselves without assistance. Lawrence County has received 5 generators since 2005. One at the Emergency Management office and one at New Hebron, Sontag, Monticello, and Silver Creek water associations. Lawrence County will continue to purchase critical facility generators as funding permits, so this action will remain in the plan.
ES-3	1.8	**Improve Emergency Communications –** Purchase a satellite phone system to ensure communications capabilities are unimpeded during natural disasters even if traditional communications systems fail.	Hurricane or other hazard leading to loss of traditional communications systems	N/A	N/A	N/A	Deleted	The county functions 100% on MISWIN
ES-4	1.9	**Construct New Emergency Shelter –** The county should construct a 200-person evacuation shelter. When not needed for disaster related housing, the building will serve as a Community Center and can be rented by individuals for group functions such as family reunions, weddings, or class reunions. Should an earthquake impact the surrounding region, the County typically is expected to	Hurricane, Earthquake, Tornado or other hazard requiring the use of emergency shelters	High	Lawrence County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual	2027	The Lawrence County Board of Supervisors recognize the need to have modern, safe emergency shelters for county/town residents and evacuees from other areas during times of disaster. Currently a combination of schools, churches, and other government buildings are used. This works acceptably for short-term use, but for longer term needs as were seen in the Hurricane Katrina disaster, the presence of

		house a number of evacuees. An evacuation shelter is necessary to support this function.				county general and special funds		evacuees in these facilities for more than a few days caused a disruption in the facility's designed function. A 200-person evacuation shelter is still being planned but was delayed due to funding and community prioritization and is still in the initial stages of planning, so this action will remain in the plan.
ES-5	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide/citywide system.	Tornado	High	Lawrence County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	In progress, 3 sirens inside Monticello, 9 in county. Installed prior to the last plan. 2 damaged from lightning. County feels that majority of sirens needed in the county are satisfied but would prefer 1 more siren at Topeka Attendance Center. Targeted for 2027	Many citizens in Lawrence County live in rural areas and small communities. In the event of inclement weather, it is essential that they receive timely warnings. The county currently has 5 weather sirens in addition to the sirens located within the municipalities. Additional sirens can be innstalled/upgraded to further improve the warning system in Lawrence County, so this action will remain in the plan.
ES-6	1.1	**Upgrade Dispatch/FAA consoles for E911 (MCC5500)**	Lightning, and other hazards that impact power outage	High	Lawrence County Board of Supervisors	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action. Due to repeated lightning strikes and resulting power failures, the County's E991 and dispatch center have repeatedly been unable to function.

ES-7	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Lawrence County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2027	New Action.
Public Education and Awareness								
PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Moderate	Lawrence County Board of Supervisors/ Towns of Monticello, Silver Creek, and New Hebron	N/A	Continuous/ongoing	Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan. The County conducts earthquake drills every year through the Great ShakeOut with at least 316 participants through the school system.

PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Lawrence County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP. There is continued interest within the county, but additional funding is needed to support this activity.
PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-5	3.2	**Education: FireWise –** Recommend that public information and outreach workshops on the *Firewise* program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Lawrence County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, individual county general and special funds	2026	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan. Implementation is targeted toward the southern part of the County

PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Lawrence County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Lawrence County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Lawrence County Board of Supervisors/ Towns of Monticello, Silver Creek, and New Hebron	FEMA Hazard Mitigation grants, general and special funds	2025	New Action

PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Lawrence County Board of Supervisors/ Towns of Monticello, Silver Creek, and New Hebron	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Lawrence County Board of Supervisors/ Towns of Monticello, Silver Creek, and New Hebron	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2024	New Action.

Town of Monticello Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implm. Sched.	Implementation Status (2023)
Prevention								
P-1	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include lidar with aerial photography and 100 year base flood elevations in the A Zones and any other area where base flood elevations need to be computed.	Flood	Moderate	Town of Monticello Board of Alderman and Mayor in collaboration with the Lawrence County Board of Supervisors and the County Tax Assessor's Office	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2023	A detailed flood hazard risk assessment for properties found within local jurisdictions with digital maps of features is under development in association with the County tax assessor's office, crisis trackers
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist cities with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as cities develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Town of Monticello Board of Alderman and Mayor in collaboration with Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress – target completion mid 2023	Detailed tornado and wildfire hazard assessment for properties found within local jurisdictions with digital maps of features is under development in association with the County tax assessor's office, crisis trackers

P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Town of Monticello Board of Alderman and Mayor	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
P-5	1.4	**Monitor Drought Conditions -** Identify local drought indicators (precipitation, temperature, surface water levels, soil moisture, etc.) and establish a regular schedule to monitor and report conditions.	Drought	Moderate	Town of Monticello Board of Alderman and Mayor	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action
P-6	1.4	**Conduct A Drought Economic Impact Analysis -** Gather water and climate data. Collect information on businesses that depend on water availability. (Farming, ranching, logging, etc.). Analyze the community's economic stability in relation to water availability. Quantify economic losses based on how the community and its water sources have been impacted by droughts in the past.	Drought	Moderate	Town of Monticello Board of Alderman and Mayor	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Town of Monticello should seek to retrofit all essential government buildings to increase their resistance to the	Hurricane, Tornado or other wind related hazard	High	Town of Monticello Board of Alderman and Mayor	Homeland Security grants, USDA Rural Development	2027	The Town of Monticello recognizes that damage to public buildings from wind is a serious hazard affecting the ability of government to function during and after

		effects of high winds.				Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds		disasters. Roof and structural damage and loss of electrical service in county/city government buildings due to high winds can render these buildings at least temporarily unusable and can potentially cause disruptions in government services. This action will remain in the plan.
PP-2	1.1	**Ground/Protect Critical Facilities and Equipment** – Upgrade electrical protective measures on critical facilities.	Lightning	Moderate	Town of Monticello Board of Alderman and Mayor	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action
Natural Resource Protection								
NRP-1	1.6	**Bank Stabilization along Pearl River –** The Town of Monticello Board of Aldermen and Mayor plan to embark on a bank stabilization project to shore up the riverbank in this area and prevent further damage.	Flood, Erosion	High	Town of Monticello Board of Alderman and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county/city general and special funds	Completed between 2021-2022	Continued failure of a section of the bank of the Pearl River in Monticello threatened both public and private structures, including the library, county offices, and private homes and businesses. The town installed rocks along the riverbank at the library and at the end of Caswell Street to assist in the stabilization during the last planning process. A fully engineered stabilization project was started in 2021 and completed in 2022.
Structural Projects								
SP-1	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during	Tornado, Hailstorm	High	Town of Monticello Board of Alderman and Mayor	FEMA Hazard Mitigation grants, US Economic Development	2027	New Action.

		a severe thunderstorm.				Administration grants, general and special funds		
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Hurricane, Winter Storm	High	Town of Monticello Board of Alderman and Mayor in collaboration with the Lawrence County Board of Supervisors and the Mississippi Emergency Management Agency	General and special funds	In progress – target completion 2024	Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. The county is in the process of becoming "storm ready" countywide including the towns, so this action will remain in the plan. This action was combined with ES-6 since they were duplicate actions.
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, or other hazard leading to loss of electrical power	High	Town of Monticello Board of Alderman and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2027	Loss of electrical power to critical facilities such as water and sewer systems, law enforcement offices, and other critical facilities during a natural disaster can have a severe impact on the functioning of government to provide relief and assistance to citizens and maintain civil order. This can also cause very significant problems for private citizens who depend on municipal and rural water and sewer systems and rely on county and town governments to continue to maintain order. This situation can be especially difficult on the elderly and other special needs persons who would have a difficult time maintaining the basics for themselves without assistance. Lawrence County has received 5 generators since 2005. One at the

								Emergency Management office and one at New Hebron, Sontag, Monticello, and Silver Creek water associations. The Town of Monticello will continue to purchase critical facility generators as funding permits and 2 new generators for care facilities in Monticello are targeted by 2025, so this action will remain in the plan.
ES-3	1.8	**Improve Emergency Communications –** Purchase a satellite phone system to ensure communications capabilities are unimpeded during natural disasters even if traditional communications systems fail.	N/A	N/A	N/A	N/A	Deleted	The jurisdictions within the county function 100% on MISWIN
ES-4	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the town to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the town where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the town-wide system.	Tornado	High	Town of Monticello/ Lawrence County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/Town General Fund	Completed	In the event of inclement weather, it is essential that residents of the Town of Monticello receive timely warnings. The town currently has 4 sirens which is deemed adequate.
ES-5	3.1	**StormReady**	N/A	N/A	N/A	N/A	Deleted	This action is a duplicate of ES-1,
ES-6	1.9	**Safe Rooms and Community Shelters –** The town should construct and/or encourage construction of safe rooms and community shelters. Should an earthquake impact the surrounding region, the County typically is expected to house a number of evacuees. An evacuation shelter is necessary to support this function.	Hurricane, Earthquake, Tornado or other hazard requiring the use of emergency shelters.	High	Town of Monticello Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2027	New Action.
ES-7	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Town of Monticello Board of Aldermen and Mayor in coordination with the Lawrence County Board of	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC,	2027	New Action.

					Supervisors	Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), individual city general and special funds		
Public Education and Awareness								
PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Moderate	Town of Monticello Board of Aldermen and Mayor in coordination with the Lawrence County Board of Supervisors	N/A	Continuous/ongoing	Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan. The County conducts earthquake drills every year through the Great ShakeOut with at least 316 participants through the school system.
PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Town of Monticello Board of Aldermen and Mayor in coordination with the Lawrence County Board of Supervisors and the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP. There is continued interest within the county, but additional funding is needed to support this activity.
PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the town.

		risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.						
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the town.
PEA-5	3.1	**Education: FireWise** – Recommend that public information and outreach workshops on the Firewise program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Town of Monticello Board of Aldermen and Mayor in coordination with the Lawrence County Board of Supervisors and the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, general and special funds	2026	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan.
PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	High	Town of Monticello Board of Aldermen and Mayor in coordination with the Lawrence County Board of Supervisors and the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend	Radiological	High	Town of	FEMA	2026	The public should receive continuing

		that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.			Monticello Board of Aldermen and Mayor in coordination with the Lawrence County Board of Supervisors and the Southwest Mississippi Planning and Development District, Inc.	Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds		education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Town of Monticello Board of Aldermen and Mayor in coordination with the Lawrence County Board of Supervisors	FEMA Hazard Mitigation grants, individual city general and special funds	2025	New Action
PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Town of Monticello Board of Aldermen and Mayor in coordination with the Lawrence County Board of Supervisors	FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual city general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Town of Monticello Board of Aldermen and Mayor in coordination with the Lawrence	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC)	2024	New Action.

					County Board of Supervisors	CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), individual city general and special funds		

Town of New Hebron Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implm. Sched.	Implementation Status (2023)
Prevention								
P-1	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include lidar with aerial photography and 100 year base flood elevations in the A Zones and any other area where base flood elevations need to be computed.	Flood	Moderate	Town of New Hebron Board of Alderman and Mayor in collaboration with the Lawrence County Board of Supervisors and the County Tax Assessor's Office	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2023	A detailed flood hazard risk assessment for properties found within local jurisdictions with digital maps of features is under development in association with the County tax assessor's office, crisis trackers
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist cities with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as cities develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Town of New Hebron Board of Alderman and Mayor in collaboration with Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress – target completion mid 2023	Detailed tornado and wildfire hazard assessment for properties found within local jurisdictions with digital maps of features is under development in association with the County tax assessor's office, crisis trackers

P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Town of New Hebron Board of Alderman and Mayor	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
P-5	1.4	**Monitor Drought Conditions -** Identify local drought indicators (precipitation, temperature, surface water levels, soil moisture, etc.) and establish a regular schedule to monitor and report conditions.	Drought	Moderate	Town of New Hebron Board of Alderman and Mayor	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action
P-6	1.4	**Conduct A Drought Economic Impact Analysis -** Gather water and climate data. Collect information on businesses that depend on water availability. (Farming, ranching, logging, etc.). Analyze the community's economic stability in relation to water availability. Quantify economic losses based on how the community and its water sources have been impacted by droughts in the past.	Drought	Moderate	Town of New Hebron Board of Alderman and Mayor	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for**	Hurricane, Tornado or	High	Town of New Hebron Board of	Homeland Security grants,	2027	The Town of New Hebron recognizes that damage to public buildings from wind is a

		Wind Resistance – The Town of New Hebron should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	other wind related hazard		Alderman and Mayor	USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds		serious hazard affecting the ability of government to function during and after disasters. Roof and structural damage and loss of electrical service in county/city government buildings due to high winds can render these buildings at least temporarily unusable and can potentially cause disruptions in government services. This action will remain in the plan.
PP-2	1.1	**Ground/Protect Critical Facilities and Equipment** – Upgrade electrical protective measures on critical facilities.	Lightning	Moderate	Town of New Hebron Board of Alderman and Mayor	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action
Natural Resource Protection								
NRP-1	1.6							
Structural Projects								
SP-1	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm	High	Town of New Hebron Board of Alderman and Mayor	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2027	New Action.
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro-active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities	Hurricane, Winter Storm	High	Town of New Hebron Board of Alderman and Mayor in collaboration with the Lawrence County Board of	General and special funds	In progress – target completion 2024	Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. The county is in the process of becoming "storm ready" countywide including the

		and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.			Supervisors and the Mississippi Emergency Management Agency			towns, so this action will remain in the plan. This action was combined with ES-6 since they were duplicate actions.
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, or other hazard leading to loss of electrical power	High	Town of New Hebron Board of Alderman and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2027	Loss of electrical power to critical facilities such as water and sewer systems, law enforcement offices, and other critical facilities during a natural disaster can have a severe impact on the functioning of government to provide relief and assistance to citizens and maintain civil order. This can also cause very significant problems for private citizens who depend on municipal and rural water and sewer systems and rely on county and town governments to continue to maintain order. This situation can be especially difficult on the elderly and other special needs persons who would have a difficult time maintaining the basics for themselves without assistance. Lawrence County has received 5 generators since 2005. One at the Emergency Management office and one at New Hebron, Sontag, Monticello, and Silver Creek water associations. The Town of New Hebron will continue to purchase critical facility generators as funding permits and 2 new generators for care facilities in Monticello are targeted by 2025, so this action will remain in the plan.

ES-3	1.8	**Improve Emergency Communications –** Purchase a satellite phone system to ensure communications capabilities are unimpeded during natural disasters even if traditional communications systems fail.	N/A	N/A	N/A	N/A	Deleted	The jurisdictions within the county function 100% on MISWIN
ES-4	1.9	**Construct New Emergency Shelter –** The town should construct a 50-person evacuation shelter. The town's Volunteer Fire Department could also be housed in the new facility.	Hurricane, Tornado or other hazard requiring the use of emergency shelters	High	Town of New Hebron Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	The Town of New Hebron Board of Aldermen and Mayor recognize the need to have modern, safe emergency shelters for county/town residents and evacuees from other areas during times of disaster. Currently a combination of schools, churches, and other government buildings are used. This works acceptably for short-term use, but for longer term needs as were seen in the Hurricane Katrina disaster, the presence of evacuees in these facilities for more than a few days caused a disruption in the facility's designed function. Also, the facilities for the Volunteer Fire Department do not have adequate storage space for all of the firefighting equipment. The county has installed storm shelters for workers at all county barns, fire stations and town halls. Also, the town is still in the initial stages of planning a larger shelter, so this action will remain in the plan.
ES-5	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the town to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the town where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the town-wide system.	Tornado	High	Town of New Hebron/ Lawrence County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/Town General Fund	Complete	In the event of inclement weather, it is essential that residents of the Town of New Hebron receive timely warnings. The town has 2 sirens which is deemed adequate at this time.
ES-7	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Town of New Hebron Board of Aldermen and Mayor in coordination with	U.S Department of Health and Human Services (HHS), Centers for Disease	2027	New Action.

					the Lawrence County Board of Supervisors	Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), individual city general and special funds		
Public Education and Awareness								
PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Moderate	Town of New Hebron Board of Aldermen and Mayor in coordination with the Lawrence County Board of Supervisors	N/A	Continuous/ongoing	Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan. The County conducts earthquake drills every year through the Great ShakeOut with at least 316 participants through the school system.
PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville	Flood	High	Town of New Hebron Board of Aldermen and Mayor in coordination with the Lawrence County Board of Supervisors and the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP. There is continued interest within the county, but additional funding is needed to support this activity.

		offices.						
PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the town.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the town.
PEA-5	3.1	**Education: FireWise** – Recommend that public information and outreach workshops on the Firewise program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Town of New Hebron Board of Aldermen and Mayor in coordination with the Lawrence County Board of Supervisors and the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, general and special funds	2026	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan.
PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur.	Radiological	High	Town of New Hebron Board of Aldermen and Mayor in coordination with the Lawrence County Board of Supervisors and the Southwest Mississippi	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other	2026	Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.

		Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.			Planning and Development District, Inc.	similar program in combination with individual county general and special funds		
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Town of New Hebron Board of Aldermen and Mayor in coordination with the Lawrence County Board of Supervisors and the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Town of New Hebron Board of Aldermen and Mayor in coordination with the Lawrence County Board of Supervisors	FEMA Hazard Mitigation grants, individual city general and special funds	2025	New Action
PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Town of New Hebron Board of Aldermen and Mayor in coordination with the Lawrence County	FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual	2026	New Action.

					Board of Supervisors	city general and special funds		
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Town of New Hebron Board of Aldermen and Mayor in coordination with the Lawrence County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), individual city general and special funds	2024	New Action.

Town of Silver Creek Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implm. Sched.	Implementation Status (2023)
Prevention								
P-1	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include lidar with aerial photography and 100 year base flood elevations in the A Zones and any other area where base flood elevations need to be computed.	Flood	Moderate	Town of Silver Creek Board of Alderman and Mayor in collaboration with the Lawrence County Board of Supervisors and the County Tax Assessor's Office	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - target completion mid 2023	A detailed flood hazard risk assessment for properties found within local jurisdictions with digital maps of features is under development in association with the County tax assessor's office, crisis trackers
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist cities with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as cities develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Town of Silver Creek Board of Alderman and Mayor in collaboration with Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress – target completion mid 2023	Detailed tornado and wildfire hazard assessment for properties found within local jurisdictions with digital maps of features is under development in association with the County tax assessor's office, crisis trackers

P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Town of Silver Creek Board of Alderman and Mayor	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
P-5	1.4	**Monitor Drought Conditions -** Identify local drought indicators (precipitation, temperature, surface water levels, soil moisture, etc.) and establish a regular schedule to monitor and report conditions.	Drought	Moderate	Town of Silver Creek Board of Alderman and Mayor	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action
P-6	1.4	**Conduct A Drought Economic Impact Analysis -** Gather water and climate data. Collect information on businesses that depend on water availability. (Farming, ranching, logging, etc.). Analyze the community's economic stability in relation to water availability. Quantify economic losses based on how the community and its water sources have been impacted by droughts in the past.	Drought	Moderate	Town of Silver Creek Board of Alderman and Mayor	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action
Property Protection								

PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Town of Silver Creek should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Town of Silver Creek Board of Alderman and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2027	The Town of Silver Creek recognizes that damage to public buildings from wind is a serious hazard affecting the ability of government to function during and after disasters. Roof and structural damage and loss of electrical service in county/city government buildings due to high winds can render these buildings at least temporarily unusable and can potentially cause disruptions in government services. This action will remain in the plan.
PP-2	1.1	**Ground/Protect Critical Facilities and Equipment** – Upgrade electrical protective measures on critical facilities.	Lightning	Moderate	Town of Silver Creek Board of Alderman and Mayor	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action
Natural Resource Protection								
NRP-1	1.6							
Structural Projects								
SP-1	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm	High	Town of Silver Creek Board of Alderman and Mayor	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2027	New Action.
Emergency Services								

ES-1	3.1	**StormReady –** Encourage communities to take a new pro-active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Hurricane, Winter Storm	High	Town of Silver Creek Board of Alderman and Mayor in collaboration with the Lawrence County Board of Supervisors and the Mississippi Emergency Management Agency	General and special funds	In progress – target completion 2024	Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. The county is in the process of becoming "storm ready" countywide including the towns, so this action will remain in the plan. This action was combined with ES-6 since they were duplicate actions.
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, or other hazard leading to loss of electrical power	High	Town of Silver Creek Board of Alderman and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2027	Loss of electrical power to critical facilities such as water and sewer systems, law enforcement offices, and other critical facilities during a natural disaster can have a severe impact on the functioning of government to provide relief and assistance to citizens and maintain civil order. This can also cause very significant problems for private citizens who depend on municipal and rural water and sewer systems and rely on county and town governments to continue to maintain order. This situation can be especially difficult on the elderly and other special needs persons who would have a difficult time maintaining the basics for themselves without assistance. Lawrence County has received 5 generators since 2005. One at the Emergency Management office and one at

								New Hebron, Sontag, Monticello, and Silver Creek water associations. The Town of Silver Creek will continue to purchase critical facility generators as funding permits and 2 new generators for care facilities in Monticello are targeted by 2025, so this action will remain in the plan.
ES-3	1.8	**Improve Emergency Communications –** Purchase a satellite phone system to ensure communications capabilities are unimpeded during natural disasters even if traditional communications systems fail.	N/A	N/A	N/A	N/A	Deleted	The jurisdictions within the county function 100% on MISWIN
ES-4	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the town to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the town where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the town-wide system.	Tornado	High	Town of Silver Creek/ Lawrence County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/Town General Fund	Completed	In the event of inclement weather, it is essential that residents of the Town of Silver Creek receive timely warnings. The town currently has 4 sirens which is deemed adequate.
ES-5	3.1	**StormReady**	N/A	N/A	N/A	N/A	Deleted	This action is a duplicate of ES-1,
ES-6	1.9	**Safe Rooms and Community Shelters –** The town should construct and/or encourage construction of safe rooms and community shelters. Should an earthquake impact the surrounding region, the County typically is expected to house a number of evacuees. An evacuation shelter is necessary to support this function.	Hurricane, Earthquake, Tornado or other hazard requiring the use of emergency shelters.	High	Town of Silver Creek Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2027	New Action.
ES-7	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Town of Silver Creek Board of Aldermen and	U.S Department of Health and Human Services	2027	New Action.

					Mayor in coordination with the Lawrence County Board of Supervisors	(HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), individual city general and special funds		
Public Education and Awareness								
PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Moderate	Town of Silver Creek Board of Aldermen and Mayor in coordination with the Lawrence County Board of Supervisors	N/A	Continuous/ongoing	Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan. The County conducts earthquake drills every year through the Great ShakeOut with at least 316 participants through the school system.
PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state	Flood	High	Town of Silver Creek Board of Aldermen and Mayor in coordination with the Lawrence County Board of	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP. There is

		representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.			Supervisors and the MEMA Mitigation Bureau			continued interest within the county, but additional funding is needed to support this activity.
PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the town.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the town.
PEA-5	3.1	**Education: FireWise** – Recommend that public information and outreach workshops on the Firewise program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Town of Silver Creek Board of Aldermen and Mayor in coordination with the Lawrence County Board of Supervisors and the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, general and special funds	2026	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan.
PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care	Radiological	High	Town of Silver Creek Board of Aldermen and Mayor in coordination with the Lawrence	FEMA Emergency Management grants like Homeland Security	2026	Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of

		facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.			County Board of Supervisors and the Southwest Mississippi Planning and Development District, Inc.	Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds		radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Town of Silver Creek Board of Aldermen and Mayor in coordination with the Lawrence County Board of Supervisors and the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstor	Moderate	Town of Silver Creek Board of Aldermen and Mayor in coordination with the Lawrence County Board of	FEMA Hazard Mitigation grants, individual city general and special funds	2025	New Action

		address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	m/High Wind, Lightning		Supervisors			
PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Town of Silver Creek Board of Aldermen and Mayor in coordination with the Lawrence County Board of Supervisors	FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual city general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Town of Silver Creek Board of Aldermen and Mayor in coordination with the Lawrence County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), individual city general and special funds	2024	New Action.

LINCOLN COUNTY

This annex includes jurisdiction-specific information for Lincoln County and its participating municipalities. It consists of the following five subsections:

- F.1 Lincoln County Community Profile
- F.2 Lincoln County Risk Assessment
- F.3 Lincoln County Vulnerability Assessment
- F.4 Lincoln County Capability Assessment
- F.5 Lincoln County Mitigation Strategy

F.1 LINCOLN COUNTY COMMUNITY PROFILE

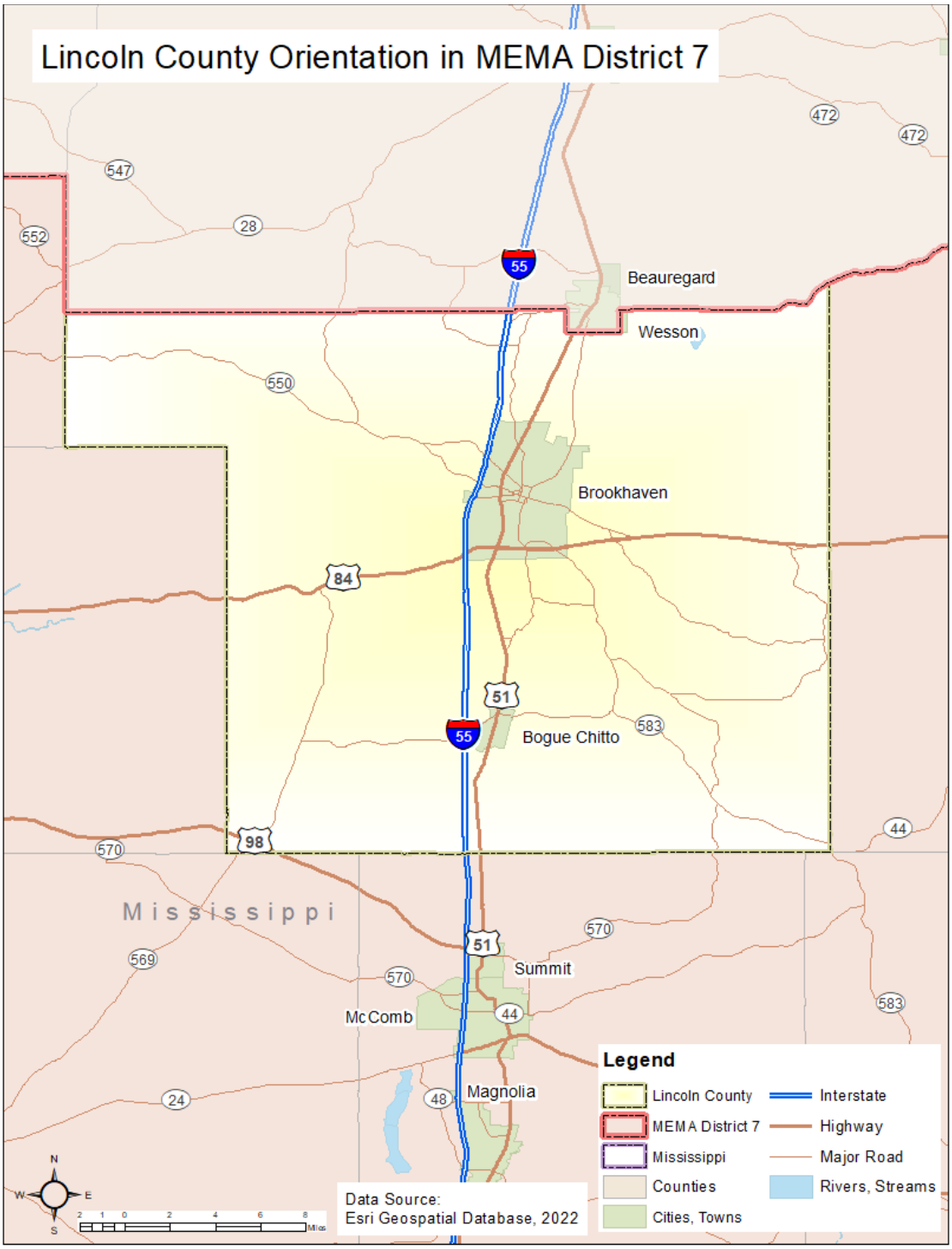
F.1.1 Geography and the Environment

Lincoln County is located in southwestern Mississippi. It comprises one city, City of Brookhaven, as well as many small unincorporated communities. An orientation map is provided below.

The county is located to the east of the Mississippi River supplying diverse recreational activities. The total area of the county is 588 square miles, 2 square miles of which is water area.

Lincoln County enjoys four distinct seasons but the climate in the region is generally hot and humid compared to the rest of the United States given its latitude and relative proximity to the Gulf Coast. Precipitation is generally highest in winter months when the temperatures are moderately lower, but the likelihood of precipitation remains relatively constant throughout the year. Summers in the region can become fairly hot with average highs in the nineties and lows in the seventies. The region is also often susceptible to turbulent weather when warm, wet air from the Gulf of Mexico is pushed up into the region to mix with cooler air coming down from across the continent which can result in severe weather conditions. This is particularly true in the spring when seasons are changing and diverse weather patterns interact.

FIGURE F.1: LINCOLN COUNTY ORIENTATION MAP



F.1.2 Population and Demographics

According to the 2020 Census, Lincoln County has a population of 34,907. The county has seen a slight increase in population between 2000 and 2020. The population density is 59.5 people per square mile. Population counts from the U.S. Census Bureau for 2000, 2010, and 2020 for the county and participating jurisdictions are presented below.

TABLE F.1: POPULATION COUNTS FOR LINCOLN COUNTY[1]

Jurisdiction	2000 Census Population	2010 Census Population	2020 Census Population	% Change 2000-2020
Lincoln County	**33,166**	**34,869**	**34,907**	**5.25%**
Brookhaven	9,786	12,513	11,674	19.29%

Based on the 2020 Census, the median age of residents of Lincoln County is 40.3 years. The racial characteristics of the county are presented below**.** People identified as white make up the majority of the population in the county, accounting for 68.2% of the population.

TABLE F.2: DEMOGRAPHICS OF LINCOLN COUNTY[2]

Jurisdiction	White	Black or African American	American Indian or Alaska Native	Asian	Native Hawaiian or Other Pacific Islander	Two or More Races	Persons of Hispanic Origin*
Lincoln County	**68.2%**	**30.0%**	**0.2%**	**0.5%**	**0.1%**	**1.1%**	**1.4%**
Brookhaven	39.0%	59.5%	0.0%	1.2%	0.0%	0.2%	1.8%

* Persons of Hispanic Origin may be of any race, so also are included in applicable race categories

F.1.3 Housing

According to the 2020 U.S. Census, there are 15,894 housing units in Lincoln County, the majority of which are single family homes or mobile homes. Housing information for the county and municipality is presented below.

TABLE F.1: HOUSING CHARACTERISTICS OF LINCOLN COUNTY[3] [4]

Jurisdiction	Housing Units (2000)	Housing Units (2010)	Housing Units (2021)	Median Home Value (2017-2021)
Lincoln County	**14,052**	**15,255**	**15,719**	**$102,500**
Brookhaven	4,240	5,519	5,435	$92,900

F.1.4 Infrastructure

TRANSPORTATION

In Lincoln County, Interstate 55 and U.S. Highway 51 provide access to the north and south and U.S. Highway 84 provides access to the east and west.

[1] *Source: United States Census Bureau, 2020 Census*

[2] *Sources: United States Census Bureau, 2020 Census; American Community Survey, 2017-2021.*

[3] *Sources: United States Census Bureau, 2000 Census, 2010 Census, and 2020 Census.*

[4] United States Census. American Community Survey 5-Year Estimates. 2020. Retrieved on 01/11/2023 from: https://data.census.gov/table?q=median+home+value+lincoln+county+mississippi+brookhaven+mississippi.

Brookhaven-Lincoln County Airport is a general aviation airport located in the northern half of Lincoln County.

Two major freight rail lines operate within Lincoln County. Canadian National Railway is a Class I railway that operates and runs east to west and north to south in the county. Natchez Railroad is a Class III Local railway that also operates and runs east to west in the county. Business and industries rely on this line along with various other major highway routes as distribution of merchandises.

UTILITIES

Electrical power in Lincoln County is provided by Entergy Mississippi Inc., Magnolia Electric Power Association, South Mississippi Electric Power Association, Southern Pine Electric Power Association, and Southwest Mississippi Electric Power Association.

Water and sewer service is provided by participating jurisdictions and/or community based associations, but unincorporated areas often rely on septic systems and wells in Lincoln County. The City of Brookhaven is served by the City of Brookhaven Water Department, the unincorporated areas of the county are served by the Rural Water Association.

COMMUNITY FACILITIES

There are a number of buildings and community facilities located throughout Lincoln County. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 14 fire stations, 2 police stations, and 15 schools located within the county.

There is one hospital located in Lincoln County, King's Daughter Medical Center, a 99-bed short term acute facility located in Brookhaven. Additional medical facilities include 6 clinics, 4 care facilities and 3 long-term care facilities, and

Recreational opportunities exist throughout Lincoln County. The Homochitto National Forest comprises almost 200,000 acres of land and is partially located in Lincoln County. Visitors can camp, hike, hunt, and fish in the forest.

The Mississippi River, which runs to the west of the county, has played an integral part in the history of the county. The river acted as a major conduit for trade in the 19th century as plantations produced large quantities of cotton that could be easily shipped down to ports such as New Orleans. Today, the river is still an important part of the local economy as products are shipped worldwide out of the Natchez port. Apart from the Mississippi River there are multiple water-based refuges, activities, and recreational features focused on local water bodies in the region. For instance, in Lincoln County, Lake Lincoln is great for camping, hiking, and water activities. There are also numerous other small lakes, creeks, and other water bodies throughout the region that offer the outstanding outdoor recreational opportunities for which the region is known.

F.1.5 Land Use

Lincoln County has a blend of old and new development that contributes to physical, cultural, and economic attributes throughout the region. There is one incorporated municipality located in the county. This area is where the county's population is generally concentrated. The incorporated area is also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the county generally consist of rural residential development, agricultural uses, and

recreational areas. There are multiple county- and regional-based agencies that serve to coordinate growth and promote economic development. Local land use and associated regulations are further discussed in *Section 7: Capability Assessment.*

F.1.6 Employment and Industry

According to the Federal Reserve Bank's economic online database (i.e., Federal Reserve Economic Data, or FRED), in 2021, Lincoln County had an average annual employment of 14,032 workers and an average unemployment rate of 5.0% (compared to 5.6% for the state).[5] [6] [7] [8] In 2021, the educational services, health care and social assistance industry employed 28.2% of the county's workforce, followed by Retail Trade (10.8%), and then construction (9.5%).[9] The median household income in 2021 for Lincoln County was $43,926 compared to $49,111 for the state of Mississippi.[10]

[5] Federal Reserve Bank of St. Louis. Federal Reserve Economic Data (FRED). Retrieved on 01/12/2023 from https://fred.stlouisfed.org/categories/28755

[6] Federal Reserve Bank of St. Louis. Federal Reserve Economic Data (FRED). Retrieved on 01/12/2023 from https://fred.stlouisfed.org/series/LAUCN280850000000005A.

[7] Federal Reserve Bank of St. Louis. Federal Reserve Economic Data (FRED). Retrieved on 01/12/2023 from https://fred.stlouisfed.org/series/LAUCN281570000000003A.

[8] Federal Reserve Bank of St. Louis. Federal Reserve Economic Data (FRED). Retrieved on 01/12/2023 from https://fred.stlouisfed.org/series/LAUST280000000000003A.

[9] United States Census Bureau. American Community Survey 5-Year Estimates. 2021. Retrieved on 01/12/2023 from: https://data.census.gov/table?q=average+annual+employment+lincoln+county+mississippi+mississippi&tid=ACSDP5Y2021.DP03.

[10] United States Census Bureau. American Community Survey 5-Year Estimates. 2021. Retrieved on 01/12/2023 from: https://data.census.gov/table?q=average+annual+employment+lincoln+county+mississippi+mississippi&tid=ACSDP5Y2021.DP03.

F.2 LINCOLN COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in Section 4: *Hazard Identification* as they pertain to Lincoln County. Each hazard profile includes a description of the hazard's location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in Section 5: *Hazard Profiles*.

FLOOD-RELATED HAZARDS

F.2.1 Dam and Levee Failure

LOCATION AND SPATIAL EXTENT

According to the Mississippi Department of Environmental Quality, there are two high hazard dams in Lincoln County.[1] The figures below show the location of these high hazard dams as well as mapped inundation areas, and the following table lists them by name. Per county data, both dams are owned and operated by federal agencies. Therefor they fall outside the county's jurisdictional ability to mitigate them.

FIGURE F.2: LINCOLN COUNTY HIGH HAZARD DAM LOCATIONS

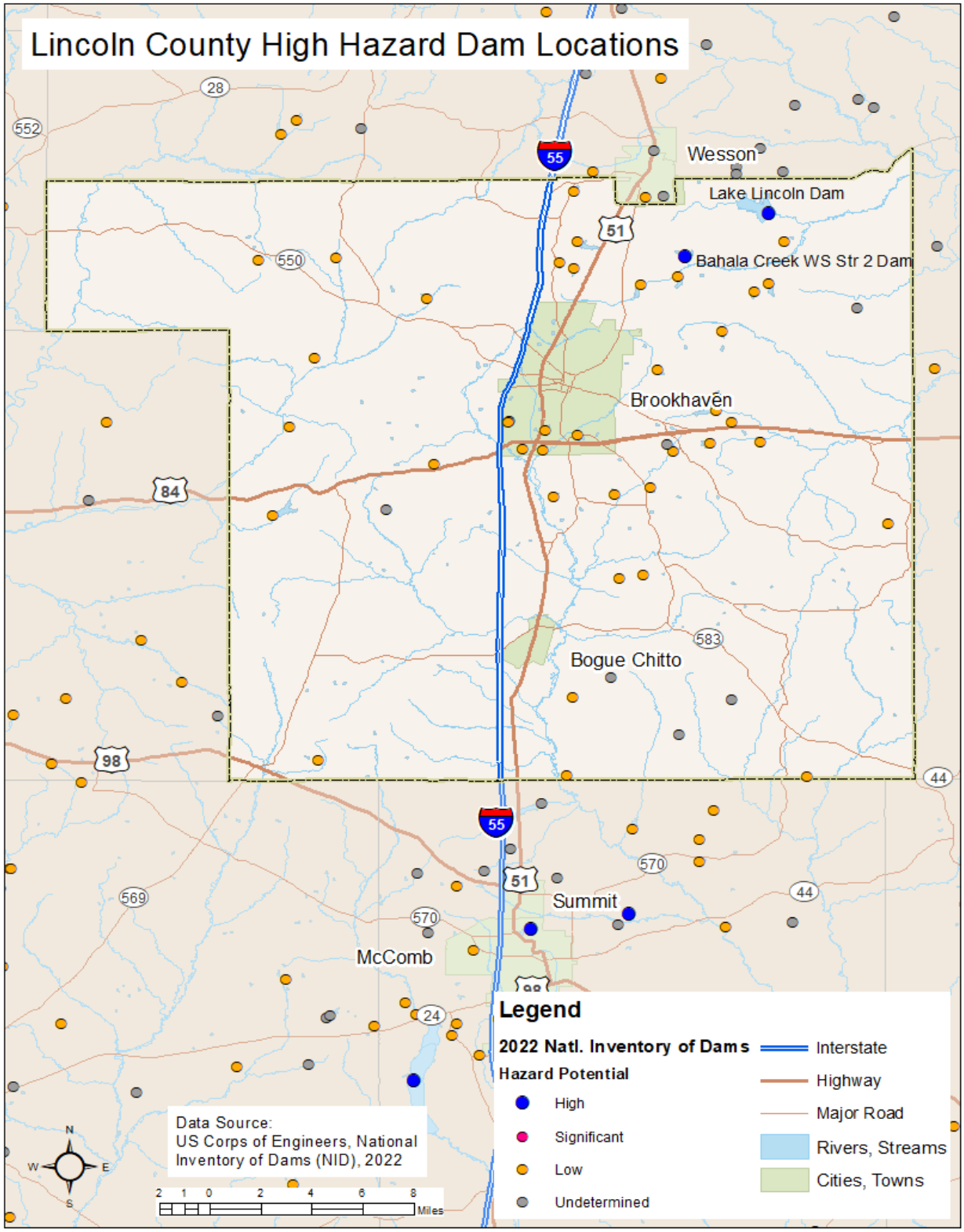


FIGURE F.3: LINCOLN COUNTY DAM INUNDATION AREAS[11]

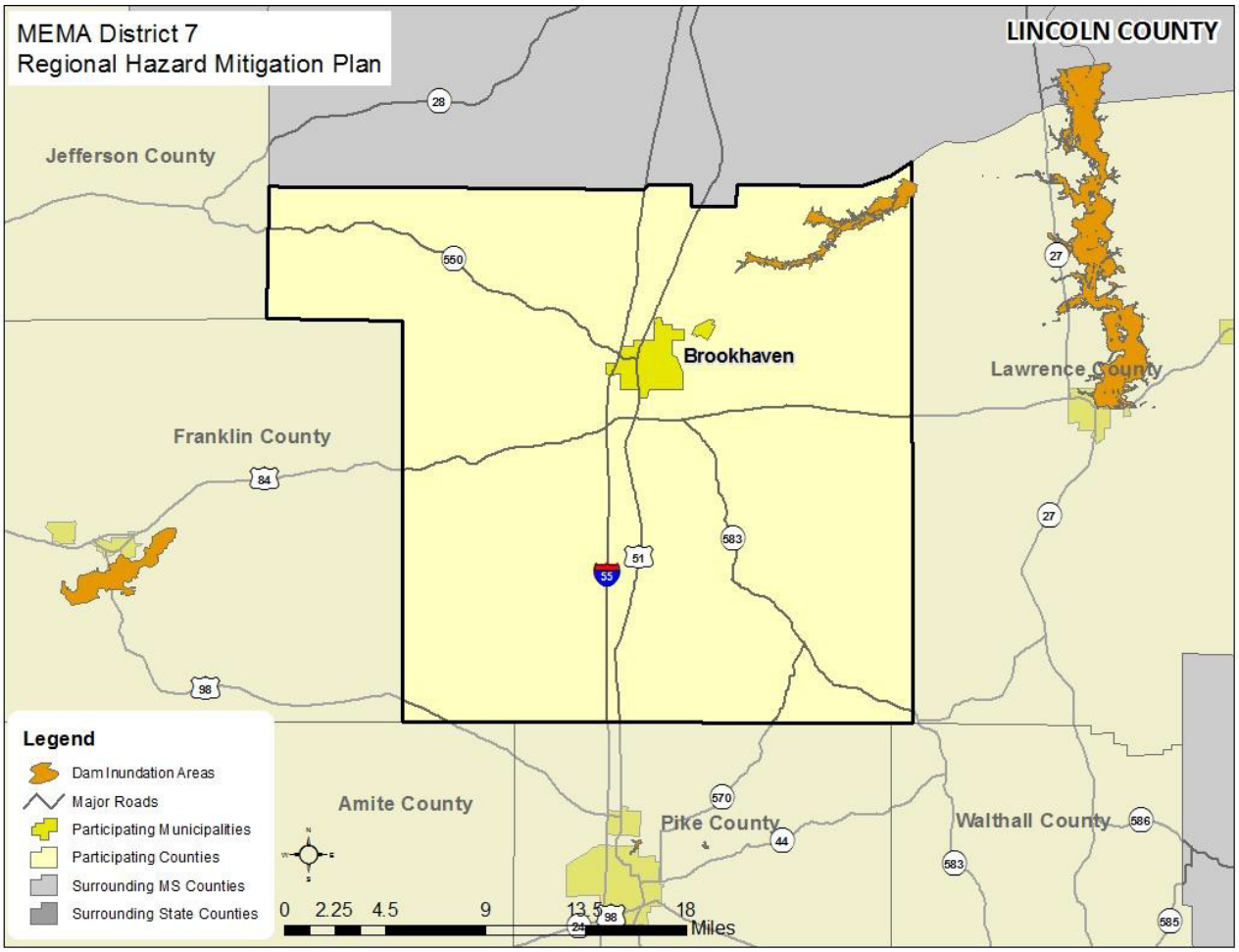


TABLE F.4 LINCOLN COUNTY HIGH HAZARD DAMS[12]

Dam Name	Hazard Potential	Max Storage (ac/ft)	Dam Height (ft)	Condition
LAKE LINCOLN DAM	High	6,544	39.5	UNK
BAHALA CREEK WS STR 2 DAM	High	1,250	31.0	UNK

HISTORICAL OCCURRENCES

According to the Mississippi State Hazard Mitigation Plan, there have been no dam failures reported in Lincoln County. However, several breach scenarios in the region could be impactful.

PROBABILITY OF FUTURE OCCURRENCES

[11] *Source: Mississippi Department of Environmental Quality*

[12] *Sources: U.S. Army Corps of Engineers; Mississippi Department of Environmental Quality*

Given the current dam inventory and historic data, a dam breach is possible (between 1 and 10 percent annual probability) in the future. As has been demonstrated in the past, regular monitoring is necessary to prevent these events.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[13] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lincoln County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[14]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop and will lead to increased strain on dam storage capacity.[15]

F.2.2 Erosion

LOCATION AND SPATIAL EXTENT

Erosion in Lincoln County is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in Lincoln County are primarily rivers/streams and reservoirs. Generally, vegetation also helps to prevent erosion in the area, but in recent years, erosion has become a growing threat to many of the participating counties and jurisdictions.

Lincoln County straddles two watersheds in which erosion is prominent. The eastern two-thirds of Lincoln County is situated within the Pearl River Basin, an 8,700-square-mile watershed found in central and southern Mississippi; this basin drains all or parts of 24 counties in Mississippi and three parishes in Louisiana.[16] The remaining western portion of Lincoln County is situated within the 107,000-square-mile Lower Mississippi River Basin, though it is not immediately adjacent to the Mississippi River itself.[17] [18] [19]

Currently, there is no regional or state-level data available on localized areas of erosion so it is a challenge to identify particularly prone areas on a wider geographic scale. However, a few areas of

[13] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[14] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[15] Please note: there is no coastal flooding in Adams County.

[16] *Citizen's Guide to Water Quality in the Pearl River Basin.* 2008. Mississippi Department of Environmental Quality. Retrieved on 01.01.2023 from https://www.mdeq.ms.gov/wp-content/uploads/2008/09/Pearl-River-Basin_Final_pr.pdf.

[17] Hydrologic Unit Map. U.S. Geological Survey. Retrieved on 01/03/2023 from https://water.usgs.gov/GIS/regions.html.

[18] Watershed Boundary Dataset for Mississippi. U.S. Geological Survey. https://pubs.usgs.gov/sim/3020/pdf/sim3020.pdf.

[19] Response to RFI for Long-Term Agro-ecosystem Research (LTAR) Network 2012: Lower Mississippi River Basin, p.1. U.S. Department of Agriculture, Agricultural Research Service, 2012. Retrieved on 01/02/2023 from https://www.ars.usda.gov/ARSUserFiles/np211/LMRBProposal.pdf

concern were reported by members of the hazard mitigation council and other local sources. While locations along the Mississippi River and Pearl River are known to be especially at-risk, there are locations in many areas within the region where erosion is prominent.

HISTORICAL OCCURRENCES

Several sources were vetted to identify areas of erosion in Lincoln County. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. The locations identified above are representative of areas where erosion has taken place in the past.

These incidents have caused major problems as bridges have become damaged in many instances and made unsafe for emergency services vehicles to cross during and after storm events. This delays response times and critical life-safety support. In addition, the shutdown of roads has hurt local communities economically as trade and commerce are temporarily shut down as bridges are repaired. It has also caused disruption to daily activities for local school boards who must re-route buses around affected areas, causing additional fuel resources to be expended and increasing drive times for students.

PROBABILITY OF FUTURE OCCURRENCES

Erosion remains a natural, dynamic, and continuous process for Lincoln County, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annually).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[20] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lincoln County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[21]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones. Both additional moisture and drying conditions can impact the rate of erosion, either by increasing the sediment transfer load due to volume and rate of flooding, or by dehydrating soils, limiting compaction, and increasing wind related erosion events.

F.2.3 Flood

LOCATION AND SPATIAL EXTENT

There are areas in Lincoln County that are susceptible to flood events. Special flood hazard areas in the county were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM).[2] This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevations), and Zone X-500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 584 square miles that make up Lincoln County, there are 60.42 square miles of land

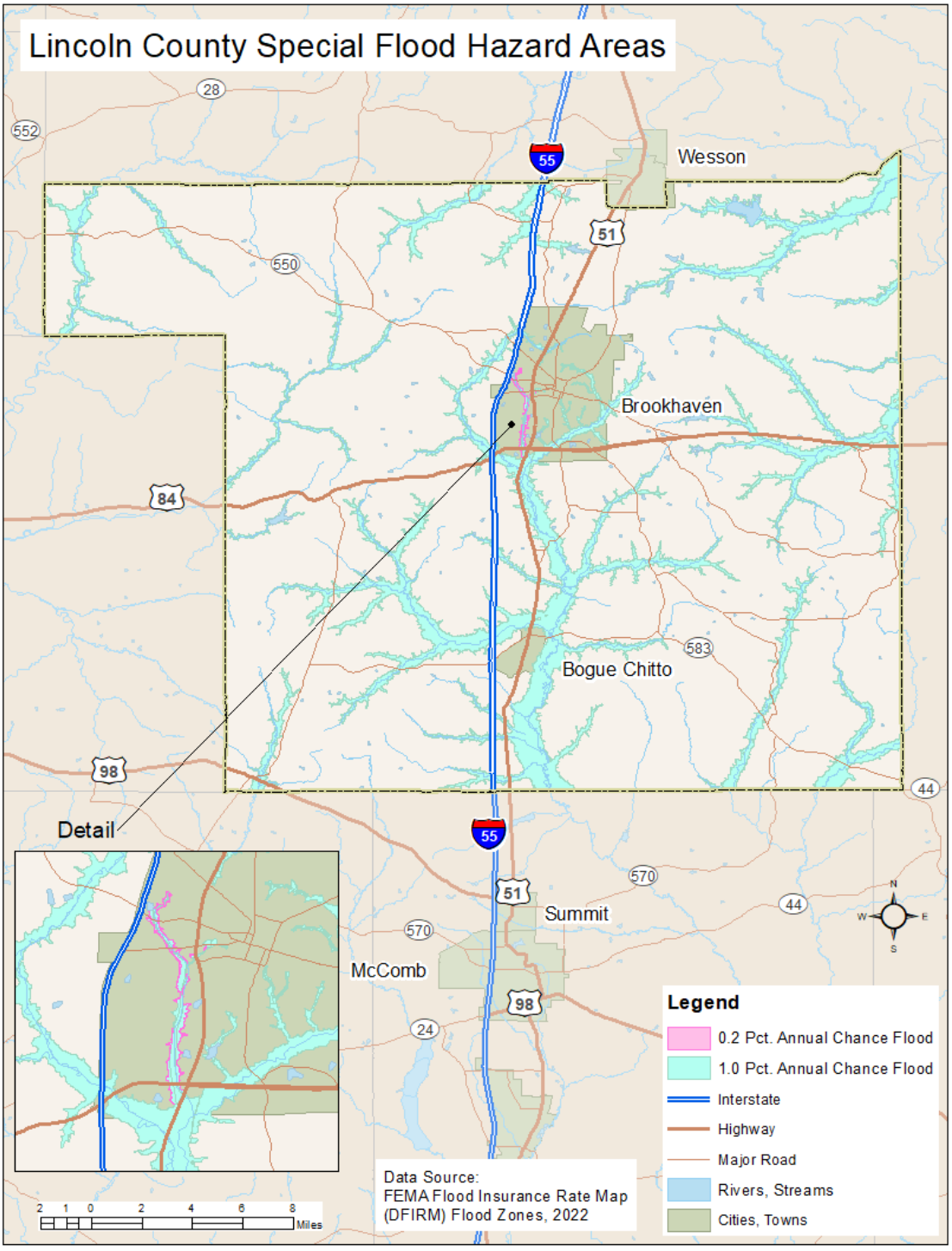
[20] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[21] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 0.04 square miles of land in zone X-500 (0.2 percent annual change floodplain/500-year floodplain).

These flood zone values account for 10.4 percent of the total land area in Lincoln County. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. The figure below illustrates the location and extent of currently mapped special flood hazard areas for Lincoln County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data.

FIGURE F.4: SPECIAL FLOOD HAZARD AREAS IN LINCOLN COUNTY



HISTORICAL OCCURRENCES

Floods were at least partially responsible for 3 major disaster declarations in Lincoln County in 1972,

1974, and 2016.[22] While additional disaster declarations involved flooding events during hurricanes, those declarations are captured under Hurricane Declarations. Information from the National Centers for Environmental Information was used to ascertain additional historical flood events. The National Centers for Environmental Information reported a total of 43 events in Lincoln County since 2001.[23] A summary of these events is presented below. These events accounted for over $6,794,000 in property damage. Specific information on flood occurrences in Lincoln County can be found below.

TABLE F.5: SUMMARY OF FLOOD OCCURRENCES IN LINCOLN COUNTY[24]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses[25]
Brookhaven	15	0/0	$2,048,000	$97,524
Unincorporated Area*	28	0/0	$4,746,000	$226,000
LINCOLN COUNTY TOTAL	**43**	**0/0**	**$6,794,000**	**$323,524**

*This community does not participate in the NFIP.

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Flood Insurance Management Agency (FIMA) Flood Insurance Data Analytics, since 2019 Mississippi has had 47 floods of record with 22 closed with payment, 19 closed without payment, and 6 remaining open. A total of $545,506 has been made in payments. This FEMA dataset is the authoritative source for FEMA's public data. This product uses the Federal Emergency Management Agency's API but is not endorsed by FEMA. FEMA cannot verify the quality and/or timeliness of any data or any analysis derived there from after the data has been retrieved from FEMA.gov. This data set was last accessed on July 2, 2023, with records updated at most every 20 minutes or at least monthly, processed the first Saturday of the month at 1:00am EST.

According to FEMA flood insurance policy records as of July 2, 2023, there have been 2 flood losses reported in Lincoln County through the National Flood Insurance Program (NFIP) since 1978, totaling $53,076.97 in claims payments. A summary of these figures for the county is provided below. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought. It is likely that many additional instances of flood loss in Lincoln County were either uninsured or not reported.

TABLE F.6: SUMMARY OF INSURED FLOOD LOSSES IN LINCOLN COUNTY[26]

Location	Number of Policies	Flood Losses	Claims Payments

[22] A complete listing of historical disaster declarations can be found in Section 4: Hazard Identification.
[23] These flood events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 2001 through November 2022. It is likely that additional occurrences have occurred and have gone unreported.
[24] Source NCEI. Annualized losses are calculated by dividing the total number of property damages by number of years of recordkeeping for the hazard.
[25] Annualized losses are calculated based on number of years of reportable NCEI data.
[26] National Flood Insurance Program. National Flood Insurance Program. *Policy and Loss Data by Geography (HUDEX)*, 10.13.2022. Retrieved on 01/05/2023 from https://nfipservices.floodsmart.gov/sites/default/files/PolicyandLossDatabyGeography.xlsx.

Brookhaven	58	2	$53,076.97
Unincorporated Area*	--	--	--
LINCOLN COUNTY TOTAL	**58**	**2**	**$53,076.97**

*This community does not participate in the NFIP. Therefore, no values are reported.

REPETITIVE LOSS PROPERTIES

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Mississippi Emergency Management Agency in 2017, there are 6 non-mitigated repetitive loss properties located in Lincoln County, which accounted for 15 losses and more than $681,000 in claims payments under the NFIP. The average claim amount for these properties is $45,409. All six properties are single family. Without mitigation, these properties will likely continue to experience flood losses. The table below presents detailed information on repetitive loss properties and NFIP claims and policies for Lincoln County as documented in the last plan. Updated data could not be obtained.

TABLE F.7: REPETITIVE LOSS PROPERTIES IN LINCOLN COUNTY[27,28]

Location	Number of Properties	Types of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Brookhaven	6	6 single-family	15	$51,572.97	$16,564.37	$681,137.34	$45,409.16
Unincorporated Area*	--	--	--	--	--	--	--
Lincoln County Total	**6**		**15**	**$51,572.97**	**$16,564.37**	**$681,137.34**	**$45,409.16**

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in Lincoln County, and the probability of future occurrences will remain highly likely (100 percent annual probability). The probability of future flood events based on magnitude and according to best available data is illustrated in the figure above, which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain).

It can be inferred from the floodplain location maps, previous occurrences, and repetitive loss properties that risk varies throughout the county. For example, areas in the central portion and northeastern corner of the county have more floodplain and thus a higher risk of flood than the rest of the county. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted, particularly for repetitive loss properties.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[29] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lincoln County.

[27] National Flood Insurance Program, OpenFEMA Data Sets

[28] Current data on Repetitive Loss Properties data was not available for this plan update.

[29] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[30] As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased *coastal, fluvial (i.e., riverine) and pluvial (i.e., rainfall) flooding.*[31] More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

FIRE-RELATED HAZARDS

F.2.4 Drought

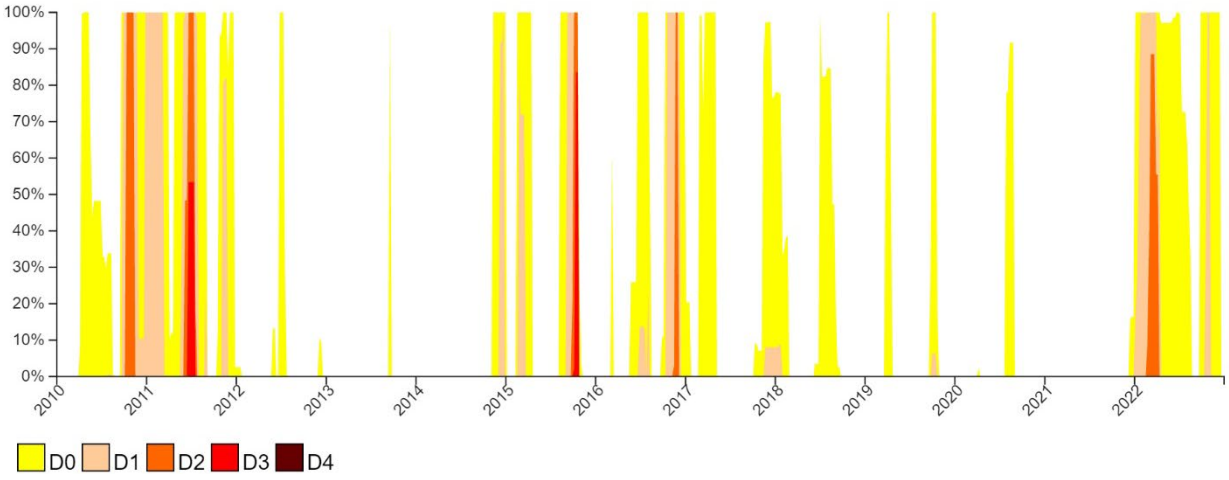
LOCATION AND SPATIAL EXTENT

Drought typically covers a large area and cannot be confined to any geographic or political boundaries. Furthermore, it is assumed that Lincoln County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment but may exacerbate wildfire conditions.

HISTORICAL OCCURRENCES

According to the U.S. Drought Monitor, Lincoln County had drought levels of Severe or worse in 5 of the last 13 years (January 2010-December 2022). The table below shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional, but a majority of the county may actually be in a less severe condition.

TABLE F.8: HISTORICAL DROUGHT OCCURRENCES IN LINCOLN COUNTY[32]



Some additional anecdotal information was provided from the National Climatic Data Center on droughts in Lincoln County.

[30] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[31] Please note: there is no coastal flooding in Lincoln County.

[32] U.S. Drought Monitor. Historical Conditions for Lincoln County, MS 2010 – 2022. Retrieved on 01/01/2023 from: https://www.drought.gov/states/mississippi/county/Lincoln

Summer to Fall 2006 – During a four and a half month period, from June to the middle of October, abnormally dry conditions prevailed across most of the Jackson, MS County Warning Area (CWA). Widespread drought conditions were reported across the area during this time period. The U.S. Drought Monitor classified the drought as extreme (D3) over Southeast Mississippi. Drought conditions in the region peaked in intensity during early August over this area.

Summer 2007 – During the month of June, the drought peaked across the region. It held firm across the same areas since May with no expansion. What did expand was the severity as by the end of June, most of Central and East-Central Mississippi was now in extreme drought (D3) with some locations across Northeast Mississippi now experiencing exceptional drought (D4). The month of June did not offer much rain as most of the forecast area saw less than 40% of the normal rainfall.

Summer to Fall 2010 – Very dry conditions continued across central Mississippi during most of October. There were some rains that came late in the month which provided some temporary relief. Rainfall amounts ranged from a half to two inches with locally higher amounts. Most locations were 1 to 3 inches below normal for the month. The dry stretch resulted in severe (D2) drought conditions to expand during the month with even the portions of extreme (D3) drought conditions expanding as well. Crops were put under stress under the warm and dry conditions.

Fall 2015 – The very dry conditions continued across Central Mississippi in October. The extended dry stretch resulted in an area of Severe (D2) drought developing across the area by October 6th. The drought intensified and Extreme (D3) drought conditions developed by October 13th. Approximately 25 to 50 percent of normal rainfall occurred across this area from August into mid-October. Crops were put under more stress from the dry and hot conditions.

Fall to Winter 2016 – Dry conditions continued into November, which created continued stress on crops. The drought continued to get worse across the state through the month before some relief came in the form of showers and thunderstorms near the end of November.

Fall 2021 through 2022 – Severe drought conditions persisted throughout the state, beginning in December 2021 and continuing through the calendar year 2022. Conditions escalated to extreme drought from January to March, before resolving In December. Throughout this period many counties also experienced flooding events indicating that while rainfall is still occurring, the shorter, more intense bursts do not resolve the drought conditions that softer more steady rainfall would address. The beginning of 2023 saw increased rainfall and a lightening of drought conditions overall.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that Lincoln County has a probability level of possible (between 1 and 10 percent annual probability) for future drought events. However, the extent (or magnitude) of drought and the amount of geographic area covered by drought, varies each year. Historic information indicates that there is a much lower probability for extreme, long-lasting drought conditions in Lincoln County.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[33] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lincoln County. With increasing global surface temperatures, the possibility of more *droughts* and increased frequency and intensity of storms will likely occur.[34] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

F.2.5 Lightning

LOCATION AND SPATIAL EXTENT

Lightning occurs randomly; therefore, it is impossible to predict where and with what frequency it will strike. It is assumed that all of Lincoln County is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, there have been 8 recorded lightning events that have affected Lincoln County since 1950 shown in the table below. However, according to the National Lightning Detection Network (NLDN) as demonstrated in the figure below there are 63.7 lightning events per square kilometer per year in Lincoln County.[35] As a result, it is likely that lightning events have generated more property damage in Lincoln County than has been reported.

TABLE F.9: SUMMARY OF LIGHTNING OCCURRENCES IN LINCOLN COUNTY[36]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Brookhaven	1	0/0	$ 100,000	$4,000
Unincorporated Area	7	0/1	$ 125,000	$ 5,000
LINCOLN COUNTY TOTAL	**8**	**0/1**	**$225,000**	**$9,000**

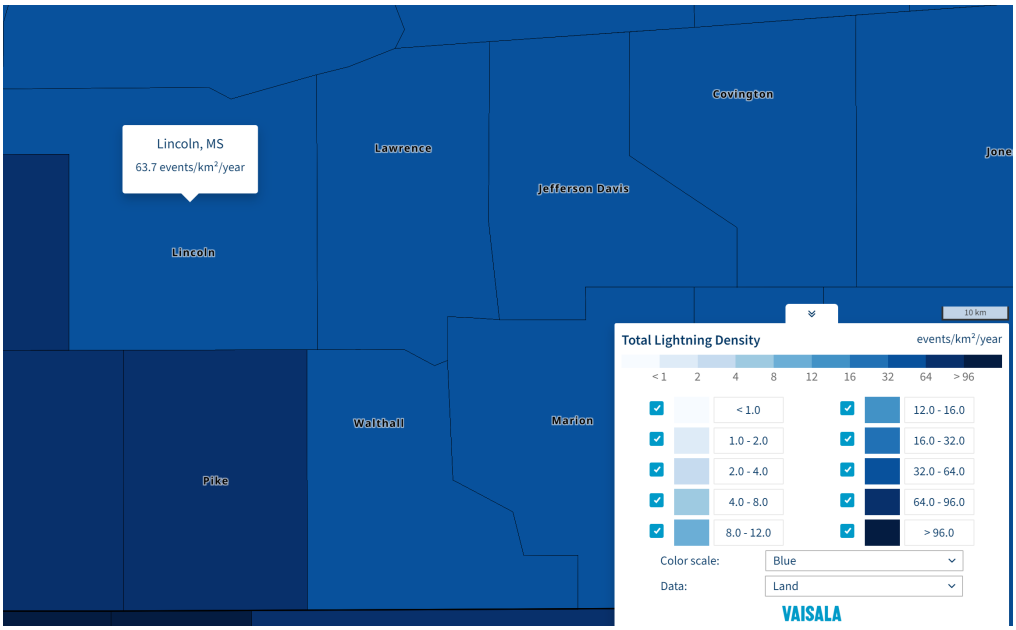
[33] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[34] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[35] Vaisala – U.S. National Lightning Detection Network. Retrieved on 01/02/2023 from: https://interactive-lightning-map.vaisala.com/?_ga=2.142433206.529238712.1672682694-816443770.1672682579

[36] *Source: National Centers for Environmental Information.*

FIGURE F.5: VAISALA'S NLDN MAP OF LIGHTNING DENSITY – LINCOLN COUNTY[37]



PROBABILITY OF FUTURE OCCURRENCES

Although here have been only 8 historical lightning events reported in Lincoln County via National Centers for Environmental Information data, lightning events are regular occurrences in the region that threaten both life and property. It is expected that future lightning events will happen on an annual basis in Lincoln County, and will continue to threaten life and cause minor property damage throughout the region. Therefore, the probability of future lightning events in Lincoln County is highly likely (100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[38] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lincoln County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *lightning strike events*.[39] As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

[37] Vaisala – U.S. National Lightning Detection Network. Retrieved on 01/02/2023 from: https://interactive-lightning-map.vaisala.com/?_ga=2.142433206.529238712.1672682694-816443770.1672682579

[38] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[39] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

F.2.6 Wildfire

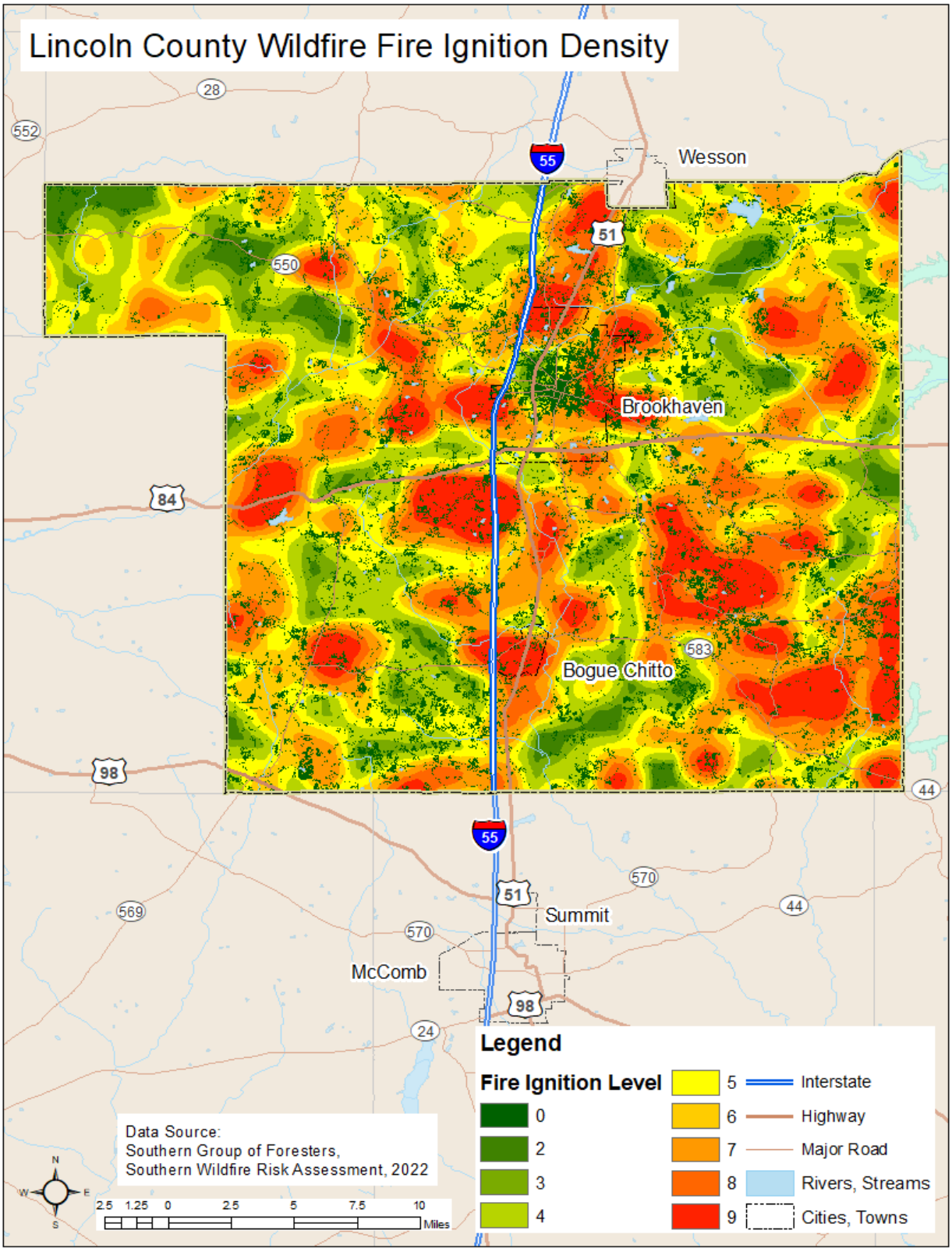
LOCATION AND SPATIAL EXTENT

The entire Lincoln County area is at risk to a wildfire occurrence, and locations near the urban-wildland interface – where populations abut formerly undeveloped areas – are particularly susceptible to wildfire hazards. Drought conditions and high levels of fuel on the forest floor may make a wildfire more likely. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

HISTORICAL OCCURRENCES

The following figure shows Wildfire Ignition Density across Lincoln County based on data from the Southern Wildfire Risk Assessment. This map provides information on historic locations of wildfire ignitions and shows the likelihood of a wildfire igniting in a particular area. Wildfire occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map and is measured in the number of fires per year per 1,000 acres.[8]

FIGURE F.6: WILDFIRE IGNITION DENSITY IN LINCOLN COUNTY



Based on data from the Mississippi Forestry Commission, Lincoln County experienced an annual average of 25.63 wildfires per year from 2015 to 2022; these wildfires burned a combined 333.25 acres per year during that period. The data indicate that most of these fires were small to moderate in size, averaging about 11.17 acres per fire. The tables below provide a summary of wildfire occurrences in Lincoln County from 2015 to 2022 and lists the number of reported wildfire occurrences in the county between the years 2012 and 2022.

TABLE F.10: SUMMARY TABLE OF ANNUAL WILDFIRE OCCURRENCES (2015-2022)[40]

	Lincoln County
Average Number of Fires Per Year	25.63
Average Number of Acres Burned Per Year	333.25
Average Number of Acres Burned Per Fire	11.17

TABLE F.11: HISTORICAL WILDFIRE OCCURRENCES IN LINCOLN COUNTY (2012-2022)[41]

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Lincoln County												
Fires	33	34	60	37	21	28	15	18	13	21	52*	332
Acres Burned	344	486	877	253	257	616	56	130	52	281	1,037	4,389

*Note: The total number of grass/woods fires that fire departments responded to in 2022 is around 329 total fires.

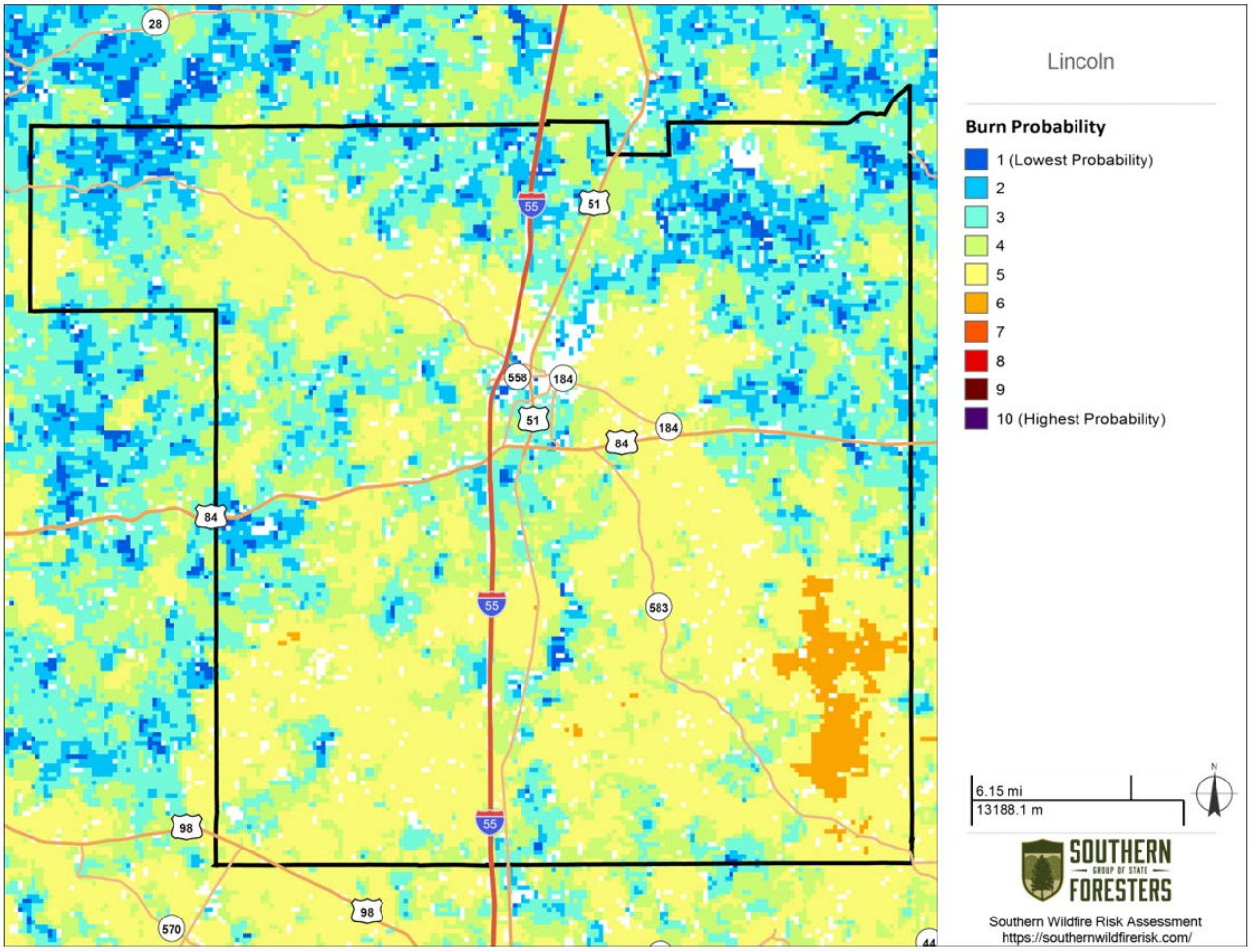
PROBABILITY OF FUTURE OCCURRENCES

Figure F.7 shows there is some probability a wildfire will occur in Lincoln County, and that wildfire events will be an ongoing occurrence in the county. The likelihood of wildfire events will increase during drought cycles and abnormally dry conditions. While wildfires are likely to stay small in size, their areal coverage could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. Highly developed areas will be less susceptible to wildfires, unless they are located near the urban-wildland interface. The risk of wildfire losses will vary based on the assets that exist in different parts of the county. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate, compared to rural, mainly forested areas. The probability assigned to Lincoln County for future wildfire events is highly likely (100 percent annual probability).

[40] *Mississippi Forestry Commission – 2015 - 2022*

[41] *Mississippi Forestry Commission*

FIGURE F.7: BURN PROBABILITY IN LINCOLN COUNTY



FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[42] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lincoln County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency *wildfire events*.[43]

[42] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[43] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

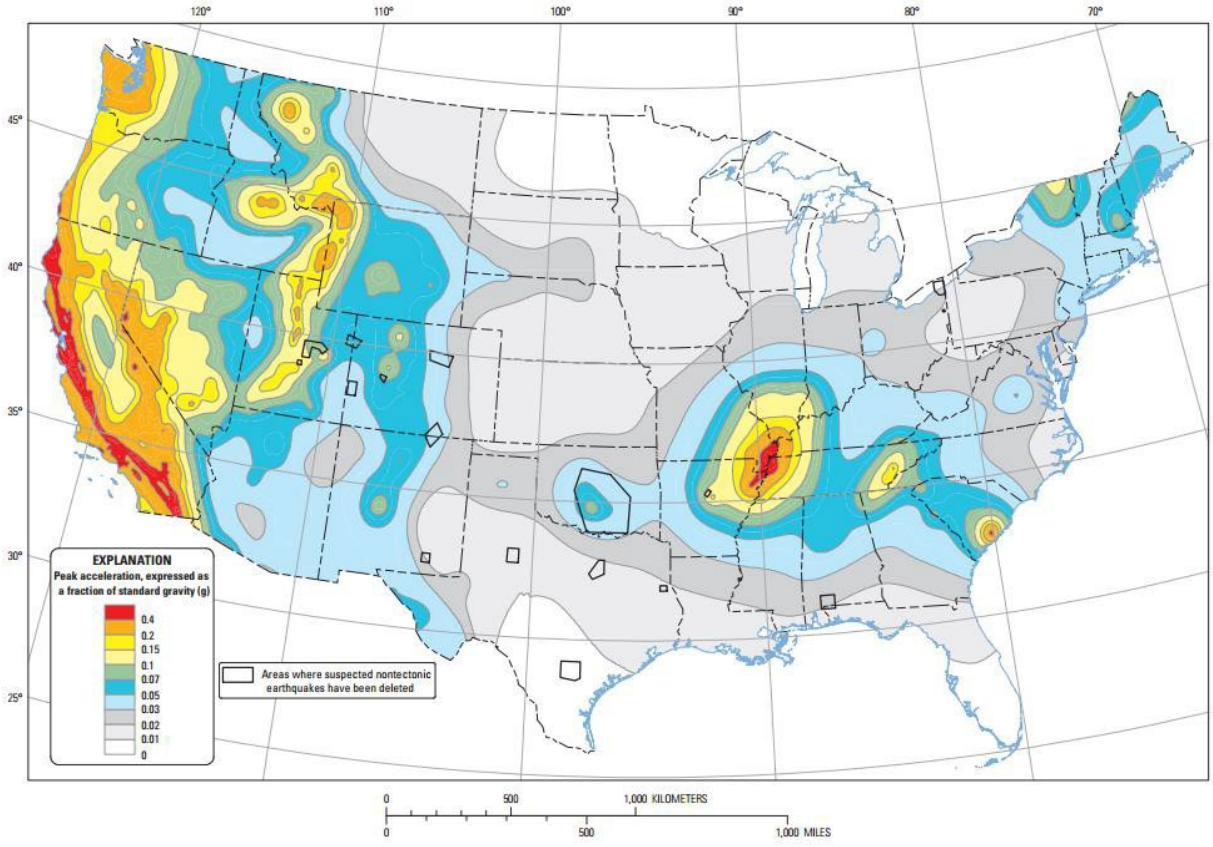
GEOLOGIC HAZARDS

F.2.7 Earthquake

LOCATION AND SPATIAL EXTENT

Figure F.8 is a map that shows the probability that ground motion will reach a certain level during an earthquake in different parts of the U.S., as indicated by data peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Lincoln County lies within an approximate zone of level "0.01" to "0.03" ground acceleration. This indicates that the county exists within an area of low seismic risk.

FIGURE F.8: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS[44]



Ten-percent probability of exceedance in 50 years map of peak ground acceleration

The primary source of potential damage to Lincoln County from an earthquake is the New Madrid Seismic Zone (NMSZ). Historically, a series of earthquakes in 1811 and 1812 demonstrated that this fault zone can produce high magnitude seismic events, sometimes on the scale of a 7.5-8.0 on the Richter

[44] United States Geological Survey, 2014

scale. The biggest challenge with earthquakes that occur in this area of seismic activity is predicting the recurrence of earthquakes emanating from the NMSZ. Although the magnitude of earthquakes from the NMSZ can be large, they occur very irregularly and infrequently. This makes it extremely difficult to predict when they will occur.

It should also be noted that the State of Mississippi Hazard Mitigation Plan identifies certain areas of concern for liquefaction and lists the counties and corresponding zones within those counties that have the highest liquefaction potential. Lincoln County does not have any identified liquefaction potential risk.

The following figure shows the Modified Mercalli Intensity Scale. The lower numbers of the intensity scale generally deal with the way the earthquake is felt by people. The higher numbers of the scale are based on observed structural damage. Structural engineers usually contribute information for assigning intensity values of VIII or above.

FIGURE F.1: MODIFIED MERCALLI INTENSITY SCALE (MMI)

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest,especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

HISTORICAL OCCURRENCES

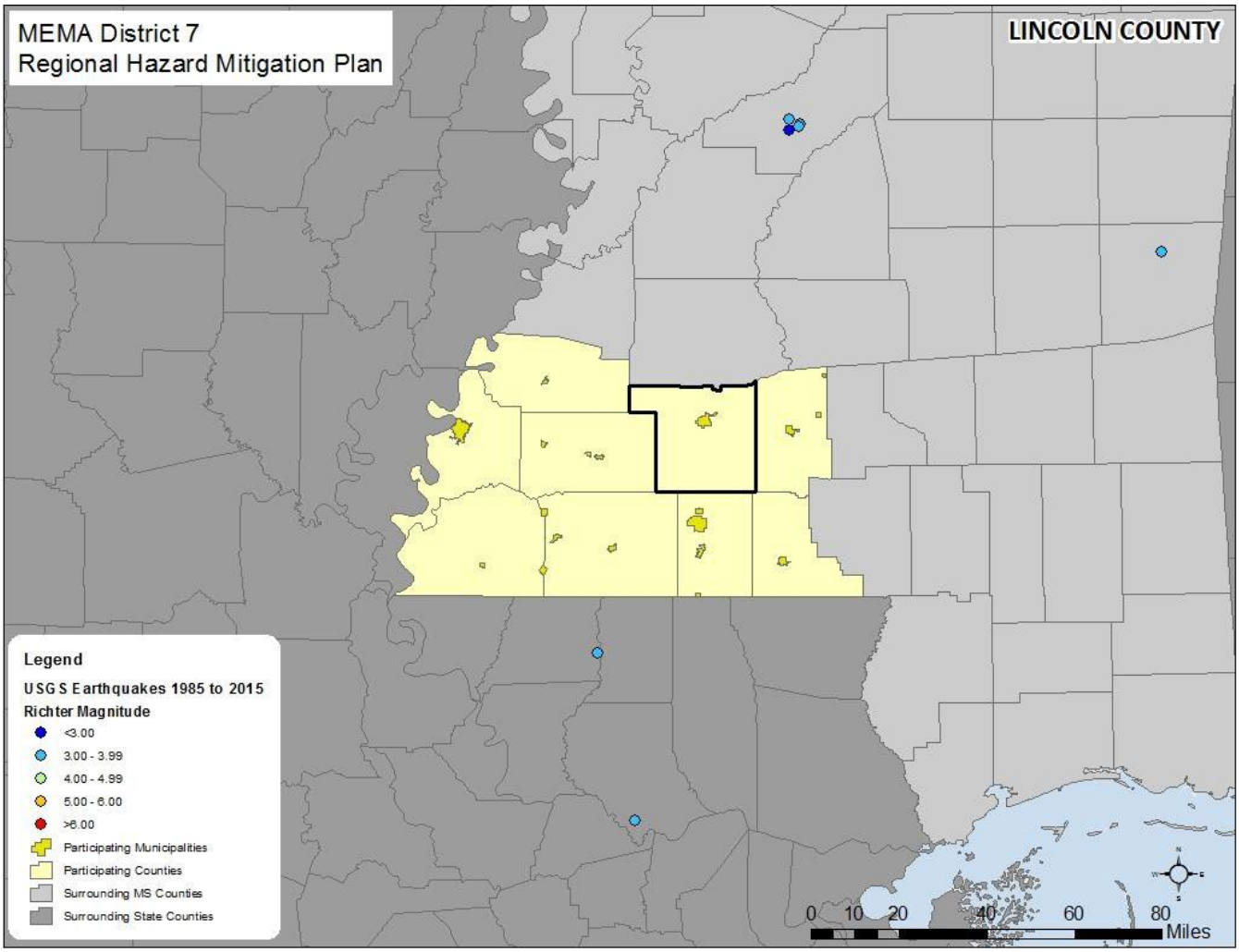
At least one earthquake is known to have affected Lincoln County since 1886. The earthquake measured II on the Modified Mercalli Intensity (MMI) scale. The table below provides a summary of earthquake events reported by the National Centers for Environmental Information (formerly National Geophysical Data Center) between 1638 and 1985, and the figure below presents a map showing earthquakes whose epicenters have occurred near the county between 1985 and 2023 (no earthquakes occurred within the county's boundaries during this period). The last table in this section presents a detailed occurrence of

each event including the date, distance for the epicenter, magnitude, and Modified Mercalli Intensity (if known).[45]

TABLE F.12: SUMMARY OF SEISMIC ACTIVITY IN LINCOLN COUNTY (1985-2023)[46]

Location	Number of Occurrences	Greatest MMI Reported	Greatest Richter Scale Reported
Brookhaven	1	II	Not Available
Unincorporated Area	0	--	--
LINCOLN COUNTY TOTAL	**1**	**II**	**--**

FIGURE F.10: HISTORIC EARTHQUAKES WITH EPICENTERS NEAR LINCOLN COUNTY[47]



[45] *Due to reporting mechanisms, not all earthquake events were recorded during this time. Furthermore, some are missing data, such as the epicenter location, due to a lack of widely used technology. In these instances, a value of "unknown" is reported.*

[46] *Source: National Centers for Environmental Information*

[47] *Source: United States Geological Survey*

TABLE F.23: SIGNIFICANT SEISMIC EVENTS IN LINCOLN COUNTY (1985-2023)[48]

Location	Date	Epicentral Distance	Magnitude	MMI
Brookhaven				
Brookhaven	9/1/1886	992.0 km	*Unknown*	II
Unincorporated Area				
None Reported	--	--	--	--

PROBABILITY OF FUTURE OCCURRENCES

The probability of significant, damaging earthquake events affecting Lincoln County is unlikely. However, it is possible that future earthquakes resulting in light or moderate perceived shaking and damages will affect the county more frequently. The annual probability level for the county is estimated to be less than 1 percent (unlikely).

TEMPERATURE & WIND RELATED HAZARDS

F.2.8 Extreme Heat

LOCATION AND SPATIAL EXTENT

Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries. Therefore, the entire county is equally susceptible to extreme heat.

HISTORICAL OCCURRENCES

Information from the National Centers for Environmental Information was used to determine historical extreme heat occurrences in Lincoln County. While no extreme heat events were reported in the county, several events were reported in the surrounding region.

August 2005 – A "HOT" stretch of weather occurred during the middle to later part of August 2005. This "Heat Wave" covered a large portion of the south and lasted for a period of about 10 days. Each of these days had high temperatures consistently between 95 and 100 degrees, with 1 or 2 of these days reaching 100 degrees or more. Additionally, overnight lows remained warm with lower and middle 70s recorded. This is the first time since August 2000 where 100-degree temperatures were reached in this area as well as having such an extended period of "HOT" weather.

July 2006 – A small "heat wave" gripped the region during the middle of July with high temperature ranging from the upper 90s to around 100 degrees for five days with overnight lows only reaching the middle 70s. The hottest temperatures during this period occurred from the Mississippi Delta, across northern Mississippi and then down to the Jackson Metro and toward Meridian. This area peaked between 100 and 102 degrees for at least two days during the hot five-day stretch.

August 2007 – During the first half of August, a heat wave took hold of the region and brought some of the warmest temperatures since the summer of 2000. This heat wave began around August 5th and lasted until the 16tF. Between August 10th and 15th, the entire area reached 100 degrees or higher.

Twenty- three record highs were also set during this time. As the temperature soared each day, high relative humidities resulted in heat index values between 105 and 112 degrees.

August 2010 – A four day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS Jackson, MS forecast area, 19 record highs were set between August 1st and 4tF. On August 2nd, the 2nd warmest average temperature was recorded. The low was 78 and the high 105, this resulted in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in 3 fatalities across the forecast area.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Lincoln County has a probability level of likely (between 10 and 100 percent annual probability) for future extreme heat events.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[49] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lincoln County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *extreme heat* events.[50] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

F.2.9 Hailstorm

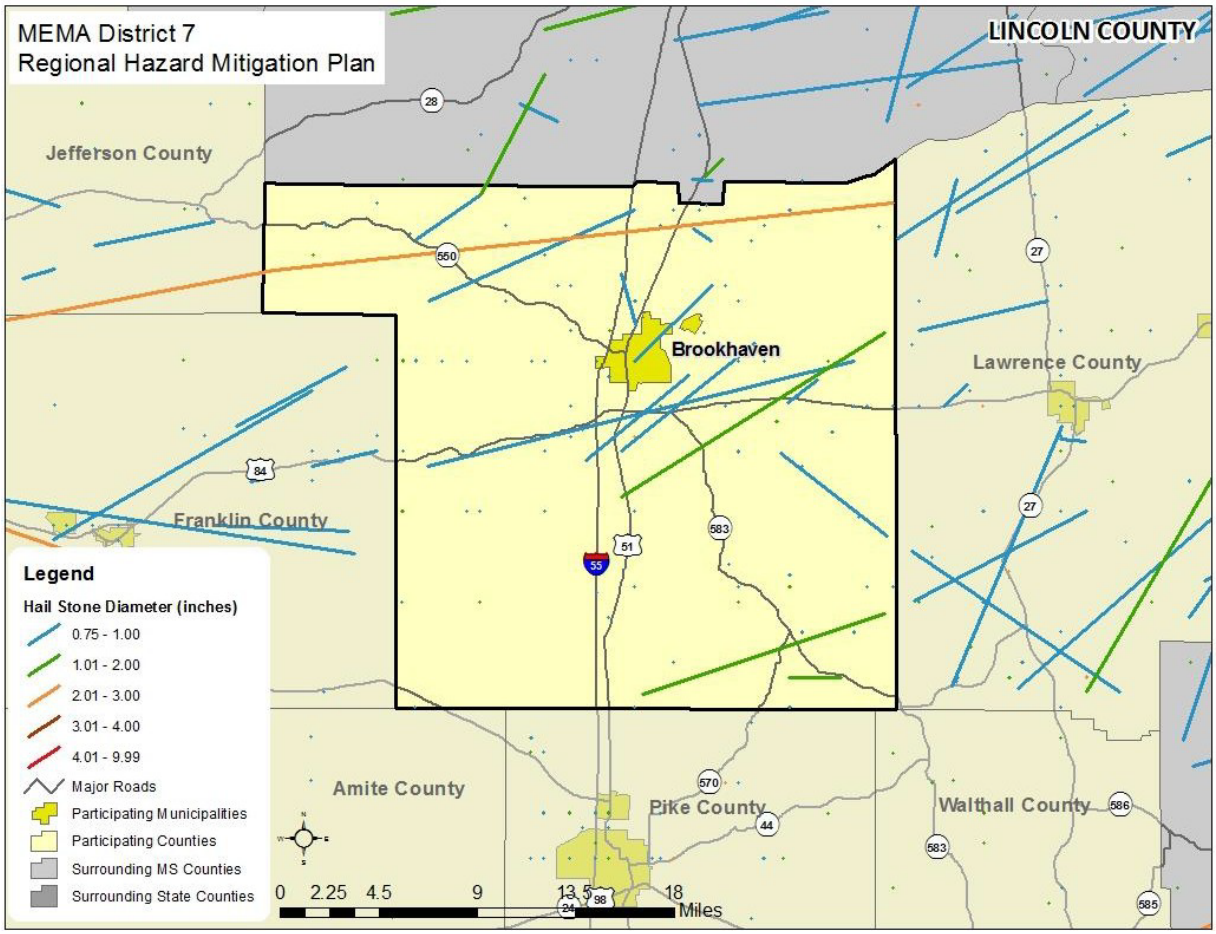
LOCATION AND SPATIAL EXTENT

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide with those of thunderstorms. As a result, because all areas of Lincoln County are uniformly exposed to severe thunderstorms, all areas of the county are uniformly exposed to hail which may be produced by such storms. The figure below shows the location of hail events that have impacted Lincoln County between 1955 and 2015.

[49] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[50] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

FIGURE F.11: HAILSTORM TRACKS IN LINCOLN COUNTY[51]



According to the National Centers for Environmental Information, 155 recorded hailstorm events have affected Lincoln County since 1968.[52] The table below is a summary of the hail events in Lincoln County. In all, hail occurrences resulted in approximately $20,000 in property damage. Hail ranged in diameter from 0.75 inches to 2.75 inches.

It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

[51] *Source: National Weather Service Storm Prediction Center*

[52] These hail events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1968 through November 2022. It is likely that additional hail events have affected Lincoln County. As additional local data becomes available, this hazard profile will be amended.

TABLE F.14: SUMMARY OF HAIL OCCURRENCES IN LINCOLN COUNTY[53]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Brookhaven	55	0/0	$1,757,000	$32,537
Unincorporated Area	100	0/0	$813,000	$15,056
LINCOLN COUNTY TOTAL	**155**	**0/0**	**$2,570,000**	**$47,593**

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that the probability of future hailstorm occurrences in Lincoln County is highly likely (100 percent annual probability). It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[54] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lincoln County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *hailstorm.*[55] As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

F.2.10 Hurricane and Tropical Storm

LOCATION AND SPATIAL EXTENT

Hurricanes and tropical storms threaten the Atlantic Ocean and Gulf of Mexico seaboards of the United States, causing substantial damage due to high winds and flooding. While coastal areas are most directly exposed to the brunt of landfalling storms, the storms' impacts are often felt in places hundreds of miles inland, including in Lincoln County. All areas in Lincoln County are equally susceptible to hurricane and tropical storms.

The following table shows the different category rankings of hurricanes on the Saffir-Simson Scale. The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures. In the western North Pacific, the term "super typhoon" is used for tropical cyclones with sustained winds exceeding 150 mph. Note that all winds are using the U.S. 1-minute average.

[53] Source: National Centers for Environmental Prediction

[54] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[55] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

TABLE F.15: SAFFIR-SIMPSON SCALE OF HURRICANE STRENGTH

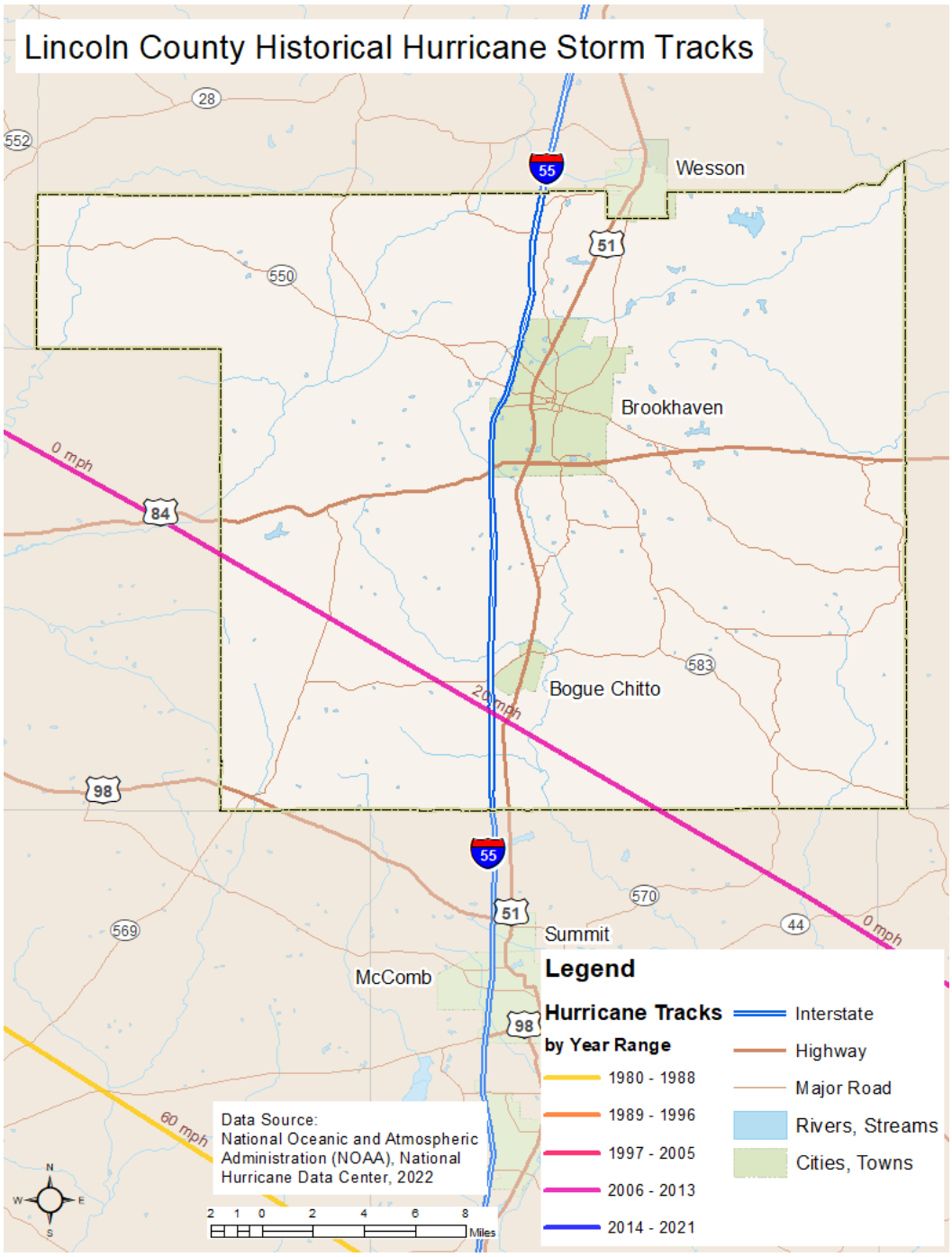
Category 1	Winds 74-95 mph (64-82 kt or 119-153 km/hr). Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
Category 2	Winds 96-110 mph (83-95 kt or 154-177 km/hr). Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
Category 3	Winds 111-129 mph (96-112 kt or 178-208 km/hr). Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
Category 4	Winds 130-156 mph (113-136 kt or 209-251 km/hr). Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
Category 5	Winds 157 mph or higher (137 kt or higher or 252 km/hr or higher). Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

HISTORICAL OCCURRENCES

According to the National Hurricane Center's historical storm track records, 76 hurricane or tropical storm/depression tracks have passed within 50 NM of Lincoln County since 1855.[56] The following figure shows hurricane storm tracks that have passed through or near Lincoln County since 1980.

[56] National Oceanic and Atmospheric Administration. Office for Coastal Management. Retrieved on 01/07/2023 from https://coast.noaa.gov/hurricanes

FIGURE F.12: LINCOLN COUNTY HISTORICAL STORM TRACKS



Federal records indicate that 8 major disaster declarations were made in Lincoln County: 1965 (Hurricane Betsy), 1969 (Hurricane Camille), 2002 (Tropical Storm Isidore), 2004 (Hurricane Ivan), 2005 (Hurricane Katrina), 2008 (Hurricane Gustav), 2012 (Hurricane Isaac), and 2021 (Hurricane Ida).[57] [58]

[57] Federal Emergency Management Agency. Disaster Declarations for States and Counties. 2023. Retrieved on 01/05/2023 from https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties

[58] Federal Emergency Management Agency. Historical Flood Risk and Costs. 2023. Retrieved on 01/05/2023 from https://www.fema.gov/data-

Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding. Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding.

The National Centers for Environmental Information also reported 7 hurricane or tropical storm events in Lincoln County since 2002.

TABLE F.16: HISTORICAL HURRICANE / TROPICAL STORM OCCURRENCES IN LINCOLN COUNTY[59]

Date of Occurrence	Storm Name	Deaths/Injuries	Property Damage	Annualized Losses
9/26/2002	Tropical Storm Isidore	0/0	$0	
8/29/2005	Hurricane Katrina	0/0	$100,000,000	
9/24/2005	Hurricane Rita	0/0	$10,000	
9/1/2008	Hurricane Gustav	0/0	$1,000,000	
8/29/2012	Hurricane Isaac	0/0	$1,500,000	
10/9/2020	Hurricane Delta	0/0	$50,000	
8/29/2021	Hurricane Ida	0/0	$100,000	
Totals		**0/0**	**$102,660,000**	**$5,133,000**

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the county. Anecdotes are available from NCEI for the major storms that have impacted the county as found below:

Hurricane Katrina – August 29, 2005
The damage from Hurricane Katrina was devastating and widespread. Damage occurred across all of the Jackson forecast area which includes 9 parishes in Northeast Louisiana, 2 counties in Southeast Arkansas and about 2/3 of Central and Southern Mississippi. As widespread as the damage was, the more concentrated and most significant damage occurred across Southeast and East-Central Mississippi. For other areas, especially the areas west of Natchez to Yazoo City to Grenada line, damage to trees and power lines was significant and scattered across the landscape. As you move toward Central Mississippi and along Interstate 55 the damage and impacts increase. This portion of the state sustained widespread damage to trees and power lines.

