



Multi Hazard Mitigation Plan

Macon County, IL

2024



Multi-Hazard Mitigation Plan
Macon County, Illinois

January 2024

Prepared for:

Macon County EMA
282 E. Macon Street
Decatur, IL 62523

Plan Adoption

[Formal FEMA Approval Letter will be inserted upon adoption of the 2024 Macon County Multi-Hazard Mitigation Plan]

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Chapter 1: Introduction

1.1 Introduction

The Macon County Multi-Hazard Mitigation Plan (HMP or Plan) was developed to guide the county in a risk-based approach to become more resilient to the impacts of natural hazards through mitigation planning. The plan documents historical disasters, assesses probabilistic disasters through Hazus-MH and GIS analyses, and addresses specific strategies to mitigate the potential impacts of these disasters.

This five-year update was a collaborative effort among the Macon County planning team. The Macon County HMP:

- Identifies areas of risk and assesses the probability, extent, vulnerability, and impacts for each natural hazard.
- Establishes strategies and priorities to mitigate risk from natural hazards.
- Identifies specific mitigation projects to pursue for each identified natural hazard.
- Guides the communities in their risk management activities and minimizes conflicts among agencies.
- Establishes eligibility for future mitigation program funds.

The 2023 HMP includes the following key updates:

- **County profile:** Demographics, social, and economic data, as well as existing and future land use descriptions, are updated to reflect the current status of the county and its jurisdictions.
- **Historical hazards:** Each hazard section within this Plan documents NCEM-reported hazards within the past five years. Where data are available, historical hazards are graphed by decade, showing disaster trends over the past 50 years.
- **Planning process:** The new planning team and updated planning process are described and documented.
- **Risk assessment:** The updated risk assessment includes Hazus-MH and GIS analyses that utilize site-specific data from the county. The hazard ranking incorporates a new risk ranking methodology that addresses underserved populations and climate change impacts.
- **Mitigation Strategies:** The mitigation section addresses status of previous plan's strategies in addition to new mitigation projects. Goals were updated to reflect current priorities in the county.

1.2 Purpose of the Plan

This Plan identifies activities that can be undertaken by both the public and the private sectors to reduce risk to hazards, health hazards, and property damage caused by natural hazards. This Plan reviews mitigation activities and selects those that will work best for Macon County.

This Plan fulfills the federal requirements for mitigation funding outlined in 44 Code of Federal Regulations, section 201.6 (U.S. Government Publishing Office, 2021, P. 1), and U.S. Code 42, section 5165 (U.S. Government Publishing Office, 2022, P. 1), the CRS program, and provides the county with a blueprint for reducing the impacts of natural hazards. A list of municipalities with general information, including the community number for FEMA's NFIP and participation in CRS, are shown in Chapter 4.

1.3 Hazard Mitigation Program

Hazard mitigation is any sustainable action that reduces or eliminates long-term risk to people and property from future disasters. Mitigation planning breaks the cycle of disaster damage, reconstruction, and repeated damage. Hazard mitigation includes long-term solutions that reduce the impact of disasters in the future (FEMA, Hazard Mitigation Assistance Grants 2023a).

1. Keep the hazard away from people, property, and structures.
2. Keep people, property, or structures away from the hazard.
3. Reduce the impact of the hazard on victims (e.g., insurance).

Macon County completed its initial Multi-Hazard Mitigation Plan in 2013 and was adopted in 2014. The planning team reviewed the previous plan prior to beginning this five-year updated process for 2024. Additionally, the county and the local communities utilized land use plans, emergency response plans, annual reports, ordinances, and building codes to direct community development.

1.4 Planning Area and Participating Jurisdictions

Macon County, Illinois, includes 12 municipalities that partially or completely reside within county boundaries. All jurisdictions were invited to participate in the planning process. The jurisdictions listed in the table below were represented by one or more municipal officials. Representatives not only attended meetings but also participated by gathering data and historical information, identified new mitigation actions and completed a hazard analysis, and participated by completing and/or sharing the community preparedness survey. Macon County and the following 12 participating jurisdictions intend to adopt and implement the Plan with full coordination and participation (Table 1-1). No jurisdictions will not be participating or adopting Macon County's Plan.

Table 1-1. Participating Jurisdictions

Participating Jurisdictions		
Macon County		
Macon County	Village of Forsyth	City of Maroa
Village of Argenta	Village of Harristown	Village of Mt. Zion
Village of Blue Mound	Village of Long Creek	Village of Niantic
City of Decatur	City of Macon	Village of Oreana
		Village of Warrensburg

All jurisdictions participated in the 2013 Multi-Hazard Mitigation Plan.

1.5 Hazard Addressed in the Plan

This Plan focuses on eight (8) natural and two (2) human-caused hazards facing Macon County: tornadoes, extreme heat, drought, earthquake, flooding, high-hazard dams and levees, severe summer storms, severe winter storms, HAZMAT incidents, and nuclear events.

1.6 Plan Approval and Adoption

This Plan represents a comprehensive description of Macon County’s commitment to significantly reduce or eliminate the potential impacts of disasters through planning and mitigation. Adoption by the local governing bodies within the county legitimizes the Plan and authorizes responsible agencies to implement mitigation responsibilities and activities.

