ALCORN STATE UNIVERSITY

Hazard Mitigation Plan

2024

In association with

The Alcorn State University

Hazard Mitigation Planning Committee

and

Homeland Preparedness & Security, LLC

Approved: 11/28/2024

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APPENDICES

1.0 EXECUTIVE SUMMARY

Alcorn State University's (ASU) Hazard Mitigation Planning process began in March of 2024, with grant funding provided by Mississippi Emergency Management Agency (MEMA) through the Hazard Mitigation Grant Program. Alcorn State University (ASU) was the primary grant recipient for the purpose of preparing the campus-specific Hazard Mitigation Plan. The goal of the project and planning process was to identify specific areas in which ASU could increase its resilience to natural disasters and minimize the costly impacts of natural disasters to the University. The update of this plan represents the continuation of the hazard mitigation planning process. Upon successful review and approval from FEMA, MEMA, and the Institution of Higher Learning (IHL), the University will be eligible to apply for FEMA Hazard Mitigation Grant assistance and other funding to financially assist in the implementation of mitigation measures outlined in the plan.

The plan mission statement is three-fold.

> First, to provide a safer environment for the University community by implementing measures designed to protect human health and safety. Secondly, to protect the assets of the University that represents a very significant investment on the part of the taxpayers of the State of Mississippi. The final goal is to implement measures that will ensure continuity of operations and to ensure the University continues to fulfill its mission prior to, during, and after a significant natural disaster event.

The University executed a professional services agreement with Homeland Preparedness & Security, LLC (HP&S) to guide the planning process. HP&S worked under the guidance of the ASU Hazard Mitigation Planning Committee. The ASU Committee is comprised of representatives from various divisions, departments, and functions of the University and includes representatives from Claiborne County. They provided valuable guidance and insight into university operations and the planning process and will continue to exist as an Ad Hoc committee to guide implementation of the plan.

The plan provides information relative to eight natural hazards that have the highest probability of affecting the University including:

- Drought / Extreme Temperatures
- Floods and Flash Flooding
- Hailstorms
- Hurricanes and Coastal Storms
- Severe Winter Storms
- Tornadoes and Funnel Clouds
- Wildfires
- Thunderstorms, Lightning, and High Wind

Through the planning process, the ASU Committee also eliminated eight hazards that had limited or no probability of affecting the University, including:

- Avalanche
- Coastal Erosion
- Dam Failure
- Earthquake

- Expansive Soils
- Land Subsidence
- Tsunami
- Volcano

In addition to addressing natural hazards, the ASU Committee, at the request of IHL in the original plan, addressed manmade hazards. Because of previous planning efforts addressing a variety of manmade hazards, the level of detail applied to manmade hazards in this plan is less than applied to natural hazards. However, many of the mitigation strategies selected for inclusion in the plan have potential benefits to manmade hazards.

The plan development process resulted in the University selecting and prioritizing twenty-six mitigation actions designed to reduce the University's vulnerability to probable natural hazards. The mitigation actions selected and prioritized range from policy actions, to planning initiatives, to actual physical improvements to select structures and buildings on campus and are all designed to address specific vulnerabilities.

1.1 Alcorn State University Mission Statement and Vision

Mission

Alcorn State University is a public historically Black, comprehensive land-grant institution of higher education that provides access and opportunity for diverse students to excel intellectually, build character, and overcome barriers so they can become productive leaders who make meaningful contributions to society. Enhancing its historic strengths in agriculture, education, and nursing, Alcorn State offers a range of undergraduate and graduate programs, including fine arts, business, humanities, social and behavioral sciences, and STEM.

The University accomplishes its mission through high standards of academic excellence, by engaging in scholarly research and discovery, and providing public service and outreach that address real-world challenges and the economic needs of the Southwest Mississippi River region, State of Mississippi, the nation, and the world. Alcorn strategically extends its resources and expertise throughout the entire state through agriculture extension service, its Vicksburg and Natchez sites as well as its distance learning programs.

Alcorn State University is committed to its tradition of instilling among its students and alumni ideals of leadership, service, and institutional pride.

Vision

Alcorn State University will achieve preeminence through transformative teaching and research excellence, collaborative partnerships, and innovative practices so our communities thrive, and our diverse students have unlimited opportunities to engage and lead in a globally competitive world.

Alcorn State University is Non-discriminatory

Alcorn State University does not discriminate based on race, color, national origin, sex, disability, or age in its programs and activities. The Director of Admissions and Records and

ADA/Civil Rights Coordinator ensures that "Under Served" populations are included in every and all facets of the college to make sure all the population is taken into consideration and is served. Therefore, there would be no underserved population at the college. For this Plan, the community being served is the campus of Alcorn State University. All communications, digital or otherwise include the entire and complete population of faculty, staff and students, therefore there is no underserved or vulnerable population.

1.2 Alcorn State University Hazard Mitigation Plan Adoption

The Hazard Mitigation Planning Committee is confident that the updated plan meets all required elements and includes supporting documentation. To avoid repeated attempts to adopt the plan prior to FEMA approval, the committee has opted to obtain a notice from FEMA that the plan is APA before adopting the plan. Per the *FEMA Guide to Local Mitigation Planning (March 2019)*, "communities are encouraged to submit the final draft of the mitigation plan to the state and FEMA for review prior to formal adoption by the elected officials or other authorized governing body. If FEMA determines the plan is not approvable and requires revisions, the community will be able to make revisions before initiating the plan adoption process, therefore, avoiding unnecessary delays in plan approval."

2.0 INTRODUCTION AND BACKGROUND INFORMATION

Alcorn State University (ASU), through a grant from the Mississippi Emergency Management Agency (MEMA) received continued funding assistance in 2024 for the purpose of conducting a plan update designed to provide the University with a campus-specific Hazard Mitigation Plan. This planning process is designed to analyze the University's vulnerability to a variety of hazard types and to determine mitigation actions and objectives that have the potential to limit those vulnerabilities. The grant is being funded through the Mississippi Emergency Management Agency (MEMA) State Hazard Mitigation Grant. The scope of the Mitigation Plan includes the main campus of ASU. The initial planned scope called for analysis and assessment of natural disasters only. However, at the request of IHL, manmade hazards are also being considered through the planning process, although it is not required by FEMA.

The University has a current emergency response plan and partners with Claiborne County in the development of the Claiborne County Comprehensive Emergency Management Plan that addresses the County and the University. Although the University does maintain these plans as part of an overall readiness and response strategy, this ASU Hazard Mitigation Plan is specific to the University and addresses the incorporation of mitigation strategies designed to limit vulnerability to critical facilities within the University. Organizationally, this plan will reference other existing plan documents and it is anticipated that those existing plans will be modified to reference this plan upon completion and adoption.

There are numerous examples and case studies of natural and manmade disasters that have had significant impacts to universities both in direct costs (damage to facilities and university assets) and indirect costs (loss of time and research capabilities). Mississippi and neighboring coastal states have recently experienced significant losses of university assets due to hurricanes and tropical weather activity. The Gulf Coast Research Lab and the USM Long Beach Campus were virtually destroyed in 2005 from the ravages of Hurricane Katrina. In November 2004, a tornado caused significant damage to the Mississippi University for Women.

The ASU campus represents a significant concentration of population. The ASU campus community includes approximately 5,788 students and approximately 500 faculty and staff for a total campus population of approximately 4,200 equating to a population density of approximately 4,349 people per square mile. In contrast, the overall population density of the nearby cities of Natchez and Vicksburg are approximately 1,243 and 759 persons per square mile, respectively. The high population density of the University suggests that any given hazard event could potentially impact a large population located within a relatively small land area. In addition, the University represents a significant investment on the part of the taxpayers of the State of Mississippi, not only in terms of brick-and-mortar infrastructure but also in terms of the University's economic impact and benefit to the region and the State as well as the value of research conducted within the University and intangible assets such as archival collections that are virtually irreplaceable. With these considerations, efforts related to mitigation planning and the mitigation strategies themselves are a critical element in ensuring that the University is resilient to potential future disaster events.

3.0 DESCRIPTION OF THE PLANNING PROCESS

Requirement §:201.6 Planning Process. To be effective, the plan must include the following elements: 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.

In the early stages of the planning process, ASU identified and communicated a seven-step planning process that would be followed to direct and organize planning activities. The primary steps in this process include:

1. Establishment of the planning process to include:
    a. Setting up the planning team and organizing an ASU Planning Committee
    b. Coordinating and communicating with project stakeholders and resource agencies
    c. Reviewing existing plans and other materials to plan for incorporation into the Plan
    d. Providing opportunities for public input into the plan and the planning process
2. Assessment of risks:
    a. Identification of potential hazard types
    b. Assessment of the risks associated with identified hazards
    c. Development of an inventory of University assets
    d. Determining the vulnerability of identified assets to identified hazards
3. Prioritization of Critical infrastructure, facilities, and University functions:
    a. Analysis of existing University infrastructure, facilities, and services
    b. Determination of those critical assets that must remain operational prior to, during, and immediately after a hazard event
    c. Consideration of mitigation measures and actions that will ensure continuity of service
4. Development of mitigation strategies:
    a. Definition of goals and objectives
    b. Identification and analysis of a comprehensive range of possible mitigation measures
    c. Development of an action plan for implementation of mitigation measures
5. Plan assembly:
    a. Incorporation of all plan elements into a single, consolidated document
    b. Conduct multiple levels of review including peer review, review on the University level, public review, and agency review
    c. Refinement of the plan to a final draft stage
6. Plan adoption:
    a. Obtain broad consensus on plan elements and recommendations
    b. Solicit stakeholder and public input
    c. Formal adoption of the plan by the University
7. Plan maintenance:
    a. Develop methods and schedules for regular monitoring, review, evaluation, and updates of the adopted plan
    b. Incorporation of the Mitigation Plan into other planning efforts such as the Campus Master Plan and capital improvement plans
    c. Provide a mechanism for continued public involvement

According to the Federal Emergency Management Agency (FEMA), any successful planning activity, such as the development of a comprehensive mitigation plan, involves bringing together a cross-section of the public to reach consensus on how to achieve a desired outcome or resolve a community problem. This process helps the public gain a better understanding of the challenges they face while aiding in the development of a common set of community values and widespread support for directing financial, technical, and human resources to an agreed-upon course of action.

The ASU Planning Committee provided critical oversight for the planning process and provided valuable input into plan development. The Committee was engaged early in the planning process and participated in all elements of plan development including identification of critical facilities, infrastructure, and functions; identification of potential hazards; and identification of priority mitigation measures.

The overall function of the Committee is critical to the long-term success and implementation of the plan to the extent that the Committee will be relied upon periodically throughout the implementation process to monitor progress of implementation and to ensure that the plan is updated regularly to maintain the relevance of the plan to existing conditions at the University. **Table 3.1** provides a listing of Committee members and their affiliation. A full record of agendas from all Committee meetings is provided in **Appendix A.** Public Outreach Meeting (Survey Monkey) results are provided in **Appendix B.** In the early stages of the planning process, ASU executed a contract with Homeland Preparedness & Security, LLC for project coordination of the planning process, assistance with organization of the committee and other planning resources, data gathering, analysis and interpretation, and plan development and assembly. The process of developing the ASU plan document was completed by HP&S through the direction and guidance of the ASU Hazard Mitigation Planning Committee. Although HP&S is the primary author of the plan, the content was guided and directed by the Planning Committee and the plan is reflective of input and information obtained from the committee through a series of meetings conducted throughout the planning process.

From a chronological standpoint, the plan development process followed the overall planning process as previously described. Each subsequent Planning Committee meeting provided guidance and valuable information that was then incorporated into the plan. The plan development process was also guided by several FEMA documents including the Local Mitigation Plan Review Tool 9-30-2019.

A meeting via conference call was held with a MEMA Advisory Committee Team to discuss the plan process thus far and to discuss the FEMA Local Mitigation Plan Review Tool.

> Requirement CFR §201.6(d)(3) A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding.

Prior to the first planning meeting, committee members were encouraged to begin considering possible goals and projects for revising and updating the Plan, by considering who would serve on committees to help in making decisions concerning the plan.

The ASU Hazard Mitigation Planning Committee reviewed the original plan and determined that there have been no changes in development that would impact ASU's overall vulnerability,

therefore; there have not been any changes in the priorities of the mitigation actions. There has been some progress made in local mitigation efforts. See **Table 7.1** to review the updated and pending mitigation actions.

The first meeting was held on April 5, 2024 at Alcorn State University at the Lorman Campus (See **Appendix A** for agenda and sign-in sheet). Members from the college community disciplines and organizations were invited to the meeting. A power-point was presented by Homeland Preparedness & Securities, LLC, to expound on the importance of plan updating and the process of plan updating. The methodology to be used in risk assessment was discussed, and goals and objectives were discussed. The planning committee decided on building vulnerabilities.

Table 3.1 ASU Hazard Mitigation Planning Committee

NAME	Organization	Affiliation
Mrs. Maxine Greenleaf	ASU	Vice President of Marketing & Communication
Dr. Joyce Buckner-Brown	ASU	Provost
Mr. Earl Robinson	ASU	Athletic Director
Dr. Marcus Ward	ASU	Vice President for Institutional Advancement
Mr. Glynn Babb	IHL	Institutions of Higher Learning
Mrs. Yadonna Watts	ASU	Director of Residence Life
Dr. Edward Rice II	ASU	Vice President of Student Affairs & Enrollment Management
Mrs. Tomeka Moore	ASU	Director of Internal Audit
Dr. Dexter Wakefield	ASU	Dean of Agriculture
Mrs. Karen R Shedrick	ASU	Chief of Staff/Executive Assistant to the President
Mrs. Naundra Heidelberg	ASU	Director of Student Engagement
Mrs. Lljuna Weir	ASU	Assistant Vice President of Student Services/Dean of Students
Mr. Windell Harried	ASU	Director of Operations

Mr. Marvin Ratcliff	Claiborne County	Emergency Management Director

An ASU Emergency Operations Leadership Team was established consisting of ASU staff and the consulting firm that is updating and revising the Plan. This group will work closely with the Hazard Mitigation Planning Committee to obtain the needed information and guidance to amend the plan. The Leadership Team members are listed in **Table 3.2**.

Table 3.2	**ASU Emergency Operations Leadership Team**
Dr. Edward Rice II Vice President for Student Affairs and Enrollment Management Alcorn State University	
Lloyd Nesbitt Associate Vice President for Facilities Management Alcorn State University	
Mr. Douglas Stewart Police Chief Alcorn State University	
Mr. Kelvin Ray White Fire Chief Alcorn State University	
Desmond Stewart Interim Chief Information Technology Officer Alcorn State University	
Carolyn Nelson Consultant/Planner Homeland Preparedness and Security, LLC	
Mr. Kent Buckley Owner/Manager Homeland Preparedness and Security, LLC	

In addition, an Advisory Committee was formed to assist the ASU Hazard Mitigation Planning Committee by providing specialized knowledge from the state and federal emergency management arenas. Members of the Advisory Committee are listed in **Table 3.3**.

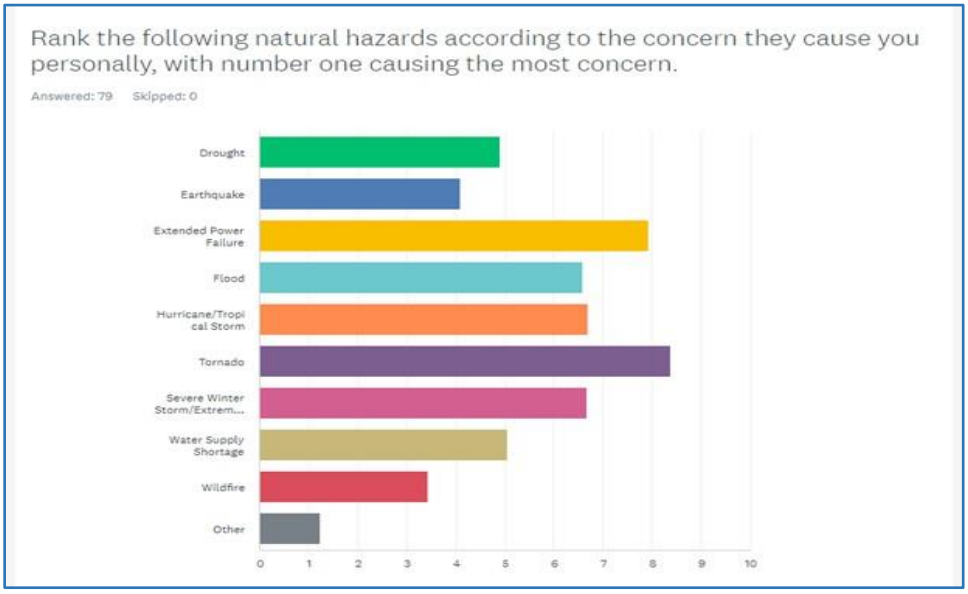
Table 3.3	**ASU Advisory Committee**
Ms. Jana Henderson Director Mitigation Office Mississippi Emergency Management Agency	
Mr. Frank Hill Bureau Director, Mitigation Plans Mississippi Emergency Management Agency	
Mr. Calvin Williams Hazard Mitigation Specialist Mississippi Emergency Management Agency	

3.1 PUBLIC OUTREACH EFFORTS

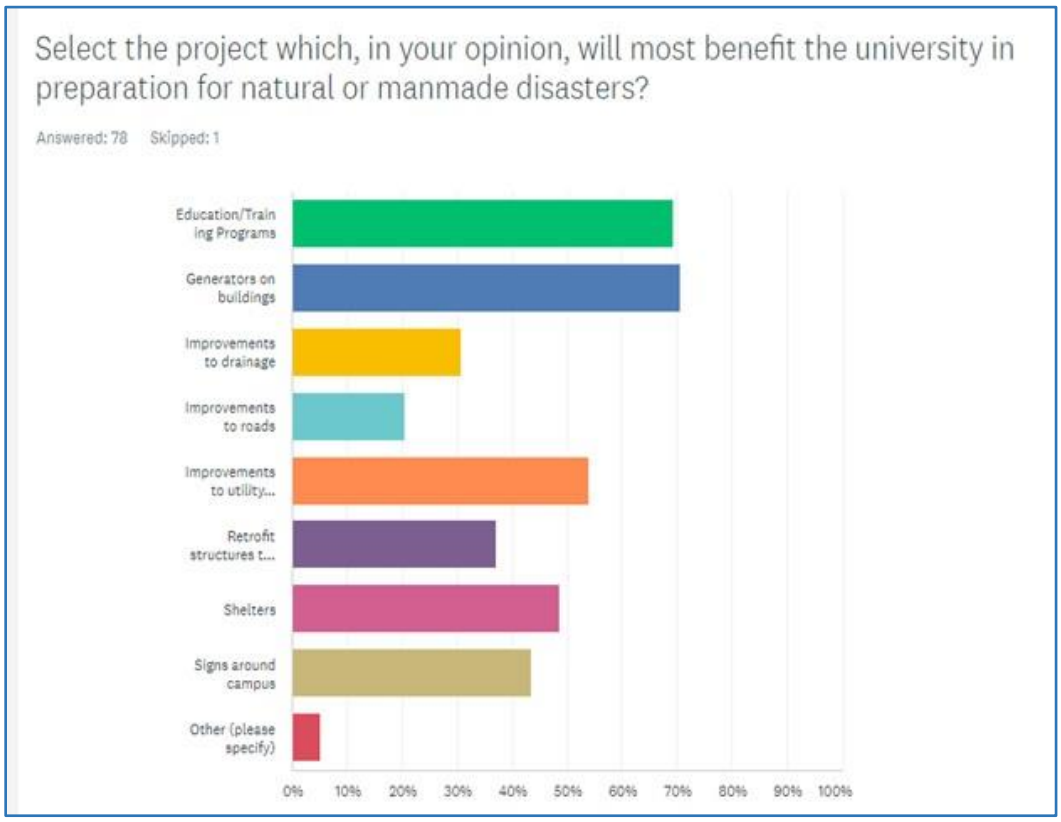
> Requirement §:201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (1) an opportunity for the public to comment on the plan during the drafting stage and prior to Plan approval; (2) an opportunity for neighboring 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 private and non--profit interest to be involved in the planning process.

ASU conducted two public outreach efforts to receive a broad spectrum of input into the planning process. These outreach efforts were conducted using Survey Monkey. During the first planning meeting, it was decided that Survey Monkey would be used for public input for several reasons: (1) physical meetings usually fall short of attendance and input; (2) The newest technology has determined that public meetings via online software are proven more effective for community input towards community projects (3) ASU has an email system that is used consistently throughout the campus for on-line surveys and other outreach. Therefore, an online survey allows today's fast paced public to participate in the survey and offer input on the go. The first outreach was performed during the beginning stages of the planning process and targeted the University community including students, faculty, and staff; this outreach effort began April 8, 2024, and lasted for seven days. Participation in the survey was announced via a mass emailing to all University students, faculty, and staff. The community for this plan is Alcorn State University and the communications are sent to each and every faculty staff and student so there is no underserved population. This The email link to the survey was included in the email. The University received comments about the potential hazards that are of concern to the public. See **Appendix B** for survey documentation for the first public outreach meeting.

As stated in the prior paragraph, the University community (public) was involved in the first survey, which was the drafting stage. There were ten questions and one comment statement. One of the primary questions was, what natural hazard concerned the campus the most. A chart is provided to disclose the most preferred method as reflected by the survey results. See **Figure 3.1** below.



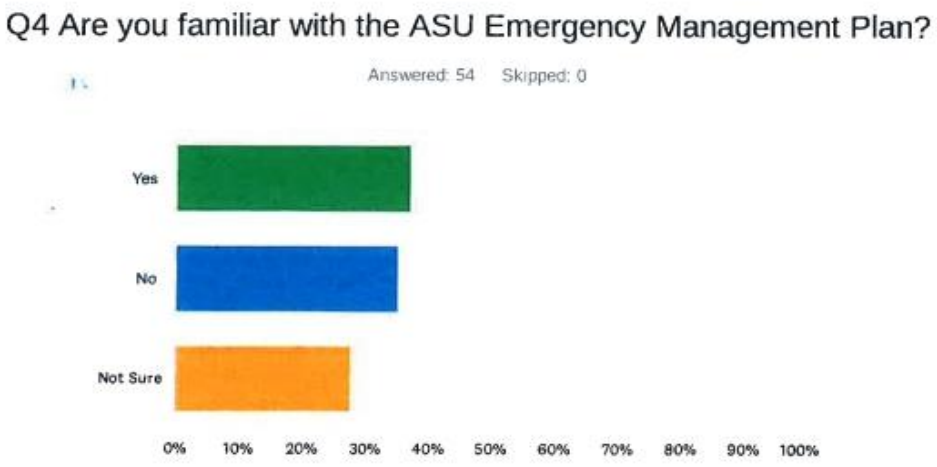
Projects always ensues the planning process. One of the questions put forth in the survey asks what projects should be considered to better mitigate disasters. The results of the answers have been formatted into a graph. See **Figure 3.2** below.