Hurricane Gustav – September 1, 2008
As the center of Gustav crossed much of southern Louisiana, tropical storm force winds extended into southern Mississippi and portions of east central Louisiana. Sustained winds were between 35 and 45 mph with higher gusts between 70 and 100 mph occurred. Tree and power line damage was extensive across these areas which resulted in widespread power outages, some of which lasted for 3 to 5 days. As Gustav slowed across central Louisiana, the outer rainbands continued to rotate across much of southern and central Mississippi. This kept those portions of Mississippi in the region which was favorable for tornadoes. Over 3 days, 26 tornadoes were confirmed, all of which were in the EF0 to EF1 range.

Hurricane Isaac – August 29, 2012
Isaac moved very slowly to the north and northwest over the course of August 29th, which made for prolonged impacts. Forward motion of about 5 mph led to tremendous flooding issues for both

visualization/historical-flood-risk-and-costs.
[59] National Centers for Environmental Information

Louisiana and portions of Mississippi south of I-20. Around noon on August 29th, Isaac was downgraded to a Tropical Storm, but this was not much relief to the many residents who were being inundated with rain and wind. The worst of the wind was felt generally along and south of an axis from Marion County to Adams County. Numerous trees were down in Adams County, leaving many without power for several days. Eighty percent of the roads were blocked in Franklin County due to downed trees.

Hurricane Ida – August 29, 2021
The county suffered minor to moderate damage to trees and homes across the county. While most structural damage was exterior, some homes did suffer major damage due to falling trees. At the peak approximately 50% of the county was without power.

PROBABILITY OF FUTURE OCCURRENCES

Due to Lincoln County's inland location, the county does not experience hurricane sub-hazards such as storm surge. However, the county is – and will continue to be – susceptible to flooding and high wind events caused by hurricanes and tropical storms. As a result, the probability level of future hurricane and tropical storm occurrence is likely (between 10 and 100 percent annual probability). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. However, when the county is impacted, the damage could be significant, threatening lives and property throughout the planning area.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[60] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lincoln County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[61] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

HURRICANE EVACUATIONS

As discussed above, the MEMA District 7 Region has been directly impacted by a number of hurricane and tropical storm events. However, the region is also susceptible to indirect effects from hurricanes and tropical storms, particularly in the form of evacuations from coastal counties. The counties within MEMA District 7 are located far enough inland that they are often the primary recipients of evacuees from counties that have been (or will be) impacted by major storm events.

[60] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf
[61] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

For example, during Hurricane Katrina in 2005, thousands of evacuees made their way to counties in southwest Mississippi to take temporary refuge from the storm. Due to the severe and devastating effects of the storm, temporary sheltering within these counties was extended much longer than originally anticipated; in some cases, the evacuees ended up staying in shelters for weeks or months. This additional population caused a major strain on resources within these relatively rural counties. Local communities with limited resources had an unexpected and immediate need to provide shelter and other life essentials such as food, water, and health care to a significant number of evacuees.

Caring for evacuees was especially challenging for counties in the MEMA District 7 Region because most of these counties had been impacted themselves by the storm and were attempting to help their own citizens recover from the storm. Recovering from a major disaster while simultaneously attempting to help evacuees from surrounding counties posed difficulties for MEMA District 7 Region emergency management personnel and other local officials.

Based on Hurricane Katrina and other major hurricane events that have impacted the Gulf Coast in the past, it is likely that many of the MEMA District 7 counties will be receiver counties when it comes to evacuees. Many of these evacuees will likely come from locations in Louisiana, including New Orleans. Indeed, the State of Louisiana evacuation plan indicates that one of the primary evacuation routes from the City of New Orleans will direct evacuees north along Interstate 55, sending people through Pike County and Lincoln County. Depending on the severity of a storm event, officials in Louisiana may even change Interstate 55 over to a contraflow traffic pattern to enable quicker evacuations.

F.2.11 Severe Thunderstorm/High Wind

LOCATION AND SPATIAL EXTENT

A severe thunderstorm/high wind event is an atmospheric hazard that has no geographic boundaries and that can occur in all regions of the United States. However, severe thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that Lincoln County has uniform exposure to a severe thunderstorm/high wind event and the spatial extent of a storm's impact could be large.

The following Beaufort scale is an empirical measure for the intensity of the wind associated with windstorms.

TABLE F.17: BEAUFORT WIND SCALE

Beaufort Scale					
NUMBER	**WIND SPEED (MPH)**	**DESCRIPTION**	**WAVE HEIGHT (FT)**	**SEA CONDITIONS**	**LAND CONDITIONS**
0	<1	Calm	0	Flat.	Calm. Smoke rises vertically.
1	1-3	Light air	0.33	Ripples without crests.	Wind motion visible in smoke.
2	3-7	Light breeze	0.66	Small wavelets.	Wind felt on exposed skin. Leaves rustle.
3	8-12	Gentle breeze	2	Large wavelets.	Leaves and smaller twigs in constant motion.
4	13-17	Moderate breeze	3.3	Small waves.	Dust and loose paper rise. Small branches begin to move.
5	18-24	Fresh breeze	6.6	Moderate (1.2 m) longer waves. Some foam and spray.	Small trees sway.
6	25-30	Strong breeze	9.9	Large waves with foam crests and some spray.	Large branches in motion. Whistling heard in overhead wires. Umbrella use difficult.
7	31-38	High wind, Moderate Gale, Near Gale	13.1	Sea heaps up and foam begins to streak.	Whole trees in motion. Effort needed to walk against the wind.
8	39-46	Fresh Gale	18	Moderately high waves with breaking crests forming spindrift. Streaks of foam.	Twigs broken from trees. Cars veer on road.
9	47-54	Strong Gale	23	High waves (6-7 m) with dense foam. Wave crests start to roll over. Considerable spray.	Larger branches break off trees, and some small trees blow over. Construction/temporary signs and barricades blow over. Damage to circus tents and canopies.

Beaufort Scale					
NUMBER	**WIND SPEED (MPH)**	**DESCRIPTION**	**WAVE HEIGHT (FT)**	**SEA CONDITIONS**	**LAND CONDITIONS**
10	55-63	Whole Gale/Storm	29.5	Very high waves. The sea surface is white and there is considerable tumbling.	Trees uprooted. Considerable structural damage.
11	64-72	Violent storm	37.7	Exceptionally high waves.	Widespread vegetation and structural damage.
12	≥73	Hurricane-force	≥46	Huge waves. Sea is completely white with foam and spray. Air is filled with driving	Massive and widespread damage to structures.

According to the National Centers for Environmental Information, 242 recorded Thunderstorm / High Wind events have affected Lincoln County since 1970.[62] The following table is a summary of the Thunderstorm / High Wind events in Lincoln County. In all, Thunderstorm / High Wind occurrences resulted in approximately $6,982,810 in property damage. It should be noted that Thunderstorm / High Wind events may cause substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

TABLE F.18: HISTORICAL THUNDERSTORM / HIGH WIND OCCURRENCES IN LINCOLN COUNTY[63]

Date of Occurrence	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Losses
Brookhaven	86	0/2	$2,385,410	$45,873
Unincorporated Area	151	0/3	$4,597,400	$ 88,412
LINCOLN COUNTY TOTAL	**242**	**0/5**	**$ 6,982,810**	**$ 134,285**

PROBABILITY OF FUTURE OCCURRENCES

Given the high number of previous events, it is certain that severe thunderstorm/ high wind events, including straight-line wind events, will occur in the future, with a highly likely probability level (100 percent annual probability) for the entire county.

[62] These Thunderstorm / High Wind events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1970 through November 2022. It is likely that additional Thunderstorm / High Wind events have affected Lincoln County. As additional local data becomes available, this hazard profile will be amended.

[63] These thunderstorm events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1970 through December 2022.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[64] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lincoln County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[65] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful *severe thunderstorm/high wind events* to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

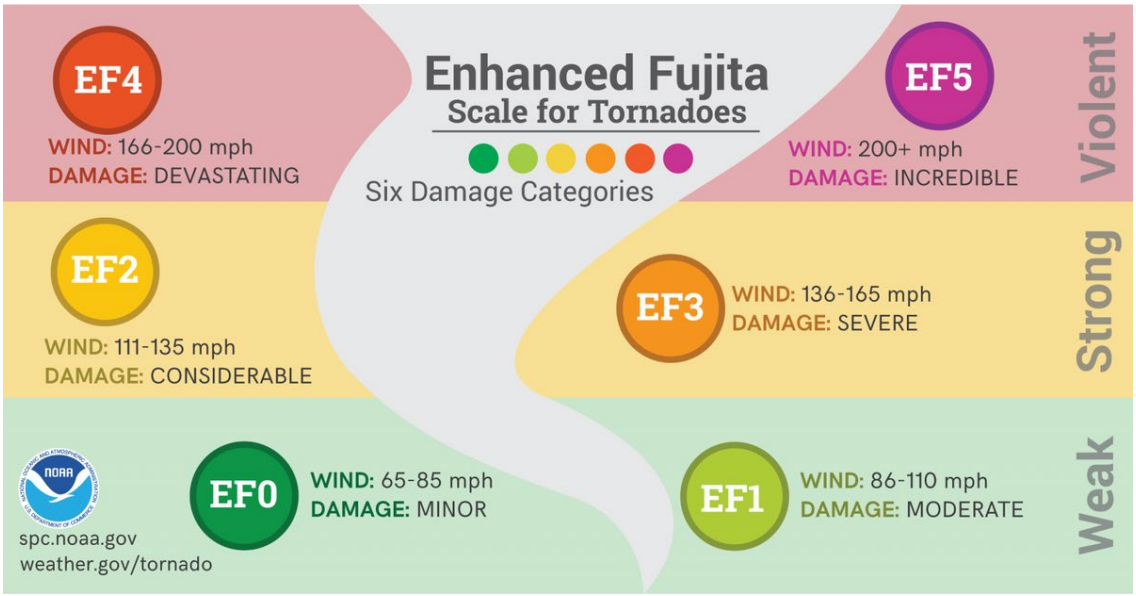
F.2.12 TORNADO

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, including in Lincoln County. Tornadoes typically impact a relatively small area, but damage may be extensive. Tornado event locations are completely random and it is not possible to determine whether some areas are more susceptible than other areas to tornado strikes. Therefore, it is assumed that Lincoln County is uniformly exposed to the tornado hazard.

The following figure depicts the Enhanced-Fujita Scale of tornado intensity.

FIGURE F.13: ENHANCED-FUJITA SCALE

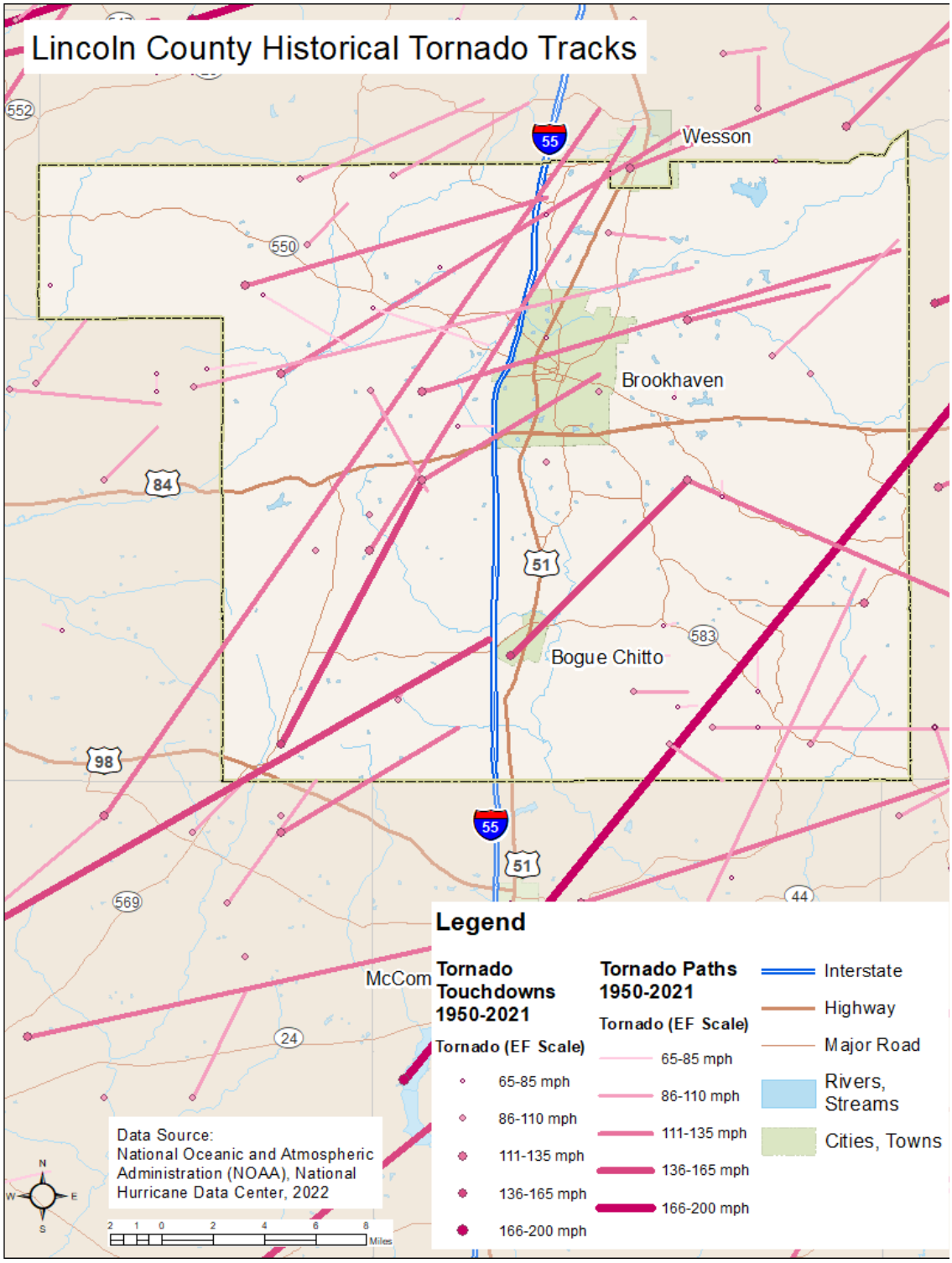


[64] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[65] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

With that in mind, the figure below shows tornado track data for many of the major tornado events that have impacted the county between 1950 and 2021. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

FIGURE F.14: LINCOLN COUNTY HISTORICAL TORNADO TRACKS



HISTORICAL OCCURRENCES

Tornadoes were at least partially responsible for 2 disaster declarations in Lincoln County in 1975 and 1992.[66] According to the National Centers for Environmental Information, 54 recorded Tornado events have affected Lincoln County since 1955.[67] The following table is a summary of the Tornado events in Lincoln County. In all, tornado occurrences resulted in approximately $11,471,500 in property damage.

TABLE F.19: HISTORICAL TORNADO IMPACTS IN LINCOLN COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Brookhaven	4	0/0	$32,000	$478
Unincorporated Area	50	5/27	$11,439,500	$170,739
LINCOLN COUNTY TOTAL	**54**	**5/27**	**$11,471,500**	**$171,216**

PROBABILITY OF FUTURE OCCURRENCES

According to historical information, tornado events pose a significant threat to Lincoln County. The probability of future tornado occurrences affecting Lincoln County is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[68] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lincoln County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[69] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storm systems that spawn tornadoes to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding, and enhancing the potential for increased *tornado activity*. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

[66] FEMA – Disaster Declarations. Retrieved on 01/01/2023 from https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties

[67] These tornado events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1955 through November 2022.

[68] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[69] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters.

F.2.13 Winter Storm, Freeze, and Extreme Cold

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm, freeze, and extreme cold events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure to this hazard typically depends on the normal, expected severity of local winter weather. Lincoln County is not accustomed to severe winter weather conditions and seldom receives severe winter weather, even during the winter months. While winter storm events tend to be mild in nature, relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage because these events are not commonplace in the region. Given the atmospheric nature of the hazard, the entire county has uniform exposure to winter storm, freeze, and extreme cold events.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, 15 recorded winter storm events have affected Lincoln County since 1996.[70] The following table is a summary of the winter storm events in Lincoln County. In all, winter storm occurrences resulted in approximately $2,360,000 in property damage.

TABLE F.20: SUMMARY OF WINTER STORM EVENTS IN LINCOLN COUNTY[71]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Lincoln County	15	0/0	$2,360,000	$90,769

There have been several severe winter weather hazard events in Lincoln County. The text below describes two of the major events and associated impacts on the county. Similar impacts can be expected with severe winter weather.

February 2010
Heavy snow affected a large portion of the region – especially locations across central and southern Mississippi – February 11th and February 12tF. The heavy snow was a result of a low pressure system that tracked eastward across the northern Gulf of Mexico, and a vigorous upper level disturbance that moved across the region while a cold air mass was in place. Light precipitation overspread the region late Thursday afternoon into the evening before becoming heavy Thursday night into early Friday morning. The snow tapered off from west to east during the midday hours Friday.

February 2011
An ice storm developed across the area on February 3rd into the early morning hours of the 4tF. While this icing event was not devastating, the impact to travel was a major issue across the region. Thousands of accidents occurred from slick roads. As a result of the accidents, three fatalities occurred along with a handful of injuries. Overall, most areas received 0.25 to 0.5 inches of ice accumulation from freezing

[70] Winter storm events include Cold/Wind Chill, Extreme Cold/Wind Chill, Frost/Freeze, Heavy Snow, Ice Storm, Winter Storm, and Winter Weather events.
[71] These winter storm events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1996 through November 2022

rain. Additionally, some areas had a mix of precipitation with sleet accumulating. Some snow did occur, but those were just across select areas and the accumulation was mainly one inch or less.

February 2021
As an arctic air mass continued to build southward across the South on February 17th, another wave of precipitation overspread this cold air mass across much of Mississippi. The main impacts across central and southern portions of the state were from freezing rain and resulting heavy icing, but some significant accumulations of sleet and snow also occurred in areas mainly north and west of the Natchez Trace. Freezing rain continued through the evening hours, ending from west to east by the early morning of February 18th. Ice accumulated quickly in many locations and downed numerous trees, large limbs, and power lines across the affected areas. Several trees and limbs fell onto power lines, resulting in more widespread power outages as well. Some trees fell onto homes or cars, and significant amounts of ice, sleet, and snow collapsed a few gas station awnings and roofs where accumulations were greatest. In the hardest hit areas, extensive damage to trees and power lines took several months and cost several hundreds of thousands of dollars to clean up.

Winter storm, freeze, and extreme cold events throughout the planning area have several negative impacts including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could to fire or an accumulation of toxic fumes.

PROBABILITY OF FUTURE OCCURRENCES
Winter storm, freeze, and extreme cold events will continue to occur in Lincoln County. Based on historical information, the probability is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE
The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[72] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Lincoln County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[73] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms). However, accelerated warming in the Artic region (i.e., Arctic amplification) may also be linked with an increase in the frequency of *winter storm, freeze, and extreme cold events* across parts of Asia and North America, including in Lincoln County. [74]

[72] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf
[73] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters.
[74] NOAA – Communication Education & Engagement. Retrieved from: https://cpo.noaa.gov/Divisions-Programs/Communication-Education-and-Engagement/CEE-News/ArtMID/8293/ArticleID/2369/Research-Links-Extreme-Cold-Weather-in-the-United-States-to-Arctic-Warming.

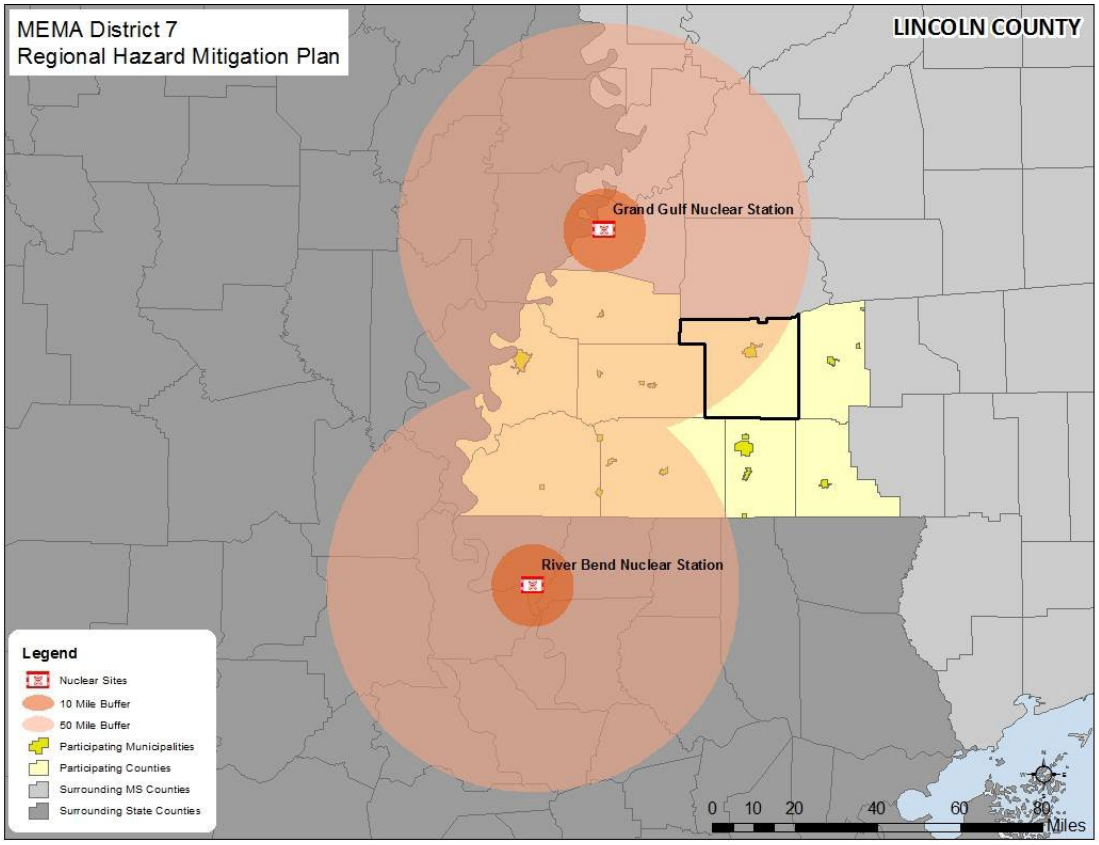
OTHER HAZARDS

F.2.14 Radiological Event

LOCATION AND SPATIAL EXTENT

The Nuclear Regulatory Commission (NRC) defines two emergency planning zones around nuclear plants: 10-mile zones and 50-mile zones. Areas located within a 10-mile radius of a nuclear station (i.e., 10-mile zones) are at highest risk of exposure to and inhalation of radioactive contamination; as a result, this radius is the designated evacuation radius recommended by the Nuclear Regulatory Commission when nuclear incidents occur. Areas outside within the secondary 50-mile radius (i.e., 50-mile zones) are still considered to be at risk of radioactive contamination, but the risks and impacts (i.e., ingestion of contaminated food and liquids) may be less severe than areas within the 10-mile radius. The western side of Lincoln County is located inside 50-mile radius of the Grand Gulf Nuclear Station but is not within either the 10-mile or 50-mile radius from the River Bend Nuclear Station, as shown in the figure below.

FIGURE F.15: NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN LINCOLN COUNTY[75]



HISTORICAL OCCURRENCES

Several minor events/notifications have been reported at both the Grand Gulf and River Bend Nuclear Stations. These incidents have been classified by the NRC using the scale found in the table below. All of

[75] Source: International Atomic Energy Agency.

these events were minor in magnitude, and many were insignificant enough that they did not register on the classification scale. A list of events at Grand Gulf Nuclear Station and a list of events at River Bend Nuclear Station can be found in the tables below. There have been no major nuclear events at either the Grand Gulf or River Bend Nuclear Stations.

TABLE F.21: NUCLEAR REGULATORY COMMISSION EMERGENCY CLASSIFICATION SCALE FOR EVENTS OCCURRING AT NUCLEAR POWER PLANTS

Classification	Description
Notification of Unusual Event (NOUE)	Events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs. [Note: This term is sometimes shortened to Unusual Event (UE). The terms Notification of Unusual Event, NOUE and Unusual Event are used interchangeably.
Alert	Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the Environmental Protection Agency (EPA) protective action guides (PAGs)
Site Area Emergency	Site Area Emergency (SAE) – Events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or hostile action that results in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to, equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA PAG exposure levels beyond the site boundary.
General Emergency	Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile action that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

TABLE F.22: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT GRAND GULF NUCLEAR STATION[76] [77]

Date	Retrieved From*	Classification	Plant	Description
8/29/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST

[76] Nuclear Regulatory Commission Preliminary Notification Reports: http://www.nrc.gov/reading-rm/doc-collections/event-status/prelim-notice/.

[77] Nuclear Regulatory Commission Licensee Event Reports: https://lersearcF.inl.gov/Entry.aspx.

10/1/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF NUCLEAR STATION SECURITY OFFICER LOCKOUT
9/29/2016	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF EXTENDED PLANT SHUTDOWN TO ADDRESS OPERATIONS PERFORMANCE

TABLE F.23: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT RIVER BEND NUCLEAR STATION[78] [79]

Date	Retrieved From*	Classification	Plant	Description
11/26/1985	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	ECCS Initiation: Improper restoration of a level transmitter causes HPSC injection
11/27/1985	Licensee Event Report	Alert	River Bend Unit 1	Failure to Perform Surveillance Tests
3/5/1992	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	REACTOR SCRAM CAUSED BY A GENERATOR TRIP DUE TO HIGH WINDS CAUSING TRANSFORMER DAMAGE
9/15/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE IVAN
10/4/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	Shutdown Greater than 72 Hours
9/23/2005	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	NRC ENTERS MONITORING MODE DUE TO HURRICANE RITA
5/23/2007	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REACTOR SHUTDOWN DUE TO UNEXPECTED CHANGE IN RECIRCULATION FLOW
9/2/2008	Preliminary Notification Reports	Notification of Unusual Event/Not Applicable	River Bend Unit 1	NRC RESPONSE TO HURRICANE GUSTAV

[78] Nuclear Regulatory Commission Preliminary Notification Reports: http://www.nrc.gov/reading-rm/doc-collections/event-status/prelim-notice/.
[79] Nuclear Regulatory Commission Licensee Event Reports: https://lersearcF.inl.gov/Entry.aspx.

Date	Retrieved From*	Classification	Plant	Description
5/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	AUGMENTED INSPECTION TEAM ONSITE AT RIVER BEND STATION
8/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST

PROBABILITY OF FUTURE OCCURRENCES

A radiological event at a nuclear station is a very rare occurrence in the United States due to the intense regulation of the nuclear power industry. While there have been minor incidents at both the Grand Gulf or River Bend Nuclear Stations, a radiological event it is considered unlikely (less than 1 percent annual probability).

RADIOLOGICAL EVACUATIONS

Like the hurricane evacuations discussed above, the MEMA District 7 Region would potentially be impacted to a greater degree by evacuations caused by a radiological event than by the event itself. Counties immediately adjacent to the region are located within a 10-mile radius of a nuclear facility and, in the aftermath of a radiological incident – populations from those counties may be evacuated to the MEMA District 7 Region.

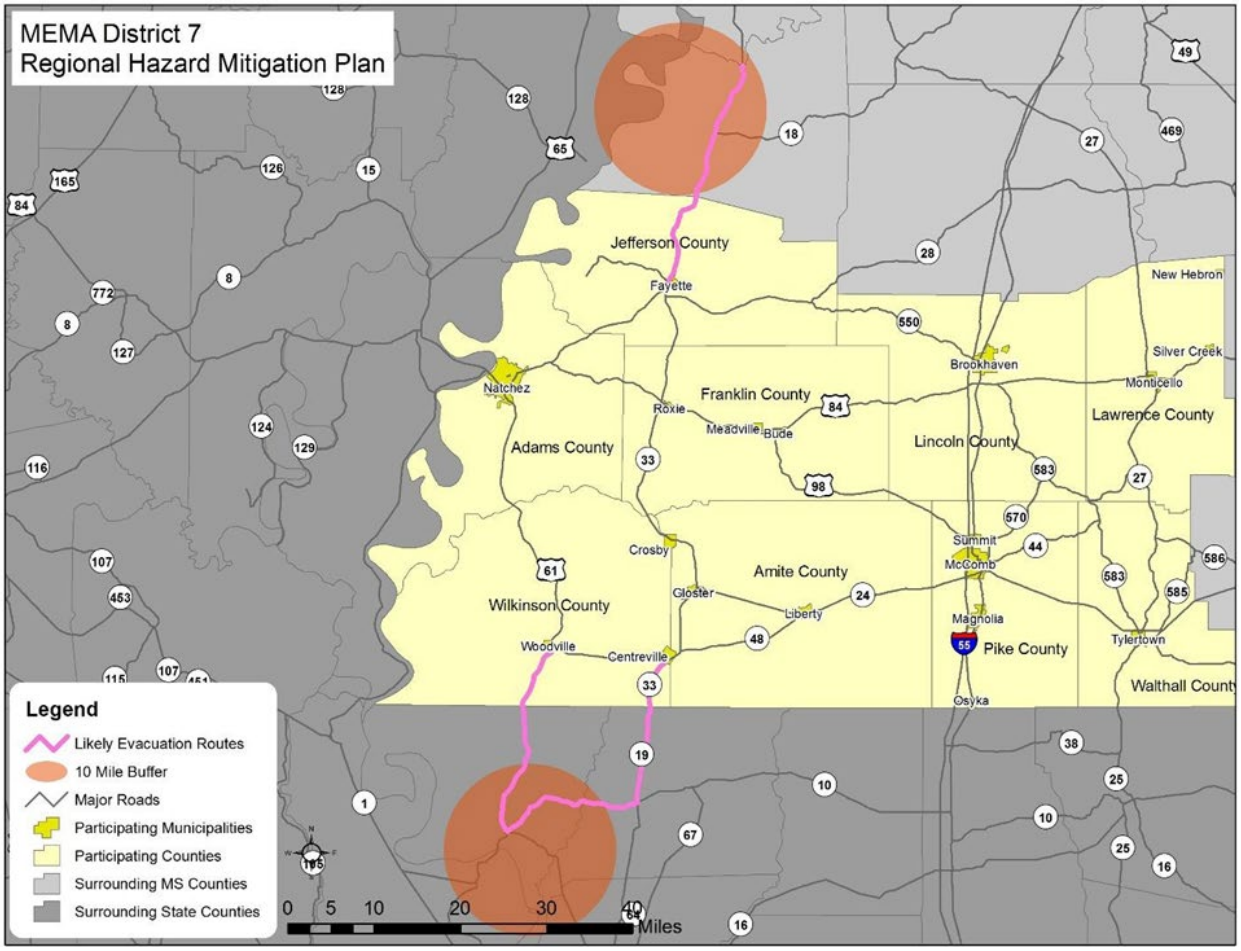
Due to the severe and long-term effects of a major radiological event, temporary sheltering will be an initial concern, but the greater challenge may be in the long-term. As has happened with historical radiological accidents in other locations, the danger in the impacted area will likely extend for a very long period after the event, and evacuees may be unable to return to their homes for months or years. This additional influx of population will cause a major strain on resources within these relatively rural counties in the short-term, as local communities with limited resources will have an unexpected and immediate need to provide shelter and other life essentials such as food, water, and health care to a significant, additional number of people. In the long-term, there may be challenges for local officials as existing infrastructure will likely be inadequate to handle larger populations.

Although there have not been any major radiological events in the region historically, hurricane evacuations (discussed above) provide a similar scenario in terms of what the region might expect. However, one additional concern that officials will need to consider in a radiological event is that evacuees may be contaminated by radioactivity. According to the Centers for Disease Control, radioactive contamination can occur when radioactive materials are released into the environment and become deposited into the air, water, surfaces, soil, plants, buildings, people, or animals. This contamination can then be spread when people touch other people, surfaces, or objects. Therefore, when people evacuate a contaminated zone, they pose a potential risk of spreading the contamination to others if they are not properly treated. Local officials in MEMA District 7 may need to be prepared to set up decontamination centers along major evacuation routes to ensure that the contamination is not spread. It is also important for citizens to understand the steps they can take to reduce the risk of spreading contamination such as evacuating quickly after an event and following decontamination instructions as directed by local officials.[24]

Based on the locations of the 10-mile evacuation areas near the region, many of these evacuees will

likely come from Claiborne County to the north and West Feliciana and East Feliciana Parishes to the south. The main roads for these evacuees will probably be U.S. Highway 61 and Mississippi State Highway 33 since these are the primary and most direct roads into and out of the evacuation counties and into MEMA District 7, as shown in the figure below. Depending on the severity of the event, officials may even change these roads over to a contraflow traffic pattern to enable quicker evacuations.

FIGURE F.16: LIKELY EVACUATION ROUTES FOR A RADIOLOGICAL EVENT IN THE MEMA DISTRICT 7 REGION



As a result of the potential for an influx of evacuees during a radiological event, it is critical for local officials in the MEMA District 7 region to prepare for evacuations. It is possible that thousands of evacuees will be relocated, either temporarily or permanently, to MEMA District 7. Therefore, plans for identifying shelters and other resources should be coordinated well in advance of future events.

F.2.15 Pandemic

LOCATION AND SPATIAL EXTENT

Pandemics are global in nature. However, they may start anywhere. Lincoln County chose to analyze this hazard given the agriculture in the area and potential for this kind of event to occur in any location at any time.

All populations should be considered at risk to pandemic. Buildings and infrastructure are not directly impacted by the virus/pathogen but could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings may be shutdown, at least temporarily, as a result. Employers may initiate work from home procedures for non-essential workers in order to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

HISTORICAL OCCURRENCES

Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below.

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to 566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population.

Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10 to 50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852- 1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours. The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

1957 Asian Flu: It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

1968 Hong Kong Flu: The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020, mainly due to the speed and scale of the transmission of the disease. Prior to that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province on February 26th, 2020. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

There is a considerable amount of data on the extent of COVID-19 throughout the State of Mississippi and Lincoln County. The number of reported cases and deaths across the State of Mississippi and Lincoln County are shown in the figure below.

TABLE F.24: COVID-19 CASES AS OF 01/02/2023[80] [81]

	Cases	Deaths
Mississippi	943,402	13,051
Lincoln County	10,185	164

[80] Mississippi Department of Health – COVID-19 Totals by County. Retrieved on 01/05/2023 from https://msdh.ms.gov/msdhsite/_static/14,0,420,884.html

[81] Mississippi Department of Health – COVID-19 Totals by County. Retrieved on 01/05/2023 from https://msdh.ms.gov/msdhsite/_static/resources/19550.pdf

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS, and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Lincoln County has a probability level of unlikely (less than 1 percent annual probability) for future pandemics events. While pandemics can have devastating impacts, they are relatively rare.

The Mississippi State Department of Health maintains a state pandemic plan which can be found at: http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf.

F.2.16 Conclusions on Hazard Risk

The hazard profiles presented in this subsection were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

HAZARD EXTENT

The following table describes the extent of each natural hazard identified for Lincoln County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

TABLE F.25: EXTENT OF LINCOLN COUNTY HAZARDS

Flood Related Hazards	
Dam & Levee Failure	Dam Failure extent is defined using the Mississippi Department of Environmental Quality classifications which include Low, Significant, and High. Two dams are classified as high-hazard in Lincoln County.
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no official erosion rate records in Lincoln County but local estimates are around 0.25 to 0.50 feet per year. Some areas of erosion have been identified by local coordinators.
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 10.4 percent of the total land area in Lincoln County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was on Big Creek at Bogue Chitto. Water reached a discharge of 13,700 cubic feet per second (recorded on October 4, 1964). The highest stream gage height was also on Big Creek at Bogue Chitto with a height that was recorded at 27.40 feet (recorded on October 4, 1964). Additional peak discharge readings, historic crest heights, and the corresponding flood categories (where available) are in the table below.

Drought	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. Lincoln County has received this ranking once over the 17-year reporting period.
Lightning	According to the Vaisala's flash density map, Lincoln County is located in an area that experiences 12 to 20 lightning flashes per square mile per year. It should be noted that future lightning occurrences may exceed these figures.
Wildfire	Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2007-2016. The greatest number of fires to occur in Lincoln County in any year was 87 in 2011. The greatest number of acres to burn in the county in a single year occurred in 2007 when 1,632 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.
Earthquake	Earthquake extent can be measured by the Richter Scale or the Modified Mercalli Intensity (MMI) scale. According to data provided by the National Centers for Environmental Information, the greatest earthquake to impact Lincoln County had a MMI of II (feeble) but no Richter magnitude was available (reported on September 1, 1886).
Extreme Heat	The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are not kept for any areas in Lincoln County. However, the highest recorded temperature in the region was 106°F in 2007 with heat index values recorded above 115°F.
Hailstorm	Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Lincoln County was 2.75 inches (last reported on April 11, 2008). It should be noted that future events may exceed this.
Hurricane & Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5. The greatest classification of hurricane to impact the MEMA District 7 Region was a Category 3 storm. This occurred in 1969 with Hurricane Camille and in 2005 with Hurricane Katrina. The storm track of both storms passed just to the east of the region, but due to the size of these storms, their impact was felt across the region.
Severe Thunderstorm / High Wind	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 73-year history from the National Centers for Environmental Information, the strongest recorded wind event in Lincoln County was last reported on February 5, 2016 at 83 knots (approximately 96 mph). It should be noted that future events may exceed these historical occurrences.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA as well as the Fujita/Enhanced Fujita Scale. The greatest magnitude reported in Lincoln County was an F4 (reported on January 10, 1975).
Winter Storm, Freeze, & Extreme Cold	The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in Lincoln County. However, reports from NCDC of the greatest snowfall in the county has been 4 to 10 inches (reported on December 11, 2008).
Radiological Event	Although there is no history of a nuclear accident at either the Grand Gulf Nuclear Station or River Bend Nuclear Station, other events across the globe and in the United States in particular indicate that an event is possible. Since several national and international events were Level 7 events on the INES, the potential for a Level 7 event at these stations is possible.

Pandemic	The extent of a pandemic impacting the county is difficult to estimate. It could result in thousands of deaths and extreme disruption of commerce and everyday life.

PRIORITY RISK INDEX RESULTS

To draw some meaningful planning conclusions on hazard risk for Lincoln County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a "Priority Risk Index" (PRI). More information on the PRI and how it was calculated can be found in Section 5.17.2.

The following table summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this subsection, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

TABLE F.26: SUMMARY OF PRI RESULTS FOR LINCOLN COUNTY

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Dam Failure and Levee Failure	Possible	Critical	Moderate	Less than 6 hours	Less than 6 hours	**2.6**
Erosion	Possible	Minor	Small	More than 24 hours	More than 1 week	**1.8**
Flood	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**3.2**
Fire-related Hazards						
Drought	Possible	Limited	Large	More than 24 hours	More than 1 week	**2.5**
Lightning	Highly Likely	Limited	Small	6 to 12 hours	Less than 6 hours	**2.6**
Wildfire	Highly Likely	Limited	Moderate	Less than 6 hours	Less than 1 week	**3.1**
Geologic Hazards						
Earthquake	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Wind-related Hazards						
Extreme Heat	Likely	Limited	Large	More than 24 hours	More than 1 week	**2.8**
Hailstorm	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Hurricane and Tropical Storm	Likely	Catastrophic	Large	More than 24 hours	Less than 1 week	**3.3**
Severe Thunderstorm/High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Tornado	Likely	Catastrophic	Moderate	Less than 6 hours	Less than 6 hours	**3.2**
Winter Storm and Freeze	Likely	Minor	Moderate	More than 24 hours	Less than 1 week	**2.2**
Other Hazards						
Radiological Event	Unlikely	Limited	Moderate	More than 24 hours	Less than 1 week	**1.9**
Pandemic	Unlikely	Limited	Large	More than 24 hours	More than 1 week	**2.2**

F.2.17 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Lincoln County, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each identified hazard displayed in the table below according to three categories: High Risk, Moderate Risk, and Low Risk. For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Lincoln County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately, and is described in Section 6: *Vulnerability Assessment* and below in Section F.3. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates. In most cases, the hazards of greatest concern did not change much since the last plan update, indicating that the priorities remained relatively stable and there were few changes in priorities.

TABLE F.27: CONCLUSIONS ON HAZARD RISK FOR LINCOLN COUNTY

HIGH RISK	Hurricane and Tropical Storm Tornado Flood Wildfire Severe Thunderstorm/High Wind
MODERATE RISK	Extreme Heat Hailstorm Dam and Levee Failure Lightning Drought
LOW RISK	Winter Storm and Freeze Radiological Event Erosion Earthquake Pandemic

F.3 LINCOLN COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Lincoln County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected amount of damage caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in Section 6: Vulnerability Assessment.

F.3.1 Asset Inventory

The table below lists the estimated number of improved properties and the total value of improvements for Lincoln County and its participating jurisdictions (study area of vulnerability assessment). Because digital parcel data was not available for most communities, data obtained from Hazus-MH 5.1 inventory was utilized to complete the analysis.

TABLE F.28: IMPROVED PROPERTY IN LINCOLN COUNTY[82]

Location	Counts of Improved Properties	Total Value of Improvements
Brookhaven	4,644	$1,333,728
Unincorporated Area	11,144	$3,177,339,272
LINCOLN COUNTY TOTAL	**15,788**	**$3,178,673,000**

In addition, the following table lists the inventory of critical facilities (i.e., fire stations, police stations, medical care facilities, emergency operation centers, schools, and ports) located in Lincoln County, according to previous plan data and Hazus-MH 5.1 data that was reviewed and updated by local officials.

TABLE F.29: CRITICAL FACILITY INVENTORY IN LINCOLN COUNTY[83]

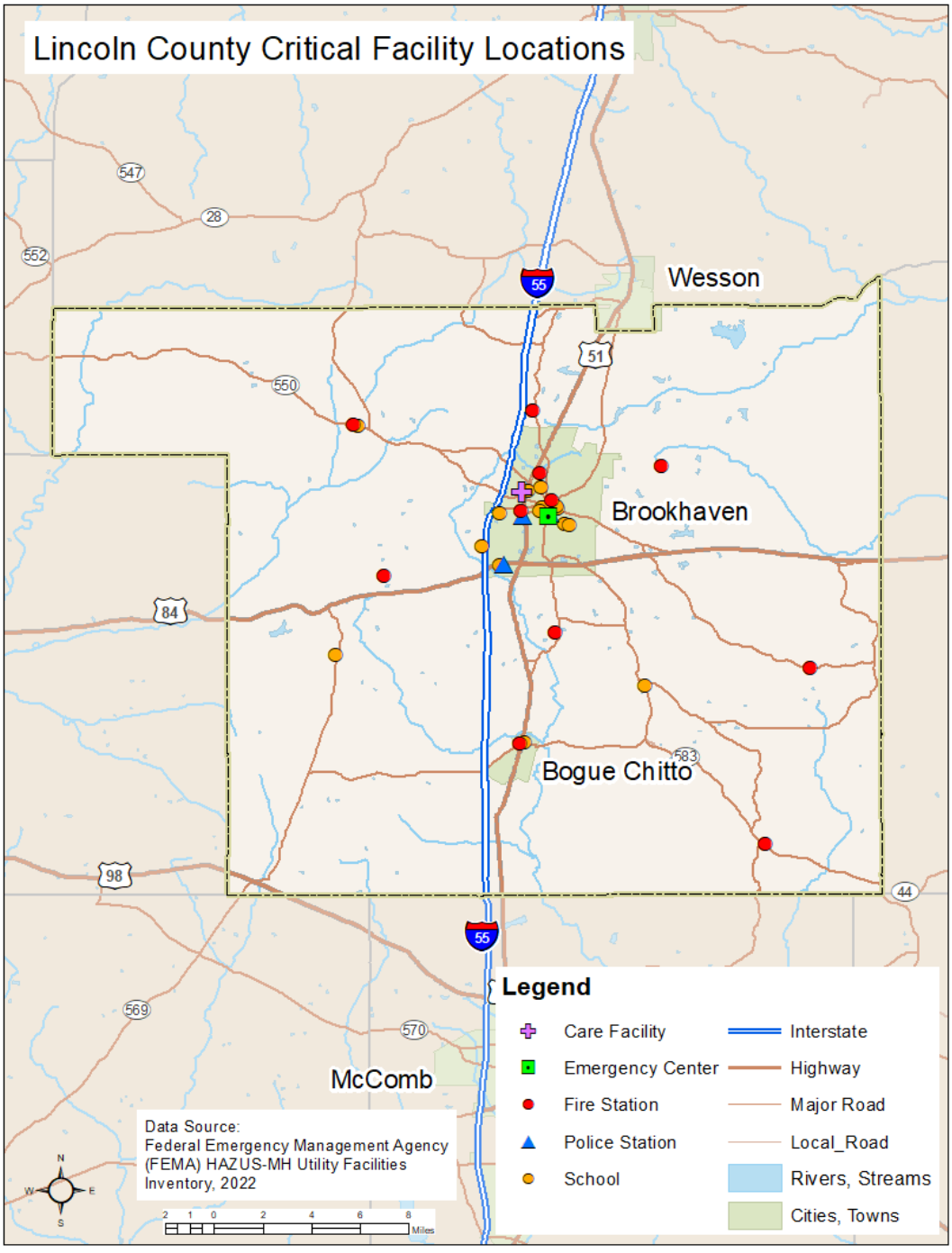
Location	Fire Stations	Police Stations	Medical Facilities	EOC	Schools	Ports
Brookhaven	4	2	16	1	13	0
Unincorporated	10	0	0	0	5	0
Lincoln County Total	**14**	**2**	**16**	**1**	**18**	**0**

The figure below shows the locations of critical facilities in Lincoln County. The table at the end of this subsection, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided through Hazus which was updated, as best as possible, with local knowledge.

[82] *Hazus-MH 5.1*

[83] *Sources: Hazus-MH 5.1; Local Officials*

FIGURE F.17: CRITICAL FACILITY LOCATIONS IN LINCOLN COUNTY



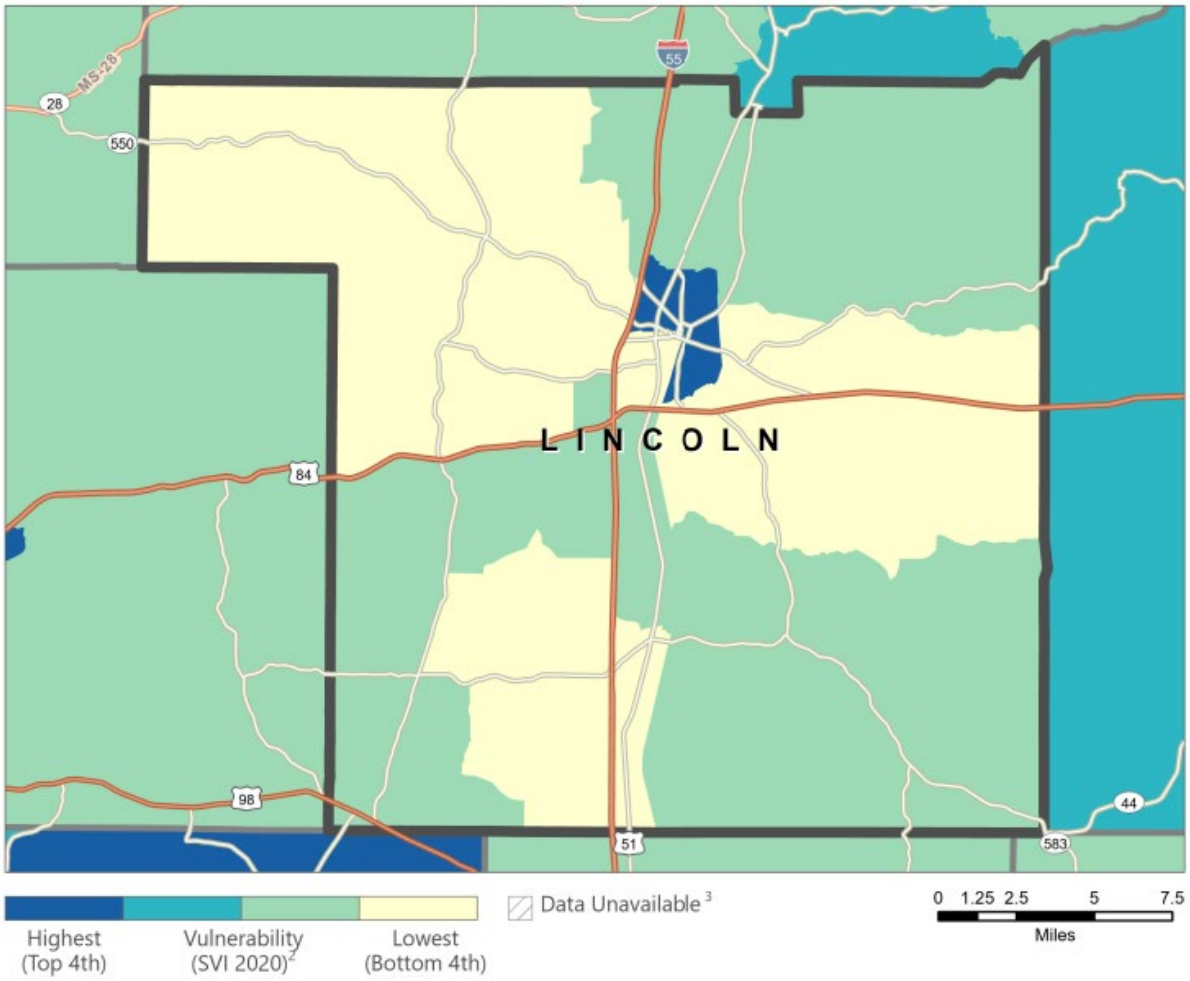
F.3.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those segments of the resident population in Lincoln County that are potentially at risk for

these hazards. Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss.

The CDC/ATSDR Social Vulnerability Index (CDC/ATSDR SVI) uses 16 U.S. census variables to help local officials identify communities that may need support before, during, or after disaster. See figure below for Lincoln County SVI score of 0.9857.

FIGURE A.28: SOCIAL VULNERABILITY INDEX IN LINCOLN COUNTY[84]



The following table lists the population of Lincoln County by jurisdiction. According to the 2020 U.S. Census, the overall total population in Lincoln County was 34,907 persons, which was a small increase from the 2015 population estimate. Additional population estimates are presented above in Section F.1.

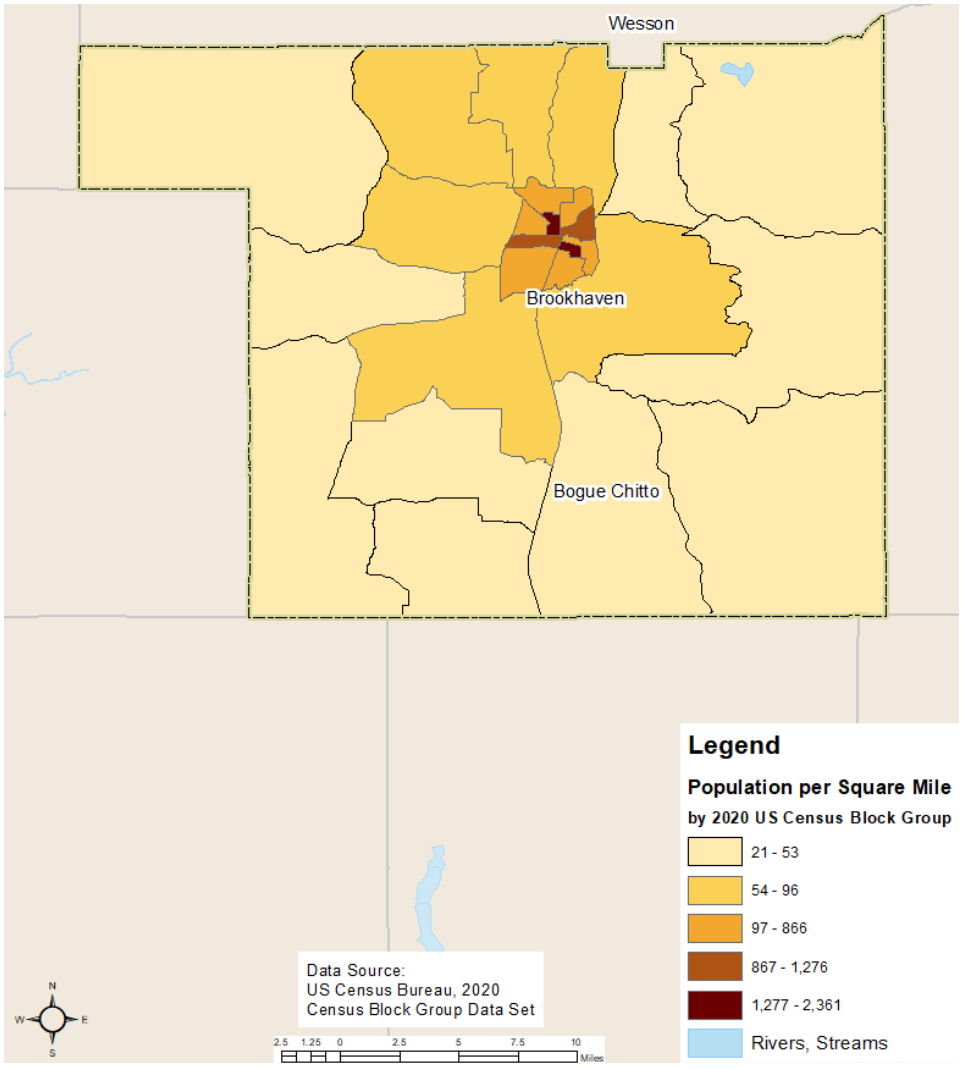
[84] CDC/ATSDR Social Vulnerability Index

TABLE F.30: POPULATION IN LINCOLN COUNTY[85] [86]

Jurisdiction	2010 Census Population	2020 Census Population	% Change 2010-2020
Brookhaven	12,513	11,674	-6.71%
Unincorporated Area	22,356	23,233	3.92%
Lincoln County Total	**34,869**	**34,907**	**-0.11%**

In addition, the figure below illustrates the population density per acre by census block as it was reported by the U.S. Census Bureau in 2020. As can be seen in the figure, the population is spread out with concentrations in municipal areas such as Brookhaven.

Figure F.19: Population Density in Lincoln County



[85] *United States Census Bureau 2020 Census.*
[86] *United States Census Bureau. Census 2011-2015 American Community Survey 5-Year Estimates.*

F.3.3 Development Trends and Changes in Vulnerability

Since the previous hazard mitigation plan was approved, Lincoln County has experienced small population gains and development. The following table shows the number of building units constructed since 2010 according to the U.S. Census American Community Survey.

TABLE F.31: BUILDING COUNTS FOR LINCOLN COUNTY[87] [88]

Location	Total Housing Units (2021)	Units Built 2010 or Later	% Building Stock Built Post-2010
Brookhaven	5,435	164	3.02%
Unincorporated Area	10,284	1,240	12.06%
Lincoln County Total	**15,719**	**1,404**	**8.93%**

TABLE F.32: POPULATION GROWTH FOR LINCOLN COUNTY[89]

Jurisdiction	2000 Census	2010 Census	2020 Census	% Change 2000 - 2020
Lincoln County	33,166	34,869	34,907	5.25%
Brookhaven	9,861	12,513	11,674	18.39%
Unincorporated Area	23,305	22,356	23,233	-0.31%

Since 2000, the county has experienced an overall population increase, and there appears to be a moderate rate of residential development in the county. However, unincorporated areas of the county have experienced a higher rate of development than incorporated areas, resulting in an increased number of structures that are vulnerable to the potential impacts of the identified hazards. This increased development has led to a slight increase in the county's vulnerability, with larger increases in vulnerability in certain areas and communities. If development continues to increase in the future, more of the county's population and infrastructure will be exposed to potential hazards, especially if that development occurs in high risk areas such as floodplains.

F.3.4 Vulnerability Assessment Results

As noted in Section 6: *Vulnerability Assessment*, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis. Those analyses, specific to Lincoln County, are presented here. Almost all other hazards are assumed to impact the entire planning region (drought, extreme heat, hailstorm, lightning, severe thunderstorm/high wind, tornado, and winter storm/freeze/extreme cold), while the remaining hazard (erosion) is not analyzed due to lack of data.

The hazards analyzed in this subsection include: dam/levee failure, flood, wildfire, earthquake, hurricane and tropical storm winds, and radiological event.

The annualized loss estimate for all hazards is presented near the end of this subsection.

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[87] Sources: United States Census Bureau, 2000 Census, 2010 Census, and 2020 Census.

[88] United States Census. American Community Survey 5-Year Estimates. 2020. Retrieved on 01/11/2023 from: https://data.census.gov/table?q=median+home+value+lincoln+county+mississippi+brookhaven+mississippi.

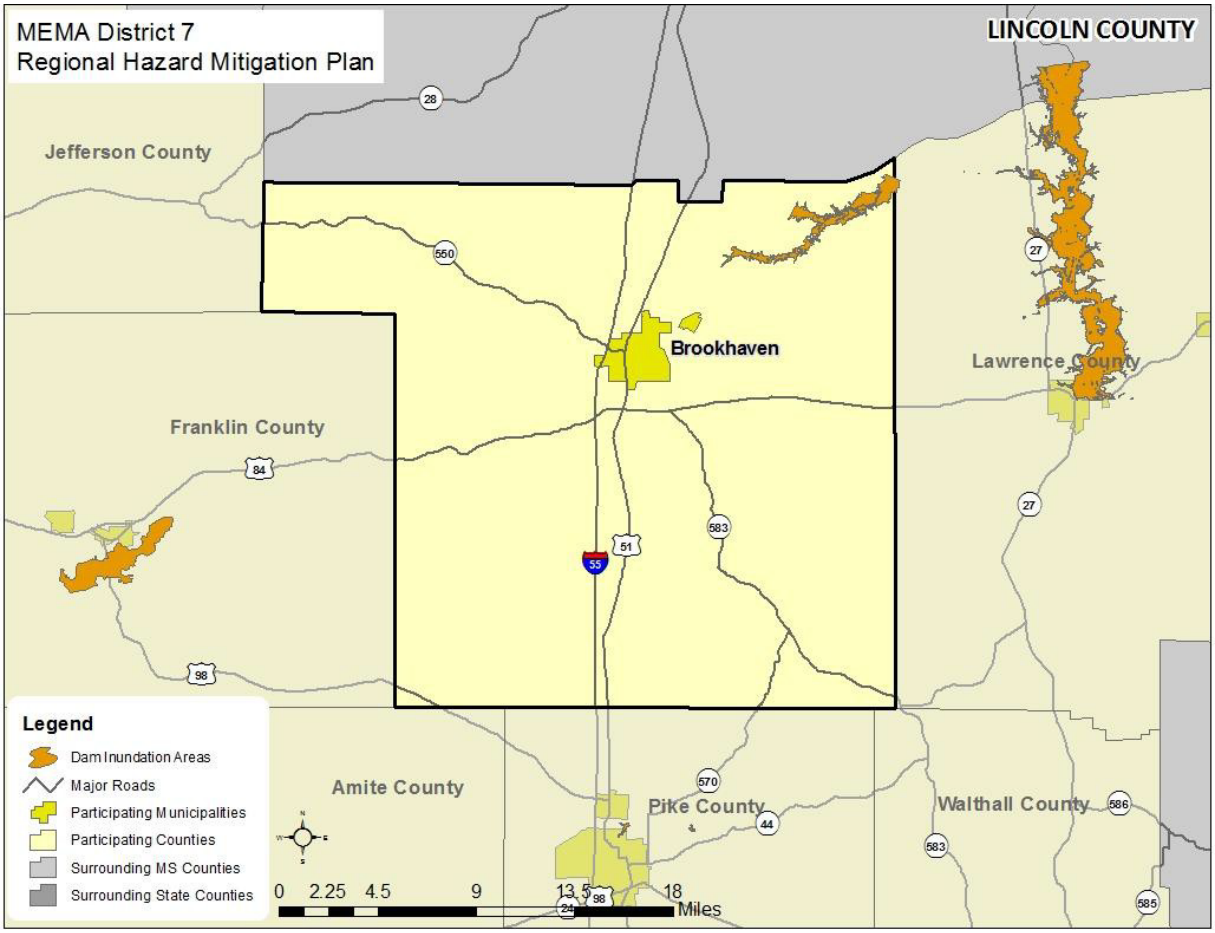
[89] United States Census. 2000, 2010, and 2020.

DAM/LEVEE FAILURE

To assess risk to a dam or levee failure, a GIS-based analyses have been used to estimate exposure of Lincoln County to areas delineated by the Mississippi Department of Environmental Quality as a potential inundation area. The determination of value at-risk (exposure) has been calculated by summing the values for improved properties located within an identified inundation area. Because this type of inundation mapping has not been completed for every dam/levee in the region, the results of this analysis likely underestimate the overall vulnerability to a dam or levee failure. However, this analysis is still useful as a baseline minimum for property that is potentially at-risk. The figure below shows identified potential inundation areas within and adjacent to Lincoln County.

In general, building footprint and parcel data are used in this analysis. However, due to a lack of digital building and parcel information for some communities, inventory data from HAZUS-MH 5.1 have been used to supplement local building and parcel data. However, HAZAUS-MH 5.1 data reflect estimations of building inventory, and may not reflect actual counts or values located in dam inundation areas. It is likely that these data overestimate the amount of property in the identified dam inundation risk zones.

FIGURE F.20: DAM INUNDATION AREAS IN LINCOLN COUNTY[90]



[90] *Source: Mississippi Department of Environmental Quality*

Social Vulnerability
There dam inundation area displayed when compared with population density is of minimal concern. This does not indicate that there is no risk to a dam/levee failure, especially considering not all dams or levees have delineated inundation area. However, this hazard poses minimal risk to populations within the county.

Critical Facilities
There are no critical facilities located within the identified dam inundation areas. Although there are no areas of concern located within Lincoln County, this does not mean that there is no risk for critical facilities to a dam/levee failure, as not all dams or levees in the region have delineated inundation areas. A list of specific critical facilities and their associated risk can be found in the table at the end of this section.

The dam/levee failure hazard has minimal potential to impact existing and future buildings, critical facilities, and populations in Lincoln County. While site-specific vulnerability determinations are outside the scope of this assessment, they will be considered during future updates if data becomes available.

FLOOD
Historical evidence indicates that Lincoln County is susceptible to flood events. A total of 43 flood events have been reported by the National Centers for Environmental Information, resulting in nearly $6.8 million in property damage. On an annualized level, these damages amounted to $323,524 for Lincoln County.

In order to assess flood risk, a GIS-based analysis has been used to estimate exposure to flood events using Digital Flood Insurance Rate Map (DFIRM) data in combination with improved property records for the county. The determination of value at-risk (exposure) is calculated using GIS analysis by summing the values for improved properties that were located within an identified floodplain.

Due to a lack of digital building and parcel information for some communities, inventory data from HAZUS-MH 5.1 have been used to supplement local building and parcel data. However, HAZAUS-MH 5.1 data reflect estimations of building inventory and may not reflect actual counts or values of buildings and parcels located in floodplains. It is likely that these data overestimate the amount of property in the floodplains.

For this plan update, a HAZUS 100yr. flood scenario was performed for the study area. The geographical size of Lincoln County is approximately 588 square miles and contains 2,224 census blocks. The region contains over 13,000 households and has a total population of 34,869 people (2010 Census Bureau data).[91] [92]

There are an estimated 15,788 buildings in the region with a total building replacement value (excluding contents) of $2.0947 billion. Approximately 91.39% of the buildings (and 72.99% of the building value)

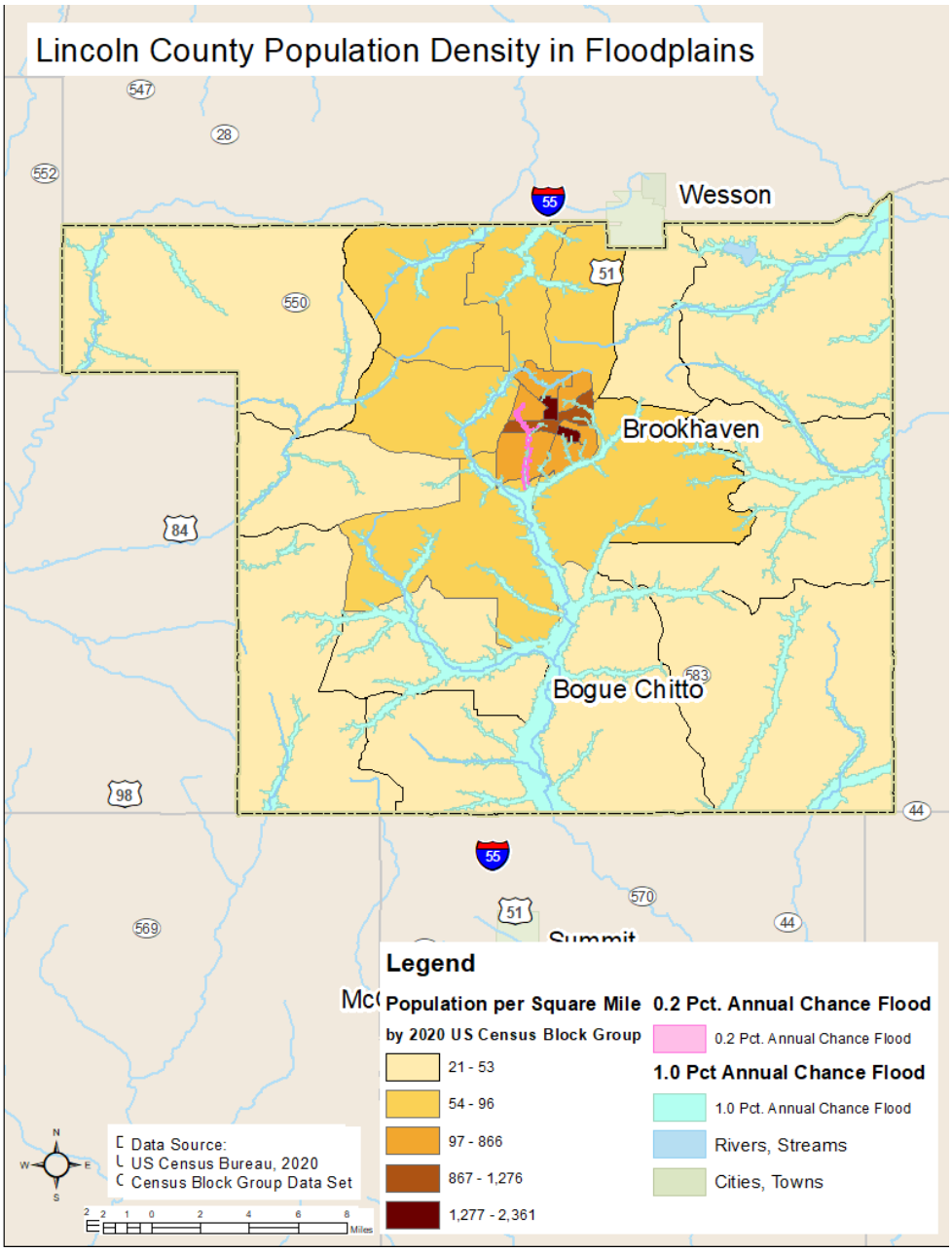
[91] United States Census Bureau. 2020 Census.
[92] United States Census Bureau. 2021 American Community Survey 5-Year Estimates. Retrieved on 01/08/2023 from https://data.census.gov/table?q=Lincoln+County+Mississippi+households+&g=0500000US28147&tid=ACSST5Y2021.S1101.

are associated with residential housing. HAZUS estimates that about 52 buildings will be at least moderately damaged. This is over 80% of the total number of buildings in the scenario, with an estimate that 2 buildings would be destroyed.

Social Vulnerability

The map below shows populations in Lincoln County that are at risk of flooding, using census block level population data and floodplain location data. There are numerous areas of concern in Lincoln County, especially in several of the county's population centers. Therefore, further investigation in these areas may be warranted. As noted in Section 6.4, no building-specific data, such as building footprints, were available to determine buildings at risk.

FIGURE F.21: LINCOLN COUNTY POPULATION DENSITY IN FLOODPLAINS



Critical Facilities

There are no critical facilities in Lincoln County that are located in a floodplain. (Please note: this analysis does not consider building elevation, which may negate risk.) A list of specific critical facilities and their associated risk can be found in the table at the end of this subsection.

A flood has the potential to impact many existing and future buildings, facilities, and populations in Lincoln County, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures have a reduced risk. While site-specific vulnerability determinations are outside the scope of this assessment, they may be added to future plan updates. Such determinations may include identifying areas subject to repetitive flooding for potential mitigation actions.

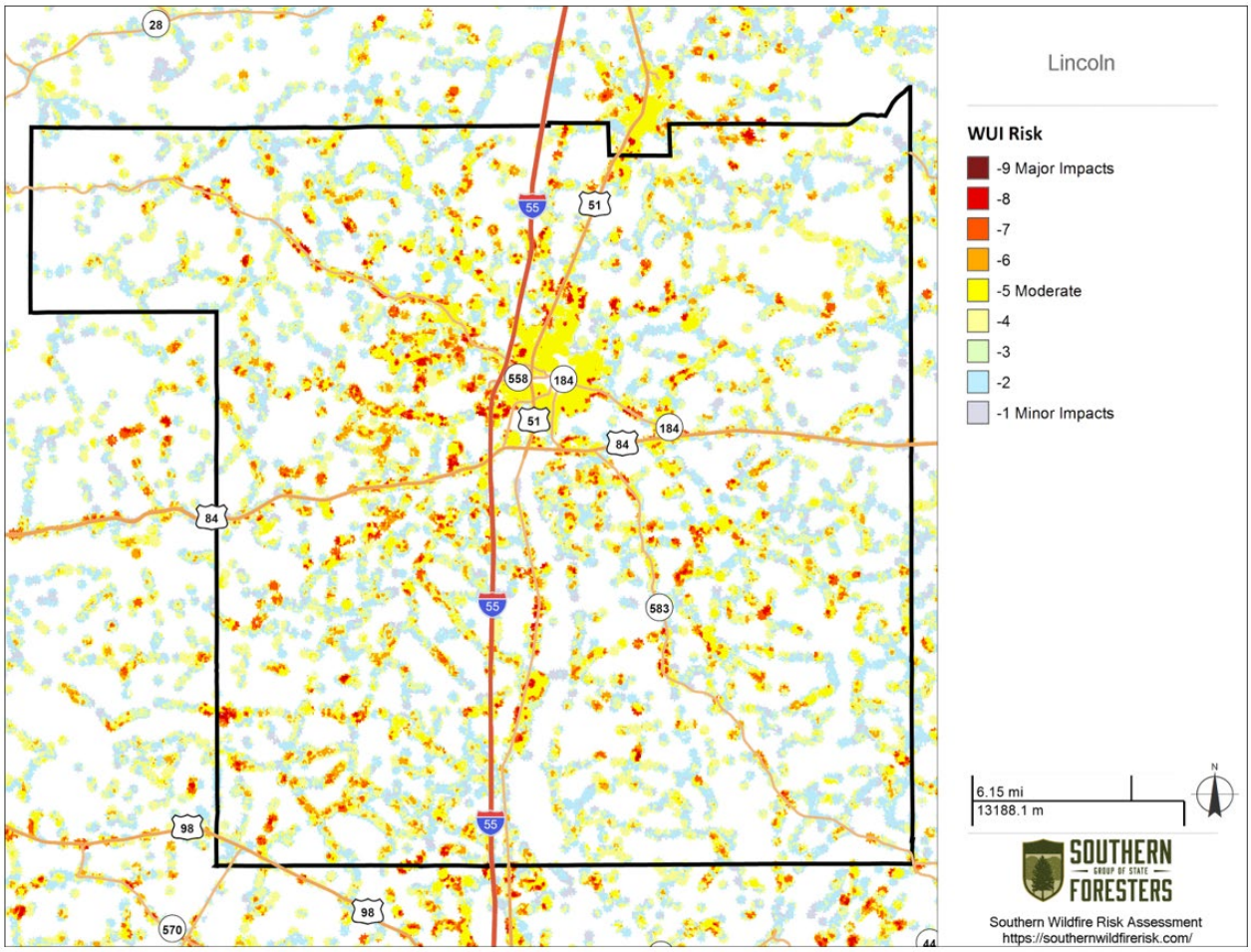
WILDFIRE

Although historical evidence indicates that Lincoln County is susceptible to wildfire events, there are few reports which include information on historic dollar losses. Therefore, it is difficult to calculate a reliable annualized loss figure. While annualized wildfire losses in Lincoln County are considered negligible, a single wildfire event could result in significant damages throughout the county.

To estimate potential exposure of Lincoln County areas to wildfire, HAZUS-MH 5.1 aggregated census-block-level building and parcel data were combined with Wildland Urban Interface Risk Index (WUIRI) data to determine wildfire vulnerability. For the critical facility analysis, locations of critical facilities within wildfire risk areas were identified.

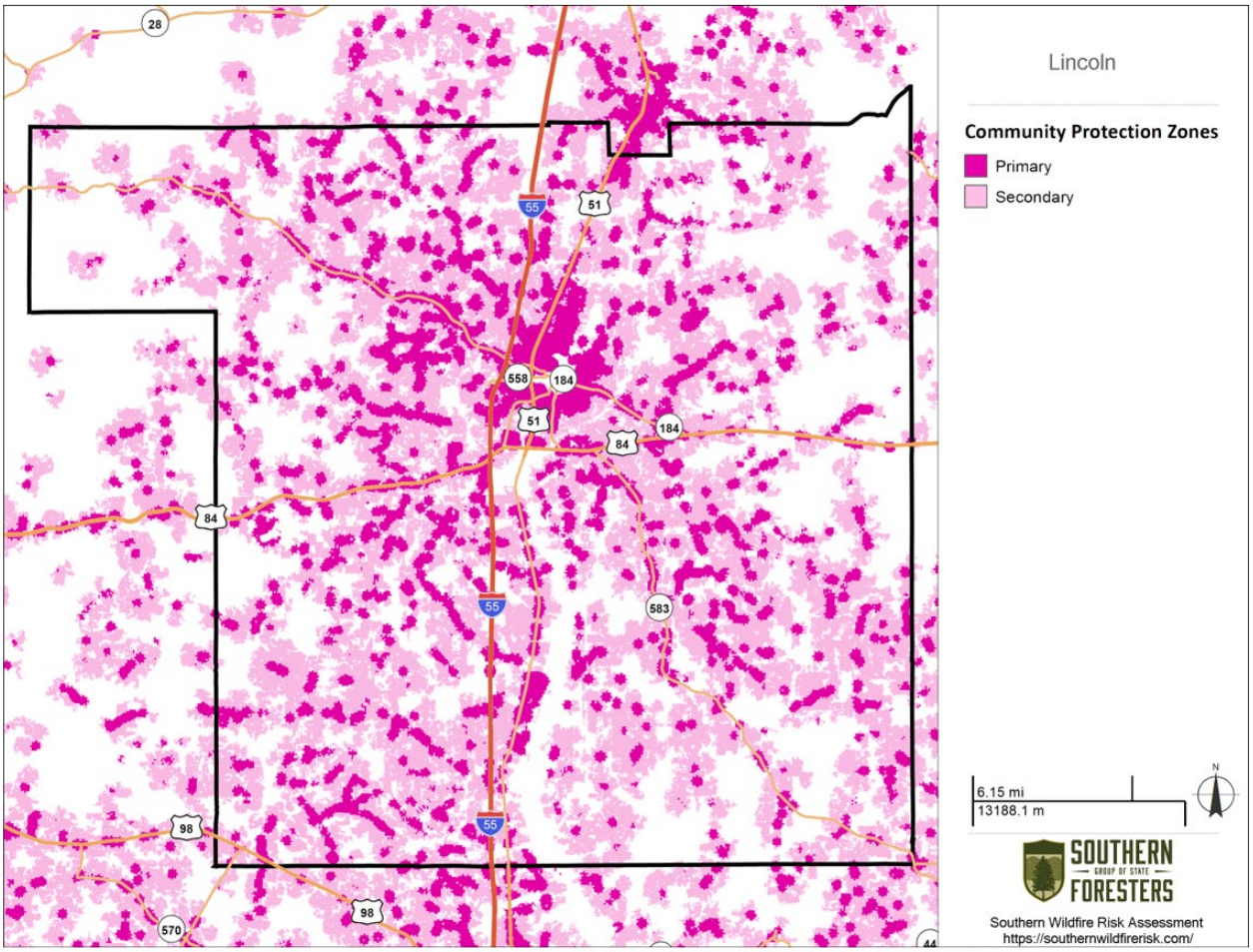
The figure below shows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). For the purposes of identifying wildfire risk vulnerability, areas in Lincoln County with a WUI Risk Value below -4 have been chosen as areas of risk because their WUI values represent the upper echelon of the scale and the areas at highest risk.

FIGURE F.22: WILDLAND URBAN INTERFACE RISK INDEX (WUIRI) IN LINCOLN COUNTY



The figure below shows Community Protection Zones (CPZ) in Lincoln County. Community Protection Zones represent those areas considered highest priority for mitigation planning activities. CPZs are based on an analysis of the "Where People Live" housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ. As in the figure above, for the purposes of identifying wildfire risk vulnerability, areas in Lincoln County with a WUI Risk Value below -4 have been chosen as areas of risk because their WUI values represent the upper echelon of the scale and the areas at highest risk.

FIGURE F.23: WILDFIRE RISK AREAS IN LINCOLN COUNTY



Social Vulnerability

Given some level of susceptibility across the entire county, it is assumed that the total population is at risk to the wildfire hazard. The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk of wildfire. For the Lincoln County Wildfire Risk project area, it is estimated that 33,108 people or 94.9% percent of the total project area population (43,902) live within the WUI.

Critical Facilities

The critical facility analysis revealed that there are 21 critical facilities located in wildfire risk areas, including 1 Emergency Operation Center (EOC), 7 fire stations, 4 medical care facilities, 2 police stations, 1 private sector building, and 6 schools. A list of specific critical facilities and their associated risk can be found in the table at the end of this subsection.

The wildfire hazard has the potential to impact existing and future buildings, critical facilities, and populations in Lincoln County. Structures at highest risk to this hazard are located in close proximity to wildfire risk areas.

EARTHQUAKE

For the earthquake hazard vulnerability assessment, a probabilistic scenario was created at the MEMA District 7 regional level to estimate the average annualized loss for the region on a county by county basis. The results of the analysis are generated at the census tract level within Hazus-MH and then aggregated to the county level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss. They do not include losses to business interruption, lost income, or relocation.

As the Hazus-MH model suggests, and historical occurrences confirm, any significant earthquake activity in the area is likely to inflict minor damage to the planning area. Hazus-MH 5.1 estimates a total annualized loss of $105,000 for the entire MEMA District 7 region; this loss estimate includes structural and non-structural damage to buildings, contents, and inventory throughout the planning area. The Hazus-MH estimate of total annualized loss for Lincoln County is $25,000, including an annualized estimate of $7,000 for structural damage to buildings alone.

Social Vulnerability
It can be assumed that all existing and future populations are at risk to the earthquake hazard.

Critical Facilities
The Hazus-MH probabilistic analysis did not indicate that any critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor to moderate damage should an event occur. A list of specific critical facilities and their associated risk can be found in the table at the end of this section.

An earthquake has the potential to impact all existing and future buildings, facilities, and populations in Lincoln County. Specific vulnerabilities for these assets will be greatly dependent on their individual design and the mitigation measures in place. Such site-specific vulnerability determinations are outside the scope of this assessment but may be considered during future plan updates. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While Lincoln County may not experience a catastrophic earthquake, localized damage is possible with a moderate to larger scale occurrence

HURRICANE AND TROPICAL STORM

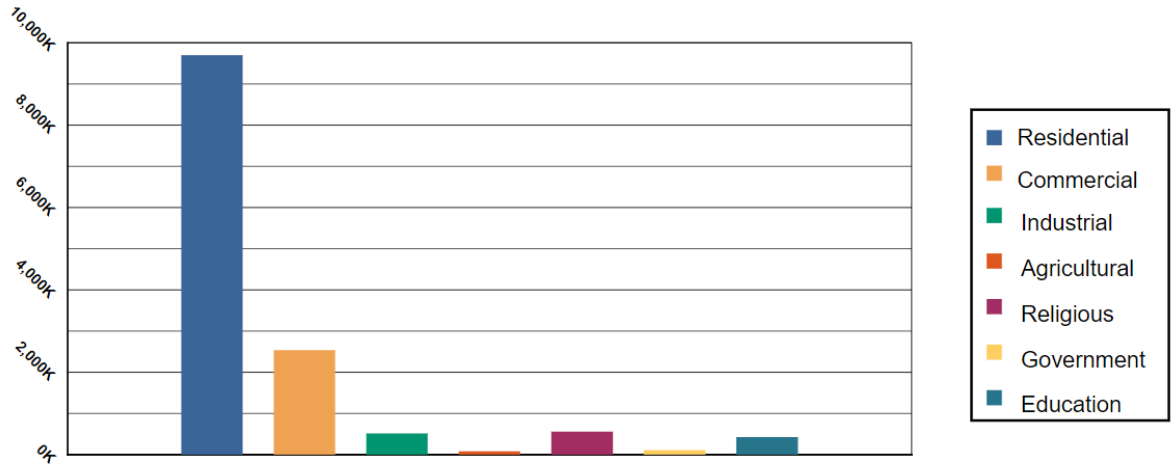
Historical evidence indicates that Lincoln County has significant risk to the hurricane and tropical storm hazard. There have been 8 major disaster declarations in Lincoln County due to hurricanes, and several tracks have come near or traversed through the county. (See Section F.2.10 above for reference.)

Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard.

Hazus-MH 5.1 has been used to determine average annualized losses for counties within MEMA District Region. For Lincoln County, Hazus-MH 5.1 estimates an estimated annualized loss of $656,000 from the hurricane wind hazard; this estimate includes only building damage, contents damage, and inventory loss.

HAZUS was utilized to perform a 100-year hurricane simulation. Hazus estimates that there are 82,485 buildings in the region which have an aggregate total replacement value of $13 billion dollars.

FIGURE F.34: BUILDING EXPOSURE BY OCCUPANCY TYPE[93]



Social Vulnerability

Given some equal susceptibility across the entire county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard.

Critical Facilities

For essential facilities, there are 11 hospitals in the region with a total bed capacity of 605 beds. There are 90 schools, 74 fire stations, 32 police stations and 9 emergency operation facilities. HAZUS estimates that about 133 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 4 buildings that will be destroyed.
The total property damage losses were $71 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies, which made up over 95% of the total loss. The table below provides a summary of the losses associated with the building damage.

RADIOLOGICAL EVENT

The location of Grand Gulf and River Bend Nuclear Stations north and south of the region, respectively, demonstrate that Lincoln County is at some risk to the effects of a nuclear accident. Although there have not been any major events at these plants in the past, there have been major events at other nuclear stations around the country. Additionally, smaller scale incidents at Grand Gulf and River Bend Nuclear Stations have occurred.

[93] HAZUS 100-year Hurricane Scenario

In order to assess nuclear risk, a GIS-based analysis was used to estimate improved property exposure to a nuclear event within each of the risk zones (i.e., 10-mile zones and 50-mile zones) described in Section F.2.14. The determination of assessed value at-risk (exposure) was calculated using GIS analysis by summing the total values for properties that were confirmed to be located within one of the risk zones.

Social Vulnerability

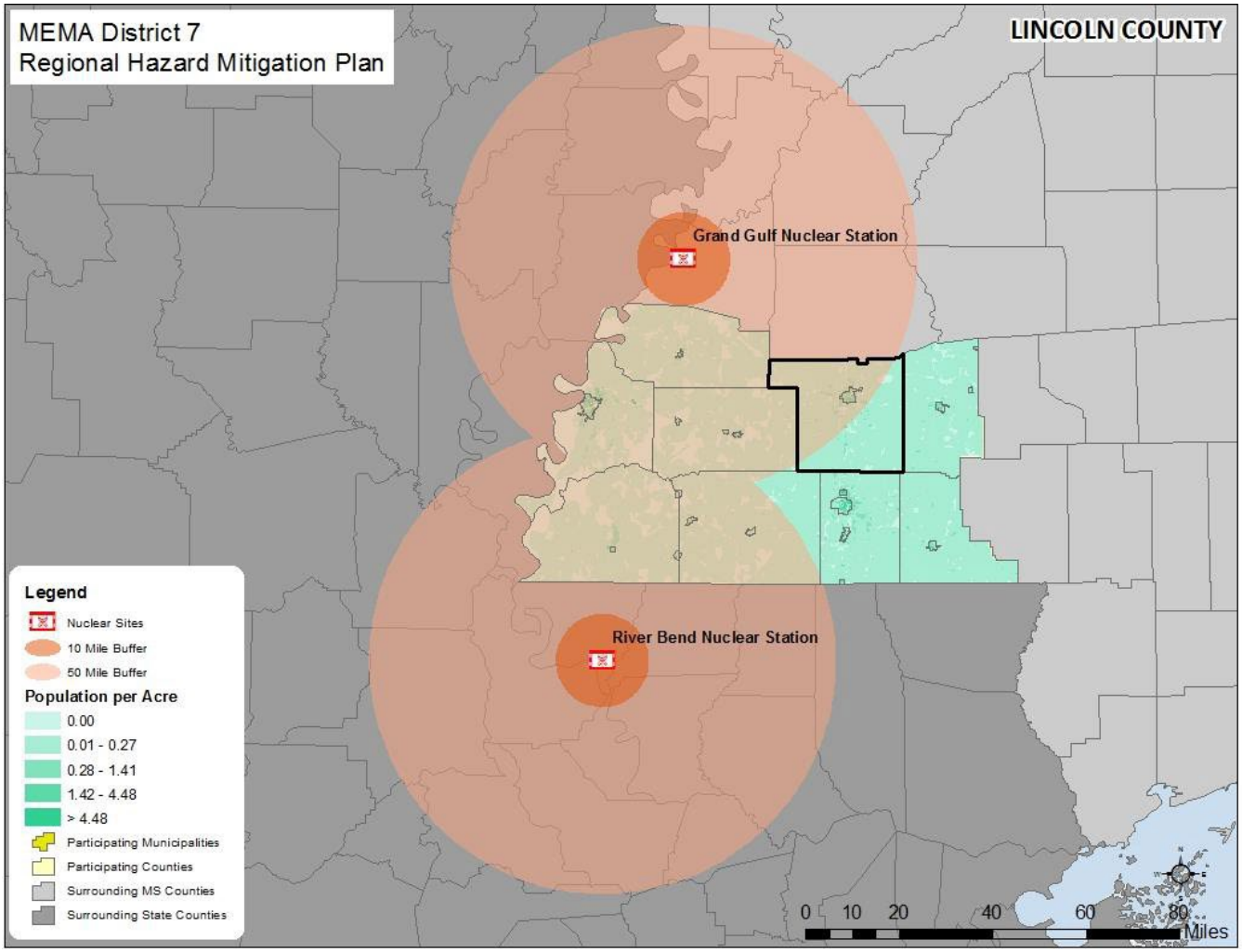
Since the northwestern half of the county is within the 50-mile buffer area, this segment of the population is considered to be at high risk to a radiological event. However, other populations in the county may also be at some risk. This can be seen in the figure below.

Critical Facilities

The critical facility analysis revealed that there are 35 critical facilities located in the 50-mile nuclear buffer area, including 1 EOC, 11 fire stations, 1 government/public building, 6 medical care facilities, 2 police stations, 1 private sector building, 12 schools, and 1 transportation infrastructure. No critical facilities are located in the 10-mile buffer area. A list of specific critical facilities and their associated risk can be found in the table at the end of this section.

It is clear that nuclear accident has the potential to impact existing and future buildings, facilities, and populations in Lincoln County.

FIGURE F.25: POPULATION DENSITY NEAR NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN LINCOLN COUNTY



CONCLUSIONS ON HAZARD VULNERABILITY

The table below presents a summary of annualized loss for each hazard in Lincoln County. Due to the reporting of hazard damages primarily at the county level, it is difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss has been determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

TABLE F.33: ANNUALIZED LOSS FOR LINCOLN COUNTY[94]

Event	Lincoln County
Flood-related Hazards	
Dam & Levee Failure	Negligible
Erosion	Negligible
Flood	$323,524
Fire-related Hazards	
Drought	$3,125
Lightning	$9,000
Wildfire	Negligible
Geologic Hazards	
Earthquake[95]	
Temperature & Wind-related Hazards	
Extreme Heat	Negligible
Hailstorms	$47,593
Hurricane & Tropical Storm	$5,133,000
Severe Thunderstorm/High Wind	$134,285
Tornado	$171,216
Winter Storm/Freeze/Extreme Temperature	$90,769
Other Hazards	
Radiological Event	Negligible
Pandemic	Negligible

All existing and future populations and buildings (including critical facilities) in Lincoln County are vulnerable to a wide variety of hazards. Some buildings may be more vulnerable to these hazards based on factors such as construction and building type. The following table shows the critical facilities vulnerable to the hazards analyzed in this section. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "X").

[94] "Negligible" is used to indicate that no records of dollar losses for the particular hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that particular type of event is not well kept.

[95] No historic losses for earthquake were recorded, so Hazus estimates for annualized loss were used.

TABLE F.34: AT-RISK CRITICAL FACILITIES IN LINCOLN COUNTY

		FLOOD-RELATED				FIRE-RELATED			GEO	WIND-RELATED						HUM	
FACILITY NAME	FACILITY TYPE	Dam and Levee Failure	Erosion	Flood – 100 yr	Flood – 500 yr	Drought	Lightning	Wildfire	Earthquake	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Severe Thunderstorm/	Tornado	Winter Storm and Freeze	Radiological Event 10-mile area	Radiological Event 50-mile area
Lincoln County																	
Lincoln County EOC	EOC		X			X	X		X	X	X	X	X	X	X		X
Bogue Chitto Volunteer Fire Department	Fire Station		X			X	X		X	X	X	X	X	X	X		
Brookhaven Central Fire Department	Fire Station		X			X	X		X	X	X	X	X	X	X		X
Brookhaven Fire Department #2	Fire Station		X			X	X		X	X	X	X	X	X	X		X
Brookhaven Fire Department #3	Fire Station		X			X	X	X	X	X	X	X	X	X	X		X
East Lincoln VFD	Fire Station		X			X	X		X	X	X	X	X	X	X		
Heuck's Retreat Community Volunteer Fire	Fire Station		X			X	X		X	X	X	X	X	X	X		X
Heucks Retreat VFD	Fire Station		X			X	X	X	X	X	X	X	X	X	X		X
Hog Chain VFD	Fire Station		X			X	X	X	X	X	X	X	X	X	X		X
Loyd Star Volunteer Fire Department	Fire Station		X			X	X		X	X	X	X	X	X	X		X
New Sight VFD	Fire Station		X			X	X		X	X	X	X	X	X	X		X
Ruth VFD	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
Zetus Volunteer Fire Department #1	Fire Station		X			X	X	X	X	X	X	X	X	X	X		X
Zetus Volunteer Fire Department #2	Fire Station		X			X	X	X	X	X	X	X	X	X	X		X
Zetus Volunteer Fire Department #3	Fire Station		X			X	X	X	X	X	X	X	X	X	X		X
Mississippi Juvenile Detention Center	Government/Public		X			X	X		X	X	X	X	X	X	X		X
Brook Manor Nursing Home	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X

		FLOOD-RELATED				FIRE-RELATED			GEO	WIND-RELATED						HUM	
FACILITY NAME	FACILITY TYPE	Dam and Levee Failure	Erosion	Flood – 100 yr	Flood – 500 yr	Drought	Lightning	Wildfire	Earthquake	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Severe Thunderstorm/	Tornado	Winter Storm and Freeze	Radiological Event 10-mile area	Radiological Event 50-mile area
County Brook Living Center	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
Clints Pharmacy	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
County Brook Living Center	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
Diversicare of Brookhaven – Long term care	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
Family Healthcare clinic	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
FastPace	Medical Care		X			X	X		X	X	X	X	X	X	X		X
Guys Pharmacy	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
Haven Hall Healthcare Center – Long term care	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
KDMC Clinic	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
KDMC Specialty Clinic	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
Kings Daughters Hospital	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
Lincoln County Residential Center	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
MS Adolescent Center	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
Region 8 Mental Health	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
Silver Cross Home	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
Brookhaven Police Dept	Police Station		X			X	X	X	X	X	X	X	X	X	X		X
Lincoln County Sheriff	Police Station		X			X	X	X	X	X	X	X	X	X	X		X
Brookhaven Industrial Park	Private Sector		X			X	X		X	X	X	X	X	X	X		X
Alexander Jr High School	School		X			X	X		X	X	X	X	X	X	X		X
Bogue Chitto School	School		X			X	X		X	X	X	X	X	X	X		

		FLOOD-RELATED				FIRE-RELATED			GEO	WIND-RELATED						HUM	
FACILITY NAME	FACILITY TYPE	Dam and Levee Failure	Erosion	Flood – 100 yr	Flood – 500 yr	Drought	Lightning	Wildfire	Earthquake	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Severe Thunderstorm/	Tornado	Winter Storm and Freeze	Radiological Event 10-mile area	Radiological Event 50-mile area
Brookhaven Academy (County)	School		X			X	X	X	X	X	X	X	X	X	X		X
Brookhaven Elementary School	School		X			X	X	X	X	X	X	X	X	X	X		X
Brookhaven High School	School		X			X	X	X	X	X	X	X	X	X	X		X
Brookhaven School District	School		X			X	X		X	X	X	X	X	X	X		X
Brookhaven Technical Cener	School		X			X	X	X	X	X	X	X	X	X	X		X
By Faith Academy	School		X			X	X	X	X	X	X	X	X	X	X		X
Enterprise School	School		X			X	X		X	X	X	X	X	X	X		
Heritage Family Church School (City of Brookhaven)	School		X			X	X	X	X	X	X	X	X	X	X		X
Lincoln County School District	School		X			X	X		X	X	X	X	X	X	X		X
Lipsey School	School		X			X	X	X	X	X	X	X	X	X	X		X
Loyd Star School	School		X			X	X		X	X	X	X	X	X	X		X
Martin Elementary School	School		X			X	X		X	X	X	X	X	X	X		X
MS School for the Arts	School		X			X	X	X	X	X	X	X	X	X	X		X
Mullins School	School		X			X	X	X	X	X	X	X	X	X	X		X
Reading Nook	School		X			X	X	X	X	X	X	X	X	X	X		X
West Lincoln School	School		X			X	X		X	X	X	X	X	X	X		X
Brookhaven-Lincoln County Airport	Transportation		X			X	X	X	X	X	X	X	X	X	X		X

F.4 LINCOLN COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Lincoln County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in Section 7: *Capability Assessment*.

F.4.1 Planning and Regulatory Capability

Table F.36 provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Lincoln County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. A dagger (†) indicates that the given item is administered for that municipality by the county. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the MEMA District 7 Regional Hazard Mitigation Plan.

TABLE F.35: RELEVANT PLANS, ORDINANCES AND PROGRAMS

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Threat and Hazard Identification and Risk Assessment (THIRA)	Comprehensive Land Use Plan	Floodplain Management Plan/Flood Mitigation Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Emergency Management Accreditation Program (EMAP Accreditation)	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment/ Reconstruction Plan/ Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System (CRS Program)
LINCOLN COUNTY	✓								✓	✓	✓				✓				✓						
Brookhaven	†		✓	✓		✓			†	†	†				†		✓	✓	✓			✓	✓	✓	

A more detailed discussion on the county's planning and regulatory capabilities follows.

EMERGENCY MANAGEMENT

Hazard Mitigation Plan
Lincoln County has previously adopted a hazard mitigation plan. The City of Brookhaven was also included in this plan.

Emergency Operations Plan
Lincoln County maintains an emergency operations plan through its Emergency Management Agency. The City of Brookhaven is also covered by this plan.

Continuity of Operations Plan
Lincoln County and the City of Brookhaven have adopted a continuity of operations plan.

Emergency Management Accreditation Program (EMAP)
Lincoln County and the City of Brookhaven have earned EMAP accreditation.

GENERAL PLANNING

Comprehensive Land Use Plan
Lincoln County has not adopted a county comprehensive land use plan. However, the City of Brookhaven has adopted a city comprehensive plan.

Zoning Ordinance
The City of Brookhaven is the only jurisdiction in Lincoln County that has adopted a zoning ordinance.

Subdivision Ordinance
Lincoln County and the City of Brookhaven have both adopted a subdivision ordinance.

Building Codes, Permitting, and Inspections
The City of Brookhaven is the only jurisdiction in Lincoln County that has adopted a building code.

FLOODPLAIN MANAGEMENT

The table below provides NFIP policy and claim information for each participating jurisdiction in Lincoln County. Additional information on insured flood losses in Lincoln County can be found above, in Section F.2.3.

TABLE F.36: NFIP POLICY AND CLAIM INFORMATION

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force^	Closed Claims	Total Payments to Date
LINCOLN COUNTY†*	--	--	--	--	--	--
Brookhaven	07/18/77	02/03/10	58	$13,466,000	2	$53,076.97

†Includes unincorporated areas of county only
^last available data 2017
Source: NFIP Community Status information as of 7/2/2023; NFIP claims and policy information as of 7/2/2023

All jurisdictions listed above that are participants in the NFIP will continue to comply with all required provisions of the program and will work to adequately comply in the future utilizing a number of strategies. For example, the jurisdictions will coordinate with MEMA and FEMA to develop maps and regulations related to special flood hazard areas within their jurisdictional boundaries and, through a consistent monitoring process, will design and improve their floodplain management program in a way that reduces the risk of flooding to people and property.

As noted above, all jurisdictions are not participants in the NFIP. Lincoln County does not participate in the NFIP due to a lack of capacity or resources to properly administer and maintain the program.

Flood Damage Prevention Ordinance
All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. The City of Brookhaven participates in the NFIP and has adopted flood damage prevention regulations.

Floodplain Management Plan
The City of Brookhaven is the only jurisdiction in Lincoln County that has adopted a floodplain management plan to help prevent damages associated with flooding and flood loss.

Stormwater Management Plan
Lincoln County does not have a stormwater management plan or ordinance in place. However, the City of Brookhaven has adopted a local stormwater pollution prevention ordinance.

F.4.2 Administrative and Technical Capability

The table below provides a summary of the capability assessment results for Lincoln County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill. A dagger (†) indicates a county-level staff member(s) provides the specified knowledge or skill to that municipality.

TABLE F.37: RELEVANT STAFF/PERSONNEL RESOURCES

Staff/Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
LINCOLN COUNTY		✓	✓	✓		✓	✓	✓	✓	
Brookhaven		✓	✓	†	✓		†	†	†	

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a

participant on the existing hazard mitigation plan's planning committee.
Administrative and technical capability credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance with a designated floodplain administrator, regardless of whether the designee was dedicated solely to floodplain management. Credit was also given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

F.4.3 Fiscal Capability

The table below provides a summary of the results for Lincoln County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource has previously been used to implement hazard mitigation actions. A dagger (†) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds).

TABLE F.38: RELEVANT FISCAL RESOURCES

Fiscal Tool/Resource	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes (or taxing districts)	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other: FEMA Hazard Mitigation Grants, Homeland Security Grants, USDA Rural Development Agency Grants, and US Economic Development Administration Grants
LINCOLN COUNTY		†								†
Brookhaven		†			†					†

F.4.4 Political Capability

During the months immediately following a disaster, local public opinion in Lincoln County is more likely to shift in support of hazard mitigation efforts.

The table below provides a summary of the results for Lincoln County with regard to political capability. A checkmark (✓) indicates the expected degree of political support by local elected officials in terms of adopting/funding information.

TABLE F.39: LOCAL POLITICAL SUPPORT

Political Support	Limited	Moderate	High
LINCOLN COUNTY	✓		
Brookhaven			✓

F.4.5 Conclusions on Local Capability

The table below shows the results of the capability assessment using the designed scoring methodology described in Section 7: *Capability Assessment*. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. This information was reviewed by all jurisdictions and each jurisdiction provided feedback on the information included in the capability assessment. Local government input was vital to identifying capabilities. According to the assessment, the average local capability score for the county and its jurisdictions is 31.0, which falls into the moderate capability ranking.

TABLE F.40: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
LINCOLN COUNTY	24	Limited
Brookhaven	38	Moderate

F.5 LINCOLN COUNTY MITIGATION STRATEGY

This subsection provides the blueprint for Lincoln County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and the findings and conclusions of the capability assessment and risk assessment. In addition, this strategy was developed with the State Hazard Mitigation Plan Goals and Objectives in mind. For this update, each action identifies the State Hazard Mitigation Program Objective that it relates to. Additional Information can be found in Section 8: *Mitigation Strategy* and Section 9: *Mitigation Action Plan*.