Following Federal review and approval, the participating jurisdictions in this Plan intend to formally adopt the plan by Resolution or Ordinance.

To be eligible for federal mitigation funding, each participating jurisdiction must adopt the Plan. After thorough review, the Macon County Board adopted the Plan on <date adopted>. Additional adoptions are included in Appendix E: Resolutions of Adoption.

1.7 References

Federal Emergency Management Agency (FEMA). (2022, March 17). *Federal Emergency Management Agency Community Status Book Report Illinois Communities Participating in the National Flood Program*. Retrieved on: March 28, 2023. Retrieved from:

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Federal Emergency Management Agency (FEMA). (2022a, November 4). *Hazard Mitigation Planning*. Retrieved on March 28, 2023. Retrieved from: <https://www.fema.gov/hazard-mitigation-planning>

Federal Emergency Management Agency (FEMA). (2023b, March 14). *Mitigation Planning and Grants*. Retrieved on: March 28, 2023. Retrieved from:

<https://www.fema.gov/emergency-managers/risk-management/hazard-mitigation-planning/requirements>

Federal Emergency Management Agency (FEMA). (2017c). *National Flood Insurance Program Community Rating System Coordinator's Manual*. Retrieved on: March 28, 2023.

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https://www.fema.gov/sites/default/files/documents/fema_community-rating-system_coordinators-manual_2017.pdf

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from: <https://www.fema.gov/grants/mitigation>

U.S. Government Publishing Office. (2022, January 3). *42 U.S.C. 5165 – Mitigation Planning*. Retrieved on March 28, 2023. Retrieved from:

<https://www.govinfo.gov/app/details/USCODE-2021-title42/USCODE-2021-title42-chap68-subchapIII-sec5165>

U.S. Government Publishing Office. (2021, October 1). *44 CFR 201.6 – Local Mitigation Plans*. Retrieved on: March 28, 2023. Retrieved from:

<https://www.govinfo.gov/app/details/CFR-2021-title44-vol1/CFR-2021-title44-vol1-sec201-6>

Chapter 2: Plan Process

2.1 Introduction

The Plan was prepared to provide a basis for identifying and managing natural hazards and to meet federal, state, and local requirements for hazard mitigation and FEMA mitigation grant funding.

Updating the Plan began with an initial kickoff meeting with the Macon County EMA Planning Team, which was held on February 16th, 2023. An additional kickoff meeting with the Macon County EMA Planning Team and the steering committee was held on February 21st, 2023. Following this meeting, the planning process involved a review of the existing Plan; updating Macon County's hazard history and risk assessment; gathering information on local hazards from individual communities; gathering input on hazard priorities; identifying specific vulnerabilities, impacts, and desired mitigation strategies; evaluating the previous Plan goals, and mitigation strategies; determining the status of previous mitigation strategies and Action Plans; identifying repetitive loss properties; facilitating the activities of the steering committee and conducting multiple stakeholder and public meetings, including outreach activities.

Information regarding hazards in the county and applicable mitigation strategies were obtained from four webinars held on March 6th, 2023, March 9th, 2023, March 15th, 2023, and March 16th, 2023, and one workshop held in the county on April 12th, 2023.

In summary, the planning process consisted of the following key tasks:

Task 1: Organize Resources

The Macon County EMA created a planning team to attend meetings, gather data and historical information, review drafts, and participate in mitigation brainstorming sessions. In addition to the core planning team, a steering committee was formed to provide overall guidance and direction throughout the mitigation planning process (see Steering Committee).

Task 2: Risk Assessment

The planning team identified the natural hazards to include in this Plan, as well as hazard profiles to address the probability, extent, vulnerabilities, and impacts associated with each hazard. The team then used local resources to inventory the county's assets and estimate losses. The core planning team, steering committee, and jurisdictional representatives provided input and subject-matter expertise throughout this process.

Task 3: Public Involvement

A comprehensive public survey was conducted and reached 230 residents. As part of this survey, steering committee members, community representatives, and the general public were asked to rate each of the hazards in terms of perceived risk. They were also asked to rate "mitigation importance" for each of the identified hazards in the Plan. Local jurisdictions shared the meeting information on their websites, Facebook pages, Twitter accounts, and community newsletters.

Information from this survey was used to inform the hazard risk prioritization process and to ensure the Plan adequately addressed the public's concerns and priorities. Two public forums were advertised, and both were held in the county on June 5th, 2023, which provided local residents with an opportunity to provide input into the Plan. The first meeting was advertised for the Spanish-speaking population and a Spanish-speaking interpreter was available. The second meeting was advertised as a general public meeting. A dedicated hazard mitigation web page was utilized to inform stakeholders and the public regarding the status of the plan, key updates, and opportunities for participation. A draft of the Plan was made available on the web page for review and comment.

Task 4: Develop Mitigation Strategies

The planning team met with representatives of each participating community to develop and prioritize mitigation strategies and action items that would reduce the costs of disaster response and recovery, protect people and infrastructure, and minimize overall disruption to the county in the event of a disaster (see Chapter 7: Mitigation Action Plan). Over 60 jurisdiction-specific mitigation projects are included in this Plan.

Task 5: Complete the Plan

The core planning team compiled all of the relevant sections of the Plan to produce a draft plan for review. The Plan was submitted to the Illinois Emergency Management Agency (IEMA) and FEMA for approval.