The second public outreach, offered the public opportunity for input and comments and was presented during July 2024 and targeted both the University community and the public in the surrounding communities, including the city of Port Gibson, along with the counties of Claiborne, Adams, and Warren – to include government representatives and non-profits. Public input relative to the second

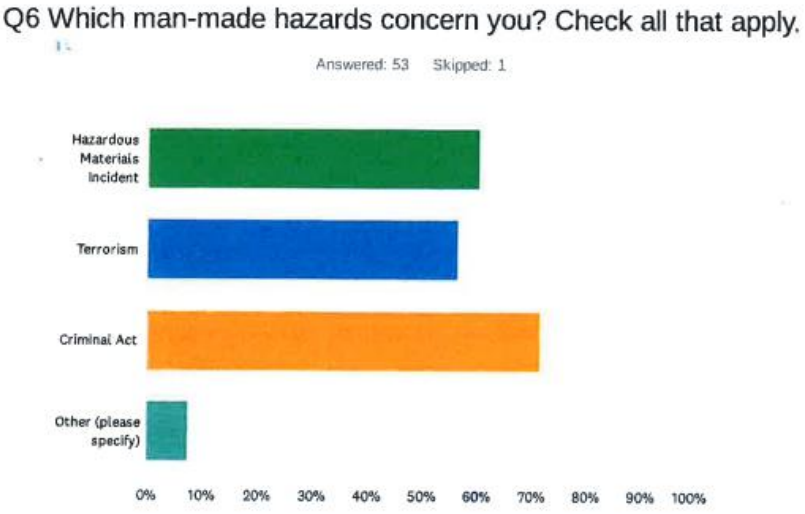
public outreach effort, including the survey questions and responses is included in **Appendix B.** There were 35 participants to include elected officials, citizens, first responders, and supporters from the three campus areas. Again, there were 10 questions that were similar to the first survey but were more correlated to the plan draft due to the fact that all participants were to view the attached draft plan and answer survey questions in regard to the plan. There was a campus blast email directed at elected officials, first responders, citizens, and supporters of the three campuses. This allowed input from responders outside of the Alcorn community as input from neighboring communities is helpful.

One of the important questions in this survey was, "Are you familiar with the university's Hazard Mitigation Plan. See **Figure 3.3** below for percentage answers to the question.



ANSWER CHOICES	RESPONSES	
Yes	37.04%	20
No	35.19%	19
Not Sure	27.78%	15
TOTAL		54

Another important question addressed in this survey was, which manmade hazards concern you the most? **Figure 3.4** below reflects the answers in percentage format.



ANSWER CHOICES	RESPONSES	
Hazardous Materials Incident	60.38%	32
Terrorism	56.60%	30
Criminal Act	71.70%	38
Other (please specify)	7.55%	4
Total Respondents: 53		

3.2 RELATED PLANNING EFFORTS

In addition to this Hazard Mitigation Plan, ASU has been the subject of two primary emergency management plans. These include the Claiborne County Comprehensive Emergency Management Plan and the Alcorn State University Emergency Management Plan. The Claiborne County Emergency Management Plan established a framework for operations and command in response to a variety of incident types throughout the County including natural and manmade disasters. The Plan provides for incident command based on the National Incident Management System (NIMS) through a unified command approach. The plan also addresses continuity of government and continuity of operations.

The Alcorn State University Emergency Management Plan establishes procedures for various states of awareness and establishes specific priorities for response and recovering including:

- Priority I: Protection of Life and Property
- Priority II: Maintenance of Life Support
- Priority III: Assessment of Damages and Restoration of General Campus Operations

Through the Emergency Management Plan, protocols and chains of command are established through designation of a Core Response Team and Building Mayors with specific areas of responsibility. The Plan also provides for cooperation with local agencies such as local sheriff and police departments, local fire departments, and local civil defense directors. The Plan addresses both natural and manmade hazards and is designed to create policies and protocols that allow the University to appropriately respond to emergency situations in a safe, effective, and timely manner.

In addition to these plans, the Grand Gulf Nuclear Power Plant has an Emergency Management Plan that includes ASU due to the University's proximity to the plant. The plan includes emergency

response procedures, incident command policies, and evacuation strategies for areas included in the emergency operations area.

Information included in this plan provided part of the foundation for establishment of vulnerabilities and risk and contributed to development of mitigation strategies. To better use resources and planning efforts across the planning area, the existing planning initiatives listed in the county's plans were reviewed and incorporated in the hazard identification and risk assessment. A review of plans and development regulations for jurisdictions within which ASU facilities are located, was conducted for consideration in the planning process.

ASU also has their own regulatory Emergency Management Plan and Master Building Plan, student handbooks, and other various plans. Some of these plans are discussed and mentioned throughout the plan. All ASU campuses fall under all ASU rules, policies, and regulations. Alcorn State University also falls under the Institutions of Higher Learning(IHL) in the State of Mississippi. All building codes have to be met, and funding sources acquired for all building projects subject to approval of IHL.

State of Mississippi Hazard Mitigation Plan

Developed by the State of Mississippi Emergency Management, the State Hazard Mitigation Plan outlines risks, mitigation capabilities, strategies, and actions on a state level. The ASU plan will roll up to the county and state plan to ensure their mitigation needs are addressed in future planning initiatives. The State Hazard Mitigation Plan is still under revision.

Regional Hazard Mitigation Plan

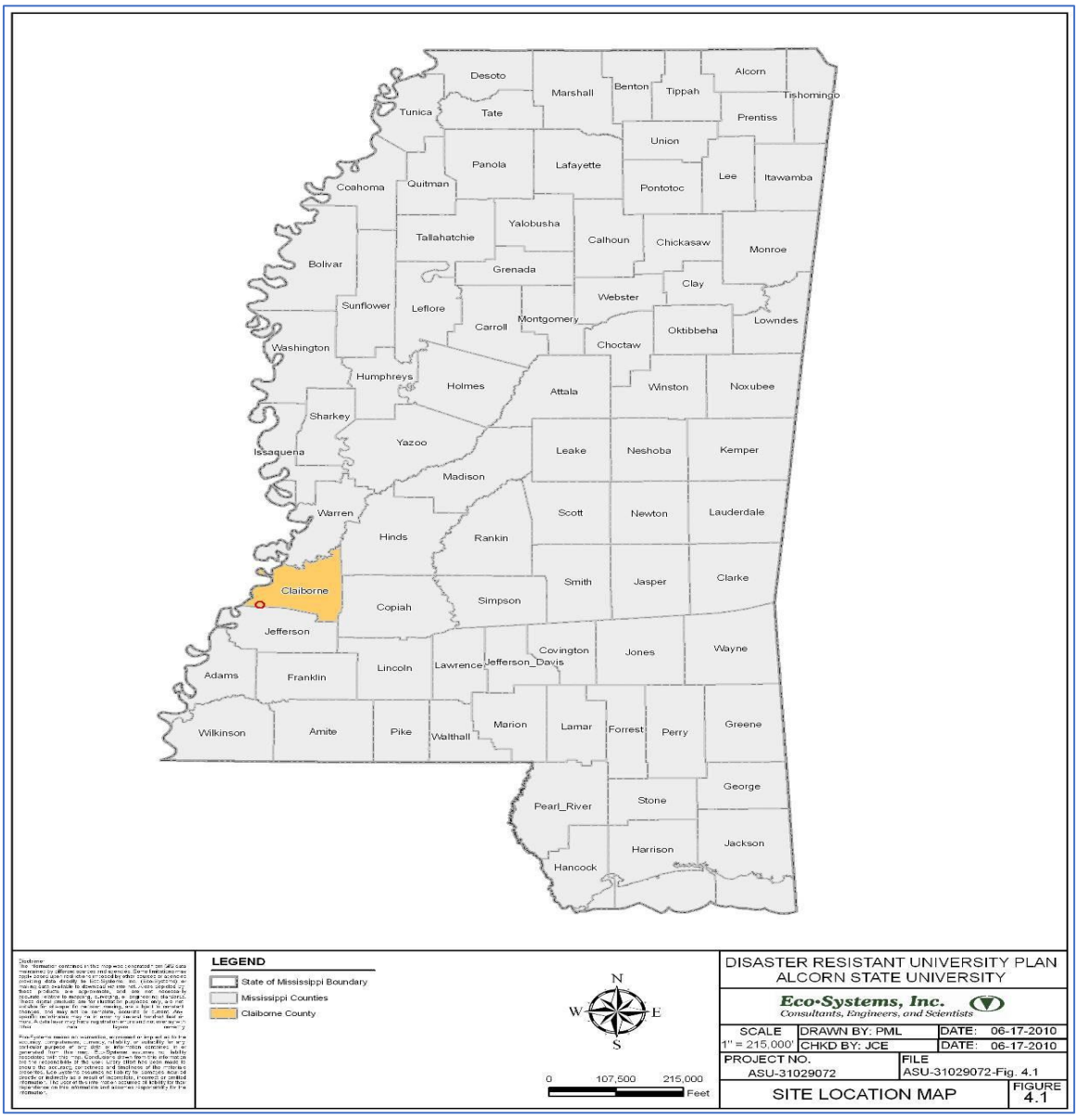
The Adams, Claiborne, and Warren counties Hazard Mitigation Plans have been updated and merged into a regional hazard mitigation plan. The planning district staff worked with the Emergency Management Agency Directors in each of these three counties. The Regional Hazard Mitigation Plan offers relevant hazard mitigation planning information for inclusion in this ASU Hazard Mitigation Plan.

4.0 HAZARD IDENTIFICATION AND RISK ASSESSMENT

4.1 INTRODUCTION TO THE PLANNING JURISDICTION

The Lorman Campus of Alcorn State University is in southwest Mississippi with most of the campus existing in Claiborne County with a small portion of the southern edge of campus in Jefferson County. See **Figure 4.1** below. The nearest incorporated municipality to campus is the City of Port Gibson, approximately ten miles to the northeast. ASU's Lorman Campus is directly accessible to U.S. Highway 61 via Mississippi Highway 552. Highway 61 provides convenient access from ASU to the Cities of Natchez, Port Gibson, Fayette, and Vicksburg. While ASU is not constrained by urban development like many of the other university campuses in Mississippi, its geographic setting does present interesting challenges with respect to hazard mitigation.

Figure 4.1 Site Location Map



The Lorman Campus of ASU is geographically isolated and is a minimum of ten miles from the nearest population center (Port Gibson). From a mitigation planning perspective, this isolation means the University must have the means and preparedness to be fully self-sustaining for a period of time following a significant natural disaster. Through discussions with the ASU Committee, a period of one calendar week was the benchmark time period the University must plan for to be self-sustaining following a disaster or hazard event.

4.2 INTRODUCTION TO THE RISK ASSESSMENT

> Requirement CFR §201.6(2) A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

Hazard identification is the process of recognizing risk-related events that threaten a community. Events are described as natural or human-caused hazards that inflict harm on people or property or interfere with commerce or human activities. Such events would include, but are not limited to hurricanes, floods, tornadoes, structure fires and other incidents that can affect populated areas.

The process of determining appropriate mitigation actions and strategies begins with the identification of the types of hazards that have the greatest potential of impacting the identified University facilities and conducting an analysis and evaluation of the potential significance of each hazard. **Table 4.1** provides a listing and preliminary evaluation of the probability of occurrence of each hazard type as well as priority ranking for mitigation measures based on the probability of impacts and the likelihood of occurrence. In addition to an analysis of natural hazards, IHL previously requested that the Plan consider manmade hazards as they relate to potential impacts to the University. The hazards listed in **Table 4.1** are consistent with the hazards identified by FEMA for hazard mitigation planning efforts.

Table 4.1 ASU Hazard Identification Worksheet

FEMA's List of Natural Hazards	Hazards Identified in MS State Plan	Hazards Identified in County Plans	Hazards Considered for 2024 ASU Plan
Avalanche			
Coastal Erosion			
Coastal Storm			
Drought	X	X	X
Earthquake	X	X	
Expansive Soils		X	
Extreme Heat		X	X
Flash Flooding	X		X
Fog			
Hailstorm		X	X

Table 4.1	**ASU Hazard Identification Worksheet**		
FEMA's List of Natural Hazards	**Hazards Identified in MS State Plan**	**Hazards Identified in County Plans**	**Hazards Considered for 2024 ASU Plan**
High-Wind			X
Hurricane	X	X	X
Land Subsidence		X	
Landslide			
Levee Failure	X		
Sea Level Rise			
Winter Storm/Extreme Cold/Ice Storms	X	X	X
Tornado	X	X	X
Tsunami			
Volcano			
Wildfire	X	X	X
Lightning			X
Storm Surge			
Salt Water Intrusion			
Thunderstorm		X	X
Human-Caused Hazards			
Arson			
Biohazard/Pandemic			
Civil Disorder			
Dam Failure	X	X	
Hazardous Materials Incident		X	X
Industrial Accidents			
Nuclear Facility Incident		X	X

Hazards identified for consideration in **Table 4.1** are categorized as high, medium, or low priority in terms of potential severity of the event, likelihood of occurrence, and potential losses from each event type. To place discussions of potential hazard types in a logical order, the following sections provide information relative to those hazards not considered to have the potential to impact the University. Detailed discussions of each hazard type, determined to be of concern to the University, are included in ***Section 6.0, Profiles of Potential Hazards of Concern.*** Probability of occurrence as "High", "Medium", or "Low" is based on a number of factors, including historical occurrence data included in **Section 6.0**, general data for the region, topography, and geography (i.e. proximity to coastal zones, earthquake zones, etc.). A high probability of occurrence indicates that a hazard of this type will occur at some point in the future. A medium probability of occurrence indicates a history of occurrence but considers the random and unpredictable nature of the event type. A low probability of occurrence indicates a general lack of historical occurrences and also factors in the random and unpredictable nature of the event (i.e. lightning). In similar fashion, mitigation priorities

for each hazard type were listed as "High", "Medium", and "Low". A high mitigation priority is one that would address an imminent threat or a hazard that has a high probability for occurrence. A medium mitigation priority is one that would address a hazard determined to have a medium probability of occurrence. A low mitigation priority is one that would address a hazard determined to have a low probability of occurrence or that would have a particularly low relative cost-benefit ratio. Likewise, low potential severity of an event is one that would not cause significant damage or interruption of services and activities on campus. An event with medium potential severity is one that would cause moderate damage and would potentially disrupt campus services and activities for a short-term period of time, generally a day or two. An event with high potential severity is one that would cause significant damage to the university and would disrupt services and activities on campus for an extended or long-term period (3 days or more). **Table 4.2** gives a visual picture description of "High", "Medium" or "Low" Qualitative Risk probability, with "Very High" having a 70-100% probability in the next year; "High" – 40-70%; "Moderate" – 10-40%; "Low" – 1-10%; and "Very Low"- less than 1%. These risk and probability percentages are used throughout the plan to properly evaluate hazards on a yearly basis.

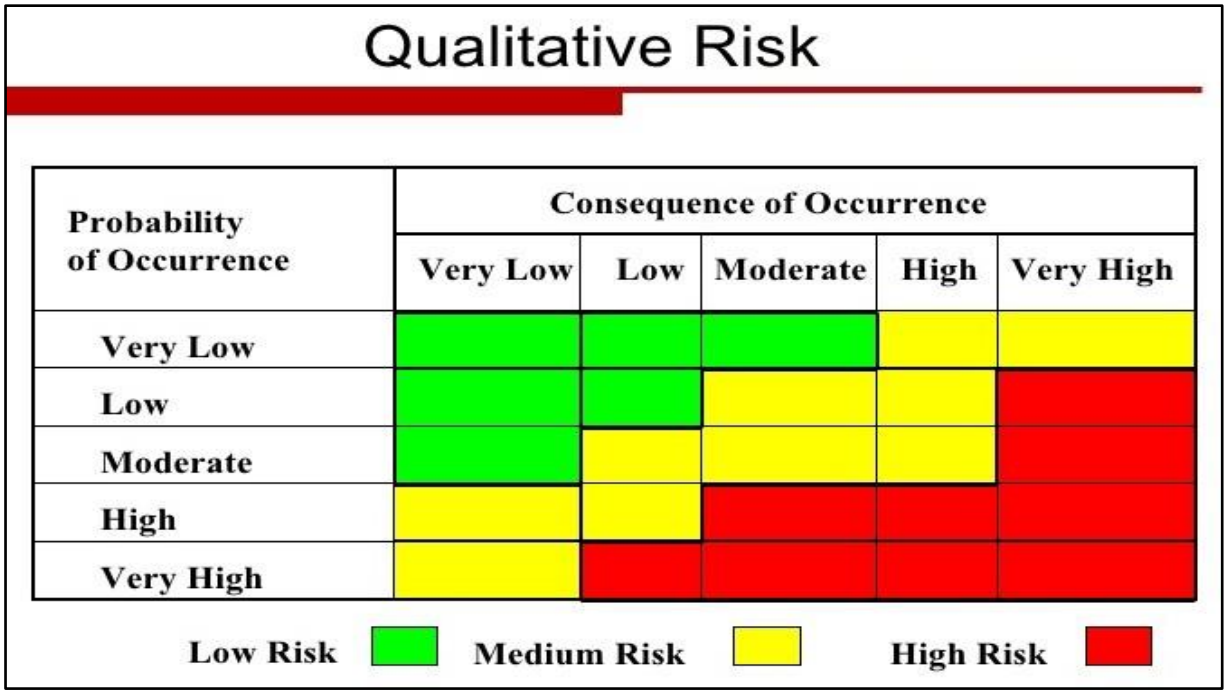


Table 4.2 (Defining Low Risk, Medium Risk, & High Risk as pertaining to ASU Hazard Occurrence in a Given Year with Low being 0-33%; Medium – 34-66%; High – 67-100%)

For each hazard addressed in the plan, the Hazard Mitigation Planning Committee was asked to provide qualitative damage/loss estimates, using low/medium/high designations and based upon their knowledge of the campus community and its facilities. Committee members looked at potential risk to people/life safety (loss of life or injury), risk to buildings and critical facilities (primarily damage to the physical structure), risk to infrastructure (utilities and roads), and college mission. **Table 4.3** shows the methodology used to determine the qualitative results provided in **Table 4.4**.

Table 4.3	**ASU Proposed Qualitative Hazard Ranking Assessment Methodology**
Impacts to People	
Low	10% or less of people impacted
Moderate	11% to 30% of people impacted
High	31% or more of people impacted
Additional Parameters	Psychological impacts; "people" includes students, staff, and faculty; disruptions that occur to people off campus; and, on campus residents vs. commuters
Impacts to Business	
Low	10% or less of buildings impacted; or, limited to L5 facilities
Moderate	11% to 30% of buildings impacted; or, limited to L4 and L5 facilities
High	31% or more of buildings impacted
Additional Parameters	Degree of structural damages; available mitigation measures; continuity of operations; and, loss of function
Impacts to Infrastructure	
Low	Loss of Function for 1 to 2 days
Moderate	Loss of Function for 3 days to a week
High	Loss of Function for greater than a week
Additional Parameters	Includes transportation, communications, electricity or gas for heat, water, sanitary sewer and access to campus. Considerations include the percentage of people impacted or areas of the campus impacted
Impacts to College Mission	
Low	Minor class disruption
Moderate	Some classes cancelled or relocated for less than a week
High	A campus closure of longer than a week
Additional Parameters	This is very tied into the other impact categories. Long term effects on economic viability or sustainability are possible

Table 4.4	**Qualitative Risk Assessment**		
People	**Buildings**	**Infrastructure**	**Mission**
Drought			
LOW	LOW	LOW	LOW
Earthquake			
LOW	LOW	LOW	LOW
Expansive Soils			
LOW	LOW	LOW	LOW

Table 4.4 Qualitative Risk Assessment			
People	**Buildings**	**Infrastructure**	**Mission**
Extreme Heat			
LOW	LOW	LOW	LOW
Flash Flood			
LOW	LOW	LOW	LOW
Hail Storm			
LOW	LOW	LOW	LOW
High Wind			
HIGH	HIGH	HIGH	HIGH
Hurricane			
MED	MED	MED	LOW
Levee Failure			
LOW	LOW	LOW	LOW
Lightning			
MED	LOW	MED	LOW
Severe Winter Storm/ Extreme Cold/Ice Storm			
LOW	LOW	LOW	LOW
Structure Fire			
MED	MED	MED	MED
Tornado			
MED	MED	MED	MED
Wildfire			
LOW	LOW	LOW	LOW
Hazardous Materials Incident			
LOW	LOW	LOW	LOW
Radiological			
LOW	LOW	LOW	LOW

Detailed information for each identified hazard type including historical occurrence data, probability of future occurrences, the University's vulnerability to each hazard type, and potential impacts to the University are included in ***Section 6.0 Profiles of Potential Hazards of Concern***.

4.3 IDENTIFICATION OF HAZARDS NOT CONSIDERED A CONCERN TO THE UNIVERSITY

4.3.1 Avalanche

An avalanche typically refers to the slope failure of a mass of snow and ice on a mountainside that

moves swiftly down to lower elevations, growing in size as it descends and collecting debris such as rocks, boulders and vegetation along the way. This type of event can occur on slopes exceeding 20 to 30 degrees. Since the campus of ASU is located in southern Mississippi where snow accumulation is rare, and the topographical elevation varies only as much as approximately 50 feet for the surrounding area, the hazard potential posed by an avalanche is considered to be zero.

4.3.2 Coastal Erosion

The campus of ASU is located approximately 150 miles from the Gulf of Mexico and is therefore not subject to coastal erosion. This hazard poses no potential threat to the university.

4.3.3 Dam Failure

According to MDEQ, there have been at least 25 dam failures resulting in 318 deaths in the United States since 1960. There are approximately 3,433 dams in the State of Mississippi according to the USACE. Each year, numbers of those dams are breached both intentionally and unintentionally. Records indicate that there have been no dam failures in the Claiborne County area in recent years. In fact, there have been no reported deaths from dam breaches in the State of Mississippi to date. Alcorn Lake on the ASU campus is listed by MDEQ as a low-hazard dam, although; the standpipe overflow system on the largest of these lakes failed in the summer of 2018, resulting in the entire fourteen-acre lake draining in two days to property behind the campus. Based on current Geographic Information Systems Data obtained from the State of Mississippi, there are no other dams within a five-mile radius of the University. The nearest high-hazard dam is located approximately 12.5 miles northeast of the ASU campus. Due to the absence of potentially hazardous dams within the vicinity of the university, dam failure is considered to pose no threat and was given no further consideration.

4.3.4 Earthquakes

Earthquakes can be described as the positive and negative acceleration of the ground over a relatively short period of time; seconds or fractions of a second and can last for minutes. The effect of the ground acceleration can be very destructive to buildings and other structures, particularly in areas of the United States where the intensity of the acceleration is severe. Fortunately, the incidence of earthquake occurrence is somewhat rare in Mississippi and when earthquakes have occurred, they have caused very little damage. The majority of the earthquakes occurring in Mississippi are centered in the northern two-thirds of the state. However, there was at least one earthquake that was centered as far south as the Gulf Coast. The latest recorded earthquake was a 3.2 on the Richter Scale SSW of Canton on May 3, 2015, with an intensity of IV, light with no damage reported.

The ASU campus is in an area described by the United States Geological Survey as having a ***%g*** rating of 6-8. This means that the expected acceleration due to an earthquake occurring at or near the campus of ASU would be 6% of the acceleration due to gravity. For perspective, there are certain areas of California with a rating of 350% and thousands of square miles of California near the coastline classified within the 120% rating zone. **Figure 4.2** is a seismic hazard map depicting the location of the ASU campus within the appropriate seismic zone. **Figure 4.3** depicts the Intensity Zones of the state in relation to the ASU campus.