F.5.1 Mitigation Goals

Lincoln County developed six mitigation goals in coordination with the other participating MEMA District 7 Region jurisdictions. The regional mitigation goals are below.

TABLE F.41: MEMA DISTRICT 7 REGIONAL MITIGATION GOALS

	Goal
Goal #1	Increase the overall public awareness of natural hazards that face the region.
Goal #2	Retrofit of critical facilities and/or critical infrastructure to lower the risk of damage from natural hazards.
Goal #3	General improvement of regional or local mitigation planning and capability.
Goal #4	Support State Identified Mitigation Initiatives such as saferooms and storm shelters, severe weather warning systems for universities and colleges, and severe weather notification systems for local communities.
Goal #5	Reduce loss of life, damage and loss of property and infrastructure, economic costs, including response, recovery and disruption of economic activity.
Goal #6	Foster cooperation among all levels of governments and the private sector with respect to improving, updating, and implementing the hazard mitigation plan.

F.5.2 Mitigation Action Plan

The mitigation actions proposed by Lincoln County and the City of Brookhaven are listed in the following individual Mitigation Action Plans.

Lincoln County Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implement Sched.	Implementation Status (2023)
Prevention								
P-1	2.2	**Comprehensive Land Use and Long-Term Recovery Planning –** The Lincoln County Board of Supervisors/City of Brookhaven should have a Comprehensive Plan developed to guide long term recovery and development.	Hurricane or other hazard	High	Lincoln County Board of Supervisors/ City of Brookhaven	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2027	The Lincoln County Board of Supervisors/City of Brookhaven recognize that comprehensive land use planning yields many benefits for both the county and towns. The existence of a Comprehensive Plan enables a county or municipality to institute zoning ordinances to regulate new development and protect or upgrade existing development and it provides a solid basis to establish stronger building codes. Many of the goals of Long-Term Recovery Planning and Comprehensive Planning are one and the same. Although Brookhaven has adopted a Comprehensive Plan, the county has not developed a Comprehensive Plan. Therefore, this action will remain in the plan.
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	N/A	N/A	N/A	Deleted	This action does not meet the County's needs. It has been deleted.

P-3	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist counties with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as counties develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Lincoln County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2027	Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.
P-5	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Lincoln County Board of Supervisors/ City of Brookhaven	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
P-6	1.4	**Monitor Drought Conditions -** Identify local drought indicators (precipitation, temperature, surface water levels, soil moisture, etc.) and establish a regular schedule to monitor and report conditions.	Drought	Moderate	Lincoln County Board of Supervisors/ City of Brookhaven	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action

P-7	1.4	**Conduct A Drought Economic Impact Analysis -** Gather water and climate data. Collect information on businesses that depend on water availability. (Farming, ranching, logging, etc.). Analyze the community's economic stability in relation to water availability. Quantify economic losses based on how the community and its water sources have been impacted by droughts in the past.	Drought	Moderate	Lincoln County Board of Supervisors/ City of Brookhaven	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Lincoln County Board of Supervisors/City of Brookhaven should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Lincoln County Board of Supervisors/ City of Brookhaven	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2027	New Action. Roof and structural damage and loss of electrical service in county/city government buildings due to high winds can render these buildings at least temporarily unusable and can potentially cause disruptions in government services. Retrofits of essential government buildings have not been completed. Therefore, this action will remain in the plan to lessen potential wind damage to those structures.
PP-2	1.1	**Ground/Protect Critical Facilities and Equipment** – Upgrade electrical protective measures on critical facilities.	Lightning	Moderate	Lincoln County Board of Supervisors/ City of Brookhaven	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action
Natural Resource Protection								
NRP-1	1.6							
Structural Projects								
SP-1	1.1	**Drainage Improvements in Bogue Chitto Community –** To eliminate damage to current	Flood	High	Lincoln County Board of	FEMA Hazard Mitigation Grant,	In progress – 2027	Flash flooding within the Bogue Chitto community has caused flooding of

		and future structures, Lincoln County plans to initiate drainage improvements and possibly buyout or relocate homeowners in the floodway.			Supervisors	Community Development Block Grant, Lincoln County General Fund		roadways, property and structures. This flooding causes damage to the structures and roadways and can prevent access to emergency vehicles during times of distress. Lincoln County will continue to seek funding to complete drainage improvements, so this action will remain in the plan.
SP-2	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm	High	Lincoln County Board of Supervisors/ City of Brookhaven	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2027	New Action.
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Hurricane, Winter Storm	High	Lincoln County Board of Supervisors/ City of Brookhaven in collaboration with the Mississippi Emergency Management Agency	General and special funds	In progress – 2025	This remains an ongoing project the county is working towards. Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. The county is in the process of becoming “storm ready” countywide including the towns, so this action will remain in the plan. This action was combined with ES-6 since they were duplicate actions.

ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, or other hazard leading to loss of electrical power	High	Lincoln County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2026	E-911 will be relocated to combine city and county to the EOC. The generator needs to be upgraded 48kw. Generators for the schools that function as emergency shelters will be prioritized, as well as the water wells that are frequently impacts by outages due to lightning strikes.
ES-3	1.8	**Improve Emergency Communications –** Purchase a satellite phone system to ensure communications capabilities are unimpeded during natural disasters even if traditional communications systems fail.	Hurricane or other hazard leading to loss of traditional communications systems	N/A	N/A	N/A	Deleted	This action does not meet the County's needs. It has been deleted.
ES-4	1.1	**Upgrade Disaster Distribution Centers –** Upgrade each VFD with additional restroom facilities. Should an earthquake impact the surrounding region, the County typically is expected to house a number of evacuees. An enhanced distribution center is necessary to support this function.	Hurricane, earthquake or other hazard requiring distribution of food, water, ice, etc.	High	Lincoln County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress – 2025	This is partially complete, but remains ongoing. Large scale distribution of food, water, ice, and other commodities to the general population after a major disaster presents logistical problems for any jurisdiction. Lincoln County chose to overcome these problems during the Hurricane Katrina disaster by using Volunteer Fire Departments (VFD) as primary distribution points from which citizens could pick up needed supplies. With many more persons manning the VFDs fulltime each day and many citizens coming and going, the sanitary facilities at each site were woefully inadequate. Since upgrades to VFDs have not been completed in Lincoln County, this action will remain in the plan.

ES-5	1.8	**Upgrade VFD Communications –** Upgrade VFD Communications to the 700 MHz system.	Hurricane	High	Lincoln County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	Completed	This was completed in 2020. The Lincoln County Volunteer Fire Departments (VFD) have a separate conventional communications system that also serves as a backup for the county EMS and Sheriff's Office. Their current system uses an antenna mounted on a water tower that is 60 feet short of the recommended effective height. This leads to more drop out of signal due to terrain shadowing, which hampers the VFDs effectiveness. Field units find themselves having to drive to the nearest hill to communicate with dispatchers thereby delaying their arrival at a fire or other emergency. Also, intermittent communications could lead to longer response times if injuries to the firefighters themselves occurred. Rather than building a new tower for housing communications antennas, Lincoln County will upgrade the VFD communications system to the 700 MHz system, so this action will remain in the plan.
ES-7	1.9	**Construct New Emergency Shelter –** The county should construct a 200-person evacuation shelter. When not needed for disaster related housing, the building will serve as a Community Center and can be rented by individuals for group functions such as family reunions, weddings, or class reunions. .	Hurricane, Tornado or other hazard requiring the use of emergency shelters	High	Lincoln County Board of Supervisors/ City of Brookhaven Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	Completed	The Lincoln County Board of Supervisors/City of Brookhaven Board of Aldermen and Mayor recognize the need to have modern, safe emergency shelters for county/town residents and evacuees from other areas during times of disaster. Currently a combination of schools, churches, and other government buildings are used. This works acceptably for short-term use, but for longer term needs as were seen in the Hurricane Katrina disaster, the presence of evacuees in these facilities for more than a few days caused a disruption in the facility's designed function. The jurisdiction currently has an application with MEMA for funding of a 361 shelter to be placed within the City of Brookhaven, so this action will remain in the plan.

ES-8	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide/citywide system.	Tornado	High	Lincoln County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	Deferred 2027	This is an ongoing concern, but is deferred for the time being while the county explores emergency alert app alternatives. Many citizens in Lincoln County live in rural areas and small communities. In the event of inclement weather, it is essential that they receive timely warnings. The jurisdiction is currently working on a siren grant through MEMA for the City of Brookhaven, so this action will remain in the plan.
ES-9	1.9	**Emergency Alert-** The county is considering emergency alert platforms, such as CodeRed, HyperReach for emergency alerts.	All	High	Lincoln County Board of Supervisors, and the City Board of Alderman.	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	In progress – 2025	This is a new project. The county understands the importance of emergency alerting to the public and are exploring options that may be more effective than outdoor sirens that may not be heard indoors.
ES-10	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Lincoln County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2027	New Action.
Public Education and Awareness								

PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Moderate	Lincoln County Board of Supervisors/ City of Brookhaven	N/A	2027	This remains an ongoing project. Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan.
PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	N/A	N/A	N/A	Deleted	This action does not meet the County's needs. It has been deleted.
PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.

PEA-5	3.2	**Education: FireWise –** Recommend that public information and outreach workshops on the *Firewise* program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Lincoln County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, individual county general and special funds	In progress – 2027	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan. Implementation is targeted toward the southern part of the County
PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Lincoln County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	In progress – 2027	Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Lincoln County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.

PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Lincoln County Board of Supervisors/ City of Brookhaven	FEMA Hazard Mitigation grants, general and special funds	2025	New Action
PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Lincoln County Board of Supervisors/ City of Brookhaven	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Lincoln County Board of Supervisors/ City of Brookhaven	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2024	New Action.

City of Brookhaven Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implement Sched.	Implementation Status (2023)
Prevention								
P-1	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	N/A	N/A	N/A	Deleted	This action does not meet the County's needs. It has been deleted.
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist counties with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as counties develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	City of Brookhaven, Lincoln Countyin collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2027	Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.
P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Lincoln County Board of Supervisors/ City of Brookhaven	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.

P-5	1.4	**Monitor Drought Conditions -** Identify local drought indicators (precipitation, temperature, surface water levels, soil moisture, etc.) and establish a regular schedule to monitor and report conditions.	Drought	Moderate	Lincoln County Board of Supervisors/ City of Brookhaven	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action
P-6	1.4	**Conduct A Drought Economic Impact Analysis -** Gather water and climate data. Collect information on businesses that depend on water availability. (Farming, ranching, logging, etc.). Analyze the community's economic stability in relation to water availability. Quantify economic losses based on how the community and its water sources have been impacted by droughts in the past.	Drought	Moderate	Lincoln County Board of Supervisors/ City of Brookhaven	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Lincoln County Board of Supervisors/City of Brookhaven should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Lincoln County Board of Supervisors/ City of Brookhaven	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress – 2027	New Action. Roof and structural damage and loss of electrical service in county/city government buildings due to high winds can render these buildings at least temporarily unusable and can potentially cause disruptions in government services. Retrofits of essential government buildings have not been completed. Therefore, this action will remain in the plan to lessen potential wind damage to those structures.
PP-2	1.1	**Ground/Protect Critical Facilities and Equipment** – Upgrade electrical protective	Lightning	Moderate	Lincoln County Board of	FEMA Hazard Mitigation	2025	New Action.

		measures on critical facilities.			Supervisors/ City of Brookhaven	grants, individual county general and special funds		
Natural Resource Protection								
NRP-1	1.6							
Structural Projects								
SP-1	1.1, 1.6	**Improve Surface Drainage –** The City of Brookhaven plans to: • Remove and replace undersized culverts at Minnesota, Evelyn, Center and St. George Streets. • Remove the existing undersized and undermined concrete ditch between Minnesota Street and its terminus, just south of St. George Street. • Excavate channel and reconstruct concrete ditch between Minnesota and St. George Street. Purchase two small tracts of vacant land for the creation of green space. • Channel cross section restoration between St. George and Washington Streets.	Flood	High	City of Brookhaven, Lincoln County	FEMA Hazard Mitigation Grant (75%), MEMA (25%) and City of Brookhaven (5%) General Fund	Delayed – targeting 2024	Flash flooding within the City of Brookhaven has caused flooding of roadways and property. This flooding causes damage to the roadways and can prevent access to emergency vehicles during times of distress. Structures have also flooded. The MEMA and City of Brookhaven funding are linked to this grant application. The City of Brookhaven will continue working to complete these surface drainage improvements, so this action will remain in the plan.
SP-2	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm	High	Lincoln County Board of Supervisors/ City of Brookhaven	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2027	New Action.
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer	Hurricane, Winter Storm	High	Lincoln County Board of Supervisors/ City of Brookhaven in collaboration with the Mississippi	General and special funds	In progress – 2025	This remains an ongoing project the county is working towards. Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their

		fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.			Emergency Management Agency			hazardous weather operations. The county is in the process of becoming "storm ready" countywide including the towns, so this action will remain in the plan. This action was combined with ES-6 since they were duplicate actions.
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, or other hazard leading to loss of electrical power	High	City of Brookhaven	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2026	Loss of electrical power to critical facilities such as water and sewer systems, law enforcement offices, and other critical facilities during a natural disaster can have a severe impact on the functioning of government to provide relief and assistance to citizens and maintain civil order. This can also cause very significant problems for private citizens who depend on municipal and rural water and sewer systems and rely on county and town governments to continue to maintain order. This situation can be especially difficult on the elderly and other special needs persons who would have a difficult time maintaining the basics for themselves without assistance. The Police Station and all three fire stations have new generators. The city will continue to seek funding for generators for other critical facilities (city hall, city owned buildings, etc.), so this action will remain in the plan. .
ES-3	1.8	**Improve Emergency Communications –** Purchase a satellite phone system to ensure communications capabilities are unimpeded	Hurricane or other hazard leading to loss of	N/A	N/A	N/A	Deleted	This action does not meet the County's needs. It has been deleted.

		during natural disasters even if traditional communications systems fail.	traditional communications systems					
ES-5	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide/citywide system.	Tornado	High	City of Brookhaven	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	Deferred 2027	This is an ongoing concern, but is deferred for the time being while the county explores emergency alert app alternatives. Many citizens in Lincoln County live in rural areas and small communities. In the event of inclement weather, it is essential that they receive timely warnings. The jurisdiction is currently working on a siren grant through MEMA for the City of Brookhaven, so this action will remain in the plan.
ES-5	1.9	**Safe Rooms and Community Shelters –** The city should construct and/or encourage construction of safe rooms and community shelters.	Hurricane, Tornado or other hazard requiring the use of emergency shelters	High	City of Brookhaven/ Lincoln County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual city general and special funds	Completed	New Action.
ES-7	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	City of Brookhaven/ Lincoln County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services	2027	New Action.

						Administration (SAMHSA), general and special funds		
Public Education and Awareness								
PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Moderate	Lincoln County Board of Supervisors/ City of Brookhaven	N/A	2027	This remains an ongoing project. Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan.
PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	N/A	N/A	N/A	Deleted	This action does not meet the County's needs. It has been deleted.
PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.

PEA-5	3.2	**Education: FireWise –** Recommend that public information and outreach workshops on the *Firewise* program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	City of Brookhaven, Lincoln County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, individual county general and special funds	In progress – 2027	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan. Implementation is targeted toward the southern part of the County
PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	City of Brookhaven, Lincoln County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	In progress – 2027	Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	City of Brookhaven, Lincoln County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.

PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Lincoln County Board of Supervisors/ City of Brookhaven	FEMA Hazard Mitigation grants, general and special funds	2025	New Action
PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Lincoln County Board of Supervisors/ City of Brookhaven	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Lincoln County Board of Supervisors/ City of Brookhaven	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2024	New Action.

PIKE COUNTY

This annex includes jurisdiction-specific information for Pike County and its participating municipalities. It consists of the following five subsections:

- G.1 Pike County Community Profile
- G.2 Pike County Risk Assessment
- G.3 Pike County Vulnerability Assessment
- G.4 Pike County Capability Assessment
- G.5 Pike County Mitigation Strategy

G.1 PIKE COUNTY COMMUNITY PROFILE

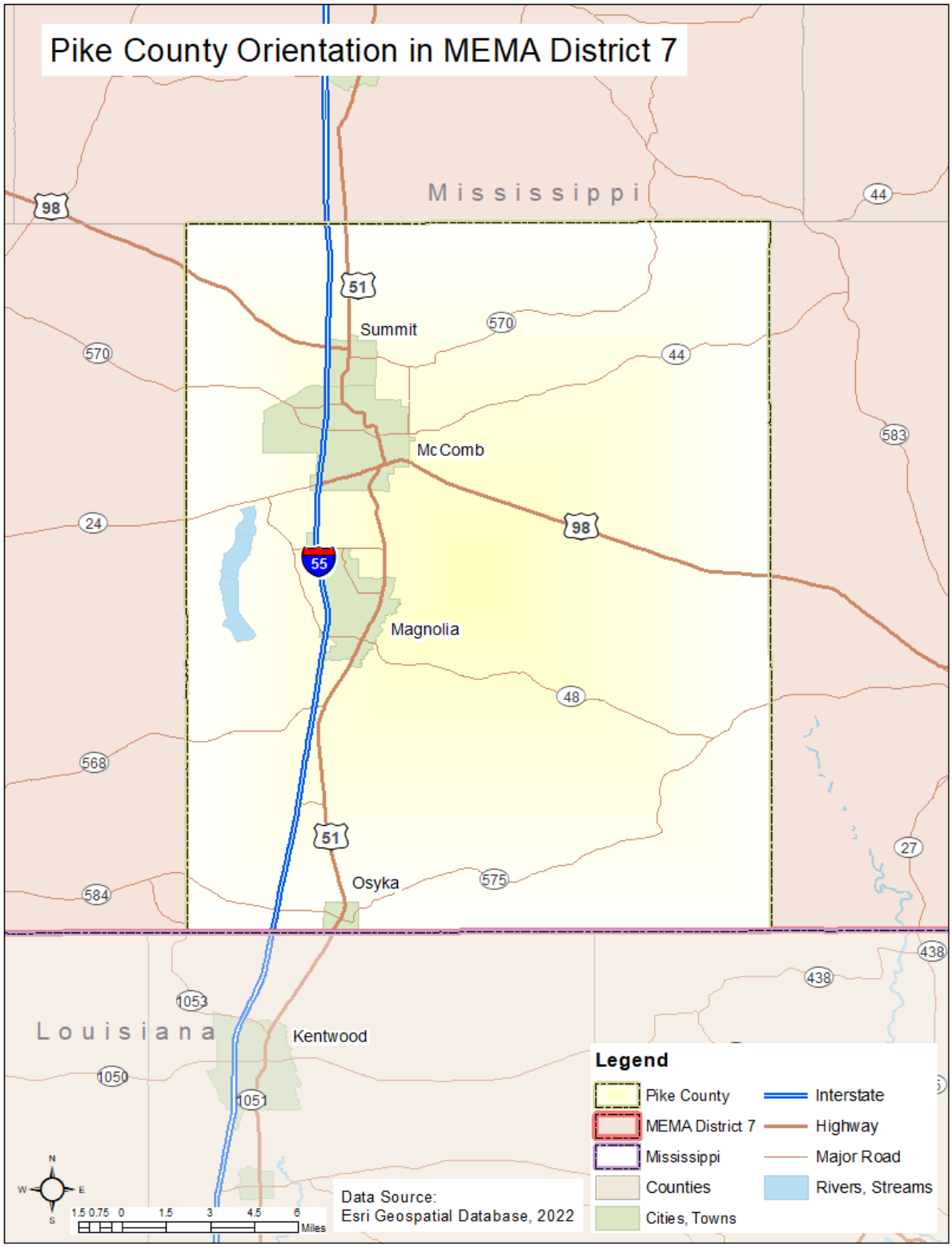
G.1.1 Geography and the Environment

Pike County is located in southwestern Mississippi. It comprises two cities and two towns, the City of Magnolia, the City of McComb, the Town of Osyka, and the Town of Summit, as well as many small unincorporated communities. An orientation map is provided in Figure G.1.

The county is located to the east of the Mississippi River supplying diverse recreational activities. The total area of the county is 411 square miles, 2 square miles of which is water area.

Pike County enjoys four distinct seasons but the climate in the region is generally hot and humid compared to the rest of the United States given its latitude and relative proximity to the Gulf Coast. Precipitation is generally highest in winter months when the temperatures are moderately lower, but the likelihood of precipitation remains relatively constant throughout the year. Summers in the region can become hot with average highs in the nineties and lows in the seventies. The region is also often susceptible to turbulent weather when warm, wet air from the Gulf of Mexico is pushed up into the region to mix with cooler air coming down from across the continent which can result in severe weather conditions. This is particularly true in the spring when seasons are changing, and diverse weather patterns interact.

FIGURE G.1: PIKE COUNTY ORIENTATION MAP



G.1.2 Population and Demographics

According to the 2020 Census, Pike County has a population of 40,324 people. The county has continued to see a decrease in population since 2000, and the population density is 98 people per square mile. Population counts from the U.S. Census Bureau for 2000, 2010, and 2020 for the county and participating jurisdictions are presented in the table below.

TABLE G.1: POPULATION COUNTS FOR PIKE COUNTY[1]

Jurisdiction	2000 Census Population	2010 Census	2020 Census	% Change 2000 - 2020
Pike County	38,940	40,404	40,324	-0.2%
Magnolia	2,071	2,420	1,883	-22.2%
McComb	13,527	12,790	12,413	-2.9%
Osyka	466	440	381	-13.4%
Summit	1,433	1,705	1,505	-11.7%

Based on the 2020 Census, the median age of residents of Pike County is 37.3 years. The racial characteristics of the county are presented in the table below. People identified as black or African American make up most of the population in the county, accounting for almost 53.5% percent of the population.

TABLE G.2: DEMOGRAPHICS OF PIKE COUNTY[2]

Jurisdiction	Black or African American	White	American Indian or Alaska Native	Asian	Native Hawaiian or Other Pacific Islander	Other Race	Two or More Races	Persons of Hispanic Origin[3]
Pike County	**53.5%**	**41.9%**	**0.3%**	**0.6%**	**0.02%**	**0.8%**	**2.8%**	**1.6%**
Magnolia	67.9%	27.2%	0.1%	0.3%	0%	0.8%	3.6%	7.2%
McComb	70.8%	23.6%	0.2%	1.2%	0.06%	1.3%	2.7%	0.8%
Osyka	50.1%	44.1%	0.3%	0.8%	0%	1.0%	3.7%	30.4%
Summit	6.9%	18.6%	0.2%	0.3%	0%	0.4%	3.5%	0.3%

G.1.3 Housing

According to the 2020 U.S. Census, there are 19,017 housing units in Pike County, the majority of which are single family homes or mobile homes. Housing information for the county and four municipalities is presented in the table below. As shown in the table, the incorporated municipalities have a slightly lower percentage of seasonal housing units compared to the unincorporated county.

TABLE G.3: HOUSING CHARACTERISTICS OF PIKE COUNTY[4]

Jurisdiction	Housing Units (2000)	Housing Units (2010)	Housing Units (2020)	Median Home Value (2016-2020)

[1] *United States Census Bureau, 2020 Census*

[2] 2021 American Community Survey

[3] Persons of Hispanic Origin may be of any race, so also are included in applicable race categories

[4] *2021 American Community Survey*

Pike County	**16,720**	**17,861**	**19,017**	**$95,800**
Magnolia	898	1,010	1,130	$62,000
McComb	5,931	5,825	6,205	$89,900
Osyka	234	232	240	$79,500
Summit	658	790	914	$92,300

G.1.4 Infrastructure

TRANSPORTATION

In Pike County, Interstate 55 and U.S. Highway 51 provide access to the north and south and U.S. Highway 98 and Mississippi Highway 48 provide access to the east and west.

McComb-Pike County Airport and Southwest Regional Medical Center Heliport are both general aviation airports located in Pike County.

A major freight rail line operates within Pike County. Canadian National Railway is a Class I railway that operates and runs north to south in the county. Business and industries rely on this line along with various other major highway routes as distribution of merchandises.

UTILITIES

Electrical power in Pike County is provided by Entergy Mississippi Inc., Magnolia Electric Power Association, and South Mississippi Electric Power Association.

Water and sewer service is provided by participating jurisdictions and/or community-based associations, but unincorporated areas often rely on septic systems and wells in Pike County.

COMMUNITY FACILITIES

There are a number of buildings and community facilities located throughout Pike County. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 11 fire stations, 7 police stations, and 20 schools located within the county.

There are also two hospitals located in Pike County, these include Southwest Mississippi Regional Medical Center, a 160-bed short term acute facility located in McComb, and Beacham Memorial Hospital, a 37-bed short term acute facility located in Magnolia.

One educational institution is found in Pike County. Southwest Mississippi Community College is a two-year community college located in Summit.

Museums based around the history and culture of the region are prevalent throughout the area. For example, in McComb, the Railroad Depot Museum contains one of the best-preserved collections of railroad history in the country.

The Mississippi River, which runs to the east of the county, has played an integral part in the history of the county. The river acted as a major conduit for trade in the 19th century as plantations produced large quantities of cotton that could be easily shipped down to ports such as New Orleans. Today, the river is still an important part of the local economy as products are shipped worldwide out of the Natchez port. Apart from the Mississippi River there are multiple water-based refuges, activities, and

recreational features focused on local water bodies in the region. For instance, fishing is a major draw for visitors to Percy Quin State Park located in Pike County. This park contains Lake Tangipahoa which has experienced a boom in recreational tourism since it was re-opened in 2016 after Hurricane Isaac forced it to shut down in 2012. There are also numerous other small lakes, creeks, and other water bodies throughout the region that offer the outstanding outdoor recreational opportunities for which the region is known.

G.1.5 Land Use

Pike County has a blend of old and new development that contributes to physical, cultural, and economic attributes throughout the region. There are four incorporated municipalities located in the county. These areas are where the county's population is generally concentrated. The incorporated areas are also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the county generally consist of rural residential development, agricultural uses, and recreational areas.

There are multiple county- and regional-based agencies that serve to coordinate growth and promote economic development. Local land use and associated regulations are further discussed in Section 7: Capability Assessment.

G.1.6 Employment and Industry

According to the U.S. Census Bureau's American Community Survey (ACS), in 2020, Pike County had an average annual employment of 30,476 workers and an average unemployment rate of 7.1[5] percent (compared to 5.3 percent for the state). In 2020, the educational services, and health care and social assistance industry employed 26.5 percent of the workforce. Retail trade was the next largest industry, employing 15.7 percent of workers, and manufacturing (12.3%). The average annual median household in 2020 for Pike County was $32,726 compared to $48,716 in the state of Mississippi.[6]

[5] Mississippi Department of Employment Security. https://www.mdes.ms.gov/media/8735/urate.pdf
[6] American Community Survey 2021

G.2 PIKE COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in Section 4: Hazard Identification as they pertain to Pike County. Each hazard profile includes a description of the hazard's location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in Section 5: Hazard Profiles.

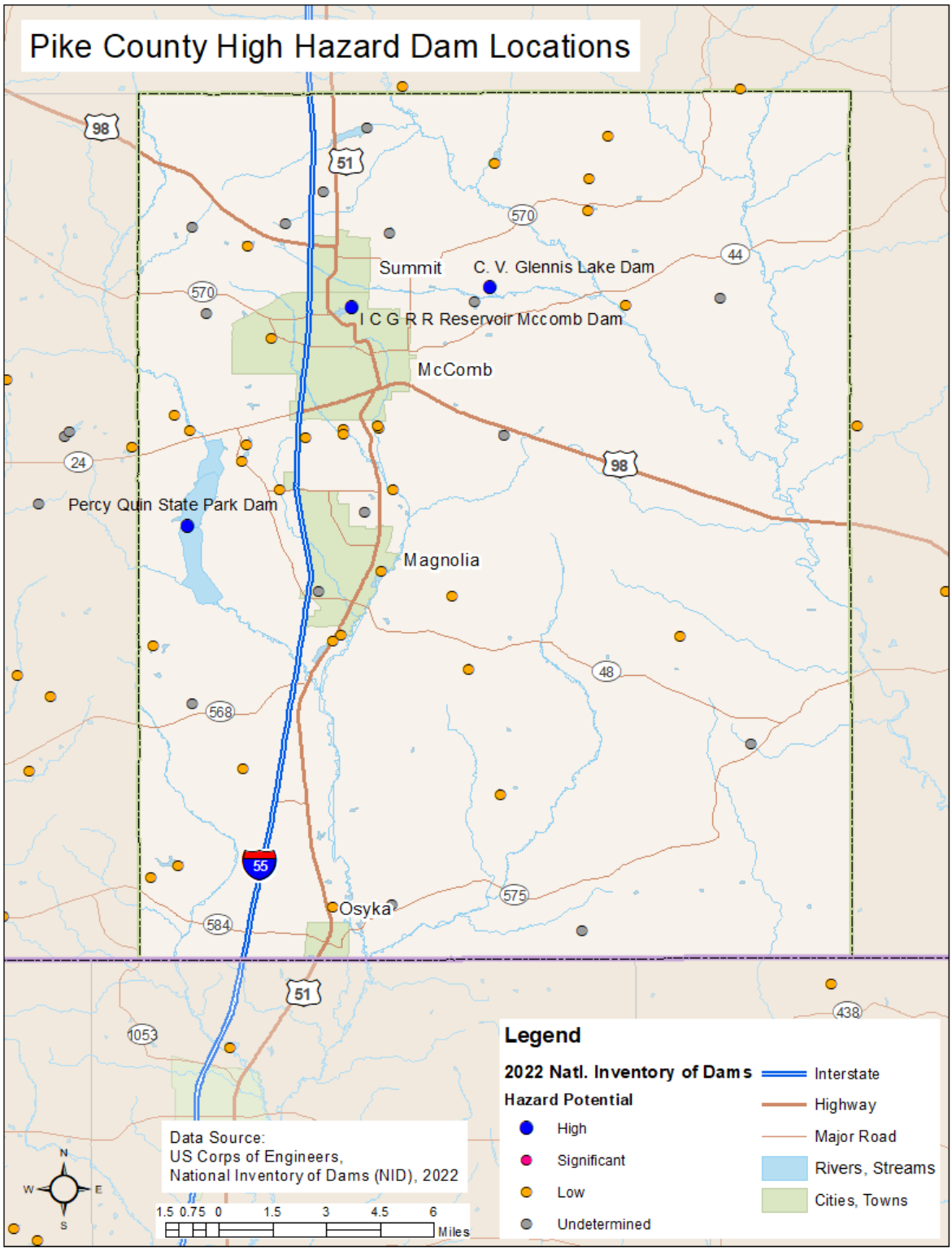
FLOOD-RELATED HAZARDS

G.2.1 Dam and Levee Failure

LOCATION AND SPATIAL EXTENT

According to the Mississippi Department of Environmental Quality, there are three high hazard dams in Pike County. The following figures show the location of these high hazard dams as well as mapped inundation areas, and the following table lists them by name.

FIGURE G.2: PIKE COUNTY HIGH HAZARD DAM LOCATIONS[7]



[7] U.S. Army Corps of Engineers – National Inventory of Dams

FIGURE G.3: PIKE COUNTY DAM INUNDATION AREAS[8]

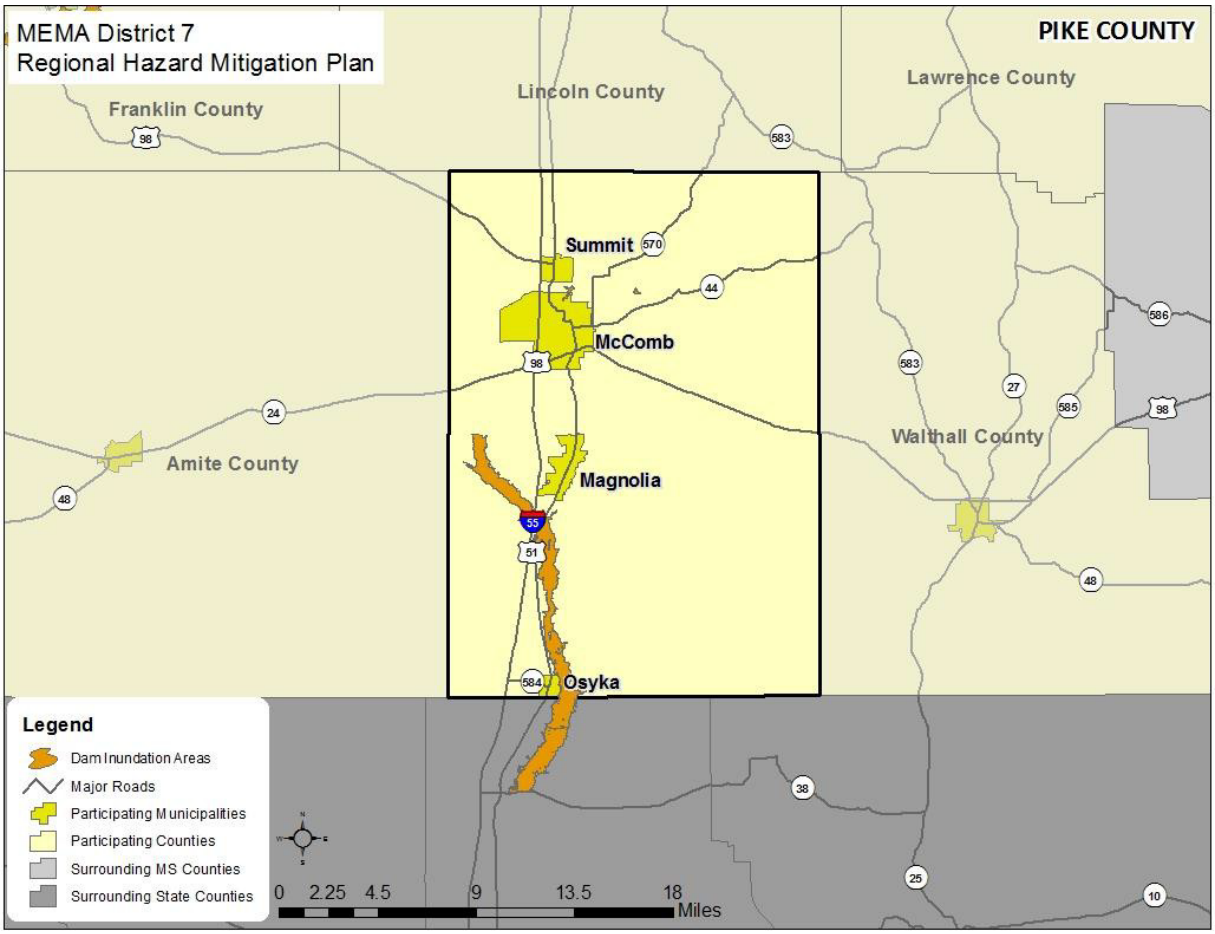


TABLE G.4: PIKE COUNTY HIGH HAZARD DAMS[9]

Dam Name	Hazard Potential	Max Storage (ac/ft)	Dam Height (ft)	Condition
Pike County				
ICGRR RESERVOIR MCCOMB DAM	High	936	26.0	Satisfactory
PERCY QUIN STATE PARK DAM	High	16,800	34.0	Fair
C.V. GLENNIS LAKE DAM	High	94	20.0	Fair

HISTORICAL OCCURRENCES

According to the Mississippi State Hazard Mitigation Plan, there have been two dam failures reported in Pike County. Although major damage was not reported with these events, several breach scenarios in the region could be catastrophic.

[8] *Mississippi Department of Environmental Quality*

[9] *Mississippi Department of Environmental Quality*

TABLE G.5: PIKE COUNTY DAM FAILURES (1982-2021)[10]

Date	County	Structure Name	Cause of Failure
September 2002	Pike	Lake Dixie Springs	Overtopping
August 2012	Pike	Percy Quinn	Large slides developed with seepage. Did not lead to uncontrolled release of pool.

PROBABILITY OF FUTURE OCCURRENCES

Given the current dam inventory and historic data, a dam breach is possible (between 1 and 10 percent annual probability) in the future. As has been demonstrated in the past, regular monitoring is necessary to prevent these events.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[11] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Pike County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[12]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop and will lead to increased strain on dam storage capacity.[13]

G.2.2 Erosion

LOCATION AND SPATIAL EXTENT

Erosion in Pike County is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in Pike County are primarily rivers/streams and reservoirs. Generally, vegetation also helps to prevent erosion in the area, but in recent years, erosion has become a growing threat to many of the participating counties and jurisdictions.

Currently, there is no regional or state-level data available on localized areas of erosion, so it is a challenge to identify particularly prone areas on a wider geographic scale. However, a few areas of concern were reported by members of the hazard mitigation council and other local sources. Locations along the Mississippi River are known to be especially at-risk, but there are locations in many areas within the region where erosion is prominent.

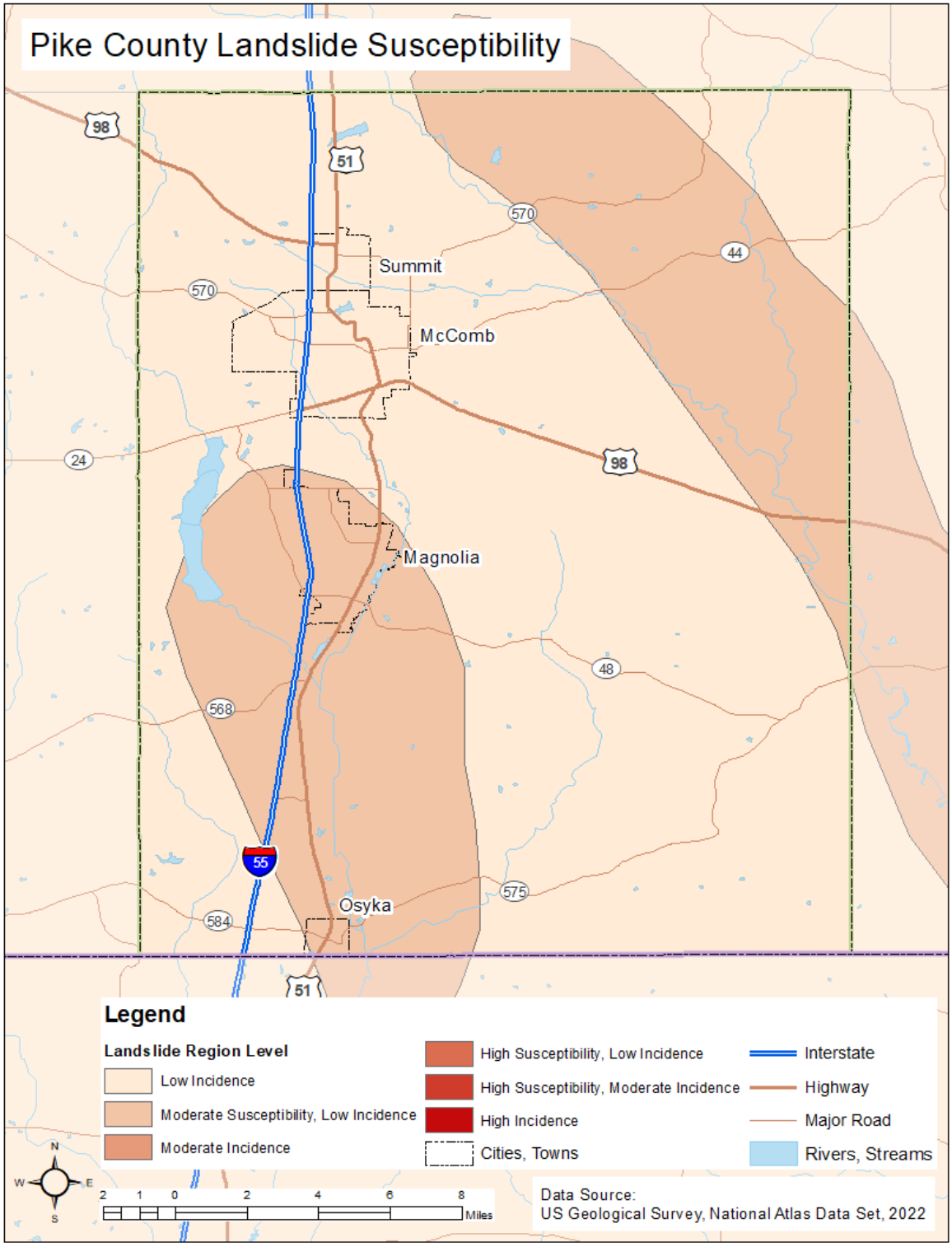
[10] *Mississippi Department of Environmental Quality*

[11] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[12] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[13] Please note: there is no coastal flooding in Adams County.

FIGURE G.4: PIKE COUNTY LANDSLIDE SUSCEPTIBILITY[14]



[14] Pike County Emergency Management

HISTORICAL OCCURRENCES

Several sources were vetted to identify areas of erosion in Pike County. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. The locations identified above are representative of areas where erosion has taken place in the past.

These incidents have caused major problems as bridges have become damaged in many instances and made unsafe for emergency services vehicles to cross during and after storm events. This delays response times and critical life-safety support. In addition, the shutdown of roads has hurt local communities economically as trade and commerce are temporarily shut down as bridges are repaired. It has also caused disruption to daily activities for local school boards who must re-route buses around affected areas, causing additional fuel resources to be expended and increasing drive times for students.

PROBABILITY OF FUTURE OCCURRENCES

Erosion remains a natural, dynamic, and continuous process for Pike County, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annually).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[15] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Pike County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[16]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones. Both additional moisture and drying conditions can impact the rate of erosion, either by increasing the sediment transfer load due to volume and rate of flooding, or by dehydrating soils, limiting compaction, and increasing wind related erosion events.

G.2.3 Flood

LOCATION AND SPATIAL EXTENT

There are areas in Pike County that are susceptible to flood events. Special flood hazard areas in the county were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM).2 This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevations), and Zone X-500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 407 square miles that make up Pike County, there are 33.52 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 0.19 square miles of land in zone X-500 (0.2 percent annual change floodplain/500-year floodplain).

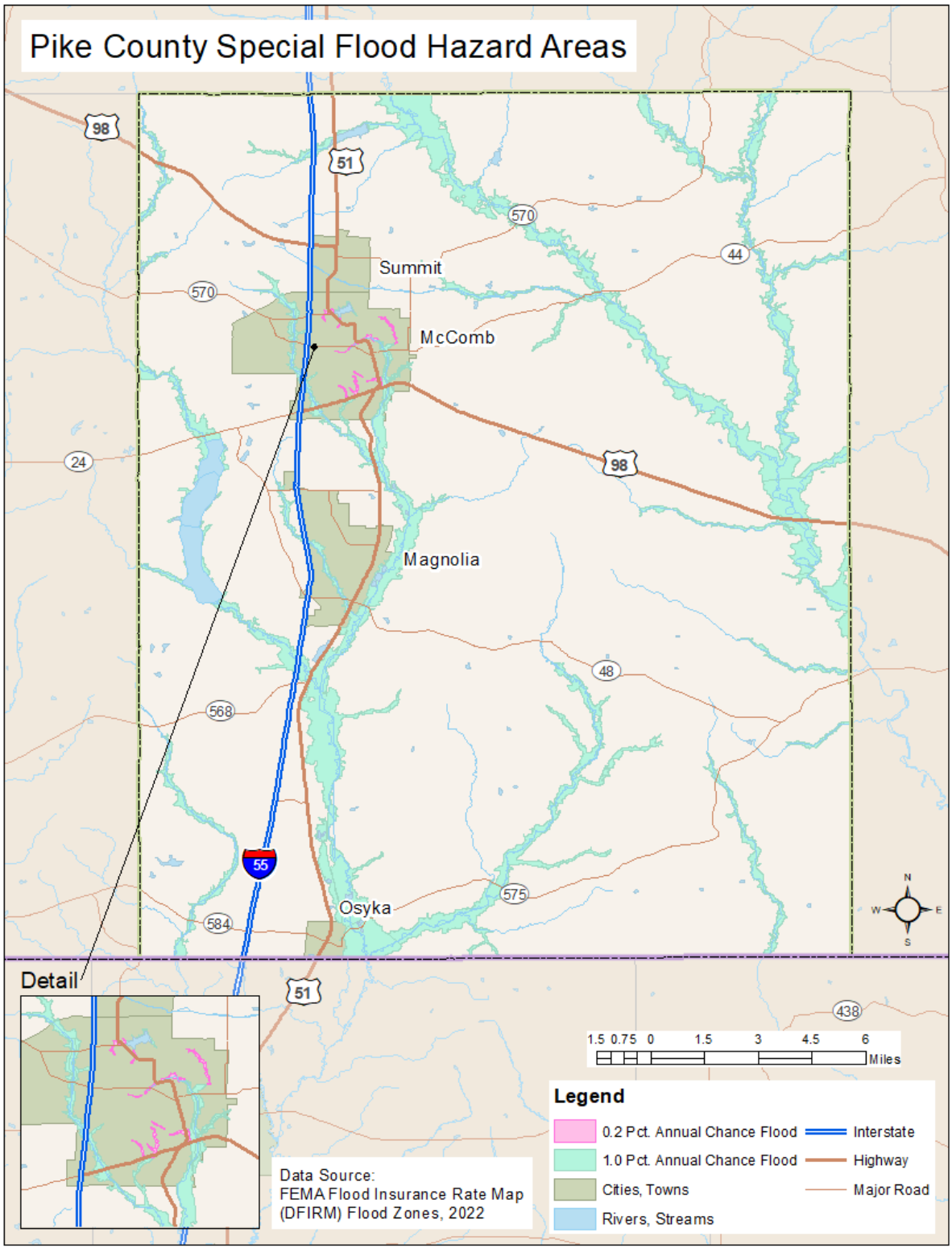
These flood zone values account for 8.3 percent of the total land area in Pike County. It is important to

[15] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[16] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. The below figure illustrates the location and extent of currently mapped special flood hazard areas for Pike County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data.

FIGURE G.5: SPECIAL FLOOD HAZARD AREAS IN PIKE COUNTY[17]



[17] Federal Emergency Management Agency

HISTORICAL OCCURRENCES

Floods were at least partially responsible for seven disaster declarations in Pike County in 1972, 1973, 1974, 1980, 1983, 1990, and 2003.[18] Information from the National Centers for Environmental Information was used to ascertain additional historical flood events. The National Center for Environmental Information reported a total of 14 events in Pike County since 1997.[19] A summary of these events is presented in the table below. These events accounted for over $1 million in property damage.[20]

TABLE G.6: SUMMARY OF FLOOD OCCURRENCES IN PIKE COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Magnolia	0	0/0	$0	$0
McComb	5	0/0	$30,527	$1,526
Osyka	1	0/0	$256,711	$256,711
Summit	1	0/0	$0	$0
Unincorporated Area	7	0/0	$749,892	$39,468
PIKE COUNTY TOTAL	**14**	**0/0**	**$1,037,130**	**$297,705**

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Flood Insurance Management Agency (FIMA) Flood Insurance Data Analytics, since 2019 Mississippi has had 47 floods of record with 22 closed with payment, 19 closed without payment, and 6 remaining open. A total of $545,506 has been made in payments. This FEMA dataset is the authoritative source for FEMA's public data. This product uses the Federal Emergency Management Agency's API but is not endorsed by FEMA. FEMA cannot verify the quality and/or timeliness of any data or any analysis derived there from after the data has been retrieved from FEMA.gov. This data set was last accessed on July 2, 2023, with records updated at most every 20 minutes or at least monthly, processed the first Saturday of the month at 1:00am EST.

According to FEMA flood insurance policy records as of July 2, 2023, there have been 52 flood losses reported in Pike County through the National Flood Insurance Program (NFIP) since 1978, totaling $1,114,709.45 in total building and $1,296,496.74 in contents claims payments. A summary of these figures for the county is provided in the table below. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought. It is likely that many additional instances of flood loss in Pike County were either uninsured or not reported.

TABLE G.7: SUMMARY OF INSURED FLOOD LOSSES IN PIKE COUNTY THROUGH 2023

Location	Current Number of Policies	Flood Losses	Claims Payments
Magnolia	1	0	$0
McComb	4	8	$22,935.97

[18] A complete listing of historical disaster declarations can be found in Section 4: *Hazard Identification*.

[19] These flood events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1996 through November 2022. It is likely that additional occurrences have occurred and have gone unreported. As additional local data becomes available, this hazard profile will be amended.

[20] Source: National Flood Insurance Program, OpenFEMA Data Sets

Osyka	0	0	$0
Summit*	--	--	--
Unincorporated Area	19	44	$2,388,270.22
PIKE COUNTY TOTAL	**24**	**52**	**$2,411,206.19**

*These communities do not participate in the NFIP. Therefore, no values are reported.

REPETITIVE LOSS PROPERTIES

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Mississippi Emergency Management Agency in 2017, there are 19 non-mitigated repetitive loss properties located in Pike County, which accounted for 61 losses and more than $2.8 million in claims payments under the NFIP. The average claim amount for these properties is $46,121.92. Of the 19 properties, 12 are single family, 1 is other residential, and 6 are other non-residential. Without mitigation, these properties will likely continue to experience flood losses. The table below presents detailed information on repetitive loss properties and NFIP claims and policies for Pike County as documented in the last plan. Updated data could not be obtained.

TABLE G.8: REPETITIVE LOSS PROPERTIES IN PIKE COUNTY[21]

Location	Magnolia	McComb	Osyka	Summit*	Unincorporated	Pike County Total/Average
#	3	4	0	-	12	19
Types of Properties	2 single family 1 other non-residential	3 single family 1 other non-residential	-	-	7 single family 1 other residential 4 other non-residential	
# of Losses	7	16	0	-	38	61
Building Payments	$94,060.25	$131,163.47	0	-	$1,102,142.90	$1,327,366.62
Content Payments	$51,986.28	$140,300.28	0	-	$1,293,783.82	$1,486,070.38
Total Payments	$146,046.50	$271,463.75	0	-	$2,395,926.72	$2,813,436.97
Average Payment	$20,863.79	$16,966.48	0	-	$63,050.70	$100,880.97

*These communities do not participate in the NFIP. Therefore, no values are reported.

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in Pike County, and the probability of future occurrences will remain highly likely (100 percent annual probability). The probability of future flood events based on magnitude and according to best available data is illustrated in the figure above, which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain). It can be inferred from the floodplain location maps, previous occurrences, and repetitive loss properties that risk varies throughout the county. For example, Summit has less floodplain and thus a lower risk of flood than the other incorporated municipalities. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted, particularly for repetitive loss

[21] National Flood Insurance Program. Current data on Repetitive Loss Properties data was not available for this plan update.

properties.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[22] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Pike County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[23]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased *coastal, fluvial (i.e., riverine) and pluvial (i.e., rainfall) flooding.*[24] More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

FIRE-RELATED HAZARDS

G.2.4 Drought

LOCATION AND SPATIAL EXTENT

Drought typically covers a large area and cannot be confined to any geographic or political boundaries. Furthermore, it is assumed that Pike County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment but may exacerbate wildfire conditions.

HISTORICAL OCCURRENCES

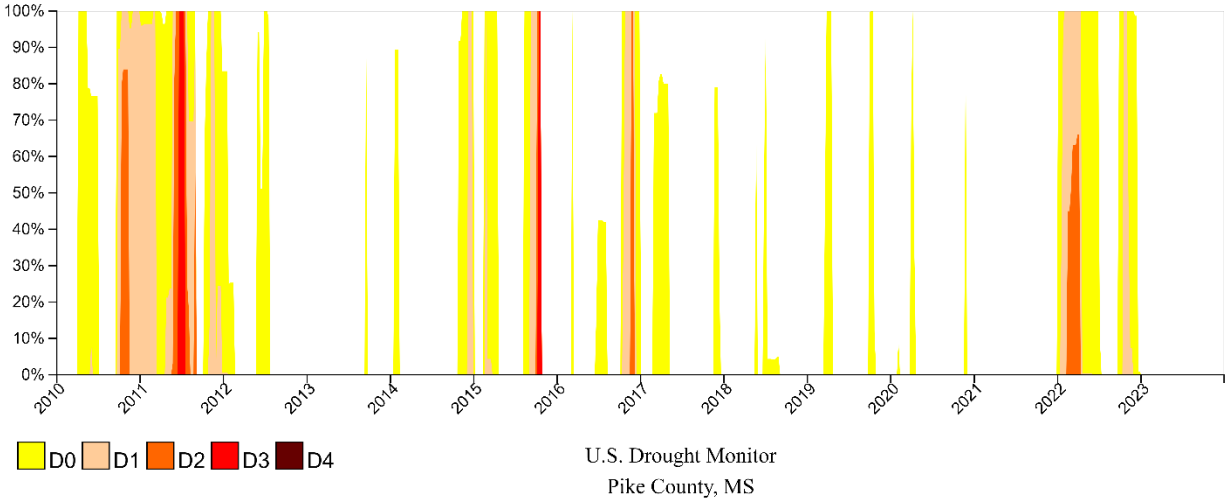
The table below shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional, but a majority of the county may be in a less severe condition.

[22] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[18] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[19] Please note: there is no coastal flooding in Pike County.

TABLE G.9: HISTORICAL DROUGHT OCCURRENCES IN PIKE COUNTY[25]



According to the U.S. Drought Monitor, Pike County had drought levels of Severe or worse in 5 of the last 12 years (January 2010-December 2022). The table above shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional, but a majority of the county may actually be in a less severe condition.

Some additional anecdotal information was provided from the National Centers for Environmental Information on droughts in Pike County.

Summer to Fall 2006 – During a four-and-a-half-month period, from June to the middle of October, abnormally dry conditions prevailed across most of the Jackson, MS County Warning Area (CWA). Widespread drought conditions were reported across the area during this time. The U.S. Drought Monitor classified the drought as extreme (D3) over Southeast Mississippi. Drought conditions in the region peaked in intensity during early August over this area.

Summer to Fall 2010 – Very dry conditions continued across central Mississippi during most of October. There was some rain that came late in the month which provided some temporary relief. Rainfall amounts ranged from a half to two inches with locally higher amounts. Most locations were 1 to 3 inches below normal for the month. The dry stretch resulted in severe (D2) drought conditions expanding during the month with even the portions of extreme (D3) drought conditions expanding as well. Crops were put under stress under the warm and dry conditions.

Fall 2015 – The very dry conditions continued across Central Mississippi in October. The extended dry stretch resulted in an area of Severe (D2) drought developing across the area by October 6th. The drought intensified and Extreme (D3) drought conditions developed by October 13th. Approximately 25 to 50 percent of normal rainfall occurred across this area from August into mid-October. Crops were put under more stress from the dry and hot conditions.

Fall to Winter 2016 – Dry conditions continued into November, which created continued stress on crops. The drought continued to get worse across the state through the month before some relief came in the

[25] U.S. Drought Monitor. Historical Conditions for Pike County, MS 2010 – 2022. Retrieved on 11/30/2022 from: https://www.drought.gov/states/mississippi/county/Pike

form of showers and thunderstorms near the end of November.

Fall 2021 through 2022 – Severe drought conditions persisted throughout the state, beginning in December 2021 and continuing through the calendar year 2022. Conditions escalated to extreme drought from January to March, before resolving In December. Throughout this period many counties also experienced flooding events indicating that while rainfall is still occurring, the shorter, more intense bursts do not resolve the drought conditions that softer more steady rainfall would address. The beginning of 2023 saw increased rainfall and a lightening of drought conditions overall.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that Pike County has a probability level of possible (between 1 and 10 percent annual probability) for future drought events. However, the extent (or magnitude) of drought and the amount of geographic area covered by drought, varies with each year. Historic information indicates that there is a much lower probability for extreme, long-lasting drought conditions.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[26] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Amite County With increasing global surface temperatures, the possibility of more *droughts* and increased frequency and intensity of storms will likely occur[27]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

G.2.5 Lightning

LOCATION AND SPATIAL EXTENT

Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of Pike County is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, there have been zero recorded lightning events in Pike County since 2007.

PROBABILITY OF FUTURE OCCURRENCES

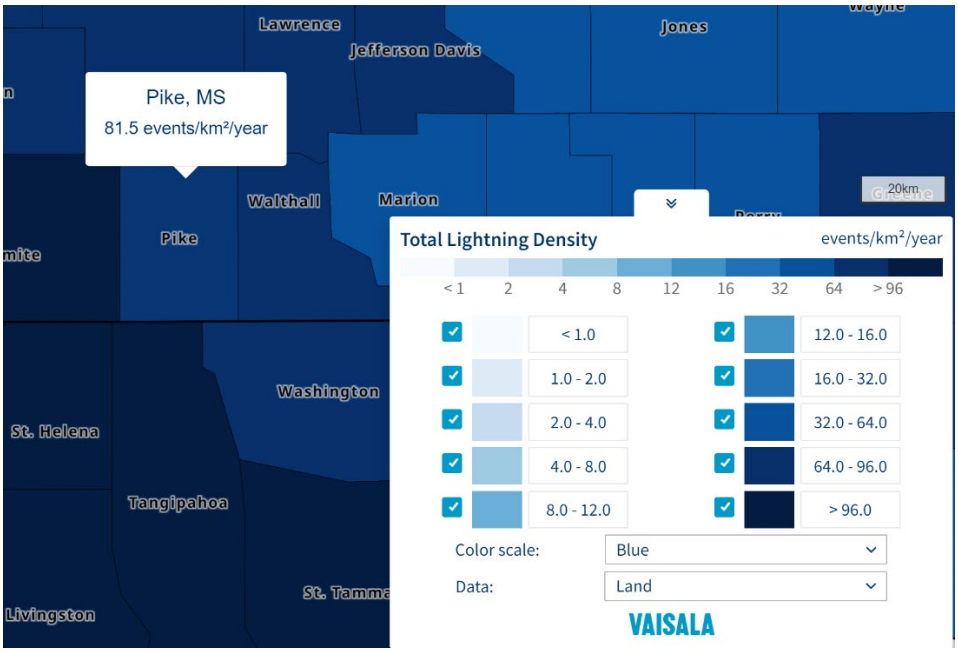
Although there were no historical lightning events reported in Pike County via NCEI data, it is a regular occurrence accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though not all events will cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN), Pike County is located in an area of the country

[26] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[27] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disaster

that experienced an average of 81.5 lightning flashes per km^2 per year between 2016 and 2021. Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the county.

FIGURE G.6: VAISALA'S NLDN MAP OF LIGHTNING DENSITY[28]



FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[29]. There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Pike County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *lightning strike events*.[30] As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

G.2.6 Wildfire

[28] Vaisala – U.S. National Lightning Detection Network. Retrieved on 11/30/2022 from: https://interactive-lightning-map.vaisala.com/?_ga=2.229872988.1951225355.1669843590-1950342430.1669843590

[24] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[25] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

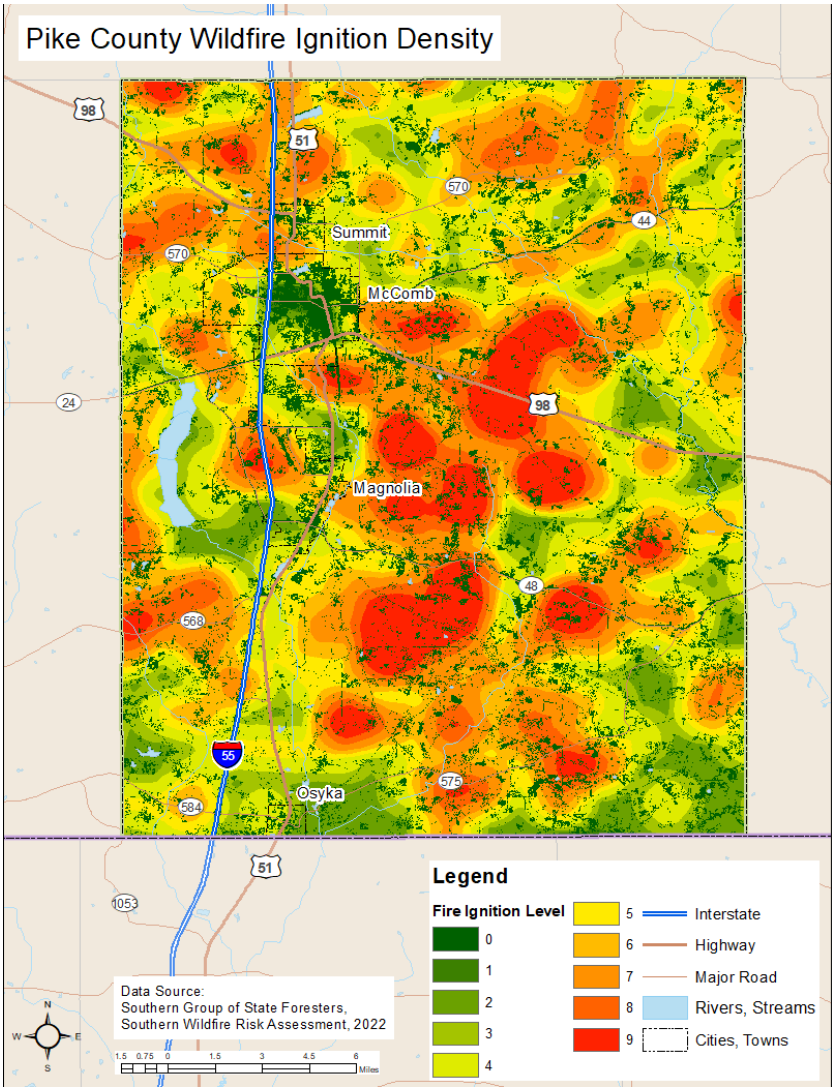
LOCATION AND SPATIAL EXTENT

The entire county is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the urban- wildland interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

HISTORICAL OCCURRENCES

The following figure shows the Wildfire Ignition Density in Pike County based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and the likelihood of a wildfire igniting in an area. Occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map. This is measured in the number of fires per year per 1,000 acres.[31]

FIGURE G.7: WILDFIRE IGNITION DENSITY IN PIKE COUNTY[32]



[31] Southern Wildfire Risk Assessment

[32] Southern Wildfire Risk Assessment

Based on data from the Mississippi Forestry Commission from 2015 to 2022, Pike County experienced an average of 14 wildfires annually which burned a combined 207.25 acres per year. The data indicate that most of these fires were small to moderate in size, averaging about 13.2 acres per fire. The table below provides a summary of wildfire occurrences in Pike County and the following table lists the number of reported wildfire occurrences in the county between the years 2015 and 2022.

TABLE G.10: SUMMARY TABLE OF ANNUAL WILDFIRE OCCURRENCES (2015-2022)

	Pike County
Average Number of Fires per year	14
Average Number of Acres Burned per year	207.25
Average Number of Acres Burned per fire	13.2

TABLE G.11: HISTORICAL WILDFIRE OCCURRENCES IN PIKE COUNTY[33]

Year	2015	2016	2017	2018	2019	2020	2021	2022
Pike County								
Number of Fires	18	14	16	8	11	5	12	28
Number of Acres Burned	499	90	188	90	152	17	191	431

PROBABILITY OF FUTURE OCCURRENCES

Wildfire events will be an ongoing occurrence in Pike County. The following shows that there is some probability a wildfire will occur throughout the county. However, the likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small in size but could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to Pike County for future wildfire events is highly likely (100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

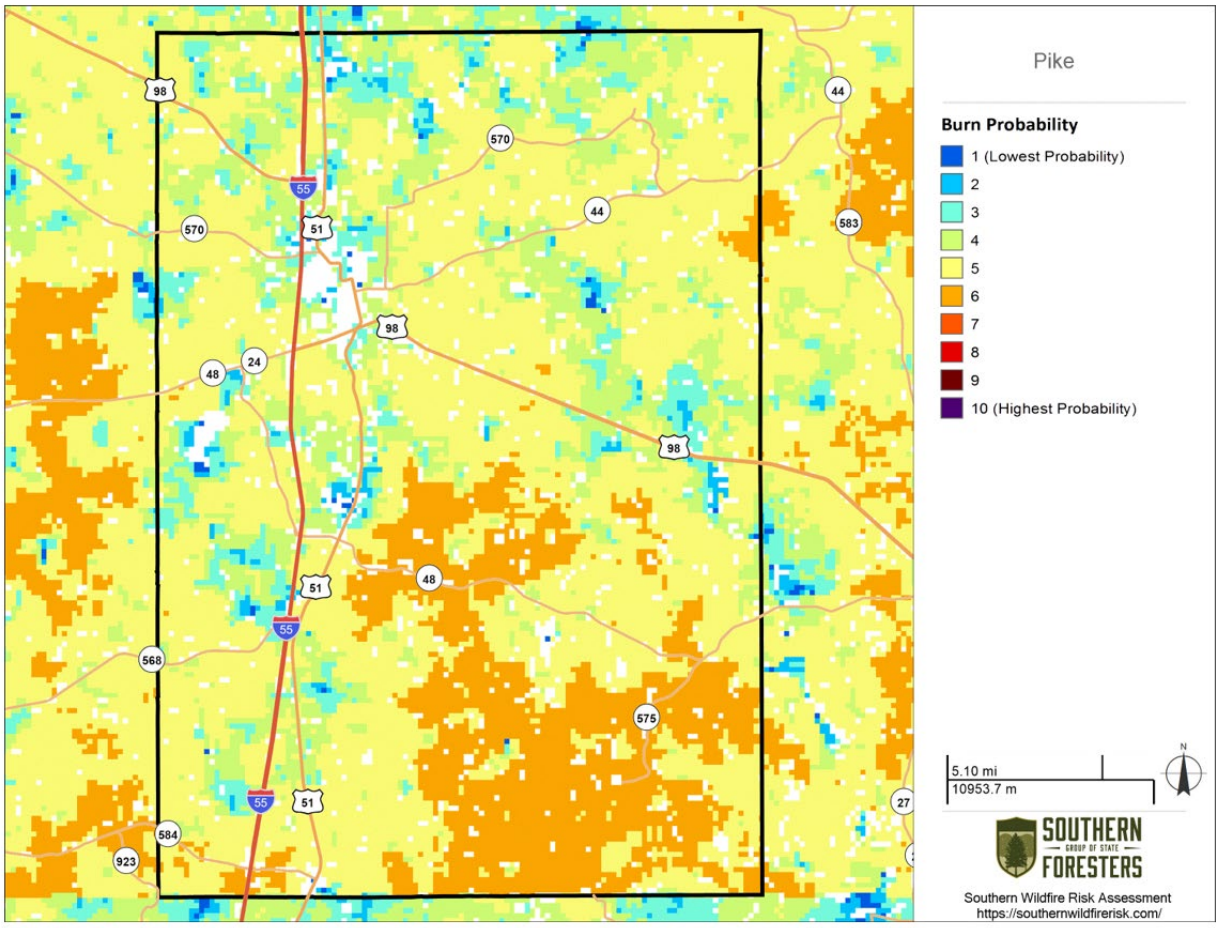
The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[34] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future

[33] Mississippi Forestry Commission

[34] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

natural hazard event frequency, intensity, and magnitude across the globe, including in Pike County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency *wildfire events*.[35]

FIGURE G.8: BURN PROBABILITY IN PIKE COUNTY



GEOLOGIC HAZARDS

G.2.7 Earthquake

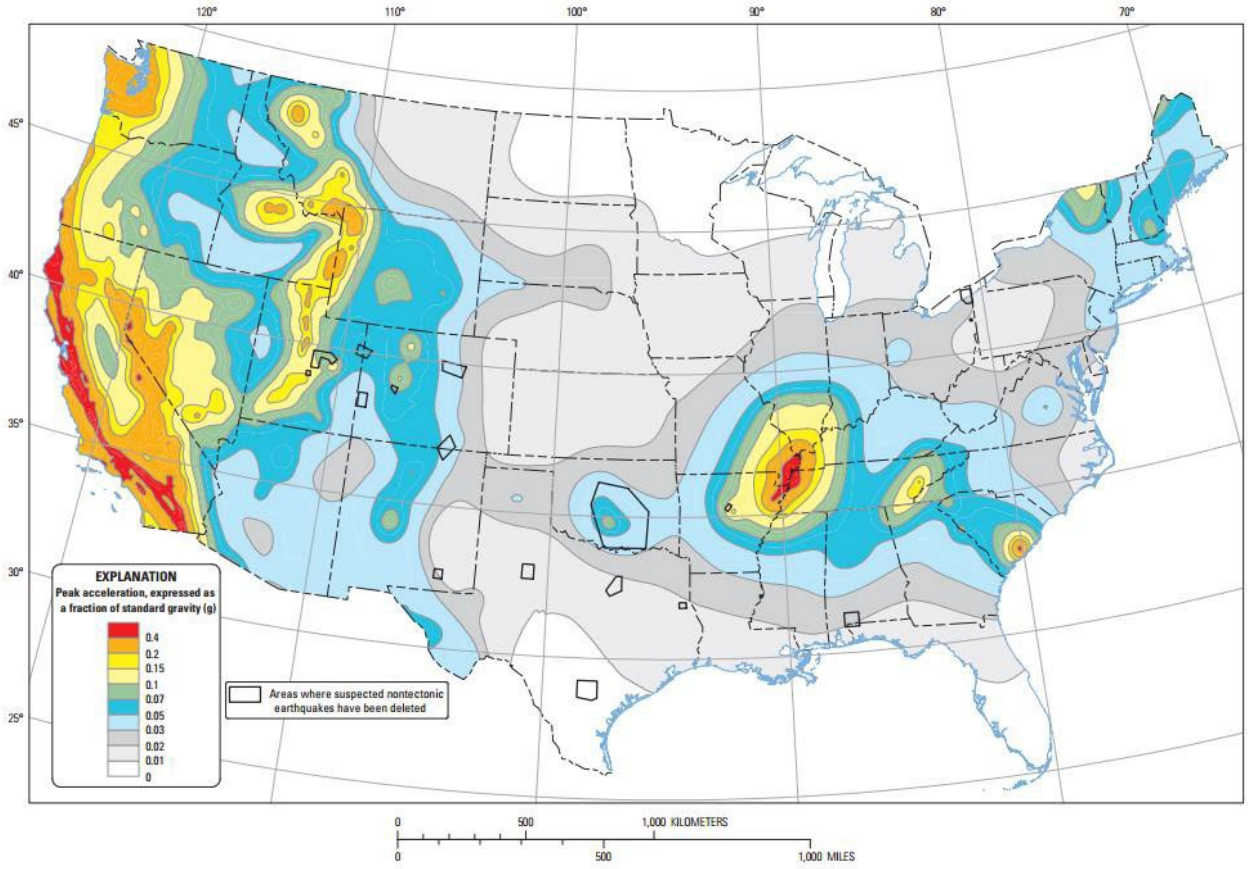
LOCATION AND SPATIAL EXTENT

The following figure shows the intensity level associated with Pike County, based on the national USGS map of peak acceleration with 10 percent probability of exceedance in 50 years. It is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global

[35] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Pike County lies within an approximate zone of level "0.01" to "0.03" ground acceleration. This indicates that the county exists within an area of low seismic risk.

FIGURE G.9: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS[36]



Ten-percent probability of exceedance in 50 years map of peak ground acceleration

The primary source of potential damage to Pike County from an earthquake is the New Madrid Seismic Zone (NMSZ). Historically, a series of earthquakes in 1811 and 1812 demonstrated that this fault zone can produce high magnitude seismic events, sometimes on the scale of a 7.5-8.0 on the Richter scale. The biggest challenge with earthquakes that occur in this area of seismic activity is predicting the recurrence of earthquakes emanating from this zone. Although the magnitude of earthquakes from the NMSZ can be large, they occur very irregularly and fairly infrequently. This makes it extremely difficult to project when they will occur.

It should also be noted that the State of Mississippi Hazard Mitigation Plan identifies certain areas of concern for liquefaction and lists the counties and corresponding zones within those counties that have the highest liquefaction potential. Pike County does not have any identified liquefaction potential risk.

[36] United States Geological Survey, 2014

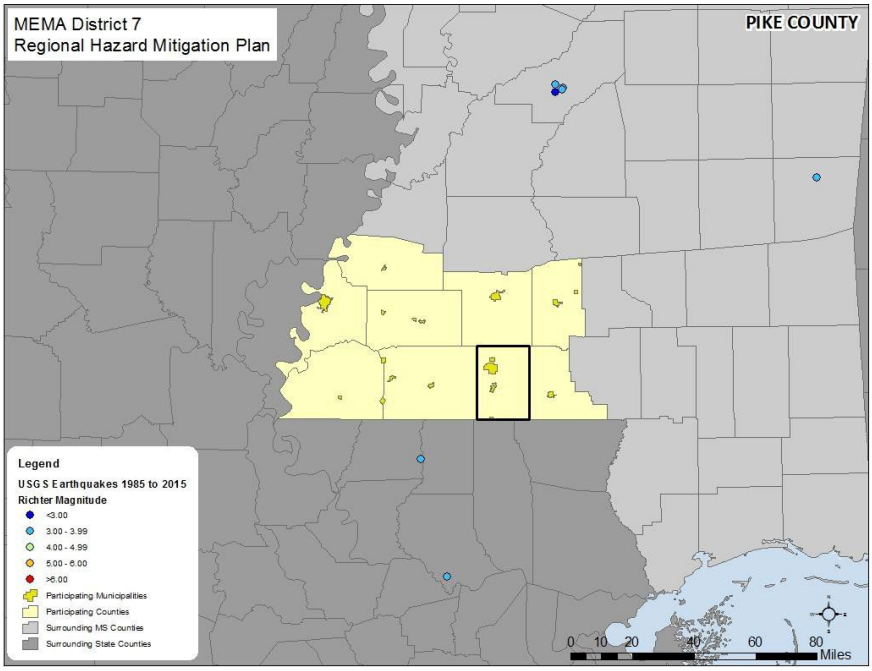
FIGURE G.10: MODIFIED MERCALLI INTENSITY SCALE (MMI)

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest,especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

HISTORICAL OCCURRENCES

No earthquakes are known to have affected Pike County since 1638. The following presents a map showing earthquakes whose epicenters have occurred near the county between 1985 and 2023 (no earthquakes occurred within the county's boundaries during this period).

FIGURE G.11: HISTORIC EARTHQUAKES WITH EPICENTERS NEAR PIKE COUNTY (1985-2023)[37]



PROBABILITY OF FUTURE OCCURRENCES

The probability of significant, damaging earthquake events affecting Pike County is unlikely. However, it is certainly possible that future earthquakes resulting in light or moderate perceived shaking and damages will affect the county much more frequently. The annual probability level for the county is estimated to be less than 1 percent (unlikely).

TEMPERATURE & WIND-RELATED HAZARDS

G.2.8 Extreme Heat

LOCATION AND SPATIAL EXTENT

Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries. Therefore, the entire county is equally susceptible to extreme heat.

HISTORICAL OCCURRENCES

The National Centers for Environmental Information was used to determine historical heat wave occurrences in the county. No events specific to Pike County were reported, however, several events were reported elsewhere in the region. Similar events and impacts can be expected in Pike County.

Summer of 2000 Heat Wave – Hot temperatures persisted from July to September across the South and Plains. Known as the Summer of 2000 Heat Wave, high temperatures commonly peaked over 100 degrees.

August 2005 – A "HOT" stretch of weather occurred during the middle to later part of August 2005. This

[37] United States Geological Survey

"Heat Wave" covered a large portion of the south and lasted for a period of about 10 days. Each of these days had high temperatures consistently between 95 and 100 degrees, with 1 or 2 of these days reaching 100 degrees or more. Additionally, overnight lows remained warm with lower and middle 70s recorded. This is the first time since August 2000 where 100-degree temperatures were reached in this area as well as having such an extended period of "HOT" weather.

July 2006 – A small "heat wave" gripped the region during the middle of July with high temperature ranging from the upper 90s to around 100 degrees for five days with overnight lows only reaching the middle 70s. The hottest temperatures during this period occurred from the Mississippi Delta, across northern Mississippi and then down to the Jackson Metro and toward Meridian. This area peaked between 100 and 102 degrees for at least two days during the hot five-day stretch.

August 2007 – During the first half of August, a heat wave took hold of the region and brought some of the warmest temperatures since the summer of 2000. This heat wave began around August 5th and lasted until the 16th. Between August 10th and 15th, the entire area reached 100 degrees or higher. Twenty- three record highs were also set during this time. As the temperature soared each day, high relative humidity resulted in heat index values between 105 and 112 degrees.

August 2010 – A four day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS Jackson, MS forecast area, 19 record highs were set between August 1st and 4th. On August 2nd, the 2nd warmest average temperature was recorded. The low was 78 and the high 105, this resulted in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in 3 fatalities across the forecast area.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Pike County has a probability level of likely (between 10 and 100 percent annual probability) for future heat wave events.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[38] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Pike County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *extreme heat* events[39]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

[38] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[39] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

G.2.9 Hailstorm

LOCATION AND SPATIAL EXTENT

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that Pike County is uniformly exposed to severe thunderstorms; therefore, all areas of the county are equally exposed to hail which may be produced by such storms.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, 84 recorded hailstorm events have affected Pike County since 1963.[40] The following table is a summary of the hail events in Pike County. In all, hail occurrences resulted in approximately $50,000 in property damages.[41] Hail ranged in diameter from 0.75 inches to 2.75 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

TABLE G.12: SUMMARY OF HAIL OCCURRENCES IN AMITE COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Magnolia	7	0/0	$50,000	$3,548
McComb	21	0/0	$0	$0
Osyka	4	0/0	$0	$0
Summit	11	0/0	$0	$0
Unincorporated Area	41	0/0	$0	$0
PIKE COUNTY TOTAL	**84**	**0/0**	**$50,000**	**$3,548**

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that the probability of future hail occurrences is highly likely (100 percent annual probability). Since hail is an atmospheric hazard, it is assumed that Pike County has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[42] There is strong evidence that long-term changes in climate-related

[40] These hail events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1963 through November 2022. It is likely that additional hail events have affected Pike County. As additional local data becomes available, this hazard profile will be amended.

[41] *National Centers for Environmental Information*

[42] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Pike County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *hailstorm*[43]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

G.2.10 Hurricane and Tropical Storm

LOCATION AND SPATIAL EXTENT

Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect Pike County. All areas in Pike County are equally susceptible to hurricane and tropical storms.

The following table shows the different category rankings of hurricanes on the Saffir-Simson Scale. The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures. In the western North Pacific, the term "super typhoon" is used for tropical cyclones with sustained winds exceeding 150 mph. Note that all winds are using the U.S. 1-minute average.

TABLE G.13 SAFFIR-SIMPSON SCALE OF HURRICANE STRENGTH

Category 1	Winds 74-95 mph (64-82 kt or 119-153 km/hr). Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
Category 2	Winds 96-110 mph (83-95 kt or 154-177 km/hr). Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
Category 3	Winds 111-129 mph (96-112 kt or 178-208 km/hr). Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
Category 4	Winds 130-156 mph (113-136 kt or 209-251 km/hr). Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate

[43] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

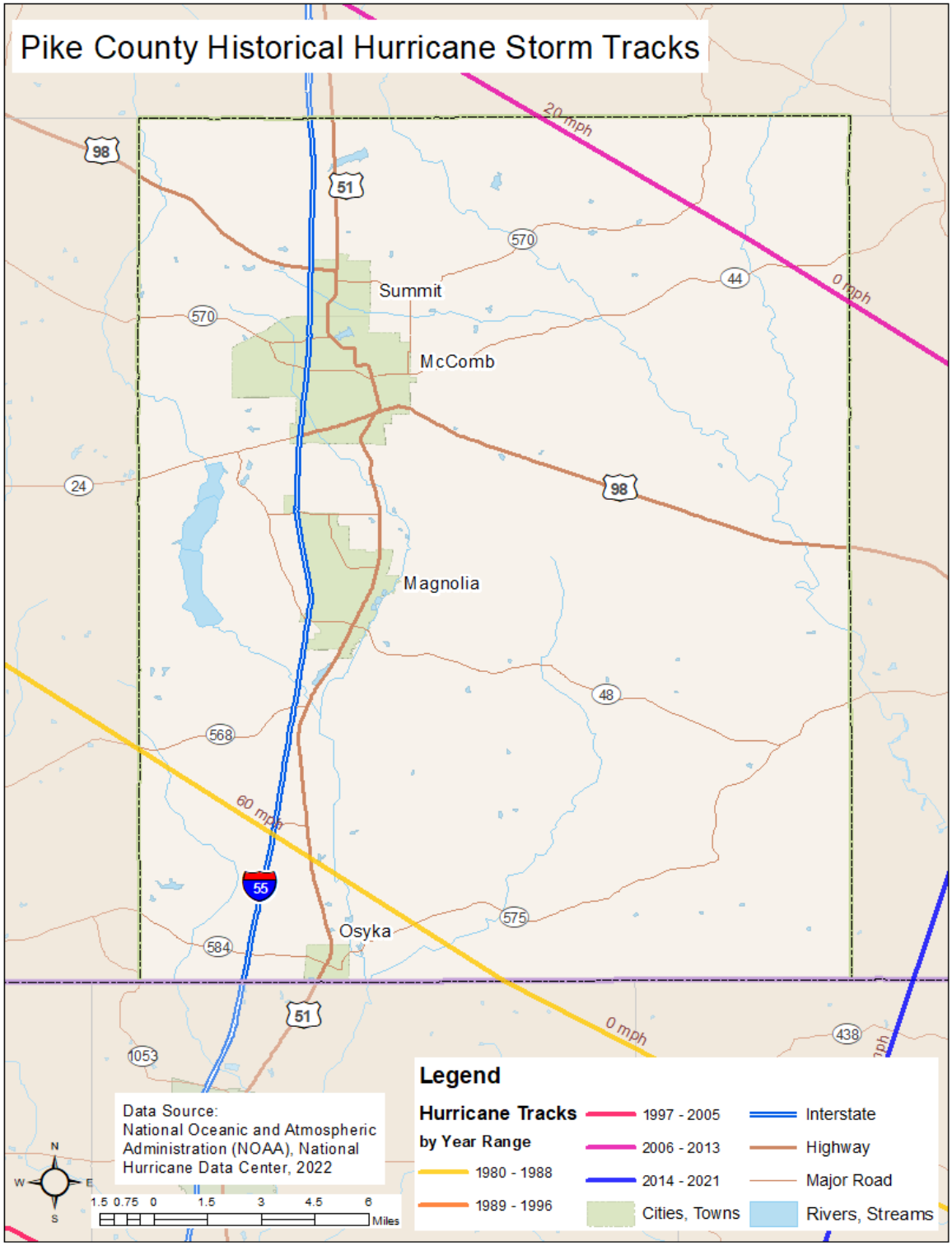
	residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
Category 5	Winds 157 mph or higher (137 kt or higher or 252 km/hr or higher). Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

HISTORICAL OCCURRENCES

The following figure and table provide the date of occurrence, name (if applicable), maximum wind and category of the storm based on the Saffir-Simpson Scale for each event. Lesser events may still cause significant local impact in terms of rainfall and high winds. This map represents recent storm tracks since 1980.[44]

[44] National Hurricane Center

FIGURE G.12: HISTORICAL HURRICANE TRACKS THROUGH PIKE COUNTY[45]



[45] National Oceanic and Atmospheric Administration; National Hurricane Center

Federal records indicate that sixteen disaster declarations were made in Pike County: 1965 (Hurricane Betsy), 1969 (Hurricane Camille), 1998 (Hurricane Georges), 2002 (Tropical Storm Isidore), 2004 (Hurricane Ivan), 2005 (Hurricane Katrina), 2008 (Hurricane Gustav), 2012 (Hurricane Isaac), 2020 (Hurricane Marco and Tropical Storm Laura), 2020 (Hurricane Sally), 2020 (Hurricane Delta), and 2021 (Hurricane Ida). Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding. **Hurricane Ida – August 29, 2021**
The county suffered widespread tree damage with mostly minor to moderate damage to homes and other structures as Ida's center moved through the county. A few homes suffered major damage due to falling trees. Several roads, including some state highways, were blocked by downed trees or other debris. At the peak approximately 54% of the county was without power.

The National Centers for Environmental Information also reported three hurricane or tropical storm events in Pike County since 2002.

TABLE G.14: HISTORICAL HURRICANE / TROPICAL STORM OCCURRENCES IN PIKE COUNTY[46]

Date of Occurrence	Storm Name	Deaths/Injuries	Property Damage	Annualized Losses
8/28/2005	Hurricane Katrina	0/0	$294,000,000	
9/1/2008	Hurricane Gustav	0/0	$500,000	
08/29/2021	Hurricane Ida	0/0	$1,000,000	
Totals		**0/0**	**$295,500,000**	**$14,775,000**

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the county. Anecdotes are available from NCEI for the major storms that have impacted the county as found below:

Hurricane Katrina – August 29, 2005
The damage from Hurricane Katrina was devastating and widespread. Damage occurred across all of the Jackson forecast area which includes 9 parishes in Northeast Louisiana, 2 counties in Southeast Arkansas and about 2/3 of Central and Southern Mississippi. As widespread as the damage was, the more concentrated and most significant damage occurred across Southeast and East-Central Mississippi. For other areas, especially that west of Natchez to Yazoo City to Grenada line, damage to trees and power lines was significant and scattered across the landscape. As you move toward Central Mississippi and along Interstate 55 the damage and impacts increase. This portion of the state sustained widespread damage to trees and power lines.

Hurricane Gustav – September 1, 2008
As the center of Gustav crossed much of southern Louisiana, tropical storm force winds extended into southern Mississippi and portions of east central Louisiana. Sustained winds were between 35 and 45 mph with higher gusts between 70 and 100 mph occurred. Tree and power line damage was extensive across these areas which resulted in widespread power outages, some of which lasted for 3 to 5 days. As Gustav slowed across central Louisiana, the outer rainbands continued to rotate across much of southern and central Mississippi. This kept those portions of Mississippi in the region which was favorable for tornadoes. Over 3 days, 26 tornadoes were confirmed, all of which were in the EF0 to EF1 range.

Hurricane Ida – August 29, 2021

[46] National Centers for Environmental Information

The county suffered widespread tree damage with mostly minor to moderate damage to homes and other structures as Ida moved through the county. A few homes suffered major damage due to falling trees. Several roads, including some state highways, were blocked by downed trees or other debris.

PROBABILITY OF FUTURE OCCURRENCES

Given the inland location of the county, Pike County will not be susceptible to many of the sub-hazards that are often associated with hurricanes and tropical storms such as storm surge. Although the probability of experiencing major impacts is somewhat less than coastal areas because of this, hurricanes and tropical storms remain a real threat to Pike County due to induced events like flooding and high wind. Based on historical evidence, the probability level of future occurrence is likely (between 10 and 100 percent annual probability). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. However, when the county is impacted, the damage could be significant, threatening lives and property throughout the planning area.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[47] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Pike County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[48]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

HURRICANE EVACUATIONS

As discussed above, the MEMA District 7 Region has been directly impacted by a number of hurricane and tropical storm events historically. However, it should be noted that the region is also susceptible to indirect effects from hurricanes and tropical storms, particularly in the form of evacuations from coastal counties. The counties within MEMA District 7 are located far enough inland that they are often the primary recipients of evacuees from counties that will be (or have been) impacted by major storm events.

For example, during Hurricane Katrina in 2005, thousands of evacuees made their way to counties in southwest Mississippi to take temporary refuge from the storm. Due to the severe and devastating effects of the storm, temporary sheltering within these counties was extended much longer than originally anticipated and, in some cases, the evacuees ended up staying for weeks or months. This additional population caused a major strain on resources within these relatively rural counties, as local communities with limited resources had an unexpected and immediate need to provide shelter and other life essentials such as food, water, and health care to a significant, additional number of people.

Caring for all these evacuees was especially challenging for counties in the MEMA District 7 Region

[47] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[48] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

because most had been impacted themselves by the storm and were attempting to help their own citizens recover from the storm. Undoubtedly, recovering from a major disaster while simultaneously attempting to help evacuees from surrounding counties poses several difficulties for emergency management personnel and other local officials.

Based on Hurricane Katrina and other major hurricane events that have impacted the Gulf Coast in the past, it is likely that many of the MEMA District 7 counties will be receiver counties when it comes to evacuees. Many of these evacuees will likely come from locations in Louisiana, including New Orleans. Indeed, the State of Louisiana evacuation plan indicates that one of the primary evacuation routes from the City of New Orleans will direct evacuees north along Interstate 55, sending people through Pike County and Lincoln County. Depending on the severity of the event, officials in Louisiana may even change Interstate 55 over to a contraflow traffic pattern to enable quicker evacuations.

G.2.11 Severe Thunderstorm/High Wind

LOCATION AND SPATIAL EXTENT

A thunderstorm event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that Pike County has uniform exposure to an event and the spatial extent of an impact could be large.

The following Beaufort scale is an empirical measure for the intensity of the wind associated with windstorms.

TABLE A.15: BEAUFORT WIND SCALE

Beaufort Scale					
NUMBER	**WIND SPEED (MPH)**	**DESCRIPTION**	**WAVE HEIGHT (FT)**	**SEA CONDITIONS**	**LAND CONDITIONS**
0	<1	Calm	0	Flat.	Calm. Smoke rises vertically.
1	1-3	Light air	0.33	Ripples without crests.	Wind motion visible in smoke.
2	3-7	Light breeze	0.66	Small wavelets.	Wind felt on exposed skin. Leaves rustle.
3	8-12	Gentle breeze	2	Large wavelets.	Leaves and smaller twigs in constant motion.
4	13-17	Moderate breeze	3.3	Small waves.	Dust and loose paper rise. Small branches begin to move.
5	18-24	Fresh breeze	6.6	Moderate (1.2 m) longer waves. Some foam and spray.	Small trees sway.
6	25-30	Strong breeze	9.9	Large waves with foam crests and some spray.	Large branches in motion. Whistling heard in overhead wires. Umbrella use difficult.
7	31-38	High wind, Moderate Gale, Near Gale	13.1	Sea heaps up and foam begins to streak.	Whole trees in motion. Effort needed to walk against the wind.
8	39-46	Fresh Gale	18	Moderately high waves with breaking crests forming spindrift. Streaks of foam.	Twigs broken from trees. Cars veer on road.
9	47-54	Strong Gale	23	High waves (6-7 m) with dense foam. Wave crests start to roll over. Considerable spray.	Larger branches break off trees, and some small trees blow over. Construction/temporary signs and barricades blow over. Damage to circus tents and canopies.

Beaufort Scale					
NUMBER	**WIND SPEED (MPH)**	**DESCRIPTION**	**WAVE HEIGHT (FT)**	**SEA CONDITIONS**	**LAND CONDITIONS**
10	55-63	Whole Gale/Storm	29.5	Very high waves. The sea surface is white and there is considerable tumbling.	Trees uprooted. Considerable structural damage.
11	64-72	Violent storm	37.7	Exceptionally high waves.	Widespread vegetation and structural damage.
12	≥73	Hurricane-force	≥46	Huge waves. Sea is completely white with foam and spray. Air is filled with driving	Massive and widespread damage to structures.

HISTORICAL OCCURRENCES

Severe storms were at least partially responsible for five disaster declarations in Pike County in 1980, 1983, 1990, 2001, and 2003. According to NCEI[49], there have been 187 reported thunderstorm and high wind events since 1962 in Pike County. These events caused almost $1.1 million in damages.18 There were also reports of one fatality and six injuries. The following table presents detailed thunderstorm and high wind event reports including date, magnitude, and associated damages for each event.[50]

TABLE G.16: HISTORICAL THUNDERSTORM/HIGH WIND OCCURRENCES IN PIKE COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Magnolia	16	0/0	$101,850	$1,567
McComb	56	0/4	$635,200	$9,772
Osyka	11	0/0	$137,000	$2,108
Summit	25	0/0	$70,950	$1,091
Unincorporated	78	1/2	$207,700	$3,195
Pike County Total	**187**	**1/6**	**$1,152,700**	

PROBABILITY OF FUTURE OCCURRENCES

Given the high number of previous events, it is certain that thunderstorm events, including straight-line wind events, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for the entire county.

FUTURE IMPACTS OF CLIMATE CHANGE

[49] National Centers for Environmental Information

[50] These thunderstorm events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1957 through November 2022.

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[51] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Pike County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[52]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

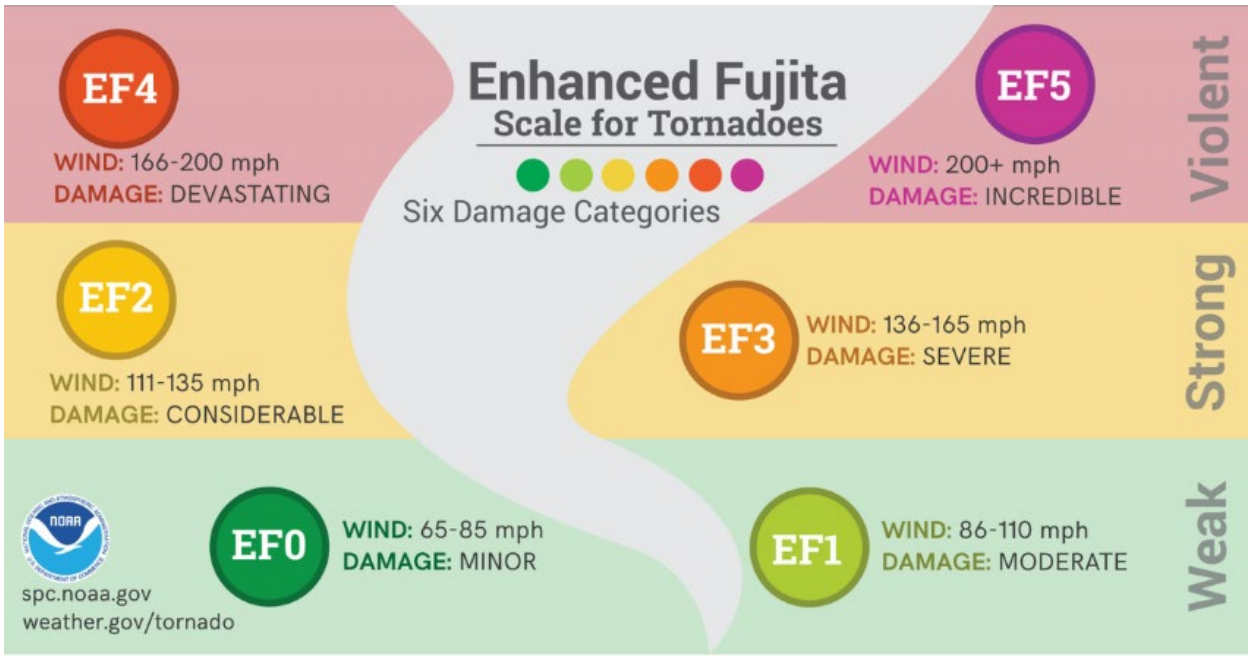
G.2.12 Tornado

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, and thus in Pike County. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random, and it is not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that Pike County is uniformly exposed to this hazard.

The following figure depicts the Enhanced-Fujita Scale of tornado intensity.

FIGURE G.13: ENHANCED-FUJITA SCALE



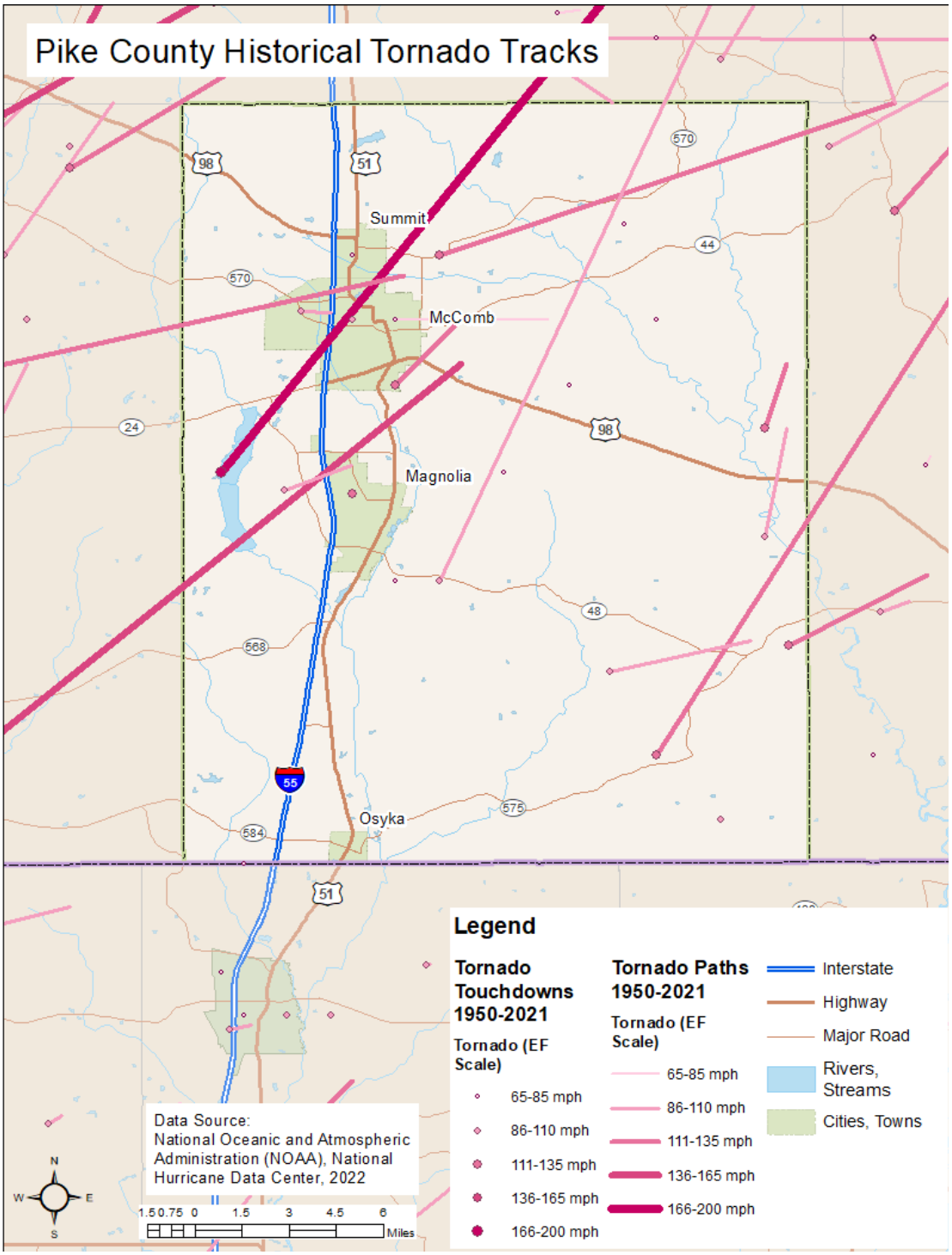
With that in mind, the figure below shows tornado track data for many of the major tornado events that

[51] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[52] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

have impacted the county between 1950 and 2022. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

FIGURE G.14: HISTORICAL TORNADO TRACKS IN PIKE COUNTY[53]



[53] National Weather Service Storm Prediction Center

HISTORICAL OCCURRENCES

Since 1953 Tornadoes were responsible for two disaster declarations in Pike County, which occurred in 1975. January 10, 1975, an F4 tornado developed near the dam at the Percy Quin State Park in Pike Count, and ran through Pike, Lincoln, Lawrence, and Simpson Counties. According to the National Centers for Environmental Information, there have been a total of 25 recorded tornado events in Pike County since 1950, resulting in more than $29 million in property damages. In addition, 4 fatalities and 213 injuries were reported. The magnitude of these tornadoes ranges from EF0 to EF4, although an F5 event is possible.

TABLE G.17: SUMMARY OF TORNADO OCCURRENCES IN PIKE COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Magnolia	1	0/0	$20,000	$278
McComb	5	0/0	$0	$0
Osyka	1	0/0	$5,000	$69
Summit	1	0/0	$0	$0
Unincorporated	17	4/213	$29,052,500	$403,506
Pike County Total	**25**	**4/213**	**$29,077,500**	**$403,853**

PROBABILITY OF FUTURE OCCURRENCES

According to historical information, tornado events significantly threaten Pike County. The probability of future tornado occurrences affecting Pike County is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[54] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Pike County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[55]. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storm systems that spawn tornadoes to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding, and enhancing the potential for increased *tornado activity*. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

G.2.13 Winter Storm, Freeze, and Extreme Cold

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm and freeze events. Some ice

[54] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[55] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. Pike County is not accustomed to severe winter weather conditions and seldom receives severe winter weather, even during the winter months. Events tend to be mild in nature; however, this creates a situation where even relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage since these events are not commonplace. Given the atmospheric nature of the hazard, the entire county has uniform exposure to a winter storm.

HISTORICAL OCCURRENCES

According to the National Climatic Data Center, there have been a total of eight recorded winter storm events in Pike County since 2002. These events did not result in any property damages.

TABLE G.18: SUMMARY OF WINTER STORM EVENTS IN PIKE COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Pike County	9	0/0	$0	$0

There have been several severe winter weather events in Pike County. The text below describes three of the major events and associated impacts on the county. Similar impacts can be expected with severe winter weather.

February 2010

Heavy snow affected a large portion of the region, especially locations across central and southern Mississippi, on Thursday night and Friday, February 11th, and 12th. The heavy snow was a result of a low-pressure system that tracked eastward across the northern Gulf of Mexico, and a vigorous upper-level disturbance that moved across the region while a cold air mass was in place. Light precipitation overspread the region late Thursday afternoon into the evening before becoming heavy Thursday night into early Friday morning. The snow tapered off from west to east during the midday hours Friday.