Task 6: Plan Adoption

The Macon County EMA coordinated the effort to ensure the Plan was formally adopted by each participating jurisdiction.

2.2 Defining the Planning Area

The planning area was initially defined as all incorporated and unincorporated areas of Macon County. Macon County, which includes the unincorporated areas in the County, and 12 participating jurisdictions intend to adopt and implement the Plan. All partners to this Plan have jurisdictional authority within this planning area.

2.3 Establishment of the Planning Partnership

Each jurisdiction participating in the Plan was asked to provide a designated point of contact for the jurisdiction and confirmed the jurisdiction's commitment to the process and understanding of expectations. A list of the participating jurisdictions is provided in Chapter 1: Introduction.

2.4 Plan Participation

2.4.1 Core Planning Team

The core planning team consisted of key members of Macon County EMA and Integrated Solutions Consulting. Meetings were held bi-weekly throughout the planning process. The core planning team also served on the steering committee and helped guide the process.

Table 2-1. Core Planning Team

Name	Title	Organization
Tammy Schneider	EMA Coordinator	Macon County EMA
Justin Root	Administration Assistant	Macon County EMA
Tamara Wilcox	County Administrator	Macon County

2.4.2 Steering Committee

Hazard mitigation planning enhances collaboration and support among diverse parties whose interests can be affected by hazard losses. The LEPC served as the steering to oversee all phases of the Plan.

During the 2023/2024 update of the Plan, the steering committee agreed to meet as often as needed throughout the course of the Plan's development. The core planning team facilitated each steering committee meeting, which addressed a set of objectives based on the work plan established for the Plan.

The steering committee was responsible for:

- The updating and prioritizing of natural hazards that impact Macon County.
- Defining critical facilities and providing necessary updates.
- Updating the Plan's mission, goals, and priorities.
- The overall planning area's capability assessment and consideration of mitigation alternatives.
- The identification of new mitigation actions and the update of past countywide mitigation action items.
- Coordination and outreach with key stakeholders and planning partners.

The steering committee that supported the 2024 Macon County HMP update is detailed in the following table:

Table 2-2. Steering Committee

Name	Title	Organization
Tammy D. Schneider	Coordinator	Macon County EMA
Tamara Wilcox	County Administrator	Macon County
Justin Root	Emergency Manager	Macon County EMA
Jim Root	Sheriff	Macon County

Chad Lamb	Chief	Blue Mound
Amy McKinney	Administrator/Inspector	Macon City Environment Management
Tracy Sumpter	Director	Macon County Plan/Zone
Evelyn Deverell	Mayor	Village of Harristown
Ted Agee	City Administrator	City of Maroa

2.4.3 Local Jurisdiction Participation

The following local jurisdictions participated in the 2024 HMP (see table below). Local representatives, participation activities, and planning documents to facilitate the planning process are provided in Appendix A: Stakeholder Participation and Documents.

Table 2-3. Participating Jurisdictions

Jurisdiction	Webinar Attendance	2022-2023 Hazard Mitigation Plan Workshop	Other Participating Activities (Public Survey)	Hazard Analysis	New Mitigation Action(s)	Reviewed/ Updated Past Mitigation Project(s), as applicable
Macon County	X	X	X	X	X	X
Argenta	X	X	X	X	X	X
Blue Mound	X	X	X	X	X	X
Decatur	-	X	X	X	X	X
Forsyth	X	X	X	X	X	X
Harristown	X	X	X	X	X	X
Long Creek	X	-	X	X	X	X
Macon	-	X	X	X	X	X
Maroa	X	X	X	X	X	X
Mt. Zion	-	-	X	X	X	X
Niantic	-	-	X	X	X	X
Oreana	X	X	X	X	X	X
Warrensburg	X	X	X	X	X	X

Table 2-4. Jurisdictions NOT Participating

Jurisdiction	Have Not Received Letter Declining Participation	Have Received Letter Declining Participation
None	X	

The focus of the 2024 Macon County HMP update was a series of structured discussions with, and opportunities for feedback from, Macon County officials, municipal officials, affected stakeholders and the general public. An online planning system enabled the planning team to keep in contact with the affected parties and supply information to a broad audience. In particular, these included the following opportunities for outreach and input:

- A project online planning system (<https://mc-ema.isc-cemp.com>)

Exhibit 2-1. Macon County Online Planning System



- Creation and distribution of online forms so county, municipal, and stakeholders could easily submit local hazard risk concerns and mitigation strategies.
 - Hazard Form: <https://integratedsolutions.wufoo.com/forms/x1avixqt0vtsln3/>
 - New Mitigation Action Projects Form: <https://integratedsolutions.wufoo.com/forms/x1hkvI90085qibp/>
- Meetings, email, and phone communication with leaders and representatives from each of the communities.

The following sections explain, in greater detail, the key activities and supporting documentation. More information about each of these activities is also provided in Appendix A: Stakeholder Participation and Documentation.

2.4.4 Mitigation Workshop

One workshop was held in Macon County to identify hazards and update and consider new mitigation strategies. In addition, individual meetings were held with jurisdictions who were unable to bring their local planning teams to these workshops or needed additional guidance and support. Prior to the workshops, four webinars were held to provide information to prepare the jurisdictions for the workshop. See Appendix A: Stakeholder Participation and Documentation for a list of the individuals who attended the Workshops and for copies of the sign-in sheets.