Figure 4.2 Seismic Hazard Map Depicting Location of ASU Campus

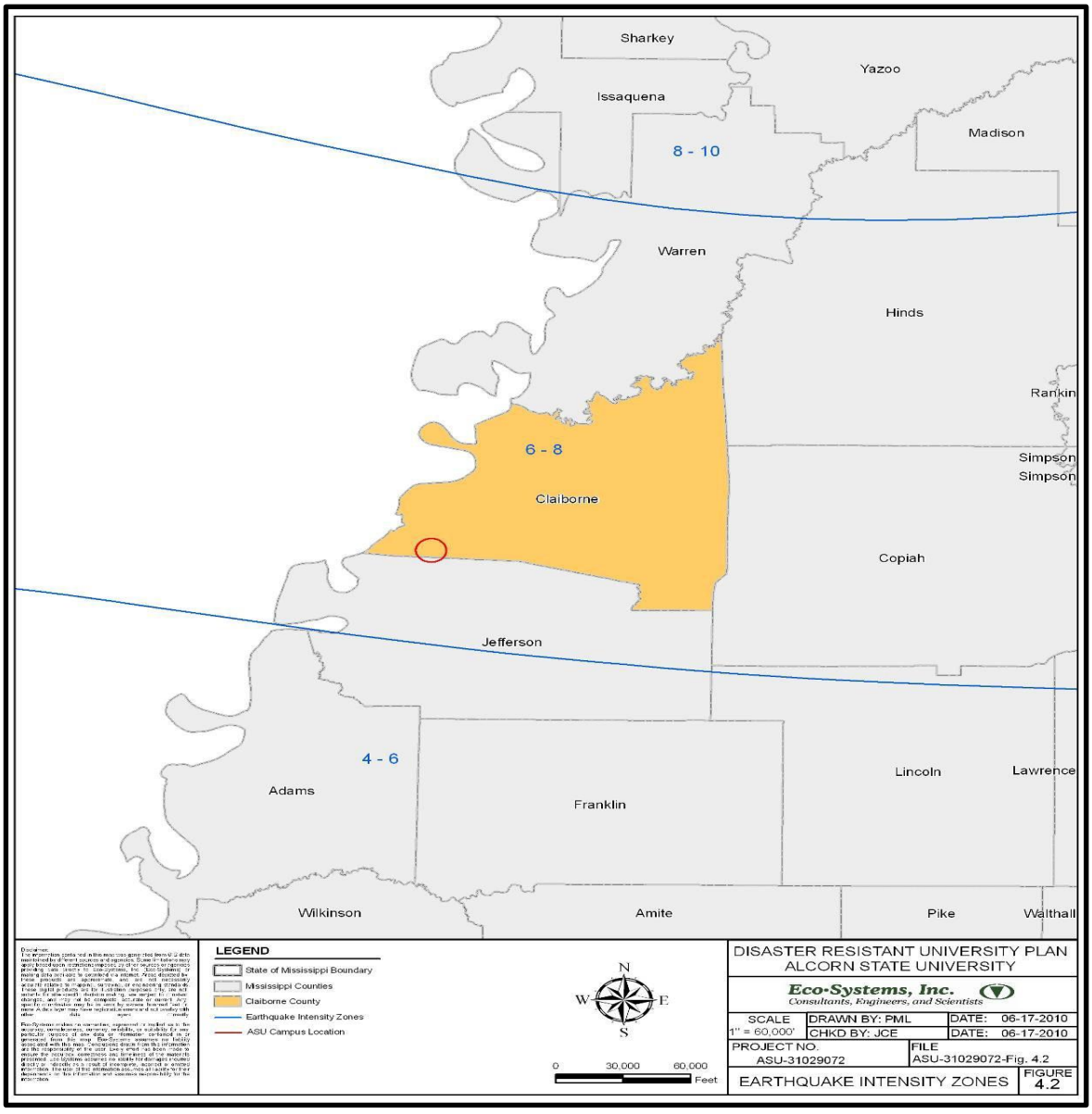
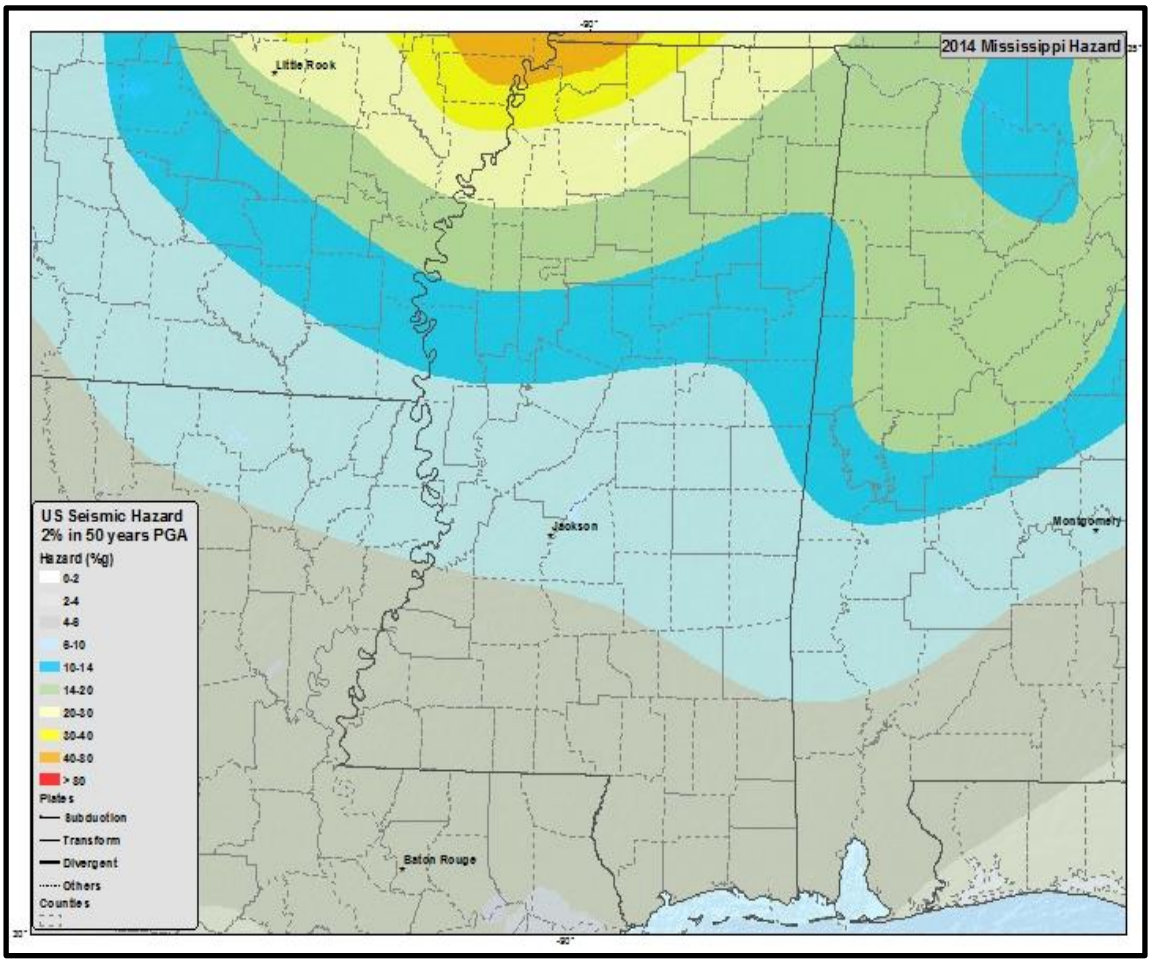


Figure 4.3 Intensity Zones in Relation to the ASU Campus



To calculate risks associated with potential earthquake damage, FEMA's HAZUS-MH model was used. Through the model's output, it was calculated that the probability of no damage to facilities from a Magnitude 5 earthquake was approximately 85.64%. The effects of an earthquake, as mentioned above for Canton, MS, can be found at the top of the Richter Scale as illustrated below in **Table 4.5**.

Table 4.5 Typical Effects of Specific Earthquake Magnitudes
(Source: USGS)

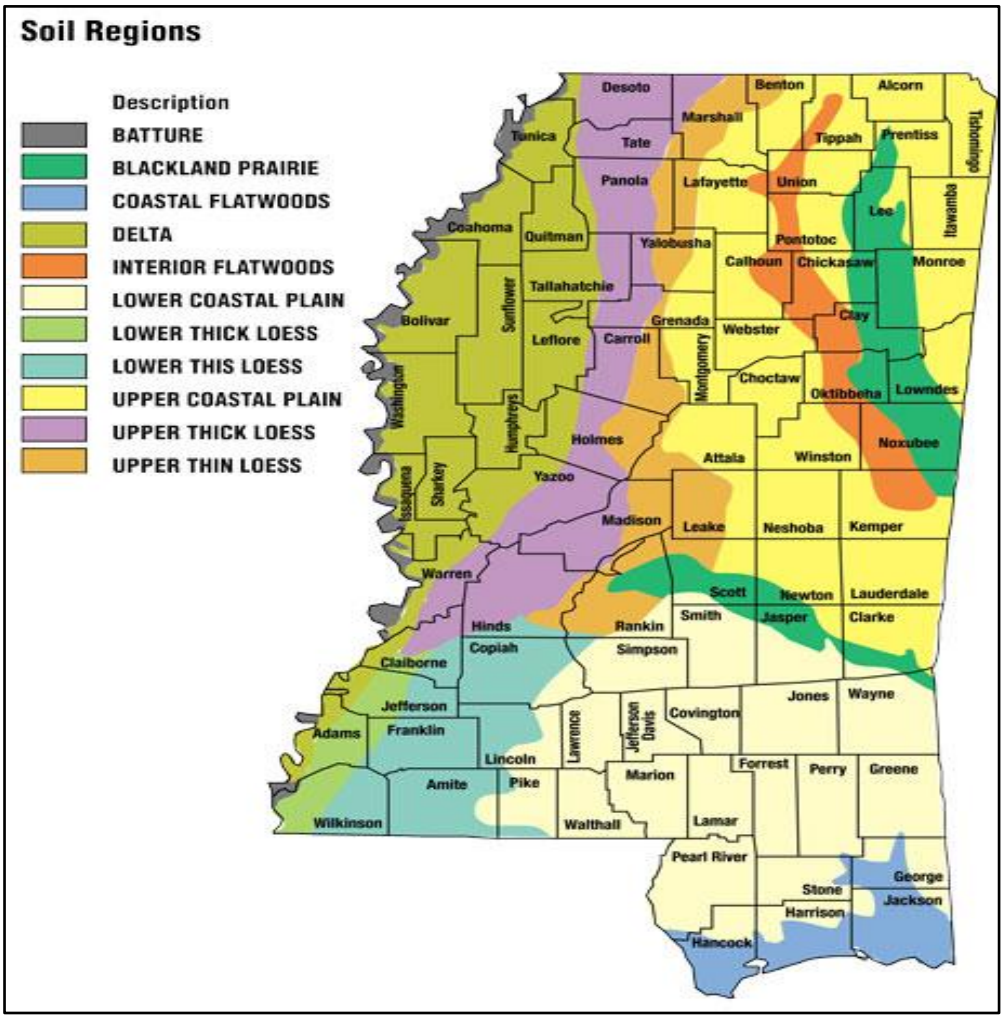
Richter Scale Number	Typical Effects
< 3.4	Detected only by seismometers.
3.5 - 4.2	Sometimes noticeable indoors.
4.3 - 4.8	Most people notice them: windows rattle.
4.9 - 5.4	Everyone notices them: dishes may break, and open doors swing.
5.5 - 6.1	Slight damage to buildings: plaster cracks and bricks fall.
6.2 - 6.9	Much damage to buildings: chimneys fall; and houses move on foundations.
7.0 - 7.3	Serious damage: bridges twist: walls fracture; and buildings may collapse.
7.4 - 7.9	Great damage: most buildings collapse.
> 8.0	Total damage: surface waves seen, and objects thrown in the air.

4.3.5 Expansive Soils

Soils differ in their ability to absorb and retain moisture. Generally, as a soil absorbs more moisture, it has a tendency to expand. Soils with higher clay content typically can absorb and retain very high levels of moisture. These soils also tend to have higher linear extensibility (shrink-swell potential). Most of the ASU campus is underlain by two soil types with each type representing approximately one third of the total composition. The soil identified as Gullied Land comprises approximately 33% of the campus surface soil. This soil type has a linear extensibility of 1.5%, a 10.0% plasticity index and a 26.0% liquid limit. The other primary soil type is described as the Memphis Silt Loam and it comprises approximately 33% of the campus area. This soil type has a linear extensibility of 1.5%, a 5% plasticity index and a liquid limit of 22.5%. These attributes mean that the soil has mild plasticity and limited potential to cause damage to structures, due to its shrink-swell potential. It is therefore not considered as a potential hazard to the university. The remaining third of the campus is comprised of a mixture of 10 different soils and surface water. The other evaluated soils have characteristics similar to the dominant soils on campus and would therefore pose a similar level of threat to campus structures.

Figure 4.4 demonstrates soil types of the ASU campus, along with soil types for Claiborne County and the state of Mississippi.

Figure 4.4 Soil Types



4.3.6 Land Subsidence

The subsidence of land is the sinking of land elevation due to consolidated materials or the collapse of a section of land due to large subsurface voids. In the case of large sinking land masses, the cause is generally the extraction of subsurface fluids such as groundwater or petroleum. Some examples of this type of subsidence include the City of New Orleans, Houston, Texas and the San Joaquin Valley, California. Additionally, subsurface caverns resulting from mining or from the natural dissolution of certain rock types (gypsum and limestone) can collapse and create a surface sinkhole. Claiborne County and more specifically, the campus of ASU is located on the Catahoula formation that consists of primarily irregularly bedded gray sand and sandstone; mottled red and gray, green, and chocolate-colored clays; some quartzite, and some gravel. The university utilizes groundwater wells that are on average 266 feet deep with the shallowest well at approximately 190 feet deep and the deepest well at 460 feet deep. The water supply wells at ASU pull water from the Catahoula aquifer. Based upon the history and geology of Claiborne County, it is highly unlikely that subsidence would pose a hazard to the university, and it is therefore dismissed from further consideration.

4.3.7 Tsunami

A tsunami is a series of waves typically generated by the sudden displacement of large volumes of ocean water. Tsunamis are usually the result of earthquakes with epicenters that are located miles offshore but can be caused by other forces such as volcanic eruptions or landslides. While these events are destructive, they are generally only a hazard for locations near the coastline. The campus of ASU is located approximately 150 miles from the Mississippi Gulf Coast and rests at an average elevation of approximately 245 feet above mean sea level. For this reason, the hazard potential posed to the campus of ASU by a tsunami is considered to be zero.

4.3.8 Volcano

The closest known volcano to the ASU campus is the extinct Jackson Volcano located approximately 85 miles to the northeast. The Jackson Volcano lies approximately 2,900 feet below Jackson, Mississippi and is believed to have been extinct for approximately 65 million years. Consequently, it is unlikely that volcanic activity poses a hazard to the university and is therefore given no further consideration.

5.0 VULNERABILITY ASSESSMENT

Requirement CFR §201.6(2)(ii) [the risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described and shall include an overall summary of each hazard and its impact on the community.

The Alcorn State University campus includes approximately 110 structures with an estimated replacement value of $337 million; this includes content and buildings. For the purposes of this plan, University facility structures have been classified according to functional classifications including Academic, Campus Services, Athletic, Housing (student and faculty), Water Treatment Plants, Stadiums, and all Agricultural facilities (to include green houses and processing centers). In addition, these structures have been classified according to their relative importance and value, for the purpose of determining those structures and facilities that are important in terms of their function before, during, and after a hazardous event. Each University building has been classified as Critical, High Priority, Medium Priority, Low Priority, and Non-Essential. In assigning a hazard classification to each building, the replacement value of the structure itself was not given as high a priority as the building or facility's potential value to the University in preparation or response to a hazardous event. Those buildings or systems useful for the continuance of campus operations and response during a crisis event or those buildings useful to recovery operations after a hazard event were classified as Critical. Buildings and systems with high exposure in terms of the building value or value of contents including research data and special collections were classified as High Priority. Also classified as High Priority structures were those buildings housing high concentrations of the University population such as buildings designated as shelters or those buildings providing services related to human sustainability such as dining halls. Buildings containing particularly expensive equipment, research or cultural materials warranting special consideration were classified as Medium Priority. All other structures were classified as Low Priority or Non-Essential – with Non-Essential being mostly Ag buildings. **Tables 5.1 – 5.5** provide an overview of structure classifications and functions. For an in-depth overview of the replacement costs of buildings and content see **Appendix C.**

TABLE 5.1 ASU CRITICAL FACILITIES

Building Name	Function	Classification (1)
Water Treatment Plant	Critical Infrastructure	Critical
Wastewater Treatment Plant	Critical Infrastructure	Critical
Water Towers 1 and 2	Critical Infrastructure	Critical
Electrical Substation	Critical Infrastructure	Critical
Bristow Dining Facility	Campus Services	Critical
David L Whitney HPER Complex	Athletic/Academic	Critical
Albert Dumas Hall	Critical Infrastructure	Critical
Rowan Hall (Infirmary)	Campus Services	Critical
Sewer Lift Stations #1, #2, #3	Critical Infrastructure	Critical
Walter Washington Admin & Classroom Bldg.	Critical Infrastructure	Critical
Agricultural Extension Complex	Critical Infrastructure	Critical
Campus Safety Center	Campus Services	Critical
Facilities Management Bldg.	Campus Services	Critical
ASU Service Station	Campus Services	Critical

James L Bolden Student Union	Campus Services	Critical
Amenities Building	Campus Services	Critical
Cottages AD, D2, D9, D11-D16 (9 Cottages)	Housing	Critical
Cottages 20-24, 26 (6 Cottages)	Housing	Critical
Honors Dormitory	Housing	Critical
New Female Residence Halls A, B, C, D	Housing	Critical
Bowles Hall	Administrative	Critical
Eunice Powell Hall	Critical Infrastructure	Critical
Radio Tower & Public Radio Station	Critical Infrastructure	Critical
Robinson Hall	Housing	Critical
Revels Hall	Housing	Critical
Matt Thomas Facility Garden AA, AB, AC, AD	Housing	Critical
Math & Science Building	Classroom	Critical
Nursing School Dorm (Natchez)	Housing	Critical
University Housing	Housing	Critical
New President's Home	Housing	Critical
Security Check Points #1 & #2	Security	Critical
Physical Plant Building	Campus Services	Critical
Water Treatment Plant	Infrastructure	Critical
Wastewater Treatment Building	Infrastructure	Critical

TABLE 5.2 HIGH PRIORITY FACILITIES		
Building Name	**Function**	**Classification (2)**
Service Station	Campus Services	High Priority
J.D. Boyd Library	Campus Services	High Priority
Walter Washington Admin/Classroom Bldg.	Campus Services	High Priority
Vehicle Storage Facility	Campus Services	High Priority
Belle Lettres Hall	Museums	High Priority
Rowan Hall (Infirmary)	Academic	High Priority

TABLE 5.3 MEDIUM PRIORITY FACILITIES		
Building Name	**Function**	**Classification (3)**
Rowan Model House	Academic	Medium Priority
Harmon Hall	Administration	Medium Priority
Lanier Hall	Faculty Offices	Medium Priority
E. Albert Dumas Hall	Academic	Medium Priority
Fine Art's Building	Academic	Medium Priority
K. L. Simmons, Sr. Industrial Technology	Academic	Medium Priority
Stadium Dressing Facility	Campus Services	Medium Priority
Dorm II	Administrative	Medium Priority
Dorm III	Administrative	Medium Priority
Waters School of Business	Academic	Medium Priority

Jessie A Morris/W.C. Boykin Ag. Science Bld	Academic	Medium Priority
W.K. Kellogg Nursing Center (Natchez)	Academic	Medium Priority
Cora S. Balmat School of Nursing (Natchez)	Academic	Medium Priority
Biological Research Building	Agricultural Research	Medium Priority
Extension and Research Building	Administrative	Medium Priority
Office Building	Agricultural Research	Medium Priority
Ecology Building	Academic	Medium Priority
Amenities Building	Student Services	Medium Priority
Graduate Business Building (Natchez)	Housing	Medium Priority

TABLE 5.4 LOW PRIORITY FACILITIES

Building Name	Function	Classification (4)
Oakland Chapel	Multi-use	Low Priority
Dorothy Gordon Gray Home Mgmt. House	Multi-use	Low Priority
E.E. Simmons Gymnasium	Assembly Area	Low Priority
Jack Spinks Stadium	Assembly Area	Low Priority
Baseball Stadium	Assembly Area	Low Priority

TABLE 5.5 NON-ESSENTIAL PRIORITY FACILITIES

Building Name	Function	Classification (5)
Microbial Poultry Lab	Agricultural Research	Non-Essential
Boar and Sow Pen	Agriculture Research	Non-Essential
Felix H. Dunn Infirmary	Vacant	Non-Essential
New Dairy Barn	Agriculture Research	Non-Essential
Aquaculture Center	Agriculture Research	Non-Essential
Biology Lab	Agriculture Research	Non-Essential
Vegetable Shed	Agriculture Research	Non-Essential
Hay Barn	Agriculture Research	Non-Essential
Range Shed (3 buildings)	Agriculture Research	Non-Essential
Stock Barn	Agriculture Research	Non-Essential
Silo (14 x 30) S-1	Agriculture Research	Non-Essential
Dairy Addition #2	Agriculture Research	Non-Essential
Feed Mill	Agriculture Research	Non-Essential
Luther Alexander/E.S. Burke Poultry Lab	Agriculture Research	Non-Essential
Processing Building	Agriculture Research	Non-Essential
Laying Building	Agriculture Research	Non-Essential
Broiler House	Agriculture Research	Non-Essential
Feed Building	Agriculture Research	Non-Essential
Gazebo	Agriculture Research	Non-Essential
David C. Carter Dairy	Agriculture Research	Non-Essential
Orchard Building (2 buildings)	Agriculture Research	Non-Essential
Horticulture Green House (2 buildings)	Agriculture Research	Non-Essential
Metal Feed Storage Bldg.	Agriculture Research	Non-Essential

Vegetable Processing Plant (Marks, MS)	Agriculture Research	Non-Essential
Swine Feed Floor # 1, #2, #3 (Church Hill, MS	Agriculture Research	Non-Essential
Swine Nursery Barn (Church Hill, MS	Agriculture Research	Non-Essential
Equipment Shed	Agriculture Research	Non-Essential
Farrowing House (Church Hill, MS)	Agriculture Research	Non-Essential
Genetic Pig Lab (Church Hill, MS)	Agriculture Research	Non-Essential
Swine Shed (Church Hill, MS)	Agriculture Research	Non-Essential
Old Farrowing House (Church Hill, MS)	Agriculture Research	Non-Essential
HL Parker	Vacant	Non-Essential
Storage Building Nursing (Natchez)	Campus Services	Non-Essential

6.0 PROFILES OF POTENTIAL HAZARDS OF CONCERN

> Requirement CFR §201.6(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.

.