February 2011

An ice storm developed across the area on February 3rd into the early morning hours of the 4th. While this icing event was not devastating, the impact to travel was a major issue across the region. Thousands of accidents occurred from slick roads. As a result of the accidents, three fatalities occurred along with a handful of injuries. Overall, most areas received 0.25 to 0.5 inches of ice accumulation from freezing rain. Additionally, some areas had a mix of precipitation with sleet accumulating. Some snow did occur, but those were just across select areas and the accumulation was mainly one inch or less.

February 2021

As an arctic air mass continued to build southward across the South on February 17th, another wave of precipitation overspread this cold air mass across much of Mississippi. The main impacts across central and southern portions of the state were from freezing rain and resulting heavy icing, but some significant accumulations of sleet and snow also occurred in areas mainly north and west of the Natchez Trace. Freezing rain continued through the evening hours, ending from west to east by the early morning of February 18th. Ice accumulated quickly in many locations and downed numerous trees, large limbs, and power lines across the affected areas. Several trees and limbs fell onto power lines, resulting in more widespread power outages as well. Some trees fell onto homes or cars, and significant amounts of ice, sleet, and snow collapsed a few gas station awnings and roofs where accumulations were greatest. In the hardest hit areas, extensive damage to trees and power lines took several months and

cost several hundred thousands of dollars to clean up.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could fire or an accumulation of toxic fumes.

PROBABILITY OF FUTURE OCCURRENCES

Winter storm events will continue to occur in Pike County. Based on historical information, the probability is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems. There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Pike County With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur. As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms). However, accelerated warming in the Artic region (i.e., Arctic amplification) may also be linked with an increase in the frequency of extreme cold events across parts of Asia and North America, including in Pike County. [56]

OTHER HAZARDS

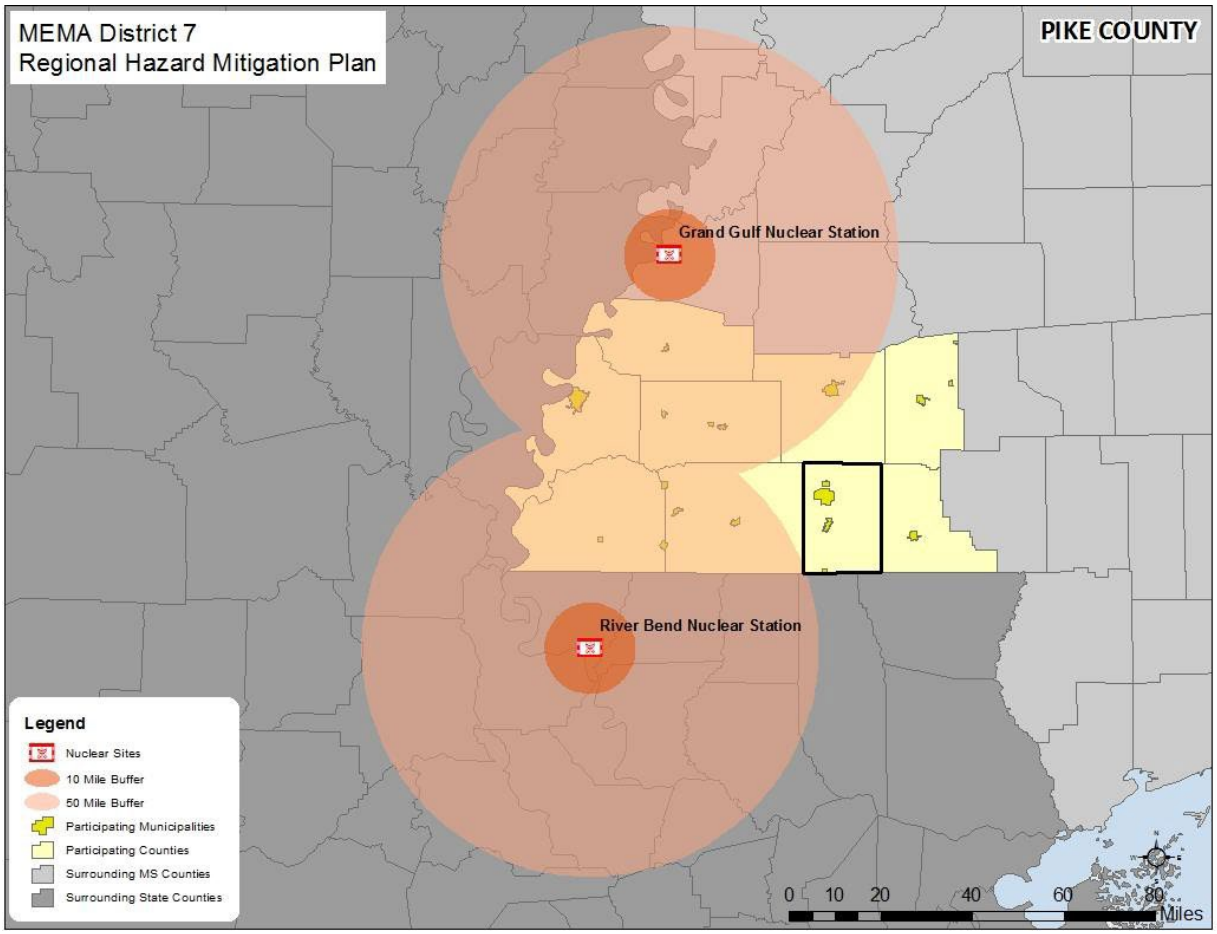
G.2.14 Radiological Event

LOCATION AND SPATIAL EXTENT

The Grand Gulf Nuclear Station and River Bend Nuclear Station are both located within a 50-mile radius of the MEMA District 7 Region. The Nuclear Regulatory Commission defines two emergency planning zones around nuclear plants. Areas located within 10 miles of the station are within the zone of highest risk to a nuclear incident and this radius is the designated evacuation radius recommended by the Nuclear Regulatory Commission. Within the 10-mile zone, the primary concern is exposure to and inhalation of radioactive contamination. No part of Pike County is in the 10-mile radius of a nuclear station. The most concerning effects in the secondary 50-mile zone are related to ingestion of food and liquids that may have been contaminated. Virtually no part of Pike County is located within this 50-mile radius, however, the county is located just outside of this zone. The 50-mile zone is still considered to be at risk from a nuclear incident, though the impacts may be less severe than in the 10-mile zone.

[56] NOAA – Communication Education & Engagement. Retrieved from: https://cpo.noaa.gov/Divisions-Programs/Communication-Education-and-Engagement/CEE-News/ArtMID/8293/ArticleID/2369/Research-Links-Extreme-Cold-Weather-in-the-United-States-to-Arctic-Warming

FIGURE G.15: NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN PIKE COUNTY[57]



HISTORICAL OCCURRENCES

Although there have been no major nuclear events at either the Grand Gulf or River Bend Nuclear Stations, one could occur as there have been incidents in the past in the United States at other facilities and at facilities around the world. Additionally, a list of minor events/notifications was acquired from reports collected by the Nuclear Regulatory Commission (NRC). The NRC classifies events using the scale found in the following tables. A list of events at Grand Gulf Nuclear Station and River Bend Nuclear Station can be found in the following tables. It is noteworthy that all the events were minor in magnitude, and many were insignificant enough that they did not register on the classification scale.

[57] International Atomic Energy Agency

TABLE G.19: NUCLEAR REGULATORY COMMISSION EMERGENCY CLASSIFICATION SCALE FOR EVENTS OCCURRING AT NUCLEAR POWER PLANTS

Classification	Description
Notification of Unusual Event (NOUE)	Events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs. [Note: This term is sometimes shortened to Unusual Event (UE). The terms Notification of Unusual Event, NOUE and Unusual Event are used interchangeably.]
Alert	Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the Environmental Protection Agency (EPA) protective action guides (PAGs)
Site Area Emergency	Site Area Emergency (SAE) – Events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or hostile action that results in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to, equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA PAG exposure levels beyond the site boundary.
General Emergency	Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile action that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

TABLE G.20: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT GRAND GULF NUCLEAR STATION[58]

Date	Retrieved From*	Classification	Plant	Description
8/29/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST
10/1/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF NUCLEAR STATION SECURITY OFFICER LOCKOUT
9/29/2016	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF EXTENDED PLANT SHUTDOWN TO ADDRESS OPERATIONS PERFORMANCE

TABLE G.21: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT RIVER BEND NUCLEAR STATION[59]

Date	Retrieved From*	Classification	Plant	Description
11/26/1985	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	ECCS Initiation: Improper restoration of a level transmitter causes HPSC injection

[58] Nuclear Regulatory Commission Preliminary Notification Reports (http://www.nrc.gov/reading-rm/doc-collections/event-status/prelim-notice/):

[59] Nuclear Regulatory Commission Preliminary Notification Reports (http://www.nrc.gov/reading-rm/doc-collections/event-status/prelim-notice/):

11/27/1985	Licensee Event Report	Alert	River Bend Unit 1	Failure to Perform Surveillance Tests
3/5/1992	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	REACTOR SCRAM CAUSED BY A GENERATOR TRIP DUE TO HIGH WINDS CAUSING TRANSFORMER DAMAGE
9/15/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE IVAN
10/4/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	Shutdown Greater than 72 Hours
9/23/2005	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	NRC ENTERS MONITORING MODE DUE TO HURRICANE RITA
5/23/2007	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REACTOR SHUTDOWN DUE TO UNEXPECTED CHANGE IN RECIRCULATION FLOW
9/2/2008	Preliminary Notification Reports	Notification of Unusual Event/Not Applicable	River Bend Unit 1	NRC RESPONSE TO HURRICANE GUSTAV
5/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	AUGMENTED INSPECTION TEAM ONSITE AT RIVER BEND STATION
8/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST

PROBABILITY OF FUTURE OCCURRENCES

A nuclear event is a very rare occurrence in the United States due to the intense regulation of the industry. There have been minor incidents in the past, but it is considered unlikely (less than 1 percent annual probability).

RADIOLOGICAL EVACUATIONS

Similar to the hurricane evacuations discussed above, in many ways the MEMA District 7 Region would potentially be impacted to a greater degree by evacuations caused by a radiological event than by the event itself. Since the region is not directly located within the 10-mile evacuation area but neighboring counties are located within this zone, it is highly likely that populations from those neighboring counties will be evacuated to the counties within the MEMA District 7 Region.

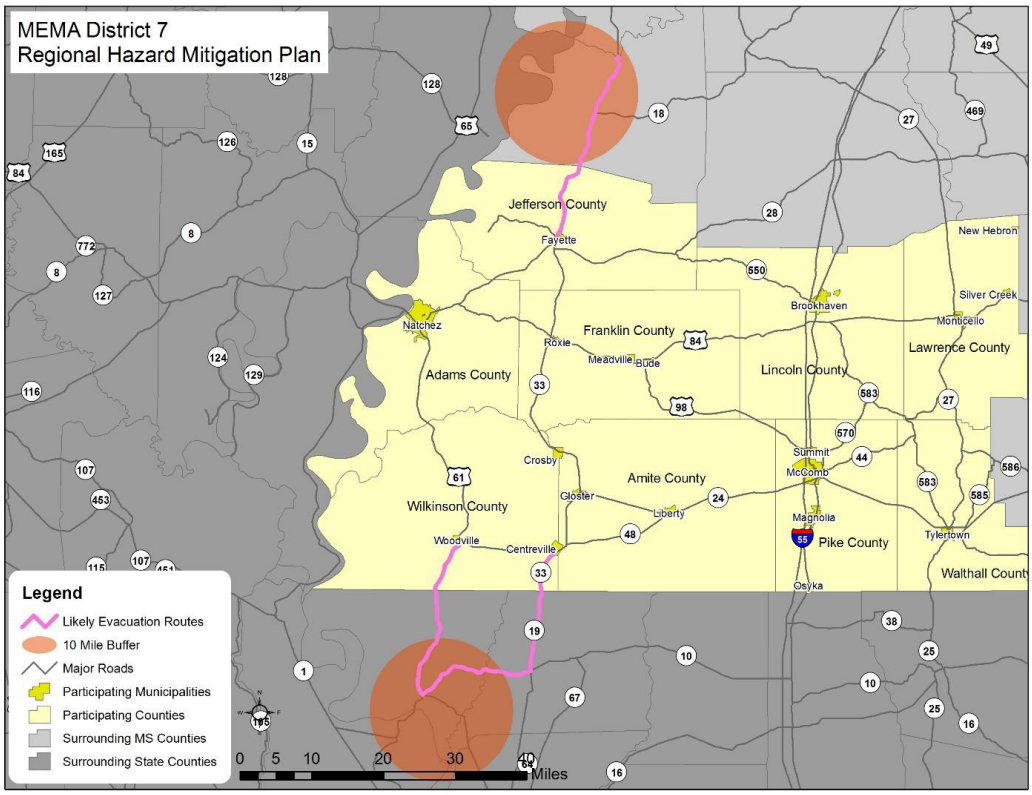
Due to the severe and long-term effects of a major radiological event, temporary sheltering will be an initial concern, but the greater challenge may be in the long-term. As has happened with historical radiological accidents in other locations, the danger in the impacted area will likely extend for a very long period after the event and evacuees may be unable to return to their homes for months or years. This additional influx of population will cause a major strain on resources within these relatively rural counties in the short-term, as local communities with limited resources will have an unexpected and immediate need to provide shelter and other life essentials such as food, water, and health care to a significant, additional number of people. In the long-term, there may be challenges for local officials as existing infrastructure will likely be inadequate to handle larger populations.

Although there have not been any major radiological events in the region historically, hurricane

evacuations (discussed above) provide a similar scenario in terms of what the region might expect. However, one additional concern that officials will need to consider in a radiological event is that evacuees may be contaminated by radioactivity. According to the Centers for Disease Control, radioactive contamination can occur when radioactive materials are released into the environment and become deposited into the air, water, surfaces, soil, plants, buildings, people, or animals. This contamination can then be spread when people touch other people, surfaces, or objects. Therefore, when people evacuate a contaminated zone, they pose a potential risk of spreading the contamination to others if they are not properly treated. Local officials in MEMA District 7 may need to be prepared to set up decontamination centers along major evacuation routes to ensure that the contamination is not spread. It is also important for citizens to understand the steps they can take to reduce the risk of spreading contamination such as evacuating quickly after an event and following decontamination instructions as directed by local officials.[60]

Based on the locations of the 10-mile evacuation areas near the region, many of these evacuees will likely come from Claiborne County to the north and West Feliciana and East Feliciana Parishes to the south. The main roads for these evacuees will probably be U.S. Highway 61 and Mississippi State Highway 33 since these are the primary and most direct roads into and out of the aforementioned evacuation counties and into MEMA District 7, below. Depending on the severity of the event, officials may even change these roads over to a contraflow traffic pattern to enable quicker evacuations.

FIGURE G.16: LIKELY EVACUATION ROUTES FOR A RADIOLOGICAL EVENT IN THE MEMA DISTRICT 7 REGION



[60] Centers for Disease Control and Prevention. *Emergency Preparedness and Response: Contamination vs. Exposure.* Retrieved on September 1, 2017 from https://emergency.cdc.gov/radiation/contamination.asp

As a result of the potential for an influx of evacuees during a radiological event, it is critical for local officials in MEMA District 7 to prepare for evacuations. It is possible that thousands of additional people will be relocated, either temporarily or permanently, to MEMA District 7. Therefore, plans for additional shelters and other resources should be coordinated well in advance of future events.

G.2.15 Pandemic

LOCATION AND SPATIAL EXTENT

Pandemics are global in nature. However, they may start anywhere. Pike County chose to analyze this hazard given the agriculture in the area and potential for this kind of event to occur in any location at any time.

All populations should be considered at risk to pandemic. Buildings and infrastructure are not directly impacted by the virus/pathogen but could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings may be shutdown, at least temporarily, as a result. Employers may initiate work from home procedures for non-essential workers to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

HISTORICAL OCCURRENCES

Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below.

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to 566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population.

Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10 to 50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852- 1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours. The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white

populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

1957 Asian Flu: It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

1968 Hong Kong Flu: The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020, mainly due to the speed and scale of the transmission of the disease. Prior to that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province on February 26th, 2020. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

There is a considerable amount of data on the extent of COVID-19 throughout the State of Mississippi and Pike County. The number of reported cases and deaths across the State of Mississippi and Pike County are shown in the figure below.

TABLE G.22: COVID-19 CASES AS OF 12/05/2022[61]

	Cases	Deaths
Mississippi	943,402	13,051
Pike County	12,212	192

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

[61] Mississippi Department of Health – COVID-19 Dashboard

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Pike County has a probability level of unlikely (less than 1 percent annual probability) for future pandemics events. While pandemics can have devastating impacts, they are relatively rare.

The Mississippi State Department of Health maintains a state pandemic plan which can be found here: http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf

G.2.16 Conclusions on Hazard Risk

The hazard profiles presented in this subsection were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled Understanding Your Risks: Identifying Hazards and Estimating Losses (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

HAZARD EXTENT

The following table describes the extent of each natural hazard identified for Pike County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

TABLE G.23: EXTENT OF PIKE COUNTY HAZARDS

Flood-related Hazards	
Dam and Levee Failure	Dam Failure extent is defined using the Mississippi Department of Environmental Quality classifications which include Low, Significant, and High. Three dams are classified as high- hazard in Pike County.
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no official erosion rate records in Pike County, but local estimates are around 0.25 to 0.50 feet per year. Some areas of erosion have been identified by local coordinators.
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 8.3 percent of the total land area in Pike County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was on Bogue Chitto near Pricedale. Water reached a discharge of 70,000 cubic feet per second (recorded in December 1919). The highest stream gage height was also on Bogue Chitto near Pricedale with a height that was recorded at 53.60 feet (recorded in December 1919). Additional peak discharge readings, historic crest heights, and the corresponding flood categories (where available) are in the table below.
Fire-related Hazards	
Drought	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. Pike County has received this ranking once over the 17-year reporting period.

Lightning	According to the Vaisala's flash density map, Pike County is located in an area that experiences 12 to 20 lightning flashes per square mile per year. It should be noted that future lightning occurrences may exceed these figures.
Wildfire	Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2007-2016. The greatest number of fires to occur in Pike County in any year was 53 in 2011. The greatest number of acres to burn in the county in a single year occurred in 2007 when 540 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale or the Modified Mercalli Intensity (MMI) scale. According to data provided by the National Centers for Environmental Information, no earthquakes were reported in Pike County.
Wind-related Hazards	
Extreme Heat	The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are not kept for any areas in Pike County. However, the highest recorded temperature in the region was 106°F in 2007 with heat index values recorded above 115°F.
Hailstorm	Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Pike County was 2.75 inches (reported on August 10, 1980). It should be noted that future events may exceed this.
Hurricane and Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5. The greatest classification of hurricane to impact the MEMA District 7 Region was a Category 3 storm. This occurred in 1969 with Hurricane Camille and in 2005 with Hurricane Katrina. The storm track of both storms passed just to the east of the region, but due to the size of these storms, their impact was felt across the region.
Severe Thunderstorm/ High Wind	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 67-year history from the National Climatic Data Center, the strongest recorded wind event in Pike County was reported on November 16, 1987 at 75 knots (approximately 86 mph). It should be noted that future events may exceed these historical occurrences.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA as well as the Fujita/Enhanced Fujita Scale. The greatest magnitude reported in Pike County was an F4 (reported on January 10, 1975).
Winter Storm and Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in Pike County. However, reports from NCDC of the greatest snowfall in the county has been 5 inches (reported on February 11, 2010).
Human-caused Hazards	
Radiological Event	Although there is no history of a nuclear accident at either the Grand Gulf Nuclear Station or River Bend Nuclear Station, other events across the globe and in the United States in particular indicate that an event is possible. Since several national and international events were Level 7 events on the INES, the potential for a Level 7 event at these stations is possible.
Pandemic	The extent of a pandemic impacting the county is difficult to estimate. It could result in thousands of deaths and extreme disruption of commerce and everyday life.

PRIORITY RISK INDEX RESULTS

To draw some meaningful planning conclusions on hazard risk for Pike County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a "Priority Risk

Index" (PRI). More information on the PRI and how it was calculated can be found in Section 5.17.2.

The table below summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this subsection, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

TABLE G.24: SUMMARY OF PRI RESULTS FOR PIKE COUNTY

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Dam Failure and Levee Failure	Possible	Critical	Moderate	Less than 6 hours	Less than 6 hours	**2.6**
Erosion	Possible	Minor	Small	More than 24 hours	More than 1 week	**1.8**
Flood	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**3.2**
Fire-related Hazards						
Drought	Possible	Limited	Large	More than 24 hours	More than 1 week	**2.5**
Lightning	Highly Likely	Limited	Small	6 to 12 hours	Less than 6 hours	**2.6**
Wildfire	Highly Likely	Limited	Moderate	Less than 6 hours	Less than 1 week	**3.1**
Geologic Hazards						
Earthquake	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Wind-related Hazards						
Extreme Heat	Likely	Limited	Large	More than 24 hours	More than 1 week	**2.8**
Hailstorm	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Hurricane and Tropical Storm	Likely	Catastrophic	Large	More than 24 hours	Less than 1 week	**3.3**
Severe Thunderstorm/High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Tornado	Likely	Catastrophic	Moderate	Less than 6 hours	Less than 6 hours	**3.2**
Winter Storm and Freeze	Likely	Minor	Moderate	More than 24 hours	Less than 1 week	**2.2**
Human-caused Hazards						
Radiological Event	Unlikely	Minor	Moderate	More than 24 hours	Less than 1 week	**1.6**
Pandemic	Unlikely	Limited	Large	More than 24 hours	More than 1 week	**2.2**

G.2.17 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Pike County, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk. For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Pike County.

A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately and is described in Section 6: Vulnerability Assessment and below in Section G.3. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates. In most cases, the hazards of greatest concern did not change much since the last plan update, indicating that the priorities remained relatively stable and there were few changes in priorities.

Table G.25: Conclusions on Hazard Risk for Pike County

HIGH RISK	Hurricane and Tropical Storm Tornado Flood Wildfire Severe Thunderstorm/High Wind
MODERATE RISK	Extreme Heat Hailstorm Dam and Levee Failure Lightning Drought
LOW RISK	Winter Storm and Freeze Erosion Radiological Event Earthquake Pandemic

G.3 PIKE COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Pike County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected number of damages caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in Section 6: *Vulnerability Assessment*.

G.3.1 Asset Inventory

The table below lists the estimated number of improved properties and the total value of improvements for Pike County and its participating jurisdictions (study area of vulnerability assessment). Because digital parcel data was not available for most communities, data obtained from Hazus-MH 5.1 inventory was utilized to complete the analysis.

TABLE G.26: IMPROVED PROPERTY IN PIKE COUNTY

Location	Counts of Improved Property	Total Value of Improvements
Magnolia	1,106	$221,010
McComb	6,079	$1,482,797
Osyka	309	$67,670
Summit	963	$162,688
Unincorporated Area	9,759	$3,495,366,835
PIKE COUNTY TOTAL	**18,216**	**$3,497,301,000**

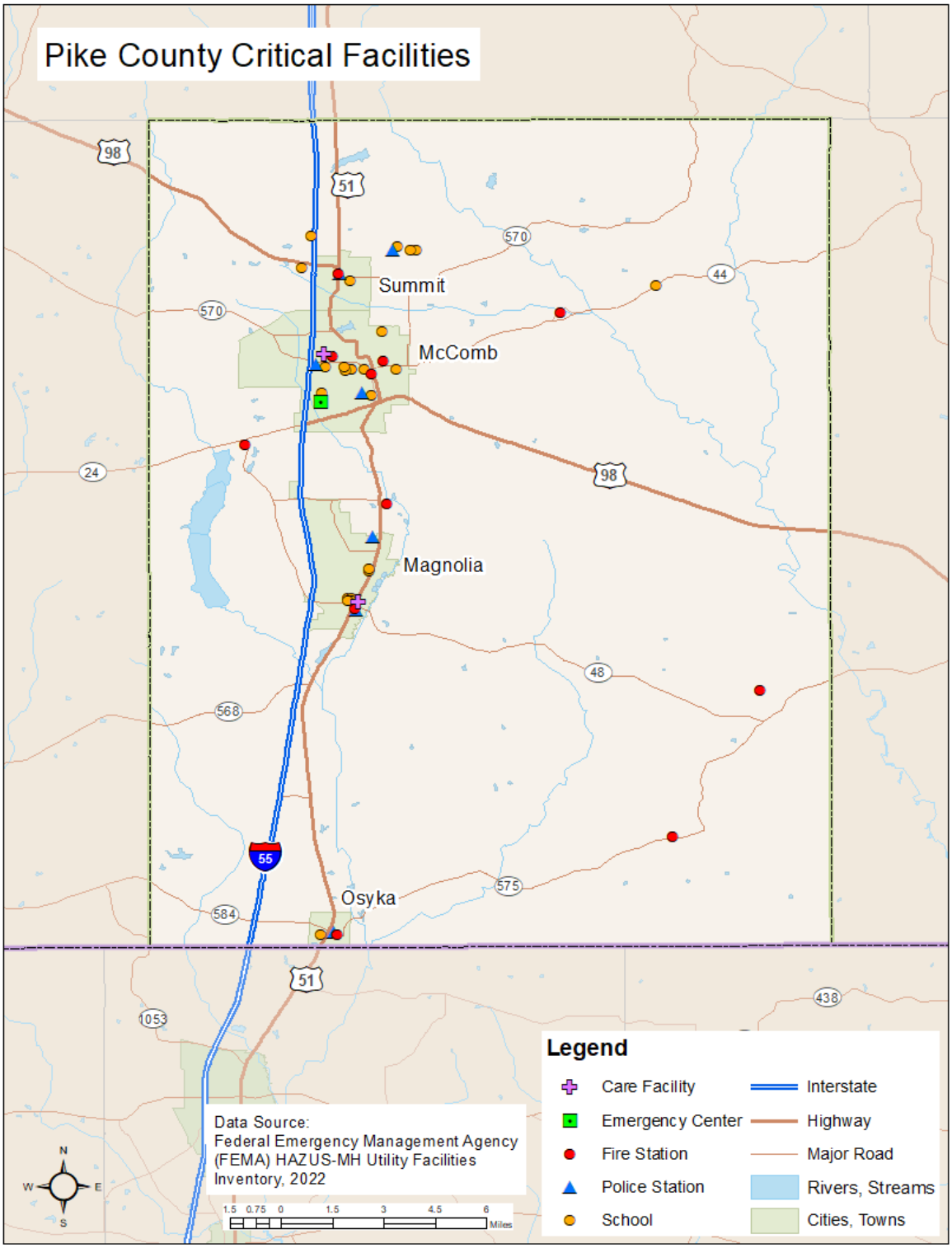
The following table lists the fire stations, police stations, medical care facilities, emergency operation centers, schools, government/public buildings, transportation infrastructure, and private facilities located in Pike County according to previous plan data and Hazus-MH 5.1 data that was reviewed and updated by local officials.

In addition, the figure below shows the locations of critical facilities in Pike County. The table at the end of this subsection shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided through Hazus which was updated, as best as possible, with local knowledge.

TABLE G.27: CRITICAL FACILITY INVENTORY IN PIKE COUNTY

Location	Fire Stations	Police Stations	Medical Care	EOC	Schools	Gov't/ Public	Trans	Private Sector
Magnolia	2	2	2	0	6	0	0	3
McComb	4	1	7	1	10	0	0	0
Osyka	2	1	0	0	1	0	0	0
Summit	1	1	0	0	8	0	0	0
Unincorporated Area	13	0	0	0	0	0	0	0
PIKE COUNTY TOTAL	**22**	**5**	**9**	**1**	**25**	**0**	**0**	**3**

FIGURE G.17: CRITICAL FACILITY LOCATIONS IN PIKE COUNTY[62]



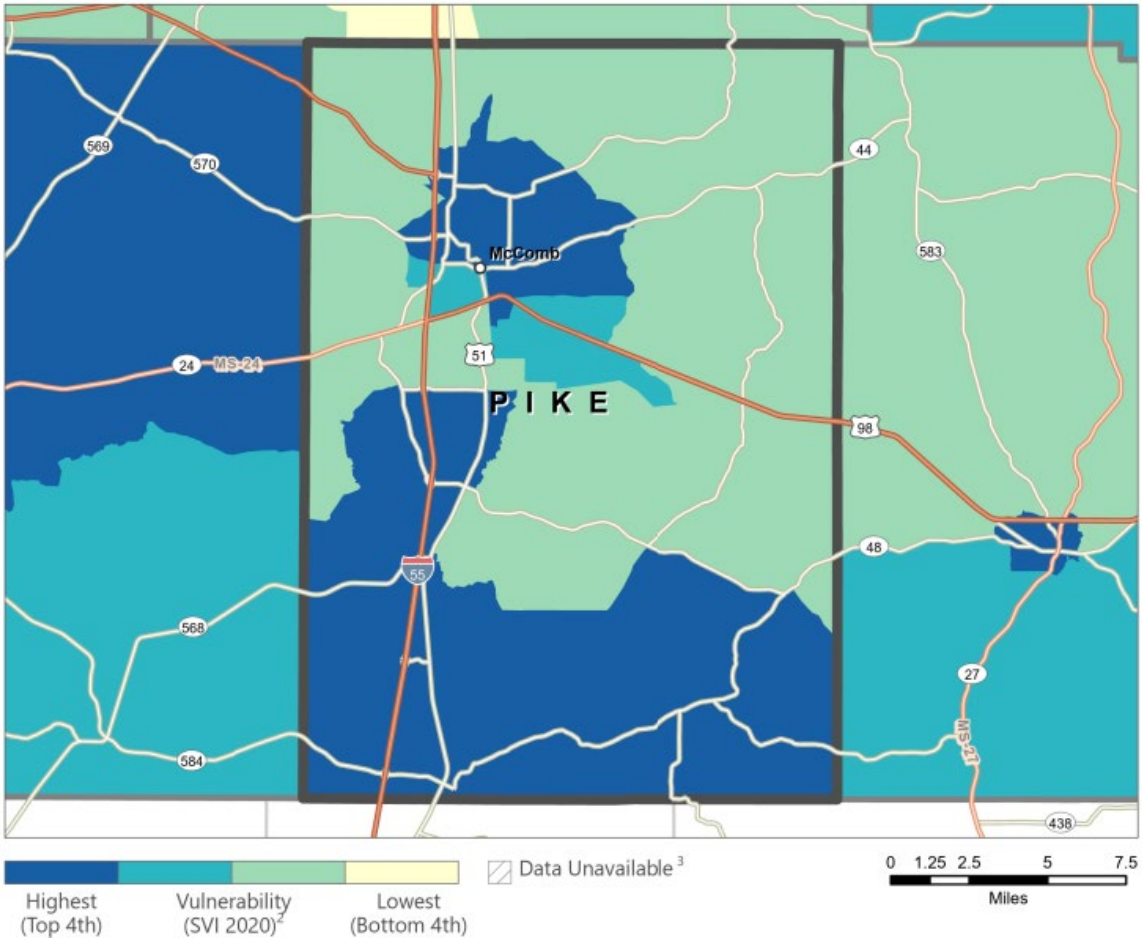
[62] HAZUS

G.3.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those segments of the resident population in Pike County that are potentially at risk for these hazards. Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss.

The CDC/ATSDR Social Vulnerability Index (CDC/ATSDR SVI) uses 16 U.S. census variables to help local officials identify communities that may need support before, during, or after disaster. See figure below for Pike County SVI score of 0.971.

FIGURE A.28: SOCIAL VULNERABILITY INDEX IN PIKE COUNTY[63]



In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those segments of the resident population in Pike County that are potentially at risk to these hazards. The table below lists the population by jurisdiction according to U.S. Census,2020. The total population in Pike County according to Census data was 40,324 persons. Additional population estimates are presented above in Section G.1.

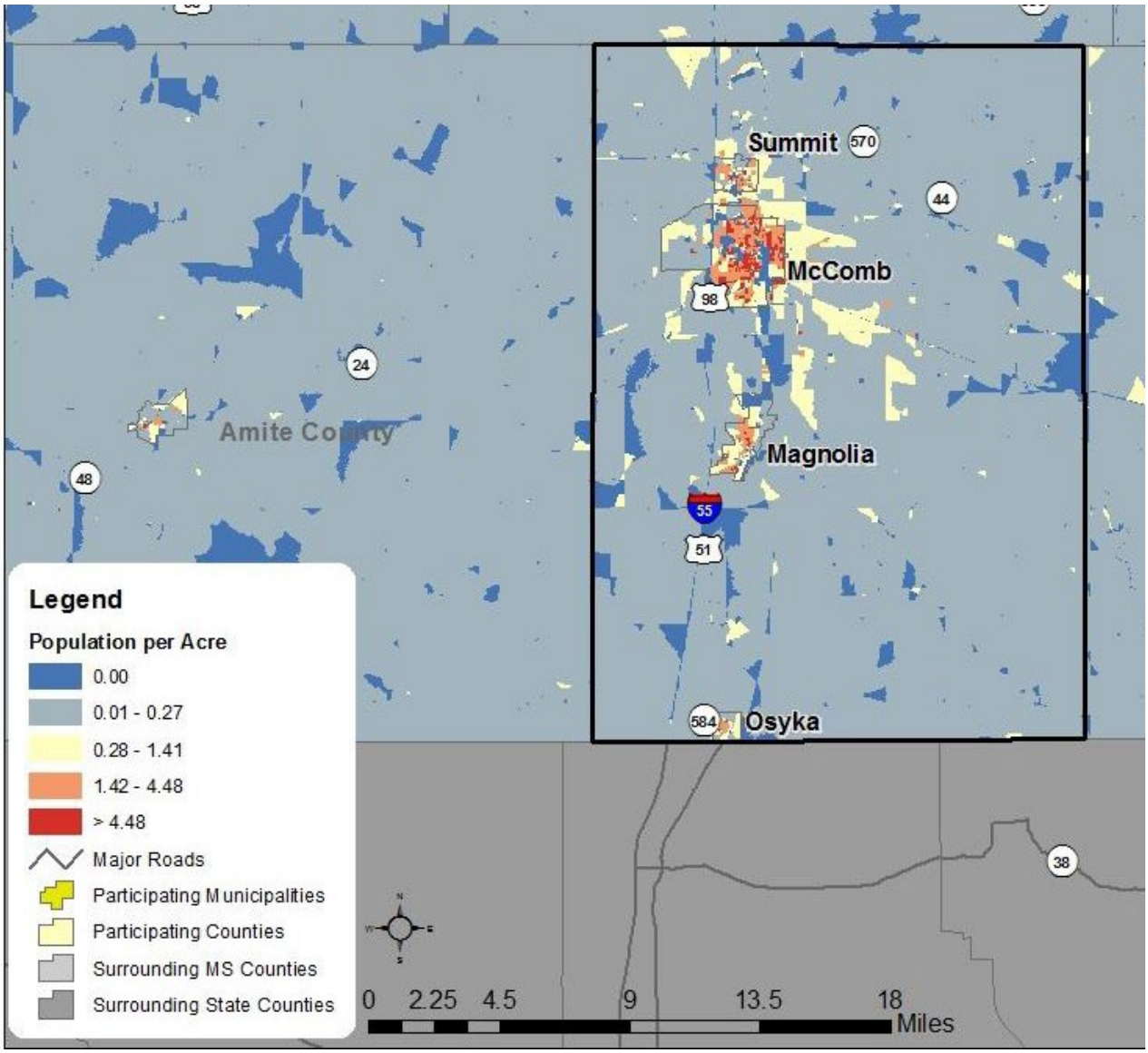
[63] CDC/ATSDR Social Vulnerability Index

TABLE G.28: TOTAL POPULATION IN PIKE COUNTY

Location	Total 2020 Population
Magnolia	1,883
McComb	12,413
Osyka	381
Summit	1,505
Unincorporated Area	24,142
Pike County Total	**40,324**

In addition, the figure below illustrates the population density per acre by census block as it was reported by the U.S. Census Bureau in 2010. As can be seen in the figure, the population is spread out with concentrations in municipal areas such as Magnolia, McComb, Osyka, and Summit.

FIGURE G.19: POPULATION DENSITY IN PIKE COUNTY[64]



[64] U.S. Census Bureau

G.3.3 Development Trends and Changes in Vulnerability

Since the previous hazard mitigation plan was approved, Pike County has experienced limited growth and development. The following table shows the number of building units constructed since 2010 according to the U.S. Census American Community Survey.

TABLE G.29: BUILDING COUNTS FOR PIKE COUNTY[65]

Location	Total Housing Units (2021)	Units Built 2010 or Later	% Building Stock Built Post-2010
Magnolia	1,121	65	5.8%
McComb	6,412	637	9.9%
Osyka	193	0	0%
Summit	964	61	6.3%
Unincorporated Area	10,192	1,207	11.8%
PIKE COUNTY TOTAL	**18,882**	**1,970**	**10.4%**

The following table shows population growth estimates for the county from 2010 to 2015 based on the U.S. Census American Community Survey.

TABLE G.30: POPULATION GROWTH FOR PIKE COUNTY[66]

Jurisdiction	2010 Census Population	2020 Census Population	% Change 2010 - 2020
Pike County	**40,404**	**40,324**	**-0.2%**
Magnolia	2,420	1,883	-22.2%
McComb	12,790	12,413	-2.9%
Osyka	440	381	-13.4%
Summit	1,705	1,505	-11.7%

Based on the data above, there has been a low rate of residential development and population growth in the county since 2010, and the county has experienced a population decline of -0.2%.

It is also important to note that as development increases in the future, greater populations and more structures and infrastructure will be exposed to potential hazards if development occurs in the floodplains or other high-risk areas.

G.3.4 Vulnerability Assessment Results

As noted in Section 6: Vulnerability Assessment, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis. Those results, specific to Pike County, are presented here. All other hazards are assumed to impact the entire planning region (drought, extreme heat, hailstorm, lightning, severe thunderstorm/high wind, tornado, and winter storm) or due to lack of data, analysis would not lead to credible results (erosion).

The hazards to be further analyzed in this subsection include dam/levee failure, flood, wildfire, earthquake, hurricane and tropical storm winds, and radiological event. The annualized loss estimate for

[65] American Community Survey – July 2021
[66] American Community Survey – July 2021

all hazards is presented near the end of this subsection.

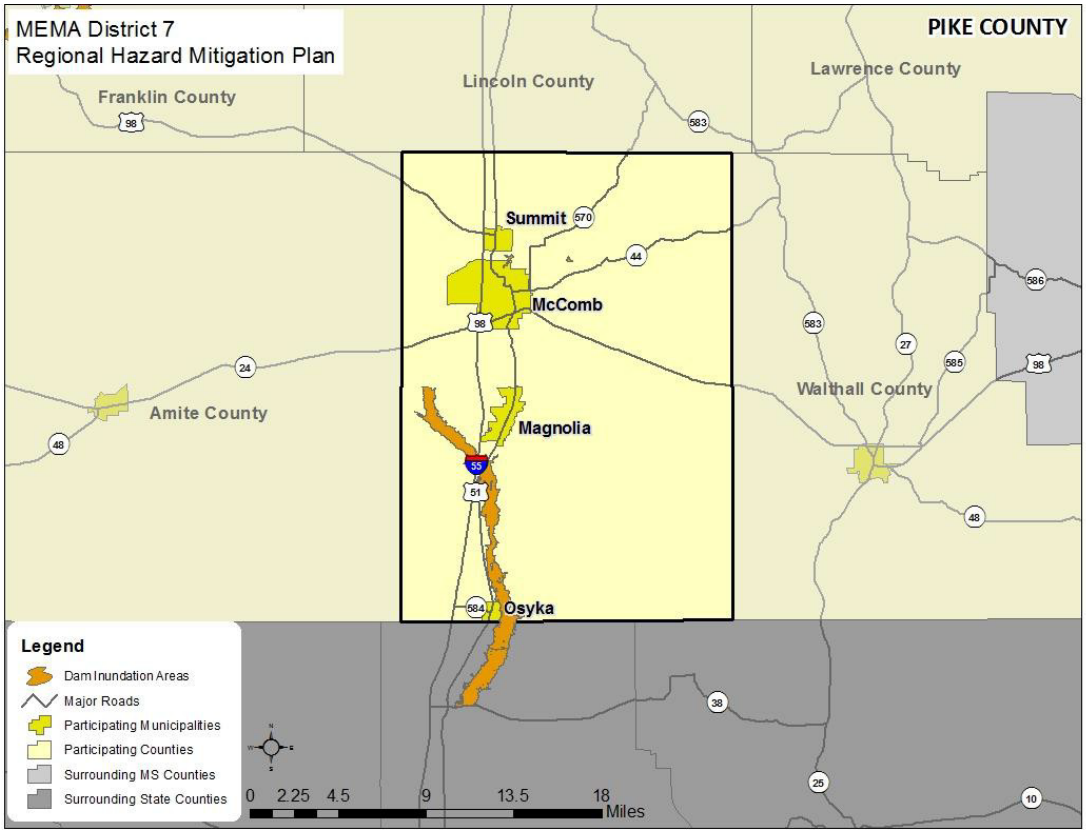
DAM/LEVEE FAILURE

To assess risk to a dam or levee failure, a GIS-based analysis was used to estimate exposure to one of the areas delineated by the Mississippi Department of Environmental Quality as a potential inundation area in the event of a failure. The determination of value at-risk (exposure) was calculated using GIS analysis by summing the values for improved properties that were located within an identified inundation area. As mentioned previously, this type of inundation mapping has not been completed for every dam/levee in the region, so the results of this analysis likely underestimate the overall vulnerability to a dam or levee failure. However, the analysis is still useful as a sort of baseline minimum of property that is potentially at-risk.

In general, building footprint and parcel data were used in this analysis. However, in some communities, due to a lack of digital parcel data, it was determined that analysis using the inventory from Hazus-MH 5.1 would be used to supplement the building/parcel data. It should be noted that this data will merely be an estimation and may not reflect actual counts or values located in dam inundation areas. Indeed, in almost all cases, this data likely overestimates the amount of property in the identified risk zones.

The table below presents the potential at-risk property. Both the number of buildings and the approximate improved value are presented.

FIGURE G.20: DAM INUNDATION AREAS IN PIKE COUNTY[67]

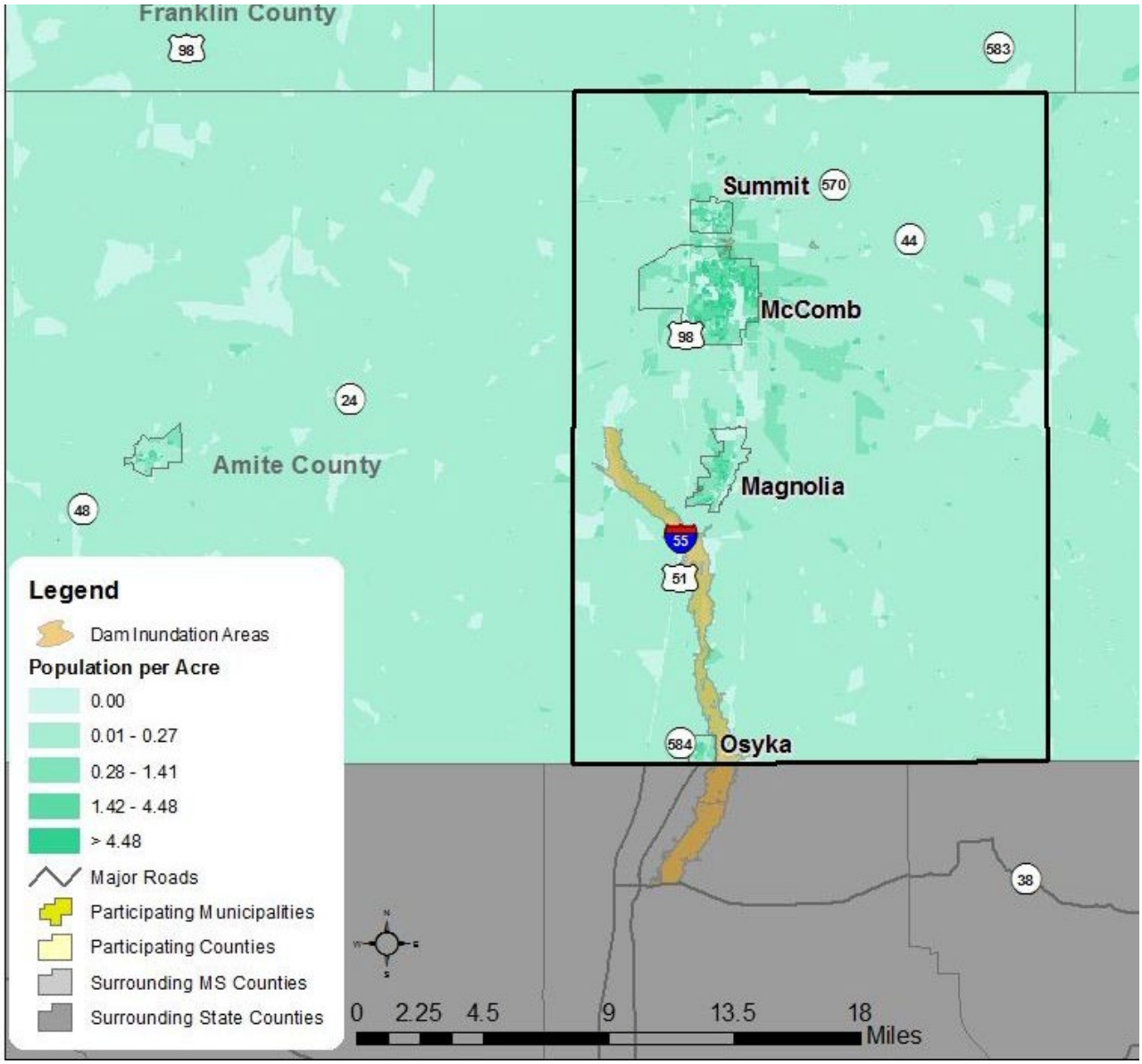


[67] Mississippi Department of Environmental Quality

Social Vulnerability

The below figure is presented to gain a better understanding of at-risk population by evaluating census block level population data against dam inundation areas. There are several areas of concern in the county, although it should be noted that most of the population of the county is not at risk to a dam/levee failure.

FIGURE G.21: POPULATION DENSITY NEAR DAM INUNDATION AREAS IN PIKE COUNTY[68]



Critical Facilities

There are no critical facilities located within the identified dam inundation areas. Although there are no facilities located in the identified areas, this does not indicate that there is no risk to a dam/levee failure,

[68] *Mississippi Department of Environmental Quality; United States Census Bureau, 2010 Census*

especially considering not all dams have delineated inundation areas. A list of specific critical facilities and their associated risk can be found at the end of this section.

In conclusion, a dam/levee failure has the potential to impact many existing and future buildings, facilities, and populations in Pike County, though structures located near or in the dam inundation areas are at highest risk. Specific vulnerabilities for Pike County assets will be greatly dependent on their individual design and the mitigation measures in place where appropriate. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates if data becomes available.

FLOOD

Historical evidence indicates that Pike County is susceptible to flood events. A total of 14 flood events have been reported by the National Climatic Data Center resulting in $1.0 million in property damage. On an annualized level, these damages amounted to $297,705 for Pike County.

To assess flood risk, a GIS-based analysis was used to estimate exposure to flood events using Digital Flood Insurance Rate Map (DFIRM) data in combination with improved property records for the county. The determination of value at-risk (exposure) was calculated using GIS analysis by summing the values for improved properties that were located within an identified floodplain. Due to a lack of digital parcel data in most counties, it was determined that an analysis using the inventory from Hazus-MH 5.1 would be used, though it should be noted that the data will merely be an estimation and may not reflect actual counts or values located in the floodplain. Indeed, in almost all cases, this analysis likely overestimates the amount of property at risk.

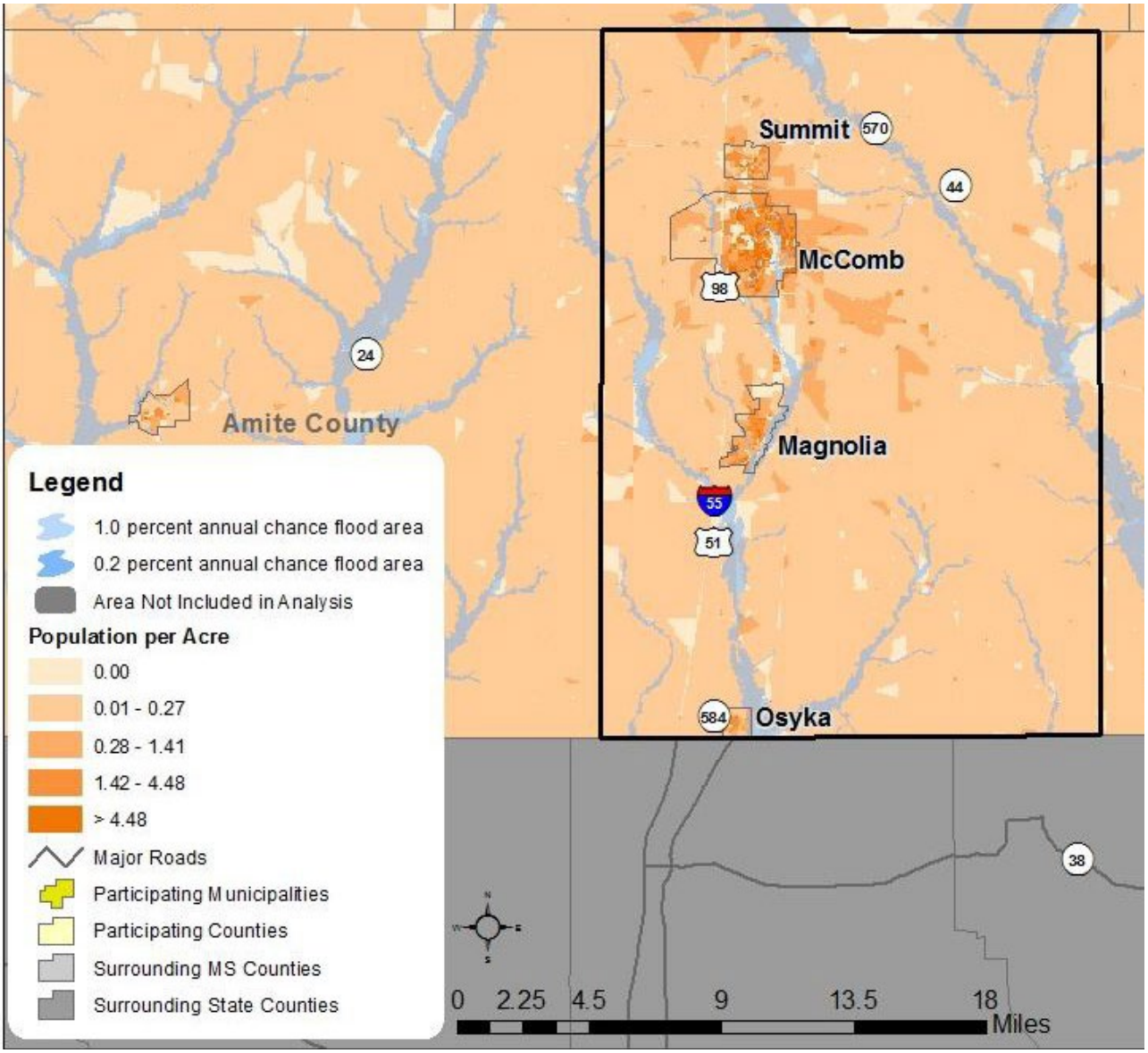
For this plan update, a HAZUS 100yr. flood scenario was performed for the study area. The geographical size of the region is approximately 411 square miles and contains 2,490 census blocks. The region contains over 5,000 households and has a total population of 13,131 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B. There are an estimated 18,216 buildings in the region with a total building replacement value (excluding contents) of $3.2 billion. Approximately 65.8% of the building value is associated with residential housing.

HAZUS estimates that there are 18,216 buildings in the county which have an aggregate total replacement value of $3.2 billion. HAZUS estimates that about 3 buildings will be at least moderately damaged. This is over 33% of the total number of buildings in the scenario, with an estimate that 1 building would be completely destroyed.

Social Vulnerability

The figure below is presented to gain a better understanding of at-risk population by evaluating census block level population data against mapped floodplains. There are areas of concern in several of the population centers. Therefore, further investigation in these areas may be warranted.

FIGURE G.22: POPULATION DENSITY NEAR FLOODPLAINS IN PIKE COUNTY[69]



Critical Facilities

The critical facility analysis revealed that there are two critical facilities located in the floodplain. (Please note, as previously indicated, this analysis does not consider building elevation, which may negate risk.) Both facilities are in the 1.0 percent annual chance flood zone, and they include a fire station and a medical care facility. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

In conclusion, a flood has the potential to impact many existing and future buildings, facilities, and populations in Pike County, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. Such site-specific

[69] Federal Emergency Management Agency DFIRM; U.S. Census Bureau, 2010

vulnerability determinations are outside the scope of this assessment but may be considered during future plan updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

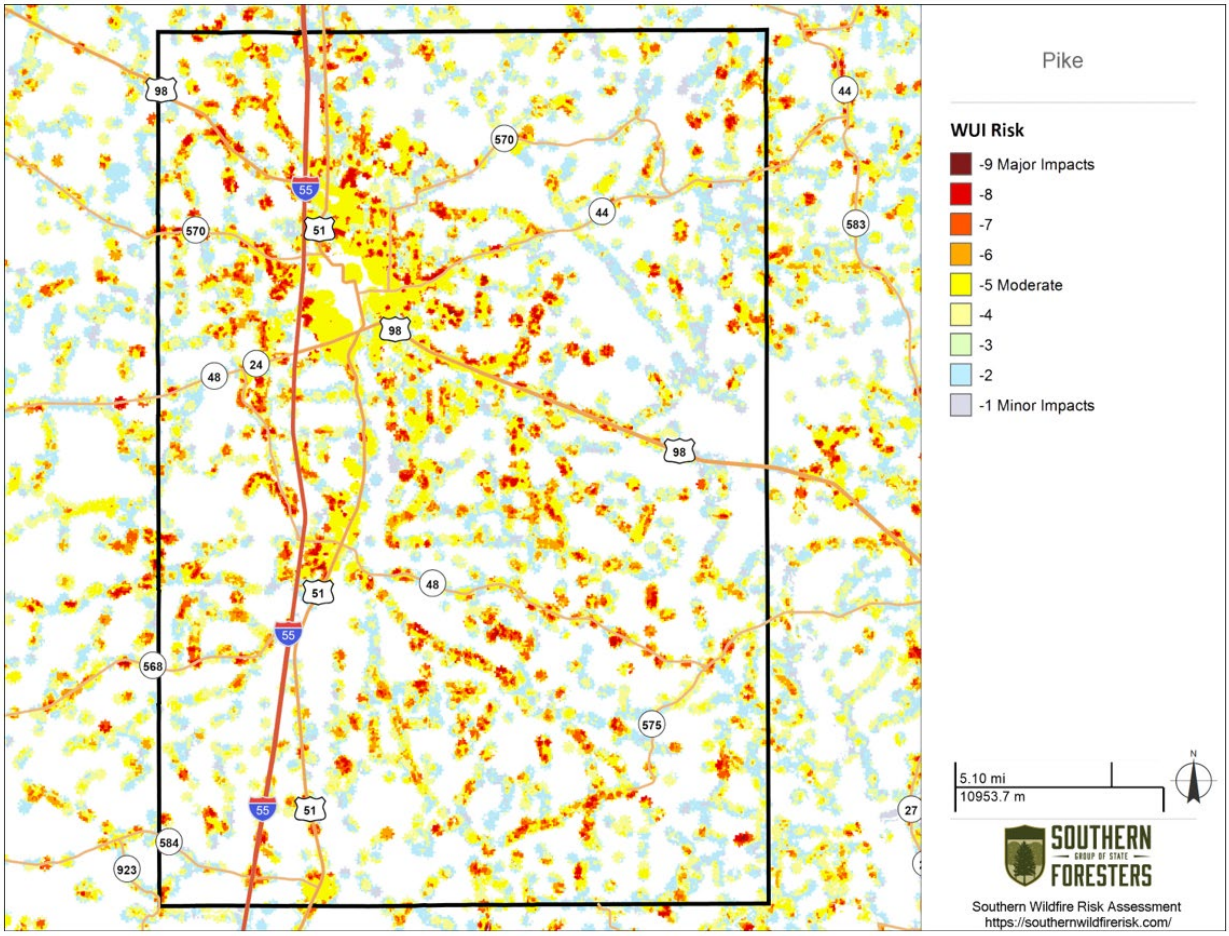
WILDFIRE

Although historical evidence indicates that Pike County is susceptible to wildfire events, there are few reports which include information on historic dollar losses. Therefore, it is difficult to calculate a reliable annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result in significant damages throughout the county.

To estimate exposure to wildfire, building data was obtained from Hazus-MH 5.1 which includes information that has been aggregated at the census block level and which has been deemed useful for analyzing wildfire vulnerability. However, it should be noted that the accuracy of Hazus data is somewhat lower than that of parcel data. For the critical facility analysis, areas of concern were intersected with critical facility locations.

The following figure presents the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). The figure below shows the areas of analysis where any grid cell is less than -4. Areas with a value below -4 were chosen to be displayed as areas of risk because this showed the upper echelon of the scale and the areas at highest risk.

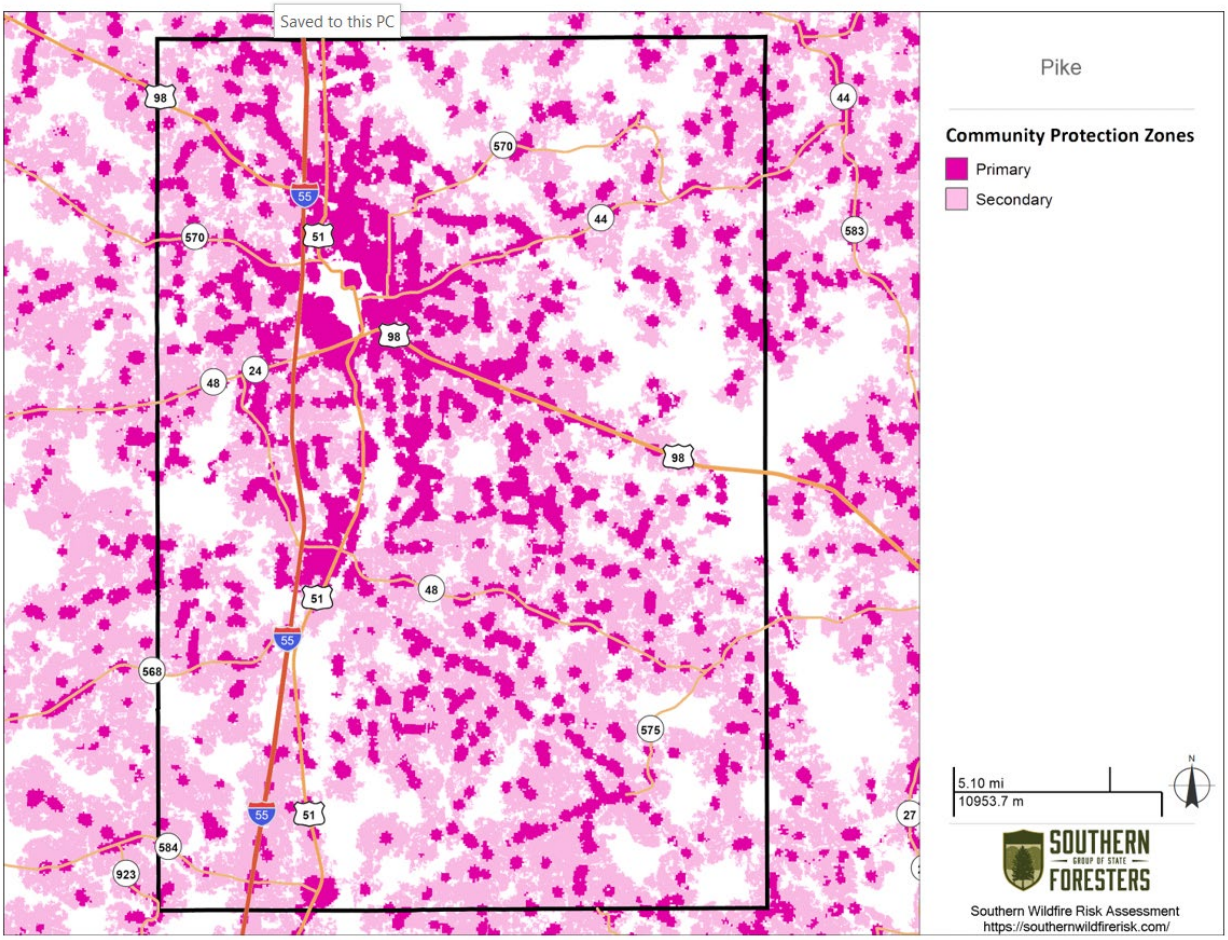
FIGURE G.23: WUI RISK INDEX AREAS IN PIKE COUNTY[70]



Community Protection Zones (CPZ) represent those areas considered highest priority for mitigation planning activities. CPZs are based on an analysis of the "Where People Live" housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ.

[70] Southern Wildfire Risk Assessment Data

FIGURE G.24: WILDFIRE RISK AREAS IN PIKE COUNTY



Social Vulnerability

Given some level of susceptibility across the entire county, it is assumed that the total population is at risk to the wildfire hazard. The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk of wildfire. For the Pike County Wildfire Risk project area, it is estimated that 31,242 people or 96.8 % percent of the total project area population (32,279) live within the WUI.

Critical Facilities

The critical facility analysis revealed that there are 31 critical facilities located in wildfire areas of concern, including 7 fire stations, 4 medical care facilities, 5 police stations, and 15 schools. It should be noted that several factors could impact the spread of a wildfire putting all facilities at risk. A list of specific critical facilities and their associated risk can be found in at the end of this subsection.

In conclusion, a wildfire event has the potential to impact many existing and future buildings, critical facilities, and populations in Pike County.

EARTHQUAKE

As the Hazus-MH model suggests below, and historical occurrences confirm, any significant earthquake activity in the area is likely to inflict minor damage to the county. Hazus-MH 5.1 estimates a total annualized loss of $22,000 which includes structural and non-structural damage to buildings, contents, and inventory throughout the county.

For the earthquake hazard vulnerability assessment, a probabilistic scenario was created to estimate the average annualized loss 27 for the county. The results of the analysis are generated at the census tract level within Hazus-MH and then aggregated to the county level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss. They do not include losses to business interruption, lost income, or relocation.

Social Vulnerability

It can be assumed that all existing and future populations are at risk to the earthquake hazard.

Critical Facilities

The Hazus-MH probabilistic analysis did not indicate that any critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor to moderate damage should an event occur. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

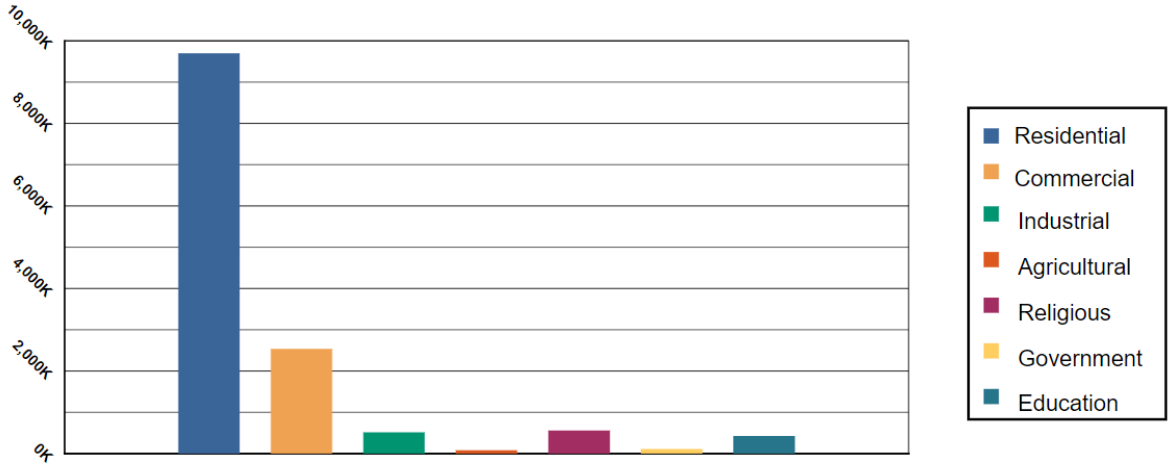
In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in Pike County. Specific vulnerabilities for these assets will be greatly dependent on their individual design and the mitigation measures in place. Such site-specific vulnerability determinations are outside the scope of this assessment but may be considered during future plan updates. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While Pike County may not experience a catastrophic earthquake, localized damage is possible with a moderate to larger scale occurrence.

HURRICANE AND TROPICAL STORM

Historical evidence indicates that Pike County has significant risk to the hurricane and tropical storm hazard. There have been eight disaster declarations due to hurricanes as noted in pervious sections. Several tracks have come near or traversed through the county, as shown, and discussed in Section G.2.10. Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard. Hazus-MH 5.1 was used to determine average annualized losses for the county as shown. Only losses to buildings, inventory, and contents are included in the results.

HAZUS was utilized to perform a 100-year hurricane simulation. Hazus estimates that there are 82,485 buildings in the region which have an aggregate total replacement value of $13 billion dollars.

FIGURE G.35: BUILDING EXPOSURE BY OCCUPANCY TYPE[71]



Social Vulnerability

Given some equal susceptibility across the entire county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard.

Critical Facilities

For essential facilities, there are 11 hospitals in the region with a total bed capacity of 605 beds. There are 90 schools, 74 fire stations, 32 police stations and 9 emergency operation facilities. HAZUS estimates that about 133 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 4 buildings that will be destroyed.
The total property damage losses were $71 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies, which made up over 95% of the total loss. The table below provides a summary of the losses associated with the building damage.

RADIOLOGICAL EVENT

The location of Grand Gulf and River Bend Nuclear Stations north and south of the region demonstrate that the county is at some risk to the effects of a nuclear accident. Although there have not been any major events at these plants in the past, there have been major events at other nuclear stations around the country. Additionally, smaller scale incidents at both these nuclear stations have occurred.

To assess nuclear risk, a GIS-based analysis was used to estimate exposure during a nuclear event within each of the risk zones described in Section G.2.14. The determination of assessed value-at-risk (exposure) was calculated using GIS analysis by summing the total values for those properties that were confirmed to be located within one of the risk zones. The figure above presents potential at-risk properties in the 50-mile buffer zone (no property was in the 10-mile buffer zone). The number of buildings, parcels, and the approximate value is presented.

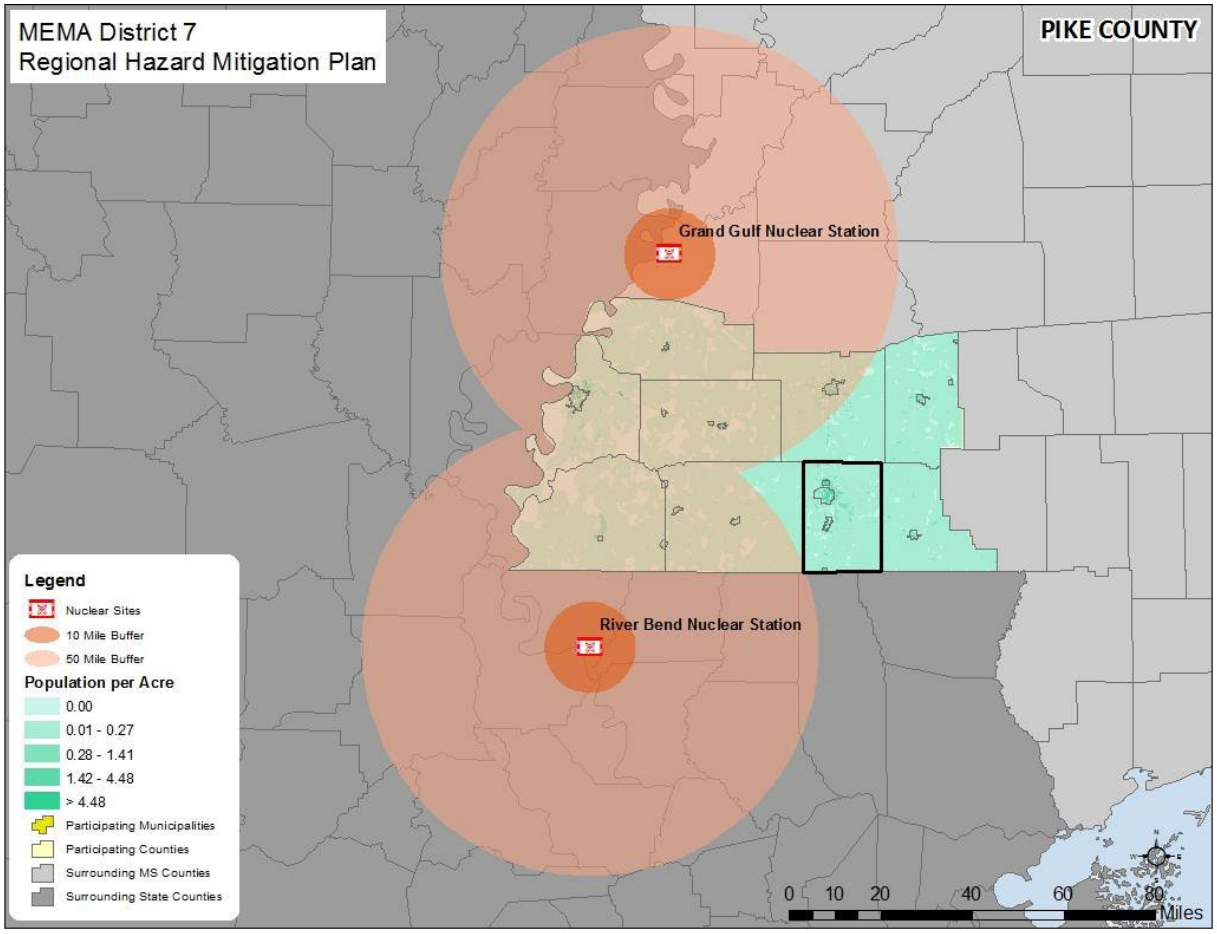
Social Vulnerability

Only a small area in the southwestern corner of the county is within the 50-mile buffer area, this segment of the population is considered to be at high risk to a radiological event. However, other

[71] HAZUS 100-year Hurricane Scenario

populations in the county may also be at some risk.

FIGURE G.26: POPULATION DENSITY NEAR NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN PIKE COUNTY[72]



Critical Facilities

The critical facility analysis revealed that there are no critical facilities located in the 50-mile nuclear buffer area. However, the county is located on the boundary of the buffer area, so facilities may be at some risk. No critical facilities are located in the 10-mile buffer area. A list of specific critical facilities and their associated risk can be found at the end of this section.

In conclusion, a nuclear accident has the potential to impact existing and future buildings, facilities, and populations in Pike County.

CONCLUSIONS ON HAZARD VULNERABILITY

Table G.44 presents a summary of annualized loss for each hazard in Pike County. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage

[72] International Atomic Energy Agency; U.S. Census Bureau, 2010

reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

TABLE G.31: ANNUALIZED LOSS FOR PIKE COUNTY[73]

Event	Pike County
Flood-related Hazards	
Dam and Levee Failure	Negligible
Erosion	Negligible
Flood	$297,705
Fire-related Hazards	
Drought	Negligible
Lightning	$492
Wildfire	Negligible
Geologic Hazards	
Earthquake*	$6,000
Wind-related Hazards	
Extreme Heat	Negligible
Hailstorm	$3,548
Hurricane & Tropical Storm	$24,593,909
Severe Thunderstorm/High Wind	$51,568
Tornado	$2,400,146
Winter Storm & Freeze	$0
Human-caused Hazards	
Radiological Event	Negligible

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to atmospheric hazards including drought, lightning, extreme heat, hailstorm, hurricane and tropical storm, severe thunderstorm/high wind, tornado, and winter storm and freeze. Some buildings may be more vulnerable to these hazards based on other factors such as construction and building type. Table G.45 shows the critical facilities vulnerable to the hazards analyzed in this section. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "X").

[73] No historic losses for earthquake were recorded, so Hazus estimates for annualized loss were used. In this table, the term "Negligible" is used to indicate that no records of dollar losses for the hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that event is not well kept.

TABLE G.32: AT-RISK CRITICAL FACILITIES IN PIKE COUNTY

		FLOOD-RELATED				FIRE-RELATED			GEO	WIND-RELATED						HUM	
FACILITY NAME	FACILITY TYPE	Dam and Levee Failure	Erosion	Flood – 100 yr	Flood – 500 yr	Drought	Lightning	Wildfire	Earthquake	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Severe Thunderstorm/	Tornado	Winter Storm and Freeze	Radiological Event 10-mile area	Radiological Event 50-mile area
Pike County																	
Pike County EOC	EOC		X			X	X		X	X	X	X	X	X	X		
Friendship Fire Department #2	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
Friendship Volunteer Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
Magnolia Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
McComb Fire Chief	Fire Station		X			X	X		X	X	X	X	X	X	X		
McComb Fire Department #2	Fire Station		X			X	X		X	X	X	X	X	X	X		
McComb Fire Department #3	Fire Station		X	X		X	X		X	X	X	X	X	X	X		
Progress Volunteer Fire Department #1	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
Progress Volunteer Fire Department #2	Fire Station		X			X	X		X	X	X	X	X	X	X		
Rural Osyka Volunteer Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
Summit Rural Volunteer Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
Sunnyhill Vol. Fire Dept. Hwy 48 West McComb,MS	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
Aston Court Assisted Living Personal Care	Medical Care		X			X	X		X	X	X	X	X	X	X		
Beacham Memorial Hospital	Medical Care		X			X	X		X	X	X	X	X	X	X		
Camelia Estates Living/Nursing Home	Medical Care		X			X	X	X	X	X	X	X	X	X	X		
Family Practice Clinic of McComb	Medical Care		X			X	X		X	X	X	X	X	X	X		
Magnolia Clinic	Medical Care		X			X	X	X	X	X	X	X	X	X	X		
McComb Extended Care Center	Medical Care		X			X	X	X	X	X	X	X	X	X	X		

		FLOOD-RELATED				FIRE-RELATED			GEO	WIND-RELATED						HUM	
FACILITY NAME	FACILITY TYPE	Dam and Levee Failure	Erosion	Flood – 100 yr	Flood – 500 yr	Drought	Lightning	Wildfire	Earthquake	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Severe Thunderstorm/	Tornado	Winter Storm and Freeze	Radiological Event 10-mile area	Radiological Event 50-mile area
McComb Nursing and Rehab	Medical Care		X			X	X	X	X	X	X	X	X	X	X		
SW Miss Regional Hospital	Medical Care		X			X	X		X	X	X	X	X	X	X		
The Claiborne	Medical Care		X	X		X	X		X	X	X	X	X	X	X		
Magnolia Police Dept	Police Station		X			X	X	X	X	X	X	X	X	X	X		
Mc Comb Police-Animal Control	Police Station		X			X	X		X	X	X	X	X	X	X		
Mc Comb Police-Support Svc	Police Station		X			X	X	X	X	X	X	X	X	X	X		
Mc Comb Police Department	Police Station		X			X	X		X	X	X	X	X	X	X		
Pike County Sheriff's Office	Police Station		X			X	X	X	X	X	X	X	X	X	X		
Pike County Sheriff's Office	Police Station		X			X	X	X	X	X	X	X	X	X	X		
Summit Police Dept	Police Station		X			X	X	X	X	X	X	X	X	X	X		
Kroft	Private Sector		X			X	X		X	X	X	X	X	X	X		
Metro Pike Industrial Park	Private Sector		X			X	X		X	X	X	X	X	X	X		
Weyerhauser Packaging	Private Sector		X			X	X		X	X	X	X	X	X	X		
Denman Jr High School	School		X			X	X	X	X	X	X	X	X	X	X		
Eva Gordon Elementary School	School		X			X	X		X	X	X	X	X	X	X		
Higgins Middle School	School		X			X	X	X	X	X	X	X	X	X	X		
Kennedy Elementary School	School		X			X	X		X	X	X	X	X	X	X		
Magnolia Elementary School	School		X			X	X	X	X	X	X	X	X	X	X		
McComb High School	School		X			X	X		X	X	X	X	X	X	X		
McComb Voc-Tech Center	School		X			X	X	X	X	X	X	X	X	X	X		

		FLOOD-RELATED				FIRE-RELATED			GEO	WIND-RELATED						HUM	
FACILITY NAME	FACILITY TYPE	Dam and Levee Failure	Erosion	Flood – 100 yr	Flood – 500 yr	Drought	Lightning	Wildfire	Earthquake	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Severe Thunderstorm/	Tornado	Winter Storm and Freeze	Radiological Event 10-mile area	Radiological Event 50-mile area
North Pike Elementary School	School		X			X	X	X	X	X	X	X	X	X	X		
North Pike Upper Elementary School	School																
North Pike High School	School		X			X	X	X	X	X	X	X	X	X	X		
North Pike Middle School	School		X			X	X	X	X	X	X	X	X	X	X		
Osyka Elementary School	School		X			X	X	X	X	X	X	X	X	X	X		
Otken Elementary School	School		X			X	X	X	X	X	X	X	X	X	X		
Parklane Academy	School		X			X	X	X	X	X	X	X	X	X	X		
South Pike High School	School		X			X	X	X	X	X	X	X	X	X	X		
South Pike Jr High School	School		X			X	X	X	X	X	X	X	X	X	X		
Southwest Mississippi Community College	School		X			X	X	X	X	X	X	X	X	X	X		
St. Alphonsus Elementary School	School		X			X	X		X	X	X	X	X	X	X		
Summit Learning Center	School		X			X	X	X	X	X	X	X	X	X	X		
Westbrook Head Start	School		X			X	X	X	X	X	X	X	X	X	X		

G.4 PIKE COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Pike County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in Section 7: Capability Assessment.

G.4.1 Planning and Regulatory Capability

Table G.46 provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Pike County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. A dagger (†) indicates that the given item is administered for that municipality by the county. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the MEMA District 7 Regional Hazard Mitigation Plan.

TABLE G.33: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Threat and Hazard Identification and Risk Assessment (THIRA)	Comprehensive Land Use Plan	Floodplain Management Plan/Flood Mitigation Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Emergency Management Accreditation Program (EMAP Accreditation)	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment/ Reconstruction Plan/ Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System (CRS Program)
PIKE COUNTY	✓	✓	✓	✓					✓		✓				✓		✓								✓	
Magnolia	†		†	†					†						†		✓		✓			✓	✓	✓	
McComb	†		✓	†		✓			†						†		✓	✓	✓			✓	✓	✓	
Osyka	†		†	†					†						†		✓							✓	
Summit	†		†	†					†						†							✓			

A more detailed discussion on the county's planning and regulatory capabilities follows.

EMERGENCY MANAGEMENT

Hazard Mitigation Plan

Pike County has previously adopted a hazard mitigation plan. The City of Magnolia, City of McComb, Town of Osyka, and Town of Summit were also included in this plan.

Emergency Operations Plan
Pike County maintains an emergency operations plan through its Emergency Management Agency. The City of Magnolia, City of McComb, Town of Osyka, and Town of Summit are also covered by this plan.

GENERAL PLANNING

Comprehensive Land Use Plan
Pike County has adopted a county comprehensive plan. This plan also includes the City of Magnolia, City of McComb, Town of Osyka, and Town of Summit. The City of McComb has also adopted a city comprehensive plan.

Historic Preservation Plan
None of the jurisdictions in Pike County has a historic preservation plan. However, the City of McComb has adopted a historic preservation ordinance.

Zoning Ordinance
The City of McComb is the only jurisdiction in Pike County that has adopted a zoning ordinance.

Subdivision Ordinance
The City of Magnolia and City of McComb are the only jurisdictions in Pike County that have adopted a subdivision ordinance.

Building Codes, Permitting, and Inspections
The City of McComb is the only jurisdiction in Pike County that has adopted a building code.

FLOODPLAIN MANAGEMENT

Table G.47 provides NFIP policy and claim information for each participating jurisdiction in Pike County.

TABLE G.34: NFIP POLICY AND CLAIM INFORMATION[74]

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force^	Closed Claims	Total Payments to Date
PIKE COUNTY†	09/15/89	06/18/10	19	$14,498,900	44	$2,388,270.22
Magnolia	07/01/87	06/18/10	1	$1,323,400	0	$0
McComb	08/01/79	06/18/10	4	$11,809,700	8	$22,935.97
Osyka	10/16/12	06/18/10	0	$350,000	0	$0
Summit*	--	--	--	--	--	--

†Includes unincorporated areas of county only

[74] *NFIP Community Status information as of 7/2/2023; NFIP claims and policy information as of 7/2/2023*

^last available data 2017
*Community does not participate in the NFIP

All jurisdictions listed above that are participants in the NFIP will continue to comply with all required provisions of the program and will work to adequately comply in the future utilizing a number of strategies. For example, the jurisdictions will coordinate with MEMA and FEMA to develop maps and regulations related to special flood hazard areas within their jurisdictional boundaries and, through a consistent monitoring process, will design and improve their floodplain management program in a way that reduces the risk of flooding to people and property.

As noted above, all jurisdictions are not participants in the NFIP. The Town of Summit does not participate because it currently does not have any identified flood hazard areas within its jurisdiction, so most residents would be unlikely to purchase flood insurance.

Flood Damage Prevention Ordinance

All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. Pike County, City of Magnolia, City of McComb, and Town of Osyka all participate in the NFIP and have adopted flood damage prevention regulations.

Stormwater Management Plan

Pike County does not have a stormwater management plan or ordinance in place. However, the City of McComb has adopted a local stormwater detention ordinance.

G.4.2 Administrative and Technical Capability

The table below provides a summary of the capability assessment results for Pike County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill. A dagger (†) indicates a county-level staff member(s) provides the specified knowledge or skill to that municipality.

TABLE G.35: RELEVANT STAFF/PERSONNEL RESOURCES

Staff/Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
PIKE COUNTY		✓		✓	✓		✓	✓	✓	
Magnolia		✓		†	†		†	†	†	

McComb	✓	✓		†	†		†	†	†	
Osyka		✓		†	†		†	†	†	
Summit		✓		†	†		†	†	†	

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

G.4.3 Fiscal Capability

The table below provides a summary of the results for Pike County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource has previously been used to implement hazard mitigation actions. A dagger (†) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds).

TABLE G.36: RELEVANT FISCAL RESOURCES

Fiscal Tool/Resource	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes (or taxing districts)	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other: FEMA Hazard Mitigation Grants, Homeland Security Grants, USDA Rural Development Agency Grants, and US Economic Development Administration Grants
PIKE COUNTY	✓	†						✓	†	✓
Magnolia		†			✓			✓		†
McComb	✓	✓	✓		✓			✓	†	†
Osyka		†			✓			✓		†
Summit		†			✓			✓		†

G.4.4 Political Capability

During the months immediately following a disaster, local public opinion in Pike County is more likely to shift in support of hazard mitigation efforts.

The table below provides a summary of the results for Pike County regarding political capability. A checkmark (✓) indicates the expected degree of political support by local elected officials in terms of adopting/funding information.

TABLE G.37: LOCAL POLITICAL SUPPORT

Political Support	Limited	Moderate	High
PIKE COUNTY		✓	
Magnolia		✓	
McComb		✓	
Osyka		✓	
Summit	✓		

G.4.5 Conclusions on Local Capability

The table below shows the results of the capability assessment using the designed scoring methodology described in Section 7: Capability Assessment. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. This information was reviewed by all jurisdictions and each jurisdiction provided feedback on the information included in the capability assessment. Local government input was vital to identifying capabilities. According to the assessment, the average local capability score for the county and its jurisdictions is 21.2, which falls into the limited capability ranking.

TABLE G.38: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
PIKE COUNTY	27	Moderate
Magnolia	19	Limited
McComb	32	Moderate
Osyka	18	Limited
Summit	10	Limited

G.5 PIKE COUNTY MITIGATION STRATEGY

This subsection provides the blueprint for Pike County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and the findings and conclusions of the capability assessment and risk assessment. In addition, this strategy was developed with the State Hazard Mitigation Plan Goals and Objectives in mind. For this update, each action identifies the State Hazard Mitigation Program Objective that it relates to. Additional Information can be found in Section 8: Mitigation Strategy and Section 9: Mitigation Action Plan.

G.5.1 Mitigation Goals

Pike County developed six mitigation goals in coordination with the other participating MEMA District 7 Region jurisdictions. The regional mitigation goals are presented in the table below.

TABLE G.39: MEMA DISTRICT 7 REGIONAL MITIGATION GOALS

	Goal
Goal #1	Increase the overall public awareness of natural hazards that face the region.
Goal #2	Retrofit of critical facilities and/or critical infrastructure to lower the risk of damage from natural hazards.
Goal #3	General improvement of regional or local mitigation planning and capability.
Goal #4	Support State Identified Mitigation Initiatives such as saferooms and storm shelters, severe weather warning systems for universities and colleges, and severe weather notification systems for local communities.
Goal #5	Reduce loss of life, damage and loss of property and infrastructure, economic costs, including response, recovery and disruption of economic activity.
Goal #6	Foster cooperation among all levels of governments and the private sector with respect to improving, updating, and implementing the hazard mitigation plan.

G.5.2 Mitigation Action Plan

The mitigation actions proposed by Pike County, City of Magnolia, City of McComb, Town of Osyka, and Town of Summit are listed in the following individual Mitigation Action Plans.

Pike County Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implement Sched.	Implementation Status (2023)
Prevention								
P-1	2.2	**Comprehensive Land Use and Long-Term Recovery Planning –** The Pike County Board of Supervisors/Cities of Magnolia and McComb/ Towns of Summit and Osyka should have a Comprehensive Plan developed to guide long term recovery and development.	Hurricane or other hazard	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress-2027	Remains an ongoing project. The Pike County Board of Supervisors/Cities of Magnolia and McComb/Towns of Summit and Osyka recognize that comprehensive land use planning yields many benefits for both the county and cities. The existence of a Comprehensive Plan enables a county or municipality to institute zoning ordinances to regulate new development and protect or upgrade existing development and it provides a solid basis to establish stronger building codes. Many of the goals of Long Term Recovery Planning and Comprehensive Planning are one and the same. The City of McComb Comprehensive Plan was updated in 2016, however, the county plan should also be reviewed and update, so this action will remain in the plan.

P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	Pike County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress-2027	This remains and ongoing project, but the county has made significant progress since the last plan update. A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.
P-3	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist counties with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as counties develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Low	Pike County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2027	This project has been downgraded to Low Priority, but remains a potential project. Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.
P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.

P-5	1.4	**Base Level Engineering –** Collaborate with local or regional resources develop Base Level Engineering, watershed-wide engineering modeling that leverages high resolution ground elevation, automated model building techniques, and manual model review to prepare broad and accurate flood risk information for FEMA to assess its current flood hazard inventory.	Flood	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Pike County Board of Supervisors/Cities of Magnolia and McComb/ Towns of Summit and Osyka should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	Completed	The EOC had retrofitting of the roof, panels were made available to cover windows to sustain 150MPH winds. The Pike County Board of Supervisors/Cities of Magnolia and McComb/Towns of Summit and Osyka recognize that damage to public buildings from wind is a serious hazard affecting the ability of government to function during and after disasters. Roof and structural damage and loss of electrical service in county/city government buildings due to high winds can render these buildings at least temporarily unusable and can potentially cause disruptions in government services. Retrofits of essential government buildings have not been completed. Therefore, this action will remain in the plan to lessen potential wind damage to those structures.
PP-2	1.1	**Retrofit Existing Public Buildings for Hail Resistance –** The Pike County Board of Supervisors/Cities of Magnolia and McComb/ Towns of Summit and Osyka should seek to retrofit all essential government buildings to increase their resistance to the effects of hail.	Hailstorm	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, individual county general and special funds	2026	New Action.

Natural Resource Protection								
NRP-1	1.6	**Bank Stabilization –** Prevent bank erosion through sloping or grading techniques, planting vegetation on slopes, terracing, or installing riprap boulders or geotextile fabric and prohibiting removal of natural vegetation from stream banks.	Erosion, Flood	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2025	New Action
Structural Projects								
SP-1	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
SP-2	1.9	**Harden the Electrical Grid –** Pike County will encourage and support local energy providers in assessing potential risks in the electric grid and taking strategic actions to proactively mitigate those risks, harden key infrastructure, and protect utility customers from outages.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, Lightning, or other hazard leading to loss of electrical power	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action.
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather	Hurricane, Winter Storm	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka in collaboration with the Mississippi	General and special funds	In progress – 2027	This item has been downgraded from High to Moderate but remains an item of concern for the county. Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. The

		arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.			Emergency Management Agency			county is in the process of becoming "storm ready" countywide including the towns, so this action will remain in the plan. This action was combined with ES-6 since they were duplicate actions.
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, or other hazard leading to loss of electrical power	High	Pike County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	Some progress has been made with county courthouse, city halls, and sheriff's office has a generator. The county is looking to procure more standby generators for some of the rural fire stations that do not have backup generators, and some of the lift stations across the county. Also, the rural water associations need standby generators for some well sites. Many critical facility generators are at capacity. The County will also target these locations due to the need for increased load.
ES-3	1.8	**Improve Emergency Communications –** Purchase a satellite phone system to ensure communications capabilities are unimpeded during natural disasters even if traditional communications systems fail.	Hurricane or other hazard leading to loss of traditional communications systems	Low	Pike County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2027	While this remains of interest to the county, other alternatives are currently being explored. Loss of the communication capabilities between law enforcement offices, other emergency responders, and other units of government during a natural disaster can have a severe impact on the functioning of government to provide relief and assistance to citizens and maintain civil order. This can also cause very significant problems for private citizens who need assistance, especially the elderly and other special needs

								persons. Pike County continues to improve emergency communications and will purchase a satellite phone system when funding allows, so this action will remain in the plan.
ES-4	1.9	**Construct New Emergency Shelter –** The county should construct a 200-person evacuation shelter. When not needed for disaster related housing, the building will serve as a Community Center and can be rented by individuals for group functions such as family reunions, weddings, or class reunions. Should an earthquake impact the surrounding region, the County typically is expected to house a number of evacuees. An evacuation shelter is necessary to support this function.	Hurricane, Earthquake, Tornado or other hazard requiring the use of emergency shelters	High	Pike County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	Completed	A 361-storm shelter was constructed at 2017 Quinnlivin Rd. The Pike County Board of Supervisors recognize the need to have modern, safe emergency shelters for county/city/town residents and evacuees from other areas during times of disaster. Currently a combination of schools, churches, and other government buildings are used. This works acceptably for short-term use, but for longer term needs as were seen in the Hurricane Katrina disaster, the presence of evacuees in these facilities for more than a few days caused a disruption in the facility's designed function. A regional storm/evacuation shelter is currently being constructed off of Hwy 55, so this action will remain in the plan.
ES-5	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide/citywide system.	Tornado	High	Pike County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	2027	The county has made progress by securing 3 new sirens in the last 6 years, but the interest remains to cover more of the rural parts of the county should funding become available. Many citizens in Pike County live in rural areas and small communities. In the event of inclement weather, it is essential that they receive timely warnings. A warning system needs to be installed in Pike County, so this action will remain in the plan.
ES-7	1.1	**Purchase additional MSWIN Radios** The County has made progress with the MSWIN radio system, they would like to procure additional radios for fire and law enforcement, both mobiles as well as portable radios.	All	High	Pike County Emergency Management	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund, E911 radio system	2025	New Project

ES-8	1.9	**Hurricane Community Safe Rooms-** Hurricanes in addition to other wind events such as tornadoes and straight-line winds pose a significant threat to the county as demonstrated by the historical losses the county has incurred. The county wishes to build safe rooms at fire stations and police stations to house up to 16 people each designed and sized appropriately based on FEMA P-320 guidance.	Hurricane	High	Pike County Emergency Management Agency, Pike	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Project
ES-9	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Pike County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2027	New Action.
ES-10	1.1	**Radiological Detection and Response Equipment** – Pike County recognizes the need for increased ability to both detect and respond to radiological events.	Radiological	Low	Pike County Board of Supervisors	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county	2026	New Action.

						general and special funds		
ES-11	1.4	**Lightning Early Detection System** –A lightning warning system is a system that alerts you about potential lightning strikes at a specific location. The lightning warning system is based on measurements of electric fields. If detected, alert via the lightning alert app will notify the Pike County EMA of the coming storm.	Lightning	Moderate	Pike County Board of Supervisors	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	New Action.
Public Education and Awareness								
PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Low	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	N/A	2027	This project has been downgraded to Low, with consideration for deletion at the next plan update. Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan.
PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Pike County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP. There is continued interest within the county, but additional funding is needed to support this activity.

PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	Moderate	Pike County EMA, MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2027	The county chose to downgrade this to moderate, but it remains an item of interest for public outreach for those within the dam inundation area. There is a need for community outreach to both the general public and to the owners of high hazard dams concerning maintenance and Emergency Action Planning. It is important that the public and owners are aware of high hazard dams, so this action will remain in the plan.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	Moderate	Pike County EMA, MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2027	This remains an ongoing effort with the landowners. Emergency action plans are developed, exercised, and maintained by the individual dam owners. The MDEQ, Dam Safety Division is tasked to review the plans. Pike County will continue to support the outreach to high hazard and significant hazard dam owners, so this action will remain in the plan.
PEA-5	3.2	**Education: FireWise –** Recommend that public information and outreach workshops on the *Firewise* program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Pike County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, individual county general and special funds	2027	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan. Implementation is targeted toward the southern part of the County

PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Pike County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Pike County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, general and special funds	2025	New Action

PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2024	New Action.
PEA-11	3.1	**Education: Public Outreach –** Develop a program to encourage school programs to incorporate the Great Shake Out	Earthquake	Low	Amite County Board of Supervisors/ Towns of Liberty and Gloster	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.

City of Magnolia Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implement Sched.	Implementation Status (2023)
Prevention								
P-1	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	City of Magnolia Board of Aldermen and Mayor/Pike County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress-2027	This remains and ongoing project, but the county has made significant progress since the last plan update. A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist counties with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as counties develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Low	City of Magnolia Board of Aldermen and Mayor/Pike County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2027	This project has been downgraded to Low Priority but remains a potential project. Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.

P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
P-5	1.4	**Base Level Engineering –** Collaborate with local or regional resources develop Base Level Engineering, watershed-wide engineering modeling that leverages high resolution ground elevation, automated model building techniques, and manual model review to prepare broad and accurate flood risk information for FEMA to assess its current flood hazard inventory.	Flood	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Pike County Board of Supervisors/Cities of Magnolia and McComb/ Towns of Summit and Osyka should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	Completed	The EOC had retrofitting of the roof, panels were made available to cover windows to sustain 150MPH winds. The Pike County Board of Supervisors/Cities of Magnolia and McComb/Towns of Summit and Osyka recognize that damage to public buildings from wind is a serious hazard affecting the ability of government to function during and after disasters. Roof and structural damage and loss of electrical service in county/city government buildings due to high winds can render these buildings at least temporarily unusable and can potentially cause disruptions in government services. Retrofits of essential government buildings have not been completed. Therefore, this action will remain in the plan to lessen

								potential wind damage to those structures.
PP-2	1.1	**Retrofit Existing Public Buildings for Hail Resistance –** The Pike County Board of Supervisors/Cities of Magnolia and McComb/ Towns of Summit and Osyka should seek to retrofit all essential government buildings to increase their resistance to the effects of hail.	Hailstorm	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, individual county general and special funds	2026	New Action.
Natural Resource Protection								
NRP-1	1.6	**Bank Stabilization –** Prevent bank erosion through sloping or grading techniques, planting vegetation on slopes, terracing, or installing riprap boulders or geotextile fabric and prohibiting removal of natural vegetation from stream banks.	Erosion, Flood	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2025	New Action
Structural Projects								
SP-1	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
SP-2	1.9	**Harden the Electrical Grid –** Pike County will encourage and support local energy providers in assessing potential risks in the electric grid and taking strategic actions to proactively mitigate those risks, harden key infrastructure, and protect utility customers from outages.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, Lightning, or other hazard leading to loss of	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action.

			electrical power					
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Hurricane, Winter Storm	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka in collaboration with the Mississippi Emergency Management Agency	General and special funds	In progress – 2027	This item has been downgraded from High to Moderate but remains an item of concern for the county. Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. The county is in the process of becoming "storm ready" countywide including the towns, so this action will remain in the plan. This action was combined with ES-6 since they were duplicate actions.
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, or other hazard leading to loss of electrical power	High	City of Magnolia Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	Some progress has been made with county courthouse, city halls, and sheriff's office has a generator. The county is looking to procure more standby generators for some of the rural fire stations that do not have backup generators, and some of the lift stations across the county. Also, the rural water associations need standby generators for some well sites. Many critical facility generators are at capacity. The County will also target these locations due to the need for increased load.
ES-3	1.8	**Improve Emergency Communications –** Purchase a satellite phone system to ensure communications capabilities are unimpeded	Hurricane or other hazard leading to loss of	Low	City of Magnolia Board of Aldermen and	Homeland Security grants, USDA Rural Development	2027	While this remains of interest to the county, other alternatives are currently being explored. Loss of the

		during natural disasters even if traditional communications systems fail.	traditional communications systems		Mayor	Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds		communication capabilities between law enforcement offices, other emergency responders, and other units of government during a natural disaster can have a severe impact on the functioning of government to provide relief and assistance to citizens and maintain civil order. This can also cause very significant problems for private citizens who need assistance, especially the elderly and other special needs persons. Pike County continues to improve emergency communications and will purchase a satellite phone system when funding allows, so this action will remain in the plan.
ES-4	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide/citywide system.	Tornado	High	City of Magnolia Board of Aldermen and Mayor	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	2027	In the event of inclement weather, it is essential that residents of the City of Magnolia receive timely warnings. A warning system needs to be installed in the City of Magnolia, so this action will remain in the plan.
ES-6	1.9	**Safe Rooms and Community Shelters –** The city should construct and/or encourage construction of safe rooms and community shelters.	Hurricane, Tornado or other hazard requiring the use of emergency shelters	High	City of Magnolia Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual city general and special funds	2026	Although his action has been delayed, it remains a priority to the city.

ES-7		**Purchase additional MSWIN Radios** The County has made progress with the MSWIN radio system, they would like to procure additional radios for fire and law enforcement, both mobiles as well as portable radios.	All	High	City of Magnolia Board of Aldermen and Mayor/Pike County Emergency Management	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund, E911 radio system	2025	New Action.
ES-8	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	City of Magnolia Board of Aldermen and Mayor/Pike County Emergency Management	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2027	New Action.
ES-9	1.1	**Radiological Detection and Response Equipment** – Pike County recognizes the need for increased ability to both detect and respond to radiological events.	Radiological	Low	City of Magnolia Board of Aldermen and Mayor/Pike County Emergency Management	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county	2026	New Action.

						general and special funds		
ES-10		**Lightning Early Detection System** –A lightning warning system is a system that alerts you about potential lightning strikes at a specific location. The lightning warning system is based on measurements of electric fields. If detected, alert via the lightning alert app will notify the Pike County EMA of the coming storm.	Lightning	Moderate	City of Magnolia Board of Aldermen and Mayor/Pike County Emergency Management	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	New Action.
Public Education and Awareness								
PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Low	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	N/A	2027	This project has been downgraded to Low, with consideration for deletion at the next plan update. Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan.
PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Pike County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP. There is continued interest within the county, but additional funding is needed to support this activity.

PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	Moderate	Pike County EMA, MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2027	The county chose to downgrade this to moderate, but it remains an item of interest for public outreach for those within the dam inundation area. There is a need for community outreach to both the general public and to the owners of high hazard dams concerning maintenance and Emergency Action Planning. It is important that the public and owners are aware of high hazard dams, so this action will remain in the plan.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	Moderate	Pike County EMA, MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2027	This remains an ongoing effort with the landowners. Emergency action plans are developed, exercised, and maintained by the individual dam owners. The MDEQ, Dam Safety Division is tasked to review the plans. Pike County will continue to support the outreach to high hazard and significant hazard dam owners, so this action will remain in the plan.
PEA-5	3.2	**Education: FireWise –** Recommend that public information and outreach workshops on the *Firewise* program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Pike County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, individual county general and special funds	2027	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan. Implementation is targeted toward the southern part of the County

PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Pike County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Pike County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, general and special funds	2025	New Action

PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2024	New Action.
PEA-11	3.1	**Education: Public Outreach –** Develop a program to encourage school programs to incorporate the Great Shake Out	Earthquake	Low	Amite County Board of Supervisors/ Towns of Liberty and Gloster	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.

City of McComb Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implement Sched.	Implementation Status (2023)
Prevention								
P-1	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	City of McComb Board of Aldermen and Mayor/Pike County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress-2027	This remains and ongoing project, but the county has made significant progress since the last plan update. A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist counties with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as counties develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Low	City of McComb Board of Aldermen and Mayor/Pike County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2027	This project has been downgraded to Low Priority but remains a potential project. Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.