The purpose of the workshop was to ensure local jurisdictions had the opportunity to identify their communities' risks and to identify/update their mitigation strategies and priorities. These workshops included local planning members from each of the communities. Participants validated the county's risk assessment findings, described specific hazard risks and concerns for

their own communities, updated existing mitigation actions/strategies from the 2014 Plan, and worked with their local planning team to identify new mitigation initiatives.

2.4.5 Other Stakeholders and Organizations

Throughout the planning process, key stakeholders, departments, and community organizations were involved in providing key inputs, disseminating information about the Plan, and reviewing the draft of the Plan. See Appendix A: Stakeholder Participation and Documentation for a list of those organizations.

Table 2-5. Stakeholders

Stakeholder and Organization	Contribution
Macon County EMA	Disaster information; Previous 2014 HMP
Macon County Conservation District	Natural resources and conservation
Macon County Planning and Zoning	Planning and Zoning data
Macon County/Decatur GIS	Spatial/GIS Data
Macon County Mental Health Board	Underserved Populations and Vulnerability in Macon County
Macon County Farm Bureau	Agricultural interests and concerns
Decatur Memorial Hospital	Health and Medical
Sanitary District of Decatur	Wastewater
United Way of Decatur & Mid-IL	Underserved Populations and Vulnerability in Macon County
Primient LLC	Private sector
University of Illinois Urbana-Champaign	Academia; Climate change
U.S. Geological Survey	Geologic information, earthquake information
U.S. Army Corps of Engineers	Dam and levee data
National Weather Service	Natural hazard history and information
IEMA	2023 IL Hazard Mitigation Plan; RL & SRL Data
Illinois DNR	Wildfire data, natural resources
DHS: FEMA	Mitigation policy, National Risk Index

2.4.6 Neighboring Jurisdictions

The neighboring counties were kept apprised of Plan development milestones and were invited to review and comment on drafts of the Plan.

Table 2-6. Neighboring Jurisdictions

Neighboring Jurisdiction	Organization	Participation Description
DeWitt County, IL	Emergency Management Agency	Invited to review and comment on the draft plan.
Piatt County, IL	Emergency Management Agency	Invited to review and comment on the draft plan.
Moultrie County, IL	Emergency Management Agency	Invited to review and comment on the draft plan.
Shelby County, IL	Emergency Management Agency	Invited to review and comment on the draft plan.
Christian County, IL	Emergency Management Agency	Invited to review and comment on the draft plan.
Sangamon County, IL	Emergency Management Agency	Invited to review and comment on the draft plan.
Logan County, IL	Emergency Management Agency	Invited to review and comment on the draft plan.

2.5 Public Involvement and Participation

Broad public participation in the planning process helps ensure that diverse points of view about the planning area's needs are considered and addressed. The public must have opportunities to comment on disaster mitigation Plans during the drafting stages and prior to Plan approval (44 CFR, Section 201.6(b)(1)). As such, a number of public outreach activities were organized to ensure public participation and input were obtained. The following sections explain, in greater detail, the key activities and supporting documentation. More information about each of these activities is also provided in Appendix B: Public Involvement Activities and Documentation.

2.5.1 Community Preparedness and Mitigation Survey

Surveys were distributed through a variety of methods beginning on April 5th, 2023, including e-mail blasts and social media platforms, such as Facebook and Twitter. A Spanish version both online and a hard copy was available and distributed beginning on May 2nd, 2023. The survey was available to the community until May 30th, 2023. Community organizations were critical in connecting county and city residents with the survey, and the Macon County EMA utilized their broad-based distribution lists of community stakeholders and partners to disseminate the survey to residents and leaders of underserved communities and organizations. In total, 230 residents participated in the 30-question survey. Results helped to validate the hazards included in the plan, the hazard ranking process, and areas where the county and municipalities could further improve outreach and education efforts.

2.5.2 Public Forum & Outreach

The public was invited to attend a public forum held at the Macon County Board Building on June 5th, 2023. There were two meetings held, the first meeting was advertised for the Spanish-speaking population of Macon County with an interpreter available. The second meeting was a general public meeting. The public meeting was advertised locally prior to the meeting, including social media platforms, community newsletters, websites, and special outreach by the United Way to the Spanish-speaking population.

The purpose of the meeting was to provide an overview of the project, share and validate the hazard risk findings, receive public input on important mitigation initiatives, and to invite the public to review the draft of the Plan. Attendees were given access to important information regarding the Plan, and an opportunity to provide input regarding the Plan and planning process.