The following sections provide details related to each identified hazard of concern including general information, historical occurrence data for each hazard type, the University's relative vulnerability to each hazard type and potential impacts to the University from each hazard. This section, combined with the previous section identifying critical, high, medium, and low priority facilities is intended to serve as the basis for development of appropriate and comprehensive mitigation strategies designed to minimize risk, reduce vulnerability, reduce costs associated with recovery from natural hazards, and protect life and property. The specific hazards identified in this section as well as their relative priority for mitigation is included in **Table 6.1** below:

TABLE 6.1 MITIGATION PRIORITY BY HAZARD TYPE

Hazard	Probability of Occurrence	Potential Severity	Mitigation Priority
Drought/Extreme Temperature	Low	Low	Low
Flooding/Flash Flooding	Low	Medium	Low
Hailstorm	Medium	High	Low
Hurricane	High	High	High
Severe Winter Storm	Low	Low	Low
Tornados	Medium	High	High
Wildland Fire	Low	Low	Low
Thunderstorms, Lightning, Wind	High	High	High

6.1 NATURAL HAZARDS

6.1.1 Drought / Extreme Temperatures General Information

Weather patterns associated with extreme temperatures occur routinely in the Deep South. However, these weather patterns are associated with several days, weeks, or months with limited rainfall and can create drought conditions that have the potential to impact university operations. Drought conditions are typically caused by both the lack of significant amounts of rainfall and high temperatures. When both factors are in effect over an extended period, drought conditions will result. The standard for drought measurement is the Palmer Drought Severity Index (PSDI). The index uses temperature and rainfall data in a formula to express a measure of dryness. The U.S. Drought Index data for Mississippi is shown in **Figure 6.1**, current, at the time of this plan update. A U.S. Drought Monitor map is also provided in **Figure 6.2.**

Figure 6.1 U.S. Drought Monitor MS

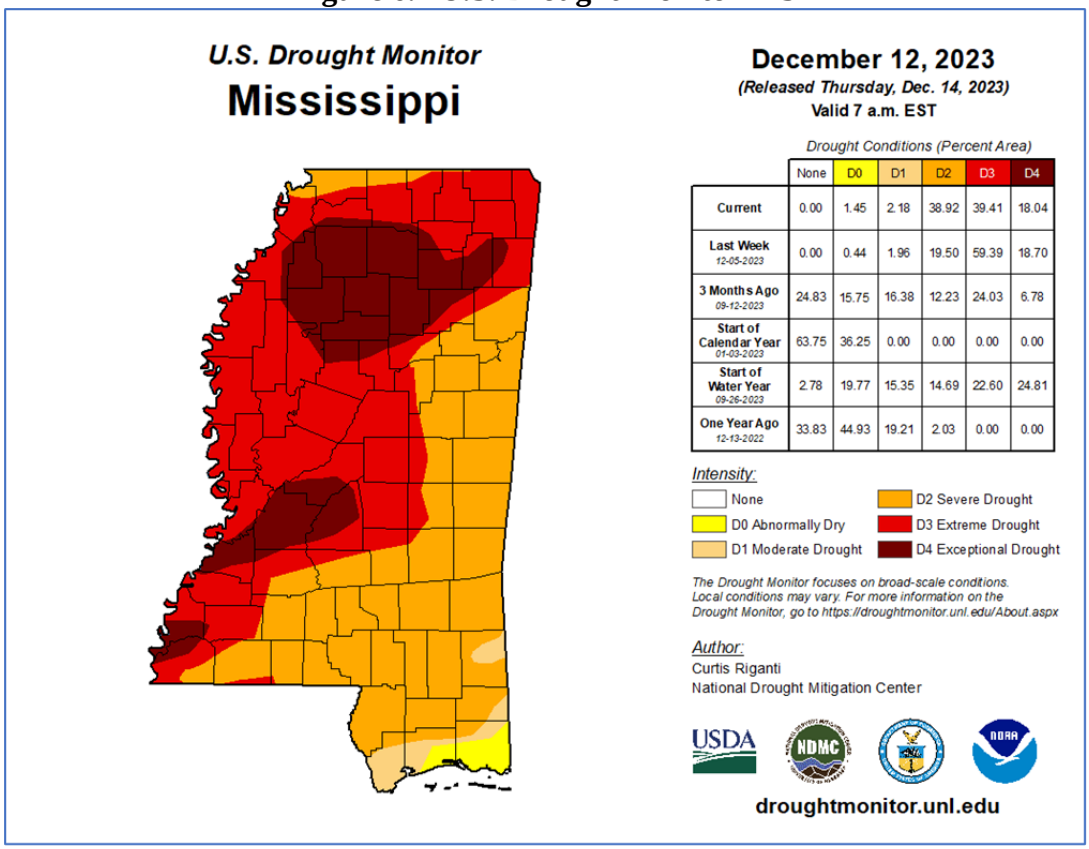
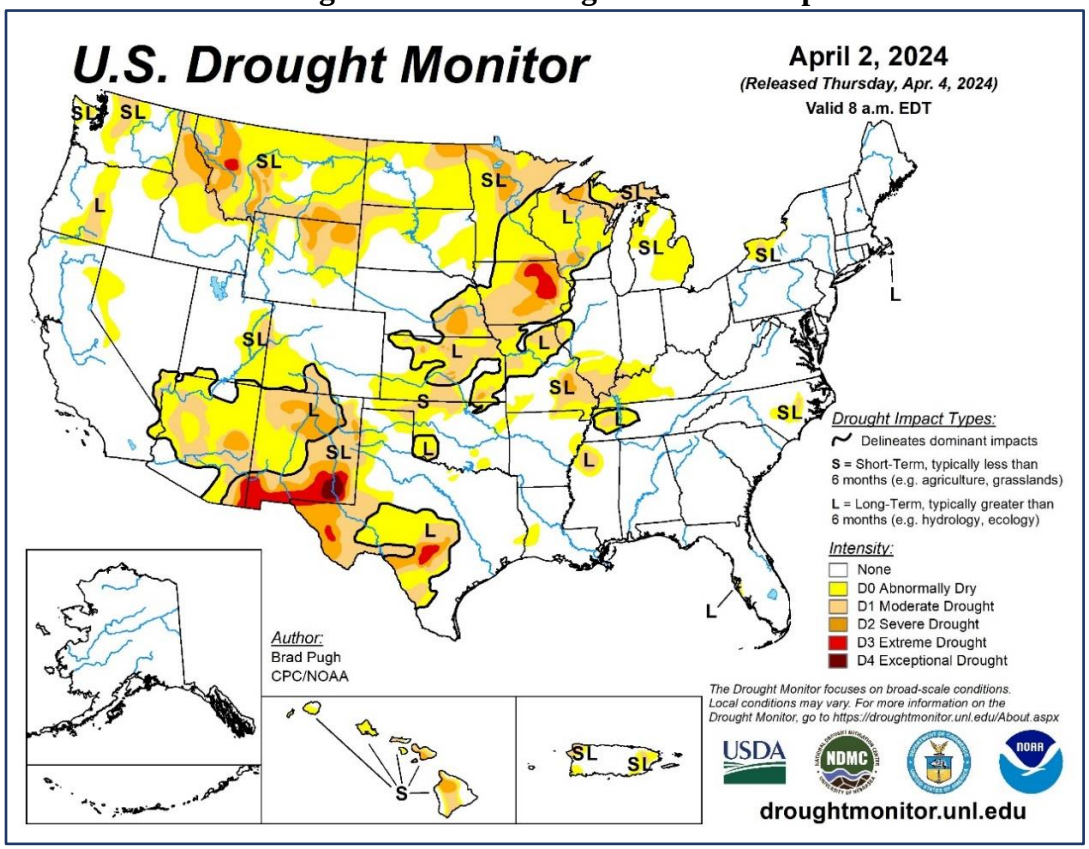


Figure 6.2 U. S. Drought Monitor Map



The Palmer Drought Severity Index (PDSI) is the standard for measuring the departure of moisture supply. The objective of the PDSI was to provide a measurement of moisture conditions that were "standardized" so that comparisons using the index could be made between locations and between time periods. While Palmer's indices are water balance indices that consider water supply (precipitation), demand (evapotranspiration) and loss (runoff), another commonly used drought index, the Standardized Precipitation Index (SPI), is a probability index that considers only precipitation. Therefore, and for the purposes of this plan, drought will be analyzed using the PDSI.

The PDSI varies roughly between -4.0 and +4.0. The weekly Palmer Index values are calculated for the Climate Divisions during every growing season and are available from the Climate Prediction Center. ASU could expect to experience the entire range of drought severity and classification. **Table 6.2** lists the Palmer Drought Severity Index. Drought conditions measuring – 3.1 is considered severe drought and – 4.0 is considered extreme drought.

Table 6.2 Palmer Drought Severity Index

(Source: http://drought.unl.edu/whatis/indices.htm)

PDSI Classifications for Dry and Wet Periods	
Index Value	**Classification**
4.00 or more	Extremely wet
3.10 to 3.99	Very wet
2.00 to 2.99	Moderately wet
1.00 to 1.99	Slightly wet
0.50 to 0.99	Incipient wet spell
0.49 to -0.49	Near normal
-0.50 to -0.99	Incipient dry spell
-1.00 to -1.99	Mild drought
-2.00 to -2.99	Moderate drought
-3.10 to -3.99	Severe drought
-4.00 or less	Extreme drought

6.1.1a Historical Occurrence Data – Drought / Extreme Temperatures

There have been eleven drought events from 1950 – 2017(only two reported property damages totaling $80,000) that affected the area of Mississippi that would include the campus of ASU. The most recent drought affecting the area occurred in December of 2016. Alcorn State University does not typically rely on precipitation for the normal operation and function of the University; drought would not normally be expected to impact the functional capacity of any critical facilities. **Tables 6.3 and 6.4** provide average and record temperatures for Alcorn and the Claiborne County area.

TABLE 6.3 AREA AVERAGE TEMPERATURES (°F)												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Avg. High	58°	62°	70°	77°	85°	90°	93°	93°	89°	80°	68°	60°
Avg. Low	36°	40°	47°	54°	63°	70°	72°	71°	65°	53°	43°	38°
Mean	47°	51°	59°	66°	74°	80°	83°	82°	77°	67°	56°	49°

TABLE 6.4 AREA RECORD TEMPERATURES (°F)												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Record High	85°	87°	91°	98°	100°	104°	105°	108°	107°	98°	89°	85°
Record Low	-5°	-1°	14°	25°	40°	45°	51°	51°	35°	23°	15°	2°

6.1.1b ASU's Vulnerability to Drought / Extreme Temperatures

While periods of extreme temperatures are commonplace in south Mississippi, these events typically do not impact the University in any significant way. All buildings on campus designed for occupancy are equipped with mechanical air conditioning equipment that serves to mitigate potential human impacts of drought and extreme temperature events. In terms of university operations, ASU relies on groundwater supplied by three wells on campus for the potable water used on campus and is not dependent on surface water supply for potable water, nor is the University necessarily dependent on precipitation for normal and routine functions. It is not anticipated that drought and extreme temperatures alone present a vulnerability risk to the University, therefore; drought and extreme temperatures are a low probability for future occurrence and mitigation. See **Table 6.1** for probability of future events.

6.1.1c Potential Drought / Extreme Temperature Impact to the University

Typical impacts to university operations are associated with higher-than-normal energy usage and potential restrictions on irrigation activities for green areas located throughout campus. While drought and extreme temperature events are routine occurrences for this region, mitigation opportunities are slight with the most logical mitigation action being public education targeting potential health risks associated with extreme temperatures including dehydration and heat stroke. Additionally, drought conditions and extreme temperatures can lead to an increase in the potential occurrence and severity of wildland fires, which is a concern for ASU. However, for the purposes of this planning exercise, mitigation for drought and extreme temperatures alone is a low priority.

6.1.2 Floods and Flash Flooding – General Information

The campus of ASU is located outside the 100-year flood plain according to the most recent version of the Flood Insurance Rate Map (FIRM) for the area of Claiborne and Jefferson Counties including the University. The campus of ASU is situated at the headwaters of Muddy Bayou and Mammy Judy Bayou. It is not anticipated that the ASU campus would be affected by flooding from the overtopping of natural, improved or manmade surface water drainage channels. However, localized rainstorms that have intensities greater than the 25-year, 24-hour storm may cause flash flooding concerns for certain areas of the campus, such as on-campus lakes or ponds, or particularly if the area storm water systems are blocked or in need of repair. Flood producing storms may occur any month of the year but are more prevalent during the winter and spring months. Past records indicate that floods and flash floods have occurred in Claiborne County

during the months of January, February, March, May, June, July and September.

6.1.2a Historical Occurrence Data – Floods and Flash Flooding

Since no lands associated with the University are located within FEMA-designated flood hazard areas, the application of the HAZUS-MH model to predict potential impacts from flooding is not warranted. It is anticipated that outputs from the HAZUS-MH model would yield no results for the Alcorn State University campus. However, there are no areas of campus that have a history of flash flooding associated with severe storms and thunderstorms. In addition, there are no structures on campus covered under a National Flood Insurance Program policy, therefore, there are no repetitive loss properties on campus warranting special consideration for mitigation from flood events. NCDC reflects no record of flash flooding on the ASU campus. The University indicates no history of flash flooding issues other than minor street flooding.

6.1.2b ASU's Vulnerability to Floods and Flash Flooding

In general terms, the University is not particularly vulnerable to normal occurrences of flooding. However, history does indicate that there are areas of the campus that have been subject to localized flash flooding, but in streets only. These particular areas of campus remain vulnerable to flash flooding. However, drainage improvements to these areas would minimize vulnerability to flash floods. In addition, **Table 6.5** provides average rainfall data for the University and Claiborne County areas.

TABLE 6.5 AREA AVERAGE RAINFALL

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. Precipitation (inches)	5.61	4.91	5.37	5.08	4.39	4.61	5.13	5.13	4.37	4.27	4.37	5.49

6.1.2c Potential Flooding and Flash Flooding Impact to the University

Based on information presented relative to the absence of FEMA-designated flood zones within the ASU campus, the potential impacts to the University from flooding and flash flooding are minimal with impacts confined to localized areas of campus and potential impacts to no more than one or two parking lots by buildings in the most extreme of circumstances. An analysis of contour information from the ASU campus indicates a topographic differential of approximately 50' from north to south and east to west across the campus. The highest elevations on campus are generally located in the southeastern portions of campus and the lowest elevations generally in the south-central areas of campus. Based on historical events, floods and flash flooding are a low probability for future occurrence and mitigation. See **Table 6.1** for probability of future events.

6.1.3 Hailstorms – General Information

TABLE 6.6 CLAIBORNE COUNTY HAIL EVENTS

Location	Date	Size (inches)	Property Damage
Reganton	5/20/2010	1.00	
Carlisle	5/29/2010	1.00	
Grand Gulf	3/27/2011	1.25	
Galloway	3/29/2011	1.75	

Westside	4/27/2011	1.75	$100,000
Grand Gulf	2/12/2013	0.75	
Galloway	2/12/2013	.88	
Rocky Springs	3/18/2013	1.75	$20,000
Willows	4/27/2014	1.50	$1,000
Badland	5/29/2015	1.25	
Galloway	2/23/2016	1.00	
Westside	11/29/2016	1.00	
Port Gibson	4/6/2018	1.75	$3,000
Port Gibson	6/15/2023	1.00	$500,000
Totals:			**$624,000**

Hail, a form of precipitation, usually develops in severe thunderstorms and could be characterized as spheroids of ice. The spheres typically range in size from ¼ inch in diameter to 4 ½ inches in diameter. The National Severe Storms Laboratory (NSSL) has compiled data on severe storms derived from empirical data collected from 2005-2016. Based upon that data, ASU is in the area that depicts an expected 3 hail days per year, therefore hailstorms are retained for mitigation consideration.

6.1.3a Historical Occurrence Data – Hailstorms

NOAA has recorded 14 reports of hail in Claiborne County between 2010 and 2023. This represents approximately 1.4 reported hail events in Claiborne County each year. However, the data suggests that hail events have decreased in the last 10 years as the number of reported incidents has decreased over the past 10 years. For instance, the years 2010-2013 saw a reported 2 to 3 incidents of hail per year in Claiborne County while the previous yearly average from 2005-2016 was 2.4 hail events per year. The average size hailstone for the reported incidents was nearly 1 ¼ inches in diameter, or, about the same size as a ping-pong ball. The largest hailstone on record in Claiborne County fell on May 14, 2006, in Grand Gulf and measured 2.0 inches in diameter. The storm that produced the large hailstone caused $70,000 in damage to area rooftops and vehicles. **Table 6.6** provides a historical record of hailstorm events in Claiborne County since 2010.

Table 6.6 provides a historical record of hailstorm events in Claiborne County since 2005.

6.1.3b ASU's Vulnerability to Hailstorms

Due to the high likelihood of the University experiencing a hailstorm each year and the potential for hailstorms to cause damage to buildings, structures, infrastructure, and transportation, it is considered a priority hazard and is included in discussions related to mitigation strategies. However, it is anticipated that the cost/benefit ratio for mitigation strategies related to hailstorm events will place mitigation for hailstorms as a medium to low priority. Therefore, hailstorms are a medium probability for future occurrence and mitigation. See **Table 6.1** for probability of future events.

6.1.3c Potential Hailstorm Impacts to the University

The National Severe Storms Laboratory indicates that hailstones of ¾" or greater have the capability of causing severe damage including damage to property. Larger hailstones also have the potential to cause injury to people caught in the open during a severe hailstorm. Common damage to property from severe hailstorms includes broken windows in buildings and vehicles

and roof damage. The probability of significant structural damage from a hailstorm event is slight. However, since most hailstorms are associated with severe thunderstorms, the potential for roof damage combined with large volumes of rain has the potential to create significant content damage to university buildings.

6.1.4 Hurricanes and Coastal Storms – General Information

Atlantic hurricanes are tropical cyclones that form over the warm waters of the Atlantic Ocean, Caribbean Sea, or Gulf of Mexico generally from mid-summer to late fall. Some hurricanes can produce Category 1 wind speeds (74 miles per hour) over one hundred miles from the eye of the hurricane. Consequently, these storms can cause widespread damage long before the center of the storm moves over land; after which the storms begin to rapidly lose strength. Hurricanes' severity is rated by the Saffir-Simpson Scale that established severity or intensity by a rating of Category 1 through Category 5. Hurricane categories are based on both maximum sustained winds and minimum central barometric pressure. **Table 6.7** provides an overview of the Saffir-Simpson Scale with wind categories and potential damages associated with each category.

TABLE 6.7 SAFFIR-SIMPSON HURRICANE SCALE

Saffir-Simpson Category	Maximum Sustained Wind Speeds		Minimum Central Pressure	Storm Surge	Typical Damages
	MPH	kts	mb	ft	
1	74-95	64-82	>980	3-5	Damage to vegetation and tree foliage; no real structural damage; low-lying areas potentially inundated.
2	96-110	83-95	979-965	6-8	Considerable damage to vegetation and tree foliage; some trees blown down; major damage to exposed mobile homes; some damage to building roofs; no major structural damage; low-lying areas inundated; considerable damage to piers
3	111-130	96-113	964-945	9-12	Large trees blown down; damage to roofing, doors, and windows; some structural damage to small buildings; serious flooding in coastal zones; flat terrain 5' or less above sea level potentially flooded 8 miles or more inland.
4	131-155	114-135	944-920	13-18	Trees blown down; signs destroyed; extensive damage to roofs, windows, and doors; complete failure of roofs on many small buildings; major damage to lower floors of structures near shore; major erosion of beaches; flat terrain 10' or less above sea level potentially flooded 10 miles or more inland.
5	156+	136+	<920	19+	Trees blown down; considerable damage to roofs of all buildings; severe and extensive damage to windows and doors; complete failure of roofs on many residences and industrial buildings; some complete building failure; small buildings overturned or blown away.

6.1.4a Historical Occurrence Data – Hurricanes and Coastal Storms

The destructive capability of hurricanes was clearly demonstrated on August 29, 2005, when Hurricane Katrina made landfall at the mouth of the Pearl River. A total of 1,844 people died because of Hurricane Katrina with 238 of those fatalities occurring in Mississippi. The Claiborne

County area suffered mostly vegetative damage with most of the structural damage to buildings and infrastructure caused by downed trees. There was widespread damage to the electrical distribution grid resulting in the loss of refrigeration for residential and commercial users, the loss of wastewater collection and drinking water distribution capability. The loss of these services can lead to unsanitary conditions, particularly in areas of high population density, and can result in human health concerns. The University operates and maintains its own drinking water distribution and wastewater collection systems. Without electricity, these systems would be inoperable. Since 1992, ten tropical storms or hurricanes have impacted the area that includes the ASU campus. **Table 6.8** provides a historical record of hurricanes and tropical storms impacting the Claiborne County area, since 2002.

TABLE 6.8 RECENT CLAIBORNE COUNTY HURRICANE AND TROPICAL STORM EVENTS

Storm	Date	Type	Property Damage	Crop Damage
Isadore	9/26/2002	Tropical Storm	$500,000.00	
Bill	6/30/2003	Tropical Storm	$100,000.00	
Bill	7/1/2003	Tropical Storm	$100,000.00	
Ivan	9/16/2004	Hurricane	$1,500,000.00	$501,000.00
Cindy	7/6/2005	Tropical Storm	$150,000.00	
Dennis	7/10/2005	Hurricane	$2,600,000.00	$2,200,000.00
Katrina	8/29/2005	Hurricane	$5,900,000,000.00	$1,500,000,000.00
Gustav	9/1/2008	Hurricane	$100,000.00	$100,000.00
Isaac	8/29/2012	Hurricane	$200,000.00	
Delta	9/10/2020	Tropical Storm	25,000.00	
Totals:			**$5,905,250,000.00**	**$1,502,701,000.00**

6.1.4b ASU's Vulnerability to Hurricanes and Coastal Storms

The ASU campus is located approximately 150 miles from the Gulf of Mexico coastline and is well within the destructive reach of a major hurricane. The University's proximity to coastal regions combined with the historical record of impacts to the region from hurricanes indicates that its hazard type should remain as a hazard of concern to the University and should be listed as a high priority for mitigation actions.