P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
P-5	1.4	**Base Level Engineering –** Collaborate with local or regional resources develop Base Level Engineering, watershed-wide engineering modeling that leverages high resolution ground elevation, automated model building techniques, and manual model review to prepare broad and accurate flood risk information for FEMA to assess its current flood hazard inventory.	Flood	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Pike County Board of Supervisors/Cities of Magnolia and McComb/ Towns of Summit and Osyka should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	Completed	The EOC had retrofitting of the roof, panels were made available to cover windows to sustain 150MPH winds. The Pike County Board of Supervisors/Cities of Magnolia and McComb/Towns of Summit and Osyka recognize that damage to public buildings from wind is a serious hazard affecting the ability of government to function during and after disasters. Roof and structural damage and loss of electrical service in county/city government buildings due to high winds can render these buildings at least temporarily unusable and can potentially cause disruptions in government services. Retrofits of essential government buildings have not

								been completed. Therefore, this action will remain in the plan to lessen potential wind damage to those structures.
PP-2	1.1	**Retrofit Existing Public Buildings for Hail Resistance –** The Pike County Board of Supervisors/Cities of Magnolia and McComb/ Towns of Summit and Osyka should seek to retrofit all essential government buildings to increase their resistance to the effects of hail.	Hailstorm	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, individual county general and special funds	2026	New Action.
Natural Resource Protection								
NRP-1	1.6	**Bank Stabilization –** Prevent bank erosion through sloping or grading techniques, planting vegetation on slopes, terracing, or installing riprap boulders or geotextile fabric and prohibiting removal of natural vegetation from stream banks.	Erosion, Flood	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2025	New Action
Structural Projects								
SP-1	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
SP-2	1.9	**Harden the Electrical Grid –** Pike County will encourage and support local energy providers in assessing potential risks in the electric grid and taking strategic actions to proactively mitigate those risks, harden key infrastructure, and protect utility	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, Lightning, or	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action.

		customers from outages.	other hazard leading to loss of electrical power					
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Hurricane, Winter Storm	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka in collaboration with the Mississippi Emergency Management Agency	General and special funds	In progress – 2027	This item has been downgraded from High to Moderate but remains an item of concern for the county. Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. The county is in the process of becoming "storm ready" countywide including the towns, so this action will remain in the plan. This action was combined with ES-6 since they were duplicate actions.
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, or other hazard leading to loss of electrical power	High	City of McComb Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	Some progress has been made with county courthouse, city halls, and sheriff's office has a generator. The county is looking to procure more standby generators for some of the rural fire stations that do not have backup generators, and some of the lift stations across the county. Also, the rural water associations need standby generators for some well sites. Many critical facility generators are at capacity. The County will also target these locations due to the need for increased load.

ES-3	1.8	**Improve Emergency Communications –** Purchase a satellite phone system to ensure communications capabilities are unimpeded during natural disasters even if traditional communications systems fail.	Hurricane or other hazard leading to loss of traditional communications systems	Low	City of McComb Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2027	While this remains of interest to the county, other alternatives are currently being explored. Loss of the communication capabilities between law enforcement offices, other emergency responders, and other units of government during a natural disaster can have a severe impact on the functioning of government to provide relief and assistance to citizens and maintain civil order. This can also cause very significant problems for private citizens who need assistance, especially the elderly and other special needs persons. Pike County continues to improve emergency communications and will purchase a satellite phone system when funding allows, so this action will remain in the plan.
ES-4	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide/citywide system.	Tornado	High	City of McComb Board of Aldermen and Mayor	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	2027	In the event of inclement weather, it is essential that residents of the City of McComb receive timely warnings. A warning system needs to be installed in the City of McComb, so this action will remain in the plan.
ES-6	1.9	**Safe Rooms and Community Shelters –** The city should construct and/or encourage construction of safe rooms and community shelters.	Hurricane, Tornado or other hazard requiring the use of emergency shelters	High	City of McComb Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual city general and special funds	2026	Although his action has been delayed, it remains a priority to the city.

ES-7		**Purchase additional MSWIN Radios** The County has made progress with the MSWIN radio system, they would like to procure additional radios for fire and law enforcement, both mobiles as well as portable radios.	All	High	City of McComb Board of Aldermen and Mayor/Pike County Emergency Management	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund, E911 radio system	2025	New Action.
ES-8	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	City of McComb Board of Aldermen and Mayor/Pike County Emergency Management	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2027	New Action.
ES-9	1.1	**Radiological Detection and Response Equipment** – Pike County recognizes the need for increased ability to both detect and respond to radiological events.	Radiological	Low	City of McComb Board of Aldermen and Mayor/Pike County Emergency Management	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	New Action.

ES-10		**Lightning Early Detection System** –A lightning warning system is a system that alerts you about potential lightning strikes at a specific location. The lightning warning system is based on measurements of electric fields. If detected, alert via the lightning alert app will notify the Pike County EMA of the coming storm.	Lightning	Moderate	City of McComb Board of Aldermen and Mayor/Pike County Emergency Management	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	New Action.
Public Education and Awareness								
PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Low	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	N/A	2027	This project has been downgraded to Low, with consideration for deletion at the next plan update. Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan.
PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Pike County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP. There is continued interest within the county, but additional funding is needed to support this activity.

PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	Moderate	Pike County EMA, MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2027	The county chose to downgrade this to moderate, but it remains an item of interest for public outreach for those within the dam inundation area. There is a need for community outreach to both the general public and to the owners of high hazard dams concerning maintenance and Emergency Action Planning. It is important that the public and owners are aware of high hazard dams, so this action will remain in the plan.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	Moderate	Pike County EMA, MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2027	This remains an ongoing effort with the landowners. Emergency action plans are developed, exercised, and maintained by the individual dam owners. The MDEQ, Dam Safety Division is tasked to review the plans. Pike County will continue to support the outreach to high hazard and significant hazard dam owners, so this action will remain in the plan.
PEA-5	3.2	**Education: FireWise –** Recommend that public information and outreach workshops on the *Firewise* program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Pike County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, individual county general and special funds	2027	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan. Implementation is targeted toward the southern part of the County

PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Pike County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Pike County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, general and special funds	2025	New Action

PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2024	New Action.
PEA-11	3.1	**Education: Public Outreach –** Develop a program to encourage school programs to incorporate the Great Shake Out	Earthquake	Low	Amite County Board of Supervisors/ Towns of Liberty and Gloster	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.

Town of Osyka Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implement Sched.	Implementation Status (2023)
Prevention								
P-1	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	Town of Osyka Board of Aldermen and Mayor/Pike County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress-2027	This remains and ongoing project, but the county has made significant progress since the last plan update. A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist counties with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as counties develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Low	Town of Osyka Board of Aldermen and Mayor/Pike County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2027	This project has been downgraded to Low Priority but remains a potential project. Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.

P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
P-5	1.4	**Base Level Engineering –** Collaborate with local or regional resources develop Base Level Engineering, watershed-wide engineering modeling that leverages high resolution ground elevation, automated model building techniques, and manual model review to prepare broad and accurate flood risk information for FEMA to assess its current flood hazard inventory.	Flood	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Pike County Board of Supervisors/Cities of Magnolia and McComb/ Towns of Summit and Osyka should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	Completed	The EOC had retrofitting of the roof, panels were made available to cover windows to sustain 150MPH winds. The Pike County Board of Supervisors/Cities of Magnolia and McComb/Towns of Summit and Osyka recognize that damage to public buildings from wind is a serious hazard affecting the ability of government to function during and after disasters. Roof and structural damage and loss of electrical service in county/city government buildings due to high winds can render these buildings at least temporarily unusable and can potentially cause disruptions in government services. Retrofits of essential government buildings have not been completed. Therefore, this action will remain in the plan to lessen potential wind damage to those

								structures.
PP-2	1.1	**Retrofit Existing Public Buildings for Hail Resistance –** The Pike County Board of Supervisors/Cities of Magnolia and McComb/ Towns of Summit and Osyka should seek to retrofit all essential government buildings to increase their resistance to the effects of hail.	Hailstorm	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, individual county general and special funds	2026	New Action.
Natural Resource Protection								
NRP-1	1.6	**Bank Stabilization –** Prevent bank erosion through sloping or grading techniques, planting vegetation on slopes, terracing, or installing riprap boulders or geotextile fabric and prohibiting removal of natural vegetation from stream banks.	Erosion, Flood	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2025	New Action
Structural Projects								
SP-1	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
SP-2	1.9	**Harden the Electrical Grid –** Pike County will encourage and support local energy providers in assessing potential risks in the electric grid and taking strategic actions to proactively mitigate those risks, harden key infrastructure, and protect utility customers from outages.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, Lightning, or other hazard leading to loss of electrical power	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action.

Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Hurricane, Winter Storm	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka in collaboration with the Mississippi Emergency Management Agency	General and special funds	In progress – 2027	This item has been downgraded from High to Moderate but remains an item of concern for the county. Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. The county is in the process of becoming "storm ready" countywide including the towns, so this action will remain in the plan. This action was combined with ES-6 since they were duplicate actions.
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, or other hazard leading to loss of electrical power	High	Town of Osyka Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	Some progress has been made with county courthouse, city halls, and sheriff's office has a generator. The county is looking to procure more standby generators for some of the rural fire stations that do not have backup generators, and some of the lift stations across the county. Also, the rural water associations need standby generators for some well sites. Many critical facility generators are at capacity. The County will also target these locations due to the need for increased load.
ES-3	1.8	**Improve Emergency Communications –** Purchase a satellite phone system to ensure communications capabilities are unimpeded during natural disasters even if traditional communications systems fail.	Hurricane or other hazard leading to loss of traditional communications	Low	Town of Osyka Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard	2027	While this remains of interest to the county, other alternatives are currently being explored. Loss of the communication capabilities between law enforcement offices, other emergency

			systems			Mitigation grants, US Economic Development Administration grants, individual county general and special funds		responders, and other units of government during a natural disaster can have a severe impact on the functioning of government to provide relief and assistance to citizens and maintain civil order. This can also cause very significant problems for private citizens who need assistance, especially the elderly and other special needs persons. Pike County continues to improve emergency communications and will purchase a satellite phone system when funding allows, so this action will remain in the plan.
ES-4	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide/citywide system.	Tornado	High	Town of Osyka Board of Aldermen and Mayor	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	2027	In the event of inclement weather, it is essential that residents of the Town of Osyka receive timely warnings. A warning system needs to be installed in the Town of Osyka, so this action will remain in the plan.
ES-6	1.9	**Safe Rooms and Community Shelters –** The city should construct and/or encourage construction of safe rooms and community shelters.	Hurricane, Tornado or other hazard requiring the use of emergency shelters	High	Town of Osyka Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual city general and special funds	2026	Although his action has been delayed, it remains a priority to the city.

ES-7		**Purchase additional MSWIN Radios** The County has made progress with the MSWIN radio system, they would like to procure additional radios for fire and law enforcement, both mobiles as well as portable radios.	All	High	Town of Osyka Board of Aldermen and Mayor/Pike County Emergency Management	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund, E911 radio system	2025	New Action.
ES-8	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Town of Osyka Board of Aldermen and Mayor/Pike County Emergency Management	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2027	New Action.
ES-9	1.1	**Radiological Detection and Response Equipment** – Pike County recognizes the need for increased ability to both detect and respond to radiological events.	Radiological	Low	Town of Osyka Board of Aldermen and Mayor/Pike County Emergency Management	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	New Action.

ES-10		**Lightning Early Detection System** –A lightning warning system is a system that alerts you about potential lightning strikes at a specific location. The lightning warning system is based on measurements of electric fields. If detected, alert via the lightning alert app will notify the Pike County EMA of the coming storm.	Lightning	Moderate	Town of Osyka Board of Aldermen and Mayor/Pike County Emergency Management	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	New Action.
Public Education and Awareness								
PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Low	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	N/A	2027	This project has been downgraded to Low, with consideration for deletion at the next plan update. Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan.
PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Pike County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP. There is continued interest within the county, but additional funding is needed to support this activity.

PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	Moderate	Pike County EMA, MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2027	The county chose to downgrade this to moderate, but it remains an item of interest for public outreach for those within the dam inundation area. There is a need for community outreach to both the general public and to the owners of high hazard dams concerning maintenance and Emergency Action Planning. It is important that the public and owners are aware of high hazard dams, so this action will remain in the plan.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	Moderate	Pike County EMA, MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2027	This remains an ongoing effort with the landowners. Emergency action plans are developed, exercised, and maintained by the individual dam owners. The MDEQ, Dam Safety Division is tasked to review the plans. Pike County will continue to support the outreach to high hazard and significant hazard dam owners, so this action will remain in the plan.
PEA-5	3.2	**Education: FireWise –** Recommend that public information and outreach workshops on the *Firewise* program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Pike County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, individual county general and special funds	2027	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan. Implementation is targeted toward the southern part of the County

PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Pike County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Pike County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, general and special funds	2025	New Action

PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2024	New Action.
PEA-11	3.1	**Education: Public Outreach –** Develop a program to encourage school programs to incorporate the Great Shake Out	Earthquake	Low	Amite County Board of Supervisors/ Towns of Liberty and Gloster	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.

Town of Summit Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implement Sched.	Implementation Status (2023)
Prevention								
P-1	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	Town of Summit Board of Aldermen and Mayor/Pike County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress-2027	This remains and ongoing project, but the county has made significant progress since the last plan update. A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist counties with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as counties develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Low	Town of Summit Board of Aldermen and Mayor/Pike County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2027	This project has been downgraded to Low Priority but remains a potential project. Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.

P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Summit	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
P-5	1.4	**Base Level Engineering –** Collaborate with local or regional resources develop Base Level Engineering, watershed-wide engineering modeling that leverages high resolution ground elevation, automated model building techniques, and manual model review to prepare broad and accurate flood risk information for FEMA to assess its current flood hazard inventory.	Flood	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Pike County Board of Supervisors/Cities of Magnolia and McComb/ Towns of Summit and Osyka should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	Completed	The EOC had retrofitting of the roof, panels were made available to cover windows to sustain 150MPH winds. The Pike County Board of Supervisors/Cities of Magnolia and McComb/Towns of Summit and Osyka recognize that damage to public buildings from wind is a serious hazard affecting the ability of government to function during and after disasters. Roof and structural damage and loss of electrical service in county/city government buildings due to high winds can render these buildings at least temporarily unusable and can potentially cause disruptions in government services. Retrofits of essential government buildings have not

								been completed. Therefore, this action will remain in the plan to lessen potential wind damage to those structures.
PP-2	1.1	**Retrofit Existing Public Buildings for Hail Resistance –** The Pike County Board of Supervisors/Cities of Magnolia and McComb/ Towns of Summit and Osyka should seek to retrofit all essential government buildings to increase their resistance to the effects of hail.	Hailstorm	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, individual county general and special funds	2026	New Action.
Natural Resource Protection								
NRP-1	1.6	**Bank Stabilization –** Prevent bank erosion through sloping or grading techniques, planting vegetation on slopes, terracing, or installing riprap boulders or geotextile fabric and prohibiting removal of natural vegetation from stream banks.	Erosion, Flood	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2025	New Action
Structural Projects								
SP-1	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
SP-2	1.9	**Harden the Electrical Grid –** Pike County will encourage and support local energy providers in assessing potential risks in the electric grid and taking strategic actions to proactively mitigate those risks, harden key infrastructure, and protect utility customers from outages.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, Lightning, or other hazard	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action.

			leading to loss of electrical power					
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Hurricane, Winter Storm	High	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka in collaboration with the Mississippi Emergency Management Agency	General and special funds	In progress – 2027	This item has been downgraded from High to Moderate but remains an item of concern for the county. Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. The county is in the process of becoming "storm ready" countywide including the towns, so this action will remain in the plan. This action was combined with ES-6 since they were duplicate actions.
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, or other hazard leading to loss of electrical power	High	Town of Summit Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	Some progress has been made with county courthouse, city halls, and sheriff's office has a generator. The county is looking to procure more standby generators for some of the rural fire stations that do not have backup generators, and some of the lift stations across the county. Also, the rural water associations need standby generators for some well sites. Many critical facility generators are at capacity. The County will also target these locations due to the need for increased load.
ES-3	1.8	**Improve Emergency Communications –** Purchase a satellite phone system to ensure communications capabilities are unimpeded	Hurricane or other hazard leading to loss of	Low	Town of Summit Board of Aldermen and	Homeland Security grants, USDA Rural Development	2027	While this remains of interest to the county, other alternatives are currently being explored. Loss of the

		during natural disasters even if traditional communications systems fail.	traditional communications systems		Mayor	Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds		communication capabilities between law enforcement offices, other emergency responders, and other units of government during a natural disaster can have a severe impact on the functioning of government to provide relief and assistance to citizens and maintain civil order. This can also cause very significant problems for private citizens who need assistance, especially the elderly and other special needs persons. Pike County continues to improve emergency communications and will purchase a satellite phone system when funding allows, so this action will remain in the plan.
ES-4	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide/citywide system.	Tornado	High	Town of Summit Board of Aldermen and Mayor	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	2027	In the event of inclement weather, it is essential that residents of the Town of Summit receive timely warnings. A warning system needs to be installed in the Town of Summit, so this action will remain in the plan.
ES-6	1.9	**Safe Rooms and Community Shelters –** The city should construct and/or encourage construction of safe rooms and community shelters.	Hurricane, Tornado or other hazard requiring the use of emergency shelters	High	Town of Summit Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual city general and special funds	2026	Although his action has been delayed, it remains a priority to the city.

ES-7		**Purchase additional MSWIN Radios** The County has made progress with the MSWIN radio system, they would like to procure additional radios for fire and law enforcement, both mobiles as well as portable radios.	All	High	Town of Summit Board of Aldermen and Mayor/Pike County Emergency Management	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund, E911 radio system	2025	New Action.
ES-8	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Town of Summit Board of Aldermen and Mayor/Pike County Emergency Management	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2027	New Action.
ES-9	1.1	**Radiological Detection and Response Equipment** – Pike County recognizes the need for increased ability to both detect and respond to radiological events.	Radiological	Low	Town of Summit Board of Aldermen and Mayor/Pike County Emergency Management	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	New Action.

ES-10		**Lightning Early Detection System** –A lightning warning system is a system that alerts you about potential lightning strikes at a specific location. The lightning warning system is based on measurements of electric fields. If detected, alert via the lightning alert app will notify the Pike County EMA of the coming storm.	Lightning	Moderate	Town of Summit Board of Aldermen and Mayor/Pike County Emergency Management	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2026	New Action.
Public Education and Awareness								
PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Low	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	N/A	2027	This project has been downgraded to Low, with consideration for deletion at the next plan update. Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan.
PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Pike County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP. There is continued interest within the county, but additional funding is needed to support this activity.

PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	Moderate	Pike County EMA, MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2027	The county chose to downgrade this to moderate, but it remains an item of interest for public outreach for those within the dam inundation area. There is a need for community outreach to both the general public and to the owners of high hazard dams concerning maintenance and Emergency Action Planning. It is important that the public and owners are aware of high hazard dams, so this action will remain in the plan.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	Moderate	Pike County EMA, MDEQ, Dam Safety Division	Individual county general and special funds, FEMA High Hazard Potential Dam Grant Program.	2027	This remains an ongoing effort with the landowners. Emergency action plans are developed, exercised, and maintained by the individual dam owners. The MDEQ, Dam Safety Division is tasked to review the plans. Pike County will continue to support the outreach to high hazard and significant hazard dam owners, so this action will remain in the plan.
PEA-5	3.2	**Education: FireWise –** Recommend that public information and outreach workshops on the *Firewise* program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Pike County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, individual county general and special funds	2027	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan. Implementation is targeted toward the southern part of the County

PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Pike County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Pike County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, general and special funds	2025	New Action

PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Pike County Board of Supervisors/ Cities of Magnolia and McComb/ Towns of Summit and Osyka	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2024	New Action.
PEA-11	3.1	**Education: Public Outreach –** Develop a program to encourage school programs to incorporate the Great Shake Out	Earthquake	Low	Pike County Board of Supervisors/ Towns of Liberty and Gloster	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.

WALTHALL COUNTY

This annex includes jurisdiction-specific information for Walthall County and its participating municipalities. It consists of the following five subsections:

- H.1 Walthall County Community Profile
- H.2 Walthall County Risk Assessment
- H.3 Walthall County Vulnerability Assessment
- H.4 Walthall County Capability Assessment
- H.5 Walthall County Mitigation Strategy

H.1 WALTHALL COUNTY COMMUNITY PROFILE

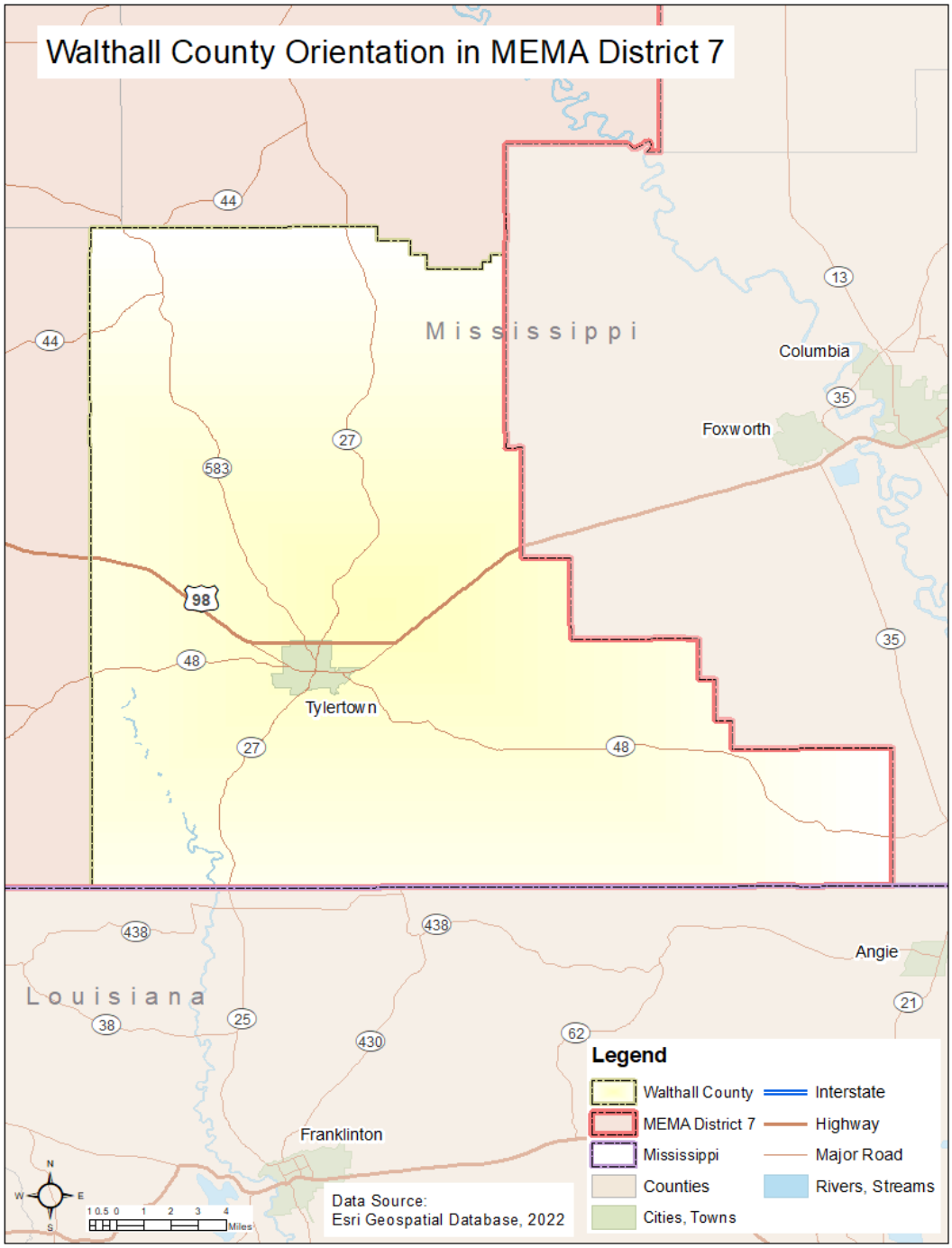
H.1.1 Geography and the Environment

Walthall County is located in southwestern Mississippi. It comprises one town, Town of Tylertown, as well as many small unincorporated communities. An orientation map is provided below.

The county is located to the east of the Mississippi River, supplying diverse recreational activities. The total area of the county is 404 square miles, less than 1 square mile of which is water area.

Walthall County enjoys four distinct seasons but the climate in the region is generally hot and humid compared to the rest of the United States, given its latitude and relative proximity to the Gulf Coast. Precipitation is typically highest in winter months when the temperatures are moderately lower, but the likelihood of precipitation remains relatively constant throughout the year. Summers in the region can become hot, with average highs in the nineties and lows in the seventies. The region is also often susceptible to turbulent weather when warm, wet air from the Gulf of Mexico is pushed up into the region to mix with cooler air coming down from across the continent which can result in severe weather conditions. This is particularly true in the spring when seasons change, and diverse weather patterns interact.

FIGURE H.1: WALTHALL COUNTY ORIENTATION MAP



H.1.2 Population and Demographics

According to the 2020 Census, Walthall County has a population of 13,884. The county has seen a 10.1% decrease in population between 2000 and 2020, and the population density is 34.4 people per square mile. Population counts from the U.S. Census Bureau for 2010 and 2020 for the county and participating jurisdictions are presented below.

TABLE H.1: POPULATION COUNTS FOR WALTHALL COUNTY[1]

Jurisdiction	2000 Census Population	2010 Census Population	2020 Census Population	% Change 2010-2020
Walthall County	**15,156**	**15,443**	**13,884**	**-10.1%**
Tylertown	1,943	1,609	1,515	-5.8%%

Based on the 2020 Census, the median age of residents of Walthall County is 39.0 years. The racial characteristics of the county are presented below. People identified as white make up the majority of the population in the county, accounting for 54.2% of the population.

TABLE H.2: DEMOGRAPHICS OF WALTHALL COUNTY[2]

Jurisdiction	White	Black or African American	American Indian or Alaska Native	Asian	Native Hawaiian or Other Pacific Islander	Two or More Races	Persons of Hispanic Origin*
Walthall County	**54.2%**	**43.0%**	**0.6%**	**0.5%**	**0.1%**	**1.6%**	**2.5%**
Tylertown	54.26 %	40.2%	0.33%	1.65%	0.07%	1.91%	1.58%

* Persons of Hispanic Origin may be of any race, so also are included in applicable race categories

H.1.3 Housing

According to the 2020 U.S. Census, there are 6,877 housing units in Walthall County, the majority of which are single family homes or mobile homes. Housing information for the county and municipality is presented below.

TABLE H.1: HOUSING CHARACTERISTICS OF WALTHALL COUNTY[3] [4]

Jurisdiction	Housing Units (2000)	Housing Units (2010)	Housing Units (2021)	Median Home Value (2017-2021)
Walthall County	**6,418**	**7,132**	**6,877**	**$102,600**
Tylertown	825	747	737	$107,000

H.1.4 Infrastructure

TRANSPORTATION

In Walthall County, U.S. Highway 98 provides access to the east and west and Mississippi Highway 27 provides access to the north and south.

[1] *Source: United States Census Bureau, 2010 Census and 2020 Census*

[2] *Sources: United States Census Bureau, 2020 Census; American Community Survey, 2017-2021.*

[3] Sources: United States Census Bureau, 2000 Census, 2010 Census, and American Community Survey, 2017-2021.

[4] United States Census. American Community Survey 5-Year Estimates. 2021. Retrieved on 01/12/2023 from: https://data.census.gov/table?q=median+home+value+walthall+county+mississippi+tylertown+mississippi.

Paul Pittman Memorial Airport is a general aviation airport centrally located in Walthall County. No railroads operate within Walthall County.

UTILITIES

Electrical power in Walthall County is provided by Entergy Mississippi Inc., Magnolia Electric Power Association, Pearl River Valley Electric Power Association, and Cooperative Energy.

There are no regulated sewer utilities in Walthall County, relying on septic systems in Walthall County, Magee's Creek, Improve, Lexie. Some water service is provided by participating jurisdictions and/or community-based associations, including East Pike Water Association Inc., Improve Water Association Inc., Kokomo-Shiloh Water Association, Lexie Water Association Inc., Magee's Creek Water Association Inc., and Magnolia Rural Water Association Inc.

COMMUNITY FACILITIES

There are several buildings and community facilities located throughout Walthall County. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 6 fire stations, 2 police stations, and 1 school located within the county.

There is also one hospital, Walthall General Hospital, and two nursing homes located in Walthall County.

The Mississippi River, which runs well west of the county, has played an integral part in the history of the county. The river acted as a major conduit for trade in the 19th century as plantations produced large quantities of cotton that could be easily shipped down to ports such as New Orleans. Today, the river is still an important part of the local economy as products are shipped worldwide out of the Natchez port. Apart from the Mississippi River there are multiple water-based refuges, activities, and recreational features focused on local water bodies in the region. There are also numerous other small lakes, creeks, and other water bodies throughout the region that offer the outstanding outdoor recreational opportunities for which the region is known.

H.1.5 Land Use

Walthall County has a blend of old and new development that contributes to physical, cultural, and economic attributes throughout the region. There is one incorporated municipality located in the county. This area is where the county's population is generally concentrated. The incorporated area is also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the county generally consist of rural residential development, agricultural uses, and recreational areas. There are multiple county- and regional-based agencies that serve to coordinate growth and promote economic development. Local land use and associated regulations are further discussed in *Section 7: Capability Assessment.*

H.1.6 Employment and Industry

According to the Federal Reserve Bank's economic online database (i.e., Federal Reserve Economic Data, or FRED), in 2021, Walthall County had an average annual employment of 4,597 workers and an average

unemployment rate of 6.9% (compared to 5.6% for the state).[5] [6] [7] [8] In 2021, the educational services, health care and social assistance industry employed 24.6% of the county's workforce, followed by Manufacturing (19.3%), and then agriculture, forestry, fishing and hunting, and mining (12.2%).[9] The median household income in 2021 for Walthall County was $34,605 compared to $49,111 for the state of Mississippi.[10]

[5] Federal Reserve Bank of St. Louis. Federal Reserve Economic Data (FRED). Retrieved on 01/12/2023 from https://fred.stlouisfed.org/categories/28755

[6] Federal Reserve Bank of St. Louis. Federal Reserve Economic Data (FRED). Retrieved on 01/12/2023 from https://fred.stlouisfed.org/series/LAUCN281470000000005A.

[7] Federal Reserve Bank of St. Louis. Federal Reserve Economic Data (FRED). Retrieved on 01/12/2023 from https://fred.stlouisfed.org/series/LAUCN281570000000003A.

[8] Federal Reserve Bank of St. Louis. Federal Reserve Economic Data (FRED). Retrieved on 01/12/2023 from https://fred.stlouisfed.org/series/LAUST2800000000000003A.

[9] United States Census Bureau. American Community Survey 5-Year Estimates. 2021. Retrieved on 01/12/2023 from: https://data.census.gov/table?q=average+annual+employment+walthall+county+mississippi+mississippi&tid=ACSDP5Y2021.DP03.

[10] United States Census Bureau. American Community Survey 5-Year Estimates. 2021. Retrieved on 01/12/2023 from: https://data.census.gov/table?q=average+annual+employment+walthall+county+mississippi+mississippi&tid=ACSDP5Y2021.DP03.

H.2 WALTHALL COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in Section 4: *Hazard Identification* as they pertain to Walthall County. Each hazard profile includes a description of the hazard's location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in Section 5: *Hazard Profiles*.

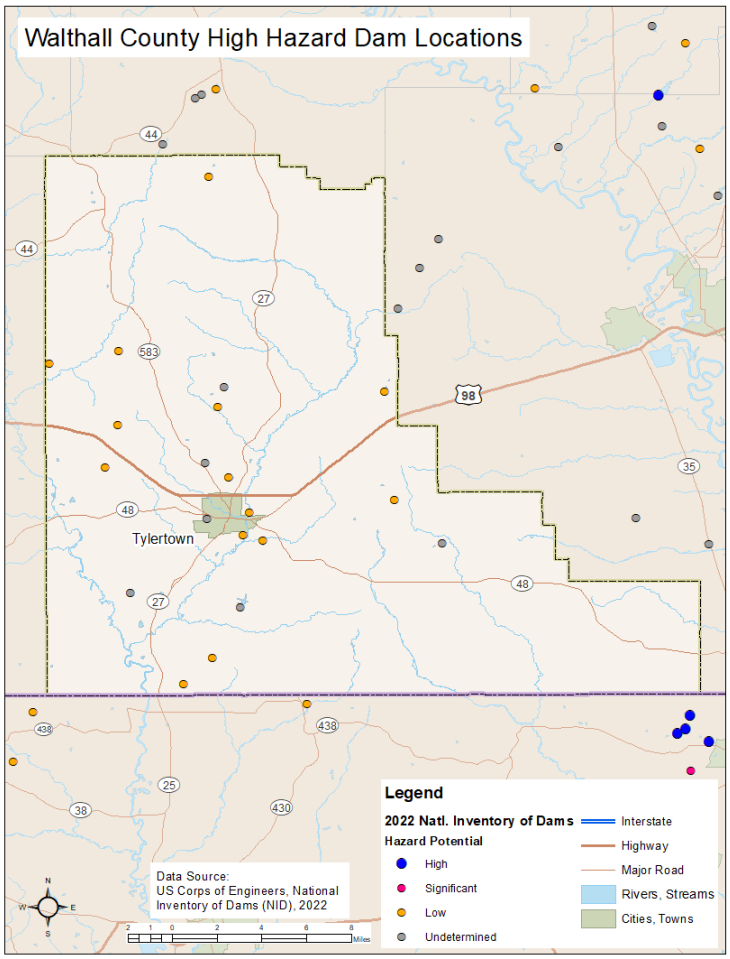
FLOOD-RELATED HAZARDS

H.2.1 Dam and Levee Failure

LOCATION AND SPATIAL EXTENT

According to the Mississippi Department of Environmental Quality, there are no high hazard dams in Walthall County as depicted in the table below.[11] The figure below show the location of these high hazard dams.

FIGURE H.2: WALTHALL COUNTY HIGH HAZARD DAM LOCATIONS



[11] The list of high hazard dams obtained from the Mississippi Department of Environmental Quality was reviewed and amended by local officials to the best of their knowledge.

TABLE H.4 WALTHALL COUNTY HIGH HAZARD DAMS[12]

Dam Name	Hazard Potential	Max Storage (ac/ft)	Dam Height (ft)	Condition
NONE	N/A	N/A	N/A	N/A

HISTORICAL OCCURRENCES

According to the Mississippi State Hazard Mitigation Plan, there have been no dam failures reported in Walthall County shown in the table below. However, several breach scenarios in the region could be catastrophic.

TABLE H.5 WALTHALL COUNTY DAM FAILURES (1982-2021)[13]

Date	County	Structure Name	Cause of Failure
None Reported	Walthall	N/A	N/A

PROBABILITY OF FUTURE OCCURRENCES

Given the current dam inventory and historic data, a dam breach is unlikely (less than 1 percent annual probability) in the future. As has been demonstrated in the past, regular monitoring is necessary to prevent these events.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[14] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Walthall County. However, given the current dam inventory and lack of planned future dam projects, climate change impacts are unlikely.

H.2.2 Erosion

LOCATION AND SPATIAL EXTENT

Erosion in Walthall County is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in Walthall County are primarily rivers/streams and reservoirs. For example, Walthall County is situated completely within the Pearl River Basin, an 8,700-square-mile watershed found in central and southern Mississippi.[15] The basin drains all or parts of 24 counties in Mississippi and three parishes in Louisiana.[16]

[12] *Source: U.S. Army Corps of Engineers*

[13] *Source: Mississippi Department of Environmental Quality*

[14] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[15] *Citizen's Guide to Water Quality in the Pearl River Basin.* 2008. Mississippi Department of Environmental Quality. Retrieved on 01.01.2023 from https://www.mdeq.ms.gov/wp-content/uploads/2008/09/Pearl-River-Basin_Final_pr.pdf.

[16] *Citizen's Guide to Water Quality in the Pearl River Basin.* 2008. Mississippi Department of Environmental Quality. Retrieved on 01.01.2023 from https://www.mdeq.ms.gov/wp-content/uploads/2008/09/Pearl-River-

Generally, vegetation helps to prevent erosion in the area, but in recent years, erosion has become a growing threat to many of the participating counties and jurisdictions in Mississippi, including Walthall County. In the Pearl River Basin, erosion has occurred due to cow grazing near streams and unprotected clear cuts of forests. [17]

Currently, there are no regional or state-level data available on localized areas of erosion, so it is a challenge to identify particularly prone areas on a wider geographic scale. However, a few areas of concern were reported by members of the hazard mitigation council and other local sources. Locations within the Pearl River Basin are known to be especially at-risk, but there are locations in many areas within the region where erosion is prominent.

HISTORICAL OCCURRENCES

Several sources were vetted to identify areas of erosion in Walthall County. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. The locations identified above are representative of areas where erosion has taken place in the past. In Supervisor District 1, Walkers Bridge area near the Bogue Chitto River are susceptible to flooding and subsequent erosion events according to the Walthall County Emergency Management.

These incidents have caused major problems, as bridges have become damaged in many instances and made unsafe for emergency services vehicles to cross during and after storm events. This delays response times and critical life-safety support. In addition, the shutdown of roads has hurt local communities economically as trade and commerce are temporarily shut down as bridges are repaired. It has also caused disruption to daily activities for local school boards who must re-route buses around affected areas, causing additional fuel resources to be expended and increasing drive times for students.

PROBABILITY OF FUTURE OCCURRENCES

Erosion remains a natural, dynamic, and continuous process for Walthall County, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annually).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[18] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Wilkinson County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[19]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere

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Basin_Final_pr.pdf.

[17] *Citizen's Guide to Water Quality in the Pearl River Basin.* 2008. Mississippi Department of Environmental Quality. Retrieved on 01.01.2023 from https://www.mdeq.ms.gov/wp-content/uploads/2008/09/Pearl-River-Basin_Final_pr.pdf.

[18] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[19] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones. Both additional moisture and drying conditions can impact the rate of erosion, either by increasing the sediment transfer load due to volume and rate of flooding, or by dehydrating soils, limiting compaction, and increasing wind related erosion events.

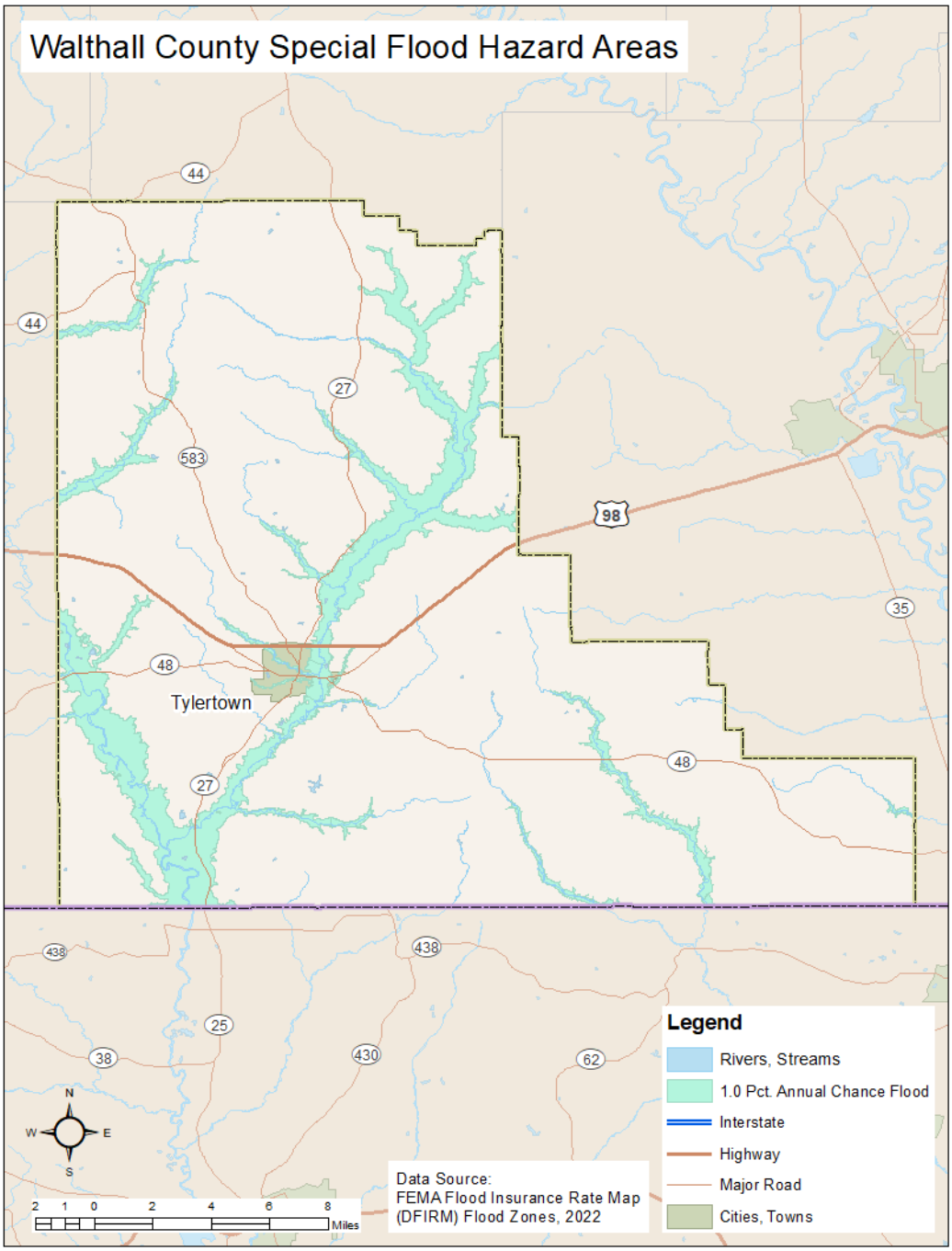
H.2.3 Flood

LOCATION AND SPATIAL EXTENT

There are areas in Walthall County that are susceptible to flood events. Special flood hazard areas in the county were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM).[2] This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevations), and Zone X-500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 404 square miles that make up Walthall County, there are 40.10 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 0.00 square miles of land in zone X-500 (0.2 percent annual change floodplain/500-year floodplain).

These flood zone values account for 9.9 percent of the total land area in Walthall County. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. The figure below illustrates the location and extent of currently mapped special flood hazard areas for Walthall County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data.

FIGURE H.3: SPECIAL FLOOD HAZARD AREAS IN WALTHALL COUNTY



Floods were at least partially responsible for 2 major disaster declarations in Walthall County in 1972 and 2016.[20] While additional disaster declarations involved flooding events during hurricanes, those declarations were captured under Hurricane Declarations.

[20] A complete listing of historical disaster declarations can be found in Section 4: Hazard Identification.

Information from the National Centers for Environmental Information was used to ascertain additional historical flood events. The National Centers for Environmental Information reported a total of 8 events in Walthall County since 1997.[21] A summary of these events is presented below. These events accounted for over $1,260,000 in property damage. Specific information on flood occurrences in Walthall County can be found below.

TABLE H.6: SUMMARY OF FLOOD OCCURRENCES IN WALTHALL COUNTY[22]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses[23]
Tylertown	1	0/0	$10,000	$400
Unincorporated Area	7	0/0	$1,250,000	$50,000
WALTHALL COUNTY TOTAL	**8**	**0/0**	**$1,260,000**	**$50,400**

Source: National Centers for Environmental Information

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Flood Insurance Management Agency (FIMA) Flood Insurance Data Analytics, since 2019 Mississippi has had 47 floods of record with 22 closed with payment, 19 closed without payment, and 6 remaining open. A total of $545,506 has been made in payments. This FEMA dataset is the authoritative source for FEMA's public data. This product uses the Federal Emergency Management Agency's API but is not endorsed by FEMA. FEMA cannot verify the quality and/or timeliness of any data or any analysis derived there from after the data has been retrieved from FEMA.gov. This data set was last accessed on July 2, 2023, with records updated at most every 20 minutes or at least monthly, processed the first Saturday of the month at 1:00am EST.

According to FEMA flood insurance policy records as of July 2, 2023, there have been 61 flood losses reported in Walthall County through the National Flood Insurance Program (NFIP) since 1978, totaling $1,253,218.61 in total building and $135,880.56 in contents in claims payments. A summary of these figures for the county is provided below. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought. It is likely that many additional instances of flood loss in Walthall County were either uninsured or not reported.

[21] These flood events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1997 through November 2022. It is likely that additional occurrences have occurred and have gone unreported.

[22] Source NCEI. Annualized losses are calculated by dividing the total number of property damages by number of years of recordkeeping for the hazard.

[23] Annualized losses are calculated based on number of years of reportable NCEI data.

TABLE H.7: SUMMARY OF INSURED FLOOD LOSSES IN WALTHALL COUNTY[24] [25]

Location	Number of Policies	Flood Losses	Claims Payments
Tylertown	5	50	$533,091.91
Unincorporated Area	17	61	$856,007.26
WALTHALL COUNTY TOTAL	**22**	**111**	**$1,389,099.17**

REPETITIVE LOSS PROPERTIES

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Mississippi Emergency Management Agency in 2017, there are 27 non-mitigated repetitive loss properties located in Walthall County, which have accounted for 62 losses and almost $1.2 million in claims payments under the NFIP. The average claim amount for these properties is $18,763. Of the 27 properties, 16 are single family, 1 is 2-4 family, 1 is assumed condominium, and 8 are other non-residential. Without mitigation, these properties will likely continue to experience flood losses. The table below presents detailed information on repetitive loss properties and NFIP claims and policies for Walthall County as documented in the last plan. Updated data could not be obtained.

TABLE H.8: REPETITIVE LOSS PROPERTIES IN WALTHALL COUNTY[26]

Location	Number of Properties	Types of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Tylertown	2	1 2-4 family; 1 other non-residential	4	$39,133.56	$0.00	$39,133.56	$9,783.39
Unincorporated Area	25	16 single-family; 1 assumed condo; 8 other non-residential	58	$986,241.68	$137,957.80	$1,124,199.48	$19,382.75
WALTHALL COUNTY TOTAL	**27**		**62**	**$1,025,375.24**	**$137,957.80**	**$1,163,333.04**	**$18,763.44**

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in Walthall County, and the probability of future occurrences will remain highly likely (100 percent annual probability). The probability of future flood events based on

[24] National Flood Insurance Program. National Flood Insurance Program. *Policy and Loss Data by Geography (HUDEX)*, 10.13.2022. Retrieved on 01/05/2023 from https://nfipservices.floodsmart.gov/sites/default/files/PolicyandLossDatabyGeography.xlsx.

[25] National Flood Insurance Program, *OpenFEMA Data Sets*

[26] Current data on NFIP and Repetitive Loss Properties data was not available for this plan update.

magnitude and according to best available data is illustrated in the figure above, which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain).

Information from the floodplain location maps, previous occurrences, and repetitive loss properties indicates that flood risk varies throughout the county. For example, areas in the southwestern corner and central portion of the county contain more floodplains and therefore have a higher risk of flooding than the rest of the county. Flooding is not the greatest concern, but it will continue to occur and cause damage within the county. Therefore, mitigation actions may be warranted, especially for repetitive loss properties.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[27] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Walthall County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[28] As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased *coastal, fluvial (i.e., riverine) and pluvial (i.e., rainfall) flooding.*[29] More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

FIRE-RELATED HAZARDS

H.2.4 Drought

LOCATION AND SPATIAL EXTENT

Drought is a non-spatial hazard that typically covers a large area and cannot be confined to any geographic or political boundaries. As a result, it is assumed that all areas within Walthall County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage directly to the built environment, but may exacerbate wildfire conditions.

HISTORICAL OCCURRENCES

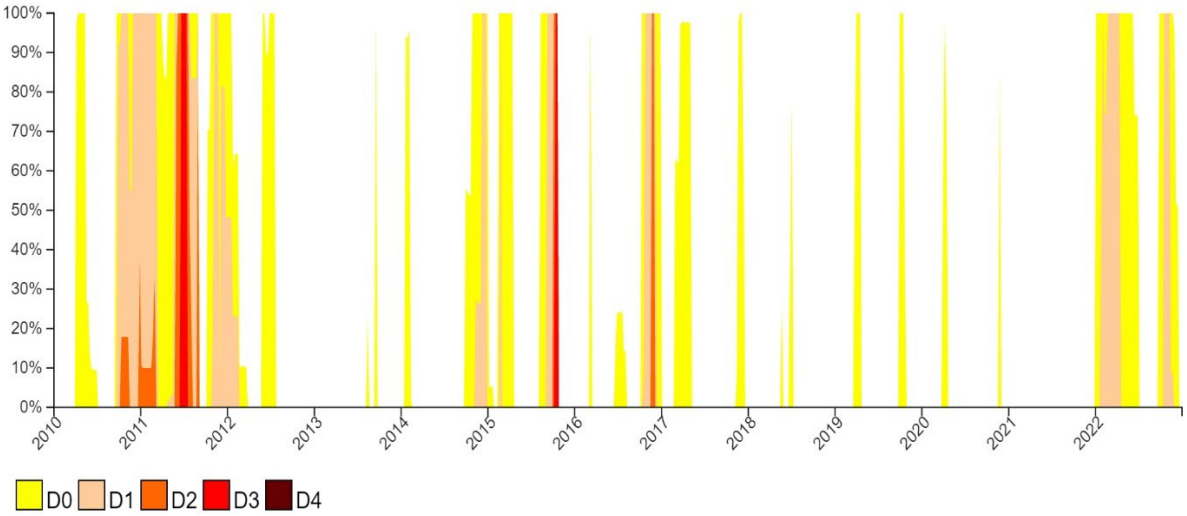
According to the U.S. Drought Monitor, Walthall County had drought levels of Severe or worse in 4 of the last 13 years (January 2010-December 2022). The table below shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional, but a majority of the county may actually be in a less severe condition.

[27] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[28] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[29] Please note: there is no coastal flooding in Walthall County.

TABLE H.9: HISTORICAL DROUGHT OCCURRENCES IN WALTHALL COUNTY[30]



Some additional anecdotal information was provided from the National Centers for Environmental Information on droughts in Walthall County.

Summer to Fall 2006 – During a four-and-a-half-month period, from June to the middle of October, abnormally dry conditions prevailed across most of the Jackson, MS County Warning Area (CWA). Widespread drought conditions were reported across the area during this time. The U.S. Drought Monitor classified the drought as extreme (D3) over Southeast Mississippi. Drought conditions in the region peaked in intensity during early August over this area.

Summer to Fall 2010 – Very dry conditions continued across central Mississippi during most of October. There was some rain that came late in the month which provided some temporary relief. Rainfall amounts ranged from a half to two inches with locally higher amounts. Most locations were 1 to 3 inches below normal for the month. The dry stretch resulted in severe (D2) drought conditions expanding during the month with even the portions of extreme (D3) drought conditions expanding as well. Crops were put under stress under the warm and dry conditions.

Fall 2015 – The very dry conditions continued across Central Mississippi in October. The extended dry stretch resulted in an area of Severe (D2) drought developing across the area by October 6th. The drought intensified and Extreme (D3) drought conditions developed by October 13th. Approximately 25 to 50 percent of normal rainfall occurred across this area from August into mid-October. Crops were put under more stress from the dry and hot conditions.

Fall to Winter 2016 – Dry conditions continued into November, which created continued stress on crops. The drought continued to get worse across the state through the month before some relief came in the form of showers and thunderstorms near the end of November.

Fall 2021 through 2022 – Severe drought conditions persisted throughout the state, beginning in December 2021 and continuing through the calendar year 2022. Conditions escalated to extreme drought from January to March, before resolving In December. Throughout this period many counties also experienced flooding events indicating that while rainfall is still occurring, the shorter, more intense

[30] U.S. Drought Monitor. Historical Conditions for Walthall County, MS 2010 – 2022. Retrieved on 12/29/2022 from: https://www.drought.gov/states/mississippi/county/Walthall

bursts do not resolve the drought conditions that softer more steady rainfall would address. The beginning of 2023 saw increased rainfall and a lightening of drought conditions overall.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that Walthall County has a probability level of possible (between 1 and 10 percent annual probability) for future drought events. However, the extent (or magnitude) of drought and the amount of geographic area covered by drought, varies each year. Historic information indicates that there is a much lower probability for extreme, long-lasting drought conditions in Walthall County.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[31] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Walthall County. With increasing global surface temperatures, the possibility of more *droughts* and increased frequency and intensity of storms will likely occur.[32] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

H.2.5 Lightning

LOCATION AND SPATIAL EXTENT

Lightning occurs randomly; therefore, it is impossible to predict where and with what frequency it will strike. It is assumed that all of Walthall County is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, there have been no recorded lightning events that have affected Walthall County since 1950 as shown in the table below. However, according to the National Lightning Detection Network (NLDN) as depicted in the figure below, there are 63.4 lightning events per square kilometer per year in Walthall County.[33] As a result, it is likely that lightning events have generated property damage in Walthall County.

TABLE H.10: SUMMARY OF LIGHTNING OCCURRENCES IN WALTHALL COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Tylertown	0	0/0	$0	$0
Unincorporated Area	0	0/0	$0	$0

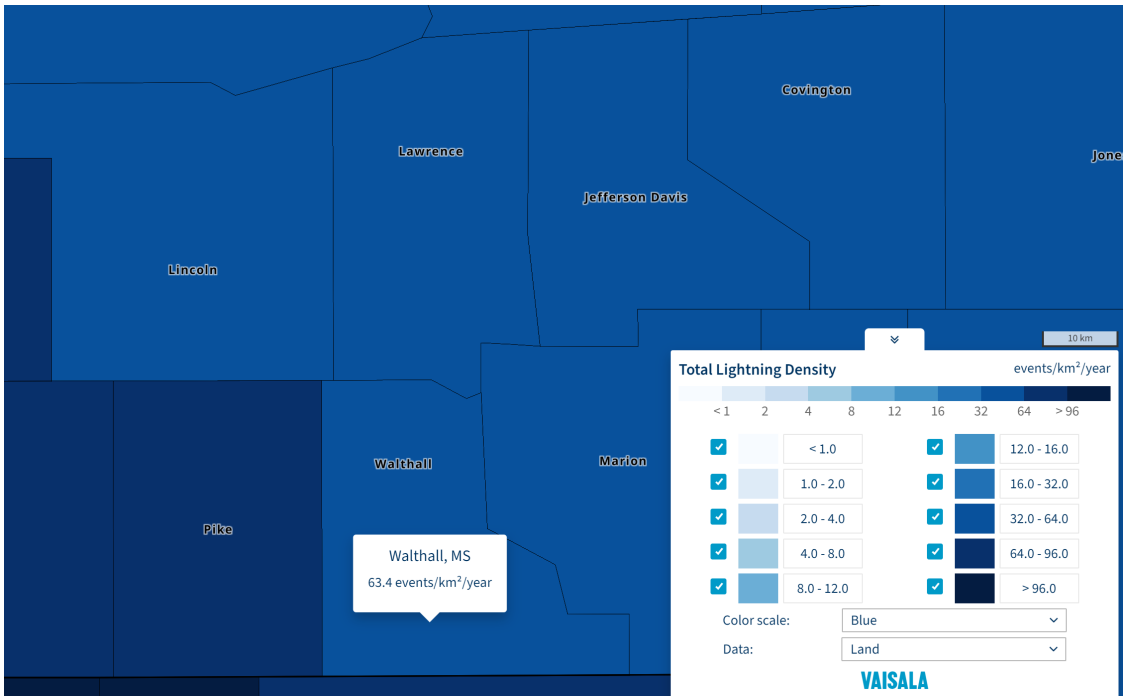
[31] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[32] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

[33] Vaisala – U.S. National Lightning Detection Network. Retrieved on 01/02/2023 from: https://interactive-lightning-map.vaisala.com/?_ga=2.142433206.529238712.1672682694-816443770.1672682579

WALTHALL COUNTY TOTAL	**0**	**0/0**	**$0**	**$0**

FIGURE H.4: VAISALA'S NLDN MAP OF LIGHTNING DENSITY – WALTHALL COUNTY[34]



PROBABILITY OF FUTURE OCCURRENCES

According to Vaisala's U.S. National Lightning Detection Network (NLDN), Walthall County is located in an area of the country that experienced an average of 12 to 20 lightning flashes per square mile per year between 2016 and 2021. Although there have been no historical lightning events reported in Walthall County via National Centers for Environmental Information data, lightning events are regular occurrences in the region that threaten both life and property. It is expected that future lightning events will happen on an annual basis in Walthall County, and will continue to threaten life and cause minor property damage throughout the region. Therefore, the probability of future lightning events in Walthall County is highly likely (100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[35] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Walthall County. With increasing global surface temperatures, the possibility of more droughts and increased frequency

[34] Vaisala – U.S. National Lightning Detection Network. Retrieved on 01/02/2023 from: https://interactive-lightning-map.vaisala.com/?_ga=2.142433206.529238712.1672682694-816443770.1672682579

[35] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

and intensity of storms will likely occur, increasing the frequency of *lightning strike events*.[36] As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

H.2.6 Wildfire

LOCATION AND SPATIAL EXTENT

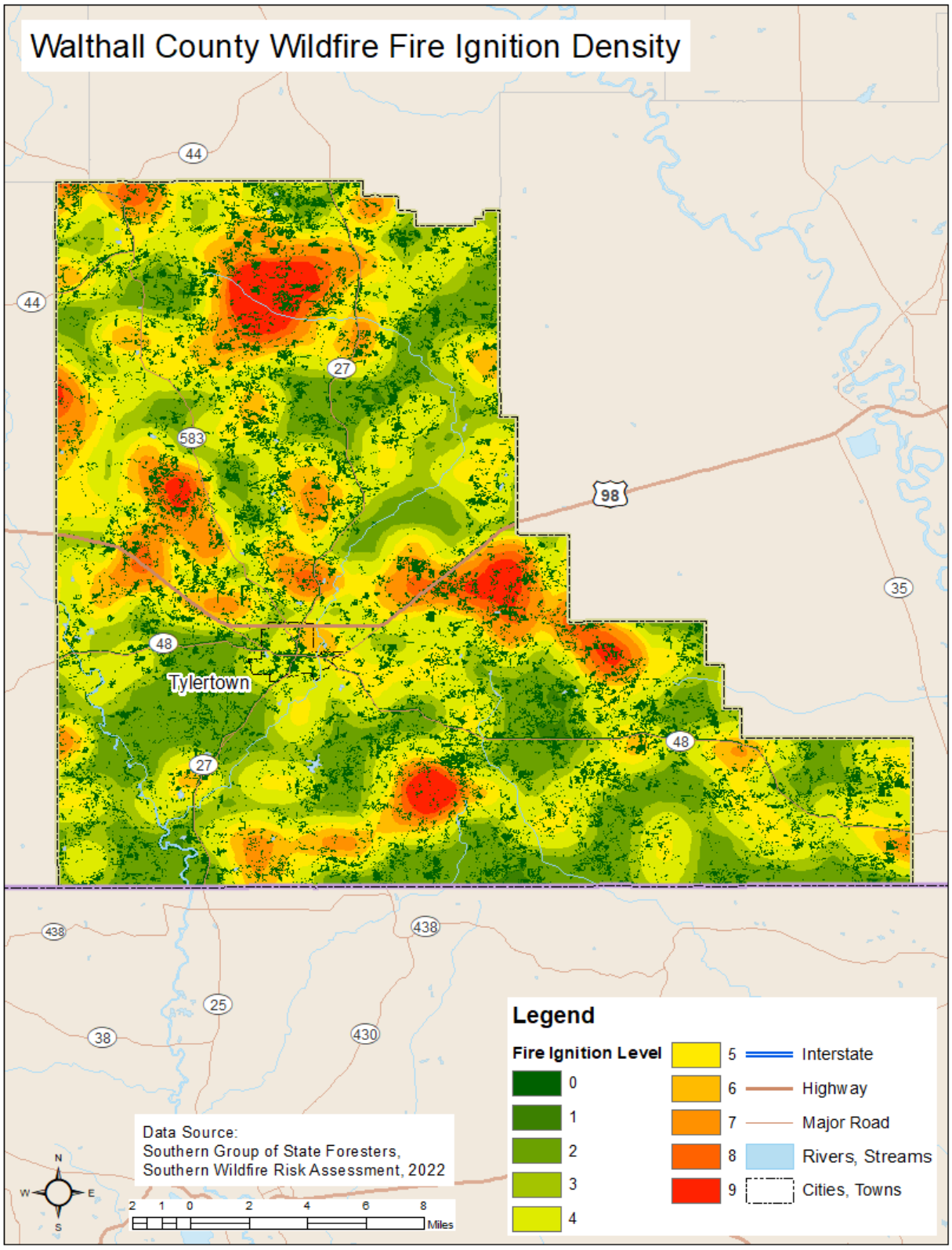
The entire Walthall County area is at risk to a wildfire occurrence, and locations near the urban-wildland interface – where populations abut formerly undeveloped areas – are particularly susceptible to wildfire hazards. Drought conditions and high levels of fuel on the forest floor may make a wildfire more likely. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

HISTORICAL OCCURRENCES

The map below shows Wildfire Ignition Density across Walthall County and is based on data from the Southern Wildfire Risk Assessment. This map provides information on historic locations of wildfire ignitions and shows the likelihood of a wildfire igniting in a particular area. Wildfire occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map and is measured in the number of fires per year per 1,000 acres.[8]

[36] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

FIGURE H.5: WILDFIRE IGNITION DENSITY IN WALTHALL COUNTY



Based on data from the Mississippi Forestry Commission, Walthall County experienced an annual average of 16.13 wildfires per year from 2015 to 2022; these wildfires burned a combined 242.63 acres per year during that period. The data indicate that most of these fires were small to moderate in size, averaging about 17.20 acres per fire. The tables below provide a summary of wildfire occurrences in Walthall County from 2015 to 2022 and lists the number of reported wildfire occurrences in the county between the years 2012 and 2022.

TABLE H.11: SUMMARY TABLE OF ANNUAL WILDFIRE OCCURRENCES (2015-2022)[37]

	Walthall County
Average Number of Fires Per Year	16.13
Average Number of Acres Burned Per Year	242.63
Average Number of Acres Burned Per Fire	17.20

TABLE H.12: HISTORICAL WILDFIRE OCCURRENCES IN WALTHALL COUNTY (2012-2022)[38]

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Walthall County												
Number of Fires	23	17	24	40	16	10	13	7	2	12	29	193
Number of Acres Burned	198	146	238	325	169	265	135	199	15	355	478	2,523

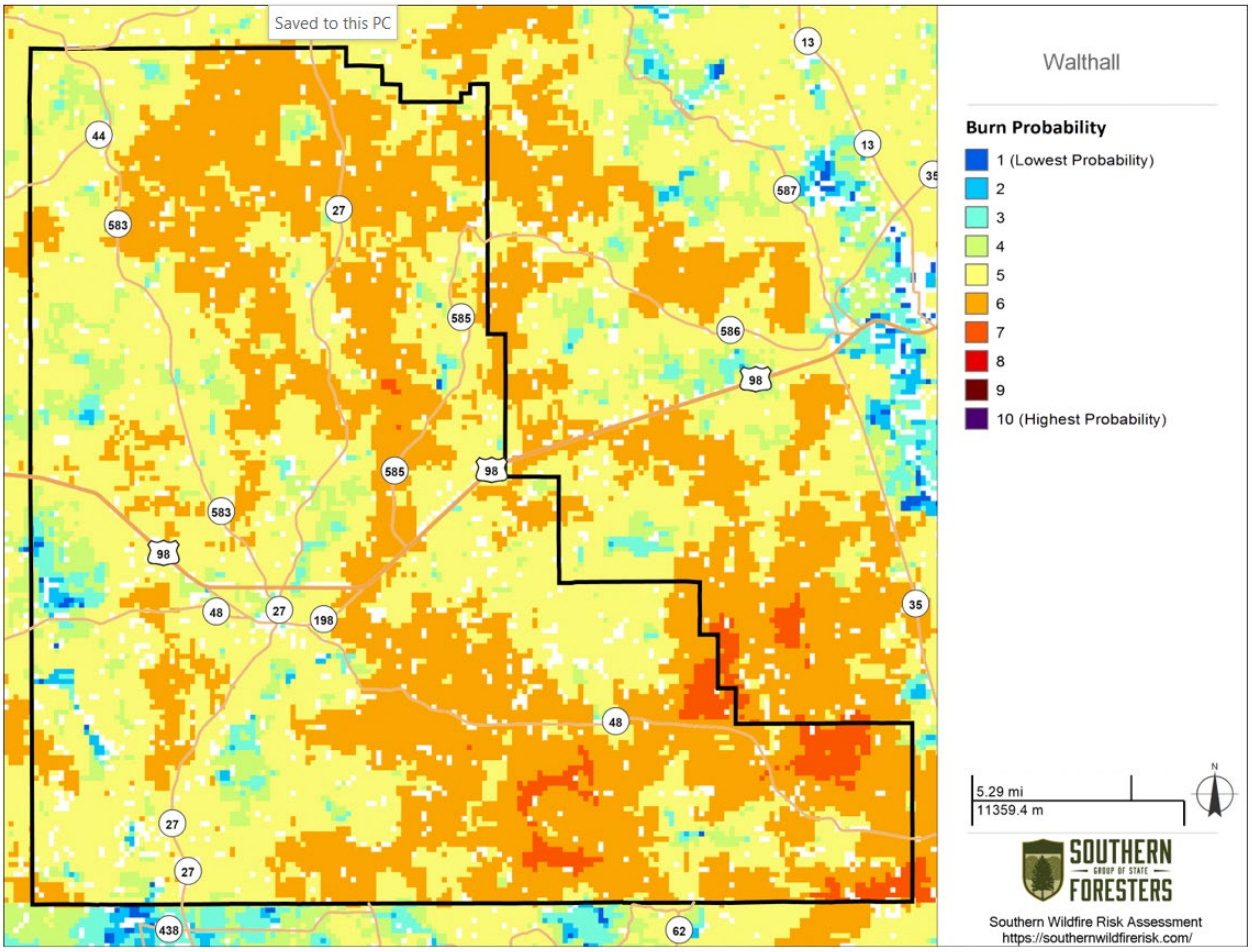
PROBABILITY OF FUTURE OCCURRENCES

The figure below shows there is some probability a wildfire will occur in Walthall County, and that wildfire events will be an ongoing occurrence in the county. The likelihood of wildfire events will increase during drought cycles and abnormally dry conditions. While wildfires are likely to stay small in size, their areal coverage could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. Highly developed areas will be less susceptible to wildfires, unless they are located near the urban-wildland interface. The risk of wildfire losses will vary based on the assets that exist in different parts of the county. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate, compared to rural, mainly forested areas. The probability assigned to Walthall County for future wildfire events is highly likely (100 percent annual probability).

[37] *Mississippi Forestry Commission – 2015 - 2022*

[38] *Mississippi Forestry Commission*

FIGURE H.6: BURN PROBABILITY IN WALTHALL COUNTY



FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[39] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Walthall County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency *wildfire events*.[40]

[39] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[40] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

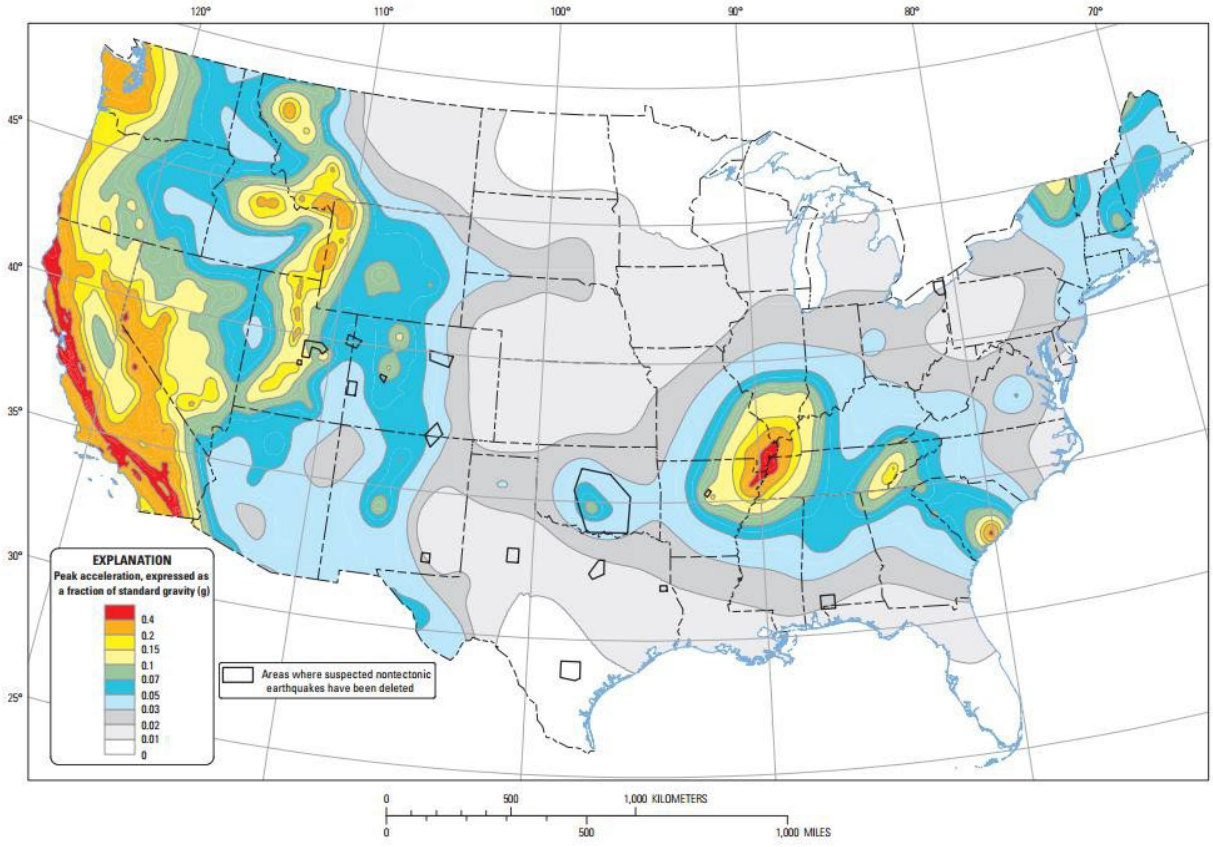
GEOLOGIC HAZARDS

H.2.7 Earthquake

LOCATION AND SPATIAL EXTENT

The figure below is a map that shows the probability that ground motion will reach a certain level during an earthquake in different parts of the U.S., as indicated by data peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Walthall County lies within an approximate zone of level "0.01" to "0.03" ground acceleration. This indicates that the county exists within an area of low seismic risk.

FIGURE H.7: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS[41]



Ten-percent probability of exceedance in 50 years map of peak ground acceleration

[41] United States Geological Survey, 2014

The primary source of potential damage to Walthall County from an earthquake is the New Madrid Seismic Zone (NMSZ). Historically, a series of earthquakes in 1811 and 1812 demonstrated that this fault zone can produce high magnitude seismic events, sometimes on the scale of a 7.5-8.0 on the Richter scale. The biggest challenge with earthquakes that occur in this area of seismic activity is predicting the recurrence of earthquakes emanating from the NMSZ. Although the magnitude of earthquakes from the NMSZ can be large, they occur very irregularly and infrequently. This makes it extremely difficult to predict when they will occur.

It should also be noted that the State of Mississippi Hazard Mitigation Plan identifies certain areas of concern for liquefaction and lists the counties and corresponding zones within those counties that have the highest liquefaction potential. Walthall County does not have any identified liquefaction potential risk.

The following figure shows the Modified Mercalli Intensity Scale. The lower numbers of the intensity scale generally deal with the way the earthquake is felt by people. The higher numbers of the scale are based on observed structural damage. Structural engineers usually contribute information for assigning intensity values of VIII or above.

FIGURE H.8: MODIFIED MERCALLI INTENSITY SCALE (MMI)

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest,especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

HISTORICAL OCCURRENCES

At least one earthquake is known to have affected Walthall County since 1930. The earthquake measured a III on the Modified Mercalli Intensity (MMI) scale. The table above provides a summary of earthquake events reported by the National Centers for Environmental Information (formerly National Geophysical Data Center) and the figure below presents a map showing earthquakes whose epicenters have occurred near the county between 1985 and 2023 (no earthquakes occurred within the county's

boundaries during this period). The table below presents a detailed occurrence of each event including the date, distance for the epicenter, magnitude, and Modified Mercalli Intensity (if known).[42]

TABLE H.2: SUMMARY OF SEISMIC ACTIVITY IN WALTHALL COUNTY THROUGH 2023

Location	Number of Occurrences	Greatest MMI Reported	Greatest Richter Scale Reported
Tylertown	1	III	Not Available
Unincorporated Area	0	--	--
WALTHALL COUNTY TOTAL	**1**	**III**	**--**

Source: National Centers for Environmental Information

FIGURE H.9: HISTORIC EARTHQUAKES WITH EPICENTERS NEAR WALTHALL COUNTY

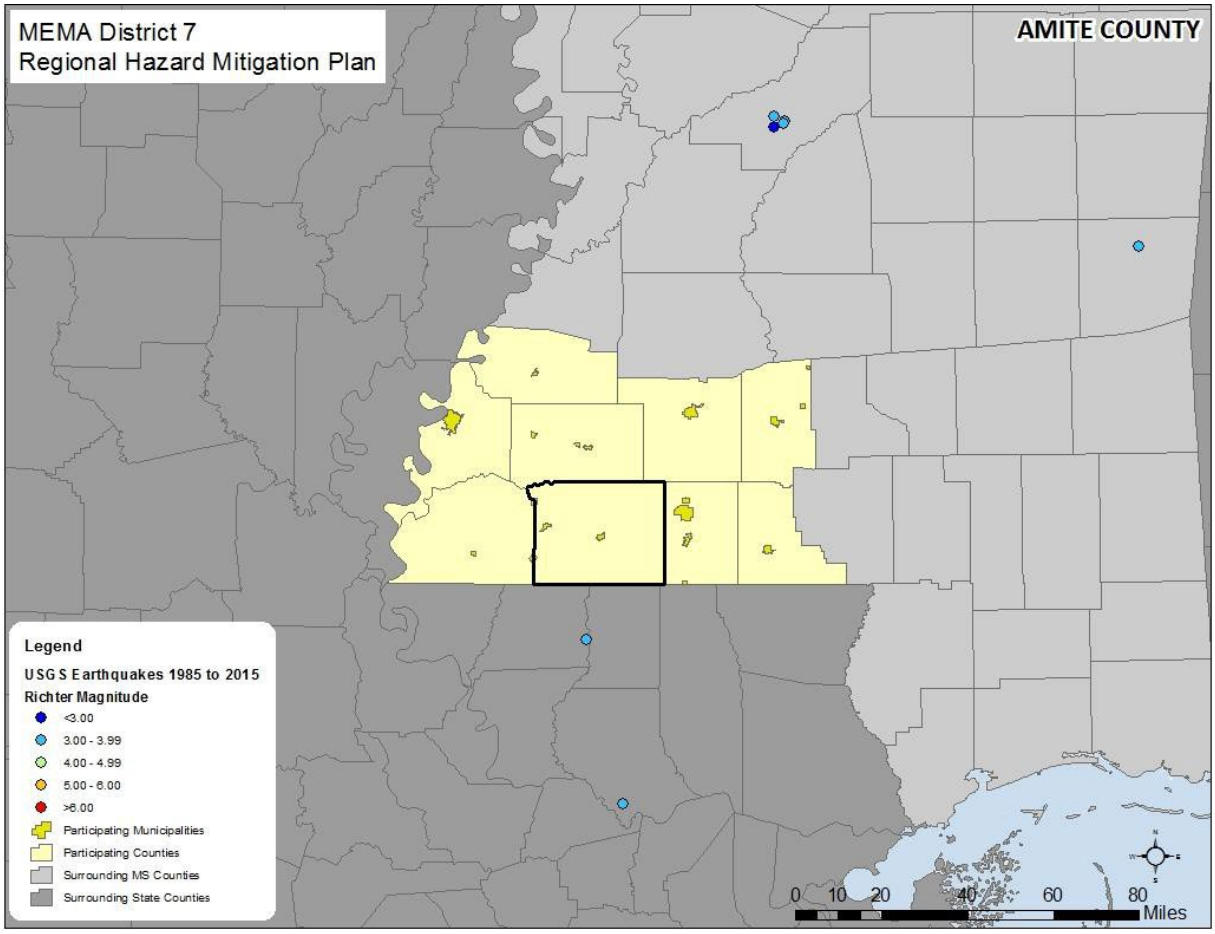


TABLE H.14: SIGNIFICANT SEISMIC EVENTS IN WALTHALL COUNTY (1638 -1985)

Location	Date	Epicentral Distance	Magnitude	MMI
Tylertown				
TYLERTOWN	10/19/1930	146.0 km	*Unknown*	III

[42] Due to reporting mechanisms, not all earthquake events were recorded during this time. Furthermore, some are missing data, such as the epicenter location, due to a lack of widely used technology. In these instances, a value of "unknown" is reported.

Unincorporated Area					
None reported	--	--	--	--	

Source: National Centers for Environmental Information

PROBABILITY OF FUTURE OCCURRENCES

The probability of significant, damaging earthquake events affecting Walthall County is unlikely. However, it is possible that future earthquakes resulting in light or moderate perceived shaking and damages will affect the county more frequently. The annual probability level for the county is estimated to be less than 1 percent (unlikely).

TEMPERATURE & WIND RELATED HAZARDS

H.2.8 Extreme Heat

LOCATION AND SPATIAL EXTENT

Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries. Therefore, the entire county is equally susceptible to extreme heat.

HISTORICAL OCCURRENCES

Information from the National Centers for Environmental Information was used to determine historical extreme heat occurrences in Walthall County. While no extreme heat events were reported in the county, several events were reported in the surrounding region.

Summer of 2000 Heat Wave – Hot temperatures persisted from July to September across the South and Plains. Known as the Summer of 2000 Heat Wave, high temperatures commonly peaked over 100 degrees.

August 2005 – A "HOT" stretch of weather occurred during the middle to later part of August 2005. This "Heat Wave" covered a large portion of the south and lasted for a period of about 10 days. Each of these days had high temperatures consistently between 95 and 100 degrees, with 1 or 2 of these days reaching 100 degrees or more. Additionally, overnight lows remained warm with lower and middle 70s recorded. This is the first time since August 2000 where 100-degree temperatures were reached in this area as well as having such an extended period of "HOT" weather.

July 2006 – A small "heat wave" gripped the region during the middle of July with high temperature ranging from the upper 90s to around 100 degrees for five days with overnight lows only reaching the middle 70s. The hottest temperatures during this period occurred from the Mississippi Delta, across northern Mississippi and then down to the Jackson Metro and toward Meridian. This area peaked between 100 and 102 degrees for at least two days during the hot five-day stretch.

August 2007 – During the first half of August, a heat wave took hold of the region and brought some of the warmest temperatures since the summer of 2000. This heat wave began around August 5th and lasted until the 16th. Between August 10th and 15th, the entire area reached 100 degrees or higher. Twenty- three record highs were also set during this time. As the temperature soared each day, high relative humidities resulted in heat index values between 105 and 112 degrees.

August 2010 – A four day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS Jackson, MS forecast area, 19 record highs were set between August 1st and 4th. On August 2nd, the 2nd warmest average temperature was recorded. The low was 78 and the high 105, this resulted in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in 3 fatalities across the forecast area.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Walthall County has a probability level of likely (between 10 and 100 percent annual probability) for future extreme heat events.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[43] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Walthall County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *extreme heat* events.[44] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

H.2.9 Hailstorm

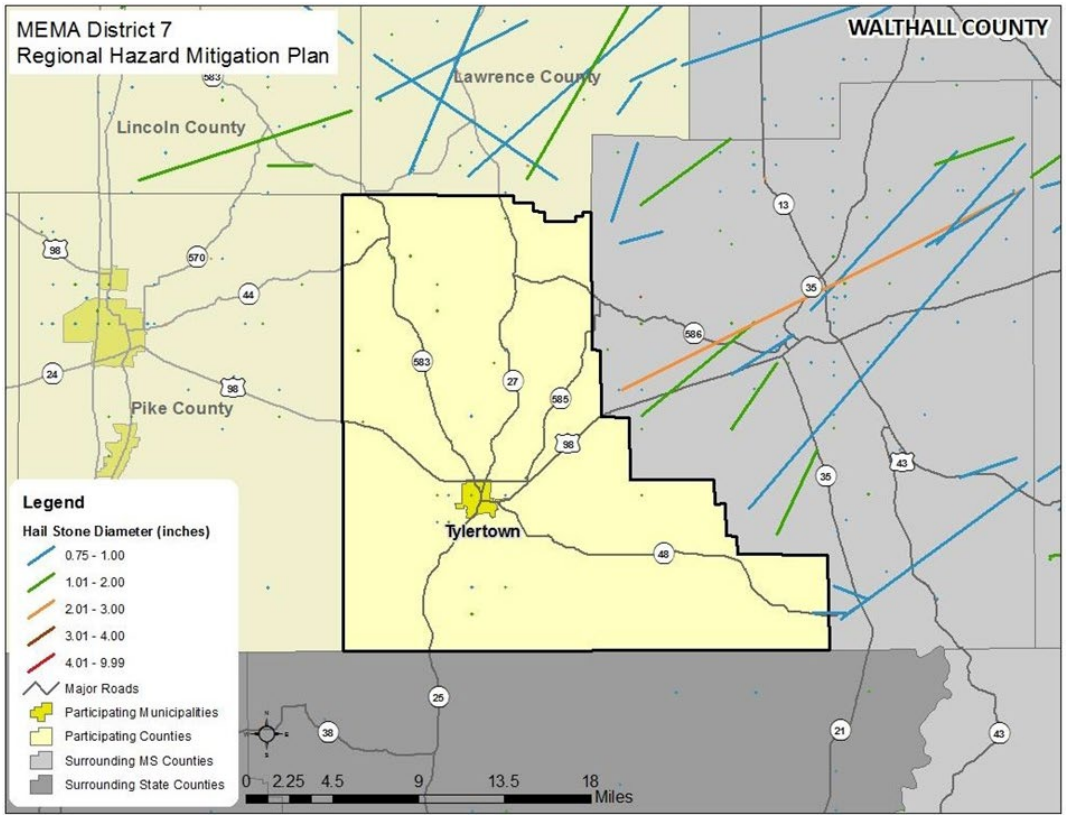
LOCATION AND SPATIAL EXTENT

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide with those of thunderstorms. As a result, because all areas of Walthall County are uniformly exposed to severe thunderstorms, all areas of the county are uniformly exposed to hail which may be produced by such storms. **Figure H.11** shows the location of hail events that have impacted Walthall County between 1955 and 2015.

[43] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[44] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

Figure H.10: Hailstorm Tracks in Walthall County[45]



According to the National Centers for Environmental Information, 41 recorded hailstorm events have affected Walthall County since 1963.[46] The table below is a summary of the hail events in Walthall County. In all, hail occurrences resulted in approximately $20,000 in property damage. Hail ranged in diameter from 0.75 inches to 2.75 inches.

It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

TABLE H.15: SUMMARY OF HAIL OCCURRENCES IN WALTHALL COUNTY[47]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Tylertown	19	0/0	$20,000	$339
Unincorporated Area	22	0/0	$0	$0
WALTHALL COUNTY TOTAL	**41**	**0/0**	**$20,000**	**$339**

[45] *Source: National Weather Service Storm Prediction Center*
[46] These hail events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1963 through November 2022. It is likely that additional hail events have affected Walthall County. As additional local data becomes available, this hazard profile will be amended.
[47] Source: National Centers for Environmental Prediction

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that the probability of future hailstorm occurrences in Walthall County is highly likely (100 percent annual probability). It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[48] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Walthall County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *hailstorm.*[49] As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

H.2.10 Hurricane and Tropical Storm

LOCATION AND SPATIAL EXTENT

Hurricanes and tropical storms threaten the Atlantic Ocean and Gulf of Mexico seaboards of the United States, causing substantial damage due to high winds and flooding. While coastal areas are most directly exposed to the brunt of landfalling storms, the storms' impacts are often felt in places hundreds of miles inland, including in Walthall County. All areas in Walthall County are equally susceptible to hurricane and tropical storms.

The following table shows the different category rankings of hurricanes on the Saffir-Simson Scale. The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures. In the western North Pacific, the term "super typhoon" is used for tropical cyclones with sustained winds exceeding 150 mph. Note that all winds are using the U.S. 1-minute average.

TABLE H.16: SAFFIR-SIMPSON SCALE OF HURRICANE STRENGTH

Category 1	Winds 74-95 mph (64-82 kt or 119-153 km/hr). Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
Category 2	Winds 96-110 mph (83-95 kt or 154-177 km/hr). Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or

[48] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[49] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

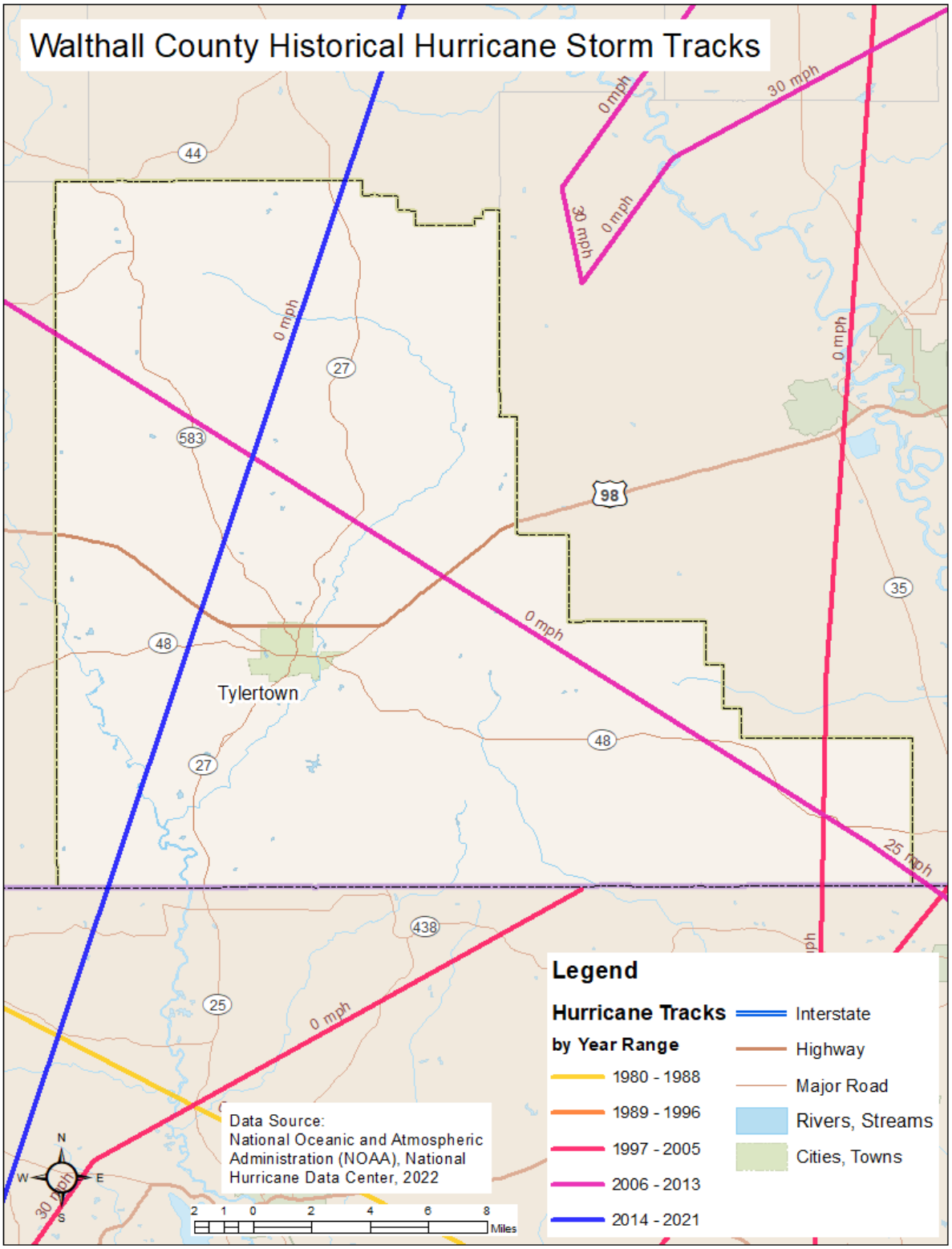
	uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
Category 3	Winds 111-129 mph (96-112 kt or 178-208 km/hr). Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
Category 4	Winds 130-156 mph (113-136 kt or 209-251 km/hr). Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
Category 5	Winds 157 mph or higher (137 kt or higher or 252 km/hr or higher). Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

HISTORICAL OCCURRENCES

According to the National Hurricane Center's historical storm track records, 76 hurricane or tropical storm/depression tracks have passed within 50 NM of Walthall County since 1855.[50] The following figure shows hurricane storm tracks that have passed through or near Walthall County since 1980.

[50] National Oceanic and Atmospheric Administration. Office for Coastal Management. Retrieved on 01/07/2023 from https://coast.noaa.gov/hurricanes

FIGURE H.11: WALTHALL COUNTY HISTORICAL STORM TRACKS



Federal records indicate that 6 major disaster declarations were made in Walthall County: 1969 (Hurricane Camille), 2004 (Hurricane Ivan), 2005 (Hurricane Katrina), 2008 (Hurricane Gustav), 2012 (Hurricane Isaac), and 2021 (Hurricane Ida).[51] [52] Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding. Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding. Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding.

The National Centers for Environmental Information also reported 8 hurricane or tropical storm events in Walthall County since 2002.

TABLE H.17: HISTORICAL HURRICANE / TROPICAL STORM OCCURRENCES IN WALTHALL COUNTY[53]

Date of Occurrence	Storm Name	Deaths/Injuries	Property Damage	Annualized Losses
10/2/2002	Hurricane Lili	0/0	$1,670,000	
8/28/2005	Hurricane Katrina	0/0	$367,000,000	
8/24/2008	Tropical Storm Faye	0/0	$0	
9/1/2008	Hurricane Gustav	0/0	$200,000	
8/28/2012	Hurricane Isaac	0/0	$250,000	
10/9/2020	Hurricane Delta	0/0	$500,000	
10/28/2020	Hurricane Zeta	0/0	$100,000	
8/29/2021	Hurricane Ida	0/0	$1,000,000	
Totals		**0/0**	**$370,720,000**	**$18,536,000**

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the county. Anecdotes are available from NCEI for the major storms that have impacted the county as found below:

Hurricane Katrina – August 29, 2005
The damage from Hurricane Katrina was devastating and widespread. Damage occurred across all of the Jackson forecast area which includes 9 parishes in Northeast Louisiana, 2 counties in Southeast Arkansas and about 2/3 of Central and Southern Mississippi. As widespread as the damage was, the more concentrated and most significant damage occurred across Southeast and East-Central Mississippi. For other areas, especially the areas west of Natchez to Yazoo City to Grenada line, damage to trees and power lines was significant and scattered across the landscape. As you move toward Central Mississippi and along Interstate 55 the damage and impacts increase. This portion of the state sustained widespread damage to trees and power lines.

Hurricane Gustav – September 1, 2008
As the center of Gustav crossed much of southern Louisiana, tropical storm force winds extended into southern Mississippi and portions of east central Louisiana. Sustained winds were between 35 and 45 mph with higher gusts between 70 and 100 mph occurred. Tree and power line damage was extensive across these areas which resulted in widespread power outages, some of which lasted for 3 to 5 days. As Gustav slowed across central Louisiana, the outer rainbands continued to rotate across much of southern and central Mississippi. This kept those portions of Mississippi in the region which was

[51] Federal Emergency Management Agency. Disaster Declarations for States and Counties. 2023. Retrieved on 01/05/2023 from https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties

[52] Federal Emergency Management Agency. Historical Flood Risk and Costs. 2023. Retrieved on 01/05/2023 from https://www.fema.gov/data-visualization/historical-flood-risk-and-costs.

[53] National Centers for Environmental Information

favorable for tornadoes. Over 3 days, 26 tornadoes were confirmed, all of which were in the EF0 to EF1 range.

Hurricane Isaac – August 29, 2012
Isaac moved very slowly to the north and northwest over the course of August 29th, which made for prolonged impacts. Forward motion of about 5 mph led to tremendous flooding issues for both Louisiana and portions of Mississippi south of I-20. Around noon on August 29th, Isaac was downgraded to a Tropical Storm, but this was not much relief to the many residents who were being inundated with rain and wind. The worst of the wind was felt generally along and south of an axis from Marion County to Adams County. Numerous trees were down in Adams County, leaving many without power for several days. Eighty percent of the roads were blocked in Franklin County due to downed trees.

Hurricane Ida – August 29, 2021
The county suffered minor to moderate damage to trees and homes across the county. While most structural damage was exterior, some homes did suffer major damage due to falling trees. At the peak approximately 50% of the county was without power.

PROBABILITY OF FUTURE OCCURRENCES
Due to Walthall County's inland location, the county does not experience hurricane sub-hazards such as storm surge. However, the county is – and will continue to be – susceptible to flooding and high wind events caused by hurricanes and tropical storms. As a result, the probability level of future hurricane and tropical storm occurrence is likely (between 10 and 100 percent annual probability). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. However, when the county is impacted, the damage could be significant, threatening lives and property throughout the planning area.

FUTURE IMPACTS OF CLIMATE CHANGE
The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[54] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Walthall County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[55] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

HURRICANE EVACUATIONS
As discussed above, the MEMA District 7 Region has been directly impacted by a number of hurricane and tropical storm events. However, the region is also susceptible to indirect effects from hurricanes and tropical storms, particularly in the form of evacuations from coastal counties. The counties within

[54] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf
[55] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

MEMA District 7 are located far enough inland that they are often the primary recipients of evacuees from counties that have been (or will be) impacted by major storm events.

For example, during Hurricane Katrina in 2005, thousands of evacuees made their way to counties in southwest Mississippi to take temporary refuge from the storm. Due to the severe and devastating effects of the storm, temporary sheltering within these counties was extended much longer than originally anticipated; in some cases, the evacuees ended up staying in shelters for weeks or months. This additional population caused a major strain on resources within these relatively rural counties. Local communities with limited resources had an unexpected and immediate need to provide shelter and other life essentials such as food, water, and health care to a significant number of evacuees.

Caring for evacuees was especially challenging for counties in the MEMA District 7 Region because most of these counties had been impacted themselves by the storm and were attempting to help their own citizens recover from the storm. Recovering from a major disaster while simultaneously attempting to help evacuees from surrounding counties posed difficulties for MEMA District 7 Region emergency management personnel and other local officials.

Based on Hurricane Katrina and other major hurricane events that have impacted the Gulf Coast in the past, it is likely that many of the MEMA District 7 counties will be receiver counties when it comes to evacuees. Many of these evacuees will likely come from locations in Louisiana, including New Orleans. Indeed, the State of Louisiana evacuation plan indicates that one of the primary evacuation routes from the City of New Orleans will direct evacuees north along Interstate 55, sending people through Pike County and Lincoln County. Depending on the severity of a storm event, officials in Louisiana may even change Interstate 55 over to a contraflow traffic pattern to enable quicker evacuations.

H.2.11 Severe Thunderstorm/High Wind

LOCATION AND SPATIAL EXTENT

A severe thunderstorm/high wind event is an atmospheric hazard that has no geographic boundaries and that can occur in all regions of the United States. However, severe thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that Walthall County has uniform exposure to a severe thunderstorm/high wind event and the spatial extent of a storm's impact could be large.

The following Beaufort scale is an empirical measure for the intensity of the wind associated with windstorms.

TABLE H.18: BEAUFORT WIND SCALE

Beaufort Scale					
NUMBER	**WIND SPEED (MPH)**	**DESCRIPTION**	**WAVE HEIGHT (FT)**	**SEA CONDITIONS**	**LAND CONDITIONS**
0	<1	Calm	0	Flat.	Calm. Smoke rises vertically.
1	1-3	Light air	0.33	Ripples without crests.	Wind motion visible in smoke.
2	3-7	Light breeze	0.66	Small wavelets.	Wind felt on exposed skin. Leaves rustle.
3	8-12	Gentle breeze	2	Large wavelets.	Leaves and smaller twigs in constant motion.
4	13-17	Moderate breeze	3.3	Small waves.	Dust and loose paper rise. Small branches begin to move.
5	18-24	Fresh breeze	6.6	Moderate (1.2 m) longer waves. Some foam and spray.	Small trees sway.
6	25-30	Strong breeze	9.9	Large waves with foam crests and some spray.	Large branches in motion. Whistling heard in overhead wires. Umbrella use difficult.
7	31-38	High wind, Moderate Gale, Near Gale	13.1	Sea heaps up and foam begins to streak.	Whole trees in motion. Effort needed to walk against the wind.
8	39-46	Fresh Gale	18	Moderately high waves with breaking crests forming spindrift. Streaks of foam.	Twigs broken from trees. Cars veer on road.
9	47-54	Strong Gale	23	High waves (6-7 m) with dense foam. Wave crests start to roll over. Considerable spray.	Larger branches break off trees, and some small trees blow over. Construction/temporary signs and barricades blow over. Damage to circus tents and canopies.

Beaufort Scale					
NUMBER	**WIND SPEED (MPH)**	**DESCRIPTION**	**WAVE HEIGHT (FT)**	**SEA CONDITIONS**	**LAND CONDITIONS**
10	55-63	Whole Gale/Storm	29.5	Very high waves. The sea surface is white and there is considerable tumbling.	Trees uprooted. Considerable structural damage.
11	64-72	Violent storm	37.7	Exceptionally high waves.	Widespread vegetation and structural damage.
12	≥73	Hurricane-force	≥46	Huge waves. Sea is completely white with foam and spray. Air is filled with driving	Massive and widespread damage to structures.

According to the National Centers for Environmental Information, 108 recorded Thunderstorm / High Wind events have affected Walthall County since 1963.[56] The following table is a summary of the Thunderstorm / High Wind events in Walthall County. In all, Thunderstorm / High Wind occurrences resulted in approximately $429,900 in property damage. It should be noted that Thunderstorm / High Wind events may cause substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

TABLE H.19: HISTORICAL THUNDERSTORM / HIGH WIND OCCURRENCES IN WALTHALL COUNTY[57]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Tylertown	36	2/0	$189,400	$3,210
Unincorporated	72	0/1	$238,500	$4,042
Walthall County Total	**108**	**2/1**	**$427,900**	**$7,253**

PROBABILITY OF FUTURE OCCURRENCES

[56] These Thunderstorm / High Wind events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1963 through November 2022. It is likely that additional Thunderstorm / High Wind events have affected Walthall County. As additional local data becomes available, this hazard profile will be amended.

[57] These Thunderstorm / High Wind events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1963 through November 2022.

Given the high number of previous events, it is certain that severe thunderstorm/ high wind events, including straight-line wind events, will occur in the future, with a highly likely probability level (100 percent annual probability) for the entire county.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[58] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Walthall County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[59] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful *severe thunderstorm/high wind events* to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

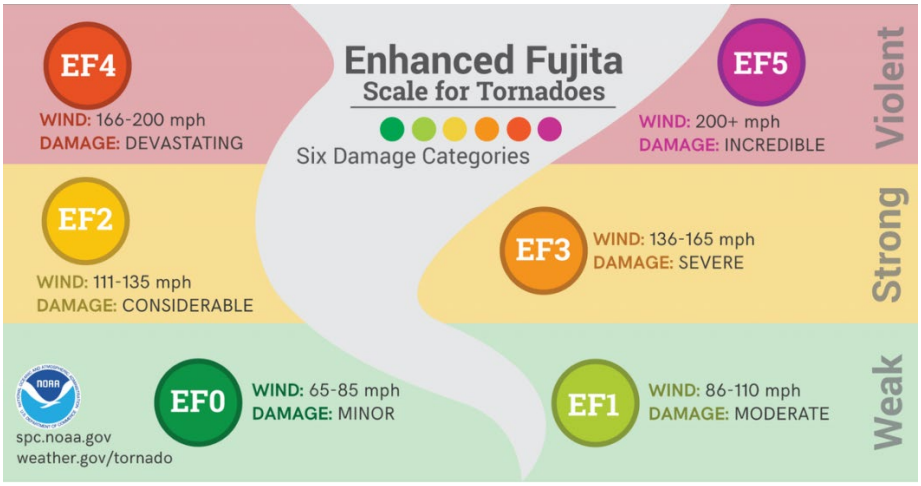
H.2.12 TORNADO

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, including in Walthall County. Tornadoes typically impact a relatively small area, but damage may be extensive. Tornado event locations are completely random and it is not possible to determine whether some areas are more susceptible than other areas to tornado strikes. Therefore, it is assumed that Walthall County is uniformly exposed to the tornado hazard.

The following figure depicts the Enhanced-Fujita Scale of tornado intensity.