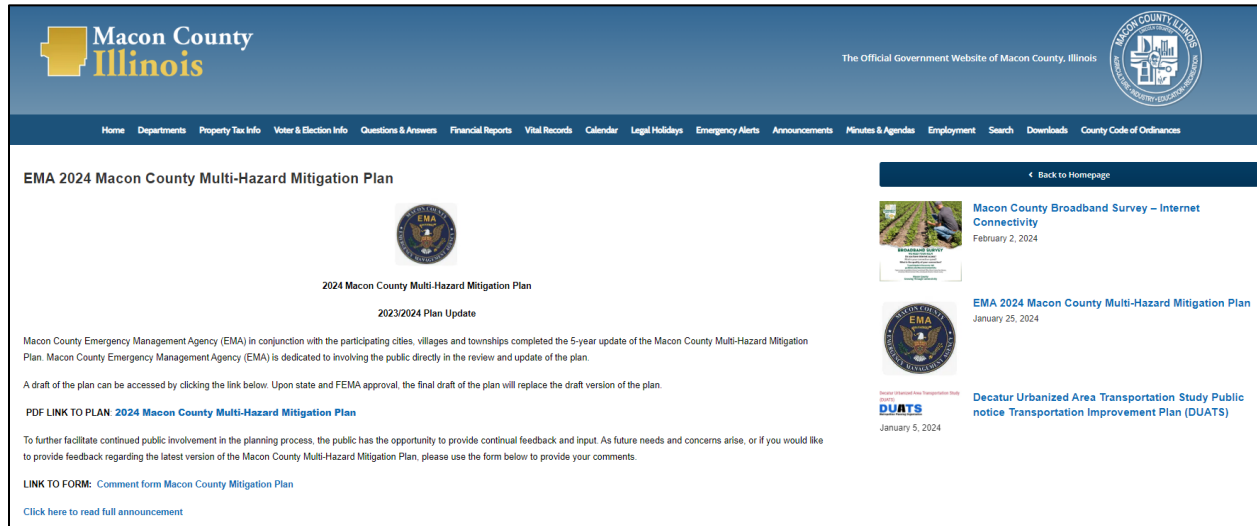
2.5.3 Macon County Website

A dedicated web page was utilized to update stakeholders and the general public regarding the Plan update. Social media and outreach activities directed participants to this site (<https://maconcounty.illinois.gov/departments/ema/>).

2.5.4 Public Plan Review and Feedback on Draft of the Plan

At the conclusion of the planning process, the public was offered an opportunity to provide feedback on the draft Plan. The public version of the Plan was made available at the following site: <https://maconcounty.illinois.gov/departments/ema/>.

Exhibit 2-2. Macon County Web site Promoting Draft Plan



The draft Plan remained on the web page until the Plan was formally approved and adopted. To further facilitate continued public involvement in the planning process, the public will have an opportunity to provide continual feedback and input. As future needs and concerns arise, or if the public would like to provide feedback regarding the latest version of the Macon County Multi-Hazard Mitigation Plan, the public is invited to use the form below (which is provided on the web site) to provide comments.

- **Link to Plan Comment Form:** <https://integratedsolutions.wufoo.com/forms/comment-form-macon-county-mitigation-plan/>

2.5.5 How Public Input was Incorporated into the Plan

Information and feedback gained from the survey and public forum provided valuable data to validate and confirm the risk assessment findings and potential mitigation strategies. Specifically, feedback from the public offered during the public forum on June 5, 2023, offered greater insights to the public's concerns regarding specific hazards and their impacts, especially with Macon County's Spanish-speaking population. The public also offered specific initiatives they felt would create greater resiliency for the county and its residents.

Survey results helped to validate the hazards included in the Plan, the hazard ranking process, and areas where the county and municipalities could further improve outreach and education efforts. Open-ended responses, specifically regarding their experience with damages from past hazards, helped to validate hazard-specific impact data in Chapter 4: Risk Assessment. These, and related findings, helped the planning team determine meaningful mitigation projects.

2.6 Equity Considerations for Underserved Communities and Socially Vulnerable Populations

Some disasters occur on larger scales and are more impacted by built environments and are most likely to continually impact those most at risk because of existing health conditions, lack of resources, being underserved by past mitigation planning work, facing historical disinvestment in their communities, or other factors. In this case, people in widely different locations can be the most harmed by repeating disaster cycles, so mitigation strategies should also work to break cycles of loss caused by social and economic disparities. Hazard mitigation strategies can reduce existing risk by, for example, relocating a building out of an area that frequently floods. In each case, an attempt has been made to lessen the harm of a future flood before the event happens. Strategies may also seek to make future development less vulnerable to hazards at the time it is built. Examples would be requiring new structures to be elevated above predicted flood levels or by building structures to better withstand future hazards. Hazard mitigation plans are designed to involve the input of stakeholders from different perspectives to ensure plans use the best available data, are aligned with the needs of the entire community, and are in alignment with other plans, such as comprehensive plans, capital improvement plans, and climate action plans.

This Plan continues to recognize that all members of the community are not impacted in the same way by natural disasters. Some community members are at more risk, for a number of possible reasons. A mitigation strategy that uses a ‘one size fits all’ approach, and does not recognize different levels of risk, will not adequately or efficiently support historically underserved populations; and can actually make inequalities worse after a disaster.

This version of the Plan highlights equity as a key part of the overall Plan vision. This Plan update seeks to continue to develop a shared understanding among participants of how hazard mitigation can be made more inclusive and be proactive in creating strategies that reduce existing disparities in risk and hazard recovery. Addressing the whole community requires an understanding that while a single solution for all seems fair, it does not address historical inequalities and current differences in age, financial resources, housing stability, neighborhood investment, health or ability, and access to government services. In mitigation planning, this means that successfully reducing risk in the most meaningful and efficient way requires understanding how the distribution of resources will actually reduce risk and for whom.