6.1.4c Potential Hurricane Impacts to the University

To better quantify the University's vulnerability to hurricanes, FEMA's HAZUS-MH model was used to assess vulnerability to hurricanes and tropical activity. The primary output from the HAZUS-MH model was a probability scale indicating the probability of slight, moderate or severe damage to critical facilities on campus. The scenario chosen for the campus of ASU was to simulate the effects of a Category 1 Hurricane with sustained winds of 83.9 miles per hour. The damage probabilities were then associated with predicted ranges of potential damages to buildings and contents on the University categorized as critical, high priority, or medium priority for mitigation planning purposes. **Table 6.9** provides a five-year projected summary of estimated wind loss costs by structure class and reveals areas of particular vulnerability with respect to impacts from hurricanes. Given the potential for substantial damage to buildings and contents combined with the probability of occurrence for hurricanes, this hazard type is considered a high priority hazard for mitigation actions that would be related to both policy and structural mitigation strategies. Therefore; hurricanes are considered to be a high probability for future occurrence and mitigation. See **Table 6.1**

for probability of future events

TABLE 6.9 SUMMARY OF ESTIMATED WIND LOSSES BY STRUCTURE CLASS (CATEGORY 1 HURRICANE)						
Summary of Estimated Wind Losses by Structure Class (Category 1 Hurricane)						
Structural Damage						
Structure Class	**Minor**		**Moderate**		**Severe**	
	2%	**14%**	**15%**	**49%**	**50%**	**75%**
Critical	$878,697	$7,276,914	$7,870,612	$25,543,116	$26,508,756	$38,983,464
High Priority	$1,358,608	$9,510,258	$10,189,562	$33,285,900	$34,644,510	$50,947,809
Medium Priority	$1,305,855	$4,706,132	$9,793,913	$31,993,450	$33,299,304	$48,969,564
Contents Loss						
Structure Class	**Minor**		**Moderate**		**Severe**	
	2%	**14%**	**15%**	**49%**	**50%**	**75%**
Critical	$602,686	$4,218,803	$4,495,304	$14,765,807	$15,067,148	$22,600,725
High Priority	$951,136	$6,657,953	$7,134,521	$23,275,233	$23,778,401	$35,667,601
Medium Priority	$914,204	$52,564,723	$6,856,535	$22,398,011	$22,855,114	$34,282,671
Total Losses						
Structure Class	**Minor**		**Moderate**		**Severe**	
	2%	**14%**	**15%**	**49%**	**50%**	**75%**
Critical	$1,481,383	$11,495,717	$12,365,916	$40,308,923	$41,575,904	$61,584,189
High Priority	$2,309,744	$16,168,211	$17,324,083	$56,561,133	$48,422,911	$86,615,410
Medium Priority	$2,220,059	$57,270,855	$16,650,448	$54,391,461	$56,154,318	$83,252,235

6.1.5 Severe Winter Storms – General Information

Severe winter storms can include heavy snowfall, freezing rain, sleet, and high wind speeds. While these types of storms are not typical for south Mississippi, they can occur. The ASU campus is located in southwest Mississippi at approximately 31.5 parallel and has an average low temperature in January of 33 degrees F (the lowest).

The gulf south region of the U.S. is typically unaccustomed to snow, ice, and freezing temperatures. Occasionally, cold air penetrates south across Texas and Florida, into the Gulf of Mexico. Temperatures fall below freezing killing tender vegetation. Wet snow and ice rapidly accumulate on trees, causing the branches to snap under the load. Motorists are generally unaccustomed to driving on slick roads and traffic accidents increase. Local municipalities generally do not have available snow removal equipment or treatments, such as sand or salt, for icy roads. Fortunately for this region, extreme cold temperatures and associated freezing rain, sleet, and snow do not last more than a few days. However, this type of storm has the potential to disable transportation, communications and electrical service to the university and is therefore retained as a hazard of concern.

6.1.5a Historical Occurrence Data – Severe Winter Storm

Although rare, NOAA has a few recent winter storms on record. Winter storms in the form of heavy snow

occurred in the years 2010, 2013, 2014, 2017, and 2021 with depths ranging 1 to 5 inches. The 4 to 5 inches of snow received on February 11, 2010, caused around $600,000 in damages. December 1997 brought 8 inches of snow to the area, which was the heaviest since 1929. The year 2021 brought 2 ½ inches of snow. Winter also brings icing conditions affecting the Claiborne County area in the form of sleet. On February 15, 2021, approximately four inches of sleet caused over $50,000 in damages. As is typically the case, these storms were of a short duration and did not cause long-term operational issues for ASU.

6.1.5b ASU's Vulnerability to Severe Winter Storms

As previously mentioned, ASU has seen six occurrences of severe winter weather within the last ten years. In each instance, classes were canceled due to impact to communication systems and utilities. Both documented events spanned a relatively short timeframe with normal university operations resuming within days of each event. No events resulted in structural damage to buildings or facilities and critical functions of the University were able to continue operating despite canceled classes. Based on the rare occurrence of severe winter weather and the minimal impacts of these events, severe winter storms and precipitation are a low priority for future occurrence and mitigation. See Table 6.1 for probability of future events.

6.1.5c Potential Severe Winter Storm Impacts to the University

Potential impacts to the University from severe winter weather are generally limited to short term power outages, cancelled classes, and impacts to transportation access. Power outages and transportation difficulties are generally the precipitating factors in cancelling classes on campus. As previously mentioned, this type of impact is generally typically short lived, with normal operations generally resuming within a day or two of the event. There have been no reports of long-term impacts or significant impacts to buildings or critical functions of the University.

6.1.6 Tornadoes and Funnel Clouds – General Information

Tornados or funnel clouds can develop from severe thunderstorms or from hurricanes. Generally, the most active time of year for tornados is during the spring months; however, tornados can develop any time of year in the Southwest. A tornado's path can be as narrow as a few yards and do little more than damage some tree limbs or it can be over ½ mile wide and destroy everything it contacts. A tornado's wind speed and corresponding damage potential is measured utilizing the Enhanced Fujita Scale. **Table 6.10** lists the Enhanced Fujita Scale wind speeds.

TABLE 6.10 Enhanced Fujita Scale and Enhance Fujita (EF) Scale

Enhanced Fujita Category	Wind Speed (mph)	Potential Damage
EF0	65-85	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over
EF1	86-110	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken

EF2	111-135	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes destroyed; large trees snapped or uprooted; light- object missiles generated; cars lifted off ground
EF3	136-165	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance
EF4	166-200	Devastating damage. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated
EF5	>200	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yd); high-rise buildings have significant structural deformation; incredible phenomena will occur

The National Severe Storms Laboratory (NSSL) has compiled data on severe storms derived from empirical data collected from 2009-2014. Based upon that data, ASU is in the region that depicts 1.0 expected tornado days per year, therefore tornadoes are retained for further mitigation consideration.

To further enhance the level of information concerning tornado intensities, the Enhanced F-Scale rates damages to specific types of buildings. Given the anticipated degrees of damage to institutional buildings combined with historical data shown in the following tables and maps of historical events, the University can expect with some degree of certainty that tornados potentially affecting the University will fall within the F0-F3 range with the most common occurrences being tornados of F1 and F2 magnitude with expected ranges from 1 through 5 as indicated in **Table 6.10** above. These indicators combined with the relatively dense nature of development and building placement on campus, expected damages from an F1-F2 tornado are expected to be high in terms of monetary loss and indicates a high priority for mitigation actions.

6.1.6a Historical Occurrence Data – Tornados

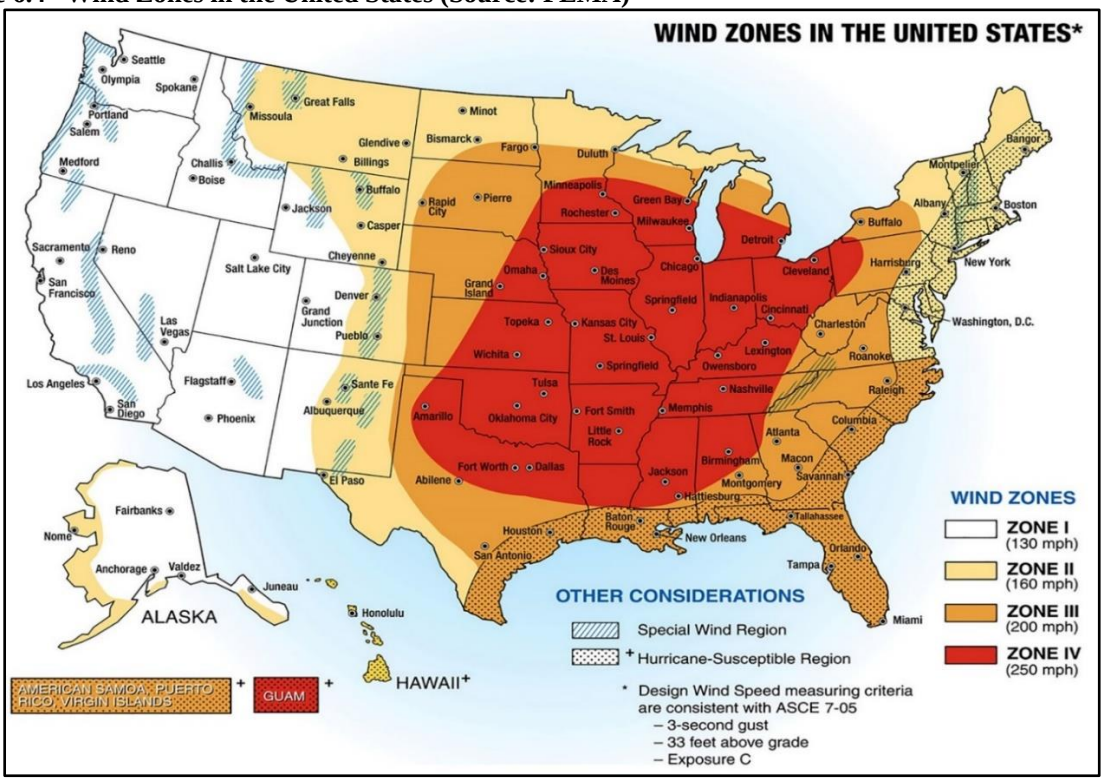
NOAA has 17 recorded reports of confirmed tornados in Claiborne County between 2008 and 2021. The overall total historical data shown below, in **Table 6.11**, represents approximately .75 confirmed tornados in Claiborne County each year with property damage over a million dollars. Due to the high likelihood of ASU experiencing a nearby confirmed tornado each year and the potential for tornados to cause massive devastation to buildings, structures, infrastructure and transportation, it should be considered as a priority hazard.

TABLE 6.11	CLAIBORNE COUNTY TORNADO EVENTS			
Location	**Date**	**Magnitude**	**Property Damage**	**Crop Damage**
Rocky Springs	1/10/2008	F1	$20,000.00	$60,000.00
Peyton	9/13/2008	F0	$0	$0
Alcorn	5/3/2009	EF1	$15,000.00	$0
Port Gibson	11/29/2010	EF0	$0	$10,000.00
Ingleside	11/29/2010	EF1	$30,000.00	$0
Grand Gulf	4/4/2011	EF1	$2,000.00	$0
Willows	3/21/2012	EF2	$100,000.00	$0
Peyton	4/30/2017	EF1	$40,000.00	$0
Gordon	4/30/2017	EF2	$500,000.00	$150,000.00
Peyton	4/30/2017	EF1	$50,000.00	$0
Tillman	4/6/2018	EF1	$0	$0
Peyton	4/6/2018	EF1	$200,000.00	$0
Port Gibson	11/1/2018	EF1	$50,000.00	$0
Ingleside	11/1/2018	EF1	$30,000.00	$0
Russum	4/18/2024	EF1	$1,000.00	$0
Grand Gulf	12/18/2024	EF1	$60,000.00	$0
Tillman	5/2/2021	EF1	$15,000.00	$0
TOTALS:			**$1,113,000.00**	**$220,000.00**

6.1.6b ASU's Vulnerability to Tornados

The National Severe Storms Laboratory (NSSL) compiles data on severe storms and has developed Wind Zone maps such as **Figure 6.4** provided by FEMA. **Figure 6.4** depicts the wind zones in the United States. ASU planning area falls in Zone 4 (250MPH).

Figure 6.4 Wind Zones in the United States (Source: FEMA)



6.1.6c Potential Tornado Impacts to the University

Due to the high likelihood of ASU experiencing severe thunderstorms each year and the potential for these storms to cause damage to buildings, structures, infrastructure, and transportation, it should be considered as a priority hazard. An impact analysis was conducted based on an F3 tornado affecting a direct strike on the University campus. The illustration uses a 1000-yard damage swath caused by an F3 tornado based on the actual path of a 1957 F1 tornado. As illustrated in **Figure 6.5** below**,** a tornado of this intensity would potentially impact sixty-four facilities including ten facilities classified as critical, one facility classified as high priority, and six facilities classified as medium priority. Anticipated damages would be at least equal to or greater than projected ranges of damages from a Category 2 hurricane. Based on projected probabilities and estimated damages from a direct tornado impact, mitigation strategies for this hazard is considered to be a high priority. **Figure 6.6** depicts the average number of tornadoes per state. According to the ASU Hazard Mitigation Planning Committee, although mitigation strategies for a tornado is considered a high priority, the probability of future events are medium. **See Table 6.1.**

Figure 6.5 Tornado Path Scenario

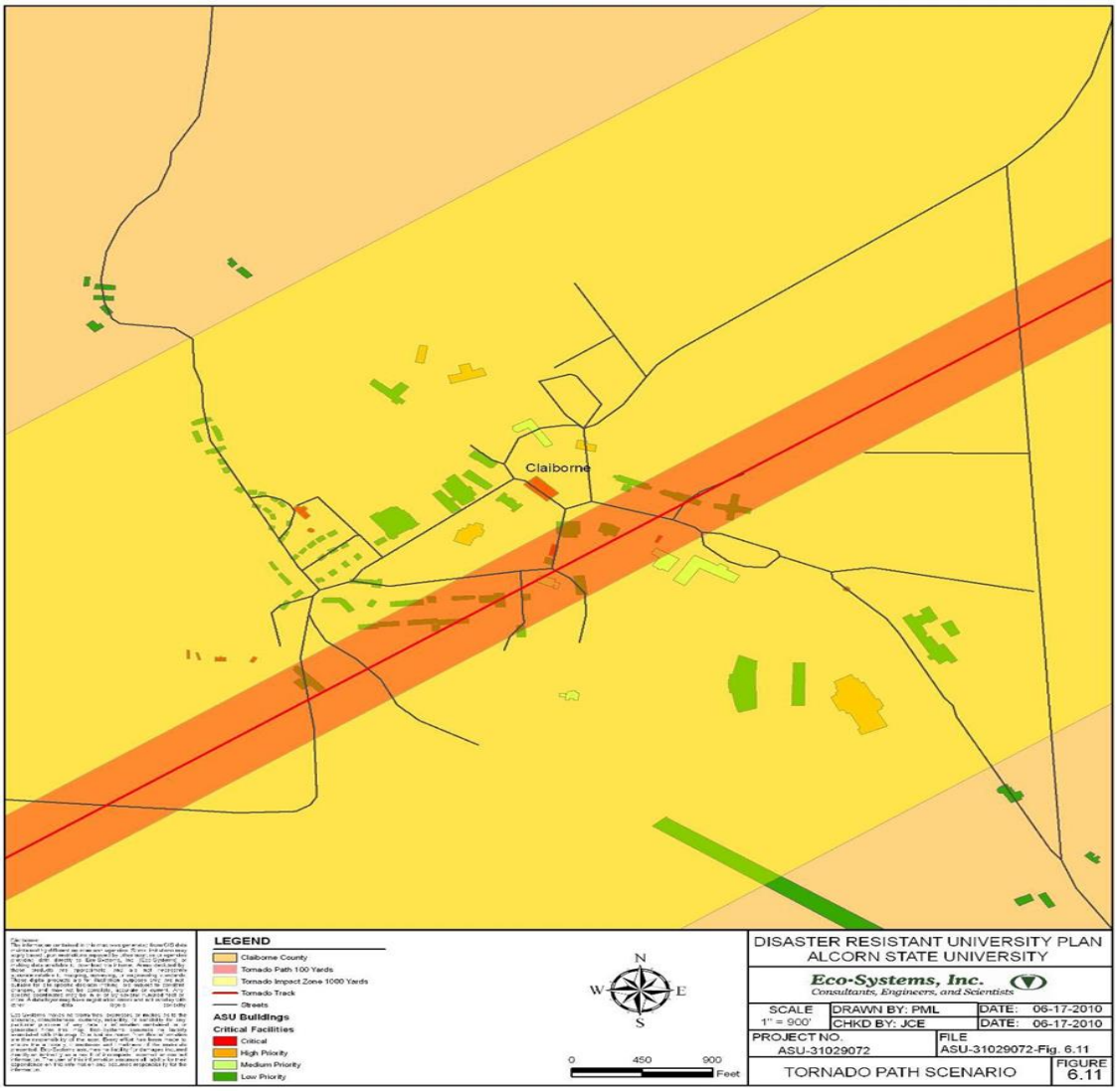
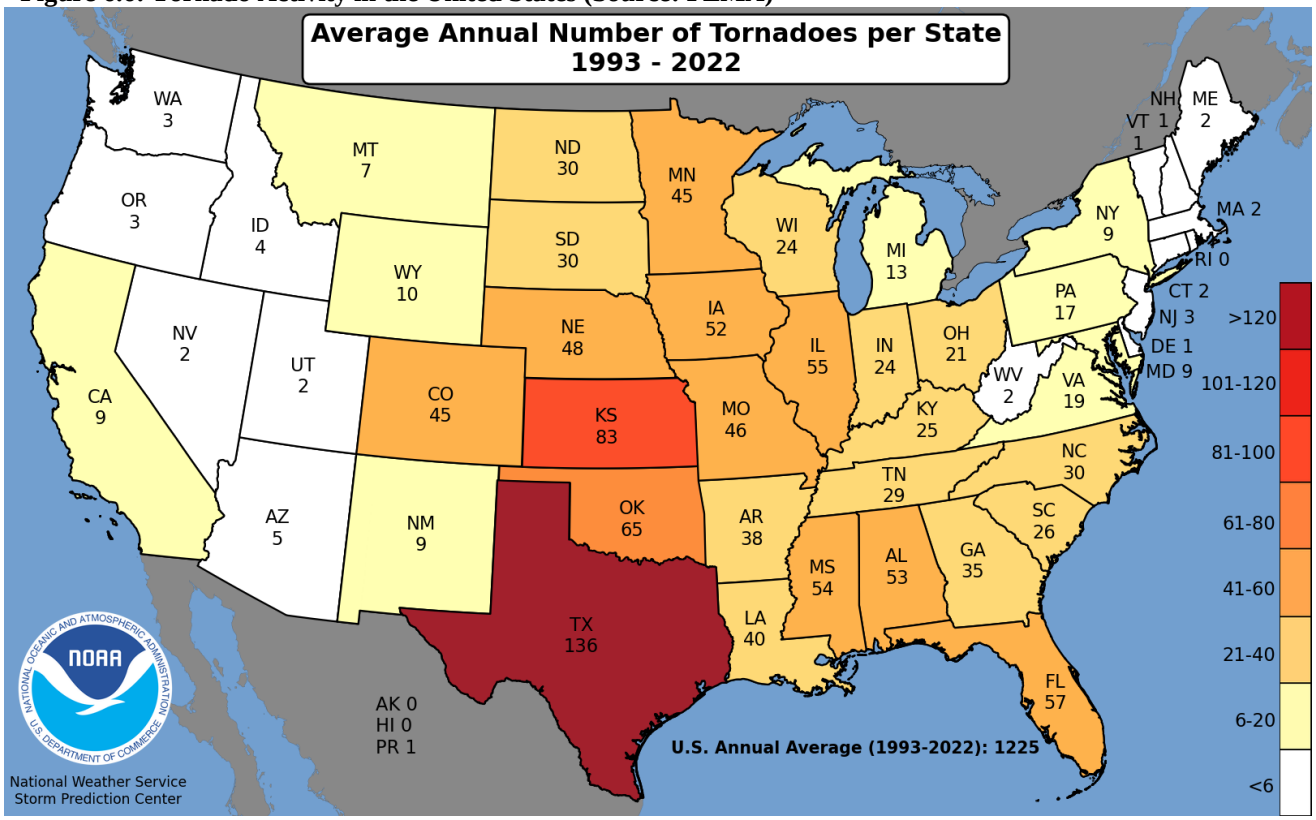


Figure 6.6: Tornado Activity in the United States (Source: FEMA)



6.1.7 Wildland Fires – General Information

A wildfire is any uncontrolled burning of undeveloped grassland, brush, or forest. Wildland fires are more prevalent in the western United States where the climate is more arid. However, wildland fire can also be a danger in south Mississippi, particularly during drought conditions. Claiborne County has experienced some cases of wildfire; however, no incidents of significance have been recorded by NOAA for Claiborne County. The campus of ASU is in a rural and heavily forested area of southwest Mississippi. Since the University is surrounded by forested land, small wildland fires have occurred in the past and drought conditions have affected the area in the past, wildland and forest fires have been retained as a potential threat to the University but there is no historical occurrence. Claiborne County has a total land area of approximately 311,600 acres, of which approximately 252,700 acres (81%) are forested.

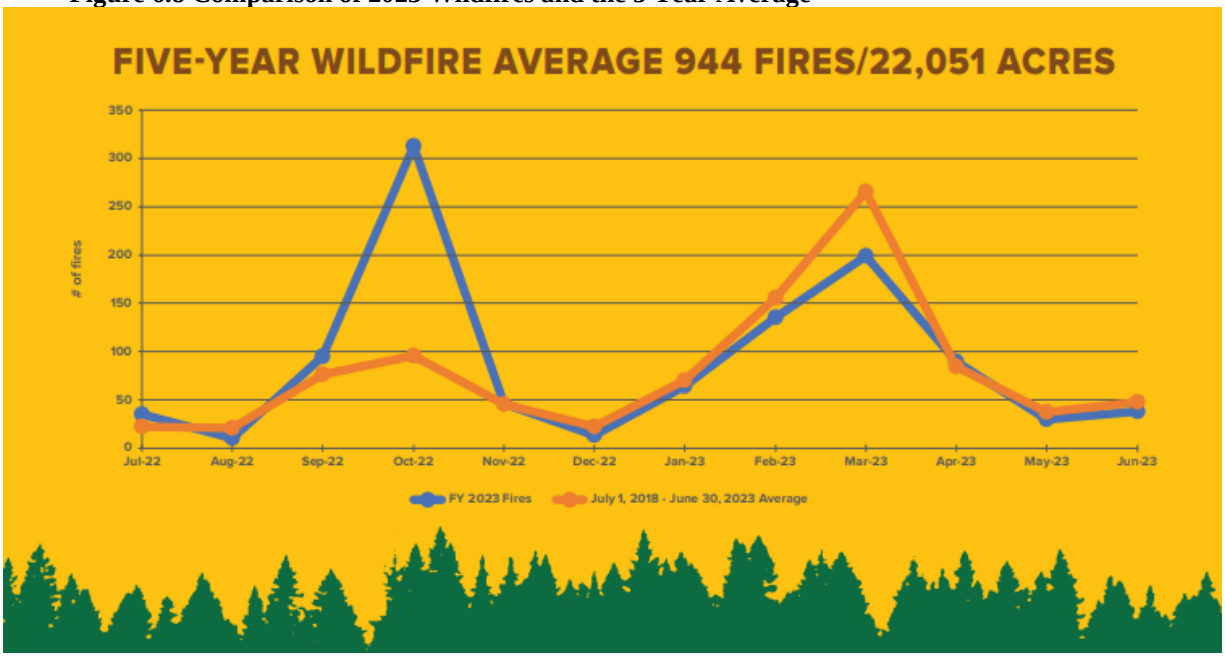
Wildfires do not stop at predetermined mapped boundaries. Wildland Urban Interface (WUI) studies make a best-case judgment on a list of factors including forestation and vegetative growth as they relate to distance from developed areas. Given the amount of forested and agricultural land in the ASU planning area the planning area is still a very low-density housing area.

6.1.7a Historical Occurrence Data – Wildland Fires

According to the Mississippi Forestry Commission, the number of wildland fires in Mississippi in FY2023 was 944 wildfires which burned 19,803 acres. MS Forestry Commission Wildland Firefighters saved 1,541 structures threatened by wildfire activity. Structures destroyed or damaged were 16. There has been a downward trend in wildfires over the last 50 years. (Source: Mississippi Forestry Commission)

Below is a comparison graph of the wildfires for 2018-2023 as shown below. ASU is located in the Southwest Forestry District. Mississippi Forestry and local EMA's have no record of any wildland fires threatening the University.