FIGURE H.12: ENHANCED-FUJITA SCALE

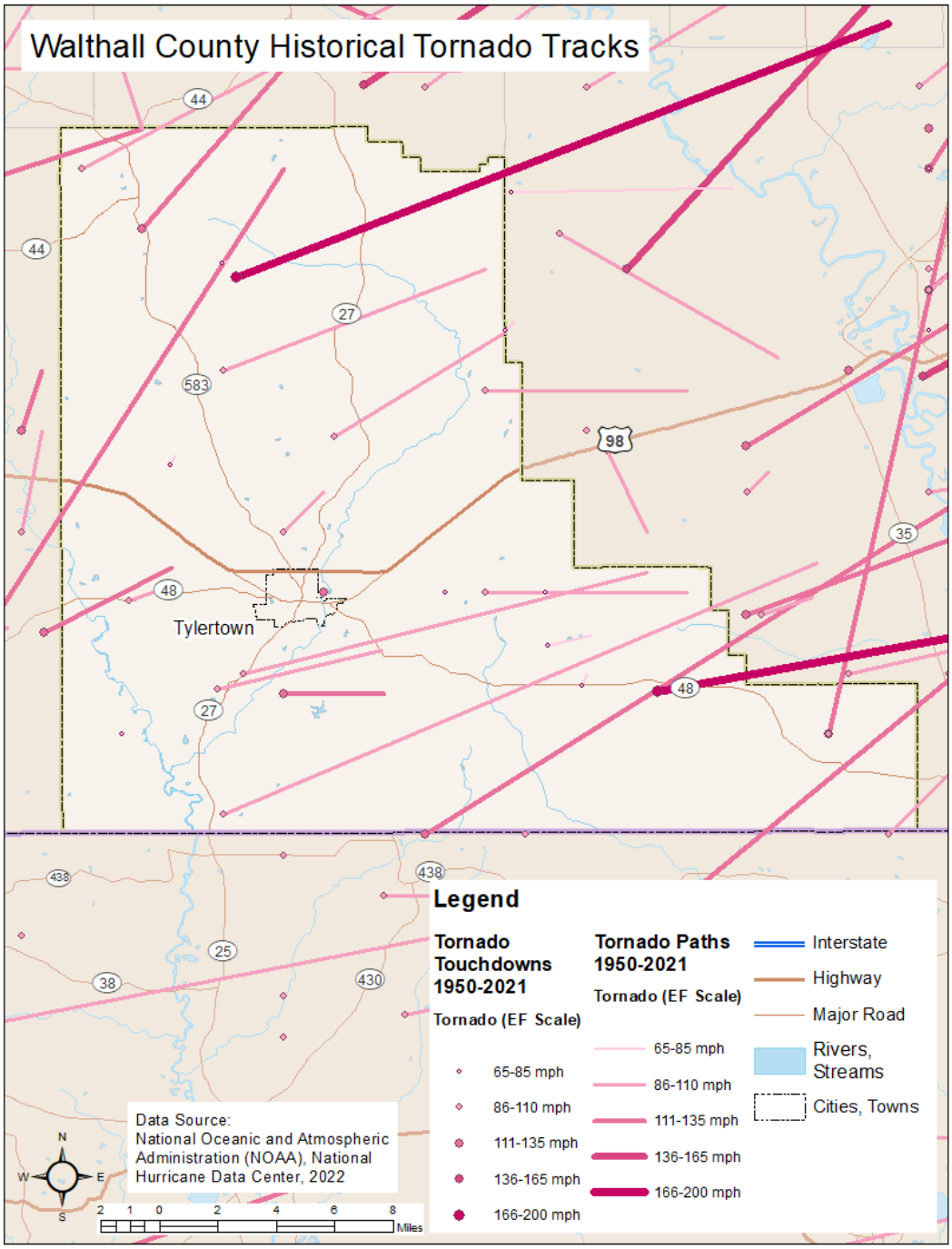


[58] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[59] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

With that in mind, the figure below shows tornado track data for many of the major tornado events that have impacted the county between 1950 and 2021. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

FIGURE H.13: WALTHALL COUNTY HISTORICAL TORNADO TRACKS



HISTORICAL OCCURRENCES

Tornadoes were at least partially responsible for 7 disaster declarations in Walthall County in 1980, 1983, 1990 , 2001, 2003, 2009, and 2020.[60] According to the National Centers for Environmental Information, there have been a total of 31 recorded tornado events in Walthall County since 1957, resulting in almost $2.3 million in property damages.[61] In addition, 14 injuries and 3 deaths were reported. The magnitude of these tornadoes ranges from F0 (EF0) to F4 (EF4) , although an F5 (EF5) event is possible.

The table below provides information about historical tornado impacts in Walthall County.

TABLE H.20: HISTORICAL TORNADO IMPACTS IN WALTHALL COUNTY[62]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Tylertown	5	1/0	$45,500	$700
Unincorporated Area	21	2/14	$2,247,500	$34,577
Walthall County Total	**31**	**3/14**	**$2,293,000**	**$35,277**

PROBABILITY OF FUTURE OCCURRENCES

According to historical information, tornado events pose a significant threat to Walthall County. The probability of future tornado occurrences affecting Walthall County is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[63] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Walthall County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[64] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storm systems that spawn tornadoes to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding, and enhancing the potential for increased *tornado activity*. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

[60] FEMA – Disaster Declarations. Retrieved on 01/01/2023 from https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties

[61] These tornado events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1957 through December 2022.

[62] Source: National Centers for Environmental Information

[63] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[64] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters.

H.2.13 Winter Storm, Freeze, and Extreme Cold

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm, freeze, and extreme cold events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure to this hazard typically depends on the normal, expected severity of local winter weather. Walthall County is not accustomed to severe winter weather conditions and seldom receives severe winter weather, even during the winter months. While winter storm events tend to be mild in nature, relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage because these events are not commonplace in the region. Given the atmospheric nature of the hazard, the entire county has uniform exposure to winter storm, freeze, and extreme cold events.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, there have been 10 recorded winter events that have affected Walthall County since 1996.[65] No property damage has been generated from any of these events.

TABLE H.21: SUMMARY OF WINTER STORM EVENTS IN WALTHALL COUNTY[66]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Walthall County	10	0/0	$0	$0

There have been several severe winter weather hazard events in Walthall County. The text below describes two of the major events and associated impacts on the county. Similar impacts can be expected with severe winter weather.

February 2010

Heavy snow affected a large portion of the region – especially locations across central and southern Mississippi – February 11th and February 12th. The heavy snow was a result of a low pressure system that tracked eastward across the northern Gulf of Mexico, and a vigorous upper level disturbance that moved across the region while a cold air mass was in place. Light precipitation overspread the region late Thursday afternoon into the evening before becoming heavy Thursday night into early Friday morning. The snow tapered off from west to east during the midday hours Friday.

February 2011

An ice storm developed across the area on February 3rd into the early morning hours of the 4th. While this icing event was not devastating, the impact to travel was a major issue across the region. Thousands of accidents occurred from slick roads. As a result of the accidents, three fatalities occurred along with a handful of injuries. Overall, most areas received 0.25 to 0.5 inches of ice accumulation from freezing

[65] Winter storm events include Cold/Wind Chill, Extreme Cold/Wind Chill, Frost/Freeze, Heavy Snow, Ice Storm, Winter Storm, and Winter Weather events.

[66] These events include extreme cold, frost, heavy snow, winter storm, ice storm and are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1996 through November 2022. It is likely that additional winter storm conditions have affected Walthall County.

rain. Additionally, some areas had a mix of precipitation with sleet accumulating. Some snow did occur, but those were just across select areas and the accumulation was mainly one inch or less.

February 2021
As an arctic air mass continued to build southward across the South on February 17th, another wave of precipitation overspread this cold air mass across much of Mississippi. The main impacts across central and southern portions of the state were from freezing rain and resulting heavy icing, but some significant accumulations of sleet and snow also occurred in areas mainly north and west of the Natchez Trace. Freezing rain continued through the evening hours, ending from west to east by the early morning of February 18th. Ice accumulated quickly in many locations and downed numerous trees, large limbs, and power lines across the affected areas. Several trees and limbs fell onto power lines, resulting in more widespread power outages as well. Some trees fell onto homes or cars, and significant amounts of ice, sleet, and snow collapsed a few gas station awnings and roofs where accumulations were greatest. In the hardest hit areas, extensive damage to trees and power lines took several months and cost several hundreds of thousands of dollars to clean up.

Winter storm, freeze, and extreme cold events throughout the planning area have several negative impacts including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could to fire or an accumulation of toxic fumes.

PROBABILITY OF FUTURE OCCURRENCES
Winter storm, freeze, and extreme cold events will continue to occur in Walthall County. Based on historical information, the probability is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE
The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[67] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Walthall County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[68] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms). However, accelerated warming in the Artic region (i.e., Arctic amplification) may also be linked with an increase in the frequency of *winter storm, freeze, and extreme cold events* across parts of Asia and North America, including in Walthall County. [69]

[67] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf
[68] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters.
[69] NOAA – Communication Education & Engagement. Retrieved from: https://cpo.noaa.gov/Divisions-Programs/Communication-Education-and-Engagement/CEE-News/ArtMID/8293/ArticleID/2369/Research-Links-Extreme-Cold-Weather-in-the-United-States-to-Arctic-Warming.

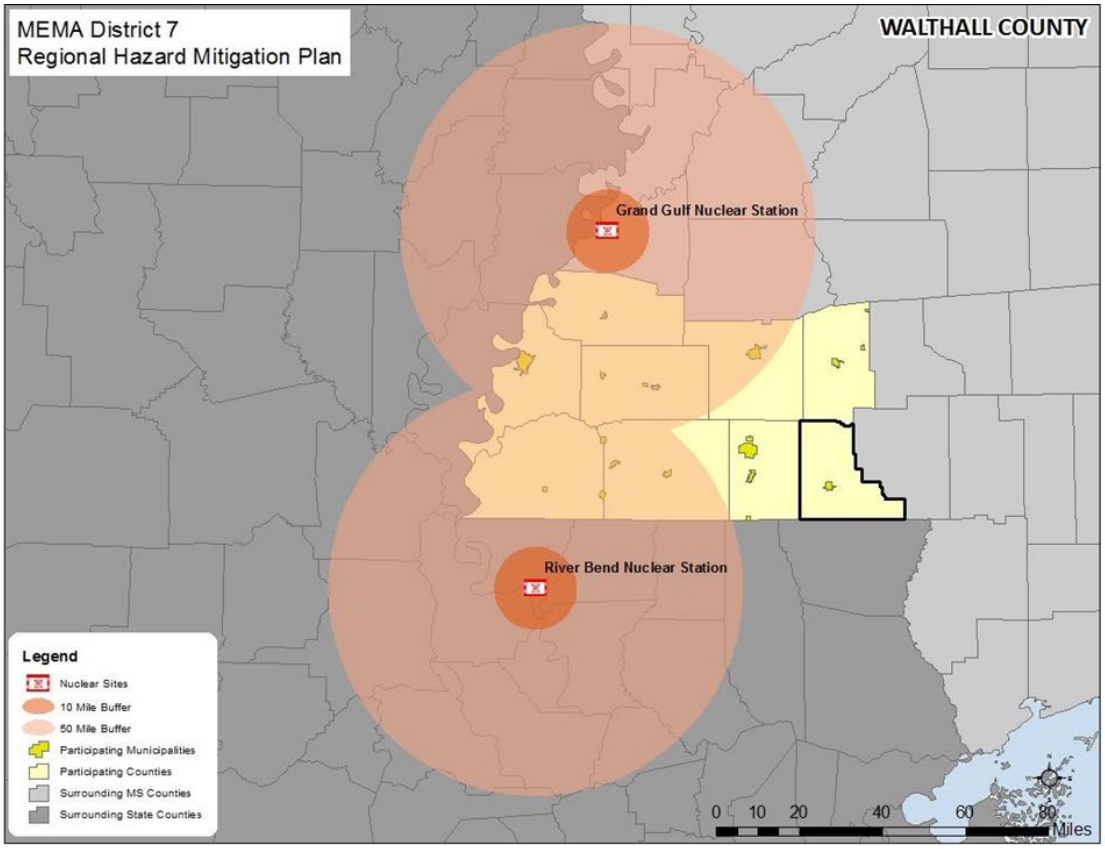
OTHER HAZARDS

H.2.14 Radiological Event

LOCATION AND SPATIAL EXTENT

The Nuclear Regulatory Commission (NRC) defines two emergency planning zones around nuclear plants: 10-mile zones and 50-mile zones. Areas located within a 10-mile radius of a nuclear station (i.e., 10-mile zones) are at highest risk of exposure to and inhalation of radioactive contamination; as a result, this radius is the designated evacuation radius recommended by the Nuclear Regulatory Commission when nuclear incidents occur. Areas outside within the secondary 50-mile radius (i.e., 50-mile zones) are still considered to be at risk of radioactive contamination, but the risks and impacts (i.e., ingestion of contaminated food and liquids) may be less severe than areas within the 10-mile radius. While no part of Walthall County is located inside either the 10-mile or 50-mile radius of a nuclear station, other parts of the MEMA District 7 region are located within 50-miles of 2 nuclear stations: the Grand Gulf Nuclear Station and the River Bend Nuclear Station.

FIGURE H.14: NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN WALTHALL COUNTY[70]



[70] Source: International Atomic Energy Agency.

HISTORICAL OCCURRENCES

Several minor events/notifications have been reported at both the Grand Gulf and River Bend Nuclear Stations. These incidents have been classified by the NRC using the scale found below. All of these events were minor in magnitude, and many were insignificant enough that they did not register on the classification scale. A list of events at Grand Gulf Nuclear Station and a list of events at River Bend Nuclear Station can be found in the tables below. There have been no major nuclear events at either the Grand Gulf or River Bend Nuclear Stations.

TABLE H.22: NUCLEAR REGULATORY COMMISSION EMERGENCY CLASSIFICATION SCALE FOR EVENTS OCCURRING AT NUCLEAR POWER PLANTS

Classification	Description
Notification of Unusual Event (NOUE)	Events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs. [Note: This term is sometimes shortened to Unusual Event (UE). The terms Notification of Unusual Event, NOUE and Unusual Event are used interchangeably.
Alert	Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the Environmental Protection Agency (EPA) protective action guides (PAGs)
Site Area Emergency	Site Area Emergency (SAE) – Events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or hostile action that results in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to, equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA PAG exposure levels beyond the site boundary.
General Emergency	Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile action that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

TABLE H.23: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT GRAND GULF NUCLEAR STATION[71] [72]

Date	Retrieved From*	Classification	Plant	Description
8/29/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST
10/1/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF NUCLEAR STATION SECURITY OFFICER LOCKOUT
9/29/2016	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF EXTENDED PLANT SHUTDOWN TO ADDRESS OPERATIONS PERFORMANCE

TABLE H.24: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT RIVER BEND NUCLEAR STATION[73] [74]

Date	Retrieved From*	Classification	Plant	Description
11/26/1985	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	ECCS Initiation: Improper restoration of a level transmitter causes HPSC injection
11/27/1985	Licensee Event Report	Alert	River Bend Unit 1	Failure to Perform Surveillance Tests
3/5/1992	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	REACTOR SCRAM CAUSED BY A GENERATOR TRIP DUE TO HIGH WINDS CAUSING TRANSFORMER DAMAGE
9/15/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE IVAN
10/4/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	Shutdown Greater than 72 Hours
9/23/2005	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	NRC ENTERS MONITORING MODE DUE TO HURRICANE RITA

[71] Nuclear Regulatory Commission Preliminary Notification Reports: http://www.nrc.gov/reading-rm/doc-collections/event-status/prelim-notice/.
[72] Nuclear Regulatory Commission Licensee Event Reports: https://lersearch.inl.gov/Entry.aspx.
[73] Nuclear Regulatory Commission Preliminary Notification Reports: http://www.nrc.gov/reading-rm/doc-collections/event-status/prelim-notice/.
[74] Nuclear Regulatory Commission Licensee Event Reports: https://lersearch.inl.gov/Entry.aspx.

Date	Retrieved From*	Classification	Plant	Description
5/23/2007	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REACTOR SHUTDOWN DUE TO UNEXPECTED CHANGE IN RECIRCULATION FLOW
9/2/2008	Preliminary Notification Reports	Notification of Unusual Event/Not Applicable	River Bend Unit 1	NRC RESPONSE TO HURRICANE GUSTAV
5/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	AUGMENTED INSPECTION TEAM ONSITE AT RIVER BEND STATION
8/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST

PROBABILITY OF FUTURE OCCURRENCES

A radiological event at a nuclear station is a very rare occurrence in the United States due to the intense regulation of the nuclear power industry. While there have been minor incidents at both the Grand Gulf or River Bend Nuclear Stations, a radiological event it is considered unlikely (less than 1 percent annual probability).

RADIOLOGICAL EVACUATIONS

Like the hurricane evacuations discussed above, the MEMA District 7 Region would potentially be impacted to a greater degree by evacuations caused by a radiological event than by the event itself. Counties immediately adjacent to the region are located within a 10-mile radius of a nuclear facility and, in the aftermath of a radiological incident – populations from those counties may be evacuated to the MEMA District 7 Region.

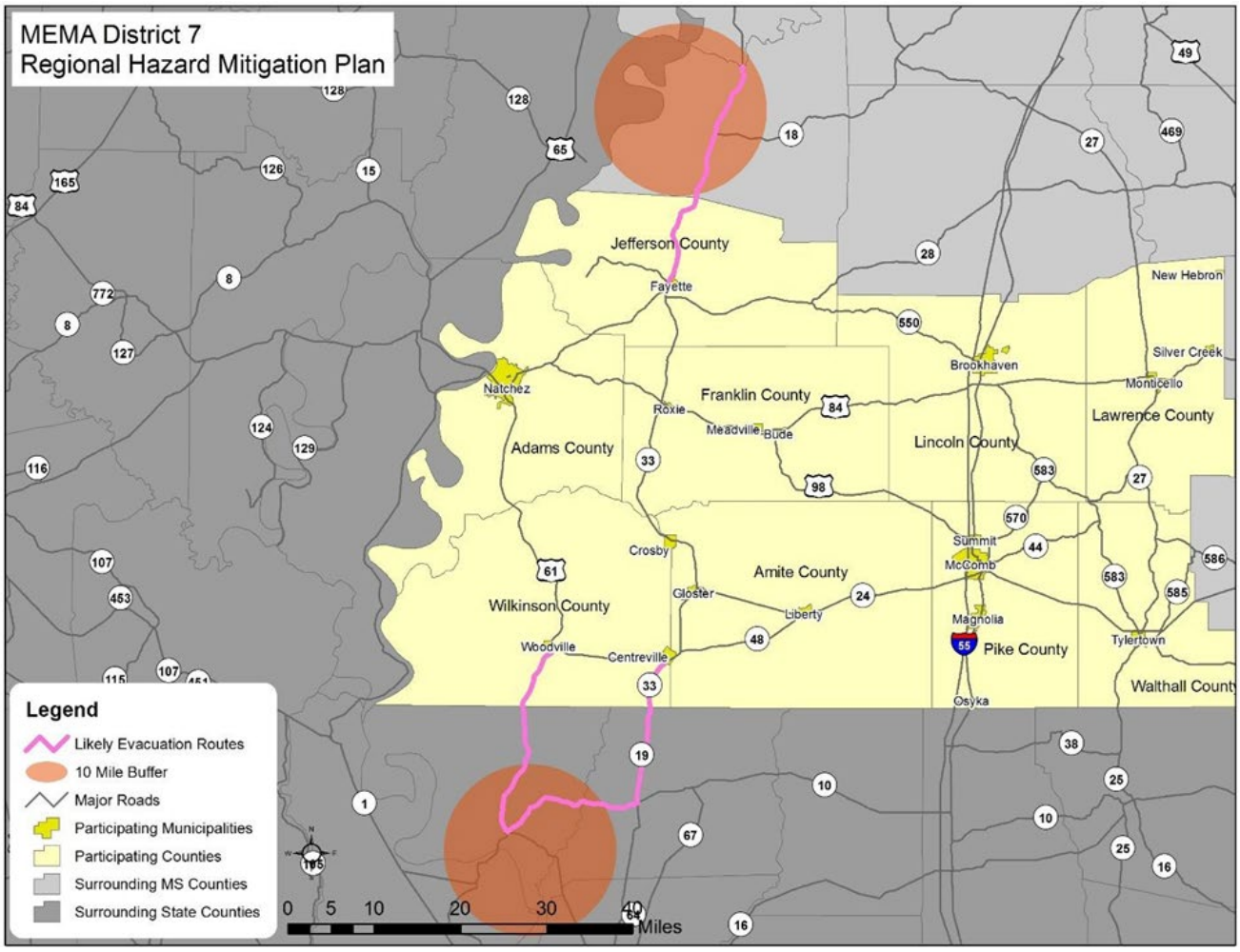
Due to the severe and long-term effects of a major radiological event, temporary sheltering will be an initial concern, but the greater challenge may be in the long-term. As has happened with historical radiological accidents in other locations, the danger in the impacted area will likely extend for a very long period after the event, and evacuees may be unable to return to their homes for months or years. This additional influx of population will cause a major strain on resources within these relatively rural counties in the short-term, as local communities with limited resources will have an unexpected and immediate need to provide shelter and other life essentials such as food, water, and health care to a significant, additional number of people. In the long-term, there may be challenges for local officials as existing infrastructure will likely be inadequate to handle larger populations.

Although there have not been any major radiological events in the region historically, hurricane evacuations (discussed above) provide a similar scenario in terms of what the region might expect. However, one additional concern that officials will need to consider in a radiological event is that evacuees may be contaminated by radioactivity. According to the Centers for Disease Control, radioactive contamination can occur when radioactive materials are released into the environment and

become deposited into the air, water, surfaces, soil, plants, buildings, people, or animals. This contamination can then be spread when people touch other people, surfaces, or objects. Therefore, when people evacuate a contaminated zone, they pose a potential risk of spreading the contamination to others if they are not properly treated. Local officials in MEMA District 7 may need to be prepared to set up decontamination centers along major evacuation routes to ensure that the contamination is not spread. It is also important for citizens to understand the steps they can take to reduce the risk of spreading contamination such as evacuating quickly after an event and following decontamination instructions as directed by local officials.[24]

Based on the locations of the 10-mile evacuation areas near the region, many of these evacuees will likely come from Claiborne County to the north and West Feliciana and East Feliciana Parishes to the south. The main roads for these evacuees will probably be U.S. Highway 61 and Mississippi State Highway 33 since these are the primary and most direct roads into and out of the evacuation counties and into MEMA District 7 as shown below. Depending on the severity of the event, officials may even change these roads over to a contraflow traffic pattern to enable quicker evacuations.

FIGURE H.15: LIKELY EVACUATION ROUTES FOR A RADIOLOGICAL EVENT IN THE MEMA DISTRICT 7 REGION



As a result of the potential for an influx of evacuees during a radiological event, it is critical for local officials in the MEMA District 7 region to prepare for evacuations. It is possible that thousands of evacuees will be relocated, either temporarily or permanently, to MEMA District 7. Therefore, plans for identifying shelters and other resources should be coordinated well in advance of future events.

H.2.15 Pandemic

LOCATION AND SPATIAL EXTENT

Pandemics are global in nature. However, they may start anywhere. Walthall County chose to analyze this hazard given the agriculture in the area and potential for this kind of event to occur in any location at any time.

All populations should be considered at risk to pandemic. Buildings and infrastructure are not directly impacted by the virus/pathogen but could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings may be shutdown, at least temporarily, as a result. Employers may initiate work from home procedures for non-essential workers in order to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

HISTORICAL OCCURRENCES

Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below.

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to 566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population.

Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10 to 50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852- 1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours. The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of

cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

1957 Asian Flu: It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

1968 Hong Kong Flu: The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020, mainly due to the speed and scale of the transmission of the disease. Prior to that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province on February 26th, 2020. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

There is a considerable amount of data on the extent of COVID-19 throughout the State of Mississippi and Walthall County. The number of reported cases and deaths across the State of Mississippi and Walthall County are shown in the figure below.

TABLE H.25: COVID-19 CASES AS OF 01/02/2023[75] [76]

	Cases	Deaths
Mississippi	943,402	13,051
Walthall County	4,490	83

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS, and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Walthall County has a probability level of unlikely (less than 1 percent annual probability) for future pandemics events. While pandemics can have devastating impacts, they are relatively rare.

The Mississippi State Department of Health maintains a state pandemic plan which can be found at: http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf.

H.2.16 Conclusions on Hazard Risk

The hazard profiles presented in this subsection were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

HAZARD EXTENT

The following table describes the extent of each natural hazard identified for Walthall County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

TABLE H.26: EXTENT OF WALTHALL COUNTY HAZARDS

Flood Related Hazards	
Dam & Levee Failure	Dam Failure extent is defined using the Mississippi Department of Environmental Quality classifications which include Low, Significant, and High. No dams are classified as high-hazard in Walthall County.

[75] Mississippi Department of Health – COVID-19 Totals by County. Retrieved on 01/05/2023 from https://msdh.ms.gov/msdhsite/_static/14,0,420,884.html

[76] Mississippi Department of Health – COVID-19 Totals by County. Retrieved on 01/05/2023 from https://msdh.ms.gov/msdhsite/_static/resources/19550.pdf

Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no official erosion rate records in Walthall County but local estimates are around 0.25 to 0.50 feet per year. Some areas of erosion have been identified by local coordinators.
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 9.9 percent of the total land area in Walthall County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was on Magees Creek at Tylertown, where water reached a discharge of 30,000 cubic feet per second (recorded on April 7, 1983). The highest stream gage height was also on Magees Creek at Tylertown, with a height of 31.38 feet (recorded on April 7, 1983). Additional peak discharge readings, historic crest heights, and the corresponding flood categories (where available) are in the table below.
Fire Related Hazards	
Drought	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. Walthall County has received this ranking once over the 17-year reporting period.
Lightning	According to the Vaisala's flash density map, Walthall County is located in an area that experiences 12 to 20 lightning flashes per square mile per year. It should be noted that future lightning occurrences may exceed these figures.
Wildfire	Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2007-2016. The greatest number of fires to occur in Walthall County in any year was 60 in 2011 and 2016. The greatest number of acres to burn in the county in a single year occurred in 2011 when 1,650 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale or the Modified Mercalli Intensity (MMI) scale. According to data provided by the National Centers for Environmental Information, the greatest earthquake to impact Walthall County had a MMI of III (sight) but no Richter magnitude was available (reported on October 19, 1930).
Temperature & Wind Related Hazards	
Extreme Heat	The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are not kept for any areas in Walthall County. However, the highest recorded temperature in the region was 106°F in 2007 with heat index values recorded above 115°F.
Hailstorm	Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Walthall County was 2.75 inches (reported on March 17, 2016). It should be noted that future events may exceed this.
Hurricane & Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5. The greatest classification of hurricane to impact the MEMA District 7 Region was a Category 3 storm. This occurred in 1969 with Hurricane Camille and in 2005 with Hurricane Katrina. The storm track of both storms passed just to the east of the region, but due to the size of these storms, their impact was felt across the region.

Severe Thunderstorm / High Wind	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 67-year history from the National Centers for Environmental Information, the strongest recorded wind event in Walthall County was last reported on January 2, 2017, at 65 knots (approximately 75 mph). It should be noted that future events may exceed these historical occurrences.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA as well as the Fujita/Enhanced Fujita Scale. The greatest magnitude reported in Walthall County was an F2 (last reported on November 15, 2006).
Winter Storm & Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in Walthall County. However, reports from National Centers for Environmental Information (NCDC) of the greatest snowfall in the county has been 4 inches (reported on February 11, 2010).
Other Hazards	
Radiological Event	Although there is no history of a nuclear accident at either the Grand Gulf Nuclear Station or River Bend Nuclear Station, other events across the globe and in the United States indicate that an event is possible. Since several national and international events were Level 7 events on the INES, the potential for a Level 7 event at these stations is possible.
Pandemic	The extent of a pandemic impacting the county is difficult to estimate. It could result in thousands of deaths and extreme disruption of commerce and everyday life.

PRIORITY RISK INDEX RESULTS

To draw some meaningful planning conclusions on hazard risk for Walthall County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a "Priority Risk Index" (PRI). More information on the PRI and how it was calculated can be found in Section 5.17.2.

The following table summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this subsection, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

TABLE H.27: SUMMARY OF PRI RESULTS FOR WALTHALL COUNTY

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Dam Failure and Levee Failure	Unlikely	Critical	Moderate	Less than 6 hours	Less than 6 hours	**2.3**
Erosion	Possible	Minor	Small	More than 24 hours	More than 1 week	**1.8**
Flood	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**3.2**
Fire-related Hazards						
Drought	Possible	Limited	Large	More than 24 hours	More than 1 week	**2.5**
Lightning	Highly Likely	Limited	Small	6 to 12 hours	Less than 6 hours	**2.6**
Wildfire	Highly Likely	Limited	Moderate	Less than 6 hours	Less than 1 week	**3.1**
Geologic Hazards						

Earthquake	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Temperature & Wind Hazards						
Extreme Heat	Likely	Limited	Large	More than 24 hours	More than 1 week	**2.8**
Hailstorm	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Hurricane and Tropical Storm	Likely	Catastrophic	Large	More than 24 hours	Less than 1 week	**3.3**
Severe Thunderstorm/High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Tornado	Likely	Catastrophic	Moderate	Less than 6 hours	Less than 6 hours	**3.2**
Winter Storm/Freeze/Extreme Cold	Likely	Minor	Moderate	More than 24 hours	Less than 1 week	**2.2**
Other Hazards						
Radiological Event	Unlikely	Minor	Moderate	More than 24 hours	Less than 1 week	**1.6**
Pandemic	Unlikely	Limited	Large	More than 24 hours	More than 1 week	**2.2**

H.2.17 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Walthall County, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each identified hazard can be found in the table below according to three categories: High Risk, Moderate Risk, and Low Risk. For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Walthall County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately and is described in Section 6: *Vulnerability Assessment* and below in Section H.3. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates. In most cases, the hazards of greatest concern did not change much since the last plan update, indicating that the priorities remained relatively stable and there were few changes in priorities.

TABLE H.3: CONCLUSIONS ON HAZARD RISK FOR WALTHALL COUNTY

HIGH RISK	Hurricane and Tropical Storm Tornado Flood Wildfire Severe Thunderstorm/High Wind
MODERATE RISK	Extreme Heat Hailstorm Lightning Drought
LOW RISK	Dam and Levee Failure Winter Storm/Freeze/Extreme Cold Erosion Radiological Event Earthquake Pandemic

H.3 WALTHALL COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Walthall County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected amount of damage caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in Section 6: *Vulnerability Assessment*.

H.2.18 Asset Inventory

The table below lists the estimated number of improved properties and the total value of improvements for Walthall County and its participating jurisdictions (study area of vulnerability assessment). Because digital parcel data was not available for most communities, data obtained from Hazus-MH 5.1 inventory was utilized to complete the analysis.

TABLE H.29: IMPROVED PROPERTY IN WALTHALL COUNTY[77]

Location	Counts of Improved Properties	Total Value of Improvements
Tylertown	962	$224,096
Unincorporated Area	6,547	$1,086,718,904
Walthall COUNTY TOTAL	**7,509**	**$1,086,943,000**

In addition, following table lists the inventory of critical facilities (i.e., fire stations, police stations, medical care facilities, emergency operation centers, schools, and ports) located in Walthall County, according to previous plan data and Hazus-MH 5.1 data that was reviewed and updated by local officials.

TABLE H.30: CRITICAL FACILITY INVENTORY IN WALTHALL COUNTY[78]

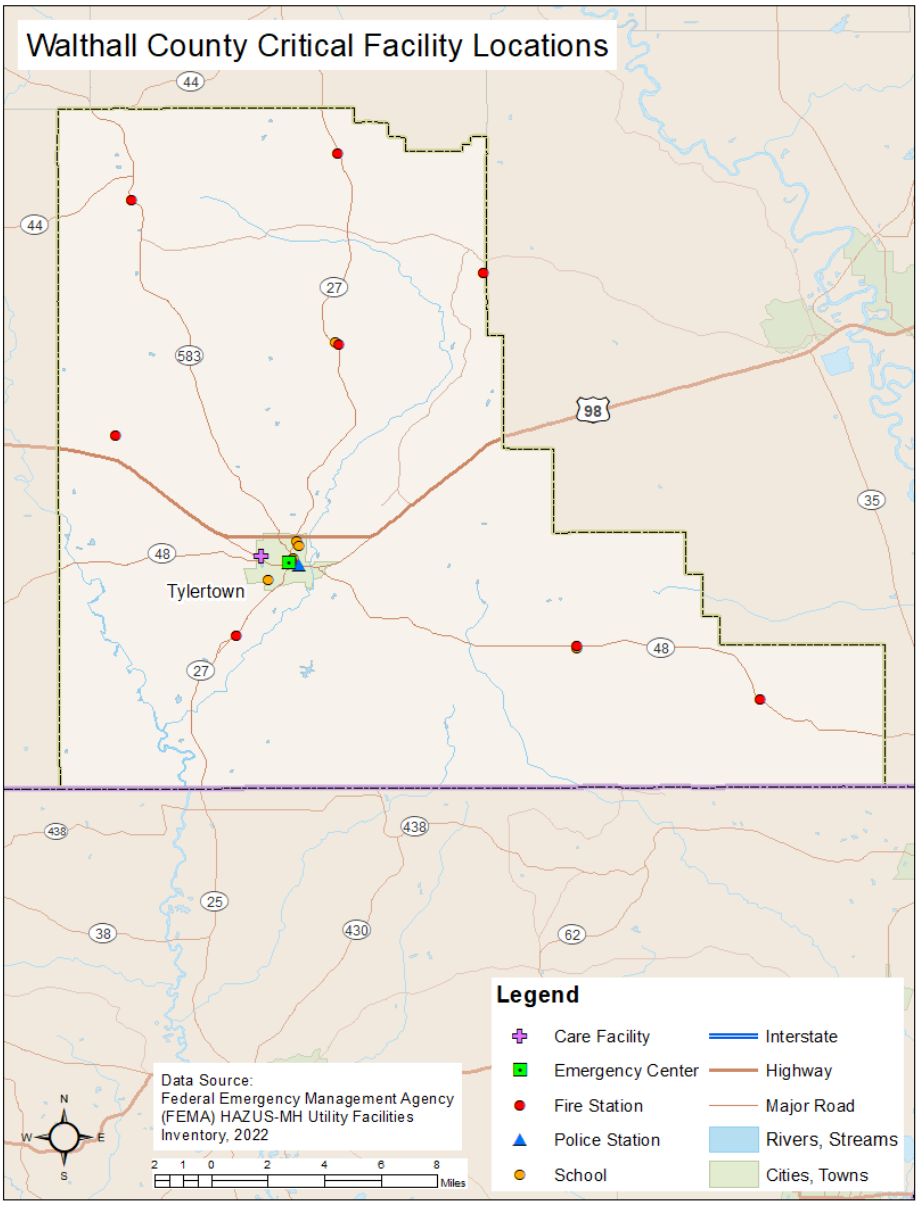
Location	Fire Stations	Police Stations	Medical Facilities	EOC	Schools	Ports
Tylertown	1	2	2	1	3	0
Unincorporated Area	5	0	0	0	2	0
Walthall County Total	**6**	**2**	**2**	**1**	**5**	**0**

The figure below shows the locations of critical facilities in Walthall County. The table at the end of this subsection, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided through Hazus which was updated, as best as possible, with local knowledge.

[77] *Hazus-MH 5.1*

[78] *Sources: Hazus-MH 5.1; Local Officials*

FIGURE H.16: CRITICAL FACILITY LOCATIONS IN WALTHALL COUNTY

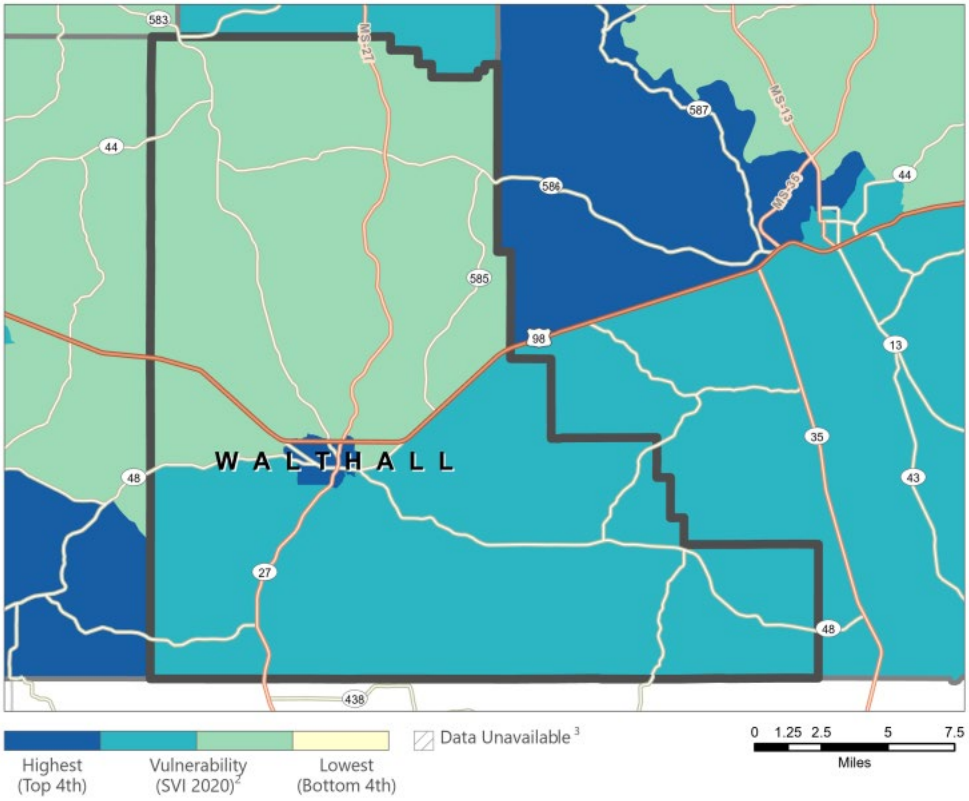


Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those segments of the resident population in Adams County that are potentially at risk for these hazards. Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss.

The CDC/ATSDR Social Vulnerability Index (CDC/ATSDR SVI) uses 16 U.S. census variables to help local officials identify communities that may need support before, during, or after disaster. See figure below for Adams County SVI score of 0.8647.

FIGURE H.17: SOCIAL VULNERABILITY INDEX IN WALTHALL COUNTY[79]



The following table lists the population by jurisdiction. According to the 2020 U.S. Census, the total population in Walthall County was 13,884 persons, which was a decrease from the 2010 population. Additional population estimates are presented above in Section H.1.

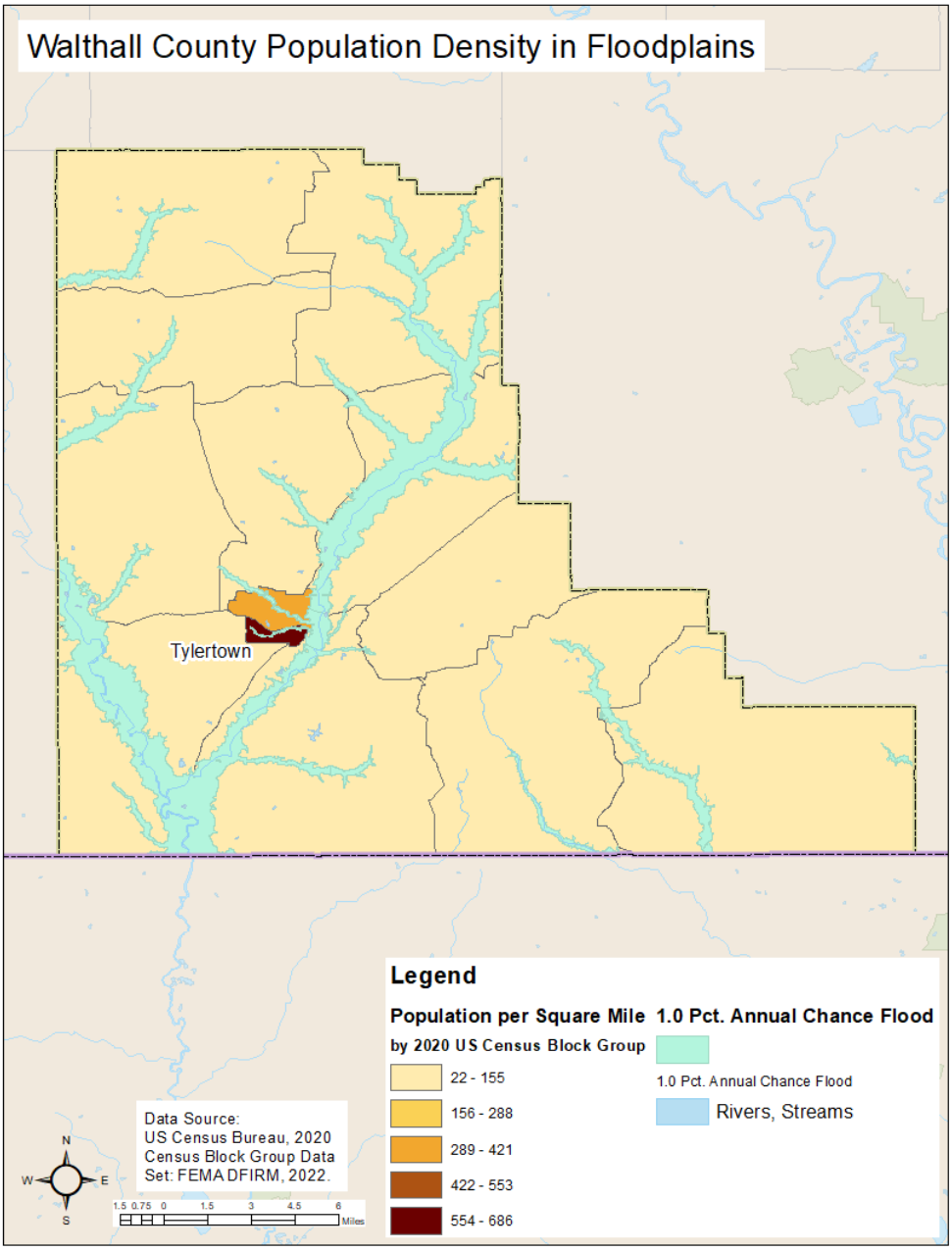
TABLE H.4: POPULATION IN WALTHALL COUNTY[80] [81]

Jurisdiction	2010 Census Population	2020 Census Population	% Change 2010-2020
Tylertown	1,609	1,515	-5.8%
Unincorporated Area	13,834	12,369	-10.6%
Walthall County Total	**15,443**	**13,884**	**-10.1%**

In addition, the figure below illustrates the population density per acre by census block as it was reported by the U.S. Census Bureau in 2020. As can be seen in the figure, the population is spread out with concentrations in municipal areas such as Tylertown.

[79] CDC/ATSDR Social Vulnerability Index
[80] *United States Census Bureau 2020 Census.*
[81] *United States Census Bureau. Census 2011-2015 American Community Survey 5-Year Estimates.*

FIGURE H.18: POPULATION DENSITY IN WALTHALL COUNTY



H.2.19 Development Trends and Changes in Vulnerability

Since the previous hazard mitigation plan was approved, Walthall County has experienced population loss and development. The following table shows the number of building units constructed since 2010 according to the U.S. Census American Community Survey.

TABLE H.32: BUILDING COUNTS FOR WALTHALL COUNTY[82]

Location	Total Housing Units (2021)	Units Built 2010 or Later	% Building Stock Built Post-2010
Tylertown	737	42	5.70%
Unincorporated Area	6,140	436	7.10%
Walthall County Total	**6,877**	**478**	**6.95%**

TABLE H.33: POPULATION GROWTH FOR WALTHALL COUNTY[83]

Jurisdiction	2000 Census	2010 Census	2020 Census	% Change 2000 - 2020
Walthall County	15,156	15,443	13,884	-8.39%
Tylertown	1,910	1,609	1,515	-20.68%
Unincorporated Area	13,246	13,834	12,369	-6.62%

Since 2000, the county has experienced a population decline. However, both incorporated and unincorporated areas of the county have experienced similar rates of development, resulting in an increased number of structures that are vulnerable to the potential impacts of the identified hazards. This increased development has led to a slight increase in the county's vulnerability, with larger increases in vulnerability in certain areas and communities. If development continues to increase in the future, more of the county's population and infrastructure will be exposed to potential hazards, especially if that development occurs in high-risk areas such as floodplains.

H.2.20 Vulnerability Assessment Results

As noted in Section 6: *Vulnerability Assessment*, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis. Those analyses, specific to Walthall County, are presented here. Almost all other hazards are assumed to impact the entire planning region (drought, extreme heat, hailstorm, lightning, severe thunderstorm/high wind, tornado, and winter storm/freeze/extreme cold), while the remaining hazard (erosion) is not analyzed due to lack of data.

The hazards analyzed in this subsection include: dam/levee failure, flood, wildfire, earthquake, hurricane and tropical storm winds, and radiological event.

The annualized loss estimate for all hazards is presented near the end of this subsection.

DAM/LEVEE FAILURE

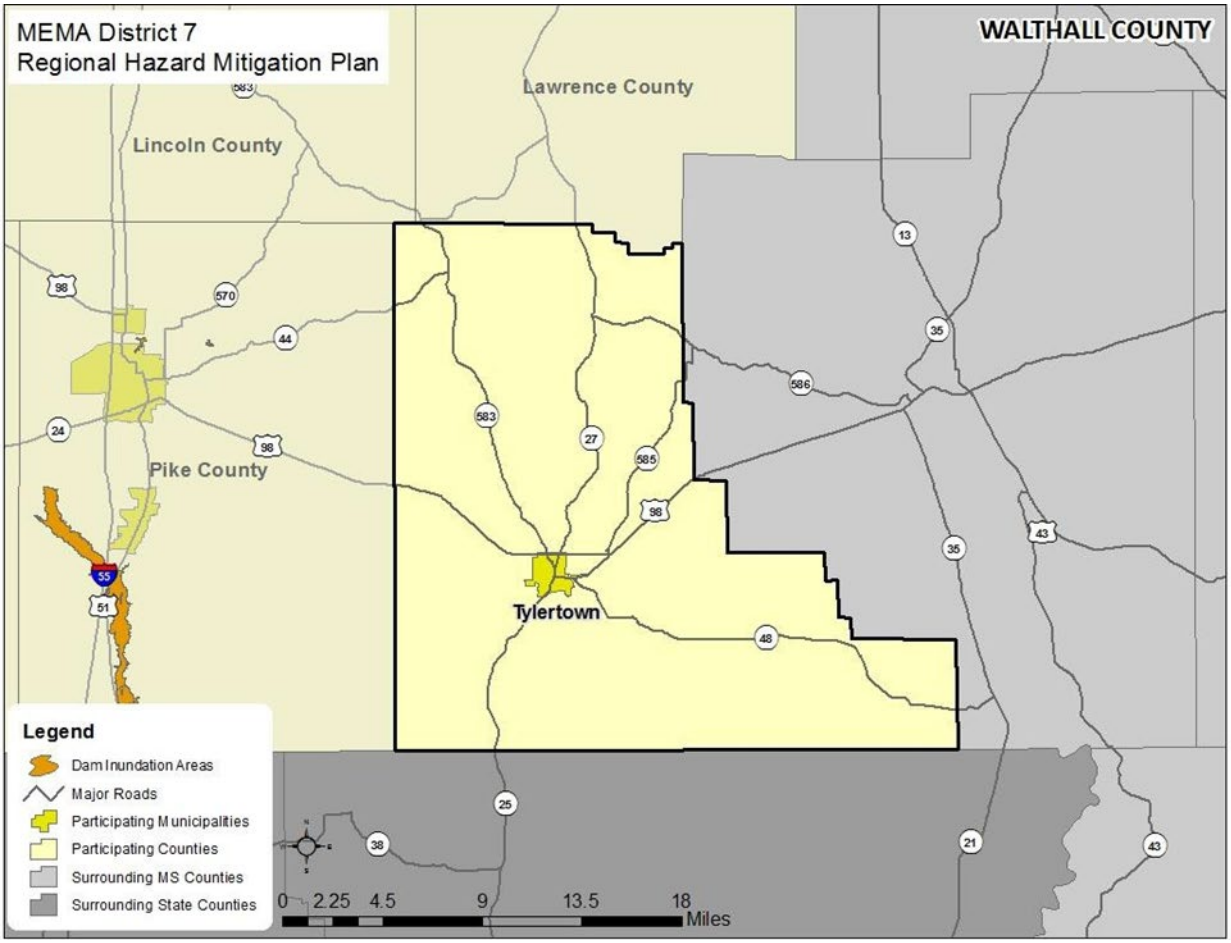
To assess risk to a dam or levee failure, a GIS-based analyses have been used to estimate exposure of Walthall County to areas delineated by the Mississippi Department of Environmental Quality as a potential inundation area. The determination of value at-risk (exposure) has been calculated by

[82] United States Census. American Community Survey 5-Year Estimates. 2021. Retrieved on 01/12/2023 from: https://data.census.gov/table?q=median+home+value+walthall+county+mississippi+tylertown+mississippi.
[83] United States Census. 2000 Census, 2010 Census, and 2020 Census.

summing the values for improved properties located within an identified inundation area. Because this type of inundation mapping has not been completed for every dam/levee in the region, the results of this analysis likely underestimate the overall vulnerability to a dam or levee failure. However, this analysis is still useful as a baseline minimum for property that is potentially at-risk. The figure below shows identified potential inundation areas within and adjacent to Walthall County.

In general, building footprint and parcel data are used in this analysis. However, due to a lack of digital building and parcel information for some communities, inventory data from HAZUS-MH 5.1 have been used to supplement local building and parcel data. However, HAZAUS-MH 5.1 data reflect estimations of building inventory and may not reflect actual counts or values located in dam inundation areas. It is likely that these data overestimate the amount of property in the identified dam inundation risk zones.

FIGURE H.19: DAM INUNDATION AREAS IN WALTHALL COUNTY



Social Vulnerability

Although there are no dam inundation areas of concern located within the county, this does not indicate that there is no risk to a dam/levee failure, especially considering not all dams or levees have delineated inundation areas.

Critical Facilities

There are no critical facilities located within the identified dam inundation areas. Although there are no areas of concern located within Walthall County, this does not mean that there is no risk for critical facilities to a dam/levee failure, as not all dams or levees in the region have delineated inundation areas. A list of specific critical facilities and their associated risk can be found in the table at the end of this section.

The dam/levee failure hazard has the potential to impact existing and future buildings, critical facilities, and populations in Walthall County. Structures at highest risk to this hazard are located near or within the dam inundation areas. Future vulnerabilities of Walthall County assets to dam/levee failure will be greatly dependent on individual dam/levee design and associated the mitigation measures therein. While site-specific vulnerability determinations are outside the scope of this assessment, they will be considered during future plan updates if data become available.

FLOOD

Historical evidence indicates that Walthall County is susceptible to flood events. A total of six flood events have been reported by the National Centers for Environmental Information resulting in $1.26 million in property damage. On an annualized level, these damages amounted to $50,400 for Walthall County.

In order to assess flood risk, a GIS-based analysis has been used to estimate exposure to flood events using Digital Flood Insurance Rate Map (DFIRM) data in combination with improved property records for the county. The determination of value at-risk (exposure) is calculated using GIS analysis by summing the values for improved properties that were located within an identified floodplain.

Due to a lack of digital building and parcel information for some communities, inventory data from HAZUS-MH 5.1 have been used to supplement local building and parcel data. However, HAZAUS-MH 5.1 data reflect estimations of building inventory and may not reflect actual counts or values of buildings and parcels located in floodplains. It is likely that these data overestimate the amount of property in the floodplains.

For this plan update, a HAZUS 100yr. flood scenario was performed for the study area. The geographical size of the Walthall County is approximately 404 square miles and contains 1,058 census blocks. The region contains over 6,000 households and has a total population of 15,443 people (2010 Census Bureau Data).[84] [85]

There are an estimated 7,509 buildings in the region with a total building replacement value (excluding contents) of $997 million. Approximately 93.73% of the buildings (and 74.78% of the building value) are associated with residential housing. HAZUS estimates that about 51 buildings will be at least moderately damaged. This is over 81% of the total number of buildings in the scenario, with an estimate that 1 building would be destroyed.

Social Vulnerability

The figure below shows populations in Walthall County that are at risk of flooding, using census block

[84] United States Census Bureau. 2020 Census.

[85] United States Census Bureau. 2021 American Community Survey 5-Year Estimates. Retrieved on 01/07/2023 from https://data.census.gov/table?g=0500000US28147&tid=ACSST5Y2021.S1101.

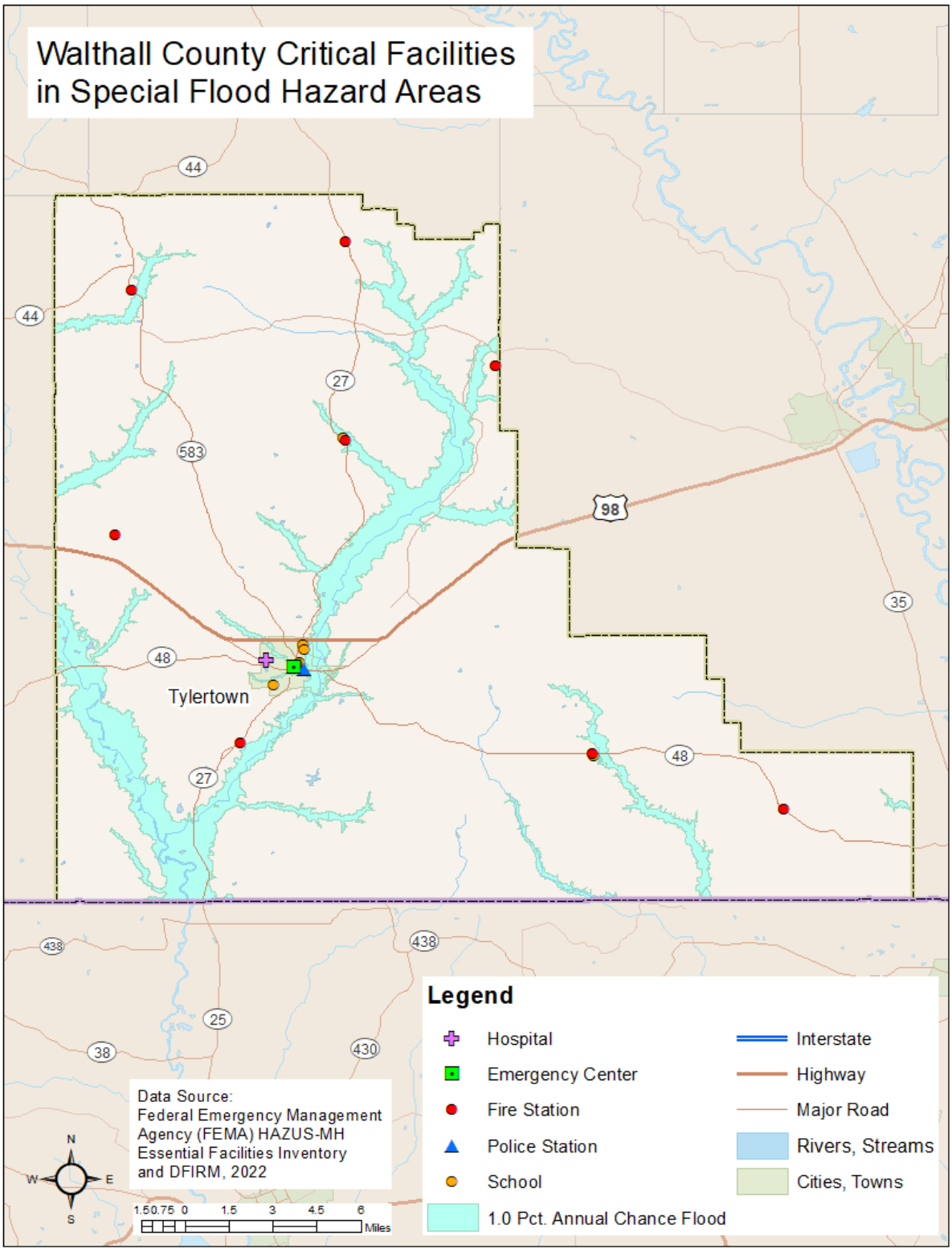
level population data and floodplain location data. There are numerous areas of concern in Walthall County, especially in several of the county's population centers. Therefore, further investigation in these areas may be warranted. As noted in Section 6.4, no building-specific data, such as building footprints, were available to determine buildings at risk.

Critical Facilities

There is one critical facility in Walthall County that is located in a floodplain. This facility is a private sector building located in the 1.0 percent annual chance flood zone. (Please note: this analysis does not consider building elevation, which may negate risk.) A list of specific critical facilities and their associated risk can be found in the table at the end of this subsection.

A flood has the potential to impact many existing and future buildings, facilities, and populations in Walthall County, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures have a reduced risk. While site-specific vulnerability determinations are outside the scope of this assessment, they may be added to future plan updates. Such determinations may include identifying areas subject to repetitive flooding for potential mitigation actions.

FIGURE H.20: WALTHALL COUNTY CRITICAL FACILITIES IN THE SFHA



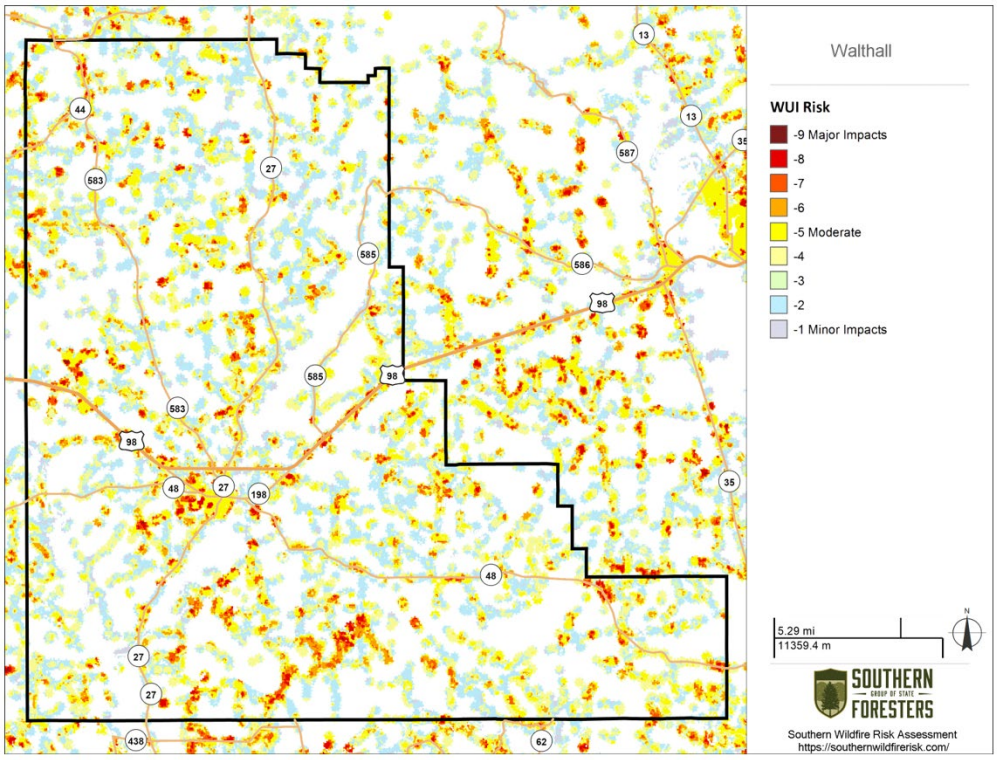
WILDFIRE

Although historical evidence indicates that Walthall County is susceptible to wildfire events, there are few reports which include information on historic dollar losses. Therefore, it is difficult to calculate a reliable annualized loss figure. While annualized wildfire losses in Walthall County are considered negligible, a single wildfire event could result in significant damages throughout the county.

To estimate potential exposure of Walthall County areas to wildfire, HAZUS-MH 5.1 aggregated census-block-level building and parcel data were combined with Wildland Urban Interface Risk Index (WUIRI) data to determine wildfire vulnerability. For the critical facility analysis, locations of critical facilities within wildfire risk areas were identified.

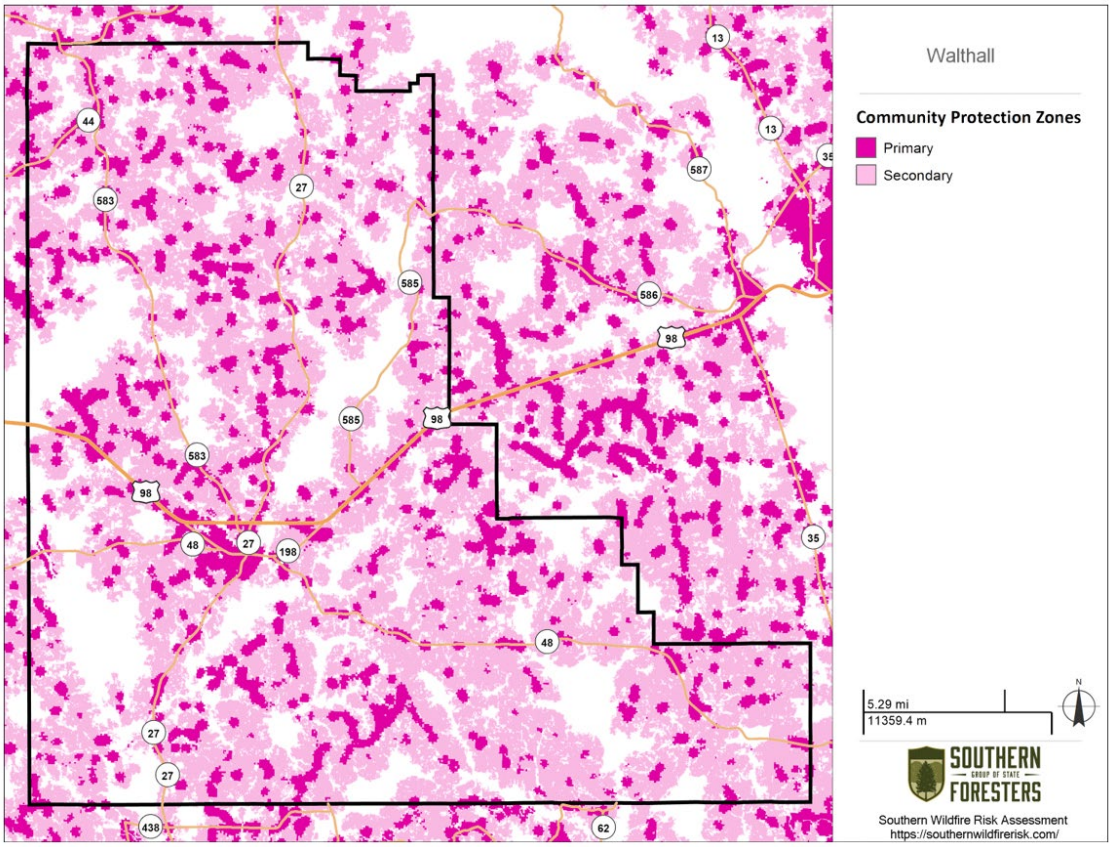
The figure below shows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). For the purposes of identifying wildfire risk vulnerability, areas in Walthall County with a WUI Risk Value below -4 have been chosen as areas of risk because their WUI values represent the upper echelon of the scale and the areas at highest risk.

Figure H.21: Wildland Urban Interface Risk Index (WUIRI) in Walthall County



The figure below shows Community Protection Zones (CPZ) in Walthall County. Community Protection Zones represent those areas considered highest priority for mitigation planning activities. CPZs are based on an analysis of the "Where People Live" housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ. As in the figure above, for the purposes of identifying wildfire risk vulnerability, areas in Walthall County with a WUI Risk Value below -4 have been chosen as areas of risk because their WUI values represent the upper echelon of the scale and the areas at highest risk.

Figure H.22: WILDFIRE RISK AREAS IN WALTHALL COUNTY



Social Vulnerability

Given some level of susceptibility across the entire county, it is assumed that the total population is at risk to the wildfire hazard. The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk of wildfire. For the Walthall County Wildfire Risk project area, it is estimated that 15,393 people or 99.7 % percent of the total project area population (15,435) live within the WUI.

Critical Facilities

The critical facility analysis revealed that there are 15 critical facilities located in wildfire risk areas, including 1 Emergency Operation Center (EOC), 6 fire stations, 2 medical care facilities, 4 police stations,

1 private sector building, and 1 school. A list of specific critical facilities and their associated risk can be found in the table at the end of this subsection.

The wildfire hazard has the potential to impact existing and future buildings, critical facilities, and populations in Walthall County. Structures at highest risk to this hazard are located in close proximity to wildfire risk areas.

EARTHQUAKE

For the earthquake hazard vulnerability assessment, a probabilistic scenario was created at the MEMA District 7 regional level to estimate the average annualized loss for the region on a county-by-county basis. The results of the analysis are generated at the census tract level within Hazus-MH and then aggregated to the county level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss. They do not include losses to business interruption, lost income, or relocation.

As the Hazus-MH model suggests, and historical occurrences confirm, any significant earthquake activity in the area is likely to inflict minor damage to the planning area. Hazus-MH 5.1 estimates a total annualized loss of $105,000 for the entire MEMA District 7 region; this loss estimate includes structural and non-structural damage to buildings, contents, and inventory throughout the planning area. The Hazus-MH estimate of total annualized loss for Walthall County is $7,000, including an annualized estimate of $2,000 for structural damage to buildings alone.

Social Vulnerability
It can be assumed that all existing and future populations are at risk to the earthquake hazard.

Critical Facilities
The Hazus-MH probabilistic analysis did not indicate that any critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor to moderate damage should an event occur. A list of specific critical facilities and their associated risk can be found in the table at the end of this section.

An earthquake has the potential to impact all existing and future buildings, facilities, and populations in Walthall County. Specific vulnerabilities for these assets will be greatly dependent on their individual design and the mitigation measures in place. Such site-specific vulnerability determinations are outside the scope of this assessment but may be considered during future plan updates. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While Walthall County may not experience a catastrophic earthquake, localized damage is possible with a moderate to larger scale occurrence.

HURRICANE AND TROPICAL STORM

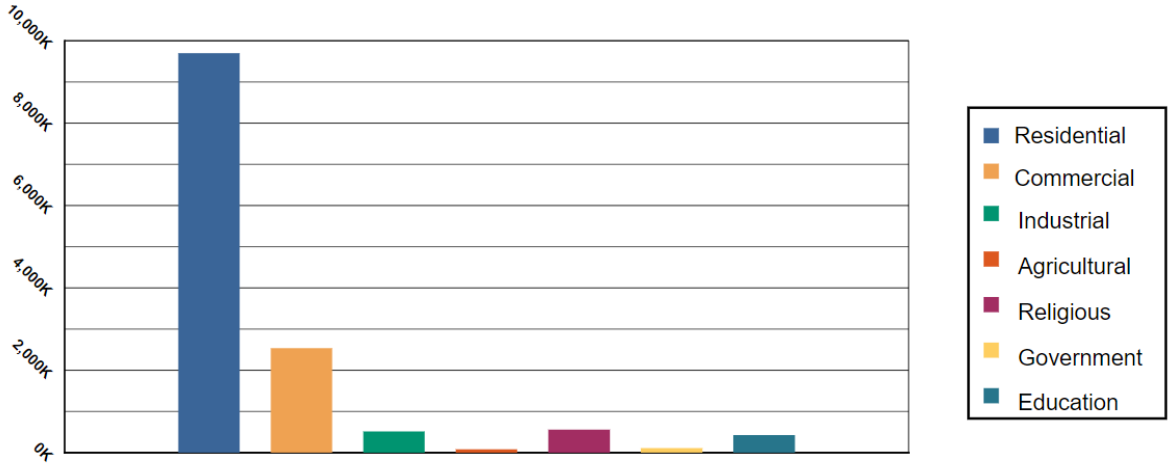
Historical evidence indicates that Walthall County has significant risk to the hurricane and tropical storm hazard. There have been 6 major disaster declarations in Walthall County due to hurricanes, and several tracks have come near or traversed through the county. (See Section H.2.10 above for reference.)

Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from

these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard.

HAZUS was utilized to perform a 100-year hurricane simulation. Hazus estimates that there are 82,485 buildings in the region which have an aggregate total replacement value of $13 billion dollars.

FIGURE B.13: BUILDING EXPOSURE BY OCCUPANCY TYPE[86]



Social Vulnerability

Given some equal susceptibility across the entire county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard.

Critical Facilities

For essential facilities, there are 11 hospitals in the region with a total bed capacity of 605 beds. There are 90 schools, 74 fire stations, 32 police stations and 9 emergency operation facilities. HAZUS estimates that about 133 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 4 buildings that will be destroyed.
The total property damage losses were $71 million dollars. 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies, which made up over 95% of the total loss. The table below provides a summary of the losses associated with the building damage.

RADIOLOGICAL EVENT

The location of Grand Gulf and River Bend Nuclear Stations north and south of the region, respectively, demonstrate that Walthall County is at some risk to the effects of a nuclear accident. Although there have not been any major events at these plants in the past, there have been major events at other nuclear stations around the country. Additionally, smaller scale incidents at Grand Gulf and River Bend Nuclear Stations have occurred.

[86] HAZUS 100-year Hurricane Scenario

In order to assess nuclear risk, a GIS-based analysis was used to estimate improved property exposure to a nuclear event within each of the risk zones (i.e., 10-mile zones and 50-mile zones) described in Section H.2.14. The determination of assessed value at-risk (exposure) was calculated using GIS analysis by summing the total values for properties that were confirmed to be located within one of the risk zones.

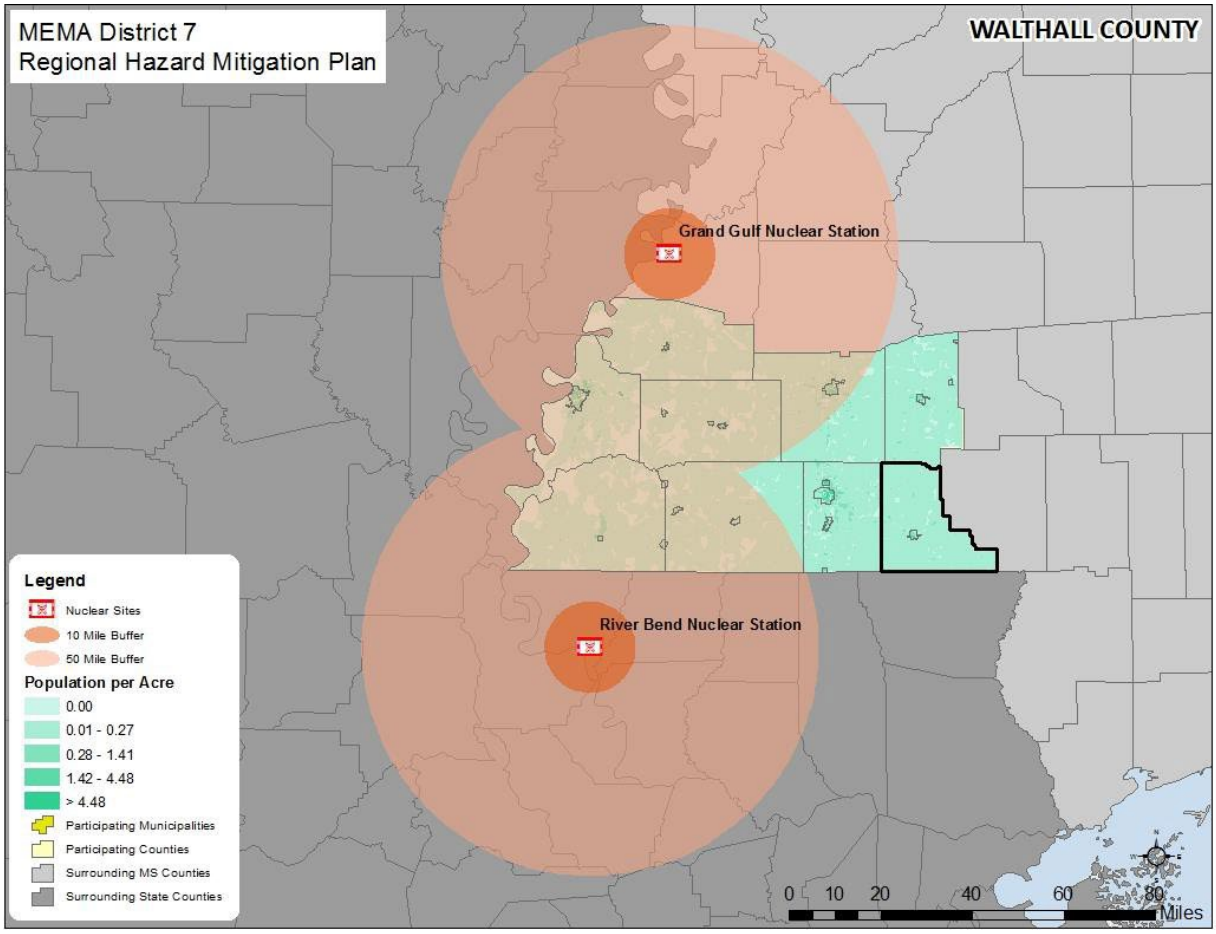
Social Vulnerability

No portion of Walthall County is located within either the 10- or 50-mile buffer area. However, the county is located close enough to both nuclear stations that its entire population may be at some risk to a radiological event. This risk can be seen in the figure below**.**

Critical Facilities

The critical facility analysis revealed that there are no Walthall County critical facilities located in either the 10-mile or 50-mile nuclear buffer areas. However, the county is located close enough to both 50-mile buffer areas that critical facilities may be at some nuclear risk. A list of specific critical facilities and their associated risk can be found in the table at the end of this section.

FIGURE H.24: POPULATION DENSITY NEAR NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN WALTHALL COUNTY



CONCLUSIONS ON HAZARD VULNERABILITY

The table below presents a summary of annualized loss for each hazard in Walthall County. Due to the reporting of hazard damages primarily at the county level, it is difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss has been determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

TABLE H.34: ANNUALIZED LOSS FOR WALTHALL COUNTY[87]

Event	Walthall County
Flood-related Hazards	
Dam & Levee Failure	Negligible
Erosion	Negligible
Flood	$50,400
Fire-related Hazards	
Drought	Negligible
Lightning	$0
Wildfire	Negligible
Geologic Hazards	
Earthquake[88]	
Temperature & Wind-related Hazards	
Extreme Heat	Negligible
Hailstorms	$339
Hurricane & Tropical Storm	$18,536,000
Severe Thunderstorm/High Wind	$7,253
Tornado	$35,277
Winter Storm & Freeze	$0
Other Hazards	
Radiological Event	Negligible
Pandemic	Negligible

All existing and future populations and buildings (including critical facilities) in Walthall County are vulnerable to a wide variety of hazards. Some buildings may be more vulnerable to these hazards based on factors such as construction and building type. The following table shows the critical facilities vulnerable to the hazards analyzed in this section. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "X").

[87] "Negligible" is used to indicate that no records of dollar losses for the particular hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that particular type of event is not well kept.

[88] No historic losses for earthquake were recorded, so Hazus estimates for annualized loss were used.

TABLE H.35: AT-RISK CRITICAL FACILITIES IN WALTHALL COUNTY

		FLOOD-RELATED				FIRE-RELATED			GEO	WIND-RELATED						HUM	
FACILITY NAME	FACILITY TYPE	Dam and Levee Failure	Erosion	Flood – 100 yr	Flood – 500 yr	Drought	Lightning	Wildfire	Earthquake	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Severe Thunderstorm/	Tornado	Winter Storm and Freeze	Radiological Event 10-mile area	Radiological Event 50-mile area
Walthall County																	
Walthall County EOC	EOC		X			X	X	X	X	X	X	X	X	X	X		
3rd District Fire Department	Fire Station		X			X	X		X	X	X	X	X	X	X		
4th District Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
Enon Volunteer Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
Lexie Volunteer Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
Oak Grove Volunteer Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
Tylertown Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		
Diversicare	Medical Care		X			X	X	X	X	X	X	X	X	X	X		
Walthall County Hospital	Medical Care		X			X	X	X	X	X	X	X	X	X	X		
Tylertown Police Dept	Police Station		X			X	X	X	X	X	X	X	X	X	X		
Walthall County Sheriff	Police Station		X			X	X	X	X	X	X	X	X	X	X		
Bill Dora Inc.	Private Sector		X			X	X	X	X	X	X	X	X	X	X		
Georgia Pacific	Private Sector		X			X	X		X	X	X	X	X	X	X		
Stringer Industries Inc.	Private Sector		X	X		X	X		X	X	X	X	X	X	X		
Walthall County Industrial Park	Private Sector		X			X	X		X	X	X	X	X	X	X		
Tylertown High School	School		X			X	X	X	X	X	X	X	X	X	X		

H.3 WALTHALL COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Walthall County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in Section 7: *Capability Assessment*.

H.3.1 Planning and Regulatory Capability

Table H.36 provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Walthall County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. A dagger (†) indicates that the given item is administered for that municipality by the county. Each of these local plans, ordinances, and programs should be considered as available mechanisms for incorporating the requirements of the MEMA District 7 Regional Hazard Mitigation Plan.

TABLE H.36: RELEVANT PLANS, ORDINANCES AND PROGRAMS

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Threat and Hazard Identification and Risk Assessment (THIRA)	Comprehensive Land Use Plan	Floodplain Management Plan/Flood Mitigation Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Emergency Management Accreditation Program (EMAP Accreditation)	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment/ Reconstruction Plan/ Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System (CRS Program)
WALTHALL COUNTY	✓								✓		✓				✓		✓							✓	
Tylertown	†								†						†		✓							✓	

A more detailed discussion on the county's planning and regulatory capabilities follows.

EMERGENCY MANAGEMENT

Hazard Mitigation Plan
Walthall County has previously adopted a hazard mitigation plan. The Town of Tylertown was also included in this plan.

Emergency Operations Plan
Walthall County maintains an Emergency Operations Plan through its Emergency Management Agency. The Town of Tylertown is also covered by this plan.

FLOODPLAIN MANAGEMENT

Table H.37 provides NFIP policy and claim information for each participating jurisdiction in Walthall County. Additional information on insured flood losses in Walthall County can be found above, in **Section H.2.3**.

TABLE H.37: NFIP POLICY AND CLAIM INFORMATION

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force^	Closed Claims	Total Payments to Date
WALTHALL COUNTY†	08/01/86	10/18/19	17	$11,710,400^	61	$856,007.26
Tylertown	09/30/88	10/18/19	5	$4,400,000^	50	$533,091.91

†Includes unincorporated areas of county only
^last available data 2017
Source: NFIP Community Status information as of 7/2/2023; NFIP claims and policy information as of 7/2/2023

All jurisdictions listed above that are participants in the NFIP will continue to comply with all required provisions of the program and will work to adequately comply in the future utilizing a number of strategies. For example, the jurisdictions will coordinate with MEMA and FEMA to develop maps and regulations related to special flood hazard areas within their jurisdictional boundaries and, through a consistent monitoring process, will design and improve their floodplain management program in a way that reduces the risk of flooding to people and property.

Flood Damage Prevention Ordinance
All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. Walthall County and the Town of Tylertown both participate in the NFIP and have adopted flood damage prevention regulations.

H.3.2 Administrative and Technical Capability

Table H.38 provides a summary of the capability assessment results for Walthall County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill. A dagger (†) indicates a county-level staff member(s) provides the specified knowledge or skill to that municipality.

TABLE H.38: RELEVANT STAFF/PERSONNEL RESOURCES

Staff/Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS and/or HAZUS	Resource development staff or grant writers
WALTHALL COUNTY				✓	✓		✓	✓	✓	
Tylertown				†	✓		†	†	†	

Administrative and technical capability credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance with a designated floodplain administrator, regardless of whether the designee was dedicated solely to floodplain management. Credit was also given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

H.3.3 Fiscal Capability

Table H.39 provides a summary of the results for Walthall County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource has previously been used to implement hazard mitigation actions. A dagger (†) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds).

TABLE H.39: RELEVANT FISCAL RESOURCES

Fiscal Tool/Resource	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes (or taxing districts)	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other: FEMA Hazard Mitigation Grants, Homeland Security Grants, USDA Rural Development Agency Grants, and US Economic Development Administration Grants
WALTHALL COUNTY		†								†

Tylertown		†			✓					†

H.3.4 Political Capability

During the months immediately following a disaster, local public opinion in Walthall County is more likely to shift in support of hazard mitigation efforts.

Table H.40 provides a summary of the results for Walthall County with regard to political capability. A checkmark (✓) indicates the expected degree of political support by local elected officials in terms of adopting/funding information.

TABLE H.40: LOCAL POLITICAL SUPPORT

Political Support	Limited	Moderate	High
WALTHALL COUNTY		✓	
Tylertown		✓	

H.3.5 Conclusions on Local Capability

Table H.41 shows the results of the capability assessment using the designed scoring methodology described in Section 7: *Capability Assessment*. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. This information was reviewed by all jurisdictions and each jurisdiction provided feedback on the information included in the capability assessment. Local government input was vital to identifying capabilities. According to the assessment, the average local capability score for the county and its jurisdictions was 20.0, which falls into the limited capability ranking.

TABLE H.41: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
WALTHALL COUNTY	22	Limited
Tylertown	18	Limited

H.4 WALTHALL COUNTY MITIGATION STRATEGY

This subsection provides the blueprint for Walthall County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and the findings and conclusions of the capability assessment and risk assessment. In addition, this strategy was developed with the State Hazard Mitigation Plan Goals and Objectives in mind. For this update, each action identifies the State Hazard Mitigation Program Objective that it relates to. Additional Information can be found in Section 8: *Mitigation Strategy* and Section 9: *Mitigation Action Plan*.

H.4.1 Mitigation Goals

Walthall County developed six mitigation goals in coordination with the other participating MEMA District 7 Region jurisdictions. The regional mitigation goals are presented below.

TABLE H.42: MEMA DISTRICT 7 REGIONAL MITIGATION GOALS

Goal	
Goal #1	Increase the overall public awareness of natural hazards that face the region.
Goal #2	Retrofit of critical facilities and/or critical infrastructure to lower the risk of damage from natural hazards.
Goal #3	General improvement of regional or local mitigation planning and capability.
Goal #4	Support State Identified Mitigation Initiatives such as saferooms and storm shelters, severe weather warning systems for universities and colleges, and severe weather notification systems for local communities.
Goal #5	Reduce loss of life, damage and loss of property and infrastructure, economic costs, including response, recovery and disruption of economic activity.
Goal #6	Foster cooperation among all levels of governments and the private sector with respect to improving, updating, and implementing the hazard mitigation plan.

H.4.2 Mitigation Action Plan

The mitigation actions proposed by Walthall County and the Town of Tylertown are listed in the following individual Mitigation Action Plans.

Walthall County Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implement Sched.	Implementation Status (2023)
Prevention								
P-1	2.2	**Comprehensive Land Use and Long-Term Recovery Planning –** The Walthall County Board of Supervisors/City of Tylertown should have a Comprehensive Plan developed to guide long term recovery and development.	Hurricane or other hazard	Moderate	Walthall County Board of Supervisors/ City of Tylertown	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2027	This remains an ongoing item of interest, but the priority was downgraded. The Walthall County Board of Supervisors/Town of Tylertown recognize that comprehensive land use planning yields many benefits for both the county and towns. The existence of a Comprehensive Plan enables a county or municipality to institute zoning ordinances to regulate new development and protect or upgrade existing development and it provides a solid basis to establish stronger building codes. Many of the goals of Long Term Recovery Planning and Comprehensive Planning are one and the same. The county and town have not developed a Comprehensive Plan. Therefore, this action will remain in the plan.

P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	Walthall County Emergency Management in collaboration with the Southwest Mississippi Planning and Development District, Inc.	N/A	In progress - 2025	This remains ongoing. A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.
P-3	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist counties with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as counties develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Walthall County Emergency Management in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2025	Some progress has been made, but this an ongoing process. Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.
P-5	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Moderate	Walthall County Board of Supervisors/ City of Tylertown	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.

P-6	1.4	**Monitor Drought Conditions -** Identify local drought indicators (precipitation, temperature, surface water levels, soil moisture, etc.) and establish a regular schedule to monitor and report conditions.	Drought	Low	Walthall County Board of Supervisors/ City of Tylertown	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action
P-6	1.4	**Conduct A Drought Economic Impact Analysis -** Gather water and climate data. Collect information on businesses that depend on water availability. (Farming, ranching, logging, etc.). Analyze the community's economic stability in relation to water availability. Quantify economic losses based on how the community and its water sources have been impacted by droughts in the past.	Drought	Low	Walthall County Board of Supervisors/ City of Tylertown	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Walthall County Board of Supervisors/City of Tylertown should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Walthall County Board of Supervisors/ City of Tylertown	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2025	While little progress has been made, the building that most urgently requires retrofitting is the Walthall County Courthouse. The Walthall County Board of Supervisors/Town of Tylertown recognize that damage to public buildings from wind is a serious hazard affecting the ability of government to function during and after disasters. Roof and structural damage and loss of electrical service in county/city government buildings due to high winds can render these buildings at least temporarily unusable and can potentially cause disruptions in government services. Retrofits of

								essential government buildings have not been completed. Therefore, this action will remain in the plan to lessen potential wind damage to those structures.
PP-2	1.1	**Bury Electric Power Cables –** The Walthall County Board of Supervisors/Town of Tylertown should implement a program to bury electric power cables serving critical facilities.	Hurricane, Tornado or other hazard affecting Electric Power distribution	High	Walthall County Board of Supervisors/ Town of Tylertown	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2025	Ongoing. This remains an item of concern, but some discussion needs to occur as to who is responsible. Loss of electrical power to critical facilities such as water and sewer systems, law enforcement offices, and other critical facilities during a natural disaster can have a severe impact on the functioning of government to provide relief and assistance to citizens and maintain civil order. This can also cause very significant problems for private citizens who depend on municipal and rural water and sewer systems and rely on county and town governments to continue to maintain order. This situation can be especially difficult on the elderly and other special needs persons who would have a difficult time maintaining the basics for themselves without assistance. Electric power cables to critical facilities have not been buried. Therefore, this action will remain in the plan to reduce potential loss of power to those facilities.
PP-3	1.1	**Ground/Protect Critical Facilities and Equipment** – Upgrade electrical protective measures on critical facilities.	Lightning		Walthall County Board of Supervisors/ City of Tylertown	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action
Natural Resource Protection								
NRP-1	1.6							
Structural Projects								

SP-1	1.1	**Drainage Improvements (Whitmore Road) –** Install a culvert to provide for adequate water flow and raise the road bed.	Flood	High	Walthall County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	This remains an active discussion and will remain an item of interest. An area along Whitmore Road repeatedly washes out during intense storm events. Walthall County will continue to seek funding to complete drainage improvements, so this action will remain in the plan.
SP-2	1.1	**Drainage Improvements (Hinson Road) –** Install a culvert to provide for adequate water flow and raise the road bed.	Flood	High	Walthall County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	The fitches have been dug deeper, but additional work needs to occur as funding becomes available. An area along Hinson Road repeatedly washes out during intense storm events. Walthall County will continue to seek funding to complete drainage improvements, so this action will remain in the plan.
SP-3	1.1	**Drainage Improvements (Tom Woods Road) –** Install a culvert to provide for adequate water flow and raise the road bed.	Flood	High	Walthall County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	Remains an ongoing concern and discussion. An area along Tom Woods Road repeatedly washes out during intense storm events. Walthall County will continue to seek funding to complete drainage improvements, so this action will remain in the plan.
SP-4	1.1	**Drainage Improvements (Ryans Road) –** Install a culvert to provide for adequate water flow and raise the road bed.	Flood	High	Walthall County Board of Supervisors	Homeland Security grants, USDA Rural Development	2024	Remains ongoing. An area along Ryans Road repeatedly washes out during intense storm events. Walthall County

						Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds		will continue to seek funding to complete drainage improvements, so this action will remain in the plan.
SP-5	1.1	**Drainage Improvements (Dillon Hill Road) –** Install a culvert to provide for adequate water flow and raise the road bed.	Flood	High	Walthall County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	This is an ongoing item. An area along Dillon Hill Road repeatedly washes out during intense storm events. Walthall County will continue to seek funding to complete drainage improvements, so this action will remain in the plan.
SP-6	1.1	**Drainage Improvements (Brandon Bay Road) –** Install a culvert to provide for adequate water flow and raise the road bed.	Flood	High	Walthall County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	Parts of the road has been improved, but the culvert hasn't bee replaced. An area along Brandon Bay Road repeatedly washes out during intense storm events. Walthall County will continue to seek funding to complete drainage improvements, so this action will remain in the plan.
SP-7	1.1	**Drainage Improvements (East Centerville Road) –** Install a culvert to provide for adequate water flow and raise the road bed.	Flood	High	Walthall County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants,	2024	This item remains an ongoing project. An area along East Centerville Road repeatedly washes out during intense storm events. Walthall County will continue to seek funding to complete drainage

						US Economic Development Administration grants, individual county general and special funds		improvements, so this action will remain in the plan.
SP-8	1.1	**Drainage Improvements (Settlement Road) –** Install a bridge to provide for adequate water flow and raise the road bed.	Flood	High	Walthall County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	This remains an item of interest. An area along Settlement Road repeatedly washes out during intense storm events because an existing culvert is not able to handle the volume of water. Walthall County will continue to seek funding to complete drainage improvements, so this action will remain in the plan.
SP-9	1.1	**Drainage Improvements (East Centerville Road) –** Install two bridges to provide for adequate water flow and raise the road bed.	Flood	High	Walthall County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	This remains ongoing. An area along East Centerville Road repeatedly washes out during intense storm events because an existing culvert is not able to handle the volume of water. Walthall County will continue to seek funding to complete drainage improvements, so this action will remain in the plan.
SP-10	1.1	**Drainage Improvements (Huey Road) –** Install a bridge to provide for adequate water flow and raise the road bed.	Flood	High	Walthall County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration	2024	This remains ongoing. An area along Huey Road repeatedly washes out during intense storm events because an existing culvert is not able to handle the volume of water. Walthall County will continue to seek funding to complete drainage improvements, so this action will remain in the plan.

						grants, individual county general and special funds		
SP-11	1.1	**Drainage Improvements (Howell Road) –** Install a bridge to provide for adequate water flow and raise the road bed.	Flood	High	Walthall County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	Some work on the ditches have been done, but a new bridge is yet to be installed. An area along Howell Road repeatedly washes out during intense storm events because an existing culvert is not able to handle the volume of water. Walthall County will continue to seek funding to complete drainage improvements, so this action will remain in the plan.
SP-12	1.1	**Drainage Improvements (Carter Road) –** Install a bridge to provide for adequate water flow and raise the road bed.	Flood	High	Walthall County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	This remains ongoing. An area along Carter Road repeatedly washes out during intense storm events because an existing culvert is not able to handle the volume of water. Walthall County will continue to seek funding to complete drainage improvements, so this action will remain in the plan.
SP-2	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm		Walthall County Board of Supervisors/ City of Tylertown	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2027	New Action.
Emergency Services								

ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Hurricane, Winter Storm	High	Walthall County Board of Supervisors/ City of Tylertown in collaboration with the Mississippi Emergency Management Agency	General and special funds	2027	This remains an ongoing project. Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. The county is in the process of becoming "storm ready" countywide including the towns, so this action will remain in the plan. This action was combined with ES-7 since they were duplicate actions.
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, or other hazard leading to loss of electrical power	High	Walthall County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	A lot of progress has been made with many critical facilities now having newer standby generators. However, some older standby generators need replaced at the Sheriff's Office and the Tylertown Police Department. The schools that are currently used as emergency sheltering locations have also been targeted for generator installation.
ES-3	1.8	**Improve Emergency Communications –** Purchase a satellite phone system to ensure communications capabilities are unimpeded during natural disasters even if traditional communications systems fail.	Hurricane or other hazard leading to loss of traditional communications systems	N/A	N/A	N/A	Deleted	This action does not meet the County's needs. It has been deleted.

ES-4	1.9	**Construct New Emergency Shelter –** The county should construct a 200-person evacuation shelter. When not needed for disaster related housing, the building will serve as a Community Center and can be rented by individuals for group functions such as family reunions, weddings, or class reunions. .	Hurricane, Tornado or other hazard requiring the use of emergency shelters	High	Walthall County Board of Supervisors/ City of Tylertown Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2025	While there is a significant need, there is some push back as to where one should be installed. This will remain an ongoing project. The Walthall County Board of Supervisors recognize the need to have modern, safe emergency shelters for county/town residents and evacuees from other areas during times of disaster. Currently a combination of schools, churches, and other government buildings are used. This works acceptably for short-term use, but for longer term needs as were seen in the Hurricane Katrina disaster, the presence of evacuees in these facilities for more than a few days caused a disruption in the facility's designed function. Since a new emergency shelter has not been constructed in Walthall County, this action will remain in the plan.
ES-5	1.1	**Purchase Integrated Voice Mail System –** The Walthall County Board of Supervisors/Town of Tylertown should purchase an Integrated Voice Mail System for emergency notification of government authorities and citizens during times of natural disasters.	Hurricane, Tornado or other hazard affecting communications	High	Walthall County Board of Supervisors/ Town of Tylertown	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2024	This remains an ongoing project. The Walthall County Board of Supervisors/Town of Tylertown understand the need for emergency notification of government authorities and citizens during times of natural disasters. Timely information is critical for government authorities during and in the aftermath of natural disasters to facilitate rescue and recovery operations. The ability to notify citizens of impending natural disasters and to communicate information concerning recovery efforts gives government authorities a powerful tool to manage a disaster and assist the citizenry to the maximum extent possible. This action will remain in the plan to improve emergency notification.
ES-6	1.1	**Renovate or Construct Emergency Supply Storage and Distribution Facility –** The Walthall County Board of Supervisors/Town of Tylertown should renovate or construct adequate facilities	Hurricane, earthquake, or other hazard	High	Walthall County Board of Supervisors/ Town of Tylertown	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard	In progress - 2024	Ongoing. During certain natural disasters which cause long-term electric power outages or other widespread damage, the county may need to distribute emergency supplies to the citizens. The facilities where

		for the storage and distribution of emergency supplies.				Mitigation grants, US Economic Development Administration grants, individual county general and special funds		these supplies are stored and distributed should have adequate space for safe storage and be located in accessible areas for orderly distribution. This action will remain in the plan to improve the storage and distribution of emergency supplies.
ES-8	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide/citywide system.	Tornado	N/A	N/A	N/A	Deleted	This action does not meet the County's needs. It has been deleted.
ES-9	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Moderate	Walthall County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2027	New Action.
Public Education and Awareness								

PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Moderate	Walthall County Board of Supervisors/ City of Tylertown	N/A	2027	This remains an ongoing project. Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan.
PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Walthall County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2027	This remains an ongoing project for the county. Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP.
PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-5	3.2	**Education: FireWise –** Recommend that public information and outreach workshops on the *Firewise* program be scheduled and encourage participation at one and two-day workshops presented by	Wildfire	High	Walthall County Board of Supervisors through collaboration with	Mississippi Forestry Commission, county general and special funds		Ongoing, but has been downgraded for this plan update. Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone

		the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.			the Southwest Mississippi Planning and Development District, Inc.		2027	and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan.
PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Walthall County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with county general and special funds	2027	Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Walthall County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with county general and special funds	2027	The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.

PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Walthall County Board of Supervisors/ City of Tylertown	FEMA Hazard Mitigation grants, general and special funds	2025	New Action
PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Walthall County Board of Supervisors/ City of Tylertown	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Walthall County Board of Supervisors/ City of Tylertown	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2024	New Action.

PEA-11	3.1	**Education: Public Outreach –** Develop a program to encourage school programs to incorporate the Great Shake Out	Earthquake	Low	Walthall County Board of Supervisors/ City of Tylertown	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.

Town of Tylertown Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implement Sched.	Implementation Status (2023)
Prevention								
P-1	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	Town of Tylertown Board of Aldermen and Mayor/Walthall County Emergency Management in collaboration with the Southwest Mississippi Planning and Development District, Inc.	N/A	In progress - 2025	This remains ongoing. A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.

P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist counties with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as counties develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Town of Tylertown Board of Aldermen and Mayor/Walthall County Emergency Management in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2025	Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the city would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-3 since they were duplicate actions.
P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Low	Walthall County Board of Supervisors/ City of Tylertown	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
P-5	1.4	**Monitor Drought Conditions -** Identify local drought indicators (precipitation, temperature, surface water levels, soil moisture, etc.) and establish a regular schedule to monitor and report conditions.	Drought	Moderate	Walthall County Board of Supervisors/ City of Tylertown	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action

P-6	1.4	**Conduct A Drought Economic Impact Analysis -** Gather water and climate data. Collect information on businesses that depend on water availability. (Farming, ranching, logging, etc.). Analyze the community's economic stability in relation to water availability. Quantify economic losses based on how the community and its water sources have been impacted by droughts in the past.	Drought	Moderate	Walthall County Board of Supervisors/ City of Tylertown	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Walthall County Board of Supervisors/City of Tylertown should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Town of Tylertown Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2025	New Action.
PP-2	1.1	**Bury Electric Power Cables –** The Walthall County Board of Supervisors/Town of Tylertown should implement a program to bury electric power cables serving critical facilities.	Hurricane, Tornado or other hazard affecting Electric Power distribution	High	Town of Tylertown Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special	2025	New action

						funds		
PP-3	1.1	**Ground/Protect Critical Facilities and Equipment** – Upgrade electrical protective measures on critical facilities.	Lightning	Moderate	Town of Tylertown Board of Aldermen and Mayor	FEMA Hazard Mitigation grants, individual county general and special funds	2025	New Action
Natural Resource Protection								
NRP-1	1.6							
Structural Projects								
SP-2	1.9	**Individual Saferooms** - Locate tornado safe rooms inside or directly adjacent to houses to prevent hail-induced injuries that may occur when taking shelter during a severe thunderstorm.	Tornado, Hailstorm	High	Town of Tylertown Board of Aldermen and Mayor	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2027	New Action.
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our	Hurricane, Winter Storm	High	Walthall County Board of Supervisors/ City of Tylertown in collaboration with the Mississippi Emergency Management Agency	General and special funds	2027	This remains an ongoing project. Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. The county is in the process of becoming “storm ready” countywide including the towns, so this action will remain in the plan. This action was combined with ES-7 since they were duplicate actions.

		Natchez or Meadville offices.						
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, or other hazard leading to loss of electrical power	High	Town of Tylertown Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2024	A lot of progress has been made with many critical facilities now having newer standby generators. However, some older standby generators need replaced at the Sheriff's Office and the Tylertown Police Department. The schools that are currently used as emergency sheltering locations have also been targeted for generator installation.
ES-3	1.8	**Improve Emergency Communications –** Purchase a satellite phone system to ensure communications capabilities are unimpeded during natural disasters even if traditional communications systems fail.	Hurricane or other hazard leading to loss of traditional communications systems	N/A	N/A	N/A	Deleted	This action does not meet the Town's needs. It has been deleted.
ES-4	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide/citywide system.	Tornado	N/A	N/A	N/A	Deleted	This action does not meet the Town's needs. It has been deleted.

ES-6	1.9	**Construct New Emergency Shelter –** The county should construct a 200-person evacuation shelter. When not needed for disaster related housing, the building will serve as a Community Center and can be rented by individuals for group functions such as family reunions, weddings, or class reunions. .	Hurricane, Tornado or other hazard requiring the use of emergency shelters	High	Walthall County Board of Supervisors/ City of Tylertown Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2025	New Action.
ES-7	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic		Walthall County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2027	New Action.
Public Education and Awareness								

PEA-1	3.2	**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Moderate	Walthall County Board of Supervisors/ City of Tylertown	N/A	2027	This remains an ongoing project. Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan.
PEA-2	3.2	**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Walthall County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2027	This remains an ongoing project for the county. Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP.
PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.

PEA-5	3.2	**Education: FireWise –** Recommend that public information and outreach workshops on the *Firewise* program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Walthall County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, individual county general and special funds	2027	Ongoing, but has been downgraded for this plan update. Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan.
PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Walthall County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	Low	Walthall County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	2027	The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.

PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Walthall County Board of Supervisors/ City of Tylertown	FEMA Hazard Mitigation grants, general and special funds	2025	New Action
PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Walthall County Board of Supervisors/ City of Tylertown	FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Walthall County Board of Supervisors/ City of Tylertown	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), general and special funds	2024	New Action.

PEA-11	3.1	**Education: Public Outreach –** Develop a program to encourage school programs to incorporate the Great Shake Out	Earthquake	Low	Walthall County Board of Supervisors/ City of Tylertown	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.