Equitable mitigation success should be measured by assessing who was most impacted in loss of life or financial harm by past and future disasters, quantifiable reductions of vulnerability to those most at risk, and increasing engagement with historically underserved populations and community organizations to better understand how plans and processes and natural hazard events are affecting different communities.

Chapter 3: Community Profile describes different demographic and economic factors in Macon County. This section includes FEMA’s National Risk Index scores for Macon County for social

vulnerability and community resilience. Social vulnerability is defined as the susceptibility of social groups to the adverse impacts of natural hazards, including disproportionate death, injury, loss, or disruption of livelihood (FEMA, 2023).

Community resilience is defined as the ability of a community to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions (FEMA, 2023).

The Community Profile section also included an analysis of the 14 (out of 34) census tracts in Macon County which are identified as “disadvantaged” by the U.S. Council on Environmental Quality (ACEQ). According to the U.S. Council on Environmental Quality (ACEQ), a community is identified as “disadvantaged” if it is located in a census tract that is at or above the threshold for one or more environmental, climate, or other burdens, and at or above the threshold for associated socioeconomic burdens, including poverty and language barriers (U.S. Council on Environmental Quality, 2022). The total population of these 14 census tracts is 31,633 which is 30.88% of the total Macon County population. Each census tract is further identified in Appendix C: Disadvantaged Communities, illustrating specific socioeconomic burdens to each census tract. This information was used as part of the hazard risk ranking process and to determine potential inequities and disparities regarding potential impacts from natural hazards.

Chapter 4: Risk Assessment includes a hazard ranking methodology that specifically assessed the impact of the natural hazard on underserved populations. Furthermore, each hazard profile included FEMA’s Expected Annual Loss analysis and National Risk Index score for the county. The Risk Index score is based on the following components: Social Vulnerability, Community Resilience, and Estimate Annual Loss (EAL), with EAL based on Exposure, Annualized Frequency, and Historic Loss Ratio (HLR) factors, for a total of five risk factors (FEMA, 2023).

Mitigation goals were updated to encourage greater participation and engagement from underserved populations and groups. During stakeholder meetings, in which new and ongoing mitigation strategies were discussed, jurisdictional representatives were encouraged to consider how the mitigation actions directly and/or indirectly resulted in equitable outcomes.

During the Plan update process, a comprehensive community preparedness questionnaire was developed and disseminated. The questionnaire was developed with a specific focus to better understand the challenges and concerns related to access and functional needs, access to information, ability to recover, and services needed, especially for those who may be underserved or lack access to key resources. Additionally, a public meeting was held and advertised for those who may need Spanish translation assistance, which is a key demographic in the county.

The county and participating jurisdictions have a responsibility to ensure equitable outcomes in the implementation of this Plan and to ensure that action is taken to reduce vulnerabilities to disasters experienced disproportionately by marginalized populations.

When conducting community engagement related to implementation of or update to this Plan, the county will ensure that the whole community has an opportunity to participate in the process and discussion. FEMA defines the “whole community” as “individuals and families, including those with access and functional needs, businesses, faith-based and community organizations, nonprofit groups, schools and academia, media outlets, and all levels of government, including state, local, tribal, territorial, and federal partners that have a shared responsibility in emergency preparedness and mitigation” (FEMA, 2011).

2.7 Existing Plans, Studies, and Reports

Hazard mitigation planning must include a review and incorporation, if appropriate, of existing plans, studies, reports, and technical information (44 CFR, Section 201.6(b)(3)). Chapter 5: Capabilities and Integration of Mitigation Measures provides a review of key studies, plans, laws, and ordinances in effect within the planning area that can affect hazard mitigation actions. All these documents were reviewed as part of the plan update process. Additionally, each chapter in this Plan includes its own reference section, which also acknowledges key plans, studies, and technical information utilized in this Plan.

2.8 References

- Federal Emergency Management Agency (FEMA). (2022, April 19). *Local Mitigation Planning Policy Guide*. Retrieved on March 28, 2023. Retrieved from: https://www.fema.gov/sites/default/files/documents/fema_local-mitigation-planning-policy-guide_042022.pdf
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Chapter 3: Community Profile

3.1 History and Overview

Macon County was formed on January 19, 1829, out of Shelby County. It was named for Nathaniel Macon, a Colonel in the Revolutionary War. Macon County is located in central Illinois, approximately 30 miles east of Springfield, Illinois as seen to the right. Macon County is often referred to as “The Heart of Illinois” because of its central location in the state.

Macon county is bounded on the west by Christian County, Sangamon County, and Logan County, the east by Piatt County and Moultrie County, the north by De Witt County, and the south by Shelby County.

The Sangamon River is the main river running through Macon County, which splits the county in half north to south. The largest body of surface water in the county is Lake Decatur, which is a reservoir located within the City of Decatur. An earthen/concrete dam was built in 1923 to produce this lake, which serves as a source of water for multiple communities in Macon County especially the City of Decatur.