Figure 6.8 Comparison of 2023 Wildfires and the 5 Year Average

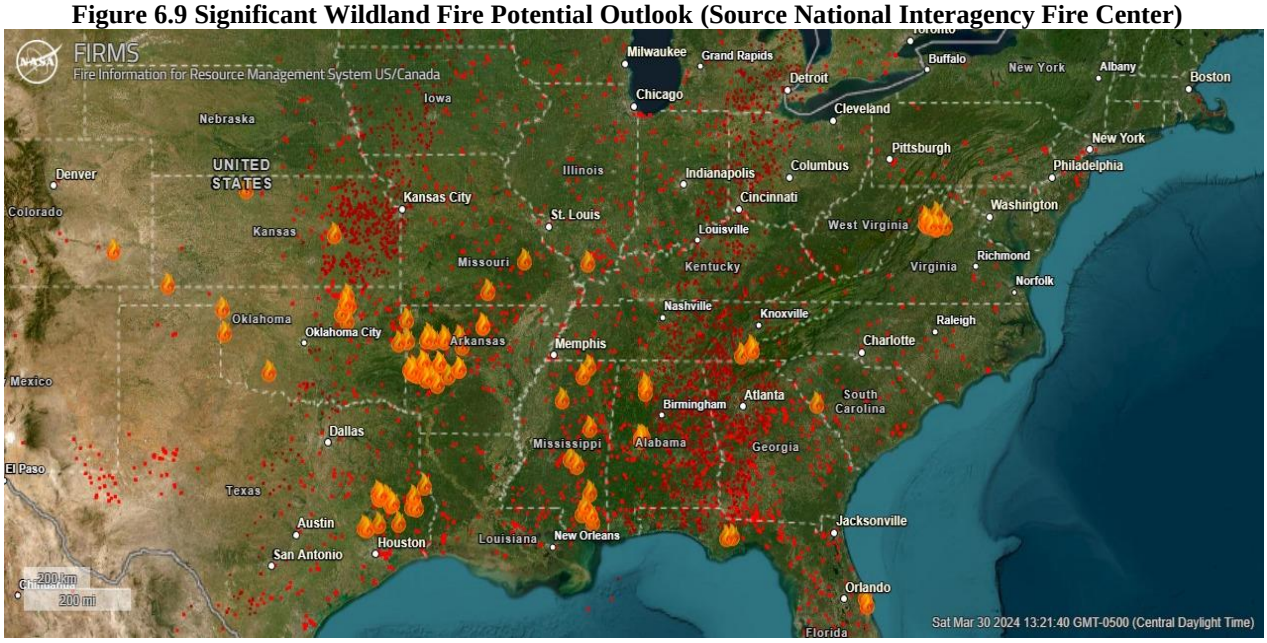


The overall downward trend in the number of wildfires is likely a direct result of proper forestry management techniques and public education initiatives. While the number of wildland fires reported and extinguished each year in Mississippi may seem alarming, the average number of acres burned during a Mississippi wildland fire is approximately 19 acres. (Source: Mississippi Forestry Commission)

6.1.7b ASU's Vulnerability to Wildland Fires

Drought conditions significantly increase the University's vulnerability and are generally long-term recognizable conditions. Fortunately, most wildland fires in Mississippi tend to be small compared to other areas of the United States. **Figure 6.9** shows the Significant Wildland Fire Potential Outlook for the United States which is updated monthly from the National Interagency Fire Coordination Center. As reflected on the map, SW MS is not as susceptible to wildfires.

Figure 6.9 Significant Wildland Fire Potential Outlook (Source National Interagency Fire Center)



6.1.7c Potential Wildland Fire Impacts to the University

Should the ASU campus experience a wildfire, the University may experience very poor air quality and visibility which could lead up to hazardous conditions. The cancellation of classes and campus evacuation could result from a severe wildland fire. Although, campus facilities and structures could be lost due to fire either from heat and/or proximity to the wood line or from embers igniting a fuel source, such as asphalt roofing material, wildland fires are not considered to be a mitigation risk of concern. There are no past threats of wildland fires; the buildings are not immediately surrounded by forests, therefore mitigation for wildland fire should be considered a low priority. Due to historical data, wildfires are a low probability for future occurrence and mitigation. See **Table 6.1** for probability of future events.

6.1.8 Thunderstorms, Lightning, High Wind – General Information

In the southern United States, windstorms are closely associated with severe thunderstorms. Severe thunderstorms develop when a cold dry air mass moves into an area dominated by warm moist air. This basic scenario develops frequently during the spring and fall in the southern United States. The National Severe Storms Laboratory (NSSL) has compiled data on severe storms and has developed occurrence probability zones based upon some of that data. This data was derived from empirical data collected from 1980-1999. Based upon the compiled data, ASU is located very close to the border that depicts between 5 and 6 severe thunderstorm days per year. Due to the high likelihood that the campus of ASU will experience a severe thunderstorm and the associated high winds, this hazard has been retained for further consideration. NOAA classifies a storm as "severe" when it produces wind gusts of at least 58 MPH and/or 1-inch hail (quarter size) and/or a tornado.

6.1.8a Historical Occurrence Data – Thunderstorm, Wind, and Lightning

NOAA has recorded 69 reports of severe wind events in Claiborne County between 2013 and 2023. This represents approximately 6.9 reported thunderstorm wind events in Claiborne County each year. Severe thunderstorms wind events associated with severe thunderstorms caused an

estimated $1,145,000 in property in Claiborne County during 2023 alone. No reported crop damage was shown. Due to the high likelihood of ASU experiencing severe thunderstorms each year and the potential for these storms to cause damage to buildings, structures, infrastructure, and transportation, it should be considered as a high priority hazard. **Table 6.12** reflects historical thunderstorm and high wind events in the ASU planning district.

TABLE 6.12 CLAIBORNE COUNTY THUNDERSTORM AND HIGH WIND EVENTS

Location	Date	Property Damage	Crop Damage
Port Gibson	1/10/2013	$5,000	
Port Gibson	3/31/2013	$1,000	
Pattison	6/28/2013	$52,000	
Tillman	7/14/2013	$5,000	
Port Gibson	3/28/2014	$1,000	
Ingleside	4/28/2014	$12,000	
Rocky Springs	4/28/2014	$25,000	
Pattison	4/28/2014	$1,000	
Port Gibson	6/9/2014	$80,000	
Insmore	6/13/2014	$2,000	
Badland	10/13/2014		
Willows	10/13/2014		
Reganton	2/1/2015	$2,000	
Pattison	5/17/2015	$8,000	
Carlisle	5/25/2015	$4,000	
Insmore	5/25/2015	$4,000	
Port Gibson	5/25/2015	$7,000	
Gordon	7/30/2015	$2,000	
Port Gibson	11/17/2015	$3,000	
Rocky Springs	11/17/2015	$5,000	
Pattison	12/28/2015	$5,000	
Pattison	1/21/2016	$3,000	
Rocky Springs	2/15/2016	$5,000	
Gordon	2/23/2016	$9,000	
Willows	3/10/2016	$1,000	
Rocky Springs	1/2/2017	$7,000	
Port Gibson	3/27/2017	$40,000	
Port Gibson	5/21/2017	$45,000	
Westside	5/28/2017	$10,000	
Russum	8/12/2018	$2,000	
Oaklawn	11/1/2018	$10,000	
Peyton	11/1/2018	$15,000	
Port Gibson	1/19/2019	$10,000	
Gordon	2.23.2019	$2,000	
Gordon	4/7/2019	$3,000	
Westside	4/18/2019	$15,000	

Port Gibson	4/18/2019	$15,000	
Pattison	4/18/2019	$15,000	
Hermanville	4/18/2019	$15,000	
Westside	4.25/2019	$3,000	
Russum	4/25/2019	$3,000	
Russum	5/8/2019	$5,000	
Port Gibson	5/9/2019	$5,000	
Pattison	5/9/2019	$2,000	
Port Gibson	6/27/2019	$10,000	
Galloway	1/11/2020	$12,000	
Port Gibson	4/19/2020	$5,000	
Rocky Springs	4/19/2020	$3,000	
Port Gibson	4/22/2020	$30,000	
Pattison	4/22/2020	$5,000	
Oaklawn	5/23/2020	$2,000	
St Elmo	5/2/2021	$1,000	
Grand Gulf	5/4/2021	$80,000	
Rocky Springs	5/4/2021	$15,000	
Port Gibson	6/7/2021	$3,000	
Westside	4/5/2022	$15,000	
Grand Gulf	4/5/2022	$10,000	
Oaklawn	5/15/2022	$1,000	
Gordon	5/25/2022	$2,000	
Rocky Springs	5/25/2022	$2,000	
Port Gibson	6/10/2022	$5,000	
Grand Gulf	7/9/2022	$200,000	
Reganton	7/13/2022	$1,500	
Carlisle	7/13/2022	$1,500	
Willows	8/8/2022	$1,000	
Rocky Springs	5/11.2023	$1,000	
Westside	6/14/2023	$25,000	
Westside	6.16.2023	$100,000	
Grand Gulf	6/16/2023	$150.000	
TOTALS:		**$1,145,000.00**	**$000,000.00**

6.1.8b ASU's Vulnerability to Thunderstorms, Wind and Lightning

Due to seasonal weather patterns in southern Mississippi having the tendency to generate severe thunderstorms on a routine basis, the University's vulnerability to thunderstorms, lightning, and high wind is high. These seasonal weather patterns have the potential to produce strong thunderstorms that have potential to generate significant lightning, high winds, and tornados. Based on this information and known historical impacts, the University will consider thunderstorms and associated weather as a high priority for mitigation actions. There has been only one lightning event recorded by NOAA in the NCEI database. That event occurred in Port Gibson 3/10/2016 with a reported damage of $75,000.00. Mississippi has had 9 fatalities from

lightning strikes between the years of 2003-2023. (Source: National Lightning Safey Council)

6.1.8c Potential Thunderstorm, Wind and Lightning, Impacts to the University

Events related to thunderstorms in south Mississippi are generally accompanied by other activities that have a higher probability of causing significant damage than the thunderstorm itself. High winds, lightning, spin-off tornados, and widespread or localized flooding are common events associated with severe thunderstorms. Because of the high probability of occurrence and the unpredictable nature of severe thunderstorms, any given storm has the potential to cause at least minor or moderate damage to the University. In general terms, the University is susceptible to damages from high wind gusts, lightning, localized flooding and associated damages to buildings, trees, and other university property. Thunderstorms in Mississippi may last anywhere from a few minutes to a couple of hours depending on the intensity, tracking speed, and other weather factors. Based on the potential for damage, frequency of occurrence, and unpredictability, the extent of severe storms and associated activities are a high mitigation priority for the University. Also, the probability of future events is high. See **Table 6.1**.

6.2 MANMADE HAZARDS

At the request of The ASU Hazard Mitigation Planning Committee, this plan incorporates a discussion and consideration of some manmade hazards, although not required, that have potential to impact the University. According to information provided by the University Facilities Management Office, the University has not experienced significant incidents related to manmade hazards. While the potential does exist for these types of events, at any location and at any time, the geographically isolated nature of the ASU campus serves to reduce threats specific to transportation incidents, hazardous materials incidents, and terrorism. However, to ensure the University is adequately prepared to respond to such incidents, the University has established and adopted the ASU Emergency Management Plan to establish protocols and policies related to emergency response. These responses are most likely to be confined to small releases, spills, or incidents on the campus. There are no quantities of hazardous materials on campus that are in reportable amounts to the EPA. However, even small spills or incidents can have a limited, but serious effect on small numbers of people, and is a concern.

6.2.1 Hazardous Materials Transportation Incidents/Accidents

For the purpose of this plan, hazardous materials transportation incidents involving highway, rail or water travel that result in the release of hazardous materials and may also result in the death or injury of persons involved, will be addressed. According to the U.S. Department of Transportation, 24,247 reported incidents occurred in 2023 in the United States that meet the described definition above resulting in approximately 11 fatalities, 81 injuries and over $42,533 million in property damages. In Mississippi, there were 184 highway transportation incidents and 3 rail transportation incidents involving hazardous materials in 2023. The center of the ASU campus is located approximately four miles from the Mississippi River, which accommodates a significant flow of barge traffic. Approximately 500 million tons of goods, some hazardous, are transported along the Mississippi River each year. In the last 10 years there have been approximately 125 water transportation incidents involving a hazardous material in the United States, but only 1 in Mississippi. Although the ASU campus is only four miles from the Mississippi River, it is considered unlikely that an incident occurring on the river would affect the campus.

6.2.2 Nuclear Radiation

Nuclear power generating facilities generate electricity by utilizing the heat from nuclear fission to convert water into steam. Steam is used to turn turbines that generate electricity. The danger from the operation of this type of facility is due to exposure to radiation. Under normal operating conditions, there is zero chance for exposure to radiation to the surrounding community. Although rare, accidents can and have happened that cause the release of radioactive materials into the environment. The ASU campus is located just over 10 miles from the Grand Gulf Nuclear Station operated Entergy. Since the University is located close enough to the nuclear facility that a release of radioactive materials could result in exposure to radiation, this threat has been retained for further evaluation due to the potential for hazard.

It is noted that Claiborne County and ASU are part of the Radiological Plan for the State of MS. Neighboring counties participate regularly in graded exercises with Grand Gulf, state and federal agencies.

6.2.2a Historical Occurrence Data

There are 99 operational nuclear generating units in the United States as of 2016 operated by 30 different power companies in 30 states. The closest fixed nuclear reactor to the University is located at Grand Gulf, Claiborne County, MS near the banks of the Mississippi River, just over 10 miles northwest of the campus. The danger posed to the University by a nuclear generating unit is exposure to dangerous levels of radiation. Under normal operating conditions, the nuclear unit does not release radioactive particles into the surrounding environment. However, accidents have occurred in the past at similar types of facilities resulting in the release of nuclear contaminants, damage to the environment, short term human health issues and human fatalities. The worst nuclear unit accident in the United States occurred on March 28th, 1979 at Three Mile Island in Pennsylvania. Through a series of incidents, Three Mile Island Unit-2 experienced a partial core meltdown due to lack of unit coolant thereby resulting in a release of radioactive materials into the atmosphere. Studies conducted afterward indicate that approximately 2 million people were exposed to approximately 1 millirem. For perspective, a chest x-ray exposes a human body to approximately 6 millirems. The maximum dose experienced by someone at the property boundary would have been less than 100 millirems. The natural background exposure to humans for the area is approximately 100-125 millirems annually. The damage to the facility was extensive; however, there were no deaths or injuries as a result of the accident.

Worldwide, there have been accidents resulting in injury and death. The worst of these incidents is the infamous disaster that occurred on April 26, 1986 at Chernobyl, Ukraine. This incident saw the complete meltdown and loss of containment of the core in Unit-4 of the four-unit generating station. In the weeks following the accident, 30 people lost their lives due to radiation exposure. It is estimated that approximately 600,000 people were exposed to some level of radiation due to proximity at the time of the incident or their involvement in the cleanup activity. To date, there remains an 18-mile buffer zone surrounding the facility with restricted access to only authorized individuals. The Fukushima nuclear disaster was at the Fukushima Nuclear Power Plant in Japan, initiated primarily by the tsunami following the major earthquake on March 11, 2011. Immediately after the earthquake, the active reactors automatically shut down their sustained fission reaction. However, the tsunami disabled the emergency generators that would have provided power to control and operate the pumps necessary to cool the reactors.

It is noted that Nuclear Power Plants in the U.S. have three safety containment components, whereas foreign plants such as Fukushima and Chernobyl have only two. The Chernobyl incident was caused by a flawed Soviet reactor design and operated with poorly trained personnel. The Fukushima disaster was caused by tsunami triggered by a magnitude 9.0 earthquake. Both of those situations are less than 1% likely to occur. Grand Gulf personnel are highly trained, are exercised and monitored regularly by state and federal agencies. Grand Gulf is nearly 300 miles from the nearest major fault that has produced a magnitude 8.0 or higher in the last 200 years. There is no possibility of a tsunami in this area.

Since the Three Mile Island incident, new regulations have been enacted in the United States to require safety procedures and system redundancies to help prevent the accidental release of radioactive materials into the environment. The strict compliance with these requirements makes it unlikely that Grand Gulf will experience an accidental release. However, the possibility does still exist, though remote. Since the University is approximately 10 miles from the Grand Gulf generating station, it is highly unlikely that there would be serious injury or loss of life due to direct exposure to released radioactive materials. In the case of an accidental release, the University Emergency Response Plan should be followed for the evacuation of campus. It should be noted that the evacuation route followed should move students, faculty, and community members away from Grand Gulf at all times of evacuation. Evacuation routes leading toward Grand Gulf should not be used.

6.2.3 Chemical

The presence of a variety of chemicals on campus related to maintenance, general university operations, and various research activities provides a significant level of concern with respect to the potential for human exposure in the event of a spill or leak. To address these concerns and to establish response protocols, the University developed the ASU Emergency Operation Plan. According to information provided by the University Facilities Management Office, there are no records of incidents of chemical release posing a direct threat to the University community and no reportable quantities on hand.

6.2.4 Civil Disturbance

ASU publishes a summary of reported crimes with the most recent summary covering the period of 2022. This report is published within the 2023 Campus Safety Report located online. This report categorizes reported crimes in 31 individual categories ranging from murder to liquor law violations. The most recent report indicates most reported crimes were on the Lorman campus and are related to drug law violations and illegal weapons possession. The Natchez campus reported five different offenses with sex offense non forcible being the most reported. The University has instituted and incorporated a campus emergency notification system through the Connect-ED system that provides a mechanism for notification of emergency situations through email and text messaging. This system combined with procedures established through the Emergency Management Plan allows the University to respond in an appropriate manner to a variety of situations potentially occurring on campus including civil disturbance.

In addition to the Connect-ED System, the University also has a siren/loudspeaker system called Big Boy. The University also has its own radio broadcast station located on campus. In addition, the University has a fully staffed and equipped police department that includes several officers, monitors, and dispatchers. The University Police Department is the primary public safety authority on campus and is positioned to provide safety and leadership in emergency situations.

6.2.5 Power Failure

Incidents of power failure are typically associated with other naturally occurring events such as thunderstorms, severe winter storms, and hurricanes. Issues related to power failure are addressed through discussions of those disaster types in previous sections of the plan and mitigation strategies are included in the plan to provide for long-term power failure.

6.2.6 Terrorism

In recent years, university campuses have seen rising concerns related to terrorism, active shooter incidents, and the potential for incidents at events with high concentrations of population including spectator sports events. As of now, ASU has not experienced any of these types of incidents but has prepared for contingencies through adoption of the Emergency Management Plan.

6.3 POTENTIALLY VULNERABLE FUTURE INFRASTRUCTURE AND STRUCTURES

As the ASU campus continues to grow, additional buildings and supporting infrastructure are potentially at risk to a variety of hazard types. All infrastructure on campus is under the operational and maintenance control of the University. The University has recently developed, this year, a new Master Plan for continued development of the University Campus. Through this planning effort, the University takes into consideration mitigation strategies as they relate to land use, development of new infrastructure, and development of new or redeveloped structures and facilities. The University currently has adequate land resources available for new development. However, recent trends of infill and redevelopment of existing lands within the current campus boundaries indicate a strategy of natural land preservation and an attempt to maintain the agricultural nature of the campus. The Master Plan will provide more concrete guidance on future land uses on campus. The Master Plan will be referenced in this plan and made part of ongoing plan maintenance and update procedures as outlined in **Section 8**.

6.4 POTENTIAL DOLLAR LOSSES TO VULNERABLE STRUCTURES

An estimation of potential dollar losses to identified vulnerable structures for each type of hazard is difficult to predict and would vary depending on the type, location, extent, duration, and severity of the hazard event. Data provided in previous sections, including predicted dollars losses resulting from hurricanes/high wind events and earthquakes is indicative of the types of damages potentially resulting from other event types having the potential to affect a broad area of campus. **Table 6.8** provides an estimate of ranges of potential damages in dollars resulting from wind events. These damage estimates were derived through use of the HAZUS-MH model for hurricanes/high wind events.

6.5 FUTURE IMPACTS OF CLIMATE CHANGE

Requirement CFR §201.6(2)(ii)(b1-e) [the plan should describe vulnerability in terms of] providing general description of how climate change can affect weather patterns, average temperature and sea levels so that mitigation options can be considered in future decisions.

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 the ASU Planning Area. With increasing global surface temperatures, the possibility of more droughts and increased frequency and intensity of storms will likely occur. This can also impact every natural risk in some way from flooding, flash flooding, erosion, winds (land and sea), wildfire, sea level/surge and any other weather conditions. Considerations will have to be made in planning future projects on campuses to help mitigate and decrease the chance of impact to the ASU Planning Area. The climate is an ever-changing natural occurrence and climate risks cannot be reduced to zero. Strengthening of infrastructure and services will help to mitigate climate change from nature and manmade incidents. Mitigation is a program to help take actions ahead of time to lessen the impact of climate change.

With increasing global surface temperatures, the possibility of more droughts and increased intensity of storms will likely occur. As more water vapor evaporates into the atmosphere, it becomes fuel for more powerful storms to develop. Tropical storms become more severe due to warmer ocean water temperatures. More heat in the atmosphere and warmer ocean surface temperatures can lead to increased wind speeds in tropical storms. Rising sea levels expose higher locations not usually subjected to the power of the sea and to the erosive forces of waves and currents. Changes in climate not only affect average temperatures, but also extreme temperatures, increasing the likelihood of weather-related natural disasters. If global climate change causes the global average temperature to rise, there will be less cold weather, and a greater probability of hot and record hot weather. An increase in average temperature combined with increased variance will have little effect on cold weather, but hot weather will be more common and record hot weather will increase greatly. Below are some of the regional impacts of global change forecast by the Intergovernmental Panel on Climate Change:

- North America: Decreasing snowpack in the western mountains; 5-20 percent increase in yields of rain-fed agriculture in some regions; increased frequency, intensity, and duration of heat waves in cities that currently experience them.

Floods

The connection between floods and climate change comes down to a few ways that climate change is impacting water. First, higher temperatures lead to increased levels of evaporation, creating denser clouds that hold more water. This eventually leads to heavier precipitation that can cause flooding. Second, more frequent and intense storms such as hurricanes can lead to floods. Finally, higher sea levels due to melting glaciers can also prompt coastal flooding. Floods can also be exacerbated by how humans manage waterways and spur urbanization.
Floods are already the most common and costly weather disasters in the United States. They will get much worse as climate change accelerates snow melting and produces more intense rainstorms. Unfortunately, these adverse impacts are increasing while dams and levees are aging and suffering from deferred maintenance. The average flood-control dam in the United States was built nearly 60 years ago while the average levee is past 50. Engineers built most of these structures to remain reliable for only 50 years. Virtually none were designed to handle the size and intensity of today's floods.

Storms

Storms are impacted by climate change in the same way that some floods are, via the effect that higher temperatures have on evaporation and subsequent precipitation. With clouds holding increased amounts of water vapor, more powerful storms develop.

Earthquakes

The connection between earthquakes and climate change is slightly less straightforward, and certainly less influential. Most earthquakes occur when tectonic plates within the Earth's crust change or move. Many things can lead to this, but where climate change comes into play is once again related to water.