WILKINSON COUNTY

This annex includes jurisdiction-specific information for Wilkinson County and its participating municipalities. It consists of the following five subsections:

- I.1 Wilkinson County Community Profile
- I.2 Wilkinson County Risk Assessment
- I.3 Wilkinson County Vulnerability Assessment
- I.4 Wilkinson County Capability Assessment
- I.5 Wilkinson County Mitigation Strategy

I.1 WILKINSON COUNTY COMMUNITY PROFILE

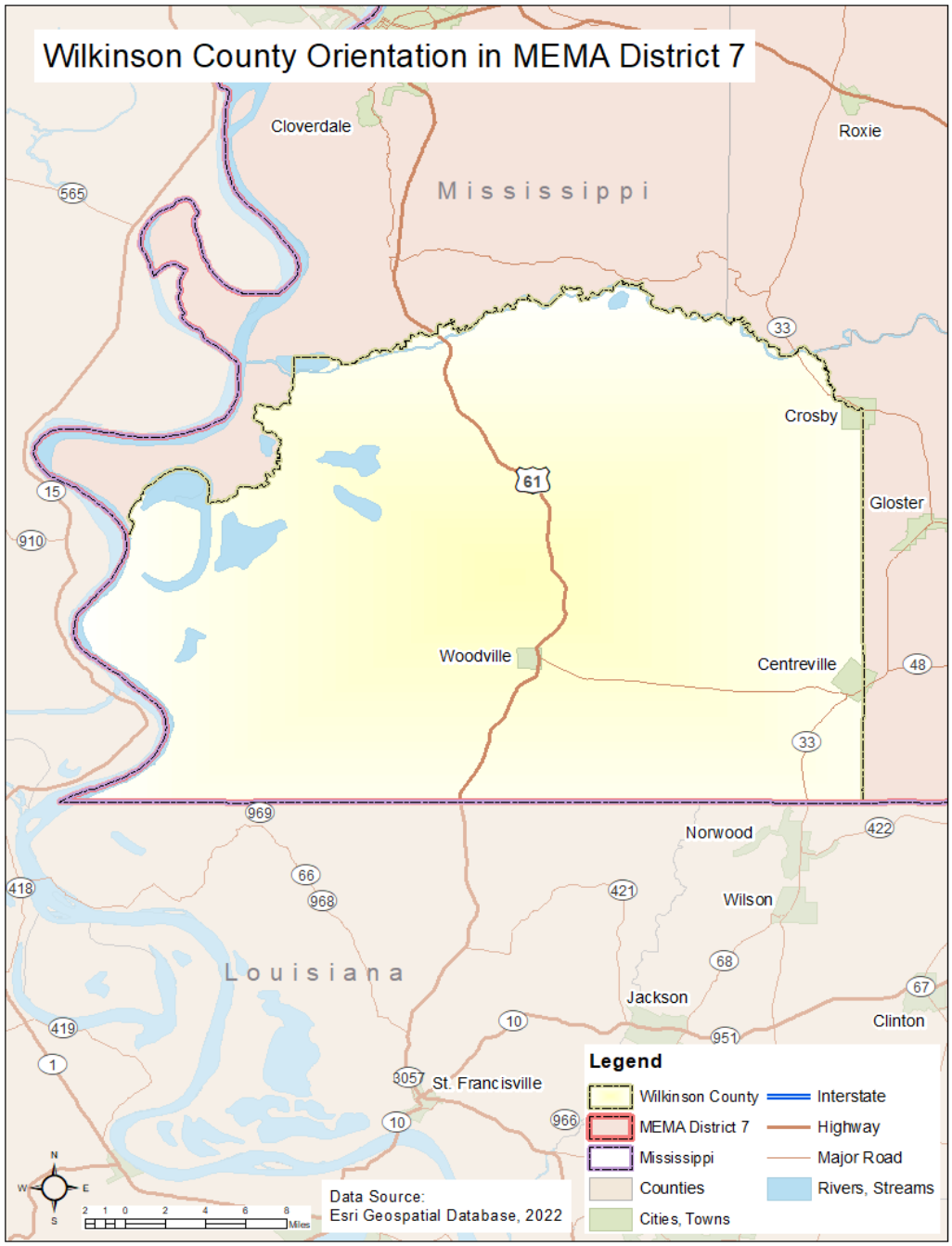
I.1.1 Geography and the Environment

Wilkinson County is in southwestern Mississippi. It comprises three towns, the Town of Centreville, the Town of Crosby, and the Town of Woodville, as well as many small unincorporated communities. An orientation map is provided below.

The county is located adjacent to the Mississippi River, supplying diverse recreational activities. The County's total area is 688 square miles, 10 square miles of which is water area.

Wilkinson County enjoys four distinct seasons but the climate in the region is generally hot and humid compared to the rest of the United States given its latitude and relative proximity to the Gulf Coast. Precipitation is typically highest in winter months when the temperatures are moderately lower, but the likelihood of precipitation remains relatively constant throughout the year. Summers in the region can become hot, with average highs in the nineties and lows in the seventies. The region is also often susceptible to turbulent weather when warm, wet air from the Gulf of Mexico is pushed up into the region to mix with cooler air coming down from across the continent which can result in severe weather conditions. This is particularly true in the spring when seasons change, and diverse weather patterns interact.

FIGURE I.1: WILKINSON COUNTY ORIENTATION MAP



I.1.2 Population and Demographics

According to the 2020 Census, Wilkinson County has a population of 8,587. The county continues to see a decrease in population since 2000. The population density is 12.7 people per square mile. Population counts from the U.S. Census Bureau for 2000, 2010, and 2020 for the county and participating jurisdictions are presented in the next table.

TABLE I.1: POPULATION COUNTS FOR WILKINSON COUNTY[1] [2]

Jurisdiction	2000 Census	2010 Census	2020 Census	% Change 2000-2020
Wilkinson County	**10,312**	**9,878**	**8,587**	**-13.07%**
Centreville*	1,699	1,684	1,258	-25.30%
Crosby*	390	318	242	-23.90%
Woodville	1,210	1,096	928	-15.33%

Based on the 2020 Census, the median age of residents of Wilkinson County is 38.9 years. The racial characteristics of the county are presented below. People identified as black or African American make up the majority of the population in the county, accounting for approximately 69.1% of the population.

TABLE I.2: DEMOGRAPHICS OF WILKINSON COUNTY[3]

Jurisdiction	Black or African American	White	American Indian or Alaska Native	Asian	Native Hawaiian or Other Pacific Islander	Two or More Races	Persons of Hispanic Origin*
Wilkinson County	**69.1%**	**28.3%**	**0.0%**	**0.0%**	**0.0%**	**0.8%**	**1.0%**
Centreville*	74.7%	18.9%	0.0%	0.0%	0.0%	0.0%	2.2%
Crosby*	76.0%	23.3%	0.0%	0.7%	0.0%	0.0%	0.0%
Woodville	61.7%	31.8%	0.0%	0.0%	0.0%	3.1%	3.4%

*Persons of Hispanic Origin may be of any race, so also are included in applicable race categories.

I.1.3 Housing

According to the 2021 U.S. Census, there are 4,554 housing units in Wilkinson County, the majority of which are single family homes or mobile homes. Housing information for the county and its municipalities is presented below.

[1] Source: United States Census Bureau, 2010 Census and 2020 Census.

[2] *Note: Centreville and Crosby both contain areas that are located in neighboring Amite County. Therefore, decennial census population tabulations for Centreville and Crosby include data from both Wilkinson and Amite counties. To see the 2021 population estimates for Centreville and Crosby in Wilkinson County only, go to https://www.census.gov/newsroom/press-kits/2022/subcounty-estimates.html, "Annual Estimates: April 1, 2020 to July 1, 2021 (SUB-EST2021)."

[3]Source: United States Census Bureau, 2020 Census. American Community Survey, 2017-2021. Retrieved on 1/11/2023 from: *https://data.census.gov/table?q=wilkinson+county+mississippi+race&g=0500000US28157&tid=ACSST5Y2021.S0601;*

https://data.census.gov/table?q=Centreville+town,+Mississippi&tid=ACSST5Y2021.S0601;

https://data.census.gov/table?q=Crosby+town,+Mississippi&tid=ACSST5Y2021.S0601;

https://data.census.gov/table?q=Woodville+town,+Mississippi&tid=ACSST5Y2021.S0601.

TABLE I.3: HOUSING CHARACTERISTICS OF WILKINSON COUNTY[4] [5] [6]

Jurisdiction	Housing Units (2000)	Housing Units (2010)	Housing Units (2021)	Median Home Value (2017-2021)
Wilkinson County	**5,106**	**5,037**	**4,554**	**$69,200**
Centreville*	704	741	1,073	$71,800
Crosby*	157	155	175	$46,700
Woodville	569	518	587	$122,100

* The housing unit counts for Centreville and Crosby may include units located in both Wilkinson County and Amite County.

I.1.4 Infrastructure

TRANSPORTATION

In Wilkinson County, U.S. Highway 61 provides access to the north and south and Mississippi Highway 24 provides access to the east and west. Forest Home Airport, Fred Netterville Lumber Company/Wilkinson Community Airport, and Green Acres Airport are all general aviation airports located in Wilkinson County.

A major freight rail line used to operate within Wilkinson County. The Gloster Southern Railroad was a Class III Local railway running north to south along a portion of the eastern county border. This entity has ceased to operate in the community. There is some discussion of reinstating the line, however the impacts will be evaluated during the next update.

UTILITIES[7]

Electrical power in Wilkinson County is provided by Entergy Mississippi Inc., Southwest Mississippi Electric Power Association, and Cooperative Energy.

Water and sewer service is provided by participating jurisdictions and/or community-based associations including Bleakhouse Water Association, South Centreville Water Association, Old River Water Association, Buffalo Water Association, City of Woodville, Coles Community Water Association, and Wilk-Amite Water Association, but unincorporated areas often rely on septic systems and wells in Wilkinson County.

Gas utilities are provided by Atmos Energy Corporation and the City of Woodville.

COMMUNITY FACILITIES

There are several buildings and community facilities located throughout Wilkinson County. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 4 fire stations, 2 police stations, and 6 schools located within the county.

There are no hospitals, but there are two medical care clinics located in Wilkinson County.

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[4] *United States Census Bureau, 2000 Census, 2010 Census, and 2020 Census.*

[5] United States Census. American Community Survey 5-Year Estimates. 2020. Retrieved on 01/11/2023 from: https://data.census.gov/table?q=median+home+value+woodville+mississippi+crosby+mississippi+centreville+mississippi.

[6] United States Census. American Community Survey 5-Year Estimates. 2020. Retrieved on 01/11/2023 from: https://data.census.gov/table?q=median+home+value+wilkinson+county+mississippi+crosby+mississippi&g=1600000US2812740.

[7] Mississippi Public Utilities. Retrieved from: https://www.mpus.ms.gov/mpus/wilkinson

Museums based around the history and culture of the region are prevalent throughout the area. For example, in Centreville, the Camp van Dorn World War II Museum highlights the achievements of soldiers who were trained at Camp van Dorn during the war.

Recreational opportunities exist throughout Wilkinson County. The Homochitto National Forest comprises almost 200,000 acres of land and is partially located in Wilkinson County. Visitors can camp, hike, hunt, and fish in the forest. In addition, St. Catherine Creek National Wildlife Refuge sits on roughly 25,000 acres and functions as a habitat for migratory waterfowl, birds, and other wildlife. This refuge is located almost completely in Adams County, but it does extend into Wilkinson County.

The Mississippi River, which runs along the western border of the county, has played an integral part in the history of the county. The river acted as a major conduit for trade in the 19th century as plantations produced large quantities of cotton that could be easily shipped down to ports such as New Orleans. Today, the river is still an important part of the local economy as products are shipped worldwide out of the Natchez port. Apart from the Mississippi River, there are multiple water-based refuges, activities, and recreational features focused on local water bodies in the region. For instance, in Wilkinson County, Lake Mary is an oxbow lake formed by the Mississippi River and well-known for boating, fishing, and hunting. There are also numerous other small lakes, creeks, and other water bodies throughout the region that offer outstanding outdoor recreational opportunities for which the region is known.

I.1.5 Land Use

Wilkinson County has a blend of old and new development that contributes to physical, cultural, and economic attributes throughout the region. There are three incorporated municipalities located in the county. These areas are where the county's population is generally concentrated. The incorporated areas are also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the county generally consist of rural residential development, agricultural uses, and recreational areas. There are multiple county- and regional-based agencies that serve to coordinate growth and promote economic development. Local land use and associated regulations are further discussed in *Section 7: Capability Assessment.*

I.1.6 Employment and Industry

According to the Federal Reserve Bank's economic online database (i.e., Federal Reserve Economic Data, or FRED), in 2021, Wilkinson County had an average annual employment of 2,431 workers and an average unemployment rate of 11.1% (compared to 5.6% for the state).[8] [9] [10] [11] In 2021, the educational services, health care and social assistance industry employed 28.2% of the county's workforce, followed by Construction (19.9%), and then Retail Trade (12.4%).[12] The median household income in 2021 for

[8] Federal Reserve Bank of St. Louis. Federal Reserve Economic Data (FRED). Retrieved on 01/12/2023 from https://fred.stlouisfed.org/categories/28755

[9] Federal Reserve Bank of St. Louis. Federal Reserve Economic Data (FRED). Retrieved on 01/12/2023 from https://fred.stlouisfed.org/series/LAUCN281570000000005A.

[10] Federal Reserve Bank of St. Louis. Federal Reserve Economic Data (FRED). Retrieved on 01/12/2023 from https://fred.stlouisfed.org/series/LAUCN281570000000003A.

[11] Federal Reserve Bank of St. Louis. Federal Reserve Economic Data (FRED). Retrieved on 01/12/2023 from https://fred.stlouisfed.org/series/LAUST280000000000003A.

[12] United States Census Bureau. American Community Survey 5-Year Estimates. 2021. Retrieved on 01/12/2023 from: https://data.census.gov/table?q=average+annual+employment+wilkinson+county+mississippi+mississippi&tid=ACSDP5Y2021.DP03.

Wilkinson County was $31,412, compared to $49,111 for the state of Mississippi.[13]

[13] United States Census Bureau. American Community Survey 5-Year Estimates. 2021. Retrieved on 01/12/2023 from: https://data.census.gov/table?q=average+annual+employment+wilkinson+county+mississippi+mississippi&tid=ACSDP5Y2021.DP03.

I.2 WILKINSON COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in Section 4: *Hazard Identification* as they pertain to Wilkinson County. Each hazard profile includes a description of the hazard's location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in Section 5: *Hazard Profiles*.

FLOOD-RELATED HAZARDS

I.2.1 Dam and Levee Failure

LOCATION AND SPATIAL EXTENT

According to the Mississippi Department of Environmental Quality, there are no high hazard dams in Wilkinson County. The figures below show the location of nearby high hazard dams, and mapped inundation areas the nearby high hazard dams.

FIGURE I.2: WILKINSON COUNTY HIGH HAZARD DAM LOCATIONS

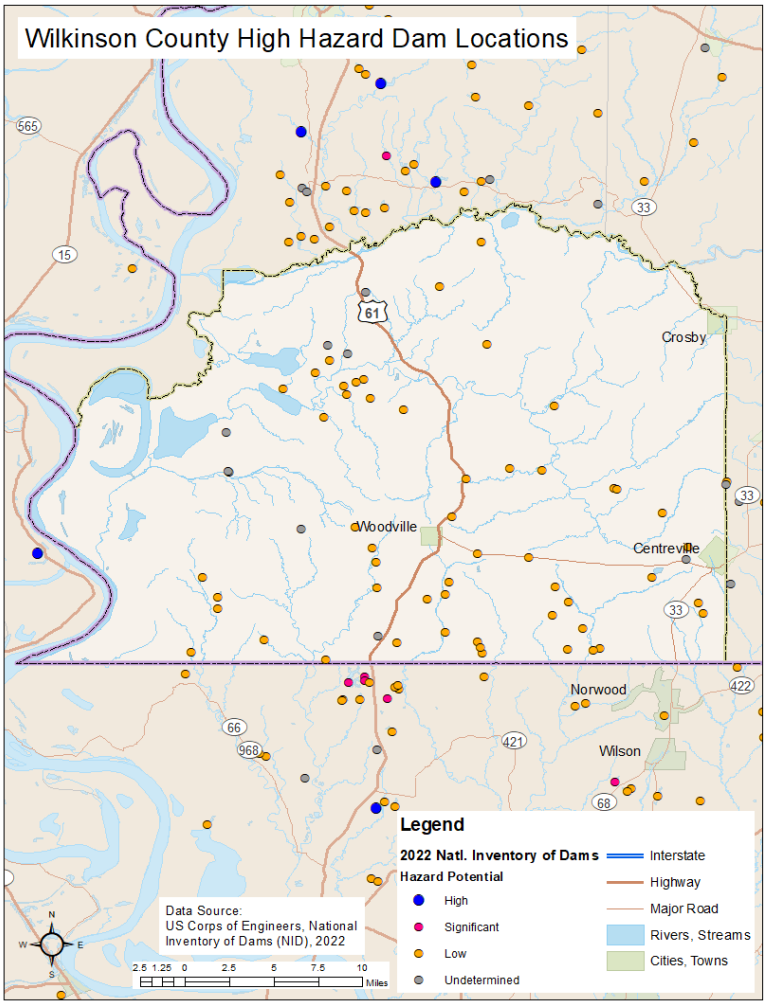
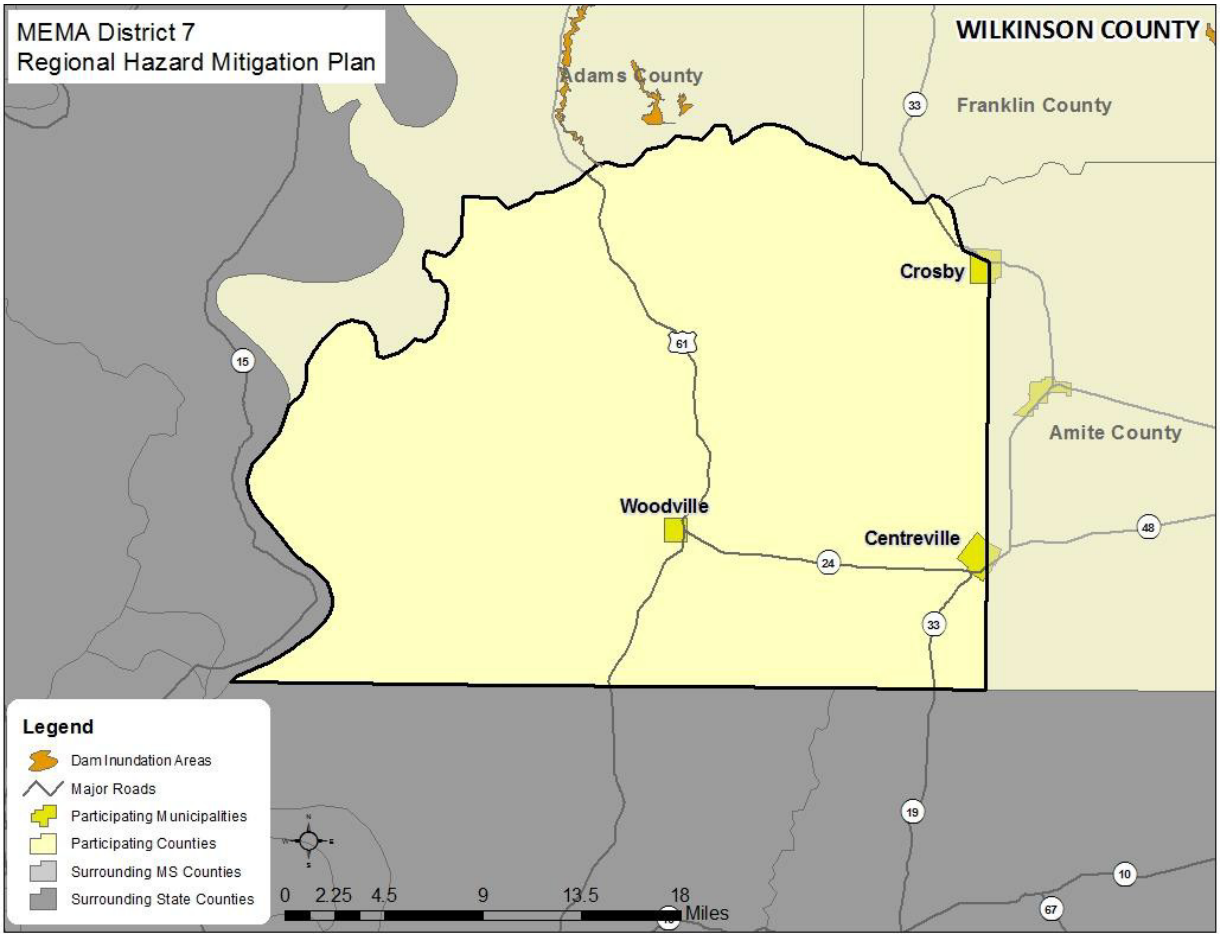


FIGURE I.3: WILKINSON COUNTY DAM INUNDATION AREAS[14]



HISTORICAL OCCURRENCES

According to the Mississippi State Hazard Mitigation Plan, there have been no dam failures reported in Wilkinson County.

PROBABILITY OF FUTURE OCCURRENCES

Given the current dam inventory and historic data, a dam breach is unlikely (less than 1 percent annual probability) in the future. This hazard is not considered a risk to the county.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[15] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Wilkinson County. However, given the current dam inventory and lack of planned future dam projects, climate change impacts are unlikely.

[14] Mississippi Department of Environmental Quality

[15] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

I.2.2 Erosion

LOCATION AND SPATIAL EXTENT

Erosion in Wilkinson County is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in Wilkinson County are primarily rivers/streams and reservoirs. For example, Wilkinson County is adjacent to and situated completely within the 107,000-square-mile Lower Mississippi River Basin that drains over portions of Missouri, Arkansas, Tennessee, Mississippi, and Louisiana.[16] [17] [18]

Generally, vegetation helps to prevent erosion in the area, but in recent years, erosion has become a growing threat to many of the participating counties and jurisdictions in Mississippi, including Wilkinson County. In the Lower Mississippi River Basin, erosion has occurred due to land clearing in riparian areas and over-grazing on stream banks.[19] Lake Mary Rd. in the western part of the county is susceptible to erosion events.

Currently, there are no regional or state-level data available on localized areas of erosion, so it is a challenge to identify particularly prone areas on a wider geographic scale. However, a few areas of concern were reported by members of the hazard mitigation council and other local sources. Locations within the Lower Mississippi River Basin are known to be especially at-risk, but there are locations in many areas within the region where erosion is prominent.

HISTORICAL OCCURRENCES

Several sources were vetted to identify areas of erosion in Wilkinson County. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. The locations identified above are representative of areas where erosion has taken place in the past.

These incidents have caused major problems as bridges have become damaged in many instances and made it unsafe for emergency services vehicles to cross during and after storm events. This delays response times and critical life-safety support. In addition, the shutdown of roads has hurt local communities economically as trade and commerce are temporarily shut down as bridges are repaired. It has also caused disruption to daily activities for local school boards who must re-route buses around affected areas, causing additional fuel resources to be expended and increasing drive times for students.

PROBABILITY OF FUTURE OCCURRENCES

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[16] Hydrologic Unit Map. U.S. Geological Survey. Retrieved on 01/03/2023 from https://water.usgs.gov/GIS/regions.html.

[17] Watershed Boundary Dataset for Mississippi. U.S. Geological Survey. https://pubs.usgs.gov/sim/3020/pdf/sim3020.pdf.

[18] Response to RFI for Long-Term Agro-ecosystem Research (LTAR) Network 2012: Lower Mississippi River Basin,
pp. 1-2. U.S. Department of Agriculture, Agricultural Research Service, 2012. Retrieved on 01/10/2023 from https://www.ars.usda.gov/ARSUserFiles/np211/LMRBProposal.pdf

[19] Response to RFI for Long-Term Agro-ecosystem Research (LTAR) Network 2012: Lower Mississippi River Basin, pp. 1-5. U.S. Department of Agriculture, Agricultural Research Service, 2012. Retrieved on 01/02/2023 from https://www.ars.usda.gov/ARSUserFiles/np211/LMRBProposal.pdf.

Erosion remains a natural, dynamic, and continuous process for Wilkinson County, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annually).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems[20] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Wilkinson County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur[21]. As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones. Both additional moisture and drying conditions can impact the rate of erosion, either by increasing the sediment transfer load due to volume and rate of flooding, or by dehydrating soils, limiting compaction, and increasing wind related erosion events.

I.2.3 Flood

LOCATION AND SPATIAL EXTENT

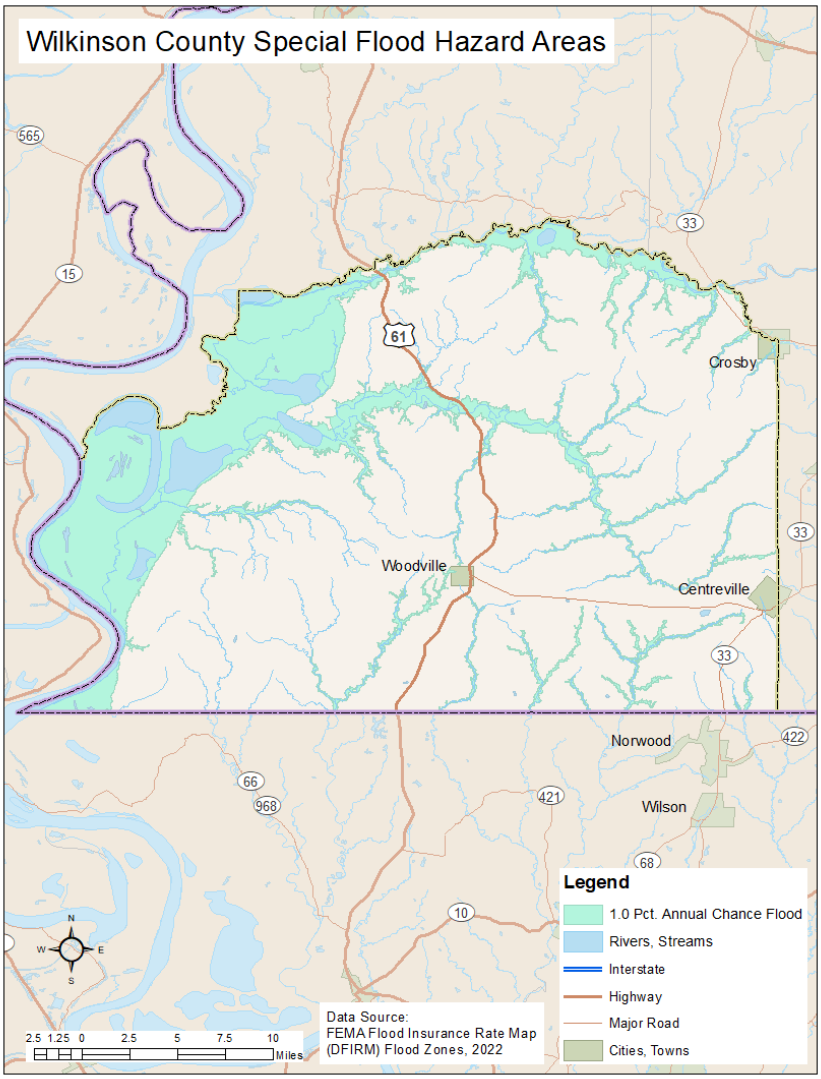
There are areas in Wilkinson County that are susceptible to flood events. Special flood hazard areas in the county were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM). This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevations), and Zone X-500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 688 square miles that make up Wilkinson County, there are 149.45 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 0.00 square miles of land in zone X-500 (0.2 percent annual chance floodplain/500-year floodplain).

These flood zone values account for 21.7 percent of the total land area in Wilkinson County. It is important to note that while FEMA digital flood data is recognized as the best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. The figure below illustrates the location and extent of currently mapped special flood hazard areas for Wilkinson County based on the best available FEMA Digital Flood Insurance Rate Map (DFIRM) data.

[20] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[21] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters

FIGURE I.4: SPECIAL FLOOD HAZARD AREAS IN WILKINSON COUNTY



HISTORICAL OCCURRENCES

Floods were at least partially responsible for 2 major disaster declarations in Wilkinson County in 1972 and 2011. [22] [23] While additional disaster declarations involved flooding events during hurricanes, those declarations were captured under Hurricane Declarations.

A flood in 2016 was declared at the local level. Along with the state of Louisiana, who did receive a disaster declaration. Proclamation of existence through the Board of County Commissioners. A grant was issued by the state through a 501c3 to assist major impacts in the county.

[22] Federal Emergency Management Agency. Disaster Declarations for States and Counties. 2023. Retrieved on 01/12/2023 from https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties.

[23] Federal Emergency Management Agency. Historical Flood Risk and Costs. 2023. Retrieved on 01/12/2023 from https://www.fema.gov/data-visualization/historical-flood-risk-and-costs.

Wilkinson was the only county in the Region to be declared under Disaster 4538 in 2020. During this event the Pearl River crested at 36.67 feet in Jackson on February 17, 2020 - the 3rd highest crest in history[24].

Information from the National Centers for Environmental Information was used to ascertain additional historical flood events. The National Centers for Environmental Information reported a total of 11 events in Wilkinson County since 1997.[25] These events accounted for approximately $7,265,000 in property damage and at least one death when a person was lost in flood waters and never found. A summary of these events is presented below.

TABLE I.4: SUMMARY OF FLOOD OCCURRENCES IN WILKINSON COUNTY[26]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Centreville*	0	0/0	$0	$0
Crosby	0	0/0	$0	$0
Woodville	2	0/0	$75,000	$2,885
Unincorporated Area	9	1/0	$7,190,000	$276,538
WILKINSON COUNTY TOTAL	**11**	**1/0**	**$7,265,000**	**$279,423**

* NSFHA – No Special Flood Hazard Area in community.

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Flood Insurance Management Agency (FIMA) Flood Insurance Data Analytics, since 2019 Mississippi has had 47 floods of record with 22 closed with payment, 19 closed without payment, and 6 remaining open. A total of $545,506 has been made in payments. This FEMA dataset is the authoritative source for FEMA's public data. This product uses the Federal Emergency Management Agency's API but is not endorsed by FEMA. FEMA cannot verify the quality and/or timeliness of any data or any analysis derived there from after the data has been retrieved from FEMA.gov. This data set was last accessed on July 2, 2023, with records updated at most every 20 minutes or at least monthly, processed the first Saturday of the month at 1:00am EST.

According to FEMA flood insurance policy records as of July 2, 2023, there have been 299 flood losses reported in Wilkinson County through the National Flood Insurance Program (NFIP) since 1978, totaling $5,655,880.98 in total building and $1,306,889.21 in contents claims payments. A summary of these figures for the county is provided in the table below. Between 2017 and 2023 one additional flood claim was filed in Crosby amounting to an $11,088.89 pay outs. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought. It is likely that many additional instances of flood loss in Wilkinson County were either uninsured or not reported.

[24] https://storymaps.arcgis.com/stories/765d21cb433147fba4a808af2eae53b3

[25] These flood events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1997 through November 2022. It is likely that additional occurrences have occurred and have gone unreported.

[26] Source NCEI. Annualized losses are calculated by dividing the total number of property damages by number of years of recordkeeping for the hazard.

TABLE I.5: SUMMARY OF INSURED FLOOD LOSSES IN WILKINSON COUNTY[27]

Location	Number of Policies	Flood Losses	Claims Payments
Centreville*	NSFHA*	--	--
Crosby	0	1	$11,028.89
Woodville	0	0	$0
Unincorporated Area	5	298	$6,962,770.19
WILKINSON COUNTY TOTAL	**5**	**299**	**$6,973,799.08**

* NSFHA – No Special Flood Hazard Area in community.

REPETITIVE LOSS PROPERTIES

For this plan update, certain information on NFIP and Repetitive Loss Properties data were not available due to changes in FEMA's data distribution policies. According to the Mississippi Emergency Management Agency in 2017, there were 25 non-mitigated repetitive loss properties located in Wilkinson County, which accounted for 58 losses and more than $1.1 million in claims payments under the NFIP. The average claim amount for these properties is $19,383. Of the 25 properties, 16 are single-family, 1 is assumed condominium, and 8 are other non-residential. Without mitigation, these properties will likely continue to experience flood losses. The table below presents detailed information on repetitive loss properties and NFIP claims and policies for Wilkinson County as documented in the last plan. Updated data could not be obtained.

TABLE I.6: REPETITIVE LOSS PROPERTIES IN WILKINSON COUNTY[28,29]

Location	Number of Properties	Types of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Centreville*	NSFHA*	--	--	--	--	--	--
Crosby	3	2 single family; 1 other non-residential	7	$94,060.25	$51,986.28	$146,046.50	$20,863.79
Woodville	0	--	0	$0.00	$0.00	$0.00	$0.00
Unincorporated Area	25	16 single family; 1 assumed condo; 8 other non-residential	58	$986,241.68	$137,957.80	$1,124,199.48	$19,382.75
Wilkinson County Total	**28**		**65**	**$1,080,301.93**	**$189,944.08**	**$1,270,245.98**	**$40,246.54**

* NSFHA – No Special Flood Hazard Area in community.

[27] National Flood Insurance Program. National Flood Insurance Program. *Policy and Loss Data by Geography (HUDEX)*, 10.13.2022. Retrieved on 01/05/2023 from https://nfipservices.floodsmart.gov/sites/default/files/PolicyandLossDatabyGeography.xlsx. And *National Flood Insurance Program, OpenFEMA Data Sets*

[28] National Flood Insurance Program

[29] Current data on Repetitive Loss Properties were not available for this plan update.

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in Wilkinson County, and the probability of future occurrences will remain highly likely (100 percent annual probability). The probability of future flood events based on magnitude and according to best available data is illustrated in the figure above, which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain).

Information from the floodplain location maps, previous occurrences, and repetitive loss properties indicates that flood risk varies throughout the county. For example, areas along the western border of the county have more floodplains and thus a higher risk of a flood than the rest of the county. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted, particularly for repetitive loss properties.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[30] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Wilkinson County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[31] As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased *coastal, fluvial (i.e., riverine) and pluvial (i.e., rainfall) flooding.*[32] More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

FIRE-RELATED HAZARDS

I.2.4 Drought

LOCATION AND SPATIAL EXTENT

Drought is a non-spatial hazard that typically covers a large area and cannot be confined to any geographic or political boundaries. As a result, it is assumed that all areas within Wilkinson County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage directly to the built environment but may exacerbate wildfire conditions.

HISTORICAL OCCURRENCES

According to the U.S. Drought Monitor, Wilkinson County had drought levels of Severe or worse in 5 of the last 13 years (January 2010 through December 2022). The table below shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of

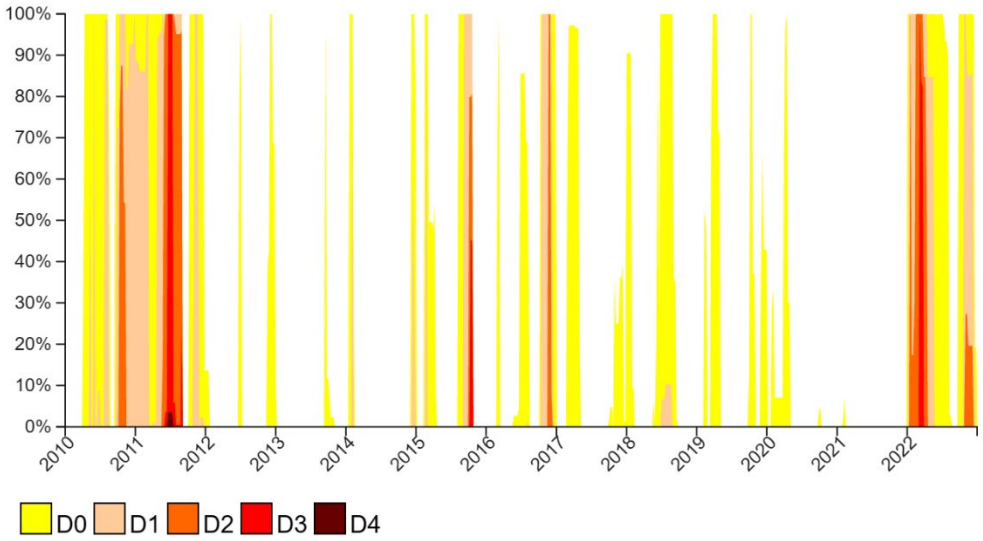
[30] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf.

[31] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters.

[32] Please note: there is no coastal flooding in Wilkinson County.

drought severity. For example, the most severe classification reported may be exceptional, but a majority of the county may actually be in a less severe condition.

TABLE I.7: HISTORICAL DROUGHT OCCURRENCES IN WILKINSON COUNTY[33]



Some additional anecdotal information was provided from the National Centers for Environmental Information on droughts in Wilkinson County.

Summer to Fall 2006 – During a four and a half month period, from June to the middle of October, abnormally dry conditions prevailed across most of the Jackson, MS County Warning Area (CWA). Widespread drought conditions were reported across the area during this time period. The U.S. Drought Monitor classified the drought as extreme (D3) over Southeast Mississippi. Drought conditions in the region peaked in intensity during early August over this area.

Summer 2007 – During the month of June, the drought peaked across the region. It held firm across the same areas since May with no expansion. What did expand was the severity as by the end of June, most of Central and East-Central Mississippi was now in extreme drought (D3) with some locations across Northeast Mississippi now experiencing exceptional drought (D4). The month of June did not offer much rain as most of the forecast area saw less than 40% of the normal rainfall.

Summer to Fall 2010 – Very dry conditions continued across central Mississippi during most of October. There were some rains that came late in the month which provided some temporary relief. Rainfall amounts ranged from a half to two inches with locally higher amounts. Most locations were 1 to 3 inches below normal for the month. The dry stretch resulted in severe (D2) drought conditions to expand during the month with even the portions of extreme (D3) drought conditions expanding as well. Crops were put under stress under the warm and dry conditions.

Fall 2015 – The very dry conditions continued across Central Mississippi in October. The extended dry stretch resulted in an area of Severe (D2) drought developing across the area by October 6th. The

[33] U.S. Drought Monitor. Historical Conditions for Wilkinson County, MS 2010 – 2022. Retrieved on 01/01/2023 from: https://www.drought.gov/states/mississippi/county/Wilkinson

drought intensified and Extreme (D3) drought conditions developed by October 13th. Approximately 25 to 50 percent of normal rainfall occurred across this area from August into mid-October. Crops were put under more stress from the dry and hot conditions.

Fall to Winter 2016 – Dry conditions continued into November, which created continued stress on crops. The drought continued to get worse across the state through the month before some relief came in the form of showers and thunderstorms near the end of November.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that Wilkinson County has a probability level of possible (between 1 and 10 percent annual probability) for future drought events. However, the extent (or magnitude) of drought and the amount of geographic area covered by drought, varies each year. Historic information indicates that there is a much lower probability for extreme, long-lasting drought conditions in Wilkinson County.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[34] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Wilkinson County. With increasing global surface temperatures, the possibility of more *droughts* and increased frequency and intensity of storms will likely occur.[35] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

I.2.5 Lightning

LOCATION AND SPATIAL EXTENT

Lightning occurs randomly; therefore, it is impossible to predict where and with what frequency it will strike. It is assumed that all of Wilkinson County is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, there has been 1 recorded lightning event in Wilkinson County (07/13/2008); during this event, 1 person was killed and least 2 other people were injured, but there was no property damage reported as depicted in the table below. According to the National Lightning Detection Network (NLDN) map below, there are 95.1 lightning events per square kilometer per year in Wilkinson County.[36] As a result, it is likely that lightning events have generated property damage in Wilkinson County.

[34] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf.

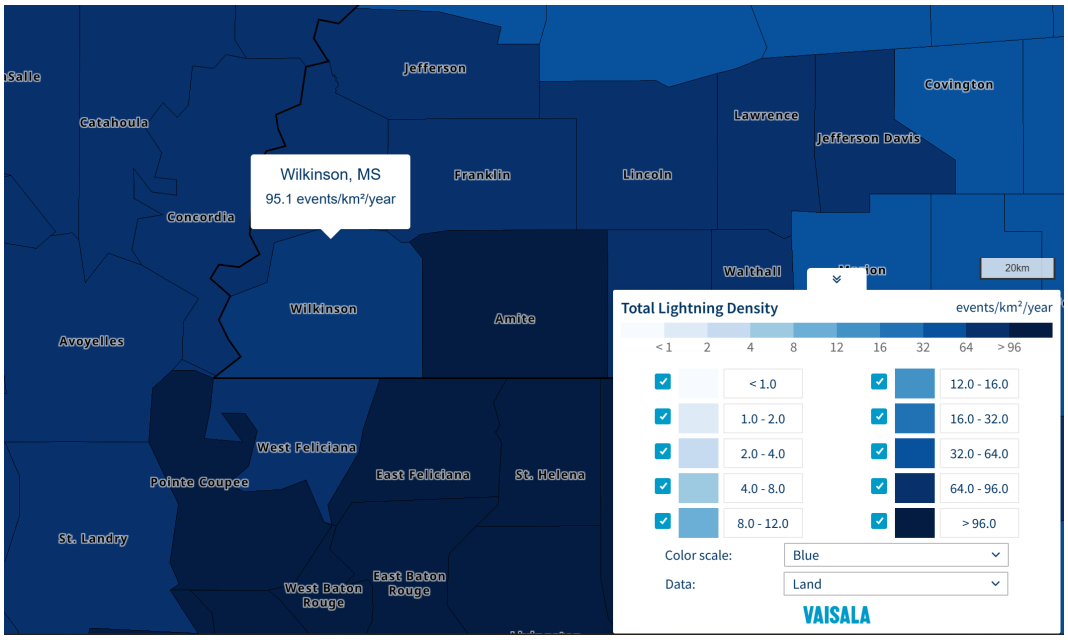
[35] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters.

[36] Vaisala – U.S. National Lightning Detection Network. Retrieved on 01/02/2023 from: https://interactive-lightning-map.vaisala.com

TABLE I.8: SUMMARY OF LIGHTNING OCCURRENCES IN WILKINSON COUNTY[37]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Centreville	1	1/2	$0	$0
Crosby	0	0/0	$0	$0
Woodville	0	0/0	$0	$0
Unincorporated Area	0	0/0	$0	$0
WILKINSON COUNTY TOTAL	**1**	**1/2**	**$0**	**$0**

FIGURE I.5: VAISALA'S NLDN MAP OF LIGHTNING DENSITY – WILKINSON COUNTY[38]



PROBABILITY OF FUTURE OCCURRENCES

Although there have been no historical lightning events reported in Wilkinson County via National Centers for Environmental Information data, lightning events are regular occurrences in the region that threaten both life and property. It is expected that future lightning events will happen on an annual basis in Wilkinson County and will continue to threaten life and cause minor property damage throughout the region. Therefore, the probability of future lightning events in Wilkinson County is highly likely (100 percent annual probability).

[37] *Source: National Centers for Environmental Information.*

[38] Vaisala – U.S. National Lightning Detection Network. Retrieved on 01/10/2023 from: https://interactive-lightning-map.vaisala.com

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[39] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Wilkinson County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *lightning strike events*.[40] As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

I.2.6 Wildfire

LOCATION AND SPATIAL EXTENT

The entire Wilkinson County area is at risk to a wildfire occurrence, and locations near the urban-wildland interface – where populations abut formerly undeveloped areas – are particularly susceptible to wildfire hazards. Drought conditions and high levels of fuel on the forest floor may make a wildfire more likely. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

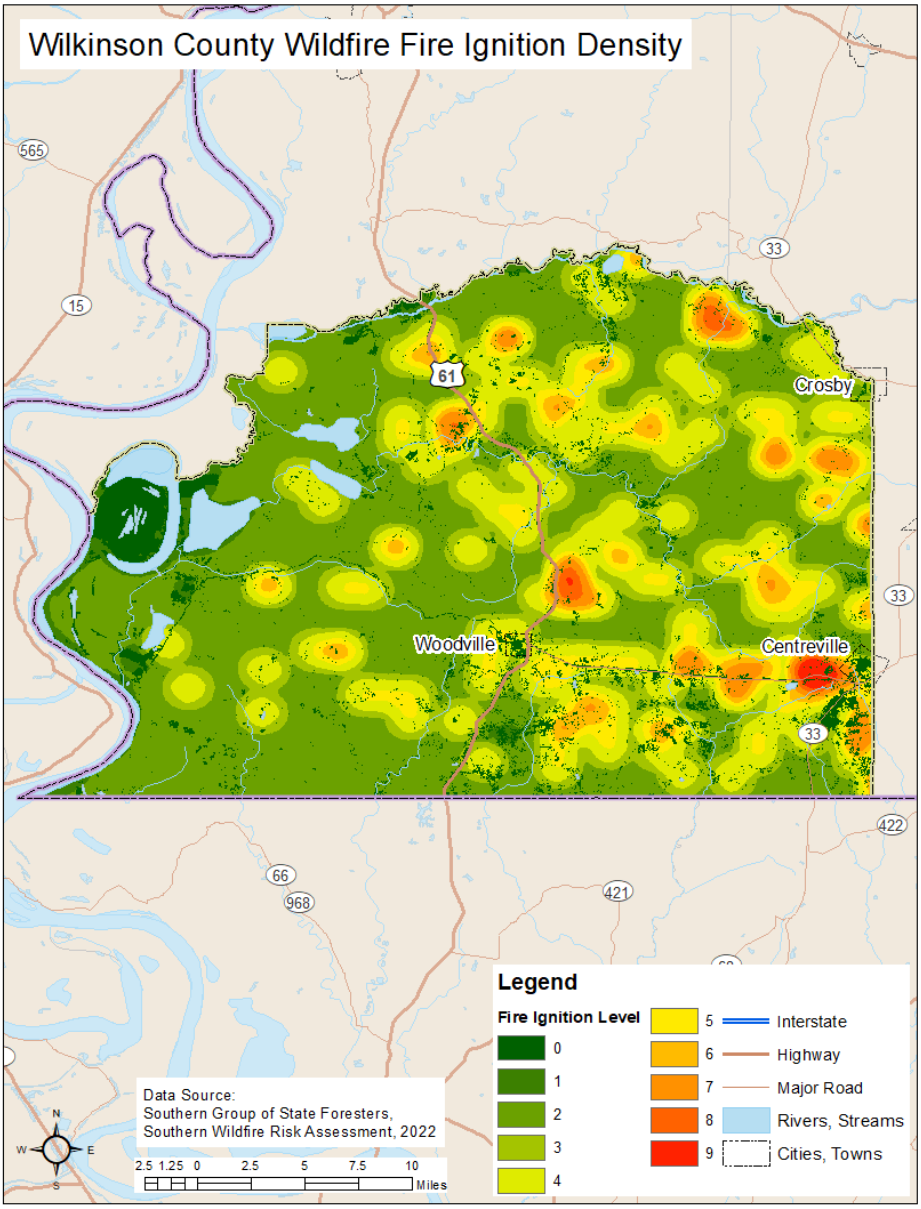
HISTORICAL OCCURRENCES

The map below shows Wildfire Ignition Density across Wilkinson County, and is based on data from the Southern Wildfire Risk Assessment. This map provides information on historic locations of wildfire ignitions, and shows the likelihood of a wildfire igniting in a particular area. Wildfire occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map, and is measured in the number of fires per year per 1,000 acres.[8]

[39] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf

[40] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters.

FIGURE I.6: WILDFIRE IGNITION DENSITY IN WILKINSON COUNTY



Based on data from the Mississippi Forestry Commission, Wilkinson County experienced an annual average of 3.125 wildfires per year from 2015 to 2022; these wildfires burned a combined 62.125 acres per year during that period. The data indicate that most of these fires were small to moderate in size, averaging 15.6625 acres per fire. The tables below provide a summary of wildfire occurrences in Wilkinson County from 2015 to 2022 and lists the number of reported wildfire occurrences in the county between the years 2012 and 2022.

TABLE I.9: SUMMARY OF ANNUAL WILDFIRE OCCURRENCES (2015-2022)[41]

	Wilkinson County
Average Number of Fires Per Year	3.125
Average Number of Acres Burned Per Year	62.125
Average Number of Acres Burned Per Fire	15.6625

TABLE I.10: HISTORICAL WILDFIRE OCCURRENCES IN WILKINSON COUNTY (2012-2022)[42]

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Wilkinson County												
Number of Fires	8	9	12	5	2	5	0	2	2	3	6	54
Number of Acres Burned	41	46	147	98	36	106	0	11	9	102	135	731

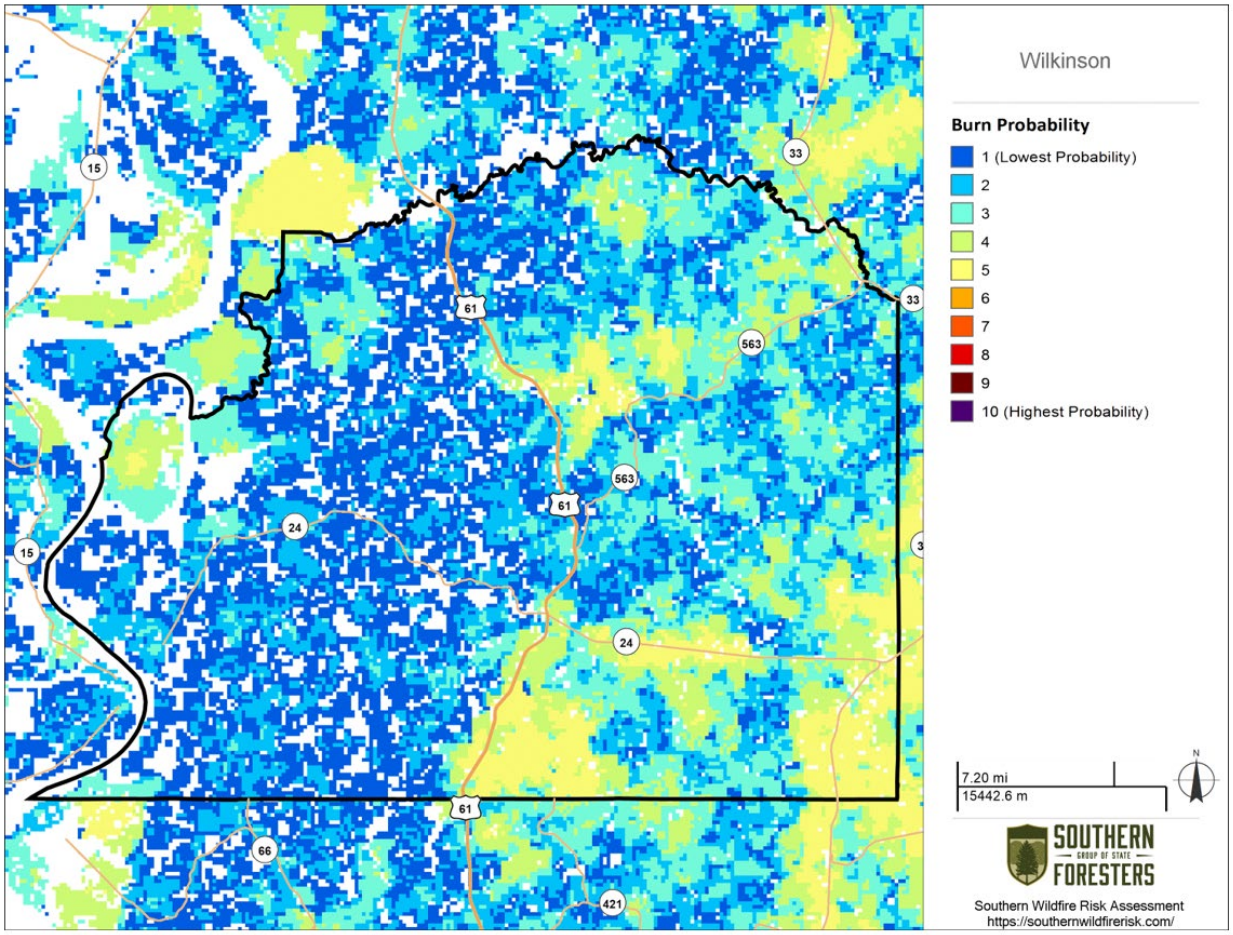
PROBABILITY OF FUTURE OCCURRENCES

The figure below shows there is some probability a wildfire will occur in Wilkinson County, and that wildfire events will be an ongoing occurrence in the county. The likelihood of wildfire events will increase during drought cycles and abnormally dry conditions. While wildfires are likely to stay small in size, their areal coverage could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. Highly developed areas will be less susceptible to wildfires, unless they are located near the urban-wildland interface. The risk of wildfire losses will vary based on the assets that exist in different parts of the county. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate, compared to rural, mainly forested areas. The probability assigned to Wilkinson County for future wildfire events is highly likely (100 percent annual probability).

[41] *Mississippi Forestry Commission – 2015 - 2022*

[42] *Mississippi Forestry Commission*

FIGURE I.7: BURN PROBABILITY IN WILKINSON COUNTY



FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[43] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Wilkinson County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency *wildfire events*.[44]

[43] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf.

[44] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters.

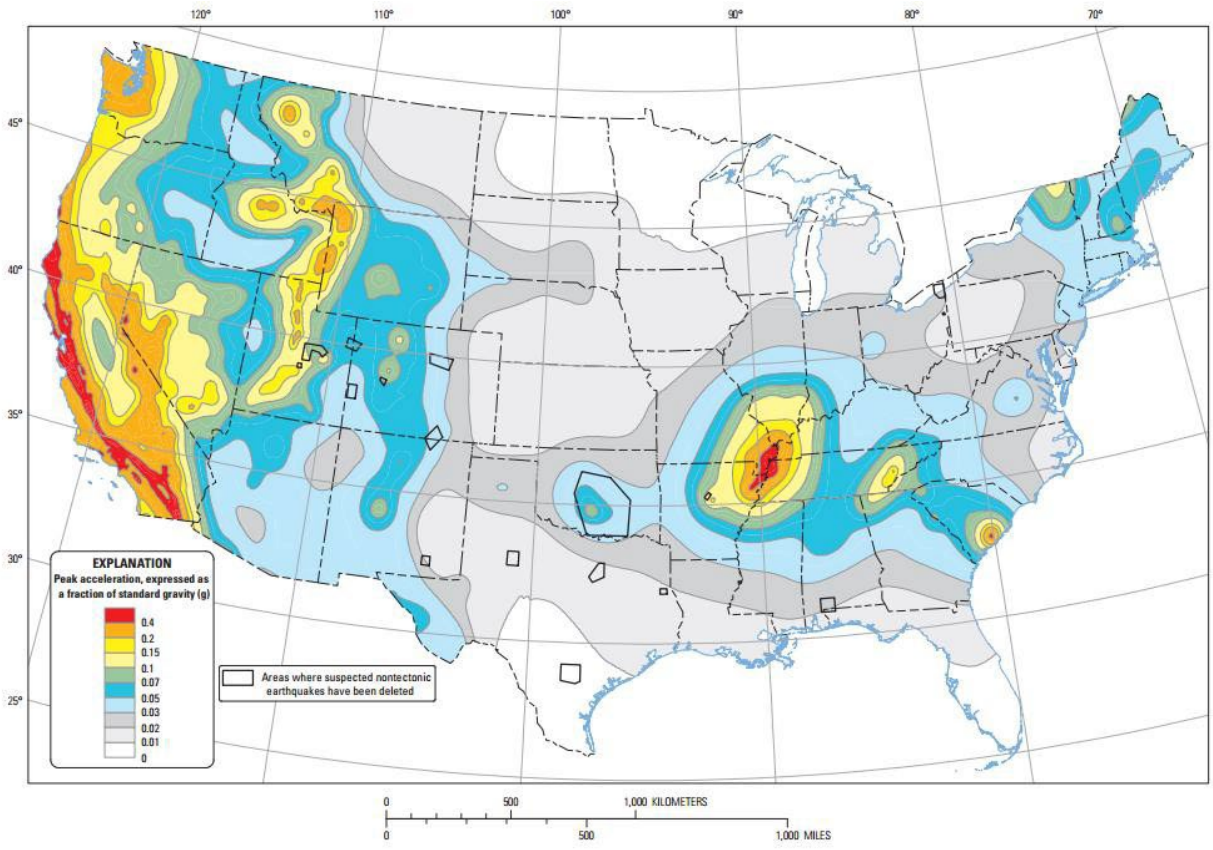
GEOLOGIC HAZARDS

I.2.7 Earthquake

LOCATION AND SPATIAL EXTENT

The figure below is a map that shows the probability that ground motion will reach a certain level during an earthquake in different parts of the U.S., as indicated by data peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Wilkinson County lies within an approximate zone of level "0.01" to "0.03" ground acceleration. This indicates that the county exists within an area of low seismic risk.

FIGURE I.8: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS[45]



Ten-percent probability of exceedance in 50 years map of peak ground acceleration

[45] United States Geological Survey, 2014

The primary source of potential damage to Wilkinson County from an earthquake is the New Madrid Seismic Zone (NMSZ). Historically, a series of earthquakes in 1811 and 1812 demonstrated that this fault zone can produce high magnitude seismic events, sometimes on the scale of a 7.5-8.0 on the Richter scale. The biggest challenge with earthquakes that occur in this area of seismic activity is predicting the recurrence of earthquakes emanating from the NMSZ. Although the magnitude of earthquakes from the NMSZ can be large, they occur very irregularly and infrequently. This makes it extremely difficult to predict when they will occur.

It should also be noted that the State of Mississippi Hazard Mitigation Plan identifies certain areas of concern for liquefaction and lists the counties and corresponding zones within those counties that have the highest liquefaction potential. Wilkinson County does not have any identified liquefaction potential risk.

The following figure shows the Modified Mercalli Intensity Scale. The lower numbers of the intensity scale generally deal with the way the earthquake is felt by people. The higher numbers of the scale are based on observed structural damage. Structural engineers usually contribute information for assigning intensity values of VIII or above.

FIGURE I.1: MODIFIED MERCALLI INTENSITY SCALE (MMI)

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest,especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

HISTORICAL OCCURRENCES

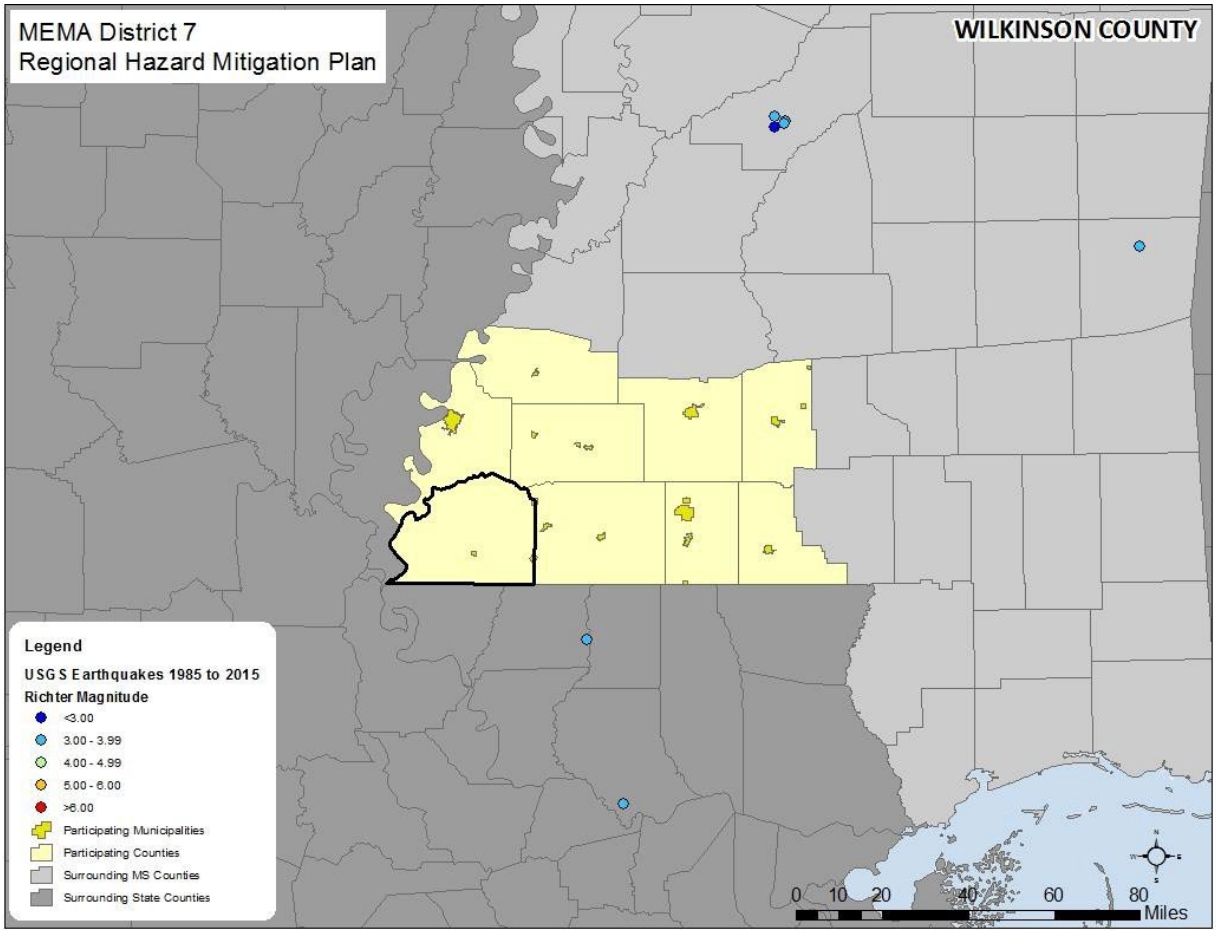
No earthquakes are known to have affected Wilkinson County since 1638. The tables below provide a summary of earthquake events reported by the National Centers for Environmental Information (formerly National Geophysical Data Center) between 1638 and 1985, and the map shows earthquakes whose epicenters have occurred near the county between 1985 and 2023 (no earthquakes occurred within the county's boundaries during this period). The table below presents a detailed occurrence of

each event including the date, distance for the epicenter, magnitude, and Modified Mercalli Intensity (if known).[46]

TABLE I.11: SUMMARY OF SEISMIC ACTIVITY IN WILKINSON COUNTY THROUGH 2023[47]

Location	Number of Occurrences	Greatest MMI Reported	Greatest Richter Scale Reported
Centreville	0	--	--
Crosby	0	--	--
Woodville	0	--	--
Unincorporated Area	0	--	--
WILKINSON COUNTY TOTAL	**0**	**--**	**--**

FIGURE I.10: HISTORIC EARTHQUAKES WITH EPICENTERS NEAR WILKINSON COUNTY (1985-2015)[48]



[46] Due to reporting mechanisms, not all earthquake events were recorded during this time. Furthermore, some are missing data, such as the epicenter location, due to a lack of widely used technology. In these instances, a value of "unknown" is reported.

[47] *Source: National Centers for Environmental Information*

[48] *Source: United States Geological Survey*

TABLE I.12: SIGNIFICANT SEISMIC EVENTS IN WILKINSON COUNTY (1638 -1985)[49]

Location	Date	Epicentral Distance	Magnitude	MMI
Centreville				
None reported	--	--	--	--
Crosby				
None reported	--	--	--	--
Woodville				
None reported	--	--	--	--
Unincorporated Area				
None reported	--	--	--	--

PROBABILITY OF FUTURE OCCURRENCES

The probability of significant, damaging earthquake events affecting Wilkinson County is unlikely. However, it is possible that future earthquakes resulting in light or moderate perceived shaking and damages will affect the county more frequently. The annual probability level for the county is estimated to be less than 1 percent (unlikely).

TEMPERATURE & WIND-RELATED HAZARDS

I.2.8 Extreme Heat

LOCATION AND SPATIAL EXTENT

Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries. Therefore, the entire county is equally susceptible to extreme heat.

HISTORICAL OCCURRENCES

Information from the National Centers for Environmental Information was used to determine historical extreme heat occurrences in Wilkinson County. While no extreme heat events were reported in the county, several events were reported in the surrounding region.

Summer of 2000 Heat Wave – Hot temperatures persisted from July to September across the South and Plains. Known as the Summer of 2000 Heat Wave, high temperatures commonly peaked over 100 degrees.

August 2005 – A "HOT" stretch of weather occurred during the middle to later part of August 2005. This "Heat Wave" covered a large portion of the south and lasted for a period of about 10 days. Each of these days had high temperatures consistently between 95 and 100 degrees, with 1 or 2 of these days reaching 100 degrees or more. Additionally, overnight lows remained warm with lower and middle 70s recorded. This is the first time since August 2000 where 100-degree temperatures were reached in this area as well as having such an extended period of "HOT" weather.

[49] Source: National Centers for Environmental Information.

July 2006 – A small "heat wave" gripped the region during the middle of July with high temperature ranging from the upper 90s to around 100 degrees for five days with overnight lows only reaching the middle 70s. The hottest temperatures during this period occurred from the Mississippi Delta, across northern Mississippi and then down to the Jackson Metro and toward Meridian. This area peaked between 100 and 102 degrees for at least two days during the hot five-day stretch.

August 2007 – During the first half of August, a heat wave took hold of the region and brought some of the warmest temperatures since the summer of 2000. This heat wave began around August 5th and lasted until the 16th. Between August 10th and 15th, the entire area reached 100 degrees or higher. Twenty- three record highs were also set during this time. As the temperature soared each day, high relative humidities resulted in heat index values between 105 and 112 degrees.

August 2010 – A four day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS Jackson, MS forecast area, 19 record highs were set between August 1st and 4th. On August 2nd, the 2nd warmest average temperature was recorded. The low was 78 and the high 105, this resulted in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in 3 fatalities across the forecast area.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Wilkinson County has a probability level of likely (between 10 and 100 percent annual probability) for future extreme heat events.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[50] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Wilkinson County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *extreme heat* events.[51] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones.

I.2.9 Hailstorm

LOCATION AND SPATIAL EXTENT

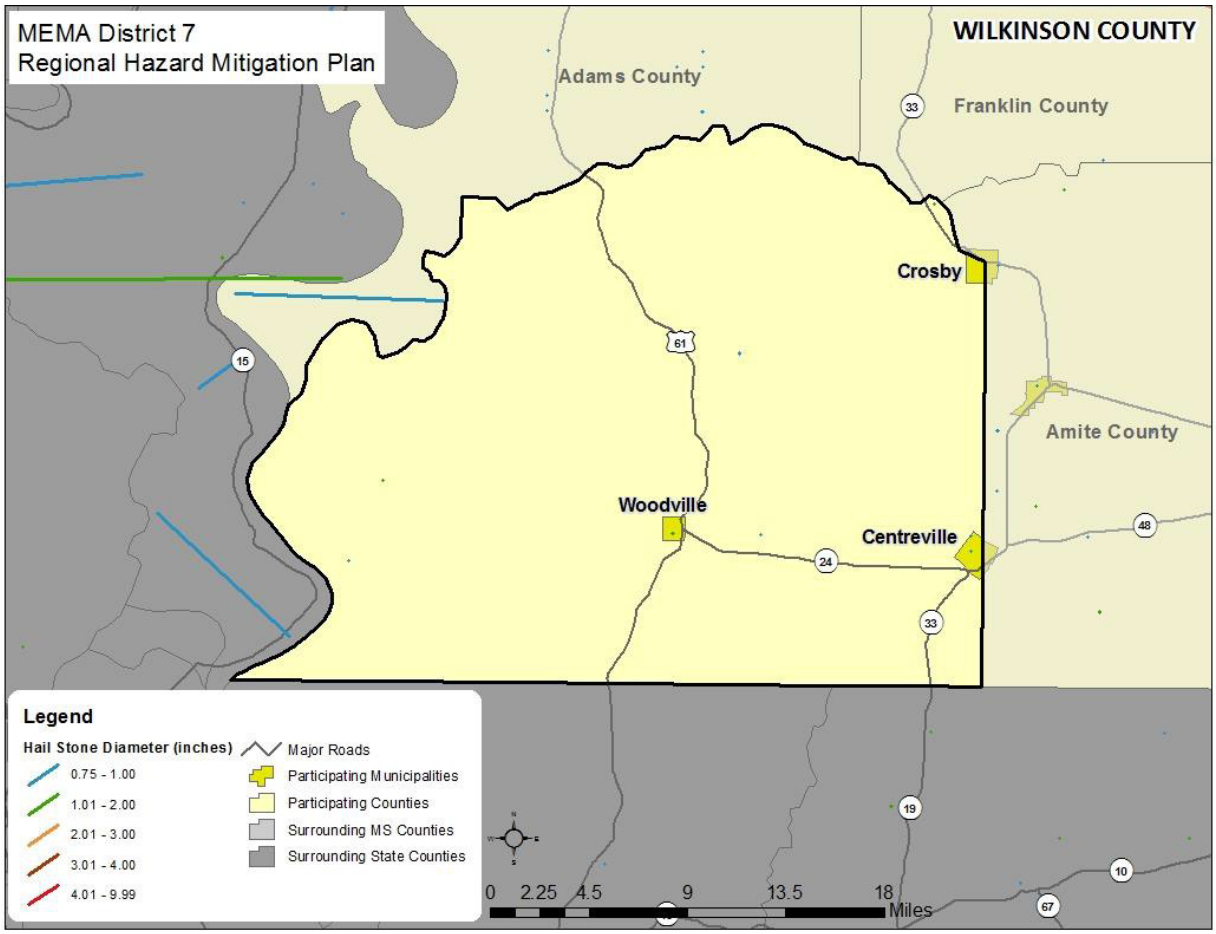
Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide with

[50] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf.

[51] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters.

those of thunderstorms. As a result, because all areas of Wilkinson County are uniformly exposed to severe thunderstorms, all areas of the county are uniformly exposed to hail which may be produced by such storms. The figure below shows the location of hail events that have impacted Wilkinson County between 1955 and 2015.

FIGURE I.11: HAILSTORM TRACKS IN WILKINSON COUNTY[52]



According to the National Centers for Environmental Information, 18 recorded hailstorm events have affected Wilkinson County since 1980.[53] The table below is a summary of the hail events in Wilkinson County. In all, hail occurrences resulted in approximately $500,000 in property damage. Hail ranged in diameter from 0.75 inches to 1.75 inches.

It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater t\than the reported value.

[52] *Source: National Weather Service Storm Prediction Center*

[53] These hail events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1980 through November 2022. It is likely that additional hail events have affected Wilkinson County. As additional local data becomes available, this hazard profile will be amended.

TABLE I.13: SUMMARY OF HAIL OCCURRENCES IN WILKINSON COUNTY[54]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Centreville	5	0/0	$0	$0
Crosby	0	0/0	$0	$0
Woodville	4	0/0	$500,000	$11,628
Unincorporated Area	9	0/0	$0	$0
WILKINSON COUNTY TOTAL	**18**	**0/0**	**$500,000**	**$11,628**

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that the probability of future hailstorm occurrences in Wilkinson County is highly likely (100 percent annual probability). It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[55] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Wilkinson County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur, increasing the frequency of *hailstorm.*[56] As more water vapor is evaporated into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding.

I.2.10 Hurricane and Tropical Storm

LOCATION AND SPATIAL EXTENT

Hurricanes and tropical storms threaten the Atlantic Ocean and Gulf of Mexico seaboards of the United States, causing substantial damage due to high winds and flooding. While coastal areas are most directly exposed to the brunt of landfalling storms, the storms' impacts are often felt in places hundreds of miles inland, including in Wilkinson County. All areas in Wilkinson County are equally susceptible to hurricane and tropical storms.

The following table shows the different category rankings of hurricanes on the Saffir-Simson Scale. The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures. In the western North Pacific,

[54] Source: National Centers for Environmental Prediction

[55] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf.

[56] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters.

the term "super typhoon" is used for tropical cyclones with sustained winds exceeding 150 mph. Note that all winds are using the U.S. 1-minute average.

TABLE I.14: SAFFIR-SIMPSON SCALE OF HURRICANE STRENGTH

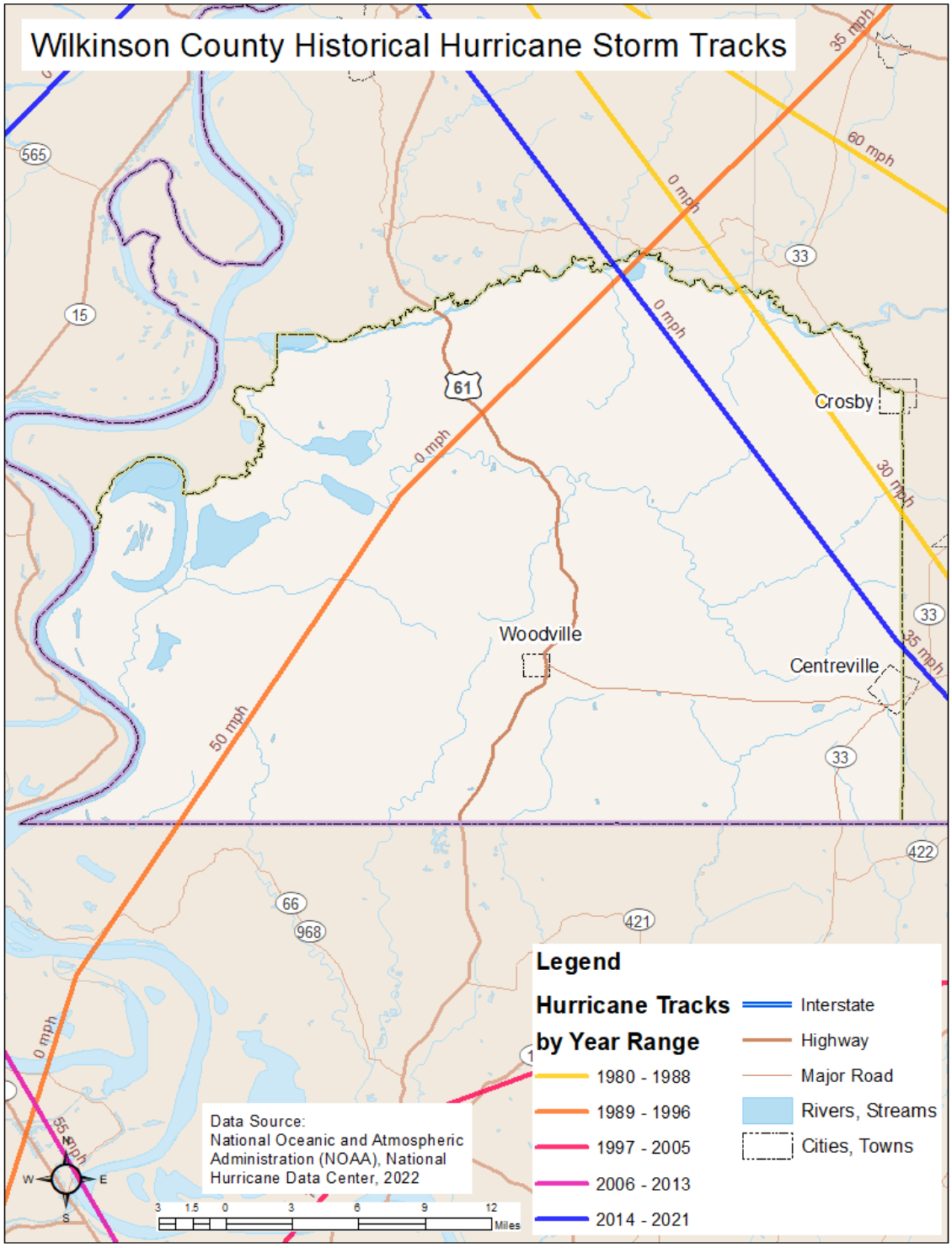
Category 1	Winds 74-95 mph (64-82 kt or 119-153 km/hr). Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
Category 2	Winds 96-110 mph (83-95 kt or 154-177 km/hr). Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
Category 3	Winds 111-129 mph (96-112 kt or 178-208 km/hr). Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
Category 4	Winds 130-156 mph (113-136 kt or 209-251 km/hr). Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
Category 5	Winds 157 mph or higher (137 kt or higher or 252 km/hr or higher). Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

HISTORICAL OCCURRENCES

According to the National Hurricane Center's historical storm track records, 75 hurricane or tropical storm/depression tracks have passed within 50 NM of Wilkinson County since 1856.[57] The following figure shows hurricane storm tracks that have passed through or near Wilkinson County since 1980.

[57] National Oceanic and Atmospheric Administration. Office for Coastal Management. Retrieved on 01/11/2023 from https://coast.noaa.gov/hurricanes

FIGURE I.12: WILKINSON COUNTY HISTORICAL STORM TRACKS



Federal records indicate that 7 major disaster declarations were made in Wilkinson County: 1965 (Hurricane Betsy), 1969 (Hurricane Camille), 2004 (Hurricane Ivan), 2005 (Hurricane Katrina), 2008

(Hurricane Gustav), 2012 (Hurricane Isaac), and 2021 (Hurricane Ida).[58] [59] Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding.

The National Centers for Environmental Information also reported 8 hurricane or tropical storm events in Wilkinson County since 2002. These events accounted for over $19.3 million in property damage. A summary of these events is presented below.

TABLE I.15: HISTORICAL HURRICANE / TROPICAL STORM OCCURRENCES IN WILKINSON COUNTY[60]

Date of Occurrence	Storm Name	Deaths/Injuries	Property Damage	Annualized Losses
10/2/2002	Hurricane Lili	0/0	$1,670,000	
8/28/2005	Hurricane Katrina	0/0	$3,400,000	
9/1/2008	Hurricane Gustav	0/0	$10,690,000	
9/2/2011	Tropical Storm Lee	0/0	$5,000	
8/29/2012	Hurricane Isaac	0/0	$50,000	
7/13/2019	Hurricane Barry	0/0	$0	
10/9/2020	Hurricane Delta	0/2	$3,000,000	
8/29/2021	Hurricane Ida	0/0	$500,000	
Wilkinson County Totals		**0/2**	**$19,315,000**	**$919,762**

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the county. Anecdotes are available from NCEI for the major storms that have impacted the county as found below:

Hurricane Katrina – August 29, 2005
The damage from Hurricane Katrina was devastating and widespread. Damage occurred across all of the Jackson forecast area which includes 9 parishes in Northeast Louisiana, 2 counties in Southeast Arkansas and about 2/3 of Central and Southern Mississippi. As widespread as the damage was, the more concentrated and most significant damage occurred across Southeast and East-Central Mississippi. For other areas, especially the areas west of Natchez to Yazoo City to Grenada line, damage to trees and power lines was significant and scattered across the landscape. As you move toward Central Mississippi and along Interstate 55 the damage and impacts increase. This portion of the state sustained widespread damage to trees and power lines.

Hurricane Gustav – September 1, 2008
As the center of Gustav crossed much of southern Louisiana, tropical storm force winds extended into southern Mississippi and portions of east central Louisiana. Sustained winds were between 35 and 45 mph with higher gusts between 70 and 100 mph occurred. Tree and power line damage was extensive across these areas which resulted in widespread power outages, some of which lasted for 3 to 5 days. As Gustav slowed across central Louisiana, the outer rainbands continued to rotate across much of southern and central Mississippi. This kept those portions of Mississippi in the region which was

[58] Federal Emergency Management Agency. Disaster Declarations for States and Counties. 2023. Retrieved on 01/11/2023 from https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties.
[59] Federal Emergency Management Agency. Historical Flood Risk and Costs. 2023. Retrieved on 01/11/2023 from https://www.fema.gov/data-visualization/historical-flood-risk-and-costs.
[60] National Centers for Environmental Information. Storm Events Database: https://www.ncdc.noaa.gov/stormevents/.

favorable for tornadoes. Over 3 days, 26 tornadoes were confirmed, all of which were in the EF0 to EF1 range.

Hurricane Isaac – August 29, 2012
Isaac moved very slowly to the north and northwest over the course of August 29th, which made for prolonged impacts. Forward motion of about 5 mph led to tremendous flooding issues for both Louisiana and portions of Mississippi south of I-20. Around noon on August 29th, Isaac was downgraded to a Tropical Storm, but this was not much relief to the many residents who were being inundated with rain and wind. The worst of the wind was felt generally along and south of an axis from Marion County to Adams County. Numerous trees were down in Adams County, leaving many without power for several days. Eighty percent of the roads were blocked in Franklin County due to downed trees.

Hurricane Ida – August 29, 2021
The county suffered minor to moderate damage to trees and homes across the county. While most structural damage was exterior, some homes did suffer major damage due to falling trees. At the peak approximately 50% of the county was without power.

PROBABILITY OF FUTURE OCCURRENCES

Due to Wilkinson County's inland location, the county does not experience hurricane sub-hazards such as storm surge. However, the county is – and will continue to be – susceptible to flooding and high wind events caused by hurricanes and tropical storms. As a result, the probability level of future hurricane and tropical storm occurrence is likely (between 10 and 100 percent annual probability). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. However, when the county is impacted, the damage could be significant, threatening lives and property throughout the planning area.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[61] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Wilkinson County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[62] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

HURRICANE EVACUATIONS

As discussed above, the MEMA District 7 Region has been directly impacted by a number of hurricane and tropical storm events. However, the region is also susceptible to indirect effects from hurricanes

[61] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf.
[62] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters.

and tropical storms, particularly in the form of evacuations from coastal counties. The counties within MEMA District 7 are located far enough inland that they are often the primary recipients of evacuees from counties that have been (or will be) impacted by major storm events.

For example, during Hurricane Katrina in 2005, thousands of evacuees made their way to counties in southwest Mississippi to take temporary refuge from the storm. Due to the severe and devastating effects of the storm, temporary sheltering within these counties was extended much longer than originally anticipated; in some cases, the evacuees ended up staying in shelters for weeks or months. This additional population caused a major strain on resources within these relatively rural counties. Local communities with limited resources had an unexpected and immediate need to provide shelter and other life essentials such as food, water, and health care to a significant number of evacuees.

Caring for evacuees was especially challenging for counties in the MEMA District 7 Region because most of these counties had been impacted themselves by the storm and were attempting to help their own citizens recover from the storm. Recovering from a major disaster while simultaneously attempting to help evacuees from surrounding counties posed difficulties for MEMA District 7 Region emergency management personnel and other local officials.

Based on Hurricane Katrina and other major hurricane events that have impacted the Gulf Coast in the past, it is likely that many of the MEMA District 7 counties will be receiver counties when it comes to evacuees. Many of these evacuees will likely come from locations in Louisiana, including New Orleans. Indeed, the State of Louisiana evacuation plan indicates that one of the primary evacuation routes from the City of New Orleans will direct evacuees north along Interstate 55, sending people through Pike County and Lincoln County. Depending on the severity of a storm event, officials in Louisiana may even change Interstate 55 over to a contraflow traffic pattern to enable quicker evacuations.

I.2.11 Severe Thunderstorm/High Wind

LOCATION AND SPATIAL EXTENT

A severe thunderstorm/high wind event is an atmospheric hazard that has no geographic boundaries and that can occur in all regions of the United States. However, severe thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that Wilkinson County has uniform exposure to a severe thunderstorm/high wind event and the spatial extent of a storm's impact could be large.

The following Beaufort scale is an empirical measure for the intensity of the wind associated with windstorms.

TABLE I.16: BEAUFORT WIND SCALE

Beaufort Scale					
NUMBER	**WIND SPEED (MPH)**	**DESCRIPTION**	**WAVE HEIGHT (FT)**	**SEA CONDITIONS**	**LAND CONDITIONS**
0	<1	Calm	0	Flat.	Calm. Smoke rises vertically.
1	1-3	Light air	0.33	Ripples without crests.	Wind motion visible in smoke.
2	3-7	Light breeze	0.66	Small wavelets.	Wind felt on exposed skin. Leaves rustle.
3	8-12	Gentle breeze	2	Large wavelets.	Leaves and smaller twigs in constant motion.
4	13-17	Moderate breeze	3.3	Small waves.	Dust and loose paper rise. Small branches begin to move.
5	18-24	Fresh breeze	6.6	Moderate (1.2 m) longer waves. Some foam and spray.	Small trees sway.
6	25-30	Strong breeze	9.9	Large waves with foam crests and some spray.	Large branches in motion. Whistling heard in overhead wires. Umbrella use difficult.
7	31-38	High wind, Moderate Gale, Near Gale	13.1	Sea heaps up and foam begins to streak.	Whole trees in motion. Effort needed to walk against the wind.
8	39-46	Fresh Gale	18	Moderately high waves with breaking crests forming spindrift. Streaks of foam.	Twigs broken from trees. Cars veer on road.
9	47-54	Strong Gale	23	High waves (6-7 m) with dense foam. Wave crests start to roll over. Considerable spray.	Larger branches break off trees, and some small trees blow over. Construction/temporary signs and barricades blow over. Damage to circus tents and canopies.

Beaufort Scale					
NUMBER	**WIND SPEED (MPH)**	**DESCRIPTION**	**WAVE HEIGHT (FT)**	**SEA CONDITIONS**	**LAND CONDITIONS**
10	55-63	Whole Gale/Storm	29.5	Very high waves. The sea surface is white and there is considerable tumbling.	Trees uprooted. Considerable structural damage.
11	64-72	Violent storm	37.7	Exceptionally high waves.	Widespread vegetation and structural damage.
12	≥73	Hurricane-force	≥46	Huge waves. Sea is completely white with foam and spray. Air is filled with driving spray,	Massive and widespread damage to structures.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, 52 recorded Thunderstorm / High Wind events have affected Wilkinson County since 1975.[63] The following table is a summary of the Thunderstorm / High Wind events in Wilkinson County. In all, Thunderstorm / High Wind occurrences resulted in approximately $133,800 in property damage. It should be noted that Thunderstorm / High Wind events may cause substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

TABLE I.17: HISTORICAL THUNDERSTORM / HIGH WIND OCCURRENCES IN WILKINSON COUNTY[64]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Centreville	8	1/0	$11,500	$240
Crosby	0	0/0	$0	$0
Woodville	18	0/0	$47,800	$996
Unincorporated Area	26	0/0	$74,500	$1,552
WILKINSON COUNTY TOTAL	**52**	**1/0**	**$133,800**	**$2,788**

PROBABILITY OF FUTURE OCCURRENCES

[63] These Thunderstorm / High Wind events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1957 through November 2022. It is likely that additional Thunderstorm / High Wind events have affected Wilkinson County. As additional local data becomes available, this hazard profile will be amended.

[64] These thunderstorm events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1957 through November 2022.

Given the high number of previous events, it is certain that severe thunderstorm/ high wind events, including straight-line wind events, will occur in the future, with a highly likely probability level (100 percent annual probability) for the entire county.

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[65] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Wilkinson County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[66] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful *severe thunderstorm/high wind events* to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

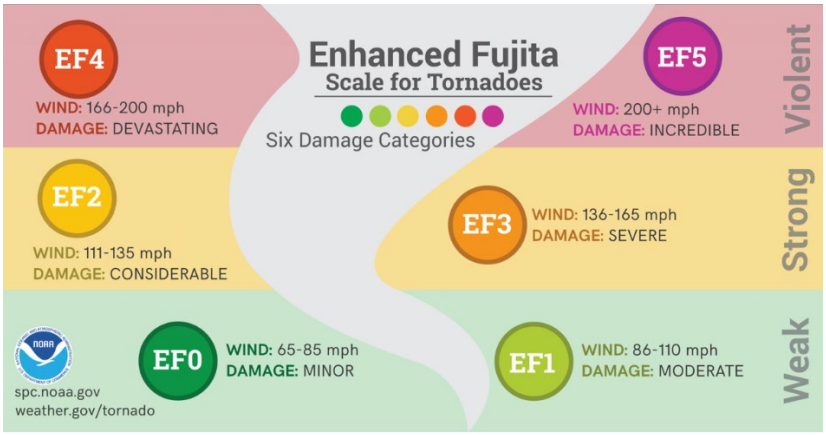
I.2.12 TORNADO

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, including in Wilkinson County. Tornadoes typically impact a relatively small area, but damage may be extensive. Tornado event locations are completely random and it is not possible to determine whether some areas are more susceptible than other areas to tornado strikes. Therefore, it is assumed that Wilkinson County is uniformly exposed to the tornado hazard.

The following figure depicts the Enhanced-Fujita Scale of tornado intensity.

FIGURE I.13: ENHANCED-FUJITA SCALE

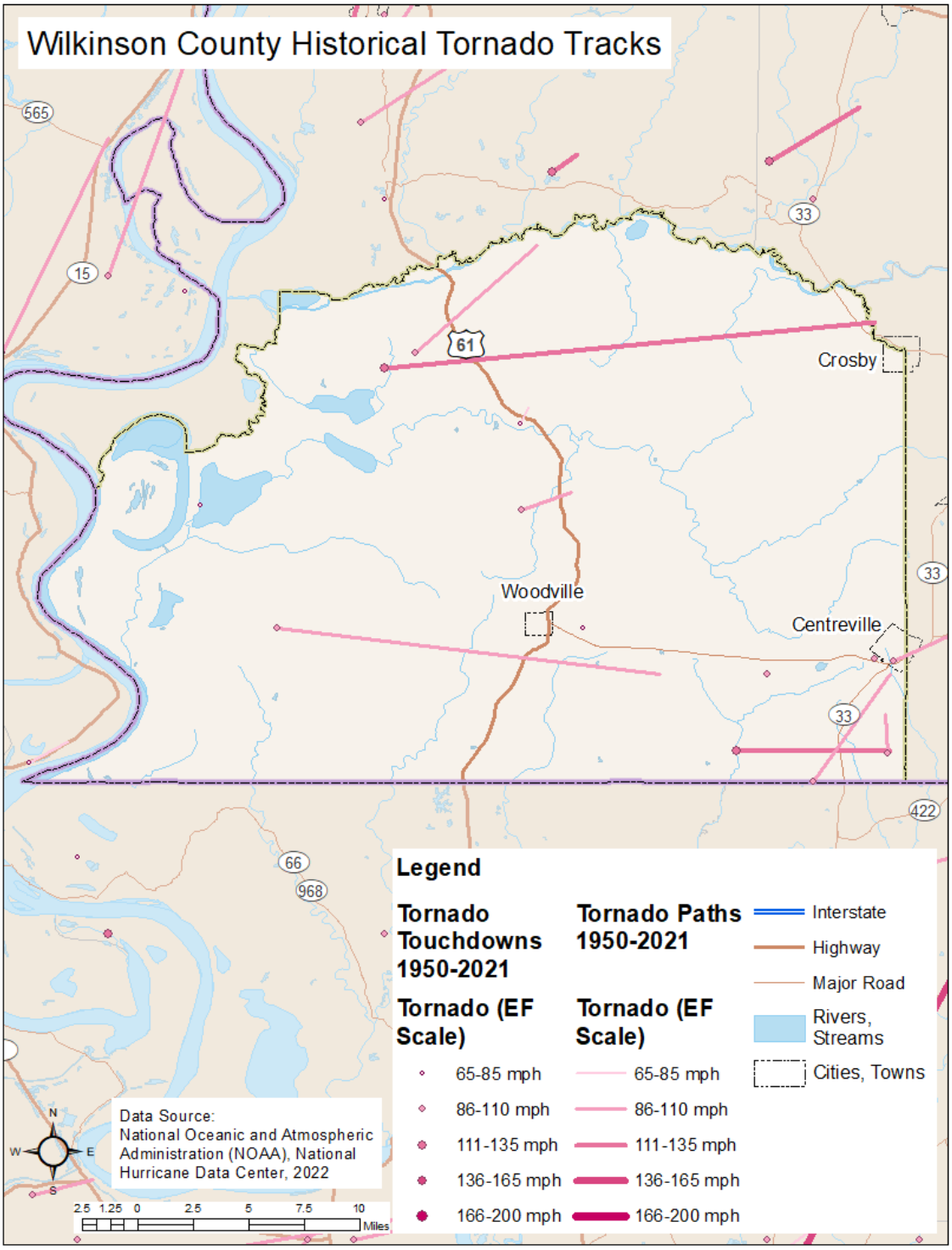


[65] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf.

[66] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters.

With that in mind, the figure below shows tornado track data for many of the major tornado events that have impacted the county between 1950 and 2021. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

FIGURE I.14: WILKINSON COUNTY HISTORICAL TORNADO TRACKS



HISTORICAL OCCURRENCES

Tornadoes were at least partially responsible for 1 major disaster declaration in Wilkinson County in 1992.[67] According to the National Centers for Environmental Information, 13 recorded tornado events have affected Wilkinson County since 1968.[68] The following table is a summary of the tornado events in Wilkinson County. In all, tornado occurrences resulted in approximately $1,153,000 in property damage. In addition, 15 injuries were reported. Tornado intensities ranged from F0 (EF0) to F2 (EF2).

The table below provides information about historical tornado impacts in Wilkinson County.

TABLE I.18: HISTORICAL TORNADO IMPACTS IN WILKINSON COUNTY

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Centreville	2	0/0	$100,000	$1,818
Crosby	0	0/0	$0	$0
Woodville	1	0/0	$500	$9
Unincorporated Area	10	0/15	$1,052,500	$19,136
WILKINSON COUNTY TOTAL	**13**	**0/15**	**$1,153,000**	**$20,964**

PROBABILITY OF FUTURE OCCURRENCES

According to historical information, tornado events pose a significant threat to Wilkinson County. The probability of future tornado occurrences affecting Wilkinson County is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE

The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[69] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Wilkinson County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[70] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storm systems that spawn tornadoes to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding, and enhancing the potential for increased *tornado activity*. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms).

[67] FEMA – Disaster Declarations. Retrieved on 01/11/2023 from https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties

[68] These tornado events are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 1968 through November 2022.

[69] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf.

[70] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters.

I.2.13 Winter Storm, Freeze, and Extreme Cold

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm, freeze, and extreme cold events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure to this hazard typically depends on the normal, expected severity of local winter weather. Wilkinson County is not accustomed to severe winter weather conditions and seldom receives severe winter weather, even during the winter months. While winter storm events tend to be mild in nature, relatively small accumulations of snow, ice, or other wintery precipitation can lead to losses and damage because these events are not commonplace in the region. Given the atmospheric nature of the hazard, the entire county has uniform exposure to winter storm, freeze, and extreme cold events.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, 12 recorded winter storm events have affected Wilkinson County since 1996.[71] The following table is a summary of the winter storm events in Wilkinson County. Winter storm occurrences resulted in no property damage.

TABLE I.19: SUMMARY OF WINTER STORM EVENTS IN WILKINSON COUNTY[72]

Location	Number of Occurrences	Deaths/Injuries	Property Damage	Annualized Property Losses
Wilkinson County	12	0/0	$0	$0

There have been several severe winter weather hazard events in Wilkinson County. The text below describes three of the major events and associated impacts on the county. Similar impacts can be expected with severe winter weather.

February 2010

Heavy snow affected a large portion of the region – especially locations across central and southern Mississippi – February 11th and February 12th. The heavy snow was a result of a low-pressure system that tracked eastward across the northern Gulf of Mexico, and a vigorous upper level disturbance that moved across the region while a cold air mass was in place. Light precipitation overspread the region late Thursday afternoon into the evening before becoming heavy Thursday night into early Friday morning. The snow tapered off from west to east during the midday hours Friday.

February 2011

An ice storm developed across the area on February 3rd into the early morning hours of the 4th. While this icing event was not devastating, the impact to travel was a major issue across the region. Thousands of accidents occurred from slick roads. As a result of the accidents, three fatalities occurred along with a

[71] Winter storm events include Cold/Wind Chill, Extreme Cold/Wind Chill, Frost/Freeze, Heavy Snow, Ice Storm, Winter Storm, and Winter Weather events.

[72] These events include extreme cold, frost, heavy snow, winter storm, ice storm and are only inclusive of those reported by the National Centers for Environmental Information (NCEI) from 2008 through November 2022.

handful of injuries. Overall, most areas received 0.25 to 0.5 inches of ice accumulation from freezing rain. Additionally, some areas had a mix of precipitation with sleet accumulating. Some snow did occur, but those were just across select areas and the accumulation was mainly one inch or less.

February 2021
As an arctic air mass continued to build southward across the South on February 17th, another wave of precipitation overspread this cold air mass across much of Mississippi. The main impacts across central and southern portions of the state were from freezing rain and resulting heavy icing, but some significant accumulations of sleet and snow also occurred in areas mainly north and west of the Natchez Trace. Freezing rain continued through the evening hours, ending from west to east by the early morning of February 18th. Ice accumulated quickly in many locations and downed numerous trees, large limbs, and power lines across the affected areas. Several trees and limbs fell onto power lines, resulting in more widespread power outages as well. Some trees fell onto homes or cars, and significant amounts of ice, sleet, and snow collapsed a few gas station awnings and roofs where accumulations were greatest. In the hardest hit areas, extensive damage to trees and power lines took several months and cost several hundreds of thousands of dollars to clean up.

Winter storm, freeze, and extreme cold events throughout the planning area have several negative impacts including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could lead to fire or an accumulation of toxic fumes.

PROBABILITY OF FUTURE OCCURRENCES
Winter storm, freeze, and extreme cold events will continue to occur in Wilkinson County. Based on historical information, the probability is likely (between 10 and 100 percent annual probability).

FUTURE IMPACTS OF CLIMATE CHANGE
The impacts of changes in climate-related systems have been identified in a wide range of natural, human, and managed systems.[73] There is strong evidence that long-term changes in climate-related systems (including the atmosphere, ocean, and cryosphere) will have significant impacts on future natural hazard event frequency, intensity, and magnitude across the globe, including in Wilkinson County. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur.[74] As more water vapor evaporates into the atmosphere, it will become fuel for more frequent and more powerful storms to develop, and will lead to increased coastal, fluvial (i.e., riverine), and pluvial (i.e., rainfall) flooding. More heat in the atmosphere and warmer ocean surface temperatures will lead to increased wind speeds in tropical cyclones (i.e., hurricanes and tropical storms). However, accelerated warming in the Artic region (i.e., Arctic amplification) may also be linked with an increase in the frequency of *winter storm, freeze, and extreme cold events* across parts of Asia and North America, including in Wilkinson County. [75]

[73] Climate Change 2022: Impacts, Adaption & Vulnerability, p.2414. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter16.pdf
[74] USGS: How can climate change affect natural disasters? Retrieved from: https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters.
[75] NOAA – Communication Education & Engagement. Retrieved from: https://cpo.noaa.gov/Divisions-Programs/Communication-Education-and-Engagement/CEE-News/ArtMID/8293/ArticleID/2369/Research-Links-Extreme-Cold-Weather-in-the-United-States-to-Arctic-Warming.

OTHER HAZARDS

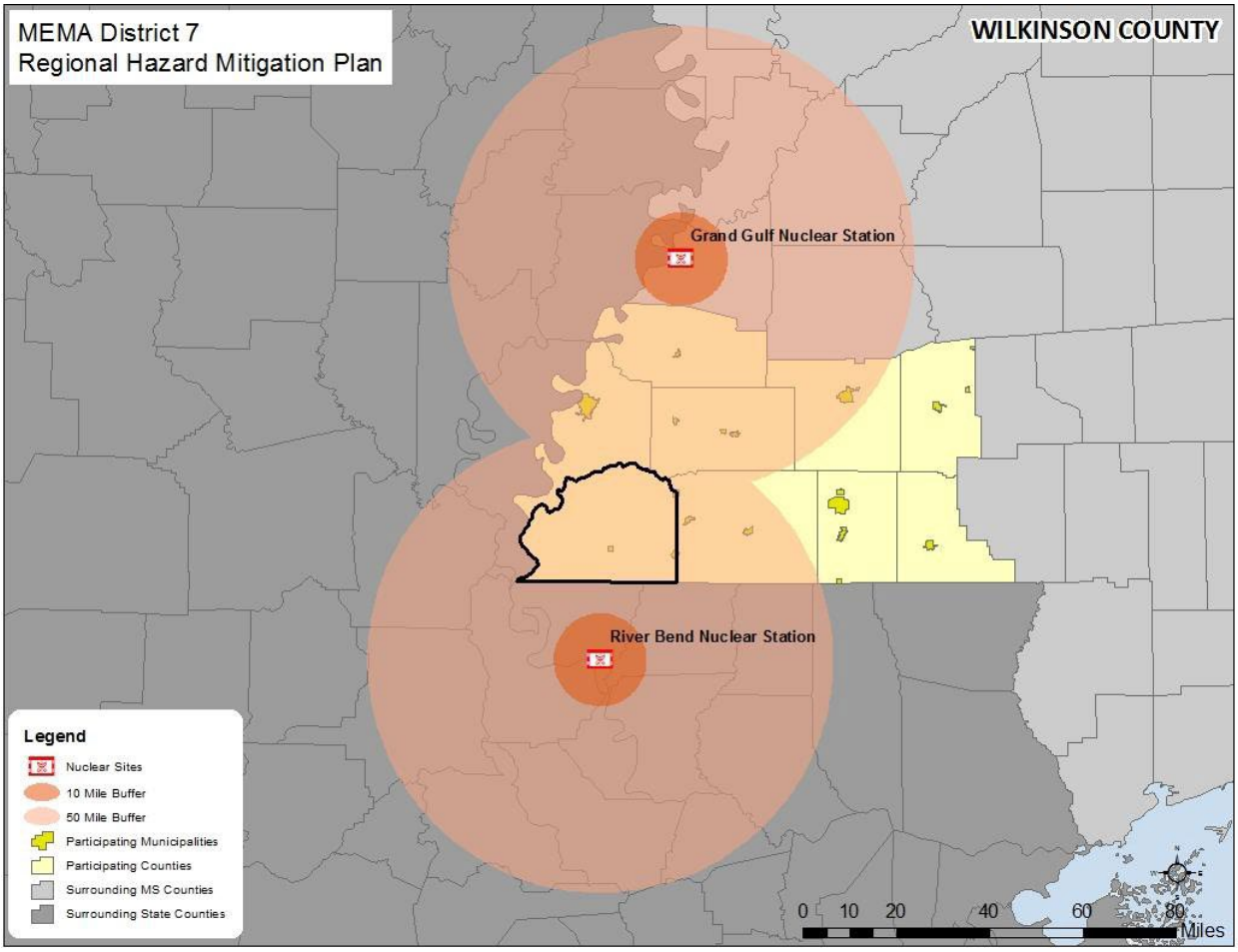
I.2.14 Radiological Event

LOCATION AND SPATIAL EXTENT

The Nuclear Regulatory Commission (NRC) defines two emergency planning zones around nuclear plants: 10-mile zones and 50-mile zones. Areas located within a 10-mile radius of a nuclear station (i.e., 10-mile zones) are at highest risk of exposure to and inhalation of radioactive contamination; as a result, this radius is the designated evacuation radius recommended by the Nuclear Regulatory Commission when nuclear incidents occur. Areas outside within the secondary 50-mile radius (i.e., 50-mile zones) are still considered to be at risk of radioactive contamination, but the risks and impacts (i.e., ingestion of contaminated food and liquids) may be less severe than areas within the 10-mile radius.