There are nine incorporated villages, three incorporated cities, and eleven unincorporated communities in Macon County. Exhibit 3-1 illustrates all communities within the county. These are:

- **Villages:** Argenta, Blue Mound, Forsyth, Harristown, Long Creek, Mount Zion, Niantic, Oreana, and Warrensburg.
- **Cities:** Decatur, Macon, and Maroa.
- **Unincorporated Communities:** Austin, Elwin, Friends Creek, Hickory Point, Illini, Milam, Oakley, Pleasant View, South Macon, South Wheatland, and Whitmore.

3.2 Geology, Watersheds, Topography

Macon County is located within the Sangamon River, Salt River, and Kaskaskia River watersheds. The Salt, Sangamon, and Kaskaskia rivers all flow into the Illinois River. Exhibit 3-2 illustrates the watershed boundaries in Macon County (thick blue lines). The land area of Macon County is approximately 580 square miles with roughly 255 miles of mapped streams and rivers. The County is situated in the Springfield Plain and the Bloomington Ridge Plain. The topography is generally level and gently sloping on the broad upland with greater relief in areas dissected by drainage ways. Elevations range from more than 700 feet above sea level in Oakley Township to less than 550 feet above sea level where the Sangamon River leaves the county.

Exhibit 3-1. Map of Macon County Municipalities

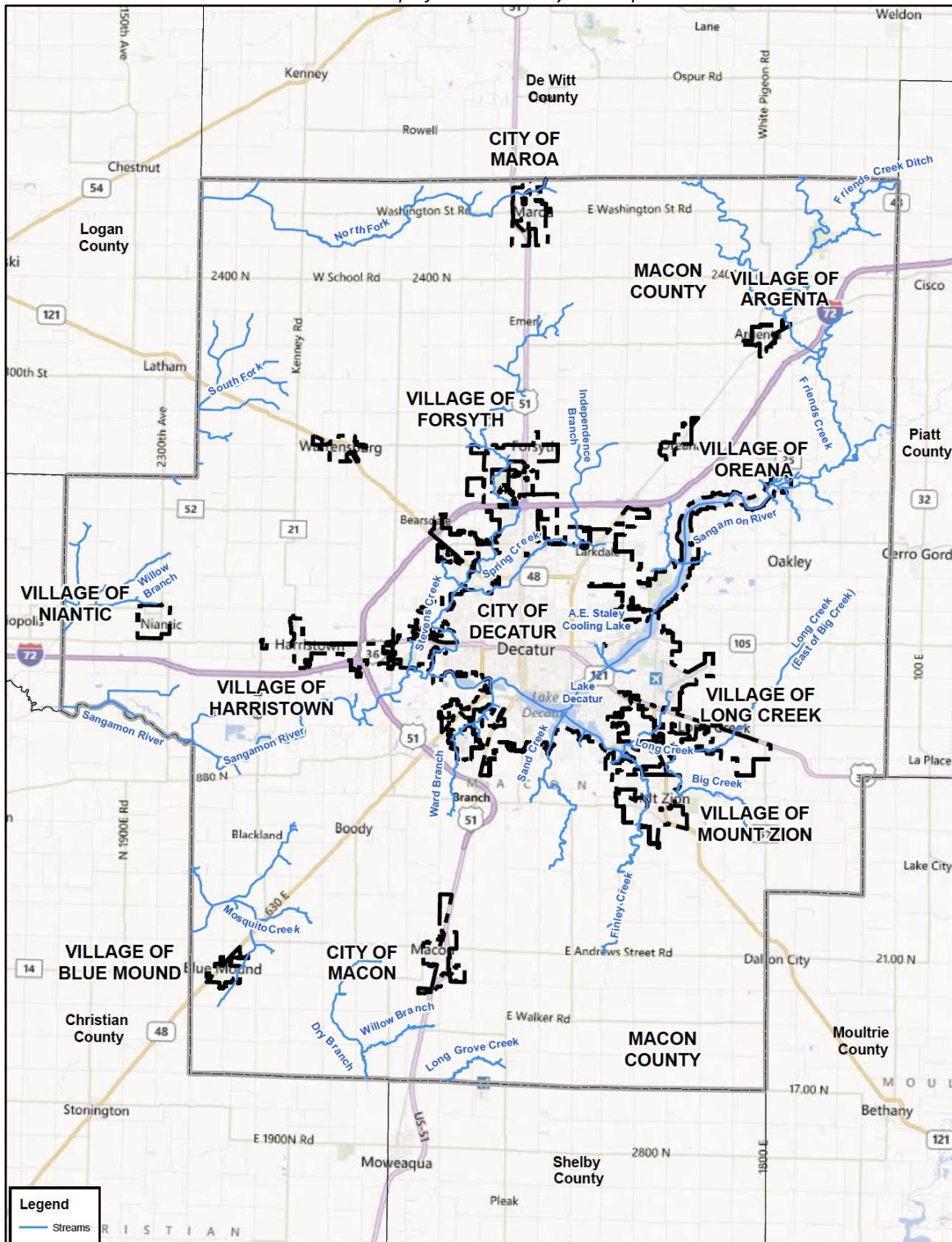
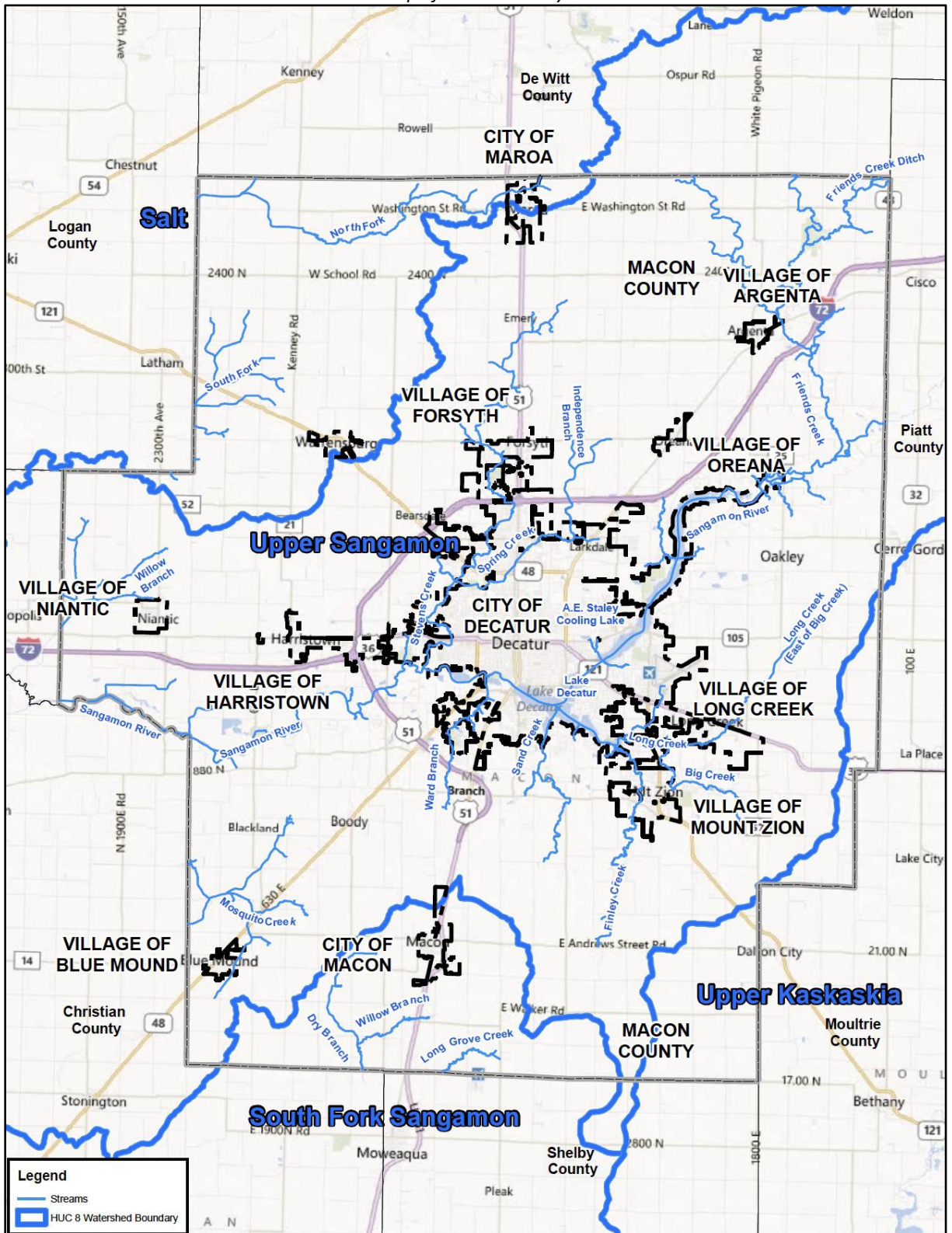