Earthquakes can be triggered or prevented by variability in stress on a fault between tectonic plates. Stress on these faults is impacted by surface water from rain or snow. When there is heavier rainfall, this precipitation and any subsequent flooding increases stress and decreases seismicity. When the season dries up and there's less water, the weight on the Earth's crust decreases and this can lead to micro seismicity.

Extreme Temperatures

Climate change can lead to both extreme high temperatures and extreme low temperatures. The connection with extreme high temperatures is more intuitive — greenhouse gases are being trapped in the atmosphere and this leads to warming. However, the connection to extreme low temperatures can be harder for some people to make. Lower temperatures in some regions are a result of the polar vortex being warmer, causing it to weaken and dip down further than it normally would, bringing with it colder temperatures. This is further exacerbated by impacts to the jet stream that change the pattern of where and when hot and cold temperatures typically occur. These two combined have led to hotter summers and harsher winters in some areas.
Droughts

On the other side of the water spectrum are droughts, though they result from the same process. Droughts are a natural part of the climate cycle, but climate change is making them more frequent, severe, and prolonged. While higher levels of evaporation lead to eventual severe rainfall, in some regions, this shift means drier conditions due to the loss of the evaporated water, which can lead to drought and dried out soils and vegetation. With climate change, places that are traditionally dry are becoming drier through the higher levels of evaporation and places that are traditionally wet are becoming wetter through the higher levels of rainfall that result.

Wildfires

Although there is no direct relationship between climate change and fire, researchers have found strong correlations between warm summer temperatures and large fire years, so there is consensus that fire occurrence will increase with climate change. Wildfires are a consequence of the drier conditions caused by climate change in some areas. The wildfire season is much longer than in previous years and the number of wildfires per season has tripled. Severe heat and

drought provide fuel for fires through drier soils and vegetation that is more flammable. Additionally, due to warmer temperatures, snowpacks are melting earlier, meaning that forests are drier for longer periods of time and increasingly at risk of fires.

Dams and Levees

Faced with major floods every other year along some stretches of the Upper Mississippi, which has historically had fewer levees than the lower part of the river, many floodplain managers have built up levees and flood walls, even though doing so will only make the problem worse in the long-term, Chicago Review Press. According to the European Geosciences Union, the projected alterations due to climate change are likely to affect different factors driving dam risk. The global effect can be assessed through the integration of the various projected effects acting on each aspect of the risk, from the input hydrology to the calculation of the consequences of the flood wave on population and assets at risk. This will provide useful information for dam owners and dam safety practitioners in their decision-making process.

This focus is on the dam safety hydrological impacts of climate change, which means that floods are the main load component to which the dam-reservoir system is subjected.

It is worth mentioning that risk impacts of climate change are conditioned by climatic but also by non-climatic drivers, such as population increase, economic development, or water management adaptation. In certain cases, these non-climatic drivers may have a significant influence in the dam risk calculation and have been considered in the research.

Moreover, climate change can impact both normal components (such as the population exposure downstream of the dam) and extreme components (such as the flood events) of risk, which can be captured by using the proposed risk analysis approach.

7.0 Mitigation Strategies

7.1 INTRODUCTION TO MITIGATION STRATEGIES

> Requirement CFR §201.6©(4)(i) Methodology. A description of the methodology, schedule for monitoring the plan must be reflected in the plan.

The mitigation strategies included in this section resulted from a careful analysis of the risk and vulnerability assessments that illustrated areas in which the University could implement strategies that would effectively minimize the risks and vulnerabilities. In addition, the ASU Committee conducted significant discussions and deliberations on the relative merits of strategies and options to be considered for inclusion into the plan and for implementation. Considerations for prioritization and inclusion of strategies included elements related to the feasibility of implementation, cost, and other considerations included in the Qualitative Hazard Ranking Assessment Methodology. This methodology is an accepted planning process for determining hazard identification, qualitative risk assessment, and hazard ranking.

Through the discussions with the ASU Committee, it became apparent that a level of vulnerability exists that is unique to the ASU campus but not necessarily specific to any hazard type. The geographic location of Alcorn potentially creates a situation where the University may be isolated and cut off from outside assistance in the event of a significant disaster affecting the University and surrounding communities. The potential for isolation and the presence of approximately 6,288 students, faculty, and staff means that the University must have the capability of being completely self-sustaining for a period of not less than five to seven days. Several strategies included in this section are designed to facilitate the level of sustainability required by the University to ensure that basic needs of food and shelter can be provided to the University population during these potential periods of isolation.

Organization of strategies in the plan is by specific goals as outlined by the ASU Committee. In some cases, mitigation strategies may include multiple options for achieving the same desired outcome. These options will be further explored, prioritized, and ranked later in this section. Through the ranking and prioritization process some options will be removed from consideration as other options are deemed more feasible or practical. In other cases, more than one option may be included and will be considered as implementation mechanisms and resources become available. The following narrative describing goals, and associated mitigation options also includes elements derived from ASU Committee discussions relative to pros and cons for various mitigation strategies as well as hazards to be addressed and specific buildings potentially affected, where applicable.

7.2 Mitigation Goals and Objectives

> Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazard.

Throughout the planning process the ASU Planning Committee reflected on appropriate and effective mitigation planning goals and objectives for the main campus and other facilities. The Committee elected to

base their goals and objectives on those adopted by the surrounding local jurisdictions of Adams County, Warren County, Claiborne County, and the State of Mississippi, to effectively support a statewide initiative for mitigation planning.

Priorities:

The ASU HMPC elected to use a basic methodology to prioritize their projects based upon the following factors: risk to infrastructure (loss of function), cost effectiveness, increase public awareness, and availability of funds. Actions were assigned a priority of Low, Moderate, or High. Additional considerations for prioritization of potential mitigation strategies included the consideration of the identified hazard profiles, vulnerabilities, costs, and projected or potential benefits. Some strategies offer benefits to only one hazard type or one structure while others provide potential benefits relative to multiple hazards and in some cases, the entire campus or university community.

After reviewing the goals and objectives in the previous plan, the Committee reached a consensus and formally approved the following goals and objectives for Alcorn State University Hazard Mitigation Plan:

Goal 1: Protect the health, safety, and welfare of students, faculty, and staff at Alcorn State University.	**Objectives:** 1.1 Develop a comprehensive public outreach/education campaign to inform the university community of response actions to watches, warnings, and other types of natural hazard alerts 1.2 Implement safety measures 1.3 Improve and ensure ADA compliance 1.4 Develop coordinated action plan for various types of emergencies
Goal 2: Ensure continuity of service for buildings, facilities, and operations identified as critical and high priority.	**Objectives:** 2.1 Minimize interruption to campus lifelines 2.2 Implement measures to protect equipment investments
Goal 3: Ensure that campus police, firefighters, and other emergency responders have the training, tools, and technology necessary to adequately protect the University, faculty, staff, students, and visitors	**Objectives:** 3.1 Offer periodic refresher training 3.2 Ensure appropriate levels of fire protection 3.3 Establish pre-incident plans for buildings 3.4 Update ASU Emergency Management Plan

Goal 4:	**Objectives:**
Establish mechanisms to ensure continuity of the University's Hazard Mitigation Plan through continuous review, revision, and updates; and through a coordinated effort to interact with other agencies/governments	4.1 Integrate mitigation and emergency preparedness 4.2 Identify funding opportunities and apply for grants on projects identified in the plan 4.3 Educate ASU on mitigation funding opportunities 4.4 Coordinate hazard mitigation efforts with local and state officials

7.3 Identification and Analysis of Mitigation Actions

> Requirement §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 efforts of each hazard, with particular emphasis on new and existing buildings and infrastructure.

With the goals and objectives in place, the HMPC identified specific actions that will help accomplish the ASU's overall mitigation strategies and can be addressed as a college-wide initiative. Not every campus identified a specific action under each goal, but they will continue to identify necessary actions to reduce vulnerabilities and include them in the plan as they are developed. Some of the goals and objectives are more long-term and specific actions will be developed as they are identified throughout the plan life, as well as each plan update. The completion of each action will be subject to funding availability. There are only two funding sources available that can be utilized toward the actions listed in the table - grant funds and state budget allocations. See Grant Sources on page 66, 8.1.1. New and existing buildings, along with infrastructure, will be built or modified according to the vulnerability assessment mentioned in the Plan (Tables 5.1-5.5) and as funding is identified.

Each mitigation action has been assigned to a responsible department and is defined in **Table 7.1** below. The timeframe for implementing the actions will be 2023-2028.

If the Status is identified as Ongoing it means that the action is a continuous action; in other words, the action is performed on a regular basis. Some of the actions identified in the following table are carried over from the previous Hazard Mitigation Plan.

All mitigation actions are planned, based on all-hazards events, due to funding. Identifying all-hazards actions and events is the feasible approach to spending mitigation funds. While specific events may require specific actions, at this time, due to limited funding, the all-hazards approach to spending directs more money to the mitigation actions. This in turn ensures continuity of campus operations. See Table 7.1.

TABLE 7.1 MITIGATION ACTIONS

Goal 1: Protect the health, safety, and welfare of students, faculty, and staff at Alcorn State University.

Mitigation Action 1

Publish and distribute a crisis management/natural hazard mitigation quick guide for faculty, staff, and students.

Hazard Addressed:	All Hazards
Entity:	ASU
New, Reoccurring, Completed	Completed
Priority (Low, Medium, High)	Moderate
Estimated Cost:	$10,000
Potential Funding Sources:	General Funds from College
Responsible Department	Campus Safety
Implementation Schedule:	Completed

Mitigation Action 2

Place quick guide on public forums (ASU website & social media)

Hazard Addressed:	All Hazards
Entity:	ASU
New, Reoccurring, Completed	Reoccurring
Priority (Low, Medium, High)	Moderate
Estimated Cost:	$5,000 annually
Potential Funding Sources:	General Funds from College/Entergy Grant
Responsible Department	Chief Information Officer
Implementation Schedule:	Ongoing as needed

Mitigation Action 3

Identify evacuation traffic routes by posting signage on campus streets for efficient emergency traffic flow

Hazard Addressed:	All Hazards
Entity:	ASU
New, Reoccurring, Completed	Reoccurring
Priority (Low, Medium, High)	Moderate
Estimated Cost:	$15,000 match
Potential Funding Sources:	General Funds from College/HMG
Responsible Department	Parking Services
Implementation Schedule:	Ongoing as needed

Mitigation Action 4

Install signage (building signs and street signs) to identify designated storm sheltering areas

Hazard Addressed:	All Hazards
Entity:	ASU
New, Reoccurring, Completed	Reoccurring
Priority (Low, Medium, High)	Moderate
Estimated Cost:	$10,000 annually
Potential Funding Sources:	General Funds from College
Responsible Department	Facilities Manager
Implementation Schedule:	Ongoing as needed

Mitigation Action 5

Acquisition of an alert system called Big Voice System. Voice capabilities were added to the alert system to allow for warning/direction to reach outside buildings.	
Hazard Addressed:	All Hazards
Entity:	ASU
New, Reoccurring, Completed	Completed
Priority (Low, Medium, High)	High
Estimated Cost:	$100,000
Potential Funding Sources:	General Funds from College
Responsible Department	Campus Safety
Implementation Schedule:	Completed

Mitigation Action 6

Utilize the campus radio station for emergency messaging	
Hazard Addressed:	All Hazards
Entity:	ASU
New, Reoccurring, Completed	Reoccurring
Priority (Low, Medium, High)	High
Estimated Cost:	$40,000 plus annually
Potential Funding Sources:	General Funds from College
Responsible Department	Chief Information Staff
Implementation Schedule:	Ongoing as needed

Mitigation Action 7

Seek funding to purchase a generator for Simmons Technology Building	
Hazard Addressed:	All Hazards
Entity:	ASU
New, Reoccurring, Completed	Reoccurring
Priority (Low, Medium, High)	High
Estimated Cost:	$10,000
Potential Funding Sources:	General Funds from College
Responsible Department	Finance & Admin
Implementation Schedule:	Ongoing as needed

Mitigation Action 8

Seek funding to renovate the David L Whitney HPER Complex, which is the primary shelter for ASU and surrounding **residents (Hurricane, tornados, thunderstorms)**	
Hazard Addressed:	Hurricane, tornados, thunderstorms
Entity:	ASU
New, Reoccurring, Completed	Reoccurring
Priority (Low, Medium, High)	High
Estimated Cost:	178,000
Potential Funding Sources:	General Funds from College
Responsible Department	Finance & Admin
Implementation Schedule:	Ongoing

Mitigation Action 9

Seek funding to install protective film to strengthen and protect large windows in the Bolden Campus Union Building.	
Hazard Addressed:	Hailstorms, hurricane, tornado
Entity:	ASU
New, Reoccurring, Completed	Ongoing

Priority (Low, Medium, High)	High
Estimated Cost:	$25,000
Potential Funding Sources:	General Funds from College
Responsible Department	Facilities Manager
Implementation Schedule:	Ongoing as needed

Mitigation Action 10

Work with office of Disability Servies to ensure ADA compliance	
Hazard Addressed:	All Hazards, elevators, sidewalks, ramps, restrooms & other facilities
Entity:	ASU
New, Reoccurring, Completed	Reoccurring
Priority (Low, Medium, High)	High
Estimated Cost:	$6.710 Million
Potential Funding Sources:	General Funds from College & grants
Responsible Department	Facilities Manager
Implementation Schedule:	Ongoing as needed

Mitigation Action 11

ASU Emergency Management Plan	
Hazard Addressed:	All Hazards
Entity:	ASU
New, Reoccurring, Completed	Completed
Priority (Low, Medium, High)	High
Estimated Cost:	$1,000
Potential Funding Sources:	General Funds from College
Responsible Department	Campus Safety & Facilities Manager
Implementation Schedule:	Maintained as needed

Goal 2: Ensure continuity of service for buildings, facilities, and operations identified as critical and high priority

Mitigation Action 12

Purchase new generators and automatic switches (See Table 7.2)	
Hazard Addressed:	All Hazards
Entity:	ASU
New, Reoccurring, Completed	Reoccurring
Priority (Low, Medium, High)	High
Estimated Cost:	$2 million
Potential Funding Sources:	General Funds from College and grants applied for
Responsible Department	Facilities Manager
Implementation Schedule:	Ongoing as needed

Mitigation Action 13

Purchased generator for Water Well #1	
Hazard Addressed:	All Hazards
Entity:	ASU
New, Reoccurring, Completed	Completed
Priority (Low, Medium, High)	High
Estimated Cost:	$50,000 match
Potential Funding Sources:	General Funds from College
Responsible Department	Facilities Manager

Implementation Schedule:	Completed

Mitigation Action 14

Explore options to increase emergency fuel supply	
Hazard Addressed:	All Hazards
Entity:	ASU
New, Reoccurring, Completed	Ongoing
Priority (Low, Medium, High)	Moderate
Estimated Cost:	$4,000 maintenance
Potential Funding Sources:	General Funds from College
Responsible Department	Facilities Manager
Implementation Schedule:	Ongoing

Mitigation Action 15

Seek funding for emergency supplies storage facilities	
Hazard Addressed:	All Hazards
Entity:	ASU
New, Reoccurring, Completed	Ongoing
Priority (Low, Medium, High)	Moderate
Estimated Cost:	$20,000 maintenance
Potential Funding Sources:	General Funds from College
Responsible Department	Director of Maintenance
Implementation Schedule:	Ongoing as needed

Goal 3: Ensure that campus police, firefighters, and other emergency responders have the training, tools, and technology necessary to adequately protect the university, faculty, staff, students, and other visitors

Mitigation Action 16

Establish a program of routine refresher training in cooperation with MEMA/FEMA to include train the trainer.	
Hazard Addressed:	All Hazards
Entity:	ASU
New, Reoccurring, Completed	Ongoing
Priority (Low, Medium, High)	Moderate
Estimated Cost:	$2,000
Potential Funding Sources:	General Funds from College
Responsible Department	Campus Safety
Implementation Schedule:	Ongoing as needed

Mitigation Action 17

A new fire loop was completed in 2017 as part of a campus wide infrastructure project, to ensure against wildfires or structural fires	
Hazard Addressed:	Wildfire
Entity:	ASU
New, Reoccurring, Completed	Completed
Priority (Low, Medium, High)	Moderate
Estimated Cost:	$2,500
Potential Funding Sources:	General Funds from College
Responsible Department	Facilities Manager
Implementation Schedule:	Completed

Mitigation Action 18

Originally an engineering and hydraulic analysis of fire hydrants and fire lines was considered but wasn't feasible	
Hazard Addressed:	Wildfire
Entity:	ASU
New, Reoccurring, Completed	Not feasible
Priority (Low, Medium, High)	Moderate
Estimated Cost:	N/A
Potential Funding Sources:	Not feasible
Responsible Department	Facilities Manager
Implementation Schedule:	N/A

Mitigation Action 19

Pre-incident management plans for buildings	
Hazard Addressed:	All Hazards
Entity:	ASU
New, Reoccurring, Completed	Ongoing
Priority (Low, Medium, High)	Moderate
Estimated Cost:	N/A
Potential Funding Sources:	General Funds from College
Responsible Department	Facilities Manager & Campus Safety
Implementation Schedule:	Ongoing as needed

Goal 4: Implement the Hazard Mitigation Plan through a coordinated effort by seeking funding and interaction with other agencies/governments.

Mitigation Action 20

Attend training courses and all-hazard conferences offered by MEMA/FEMA	
Hazard Addressed:	All Hazards
Entity:	ASU
New, Reoccurring, Completed	Ongoing
Priority (Low, Medium, High)	Moderate
Estimated Cost:	N/A
Potential Funding Sources:	General Funds from College
Responsible Department	Campus Safety
Implementation Schedule:	Ongoing as needed

Mitigation Action 21

Schedule annual meetings with emergency management directors in Adams, Warren, and Claiborne Counties (planning area) and city officials to discuss mitigation strategies	
Hazard Addressed:	All Hazards
Entity:	ASU
New, Reoccurring, Completed	Ongoing
Priority (Low, Medium, High)	Moderate
Estimated Cost:	$1,500
Potential Funding Sources:	General Funds from College
Responsible Department	Campus Safety
Implementation Schedule:	Ongoing as needed

Mitigation Action 22

Conduct meetings and maintain the ASU HMPC and Emergency OPS Leadership Team	
Hazard Addressed:	All Hazards
Entity:	ASU

New, Reoccurring, Completed	COMPLETED
Priority (Low, Medium, High)	Moderate
Estimated Cost:	N/A
Potential Funding Sources:	General Funds from College
Responsible Department	Campus Safety
Implementation Schedule:	Maintain as needed

Mitigation Action 23	
Participate in the Regional Hazard Mitigation Plan planning process	
Hazard Addressed:	All Hazards
Entity:	ASU
New, Reoccurring, or Completed	Completed
Priority (Low, Medium, High)	Moderate
Estimated Cost:	N/A
Potential Funding Sources:	General Funds from College
Responsible Department	Campus Safety
Implementation Schedule:	Ongoing

Mitigation Action 24	
Link Hazard Mitigation Plan to other university plans	
Hazard Addressed:	All Hazards
Entity:	ASU
New, Reoccurring, or Completed	Completed
Priority (Low, Medium, High)	Moderate
Estimated Cost:	N/A
Potential Funding Sources:	General Funds from College
Responsible Department	Campus Safety
Implementation Schedule:	Maintain as needed

Mitigation Action 25	
Incorporate the two satellite campuses (Natchez and Vicksburg) into updated ASU Hazard Mitigation Plan	
Hazard addressed:	All Hazards
Entity:	ASU
New, Reoccurring, Completed:	Completed
Priority (Low, Medium, High):	Moderate
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Responsible Department:	Campus Safety
Implementation Schedule:	Completed

Table 7.2 provides a listing of existing generators at buildings listed as critical or high priority. The table also indicates existing fuel sources, whether the generator is equipped with an automatic switch, and the hours on the generator.

TABLE 7.2 CURRENT EMERGENCY BACKUP GENERATOR INVENTORY				
Building Name	**Fuel Supply**	**Automatic Transfer Switch (Y/N)**	**Number of Hours of Service on Generator**	**Currently In Service**
Walter Washington Administration	Diesel	Yes Installed in Fall 2017	592	Yes

and Classroom Building				
Biotechnology Classroom Building	Natural Gas	Yes	835	Yes
Whitney Gymnasium	Diesel	No	97	Yes
Math and Science	Diesel	Yes Installed in 2018	483	Yes
President's Home	Natural Gas	Yes	104	Yes
Water Treatment Plant	Diesel	Yes	677	Yes
Heritage Village A & B	Natural Gas	Yes	283	Yes
Heritage Village C & D	Natural Gas	Yes	110	Yes
Bowles Hall	Natural Gas	Yes	109	Yes
Clinton Bristow Dining Facility	Diesel	Yes	Installed in 2018 48	Yes
Bolden Student Union	Diesel	No		Yes
Campus Safety Center	Natural Gas	Yes	761	Yes
Belles Lettres Hall	Natural Gas	Yes	Installed in 2017 175	Yes
Dumas Hall	Natural Gas	Yes	281	Yes
Natchez Campus Business Administration Building	Natural Gas	Yes	118	Yes
Natchez Campus Nursing School Dormitory	Natural Gas	Yes	190	Yes
Water Well #1	Diesel	Yes		Yes
Natchez Campus Kellog Nursing School Clinic	Natural Gas	Yes	Not metered	Yes

Table 7.3 provides an inventory of generator needs based on an evaluation of existing generator resources and based on input from the ASU Committee. The table also indicates the proposed fuel supply and the need for an automatic switch.

TABLE 7.3 GENERATOR NEEDS		
Building Name	**Generator Needed**	**Fuel Supply Proposed**
ASU Service Station	X	Natural Gas
Rowan Hall (Infirmary)	X	Natural Gas
Water Well #2	X	Diesel
Water Well #3	X	Diesel
Water Well #4	X	Diesel
Facilities Management Building	X	Diesel
Ag Extension Building	X	Natural Gas

Wastewater Treatment Plant	X	Diesel
Main Sewer Lift Station	X	Diesel
Sewer Lift Station at Ecology	X	Natural Gas
Sewer Lift Station at Football Stadium	X	Natural Gas
Sewer Lift Station at President's Home	X	Natural Gas
Amenities Building	X	Natural Gas
Honors Dormitory	X	Natural Gas
Burrus Hall	X	Natural Gas
Robinson Hall	X	Natural Gas
Albert Lott Hall	X	Natural Gas
Revels Hall	X	Natural Gas
Student Union (Additional Rewiring Needed to Power Entire Building)	X	Diesel
Lanier Hall	X	Natural Gas
Fine Arts Building	X	Natural Gas
Natchez Campus Nursing School Dormitory (Additional Rewiring Needed to Power Entire Building)	X	Natural Gas

Prevention: Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.

Property Protection: Actions that involve the modification of existing buildings or infrastructure to protect them from a hazard or remove from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, flood proofing, storm shutters, and shatter-resistant glass.

Public Education and Awareness: Actions that inform and educate citizens, elected officials, and property owners about potential risks from hazards and potential ways to mitigate said risks. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.

Natural Resource Protection: Actions that not only minimize hazard losses but also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.