No part of Wilkinson County is located inside the 10-mile radius of either nuclear station. However, the entire county lies within the 50-mile radius of the River Bend Nuclear Station, and the extreme northern portion of the county lies within the 50-mile radius of the Grand Gulf Nuclear Station as shown in the figure below. Other parts of the MEMA District 7 region are also located within 50-miles of the two nuclear stations.

FIGURE I.15: NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN WILKINSON COUNTY[76]



HISTORICAL OCCURRENCES

Several minor events/notifications have been reported at both the Grand Gulf and River Bend Nuclear Stations. These incidents have been classified by the NRC using the scale found in the table below. All of these events were minor in magnitude, and many were insignificant enough that they did not register on the classification scale. A list of events at Grand Gulf Nuclear Station can be found in **Table I.23** and a list of events at River Bend Nuclear Station can be found in the table below. There have been no major nuclear events at either the Grand Gulf or River Bend Nuclear Stations.

TABLE I.20: NUCLEAR REGULATORY COMMISSION EMERGENCY CLASSIFICATION SCALE FOR EVENTS OCCURRING AT NUCLEAR POWER PLANTS

Classification	Description
Notification of Unusual Event (NOUE)	Events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

[76] Source: International Atomic Energy Agency.

	[Note: This term is sometimes shortened to Unusual Event (UE). The terms Notification of Unusual Event, NOUE and Unusual Event are used interchangeably.
Alert	Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life-threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the Environmental Protection Agency (EPA) protective action guides (PAGs)
Site Area Emergency	Site Area Emergency (SAE) – Events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or hostile action that results in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to, equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA PAG exposure levels beyond the site boundary.
General Emergency	Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile action that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

TABLE I.21: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT GRAND GULF NUCLEAR STATION [77] [78]

Date	Retrieved From*	Classification	Plant	Description
8/29/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST
10/1/2012	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF NUCLEAR STATION SECURITY OFFICER LOCKOUT
9/29/2016	Preliminary Notification Reports	Not Applicable	Grand Gulf Unit 1	GRAND GULF EXTENDED PLANT SHUTDOWN TO ADDRESS OPERATIONS PERFORMANCE

[77] Nuclear Regulatory Commission Preliminary Notification Reports: http://www.nrc.gov/reading-rm/doc-collections/event-status/prelim-notice/.
[78] Nuclear Regulatory Commission Licensee Event Reports: https://lersearch.inl.gov/Entry.aspx.

TABLE I.22: HISTORICAL OCCURRENCES OF NOTIFIABLE EVENTS AT RIVER BEND NUCLEAR STATION [79] [80]

Date	Retrieved From*	Classification	Plant	Description
11/26/1985	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	ECCS Initiation: Improper restoration of a level transmitter causes HPSC injection
11/27/1985	Licensee Event Report	Alert	River Bend Unit 1	Failure to Perform Surveillance Tests
3/5/1992	Licensee Event Report	Notification of Unusual Event	River Bend Unit 1	REACTOR SCRAM CAUSED BY A GENERATOR TRIP DUE TO HIGH WINDS CAUSING TRANSFORMER DAMAGE
9/15/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE IVAN
10/4/2004	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	Shutdown Greater than 72 Hours
9/23/2005	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	NRC ENTERS MONITORING MODE DUE TO HURRICANE RITA
5/23/2007	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REACTOR SHUTDOWN DUE TO UNEXPECTED CHANGE IN RECIRCULATION FLOW
9/2/2008	Preliminary Notification Reports	Notification of Unusual Event/Not Applicable	River Bend Unit 1	NRC RESPONSE TO HURRICANE GUSTAV
5/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	AUGMENTED INSPECTION TEAM ONSITE AT RIVER BEND STATION
8/29/2012	Preliminary Notification Reports	Not Applicable	River Bend Unit 1	REGION IV RESPONSE TO HURRICANE/SEVERE WEATHER ON GULF COAST

PROBABILITY OF FUTURE OCCURRENCES

A radiological event at a nuclear station is a very rare occurrence in the United States due to the intense regulation

[79] Nuclear Regulatory Commission Preliminary Notification Reports: http://www.nrc.gov/reading-rm/doc-collections/event-status/prelim-notice/.

[80] Nuclear Regulatory Commission Licensee Event Reports: https://lersearch.inl.gov/Entry.aspx.

of the nuclear power industry. While there have been minor incidents at both the Grand Gulf or River Bend Nuclear Stations, a radiological event it is considered unlikely (less than 1 percent annual probability).

RADIOLOGICAL EVACUATIONS

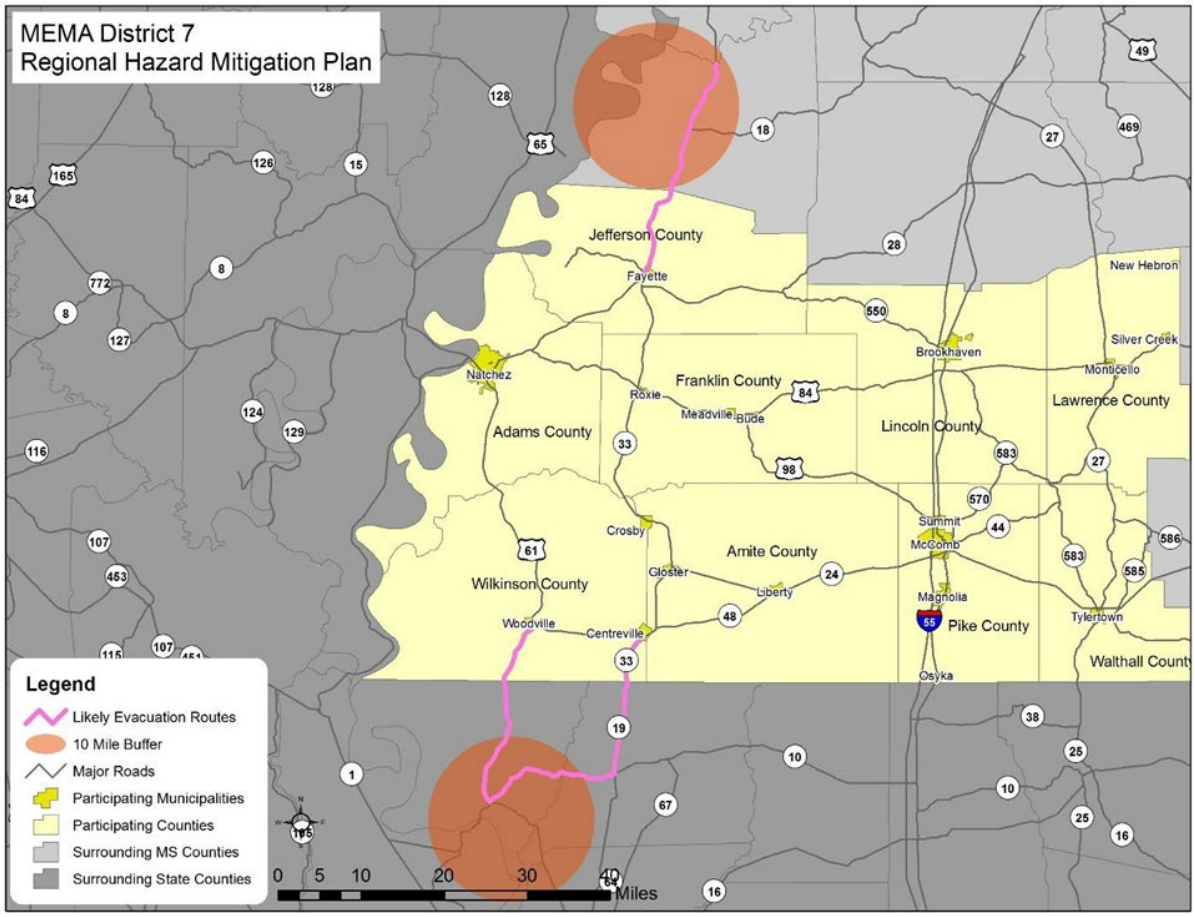
Like the hurricane evacuations discussed above, the MEMA District 7 Region would potentially be impacted to a greater degree by evacuations caused by a radiological event than by the event itself. Counties immediately adjacent to the region are located within a 10-mile radius of a nuclear facility and, in the aftermath of a radiological incident – populations from those counties may be evacuated to the MEMA District 7 Region.

Due to the severe and long-term effects of a major radiological event, temporary sheltering will be an initial concern, but the greater challenge may be in the long-term. As has happened with historical radiological accidents in other locations, the danger in the impacted area will likely extend for a very long period after the event, and evacuees may be unable to return to their homes for months or years. This additional influx of population will cause a major strain on resources within these relatively rural counties in the short-term, as local communities with limited resources will have an unexpected and immediate need to provide shelter and other life essentials such as food, water, and health care to a significant, additional number of people. In the long-term, there may be challenges for local officials as existing infrastructure will likely be inadequate to handle larger populations.

Although there have not been any major radiological events in the region historically, hurricane evacuations (discussed above) provide a similar scenario in terms of what the region might expect. However, one additional concern that officials will need to consider in a radiological event is that evacuees may be contaminated by radioactivity. According to the Centers for Disease Control, radioactive contamination can occur when radioactive materials are released into the environment and become deposited into the air, water, surfaces, soil, plants, buildings, people, or animals. This contamination can then be spread when people touch other people, surfaces, or objects. Therefore, when people evacuate a contaminated zone, they pose a potential risk of spreading the contamination to others if they are not properly treated. Local officials in MEMA District 7 may need to be prepared to set up decontamination centers along major evacuation routes to ensure that the contamination is not spread. It is also important for citizens to understand the steps they can take to reduce the risk of spreading contamination such as evacuating quickly after an event and following decontamination instructions as directed by local officials.[24]

Based on the locations of the 10-mile evacuation areas near the region, many of these evacuees will likely come from Claiborne County to the north and West Feliciana and East Feliciana Parishes to the south. The main roads for these evacuees will probably be U.S. Highway 61 and Mississippi State Highway 33 since these are the primary and most direct roads into and out of the evacuation counties and into MEMA District 7 as shown in the figure below. Depending on the severity of the event, officials may even change these roads over to a contraflow traffic pattern to enable quicker evacuations.

FIGURE I.16: LIKELY EVACUATION ROUTES FOR A RADIOLOGICAL EVENT IN THE MEMA DISTRICT 7 REGION



As a result of the potential for an influx of evacuees during a radiological event, it is critical for local officials in the MEMA District 7 region to prepare for evacuations. It is possible that thousands of evacuees will be relocated, either temporarily or permanently, to MEMA District 7. Therefore, plans for identifying shelters and other resources should be coordinated well in advance of future events.

I.2.15 Pandemic

LOCATION AND SPATIAL EXTENT

Pandemics are global in nature. However, they may start anywhere. Wilkinson County chose to analyze this hazard given the agriculture in the area and potential for this kind of event to occur in any location at any time.

All populations should be considered at risk to pandemic. Buildings and infrastructure are not directly impacted by the virus/pathogen but could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings may be shutdown, at least temporarily, as a result.

Employers may initiate work from home procedures for non-essential workers in order to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

HISTORICAL OCCURRENCES

Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below.

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to 566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population.

Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10 to 50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852- 1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours. The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

1957 Asian Flu: It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

1968 Hong Kong Flu: The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020, mainly due to the speed and scale of the transmission of the disease. Prior to that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province on February 26th, 2020. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

There is a considerable amount of data on the extent of COVID-19 throughout the State of Mississippi and WILKINSON County. The number of reported cases and deaths across the State of Mississippi and WILKINSON County are shown in the figure below.

TABLE I.23: COVID-19 CASES AS OF 01/3/2023[81] [82]

	Cases	Deaths
Mississippi	943,402	13,051
Wilkinson County	1,929	46

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS, and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Wilkinson County has a probability level of unlikely (less than 1 percent annual probability) for future pandemics events. While pandemics can have devastating impacts, they are relatively rare.

The Mississippi State Department of Health maintains a state pandemic plan which can be found at: http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf.

[81] Mississippi Department of Health – COVID-19 Totals by County. Retrieved on 01/12/2023 from https://msdh.ms.gov/msdhsite/_static/14,0,420,884.html

[82] Mississippi Department of Health – COVID-19 Totals by County. Retrieved on 01/12/2023 from https://msdh.ms.gov/msdhsite/_static/resources/19550.pdf

I.2.16 Conclusions on Hazard Risk

The hazard profiles presented in this subsection were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

HAZARD EXTENT

The following table describes the extent of each natural hazard identified for Wilkinson County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

TABLE I.24: EXTENT OF WILKINSON COUNTY HAZARDS

Flood Related Hazards	
Dam & Levee Failure	Dam Failure extent is defined using the Mississippi Department of Environmental Quality classifications which include Low, Significant, and High. No dams are classified as high-hazard in Wilkinson County.
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no official erosion rate records in Wilkinson County but local estimates are around 0.25 to 0.50 feet per year. Some areas of erosion have been identified by local coordinators.
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 21.7 percent of the total land area in Wilkinson County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was on the Buffalo River near Woodville. Water reached a discharge of 65,000 cubic feet per second (recorded on March 25, 1973). The highest stream gage height was also on the Buffalo River near Woodville with a height that was recorded at 22.30 feet (recorded on March 25, 1973). Additional peak discharge readings, historic crest heights, and the corresponding flood categories (where available) are in the table below. NA= Data not available for this particular gage *Occurred on a different date than Maximum Historic Crest
Fire Related Hazards	
Drought	Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. Wilkinson County has received this ranking twice over the 17-year reporting period.
Lightning	According to the Vaisala's flash density map, Wilkinson County is located in an area that experiences 12 to 28 lightning flashes per square mile per year. It should be noted that future lightning occurrences may exceed these figures.
Wildfire	Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2007-2016. The greatest number of fires to occur in

	Wilkinson County in any year was 27 in 2011. The greatest number of acres to burn in the county in a single year occurred in 2008 when 336 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale or the Modified Mercalli Intensity (MMI) scale. According to data provided by the National Centers for Environmental Information, no earthquakes were reported in Wilkinson County.
Temperature & Wind Related Hazards	
Extreme Heat	The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are not kept for any areas in Wilkinson County. However, the highest recorded temperature in the region was 106°F in 2007 with heat index values recorded above 115°F.
Hailstorm	Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Wilkinson County was 1.75 inches (last reported on March 30, 2016). It should be noted that future events may exceed this.
Hurricane & Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5. The greatest classification of hurricane to impact the MEMA District 7 Region was a Category 3 storm. This occurred in 1969 with Hurricane Camille and in 2005 with Hurricane Katrina. The storm track of both storms passed just to the east of the region, but due to the size of these storms, their impact was felt across the region.
Severe Thunderstorm / High Wind	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 67-year history from the National Climatic Data Center, the strongest recorded wind event in Wilkinson County was reported on April 4, 1977 at 75 knots (approximately 86 mph). It should be noted that future events may exceed these historical occurrences.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA as well as the Fujita/Enhanced Fujita Scale. The greatest magnitude reported in Wilkinson County was an F2 (last reported on May 12, 1990).
Winter Storm & Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in Wilkinson County. However, reports from NCDC of the greatest snowfall in the county has been 3 inches (reported on February 11, 2010).
Other Hazards	
Radiological Event	Although there is no history of a nuclear accident at either the Grand Gulf Nuclear Station or River Bend Nuclear Station, other events across the globe and in the United States in particular indicate that an event is possible. Since several national and international events were Level 7 events on the INES, the potential for a Level 7 event at these stations is possible.
Pandemic	The extent of a pandemic impacting the county is difficult to estimate. It could result in thousands of deaths and extreme disruption of commerce and everyday life.

PRIORITY RISK INDEX RESULTS

To draw some meaningful planning conclusions on hazard risk for Wilkinson County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a "Priority Risk Index" (PRI). More information on the PRI and how it was calculated can be found in Section 5.17.2.

The following table summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this subsection, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

TABLE I.25: SUMMARY OF PRI RESULTS FOR WILKINSON COUNTY

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Flood-related Hazards						
Dam Failure and Levee Failure	Unlikely	Critical	Moderate	Less than 6 hours	Less than 6 hours	**2.3**
Erosion	Likely	Minor	Small	More than 24 hours	More than 1 week	**2.1**
Flood	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 24 hours	**3.2**
Fire-related Hazards						
Drought	Possible	Limited	Large	More than 24 hours	More than 1 week	**2.5**
Lightning	Highly Likely	Limited	Small	6 to 12 hours	Less than 6 hours	**2.6**
Wildfire	Possible	Limited	Small	Less than 6 hours	Less than 1 week	**2.3**
Geologic Hazards						
Earthquake	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	**1.5**
Wind-related Hazards						
Extreme Heat	Likely	Limited	Large	More than 24 hours	More than 1 week	**2.8**
Hailstorm	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	**2.8**
Hurricane and Tropical Storm	Likely	Catastrophic	Large	More than 24 hours	Less than 1 week	**3.3**
Severe Thunderstorm/High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Tornado	Likely	Catastrophic	Moderate	Less than 6 hours	Less than 6 hours	**3.2**
Winter Storm and Freeze	Likely	Minor	Moderate	More than 24 hours	Less than 1 week	**2.2**
Human-caused Hazards						
Radiological Event	Unlikely	Critical	Moderate	More than 24 hours	Less than 1 week	**2.2**
Pandemic	Unlikely	Limited	Large	More than 24 hours	More than 1 week	**2.2**

I.2.17 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Wilkinson County, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each identified hazard displayed in the figure below according to three categories: High Risk, Moderate Risk, and Low Risk. For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Wilkinson County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately and is described in Section 6: *Vulnerability Assessment* and below in Section I.3. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates. In most cases, the hazards of greatest concern did not change much since the last plan update, indicating that the priorities remained relatively stable and there were few changes in priorities.

TABLE I.26: CONCLUSIONS ON HAZARD RISK FOR WILKINSON COUNTY

HIGH RISK	Hurricane and Tropical Storm Tornado Flood Severe Thunderstorm/High Wind
MODERATE RISK	Extreme Heat Hailstorm Lightning Drought Wildfire
LOW RISK	Dam and Levee Failure Winter Storm and Freeze Radiological Event Erosion Earthquake Pandemic

I.3 WILKINSON COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Wilkinson County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected amount of damage caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in Section 6: Vulnerability Assessment.

I.3.1 Asset Inventory

The table below lists the estimated number of improved properties and the total value of improvements for Wilkinson County and its participating jurisdictions (study area of vulnerability assessment). Because digital parcel data was not available for most communities, data obtained from Hazus-MH 5.1 inventory was utilized to complete the analysis.

TABLE I.27: IMPROVED PROPERTY IN WILKINSON COUNTY[83]

Location	Counts of Improved Properties	Total Value of Improvements
Centreville	866	$150,329
Crosby	211	$25,479
Woodville	804	$157,912
Unincorporated Area	3,339	$763,081,280
WILKINSON COUNTY TOTAL	**5,220**	**$763,081,280**

In addition, the following table lists the inventory of critical facilities (i.e., fire stations, police stations, medical care facilities, emergency operation centers, schools, and ports) located in Wilkinson County, according to previous plan data and Hazus-MH 5.1 data that was reviewed and updated by local officials.

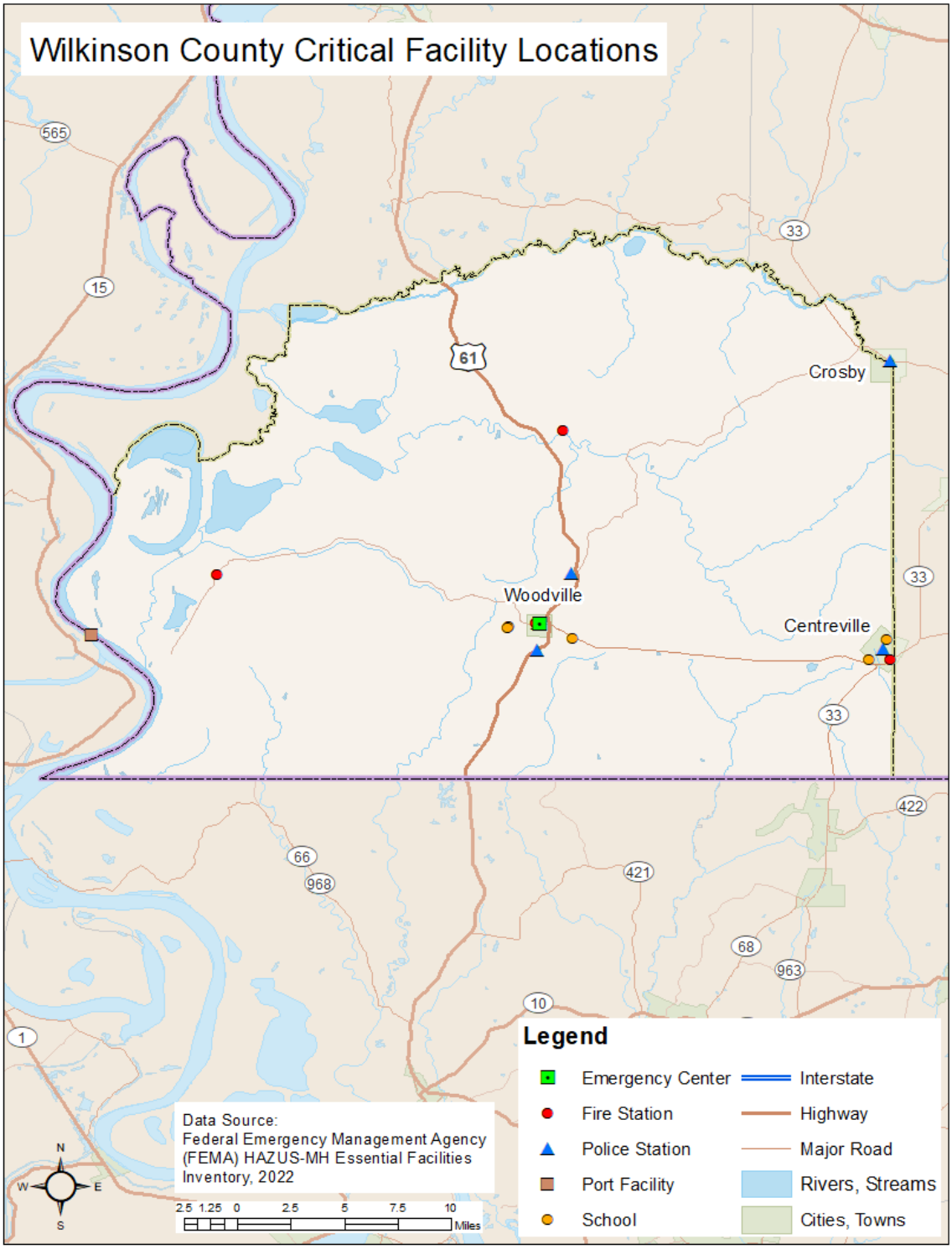
TABLE I.28: CRITICAL FACILITY INVENTORY IN WILKINSON COUNTY[84]

Location	Fire Stations	Police Stations	Medical Facilities	EOC	Schools	Ports
Centreville	1	1	1	0	2	0
Crosby	1	1	0	0	0	0
Woodville	1	2	1	1	3	0
Unincorporated Area	1	0	0	0	0	0
WILKINSON COUNTY TOTAL	**4**	**4**	**2**	**1**	**5**	**0**

[83] Hazus-MH 4.0

[84] *Sources: Hazus-MH 4.0; Local Officials*

Figure I.17: Critical Facility Locations in Wilkinson County[85]



[85] Source: HAZAUS 4.0; Local Officials.

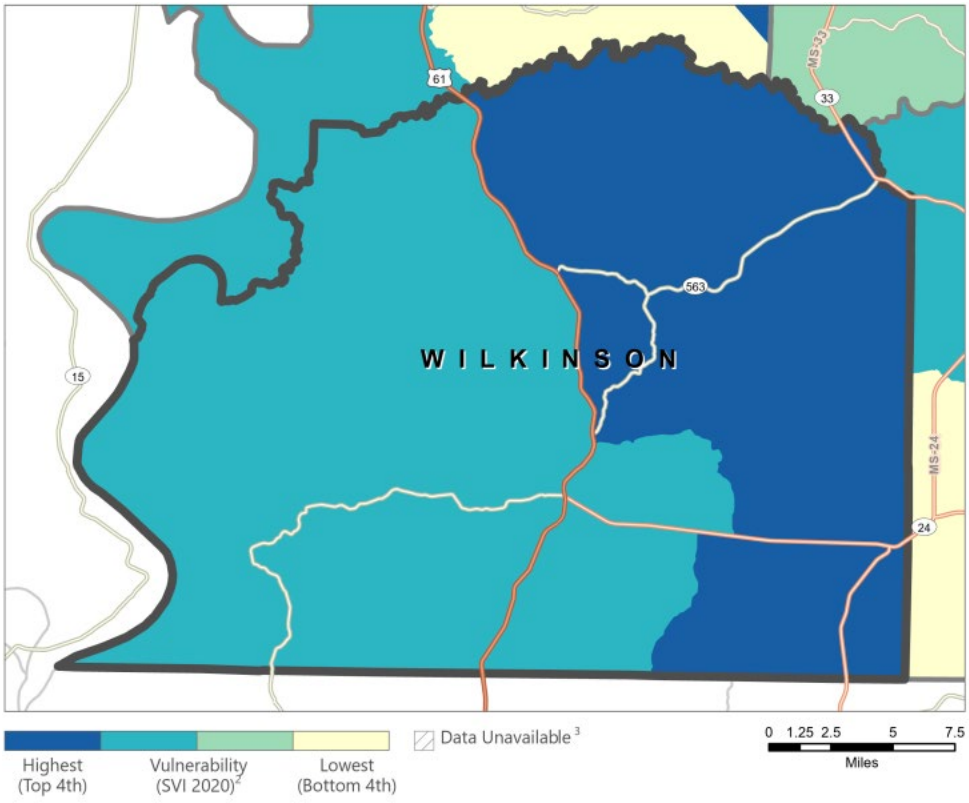
The figure below shows the locations of critical facilities in Wilkinson County. The table at the end of this subsection, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided through Hazus which was updated, as best as possible, with local knowledge.

I.3.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those segments of the resident population in Wilkinson County that are potentially at risk for these hazards.

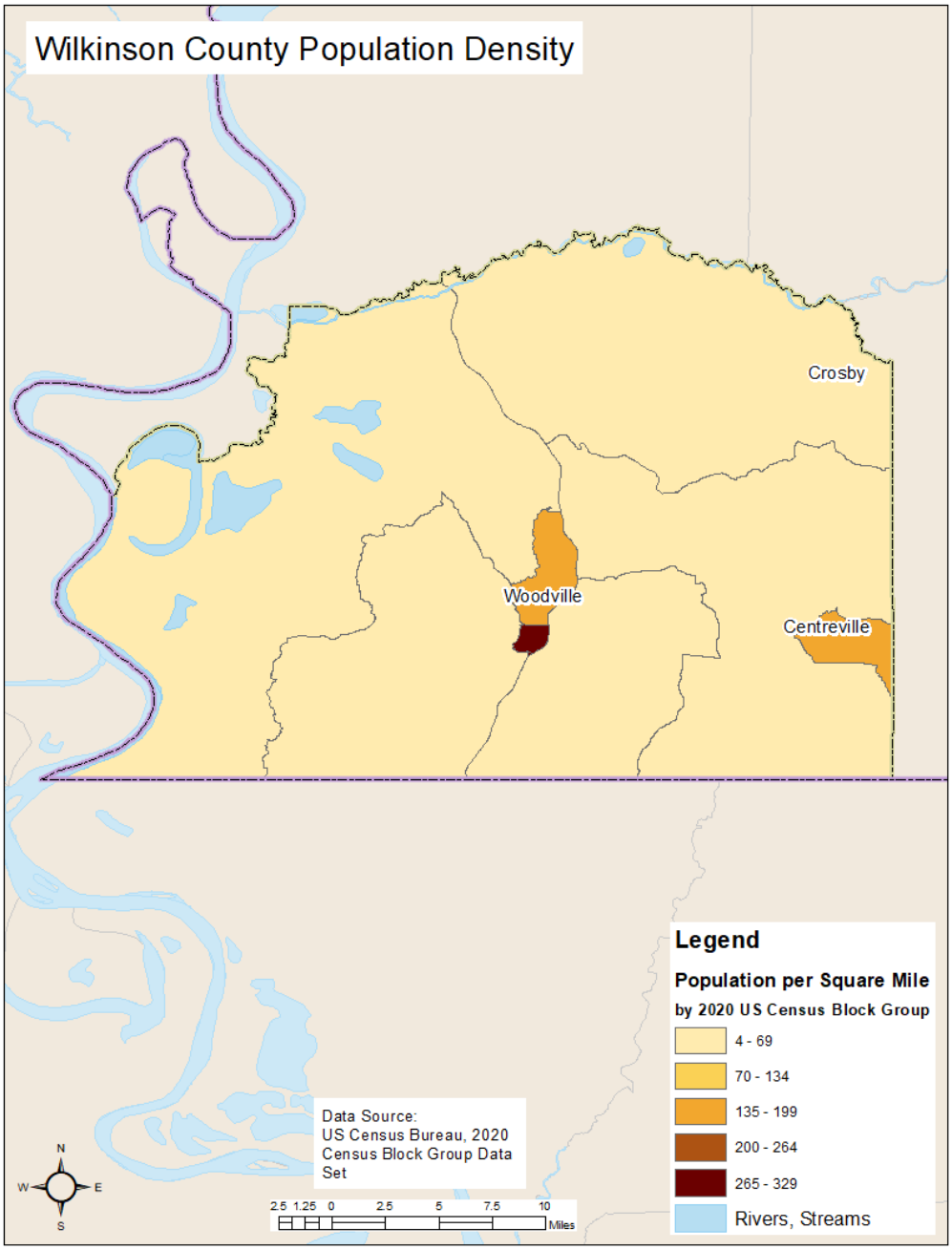
The Centers for Disease Control Social Vulnerability Index score for Wilkinson County is 0.9192. The total population in Wilkinson County according to Census data was 10,312 persons. Additional population estimates are presented above in *Section B.1*. The figure below shows vulnerability across the county.

Figure I.18: CDC Social Vulnerability Assessment



In addition, the figure below illustrates the population density per acre by census block as it was reported by the U.S. Census Bureau in 2020. As can be seen in the figure, the population is spread out with concentrations in municipal areas such as Centreville and Woodville.

FIGURE I.19: POPULATION DENSITY IN WILKINSON COUNTY



I.3.3 Development Trends and Changes in Vulnerability

Since the previous hazard mitigation plan was approved, Wilkinson County has experienced population decrease and little development. The following table shows the number of building units constructed since 2010 according to the U.S. Census American Community Survey.

TABLE I.29 BUILDING COUNTS FOR WILKINSON COUNTY[86] [87] [88]

Location	Total Housing Units (2021)	Units Built 2010 or Later	% Building Stock Built Post-2010
Centreville*	1,073	81	7.55%
Crosby*	175	13	7.43%
Woodville	587	47	8.01%
WILKINSON COUNTY TOTAL	**4,620**	**426**	**9.22%**

* The housing unit counts for Centreville and Crosby may include units located in Amite County.

TABLE I.30: POPULATION GROWTH FOR WILKINSON COUNTY[89] [90]

Jurisdiction	2000 Census	2010 Census	2020 Census	% Change 2000 - 2020
Wilkinson County	**10,312**	**9,878**	**8,587**	**-16.73%**
Centreville*	1,680	1,684	1,258	-25.12%
Crosby*	360	318	242	-32.78%
Woodville	1,192	1,096	928	-22.15%
Unincorporated Area	7,080	6,780	6,159	-13.01%

Since 2000, the county has experienced a population decline. However, unincorporated areas of the county have experienced a higher rate of development than incorporated areas, resulting in an increased number of structures that are vulnerable to the potential impacts of the identified hazards. This increased development has led to a slight increase in the county's vulnerability, with larger increases in vulnerability in certain areas and communities. If development continues to increase in the future, more of the county's population and infrastructure will be exposed to potential hazards, especially if that development occurs in high-risk areas such as floodplains.

I.3.4 Vulnerability Assessment Results

As noted in Section 6: *Vulnerability Assessment*, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis. Those analyses, specific to Wilkinson County, are presented here. Almost all other hazards are assumed to impact the entire planning region (drought, extreme heat, hailstorm, lightning, severe thunderstorm/high wind, tornado,

[86] United States Census. American Community Survey 5-Year Estimates. 2020. Retrieved on 01/11/2023 from: https://data.census.gov/table?q=median+home+value+woodville+mississippi+crosby+mississippi&g=1600000US2812740.

[87] United States Census. American Community Survey 5-Year Estimates. 2020. Retrieved on 01/11/2023 from: https://data.census.gov/table?q=median+home+value+wilkinson+county+mississippi+crosby+mississippi&g=1600000US2812740.

[88] * The housing unit counts for Centreville and Crosby include units located in Amite County.

[89] United States Census. 2020 Population and Housing State Data. Retrieved on 1/11/2023 from https://www.census.gov/library/visualizations/interactive/2020-population-and-housing-state-data.html.

[90] *Note: Centreville and Crosby both contain areas that are located in neighboring Amite County. Therefore, decennial census population tabulations for Centreville and Crosby include data from both Wilkinson County and Amite counties. To see the 2021 population estimates for Centreville and Crosby in Wilkinson County only, go to https://www.census.gov/newsroom/press-kits/2022/subcounty-estimates.html, "Annual Estimates: April 1, 2020 to July 1, 2021 (SUB-EST2021)."

and winter storm/freeze/extreme cold), while the remaining hazard (erosion) is not analyzed due to lack of data.

The hazards analyzed in this subsection include: dam/levee failure, flood, wildfire, earthquake, hurricane and tropical storm winds, and radiological event.

The annualized loss estimate for all hazards is presented near the end of this subsection.

DAM/LEVEE FAILURE

To assess risk to a dam or levee failure, a GIS-based analyses have been used to estimate exposure of Wilkinson County to areas delineated by the Mississippi Department of Environmental Quality as a potential inundation area.

Social Vulnerability

There are no dam inundation areas of concern located within the county, this does not indicate that there is no risk to a dam/levee failure, only that the risk is lower than in areas of known risk.

Critical Facilities

There are no critical facilities located within the identified dam inundation areas. Although there are no areas of concern located within Wilkinson County, this does not mean that there is no risk for critical facilities to a dam/levee failure, as not all dams or levees in the region have delineated inundation areas. A list of specific critical facilities and their associated risk can be found at the end of this section.

The dam/levee failure hazard has the potential to minimally impact existing and future buildings, critical facilities, and populations in Wilkinson County. Future vulnerabilities of Wilkinson County assets to dam/levee failure will be greatly dependent on individual dam/levee design and associated the mitigation measures therein. While site-specific vulnerability determinations are outside the scope of this assessment, they will be considered during future plan updates if data become available.

FLOOD

Historical evidence indicates that Wilkinson County is susceptible to flood events. A total of six flood events have been reported by the National Centers for Environmental Information resulting in $1.26 million in property damage. On an annualized level, these damages amounted to $50,400 for Wilkinson County.

In order to assess flood risk, a GIS-based analysis has been used to estimate exposure to flood events using Digital Flood Insurance Rate Map (DFIRM) data in combination with improved property records for the county. The determination of value at-risk (exposure) is calculated using GIS analysis by summing the values for improved properties that were located within an identified floodplain.

Due to a lack of digital building and parcel information for some communities, inventory data from HAZUS-MH 5.1 have been used to supplement local building and parcel data. However, HAZUS-MH 5.1 data reflect estimations of building inventory and may not reflect actual counts or values of buildings and parcels located in floodplains. It is likely that these data overestimate the amount of property in the floodplains.

For this plan update, a HAZUS 100yr. flood scenario was performed for the study area. The geographical size of the Wilkinson County is approximately 688 square miles and contains 988 census blocks. The region contains over 3,000 households and has a total population of 9,878 people (2010 Census Bureau data).[91] [92]

There are an estimated 5,220 buildings in the region with a total building replacement value (excluding contents) of $700 million. Approximately 94.00% of the buildings (and 75.61% of the building value) are associated with residential housing. HAZUS estimates that about 223 buildings will be at least moderately damaged. This is over 53% of the total number of buildings in the scenario, with an estimate that 57 buildings would be destroyed.

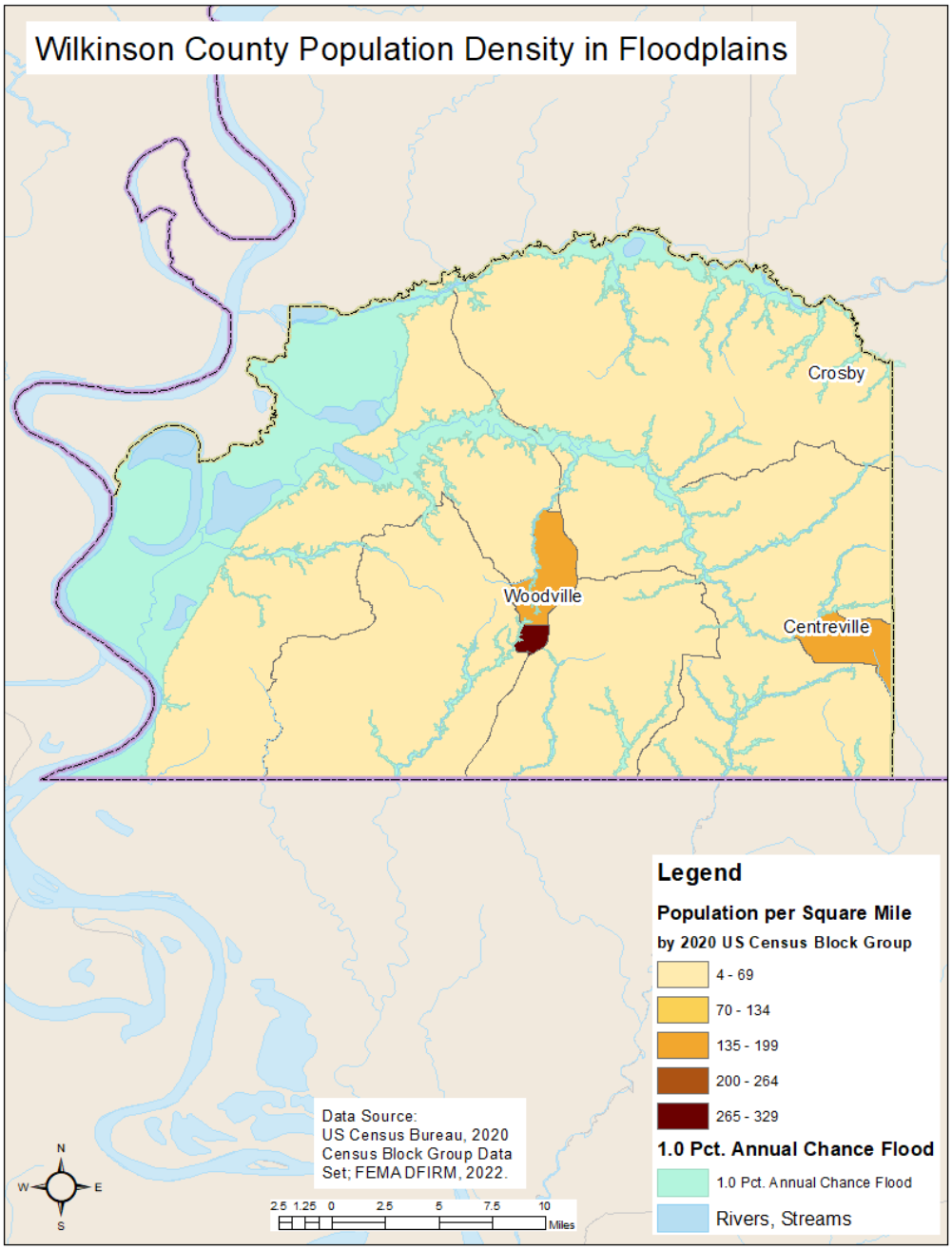
Social Vulnerability

The map below shows populations in Wilkinson County that are at risk of flooding, using census block level population data and floodplain location data. There are numerous areas of concern in Wilkinson County, especially in several of the county's population centers. Therefore, further investigation in these areas may be warranted. As noted in Section 6.4, no building-specific data, such as building footprints, were available to determine buildings at risk.

[91] United States Census Bureau. 2020 Census.

[92] United States Census Bureau. 2021 American Community Survey 5-Year Estimates. Retrieved on 01/09/2023 from https://data.census.gov/table?q=Wilkinson+County+Mississippi+households.

FIGURE I.20: WILKINSON COUNTY POPULATION DENSITY IN FLOODPLAINS



Critical Facilities

There are no critical facilities in Wilkinson County located in a floodplain. (Please note: this analysis does not consider building elevation, which may negate risk.) A list of specific critical facilities and their associated risk can be found at the end of this subsection.

A flood has the potential to impact many existing and future buildings, facilities, and populations in Wilkinson County, though some areas are at a higher risk than others. All types of structures in a

floodplain are at-risk, though elevated structures have a reduced risk. While site-specific vulnerability determinations are outside the scope of this assessment, they may be added to future plan updates. Such determinations may include identifying areas subject to repetitive flooding for potential mitigation actions.

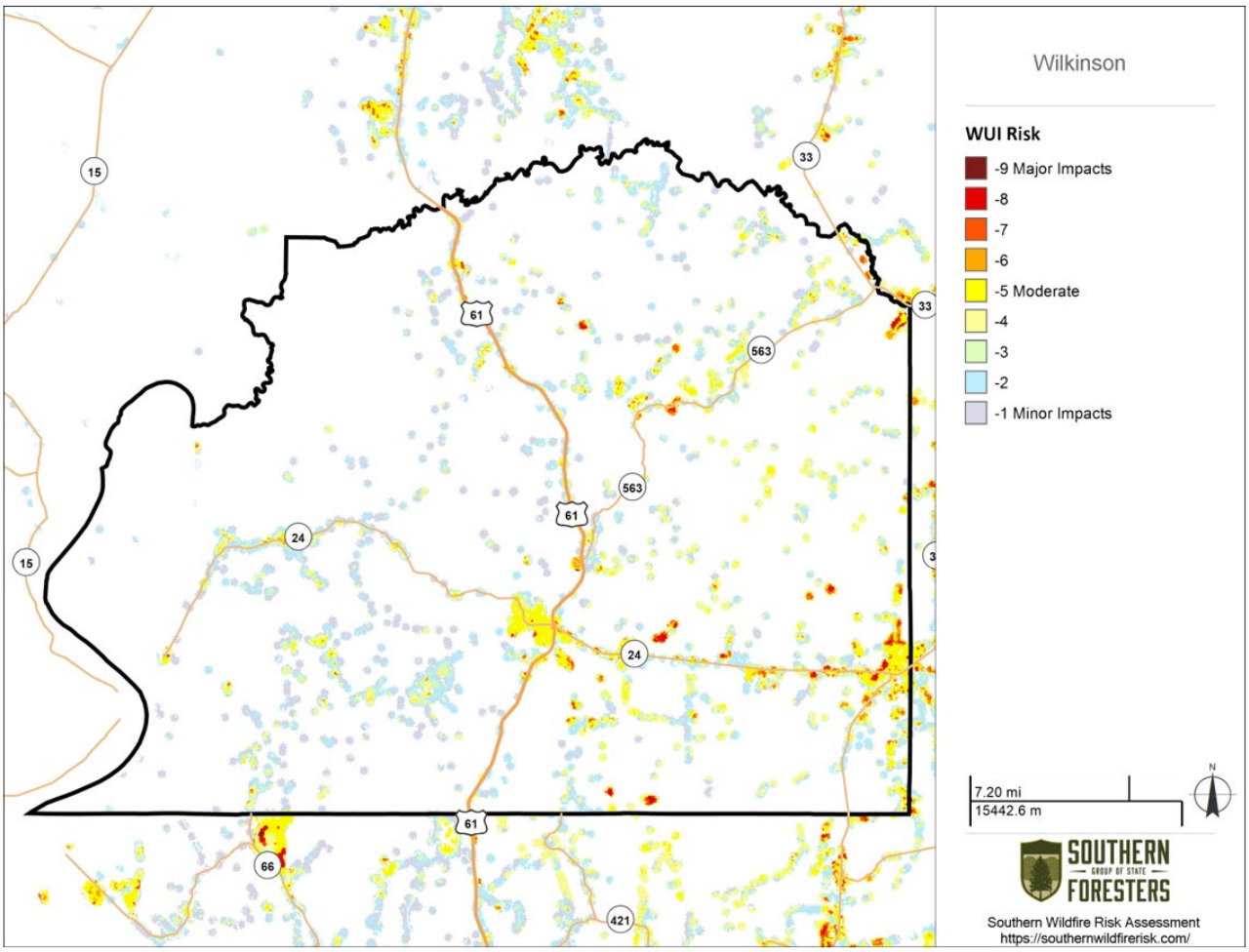
WILDFIRE

Although historical evidence indicates that Wilkinson County is susceptible to wildfire events, there are few reports which include information on historic dollar losses. Therefore, it is difficult to calculate a reliable annualized loss figure. While annualized wildfire losses in Wilkinson County are considered negligible, a single wildfire event could result in significant damages throughout the county.

To estimate potential exposure of Wilkinson County areas to wildfire, HAZUS-MH 5.1 aggregated census-block-level building and parcel data were combined with Wildland Urban Interface Risk Index (WUIRI) data to determine wildfire vulnerability. For the critical facility analysis, locations of critical facilities within wildfire risk areas were identified.

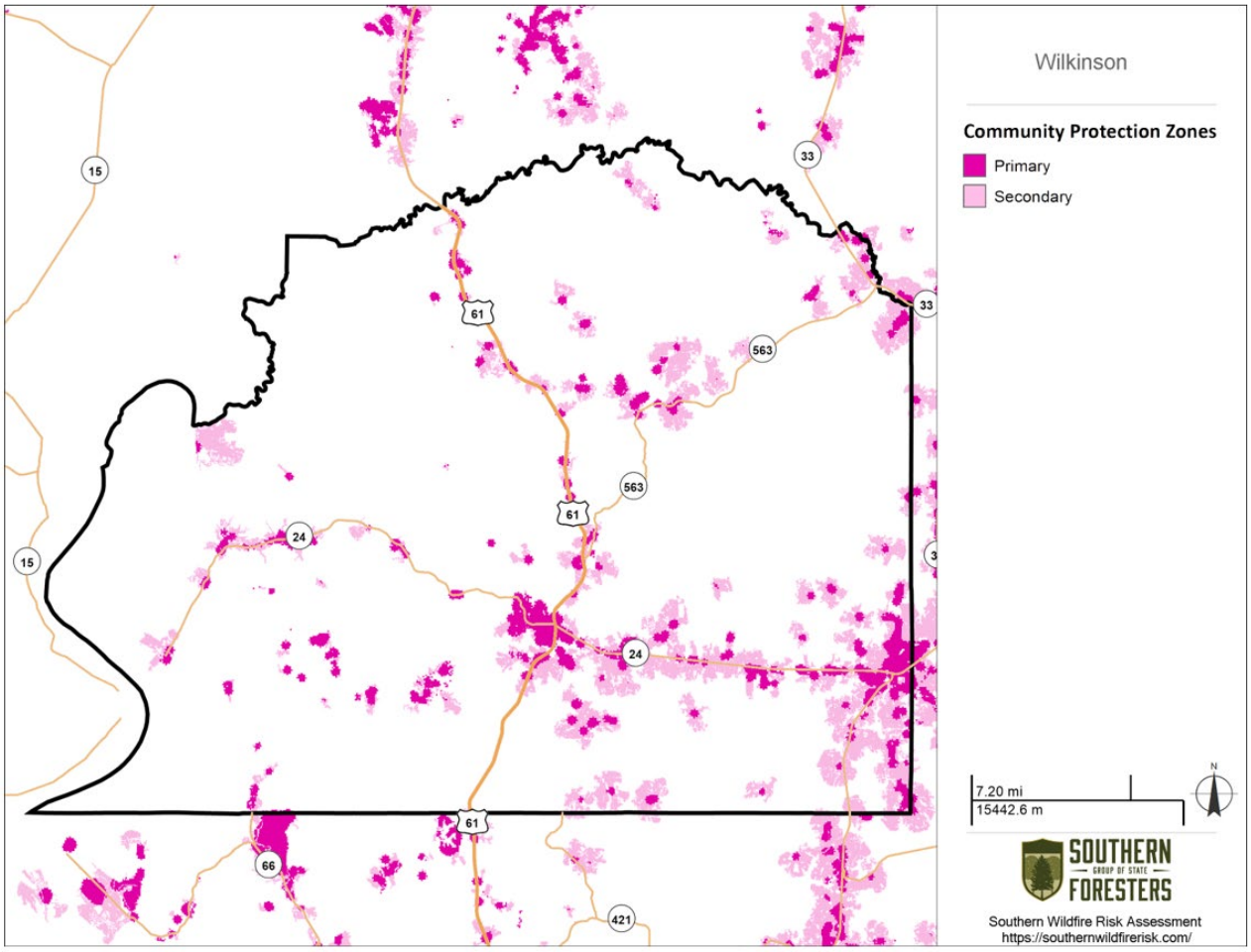
The figure below **s**hows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). For the purposes of identifying wildfire risk vulnerability, areas in Wilkinson County with a WUI Risk Value below -4 have been chosen as areas of risk because their WUI values represent the upper echelon of the scale and the areas at highest risk.

FIGURE I.21: WILDLAND URBAN INTERFACE RISK INDEX (WUIRI) IN WILKINSON COUNTY



This figure shows Community Protection Zones (CPZ) in Wilkinson County. Community Protection Zones represent those areas considered highest priority for mitigation planning activities. CPZs are based on an analysis of the "Where People Live" housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ. For the purposes of identifying wildfire risk vulnerability, areas in Wilkinson County with a WUI Risk Value below -4 have been chosen as areas of risk because their WUI values represent the upper echelon of the scale and the areas at highest risk.

FIGURE I.22: WILDFIRE RISK AREAS IN WILKINSON COUNTY



Social Vulnerability

Given some level of susceptibility across the entire county, it is assumed that the total population is at risk to the wildfire hazard. The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk of wildfire. For the Wilkinson County Wildfire Risk project area, it is estimated that 9,769 people or 99.1 % percent of the total project area population (9,861) live within the WUI.

Critical Facilities

The critical facility analysis revealed that there are 18 critical facilities in Wilkinson County located in wildfire risk areas, including 1 Emergency Operation Center (EOC), 3 fire stations, 1 government/public facility, 3 medical care facilities, 3 police stations, 1 private sector building, and 6 schools. A list of specific critical facilities and their associated risk can be found in the table at the end of this subsection.

The wildfire hazard has the potential to impact existing and future buildings, critical facilities, and populations in Wilkinson County. Structures at highest risk to this hazard are located in close proximity to wildfire risk areas.

EARTHQUAKE

For the earthquake hazard vulnerability assessment, a probabilistic scenario was created at the MEMA District 7 regional level to estimate the average annualized loss for the region on a county-by-county basis. The results of the analysis are generated at the census tract level within Hazus-MH and then aggregated to the county level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss. They do not include losses to business interruption, lost income, or relocation.

As the Hazus-MH model suggests, and historical occurrences confirm, any significant earthquake activity in the area is likely to inflict minor damage to the planning area. Hazus-MH 5.1 estimates a total annualized loss of $105,000 for the entire MEMA District 7 region; this loss estimate includes structural and non-structural damage to buildings, contents, and inventory throughout the planning area. The Hazus-MH estimate of total annualized loss for Wilkinson County is $4,000, including an annualized estimate of $1,000 for structural damage to buildings alone.

Social Vulnerability
It can be assumed that all existing and future populations are at risk to the earthquake hazard.

Critical Facilities
The Hazus-MH probabilistic analysis did not indicate that any critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor to moderate damage should an event occur. A list of specific critical facilities and their associated risk can be found in the table at the end of this section.

An earthquake has the potential to impact all existing and future buildings, facilities, and populations in Wilkinson County. Specific vulnerabilities for these assets will be greatly dependent on their individual design and the mitigation measures in place. Such site-specific vulnerability determinations are outside the scope of this assessment but may be considered during future plan updates. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While Wilkinson County may not experience a catastrophic earthquake, localized damage is possible with a moderate to larger scale occurrence.

HURRICANE AND TROPICAL STORM

Historical evidence indicates that Wilkinson County has significant risk to the hurricane and tropical storm hazard. There have been 7 major disaster declarations in Wilkinson County due to hurricanes, and several tracks have come near or traversed through the county. (See Section I.2.10 above for reference.)

Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard.

Hazus-MH 5.1 has been used to determine average annualized losses for counties within MEMA District Region. For Wilkinson County, Hazus-MH 5.1 estimates an estimated annualized loss of $335,000 from the hurricane wind hazard; this estimate includes only building damage, contents damage, and inventory loss.

Social Vulnerability
Given some equal susceptibility across the entire county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard.

Critical Facilities
All critical facilities in Wilkinson County are considered to be at equal risk and vulnerability to the hurricane and tropical storm hazard. Some of these facilities may perform better than others in a hurricane/tropical storm event due to building construction and age, among other factors. A list of specific critical facilities can be found in in the table at the end of this subsection.

RADIOLOGICAL EVENT

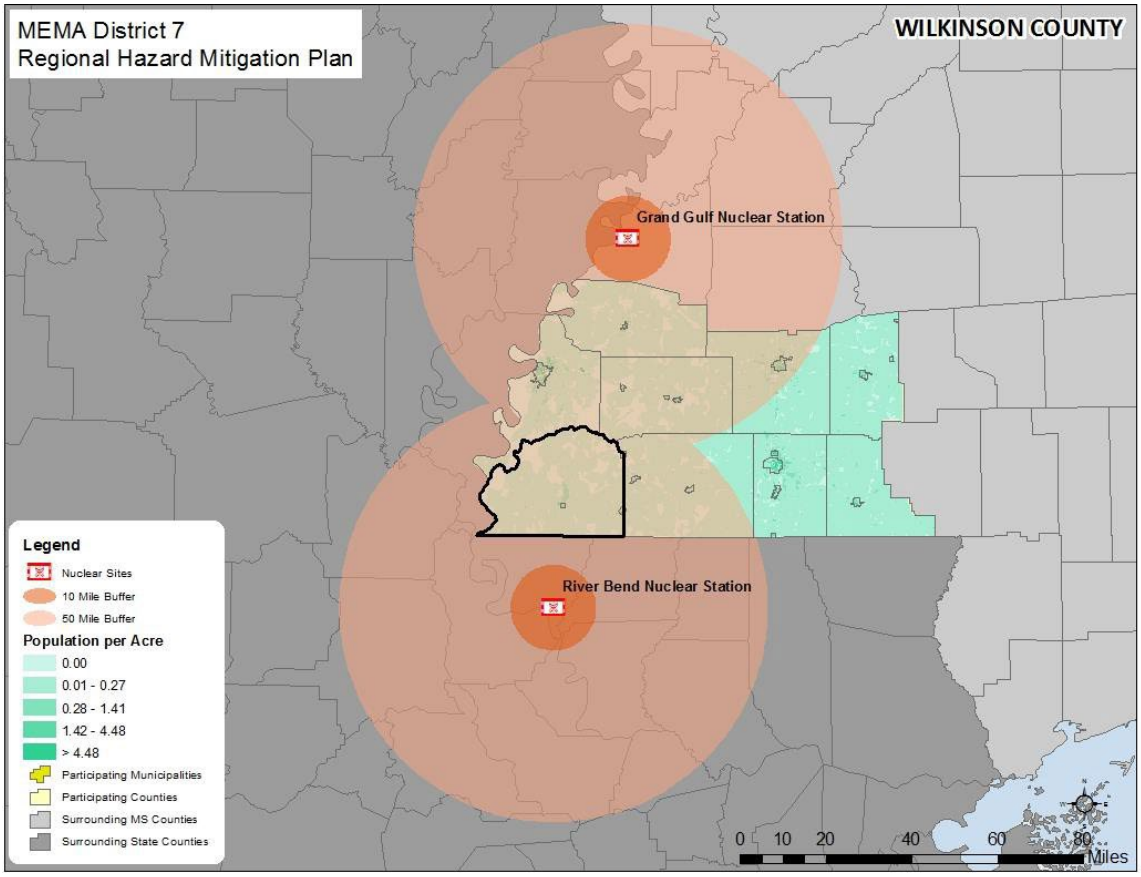
The location of Grand Gulf and River Bend Nuclear Stations north and south of the region, respectively, demonstrate that Wilkinson County is at some risk to the effects of a nuclear accident. Although there have not been any major events at these plants in the past, there have been major events at other nuclear stations around the country. Additionally, smaller scale incidents at Grand Gulf and River Bend Nuclear Stations have occurred.

In order to assess nuclear risk, a GIS-based analysis was used to estimate improved property exposure to a nuclear event within each of the risk zones (i.e., 10-mile zones and 50-mile zones) described in Section I.2.14. The determination of assessed value at-risk (exposure) was calculated using GIS analysis by summing the total values for properties that were confirmed to be located within one of the risk zones.

Social Vulnerability
No part of Wilkinson County is located inside the 10-mile radius of either nuclear station. However, the entire county lies within the 50-mile radius of the River Bend Nuclear Station, and the extreme northern portion of the county lies within the 50-mile radius of the Grand Gulf Nuclear Station. As a result, the county is located close enough to both nuclear stations that its entire population may be at some risk to a radiological event. This risk can be seen in the figure below

Critical Facilities
The critical facility analysis revealed that there are no Wilkinson County critical facilities located in within the 10-mile buffer area. However, all critical facilities in Wilkinson County are located within the 50-mile nuclear buffer area for the River Bend Nuclear Station, and it is possible that 1 critical facility in Crosby may be located within the 50-mile nuclear buffer area for the Grand Gulf Nuclear Station. As a result, the county is located close enough to both nuclear stations that critical facilities may be at some nuclear risk. A list of specific critical facilities and their associated risk can be found in the table at the end of this section.

FIGURE I.23: POPULATION DENSITY NEAR NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN WILKINSON COUNTY



CONCLUSIONS ON HAZARD VULNERABILITY

The table below presents a summary of annualized loss for each hazard in Wilkinson County. Due to the reporting of hazard damages primarily at the county level, it is difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss has been determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

TABLE I.31: ANNUALIZED LOSS FOR WILKINSON COUNTY[93]

Event	Wilkinson County
Flood-related Hazards	
Dam & Levee Failure	Negligible
Erosion	Negligible

[93] "Negligible" is used to indicate that no records of dollar losses for the particular hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that particular type of event is not well kept.

Flood	$279,423
Fire-related Hazards	
Drought	Negligible
Lightning	Negligible
Wildfire	Negligible
Geologic Hazards	
Earthquake[94]	$1,000
Temperature & Wind-related Hazards	
Extreme Heat	Negligible
Hailstorms	$11,628
Hurricane & Tropical Storm	$919,762
Severe Thunderstorm/High Wind	$2,788
Tornado	$20,964
Winter Storm & Freeze	Negligible
Other Hazards	
Radiological Event	Negligible
Pandemic	Negligible

All existing and future populations and buildings (including critical facilities) in Wilkinson County are vulnerable to a wide variety of hazards. Some buildings may be more vulnerable to these hazards based on factors such as construction and building type. The following table shows the critical facilities vulnerable to the hazards analyzed in this section. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "X").

[94] No historic losses for earthquake were recorded, so Hazus estimates for annualized loss were used.

TABLE I.32: AT-RISK CRITICAL FACILITIES IN WILKINSON COUNTY

		FLOOD-RELATED				FIRE-RELATED			GEO	WIND-RELATED						HUM	
FACILITY NAME	FACILITY TYPE	Dam and Levee Failure	Erosion	Flood – 100 yr	Flood – 500 yr	Drought	Lightning	Wildfire	Earthquake	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Severe Thunderstorm/	Tornado	Winter Storm and Freeze	Radiological Event 10-mile area	Radiological Event 50-mile area
Wilkinson County																	
Wilkinson County EOC	EOC		X			X	X	X	X	X	X	X	X	X	X		X
Buffalo Volunteer Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		X
Centreville Volunteer Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		X
Crosby Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		X
Woodville Fire Department	Fire Station		X			X	X	X	X	X	X	X	X	X	X		X
A.O. Smith Community Center	Government/Public		X			X	X		X	X	X	X	X	X	X		X
Wilkinson County Correctional Facility	Government/Public		X			X	X	X	X	X	X	X	X	X	X		X
Field Health System Catchings Clinic	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
Field Clinic	Medical Care		X			X	X		X	X	X	X	X	X	X		X
Field Health System	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
Wilkinson County Nursing Center	Medical Care		X			X	X	X	X	X	X	X	X	X	X		X
Centreville Police Dept	Police Station		X			X	X		X	X	X	X	X	X	X		X
Crosby Police Dept	Police Station		X			X	X		X	X	X	X	X	X	X		X
Wilkinson County Sheriff	Police Station		X			X	X	X	X	X	X	X	X	X	X		X
Woodville Police Dept	Police Station		X			X	X	X	X	X	X	X	X	X	X		X
Netterville Lumber Company	Private Sector		X			X	X	X	X	X	X	X	X	X	X		X
Finch Elementary School	School		X			X	X	X	X	X	X	X	X	X	X		X
Wilkinson County Christian Academy	School		X			X	X	X	X	X	X	X	X	X	X		X

		FLOOD-RELATED				FIRE-RELATED			GEO	WIND-RELATED						HUM	
FACILITY NAME	**FACILITY TYPE**	**Dam and Levee Failure**	**Erosion**	**Flood – 100 yr**	**Flood – 500 yr**	**Drought**	**Lightning**	**Wildfire**	**Earthquake**	**Extreme Heat**	**Hailstorm**	**Hurricane and Tropical Storm**	**Severe Thunderstorm/**	**Tornado**	**Winter Storm and Freeze**	**Radiological Event 10-mile area**	**Radiological Event 50-mile area**
Wilkinson County Elementary School	School		X			X	X	X	X	X	X	X	X	X	X		X
Wilkinson County High School	School		X			X	X	X	X	X	X	X	X	X	X		X
Wilkinson County Voc-Tech Center	School		X			X	X	X	X	X	X	X	X	X	X		X
William Winans Attendance Center	School		X			X	X	X	X	X	X	X	X	X	X		X

I.4 WILKINSON COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Wilkinson County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in Section 7: *Capability Assessment*.

I.4.1 Planning and Regulatory Capability

The table below provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Wilkinson County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. A dagger (†) indicates that the given item is administered for that municipality by the county. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the MEMA District 7 Regional Hazard Mitigation Plan.

TABLE I.33: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Threat and Hazard Identification and Risk Assessment (THIRA)	Comprehensive Land Use Plan	Floodplain Management Plan/Flood Mitigation Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Emergency Management Accreditation Program (EMAP Accreditation)	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment/ Reconstruction Plan/ Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System (CRS Program)
WILKINSON COUNTY	✓			✓					✓		✓				✓		✓							✓	
Centreville	†								†						†		✓							✓	
Crosby	†								†						†		✓							✓	
Woodville	†		✓						†						†		✓	✓				✓		✓	

A more detailed discussion on the county's planning and regulatory capabilities follows.

EMERGENCY MANAGEMENT

Hazard Mitigation Plan

Wilkinson County has previously adopted a hazard mitigation plan. The Town of Centreville, Town of Crosby, and Town of Woodville were also included in this plan.

Emergency Operations Plan

Wilkinson County maintains an emergency operations plan through its Emergency Management Agency. The Town of Centreville, Town of Crosby, and Town of Woodville are also covered by this plan.

GENERAL PLANNING

Comprehensive Land Use Plan
Wilkinson County has not adopted a county comprehensive land use plan. However, the Town of Woodville has adopted a town comprehensive plan.

Historic Preservation Plan
None of the jurisdictions in Wilkinson County has a historic preservation plan. However, the Town of Woodville has published historic preservation guidelines.

Zoning Ordinance
The Town of Woodville is the only jurisdiction in Wilkinson County that has adopted a zoning ordinance.

Building Codes, Permitting, and Inspections
The Town of Woodville is the only jurisdiction in Wilkinson County that has adopted a building code.

FLOODPLAIN MANAGEMENT

The table below provides NFIP policy and claim information for each participating jurisdiction in Wilkinson County. Additional information on insured flood losses in Wilkinson County can be found above, in the table below.

Table I.34: NFIP Policy and Claim Information[95]

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force^	Closed Claims	Total Payments to Date
WILKINSON COUNTY†	07/16/90	04/19/10	5	$13,223,500^	298	$6,962,770.19
Centreville	03/12/10	(NSFHA)	0	$0^	0	$0
Crosby	02/01/86	04/19/10	0	$673,000^	1	$12,028.89
Woodville	04/19/10	04/19/10	0	$107,100^	0	$0

†Includes unincorporated areas of county only
^last available data 2017
NSFHA – No Special Flood Hazard Area - All Zone C

All jurisdictions listed above that are participants in the NFIP will continue to comply with all required provisions of the program and will work to adequately comply in the future utilizing a number of strategies. For example, the jurisdictions will coordinate with MEMA and FEMA to develop maps and regulations related to special flood hazard areas within their jurisdictional boundaries and, through a

[95] Source: NFIP Community Status information as of 7/2/2023; NFIP claims and policy information as of 7/2/2023

consistent monitoring process, will design and improve their floodplain management program in a way that reduces the risk of flooding to people and property.

Flood Damage Prevention Ordinance
All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. Wilkinson County, Town of Centreville, Town of Crosby, and Town of Woodville all participate in the NFIP and have adopted flood damage prevention regulations.

I.4.2 Administrative and Technical Capability

The table below provides a summary of the capability assessment results for Wilkinson County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill. A dagger (†) indicates a county-level staff member(s) provides the specified knowledge or skill to that municipality.

Table I.35: Relevant Staff/Personnel Resources

Staff/Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community' s vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
WILKINSON COUNTY				✓	✓		✓	✓		✓
Centreville				†	✓		†	†		
Crosby				†	✓		†	†		
Woodville		✓		†	✓		†	†		

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

I.4.3 Fiscal Capability

The table below provides a summary of the results for Wilkinson County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource has previously been used to implement hazard mitigation actions. A dagger (†) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds).

TABLE I.36: RELEVANT FISCAL RESOURCES

Fiscal Tool/Resource	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes (or taxing districts)	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other: FEMA Hazard Mitigation Grants, Homeland Security Grants, USDA Rural Development Agency Grants, and US Economic Development Administration Grants
WILKINSON COUNTY		†							✓	✓
Centreville		†								†
Crosby		†								†
Woodville		†								†

I.4.4 Political Capability

During the months immediately following a disaster, local public opinion in Wilkinson County is more likely to shift in support of hazard mitigation efforts.

The table below provides a summary of the results for Wilkinson County with regard to political capability. A checkmark (✓) indicates the expected degree of political support by local elected officials in terms of adopting/funding information.

TABLE I.37: LOCAL POLITICAL SUPPORT

Political Support	Limited	Moderate	High
WILKINSON COUNTY		✓	

Centreville		✓	
Crosby		✓	
Woodville		✓	

I.4.5 Conclusions on Local Capability

The table below shows the results of the capability assessment using the designed scoring methodology described in Section 7: *Capability Assessment*. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. This information was reviewed by all jurisdictions and each jurisdiction provided feedback on the information included in the capability assessment. Local government input was vital to identifying capabilities. According to the assessment, the average local capability score for the county and its jurisdictions is 20.5, which falls into the limited capability ranking.

TABLE I.38: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
WILKINSON COUNTY	24	Limited
Centreville	17	Limited
Crosby	17	Limited
Woodville	24	Limited

I.5 WILKINSON COUNTY CAPABILITY ASSESSMENT

This subsection provides the blueprint for Wilkinson County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and the findings and conclusions of the capability assessment and risk assessment. In addition, this strategy was developed with the State Hazard Mitigation Plan Goals and Objectives in mind. For this update, each action identifies the State Hazard Mitigation Program Objective that it relates to. Additional Information can be found in Section 8: *Mitigation Strategy* and Section 9: *Mitigation Action Plan*.

I.5.1 Mitigation Goals

Wilkinson County developed six mitigation goals in coordination with the other participating MEMA District 7 Region jurisdictions. The regional mitigation goals are below.

TABLE I.39: MEMA DISTRICT 7 REGIONAL MITIGATION GOALS

	Goal
Goal #1	Increase the overall public awareness of natural hazards that face the region.
Goal #2	Retrofit of critical facilities and/or critical infrastructure to lower the risk of damage from natural hazards.
Goal #3	General improvement of regional or local mitigation planning and capability.
Goal #4	Support State Identified Mitigation Initiatives such as saferooms and storm shelters, severe weather warning systems for universities and colleges, and severe weather notification systems for local communities.
Goal #5	Reduce loss of life, damage and loss of property and infrastructure, economic costs, including response, recovery and disruption of economic activity.
Goal #6	Foster cooperation among all levels of governments and the private sector with respect to improving, updating, and implementing the hazard mitigation plan.

I.5.2 Mitigation Action Plan

The mitigation actions proposed by Wilkinson County, Town of Centreville, Town of Crosby, and Town of Woodville are listed in the following individual Mitigation Action Plans.

Wilkinson County Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implm. Sched.	Implementation Status (2023)
Prevention								
P-1	2.2	**Comprehensive Land Use and Long Term Recovery Planning –** The Wilkinson County Board of Supervisors/Towns of Woodville, Centreville, and Crosby should have a Comprehensive Plan developed to guide long term recovery and development.	Hurricane or other hazard	High	Wilkinson County Board of Supervisors/ Towns of Woodville, Centreville, and Crosby	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	Ongoing 2027	Wilkinson County Board of Supervisors/ Towns of Woodville, Centreville, and Crosby recognize that comprehensive land use planning yields many benefits for both the county and city. The existence of a Comprehensive Plan enables a county or municipality to institute zoning ordinances to regulate new development and protect or upgrade existing development and it provides a solid basis to establish stronger building codes. Many of the goals of Long-Term Recovery Planning and Comprehensive Planning are one and the same. Although Natchez has adopted a Comprehensive Plan, the county has not developed a Comprehensive Plan. Therefore, this action will remain in the plan.

P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	Wilkinson County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2027	A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.
P-3	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist cities with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as cities develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Wilkinson County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2027	Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.
P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Low	Wilkinson County Board of Supervisors/ Towns of Woodville, Centreville, and Crosby	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
Property Protection								

PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Wilkinson County Board of Supervisors/Towns of Woodville, Centreville, and Crosby should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Wilkinson County Board of Supervisors/ Towns of Woodville, Centreville, and Crosby	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2027	The Wilkinson County Board of Supervisors/Towns of Woodville, Centreville, and Crosby recognize that damage to public buildings from wind is a serious hazard affecting the ability of government to function during and after disasters. Roof and structural damage and loss of electrical service in county/city government buildings due to high winds can render these buildings at least temporarily unusable and can potentially cause disruptions in government services. Retrofits of essential government buildings have not been completed. Therefore, this action will remain in the plan to lessen potential wind damage to those structures.
PP-2	1.3	**Property Buyback** Wilkinson County wishes to explore property buyback options for properties prone to repetitive flooding near Percy Creek Sand Rd., Jackson Point Rd, Fairfield Lane, Lake Mary Rd., Tolliber Ave, Pecan Grove.	Flooding	High	Wilkinson County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds, BRIC, HMGP	2025	New Action. Major floodings have occurred repeatedly. There are about 40 houses located in this area.
Natural Resource Protection								
NRP-1								
Structural Projects								
SP-1								
Emergency Services								

ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Hurricane, Winter Storm	High	Wilkinson County Board of Supervisors/ Towns of Woodville, Centreville, and Crosby in collaboration with the Mississippi Emergency Management Agency	General and special funds	In progress – 2027	Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations. Wilkinson County is in the process of filing the necessary paperwork to become "storm ready," so this action will remain in the plan. This action was combined with ES-9 since they were duplicate actions.
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, or other hazard leading to loss of electrical power	High	Wilkinson County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2025	A generator with Automatic Transfer Switch has been identified as the next priority for the Wilkinson County EOC. Th schools and church currently used as emergency sheltering sites have also been prioritized.
ES-3	1.8	**Improve Emergency Communications –** Purchase CodeRED® or other similar product to function as a high-speed telephone communications service for emergency notifications. This system allows County officials to telephone targeted areas of a municipality or the entire County in case an emergency situation requires immediate action such as a boil-water notice, missing	Hurricane or other hazard leading to loss of traditional communications systems	High	Wilkinson County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic	Deferred 2027	This action has been modified from its original identification of satellite phones, to embrace newer and more effective technology.

		child or evacuation notices.				Development Administration grants, general and special funds		
ES-4	1.9	**Construct New Emergency Shelter –** The county should construct a 200-person evacuation shelter. When not needed for disaster related housing, the building will serve as a Community Center and can be rented by individuals for group functions such as family reunions, weddings, or class reunions. A generator with Automatic transfer switch is needed for the facility to properly function in emergency situations.	Hurricane, Earthquake, Tornado or other hazard requiring the use of emergency shelters.	High	Wilkinson County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2024	The county secured two locations to be used as temporary shelters but would still like to pursue the construction of an emergency shelter. Wilkinson County Board of Supervisors recognize the need to have modern, safe emergency shelters for county/city residents and evacuees from other areas during times of disaster. Previously a combination of schools, churches, and other government buildings were used. This worked acceptably for short-term use, but for longer term needs as were seen in the Hurricane Katrina disaster, the presence of evacuees in these facilities for
ES-5	1.1	**Renovate Emergency Operations Center –** The county will renovate an existing building to house all EOC staff and equipment. A generator with Automatic transfer switch is needed for the facility to properly function in emergency situations.	Hurricane or other hazard requiring action from the EOC	High	Wilkinson County Board of Supervisors	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2024	The Wilkinson County Board of Supervisors recognizes the need to have modern, safe emergency operations center for county/town employees (firemen, policemen) emergency personnel and volunteers to convene during times of disaster to discuss planning options, rescue operations or any disaster plan of action. Currently a combination of schools, churches, and other government buildings are used. This works acceptably for short-term use, but for longer term needs as were seen in the Hurricane Katrina. Since an EOC has not been constructed in Wilkinson County, this action will remain in the plan.
ES-6	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous	Tornado	High	Wilkinson County Board of Supervisors/	Homeland Security grants, FEMA Hazard Mitigation	In progress - 2024	The county has three sirens, but they are not operational. They can be activated manually but require

		weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide system.			Towns of Woodville, Centreville, and Crosby	Grant, Individual County/City General Fund		replacement to return to correct functionality.
ES-7	1.1	**Improve Emergency Evacuation Routes –** Wilkinson County sees the need to improve the condition of the evacuation routes including upgrading bridges where needed. Adams County is leading the effort to improve evacuation routes through Mississippi from Louisiana. As the neighboring community Wilkinson will rely on this route to protect life and safety.	Radiological, wildfire, earthquake	High	Wilkinson County Board of Supervisors is supporting Adams County in the effort.	Homeland Security grants, FEMA Hazard Mitigation grants, individual county general and special funds	In progress - 2024	The county remains in ongoing discussion about this project. River Bend Power Station is located in western Claiborne County. Part of the ten-mile Plume Emergency Planning Zone is in Wilkinson County. The county is completely within the 50-mile Ingestion Emergency Planning Zone. Adequate warning systems and timely evacuation are the citizens only defense in the event of a release of contaminants from the facility. Also, if a release of radiological pollutants were to occur at Grand Gulf, many evacuees would come to or through Wilkinson County. Therefore, this action will remain in the plan.
~~ES-8~~	~~1.3~~	~~**Construct New Emergency Operations Center (EOC) –** The county should renovate their current county owned building for the purpose of an EOC.~~	~~Hurricane, Tornado or other related hazard~~	~~High~~	~~Wilkinson County Board of Supervisors~~	~~Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds~~	~~In progress-2024~~	~~New Action. Wilkinson County interested in constructing a new EOC as the current building does not meet functional needs.~~
ES-8	1.9	**Emergency Messaging App -** County is in discussion to procure an emergency alerting app such as CodeRed or HyperReach for emergency alerts to the public.	All	High	Wilkinson County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	In progress-2024	New Action.

ES-9	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Wilkinson County Board of Supervisors/ Towns of Woodville, Centreville, and Crosby	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), individual city general and special funds	2027	New Action.
Public Education and Awareness								
PEA-1		**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Moderate	Wilkinson County Board of Supervisors/ Towns of Woodville, Centreville, and Crosby	N/A	2027	Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan. The County is interested in conducting annual earthquake drills through the Great ShakeOut.
PEA-2		**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or	Flood	High	Wilkinson County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP. There is continued interest within the county,

		workshops at our Natchez or Meadville offices.						but additional funding is needed to support this activity.
PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-5	3.1	**Education: FireWise** – Recommend that public information and outreach workshops on the Firewise program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Wilkinson County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, general and special funds	2026	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan.
PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	High	Wilkinson County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination	In progress - 2027	The county continues these discussions. Local officials, community leaders and other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.

						with individual county general and special funds		
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	High	Wilkinson County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	In progress - 2027	This remains an ongoing project. The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Wilkinson County Board of Supervisors/ Towns of Woodville, Centreville, and Crosby	FEMA Hazard Mitigation grants, individual city general and special funds	2025	New Action
PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and determine what steps can be taken to meet the community needs.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold	Moderate	Wilkinson County Board of Supervisors/ Towns of Woodville, Centreville, and Crosby	FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual city general and special funds	2026	New Action.
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning	Pandemic	Low	Wilkinson County Board of Supervisors/ Towns of	U.S Department of Health and Human Services (HHS), Centers for	2024	New Action.

		public health and infections prevention procedures			Woodville, Centreville, and Crosby	Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), individual city general and special funds		
PEA-11	3.1	**Education: Public Outreach –** Develop a program to encourage school programs to incorporate the Great Shake Out	Earthquake	Low	Wilkinson County Board of Supervisors/ Towns of Woodville, Centreville, and Crosby	FEMA Hazard Mitigation grants, individual city general and special funds	2026	New Action.

Town of Centreville Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implm. Sched.	Implementation Status (2023)
Prevention								
P-1	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	Town of Centreville Board of Aldermen and Mayor and Wilkinson County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2027	A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist cities with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as cities develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Wilkinson County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2027	Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.

P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood	Low	Wilkinson County Board of Supervisors/ Towns of Woodville, Centreville, and Crosby	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Wilkinson County Board of Supervisors/Towns of Woodville, Centreville, and Crosby should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Wilkinson County Board of Supervisors/ Towns of Woodville, Centreville, and Crosby	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2027	New Action.
Natural Resource Protection								
NRP-1								
Structural Projects								
SP-1								
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to	Hurricane, Winter Storm	High	Town of Centreville Board of Aldermen and Mayor	General and special funds	Completed	The City is StormReady. This action will be deleted during the next update.

		improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.						
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, or other hazard leading to loss of electrical power	High	Town of Centreville Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2025	Loss of electrical power to critical facilities such as water and sewer systems, law enforcement offices, and other critical facilities during a natural disaster can have a severe impact on the functioning of government to provide relief and assistance to citizens and maintain civil order. This can also cause very significant problems for private citizens who depend on municipal and rural water and sewer systems and rely on county and city governments to continue to maintain order. This situation can be especially difficult on the elderly and other special needs persons who would have a difficult time maintaining the basics for themselves without assistance. The Town of Centreville will continue to purchase critical facility generators as funding permits, so this action will remain in the plan.
ES-3	1.8	**Improve Emergency Communications –** Purchase CodeRED® or other similar product to function as a high-speed telephone communications service for emergency notifications. This system allows County officials to telephone targeted areas of a	Hurricane or other hazard leading to loss of traditional communications systems	High	Town of Centreville Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard	Deferred 2027	This action has been modified from its original identification of satellite phones, to embrace newer and more effective technology.

		municipality or the entire County in case an emergency situation requires immediate action such as a boil-water notice, missing child or evacuation notices.				Mitigation grants, US Economic Development Administration grants, general and special funds		
ES-4	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide system.	Tornado	High	Town of Centreville Board of Aldermen and Mayor/Wilkinson County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	Complete	In the event of inclement weather, it is essential that residents of the Town of Centreville receive timely warnings. Since 2005 the county has purchased and installed three additional sirens throughout the county.
ES-5	1.1	**Improve Emergency Evacuation Routes –** The Town of Centreville and Wilkinson County sees the need to improve the condition of the evacuation routes including upgrading bridges where needed	Radiological, wildfire, earthquake	High	Town of Centreville**/** Wilkinson County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation grants, individual county general and special funds	2027	River Bend Nuclear Power Station is located approximately 17 miles south of Wilkinson County in Louisiana. Most of the county is in the 50-mile Ingestion Emergency Planning Zone. Adequate warning systems and timely evacuation are the citizens only defense in the event of a release of contaminants from the facility. Also, it is anticipated that should contaminants be released from River Bend, many Louisiana residents would need to evacuate to or through Wilkinson County. Wilkinson County is currently working on a Dam and Road reconstruction in the Lake Mary area. In 2011, the county received a grant through the Mississippi Development Authority to reconstruct and reopen a bridge in Fort Adams on Pond Rd. In 2012, the county applied for grant funds to rehab eight bridges, one of which is closed, in the Homochitto National Forest through the Federal Hwy Administration's Public Lands Highways fund. All of these efforts will help

								reopen roads for efficient evacuation. The county is still working to further improve evacuation routes, so this action will remain in the plan.
ES-7	1.9	**Safe Rooms and Community Shelters –** The town should construct and/or encourage construction of safe rooms and community shelters.	Hurricane, Tornado or other hazard requiring the use of emergency shelters	NA	NA	NA	NA	Deleted. Town of Centreville has a shelter.
ES-8	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Town of Centreville**/** Wilkinson County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), individual city general and special funds	2027	New Action.
Public Education and Awareness								
PEA-1		**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Moderate	Town of Centreville**/** Wilkinson County Board of Supervisors	N/A	2027	Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan. The County is interested in conducting annual

								earthquake drills through the Great ShakeOut.
PEA-2		**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Town of Centreville/ Wilkinson County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP. There is continued interest within the county, but additional funding is needed to support this activity.
PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-5	3.1	**Education: FireWise** – Recommend that public information and outreach workshops on the Firewise program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Town of Centreville**/** Wilkinson County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, general and special funds	2026	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan.
PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that	Radiological	High	Town of Centreville**/**	FEMA Emergency	In progress - 2027	The county continues these discussions. Local officials, community leaders and

		structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.			Wilkinson County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds		other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	High	Town of Centreville**/** Wilkinson County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	In progress - 2027	This remains an ongoing project. The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Town of Centreville**/** Wilkinson County Board of Supervisors	FEMA Hazard Mitigation grants, individual city general and special funds	2025	New Action
PEA-7	3.3	**Conduct an assessment to determine our community's vulnerable populations** and	Extreme Heat, Winter Storm,	Moderate	Town of Centreville**/**	FEMA Hazard Mitigation grants,	2026	New Action.

		determine what steps can be taken to meet the community needs.	Freeze, and Extreme Cold		Wilkinson County Board of Supervisors	US Economic Development Administration grants, individual city general and special funds		
PEA-8	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Town of Centreville**/** Wilkinson County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), individual city general and special funds	2024	New Action.

Town of Crosby Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implm. Sched.	Implementation Status (2023)
Prevention								
P-1	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	Town of Crosby Board of Aldermen and Mayor and Wilkinson County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2027	A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist cities with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as cities develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Wilkinson County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2027	Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.

P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood		Wilkinson County Board of Supervisors/ Towns of Woodville, Centreville, and Crosby	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Wilkinson County Board of Supervisors/Towns of Woodville, Centreville, and Crosby should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Wilkinson County Board of Supervisors/ Towns of Woodville, Centreville, and Crosby	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2027	New Action.
Natural Resource Protection								
NRP-1								
Structural Projects								
SP-1								
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to	Hurricane, Winter Storm	High	Town of Crosby Board of Aldermen and Mayor	General and special funds	2025	Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations.

		improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.						StormReady status will improve communities' ability to prepare for and mitigate the effects of extreme weather - related events, so this action will remain in the plan. This action was combined with ES-6 since they were duplicate actions.
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, or other hazard leading to loss of electrical power	High	Town of Crosby Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2025	Loss of electrical power to critical facilities such as water and sewer systems, law enforcement offices, and other critical facilities during a natural disaster can have a severe impact on the functioning of government to provide relief and assistance to citizens and maintain civil order. This can also cause very significant problems for private citizens who depend on municipal and rural water and sewer systems and rely on county and city governments to continue to maintain order. This situation can be especially difficult on the elderly and other special needs persons who would have a difficult time maintaining the basics for themselves without assistance. The Town of Crosby will continue to purchase critical facility generators as funding permits, so this action will remain in the plan.
ES-3	1.8	**Improve Emergency Communications –** Purchase CodeRED® or other similar product to function as a high-speed telephone communications service for emergency notifications. This system allows County officials to telephone targeted areas of a	Hurricane or other hazard leading to loss of traditional communications systems	High	Town of Crosby Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard	Deferred 2027	This action has been modified from its original identification of satellite phones, to embrace newer and more effective technology.

		municipality or the entire County in case an emergency situation requires immediate action such as a boil-water notice, missing child or evacuation notices.				Mitigation grants, US Economic Development Administration grants, general and special funds		
ES-4	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide system.	Tornado	High	Town of Crosby Board of Aldermen and Mayor/Wilkinson County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	Complete	In the event of inclement weather, it is essential that residents of the Town of Crosby receive timely warnings. Since 2005 the county has purchased and installed three additional sirens throughout the county.
ES-6	1.9	**Safe Rooms and Community Shelters –** The town should construct and/or encourage construction of safe rooms and community shelters.	Hurricane, Tornado or other hazard requiring the use of emergency shelters	High	Town of Crosby**/** Wilkinson County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation grants, individual county general and special funds	2027	Although this action has been delayed, the City remains interested in constructing a shelter.
ES-7	1.1	**Improve Emergency Evacuation Routes –** The Town of Crosby and Wilkinson County sees the need to improve the condition of the evacuation routes including upgrading bridges where needed	Radiological, wildfire, earthquake	High	Town of Crosby**/** Wilkinson County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation grants, individual county general and special funds	2027	River Bend Nuclear Power Station is located approximately 17 miles south of Wilkinson County in Louisiana. Most of the county is in the 50-mile Ingestion Emergency Planning Zone. Adequate warning systems and timely evacuation are the citizens only defense in the event of a release of contaminants from the facility. Also, it is anticipated that should contaminants be released from River Bend, many Louisiana residents would need to evacuate to or through Wilkinson County. Wilkinson County is currently working on a Dam and Road reconstruction in the Lake Mary area. In 2011, the county received a grant through the Mississippi Development Authority to reconstruct and reopen a

								bridge in Fort Adams on Pond Rd. In 2012, the county applied for grant funds to rehab eight bridges, one of which is closed, in the Homochitto National Forest through the Federal Hwy Administration's Public Lands Highways fund. All of these efforts will help reopen roads for efficient evacuation. The county is still working to further improve evacuation routes, so this action will remain in the plan.
ES-8	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Town of Crosby**/** Wilkinson County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), individual city general and special funds	2027	New Action.
Public Education and Awareness								
PEA-1		**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Moderate	Town of Crosby**/** Wilkinson County Board of Supervisors	N/A	2027	Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan. The County is interested in conducting annual

								earthquake drills through the Great ShakeOut.
PEA-2		**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Town of Crosby/ Wilkinson County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP. There is continued interest within the county, but additional funding is needed to support this activity.
PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-5	3.1	**Education: FireWise** – Recommend that public information and outreach workshops on the Firewise program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Town of Crosby**/** Wilkinson County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, general and special funds	2026	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan.
PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that	Radiological	High	Town of Crosby**/** Wilkinson County	FEMA Emergency	In progress - 2027	The county continues these discussions. Local officials, community leaders and

		structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.			Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds		other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	High	Town of Crosby**/** Wilkinson County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	In progress - 2027	This remains an ongoing project. The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Town of Crosby**/** Wilkinson County Board of Supervisors	FEMA Hazard Mitigation grants, individual city general and special funds	2025	New Action
PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and	Extreme Heat, Winter Storm,	Moderate	Town of Crosby**/** Wilkinson County	FEMA Hazard Mitigation grants,	2026	New Action.

		determine what steps can be taken to meet the community needs.	Freeze, and Extreme Cold		Board of Supervisors	US Economic Development Administration grants, individual city general and special funds		
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Town of Crosby**/** Wilkinson County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), individual city general and special funds	2024	New Action.

Town of Woodville Mitigation Action Plan

#	SHMP Obj.	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implm. Sched.	Implementation Status (2023)
Prevention								
P-1	1.4	**Assessing Vulnerability by Jurisdiction –** Create or acquire geographic information system layers to include E911 roads, structures, and 100-year flood zones. Use this data to develop accurate risk assessments for flood zones throughout the jurisdiction.	Flood	Moderate	Town of Woodville Board of Aldermen and Mayor and Wilkinson County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	In progress - 2027	A detailed flood hazard risk assessment for properties found within local jurisdictions does not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments.
P-2	1.4	**Assessing Vulnerability by Jurisdiction –** Encourage and assist cities with the development of geographic information systems including such layers as ownership, structures, and infrastructure. Secure copies of this data as cities develop it to enhance tornado and wildfire hazard risk assessments.	Tornado, Wildfire	Moderate	Wilkinson County Board of Supervisors in collaboration with the Southwest Mississippi Planning and Development District, Inc.	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2027	Detailed tornado and wildfire hazard risk assessments for properties found within local jurisdictions do not currently exist. Digital maps of certain features in the county would make this much more feasible and accurate, so this action will remain in place to improve future vulnerability assessments. This action was combined with P-4 since they were duplicate actions.

P-4	1.4	**Erosion Study –** Use GIS to identify and map erosion hazard areas. Assess locations along local waterways for future bank stabilization projects to be implemented where needed**.**	Erosion, Flood		Wilkinson County Board of Supervisors/ Towns of Woodville, Centreville, and Crosby	FEMA Hazard Mitigation grants, USDA Water Grants and Loans Available to Water and Wastewater Utilities, individual county general and special funds	2027	New Action.
Property Protection								
PP-1	1.1	**Retrofit Existing Public Buildings for Wind Resistance –** The Wilkinson County Board of Supervisors/Towns of Woodville, Centreville, and Crosby should seek to retrofit all essential government buildings to increase their resistance to the effects of high winds.	Hurricane, Tornado or other wind related hazard	High	Wilkinson County Board of Supervisors/ Towns of Woodville, Centreville, and Crosby	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, individual county general and special funds	2027	New Action.
Natural Resource Protection								
NRP-1								
Structural Projects								
SP-1								
Emergency Services								
ES-1	3.1	**StormReady –** Encourage communities to take a new pro- active approach to improving local hazardous weather operations by providing emergency managers with clear guidance on how to	Hurricane, Winter Storm	High	Town of Woodville Board of Aldermen and Mayor	General and special funds	2025	Communities lack the skills and education needed to survive severe weather, before and during an event. Local emergency managers need to strengthen their hazardous weather operations.

		improve. Communities have fewer fatalities and less property damage if plans are in place before hazardous weather arrives. The National Weather Service designed StormReady to help communities better prepare for and mitigate effects of extreme weather-related events. StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.						StormReady status will improve communities' ability to prepare for and mitigate the effects of extreme weather - related events, so this action will remain in the plan. This action was combined with ES-6 since they were duplicate actions.
ES-2	1.1	**Critical Facility Generators –** Purchase permanently mounted generators for water systems and government facilities such as city halls, county courthouses, police and sheriff offices. Purchase mobile generators for sewer lift stations. Secure the services of a licensed electrician to modify the wiring at each generator site to enable its use.	Hurricane, Severe Thunderstorm/High Wind, Severe Winter Weather, or other hazard leading to loss of electrical power	High	Town of Woodville Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard Mitigation grants, US Economic Development Administration grants, general and special funds	2025	Loss of electrical power to critical facilities such as water and sewer systems, law enforcement offices, and other critical facilities during a natural disaster can have a severe impact on the functioning of government to provide relief and assistance to citizens and maintain civil order. This can also cause very significant problems for private citizens who depend on municipal and rural water and sewer systems and rely on county and city governments to continue to maintain order. This situation can be especially difficult on the elderly and other special needs persons who would have a difficult time maintaining the basics for themselves without assistance. The Town of Woodville will continue to purchase critical facility generators as funding permits, so this action will remain in the plan.
ES-3	1.8	**Improve Emergency Communications –** Purchase CodeRED® or other similar product to function as a high-speed telephone communications service for emergency notifications. This system allows County officials to telephone targeted areas of a	Hurricane or other hazard leading to loss of traditional communications systems	High	Town of Woodville Board of Aldermen and Mayor	Homeland Security grants, USDA Rural Development Agency grants, FEMA Hazard	Deferred 2027	This action has been modified from its original identification of satellite phones, to embrace newer and more effective technology.

		municipality or the entire County in case an emergency situation requires immediate action such as a boil-water notice, missing child or evacuation notices.				Mitigation grants, US Economic Development Administration grants, general and special funds		
ES-4	1.9	**Sirens/Warning Systems –** A warning system should be installed throughout the county to notify citizens of any dangerous weather or man-made event in a timely manner. In portions of the county where sirens/warning systems may have already been installed**,** they should be upgraded and incorporated into the countywide system.	Tornado	High	Town of Woodville Board of Aldermen and Mayor/Wilkinson County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation Grant, Individual County/City General Fund	Complete	In the event of inclement weather, it is essential that residents of the Town of Woodville receive timely warnings. Since 2005 the county has purchased and installed three additional sirens throughout the county.
ES-5	1.1	**Improve Emergency Evacuation Routes –** The Town of Woodville and Wilkinson County sees the need to improve the condition of the evacuation routes including upgrading bridges where needed	Radiological, wildfire, earthquake	High	Town of Woodville**/** Wilkinson County Board of Supervisors	Homeland Security grants, FEMA Hazard Mitigation grants, individual county general and special funds	2027	River Bend Nuclear Power Station is located approximately 17 miles south of Wilkinson County in Louisiana. Most of the county is in the 50-mile Ingestion Emergency Planning Zone. Adequate warning systems and timely evacuation are the citizens only defense in the event of a release of contaminants from the facility. Also, it is anticipated that should contaminants be released from River Bend, many Louisiana residents would need to evacuate to or through Wilkinson County. Wilkinson County is currently working on a Dam and Road reconstruction in the Lake Mary area. In 2011, the county received a grant through the Mississippi Development Authority to reconstruct and reopen a bridge in Fort Adams on Pond Rd. In 2012, the county applied for grant funds to rehab eight bridges, one of which is closed, in the Homochitto National Forest through the Federal Hwy Administration's Public Lands Highways fund. All of these efforts will help

								reopen roads for efficient evacuation. The county is still working to further improve evacuation routes, so this action will remain in the plan.
ES-7	1.9	**Safe Rooms and Community Shelters –** The town should construct and/or encourage construction of safe rooms and community shelters.	Hurricane, Tornado or other hazard requiring the use of emergency shelters	NA	NA	NA	NA	Deleted. Town of Woodville has a shelter.
ES-8	3.3	**Establish mass vaccination sites -** Held at Satellite, Temporary, or Off-Site Locations	Pandemic	Low	Town of Woodville**/** Wilkinson County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), individual city general and special funds	2027	New Action.
Public Education and Awareness								
PEA-1		**Media Campaign –** Encourage local newspapers, radio and television to periodically disseminate information regarding the potential dangers of earthquakes. The articles and information pieces will address existing and future buildings and infrastructure as well as other potential impacts.	Earthquake	Moderate	Town of Woodville**/** Wilkinson County Board of Supervisors	N/A	2027	Although there are no known occurrences of earthquakes originating within this region, this could change or earthquakes originating outside this region could negatively impact citizens. It is important that citizens are aware of the potential impacts of earthquakes, so this action will remain in the plan. The County is interested in conducting annual

								earthquake drills through the Great ShakeOut.
PEA-2		**Floodplain Management Workshops –** Host annual floodplain management related workshops to build around the new 'Floodplain Management Handbook for Community Administrators' and the possible inclusion of CRS related information by the ISO state representative. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Flood	High	Town of Woodville/ Wilkinson County Board of Supervisors through collaboration with the MEMA Mitigation Bureau	FEMA HMA grant – Building Resilient Infrastructure and Communities (BRIC) Partnerships project or similar.	2027	Local Floodplain Administrators and other public officials require continued training in the National Flood Insurance Program (NFIP). This action will remain in the plan as communities will need to continue to implement floodplain management activities to maintain their participation in the NFIP. There is continued interest within the county, but additional funding is needed to support this activity.
PEA-3	3.3	**Education: Community Outreach –** MDEQ to develop an outreach plan to include development and presentation of public information programs for residents in 'at risk' communities. Southwest Mississippi Planning and Development District volunteers to host meetings and/or workshops at our Natchez or Meadville offices.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-4	3.1	**Emergency Action Plans: Dam Owner Requirements –** Support MDEQ in outreach to high hazard and significant hazard dam owners concerning the development of acceptable emergency action plans.	Dam Failure	N/A	N/A	N/A	Deleted	Action deleted – this action is not applicable to the county.
PEA-5	3.1	**Education: FireWise** – Recommend that public information and outreach workshops on the Firewise program be scheduled and encourage participation at one and two-day workshops presented by the Forestry Commission for the benefit of elected and designated officials, vulnerable residents, structural firefighters and members of the State Fire Marshal's Office. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Wildfire	High	Town of Woodville**/** Wilkinson County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Mississippi Forestry Commission, general and special funds	2026	Homeowners and residents of the Wildland/Urban interface are at risk from wildfire. Existing structures in the danger zone and those considering constructing new homes and businesses within wildland settings should be educated on ways to minimize their risks. Participation in *FireWise* will improve communities' awareness of wildfire risk, so this action will remain in the plan.
PEA-6	4.1	**Education: Local Officials, Community Leaders and Others –** Recommend that	Radiological	High	Town of Woodville**/**	FEMA Emergency	In progress - 2027	The county continues these discussions. Local officials, community leaders and

		structured workshops be held periodically by MEMA to educate local officials, community leaders and other first responders, and primary care facilities concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.			Wilkinson County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds		other first responders, and primary care facilities should receive continuing education concerning evacuation procedures and treatment of affected individuals should a release of radiological materials occur. Therefore, this action will remain in the plan.
PEA-7	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically by MEMA to educate the general public concerning evacuation routes and procedures should a release of radiological materials occur. Southwest Mississippi Planning and Development District will volunteer to host meetings and/or workshops at our Natchez or Meadville offices.	Radiological	High	Town of Woodville**/** Wilkinson County Board of Supervisors through collaboration with the Southwest Mississippi Planning and Development District, Inc.	FEMA Emergency Management grants like Homeland Security Grant Program, Emergency Management Performance Grant, or other similar program in combination with individual county general and special funds	In progress - 2027	This remains an ongoing project. The public should receive continuing education concerning evacuation routes and procedures. Therefore, this action will remain in the plan.
PEA-8	3.2	**Media Campaign –** Encourage local newspapers, radio, and television to disseminate information regarding the potential dangers of extreme weather and/or temperatures during times of expected weather impacts, hot or cold depending on the need. The information disseminated will address how to prepare yourself and your home, and provide direction to those caring for pets, people with disabilities, or the elderly.	Extreme Heat, Winter Storm, Freeze, and Extreme Cold, Hailstorm, Severe Thunderstorm/High Wind, Lightning	Moderate	Town of Woodville**/** Wilkinson County Board of Supervisors	FEMA Hazard Mitigation grants, individual city general and special funds	2025	New Action
PEA-9	3.3	**Conduct an assessment to determine our community's vulnerable populations** and	Extreme Heat, Winter Storm,	Moderate	Town of Woodville**/**	FEMA Hazard Mitigation grants,	2026	New Action.

		determine what steps can be taken to meet the community needs.	Freeze, and Extreme Cold		Wilkinson County Board of Supervisors	US Economic Development Administration grants, individual city general and special funds		
PEA-10	3.1	**Education: Public Outreach –** Recommend that structured workshops and a media campaign be conducted periodically to educate the general public concerning public health and infections prevention procedures	Pandemic	Low	Town of Woodville**/** Wilkinson County Board of Supervisors	U.S Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC) CDC, Health Resources & Services Administration (HRSA), National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), individual city general and special funds	2024	New Action.

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