Emergency Services: Actions that protect people before, during, and after a hazard event. Certain critical facilities such as administrative and emergency operations offices that provide critical and vital services; coordinate warnings, responses, and recovery from a disaster are identified. Actions include protection of warning system capability, protection or hardening of critical facilities, and protection of infrastructure needed for emergency response.

Structural Projects: Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include storm water controls (i.e. culverts), floodwalls, seawalls, retaining walls, and safe rooms.

Technical Assistant Projects: Actions that involve support/education from MEMA/FEMA and other agencies as required.

Implementation of Mitigation Actions

Priorities

The ASU HMPC elected to use a basic methodology to prioritize their projects based on the criteria used in the Claiborne County Hazard Mitigation Plan. A priority number was based upon the following five factors: risk to people, risk to infrastructure (loss of function), cost effectiveness, increase public awareness, and availability of funds. Actions were assigned a number between 1 and 5, with 1 being the lowest and 5 the highest. The factors were combined for an overall priority for the action with the highest possible score of 25 as defined below:

Implementation

As funding is identified, the mitigation actions will be developed into projects. For those projects that are eligible for mitigation funding, the STAPLE/E method will be used to determine the effectiveness of the mitigation actions. This technique is used to identify, evaluate, and prioritize mitigation actions based on existing conditions and is also used by the State to assist in the development of statewide mitigation actions. ASU will refer to the FEMA Hazard Mitigation Assistance Unified Guidance (February 2015) as further development of applications for the identified mitigation actions in this plan that are eligible under the program.

STAPLE/E is defined as follows:

Social: Is the project supported by the college?

Technical: Is the project technically feasible and will it reduce losses in the long term with minimal secondary impacts? Is there an alternative action?

Administrative: Does the college have the appropriate administrative capabilities, staffing and funding requirements for effective mitigation action? Will additional resources be needed?

Political: Will the college and local/state political leadership support this action?

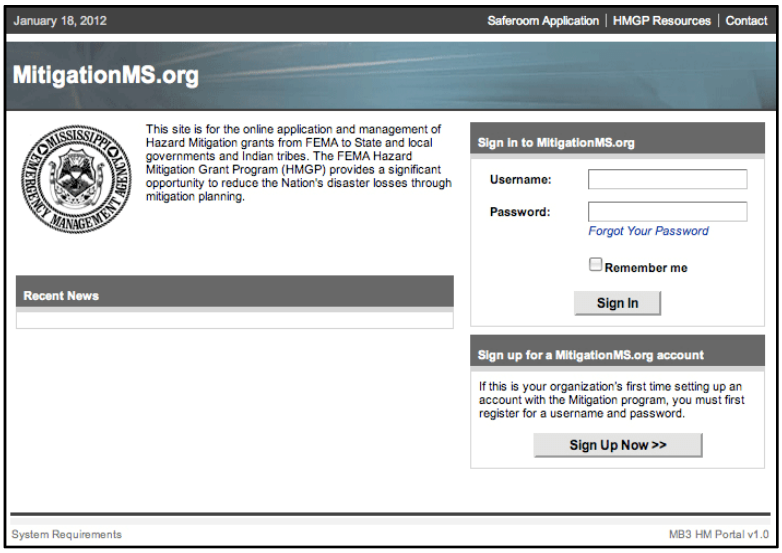
Legal: Does the college have legal authority to implement the action?

Economic: Is the mitigation action cost effective? Can it be funded in current or upcoming budgets?

Environmental: Will the mitigation action have a negative effect on the environment?

Administration

The Institutional Research and Effectiveness Department will be responsible for the administration of mitigation actions as they are implemented. Administration will include completing grant applications including www.mitigationms.org or other grant sources and complete quarterly progress reports.



7.4 BENEFIT-COST REVIEW

Requirement §201.6(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

Every potential mitigation strategy has a cost associated with implementation. These costs may be direct costs associated with the infrastructure upgrades, building retrofits, or purchase of equipment, supplies, or materials. Indirect costs may be associated with staff time dedicated to implementation or costs associated with implementation of policy-related strategies. Similarly, every potential mitigation strategy has an associated benefit or set of benefits. Direct and indirect costs associated with implementation of mitigation strategies are often easy to quantify in monetary terms. However, relative benefits of mitigation strategies are often more difficult to quantify. In general terms, those strategies offering the greatest benefit at the lowest costs are considered the highest priority and are described as having the highest benefit-cots ratio.

According to FEMA, benefits realized from mitigation projects are directly associated with the avoided damages and losses as a direct result of the mitigation activity. Specific benefits are calculated based on the estimation of future losses resulting from two scenarios: 1) the resulting damages and losses from a particular event without undertaking the mitigation project; and 2) the resulting damages and losses from the same event with the mitigation project completed. Direct benefits are the derivation of the difference between anticipated results potentially incurring if the losses with the mitigation project in place are less than losses incurred without the mitigation project in place. With this approach it is assumed that the greatest potential benefits are associated with hazard events with higher severity and higher potential for damages and losses. Thus, those event types prone to higher damages and losses typically have mitigation projects with the highest benefits. It can also be reasoned that mitigation strategies necessary to mitigate damages and losses from the most severe events have the potential to have the highest costs of implementation.

There are four categories of avoided damage associated with any hazard type. These include:

1. **Avoidance of casualties:** Because of the high population density at the ASU campus, potential casualties' factor into all considered hazard types and most of the mitigation strategies being considered for implementation.
2. **Avoidance of loss-of-function:** Loss of function is a significant consideration in establishment of mitigation strategies, and many were designed around the need to ensure continuity of service and function, specifically for those systems on campus critical to preparedness, response, and recovery from a hazard event.
3. **Avoidance of physical damage:** The potential for physical damage and the potential for loss of function may be directly related. Physical damage is also a significant consideration given the density of buildings on campus and the presence of valuable equipment, infrastructure, and irreplaceable research data and archived collections.
4. **Avoidance of emergency management costs:** These costs are associated with the level of effort and costs associated with hazard preparedness, response, and recovery. Examples of emergency management costs associated with recent hazard events include debris removal and management, cleanup costs, and costs associated with enhanced security.

All the buildings were ranked using a criterion for determining the level of criticality of the building. These levels are explained in the Ranking Methodology table shown as **Table 7.4.** The buildings are ranked from Critical – 1, High Priority – 2, Medium Priority – 3, Low Priority – 4, and non-essential - 5. The number of buildings in each category are listed.

Requirement CFR §201.6(2)(ii)(A) The plan should describe vulnerability in terms of the types and numbers of existing buildings, infrastructure, and critical facilities located in the identified hazard areas.

TABLE 7.4 Building Ranking Methodology

Criticality Level	Description	Number of Buildings
Level 1	Buildings that house populations during sleeping hours where people may not be aware of imminent, short notice dangers. Buildings that house reportable quantities of hazardous materials, research facilities, cafeterias, and public safety buildings to include police, fire and medical services where applicable.	57
Level 2	Buildings that provide services or support to essential operations. These facilities include pump houses, physical plants, water/waste management systems, and buildings used to maintain records/documents, and historical archives/artifacts such as archive buildings, libraries, and museums.	9
Level 3	Administrative buildings, classroom buildings, or multi-use buildings where the primary use is for administrative or classroom purposes.	20
Level 4	Buildings that support day-to-day and recreational activities on campus such as stadiums/arenas, gymnasiums, and student union buildings.	5
Level 5	Non-essential support buildings and structures such as sheds, fencing, scoreboards, signs, etc.	30

Mitigation strategies for potential damage were given a ranking value within one of the five levels as illustrated in **Table 7.5**. Those buildings with the potential exposure to multiple hazards at the

highest levels would influence the consideration given to mitigation actions to correct or lessen the impact of the hazards identified.

TABLE 7.5	**Summary of Quantitative Risk Assessment**						
Hazard Type	**Exposed Buildings**	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**	**Unranked**
Flash Flooding	2		2				0
Hailstorm	110	43	9	20	5	33	0
Hurricane	110	43	9	20	5	33	0
Severe Winter Storm	110	43	9	20	5	33	0
Tornado	110	43	9	20	5	33	0
Fire	110	43	9	20	5	33	0
Windstorm	110	43	9	20	5	33	0
Lightning	110	43	9	20	5	33	0
Hazardous Materials	1	1					0

Table 7.5 was provided to the ASU Committee to gain a broader perspective on ranking so that prioritizing the proposed mitigation strategies could be made. Information shown in **Table 7.5** is reflective of the quantitative risk assessment ranking for buildings by hazard and critical level as conducted by the committee.

7.5 MITIGATION STRATEGY PRIORITIZATION

> Requirement CFR §201.6 ELEMENT C. MITIGATION STRATEGY. An action plan reflecting how the actions will be identified, prioritized, implemented, and administered to reduce long- term vulnerability.

The STAPLEE Criteria is included as part of the mitigation prioritization process as a guide for evaluating the appropriateness and potential effectiveness of potential mitigation actions. While the STAPLEE Criteria are designed to evaluate mitigation actions on a local government level, it was felt that the criteria are equally applicable to a university setting. In this case, the STAPLEE Criteria was used to evaluate each proposed mitigation strategy and to enhance and complement the initial priority ranking. Within this context it is fully understood that buy-in of the plan on the part of the University administration, Faculty Senate, Staff Council, and others is necessary for the ultimate success of the plan. The University exists in many ways as a self-contained community with several constituency groups within that community. Each has a unique perspective on a given issue and each group's input is necessary to achieve success.

Additional considerations for prioritization of potential mitigation strategies included consideration of the included hazard profiles, vulnerabilities, costs, and projected or potential benefits. Some strategies offer benefit to only one hazard type or one structure while others provide potential benefit relative to multiple hazards and in some cases, the entire campus or university community.

The priority ranking of selected mitigation strategies through actions is provided in **Table 7.1** and includes the implementing office or University department as well as a status for each action considered for implementation. Specific mitigation activities will be implemented as time and resources are available to facilitate implementation. Some strategies with a lower ranking may be implemented prior to higher ranking strategies primarily due to the ease of implementation, low cost of implementation, or other factors.

A priority ranking of facilities for proposed mitigation strategies according to the hazard type resulted from the Summary of Quantitative Risk Assessment offered in **Tables 7.4 and 7.5**. However, those prioritization processes were not without input from the ASU Committee and opportunities to override the quantitative rankings were provided to the committee based on their own priorities, the priorities of the University and input obtained from public survey input processes.

8.0 Plan Implementation, Maintenance, and Evaluation

Requirement §:201.6(c)(4)(i) The plan maintenance process shall include a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

8.1 PLAN IMPLEMENTATION

The ASU Facilities Management Office will be the lead implementing unit within the University. The Facilities Management Office will work in concert with the Administration to implement the prioritized measures and will engage other units within the University as necessary and appropriate to assist with implementation activities. In addition to general oversight of implementation, the Facilities Management Office will identify specific work to be completed, timelines for completion, estimated project costs, and identification of potential funding sources. It is understood that some measures may be implemented without the assistance of external funding. In those cases, the Facilities Management Office, working through the University's budgeting process, will assign those projects for implementation as internal budget resources allow.

8.1.1 Grant Sources

Federal Hazard Mitigation Assistance Grants

The Federal Emergency Management Agency (FEMA) provides funding for five Hazard Mitigation Assistance grant programs. These programs, described in detail in FEMA's Hazard Mitigation Assistance Unified Guidance, June 1, 2010, are summarized here for future reference as mitigation activities are implemented. The grant programs are administered within the State of Mississippi by the Mississippi Emergency Management Agency, Office of Mitigation. Listed below is a brief description of each program:

Hazard Mitigation Grant Program (HMGP) is authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The key purpose of HMGP is to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the reconstruction process following a disaster. *(HMGP funds are available when authorized under a Presidential disaster declaration in the areas of the State requested by the Governor.)*

Pre-Disaster Mitigation Program (PDM) is authorized by Section 203 of the Stafford Act to assist States, Indian Tribal governments, and local communities to implement a sustained pre- disaster natural hazard mitigation program to reduce risk to the population and structures from future hazard events and to reduce reliance on Federal funding from future disasters. *(Funds provided annually subject to the availability of appropriation funding)*

Flood Mitigation Assistance (FMA) is authorized by Section 1366 of the National Flood Insurance Act of 1968 (NFIA) with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP). *(Funds provided annually subject to the availability of appropriation funding.)*

Repetitive Flood Claims Program (RFC) is authorized by Section 1323 of the NFIA with the goal of reducing flood damages to individual properties for which one or more claim payments for losses have been made under flood insurance coverage and that will result in the greatest savings to the National Flood Insurance Fund (NFIF) in the shortest period of time. *(Funds provided annually subject to the availability of appropriation funding.)*

Severe Repetitive Loss Pilot Program (SRL) is authorized by Section 1361 of the NFIA with the goal of reducing flood damages to residential properties that have experienced severe repetitive losses under flood insurance coverage and that will result in the greatest savings to the NFIF in the shortest period of time. *(Funds provided annually subject to the availability of appropriation funding.)*

Eligibility

Table 8.1 lists activities that are eligible in each Program listed above.

Table 8.1 Eligible Activities by Program

Eligible Activities	HMGP	PDM	FMA	RFC	SRL
1. Mitigation Projects	X	X	X	X	X
Property Acquisition and Structure Demolition	X	X	X	X	X
Property Acquisition and Structure Relocation	X	X	X	X	X
Structure Evaluation	X	X	X	X	X
Mitigation Reconstruction					X
Dry Floodproofing of Historic Residential Structures	X	X	X	X	X
Dry Floodproofing of Non-Residential Structures	X	X	X	X	
Minor Localized Flood Reduction Projects	X	X	X	X	X
Structural Retrofitting of Existing Buildings	X	X			
Non-Structural Retrofitting of Existing Buildings and Facilities	X	X			
Safe Room Construction	X				
Infrastructure Retrofit	X	X			
Soil Stabilization	X	X			
Wildfire Mitigation	X	X			

Table 8.1 Eligible Activities by Program					
Eligible Activities	**HMGP**	**PDM**	**FMA**	**RFC**	**SRL**
Post-Disaster Code Enforcement	X				
5% Initiative Projects	X				
2. Hazard Mitigation Planning	X	X	X		
3. Management Costs	X	X	X	X	X

Source: FEMA Hazard Mitigation Assistance Unified Guidance, June 1, 2010

Examples of Eligible Mitigation Projects:

Property Acquisition and Structure Demolition – Voluntary acquisition of an existing at-risk structure and conversion of the land to open space through demolition of the structure.

Property Acquisition and Structure Relocation – Voluntary physical relocation of an existing structure to an area outside of a hazard-prone area.

Structure Elevation – Physically raising an existing structure to the Base Flood Elevation (BFE) or higher if required by FEMA or local ordinance.

Mitigation Reconstruction – Construction of an improved, elevated building on the same site where an existing building and/or foundation has been partially or completely destroyed.

Dry Floodproofing – Techniques applied to keep structures dry by sealing the structure to keep floodwaters out.

Dry Floodproofing of Historic Residential Structures – permissible only when other techniques that would mitigate to the BFE would cause the structure to lose its status as a Historic Structure.

Dry Floodproofing of Non-residential Structures – must be performed in accordance with NFIP Technical Bulletin (TB) 3-93, *Non-Residential Floodproofing—Requirements and Certification*, and the requirements pertaining to dry floodproofing of non-residential structures found in 44 CFR Sections 60.3(b)(5) and (c)(4).

Minor Localized Flood Reduction Projects – Projects to lessen the frequency or severity of flooding and decrease predicted flood damages, such as the installation or modification of culverts and storm water management activities such as creating retention and detention basins.

Structural Retrofitting of Existing Buildings – Modifications to the structural elements of a building to reduce or eliminate the risk of future damage and to protect inhabitants.

Non-structural Retrofitting of Existing Buildings and Facilities – Modifications to the non- structural elements of a building or facility to reduce or eliminate the risk of future damage and to protect inhabitants.

Safe Room Construction – Safe room construction projects are designed to provide immediate life-safety protection for people in public and private structures from tornado and severe wind events, including hurricanes.

Infrastructure Retrofit – Measures to reduce risk to existing utility systems, roads, and bridges.

Soil Stabilization – Projects to reduce risk to structures or infrastructure from erosion and landslides, including installing geo-textiles, stabilizing sod, installing vegetative buffer strips, preserving mature vegetation, decreasing slope angles, and stabilizing with rip rap and other means of slope anchoring.

Wildfire Mitigation – Projects to mitigate the risk to at-risk structures and associated loss of life from the threat of future wildfire.

Post-Disaster Code Enforcement – Projects designed to support the post-disaster rebuilding effort by ensuring that sufficient expertise is on hand to ensure appropriate codes and standards, including NFIP local ordinance requirements, are utilized and enforced.

5% Initiative Projects – Provide an opportunity to fund mitigation actions that are consistent with the goals and objectives of the State or Tribal (Standard or Enhanced) and local mitigation plans and meet all HMGP program requirements, but for which it may be difficult to conduct a standard benefit/cost analysis to prove cost effectiveness.

Hazard Mitigation Planning

Mitigation plans are the foundation for effective hazard mitigation. A mitigation plan is a demonstration of the commitment to reduce risks from natural hazards and serves as a strategic guide for decision makers as they commit resources. The mitigation planning process includes hazard identification and risk assessment leading to the development of a comprehensive mitigation strategy for reducing risks to life and property. The mitigation strategy section of the plan identifies a range of specific mitigation actions and projects being considered to reduce risks to new and existing buildings and infrastructure.

Management Costs

Management costs are any indirect costs and administrative expenses that are reasonably incurred by a Grantee or Sub grantee in administering a grant or sub grant award.

For more information concerning applications for FEMA Hazard Mitigation Assistance Grants, contact: *Mississippi Emergency Management Agency Office of Mitigation 601-933-6362*

Listed below are agencies/other grant sources that provide programs to support communities with the development and implementation of various projects. ASU will

utilize these agencies and other sources when possible, to further their mitigation goals.

Mississippi Development Authority	CDBG Program PO Box 849 Jackson, MS 39205 601-359-3179
Mississippi Department of Environmental Quality	515 E. Amite Street Jackson, MS 39201 601- 961-5171
Mississippi Office of Homeland Security	Post Office Box 958 Jackson, MS 39205 601-346-1500
Mississippi State Department of Health	570 East Woodrow Wilson Drive Jackson, MS39216 601-576-7400
USDA Rural Development	100 W. Capitol St., Suite 831 Jackson, MS 39269 601- 965-4316

The purpose of the ASU Hazard Mitigation Plan is to avoid, minimize, and mitigate the impacts of natural and human disasters on life and property.

The ASU HMPC recognizes the importance of using this Plan as a living document to ensure that mitigation planning is taken very seriously.

8.2 PLAN MAINTENANCE, EVALUATION, AND REVISION

The ASU Committee, as the lead planning group for development of the Hazard Mitigation Plan, will continue to serve in an advisory role with respect to plan maintenance, evaluation, and subsequent revisions to the plan. The ASU Committee will meet twice per year to ensure that implementation schedules, as provided in **Table 8.1,** are being followed and to ensure the plan continues to be relevant with respect to actual campus conditions. A recommended meeting schedule will include one meeting per semester, with one conducted in the Fall semester and one in the Spring semester. Plan updates will continue to be an on-going task and will be reported to the ASU Committee for their comment, input, and approval. A Plan Implementation Worksheet is included as **Appendix D** and is designed as a tool for the ASU Committee to monitor implementation progress of the plan.

A list of public meetings, exercises, etc., is also made public through a document designed just for planning purposes. This document is located in **Appendix E.**

During the Fall meeting, the ASU Committee will evaluate the plan's overall functionality and relevance to current conditions. The purpose for this evaluation is to analyze current conditions on campus and changes since the previous Fall meeting that necessitated changes to the plan. In determining the need for plan updates, the ASU Committee will consider the following criteria:

1. New construction or planned construction of buildings that warrant consideration in the mitigation planning process,

2. Identification of additional risks or vulnerabilities that may be attributed to material changes on campus (significant population increases, new construction, etc.),
3. Identification of new mitigation strategies to be added to the plan or existing strategies that have been determined infeasible and need to be removed from the plan. It is important to note that new strategies should be subjected to the same level of review and analysis as the initial strategies to ensure potential effectiveness,
4. Incorporation of the mitigation plan and mitigation strategies into new or revised planning documents such as master plans, emergency response plans, etc. where appropriate.
5. New legislation, campus policies, or other rules, laws, or regulations that have the potential to impact the effectiveness of implementation, and
6. Other conditions or changes that warrant significant review, changes, or updates to the plan.

The Spring semester meeting of the ASU Committee will include discussions and activities as necessary to update major components of the plan based on changing conditions on campus and also based on discussions and materials presented in the Fall meeting. These discussions will consider ongoing implementation activities and the impacts, if any, of hazard events occurring since the previous meeting. Specific attention will be paid to the effectiveness of implemented strategies as they relate to hazard events that may have occurred since the last meeting. This meeting will also provide an opportunity for discussion of additional mitigation strategies that may need to be incorporated into the plan. The ASU Committee may choose to update the plan on an annual basis as needed or may choose to wait until the five-year required update. In either case, the ASU Committee shall follow the appropriate process for updating the plan including elements related to public outreach, approval by the ASU Committee as a whole and submission to MEMA and FEMA for their concurrence. All committee meetings will be open to the University community and the public. However, the spring semester meeting will be advertised as a public meeting in general local publications including the local and campus newspapers and the University website.

The plan must be considered for a re-write every five years. If significant changes are made to the plan at the five-year interval, MEMA and FEMA will be notified of major upgrades to the plan and the updated plan will be submitted to them for concurrence. In addition, all major plan upgrades must be provided to the University Administration and neighboring jurisdictions including Jefferson and Claiborne Counties.

The ASU Plan will be considered as part of the University's overall planning process and will interface directly with the Capital Improvement Plan and the Campus Master Plan. This is to ensure that all new construction planning on campus will consider mitigation strategies in siting and design of new facilities on campus. In addition, all new structures on campus will be classified

Requirement §:201.6(c)(4)(iii): [The plan 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.

as Critical, High Priority, Medium Priority, or Low Priority and incorporated into **Tables 5.1 – 5.5** as appropriate.

The ASU HMP Committee will facilitate meetings with stakeholder groups, as outlined in the subsequent section, to ensure the University's mitigation goals and objectives are met on all levels of planning. The process of creating the ASU Hazard Mitigation Plan greatly enhanced the awareness of other public risks and threat assessments; therefore, understanding the need for an Emergency Management Plan and a University Master Plan. The planning process helped to educate/train the faculty/staff involved in the plans.

As an effort to strive to reach out to stakeholder groups and citizens, the ASU HMP Committee will conduct annual meetings to address specific concerns regarding mitigation strategies and planning. The intent of these meetings is to provide an opportunity to strengthen partnerships and leverage resources throughout the ASU community.

> Requirement §: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

During the next five years, ASU has identified the following agencies that they would like to pursue, in an effort, to increase awareness of capabilities and partnerships. Working with these groups, ASU will be able to expand and improve their ability to maximize mitigation capabilities. This listing is not inclusive of all the agencies they are interested in pursuing but rather a starting point.

- Mississippi State Department of Health, Bureau of Emergency Planning and Response
- Mississippi Emergency Management Agency
- Adams, Claiborne, and Warren County Emergency Management Agencies
- Local Responders (Fire, Police, Medial, etc.)
- American Red Cross