Exhibit 3-2. Map of Macon County Watersheds



3.3 Climate

The climate in Illinois is described as continental with all four seasons. There are generally substantial annual and diurnal temperature, humidity, and pressure system fluctuations, and the area has cold winters and hot summers. Macon County experiences four seasons (winter, spring, summer, and fall), with an average of 198 sunny days per year, while the US average is 205 sunny days (Best Places, 2023). On average, the County receives 40 inches of rain and 14 inches of snow annually (Best Places, 2023).

3.4 Land Use

Land use in Macon county is predominately agricultural. According to the land cover data, as calculated by the 2006 National Land Cover Data set (NLCD), 76% of Macon County is cultivated crops. Approximately 14% of the County is classified as developed and 1.2% of the County is classified as seasonally wet to permanently open water. Table 3-1 shows the percentage of land cover by type, which is a summary provided by the NLCD. Exhibit 3-3 illustrates a map of land use by type.

Table 3-1. Land Cover Data

MACON COUNTY, ILLINOIS	
LAND COVER DATA	
Cover Type	Percent Cover
Barren Land	0%
Cultivated Crops	76.2%
Deciduous Forest	4.5%
Developed, High	<1%
Developed, Low	6.9%
Developed, Medium	1.7%
Developed, Open	5.6%
Emergent Herbaceous	<1%
Evergreen Forest	<1%
Grassland/Herbaceous	<1%
Open Water	1.2%
Pasture/Hay	2.4%
Woody Wetlands	<1%

3.5 Changes in Development

In 2022, the Rebuild Illinois capital program entered its fourth year and nine of the program's construction projects that year were either planned or already underway in Decatur and Macon County.

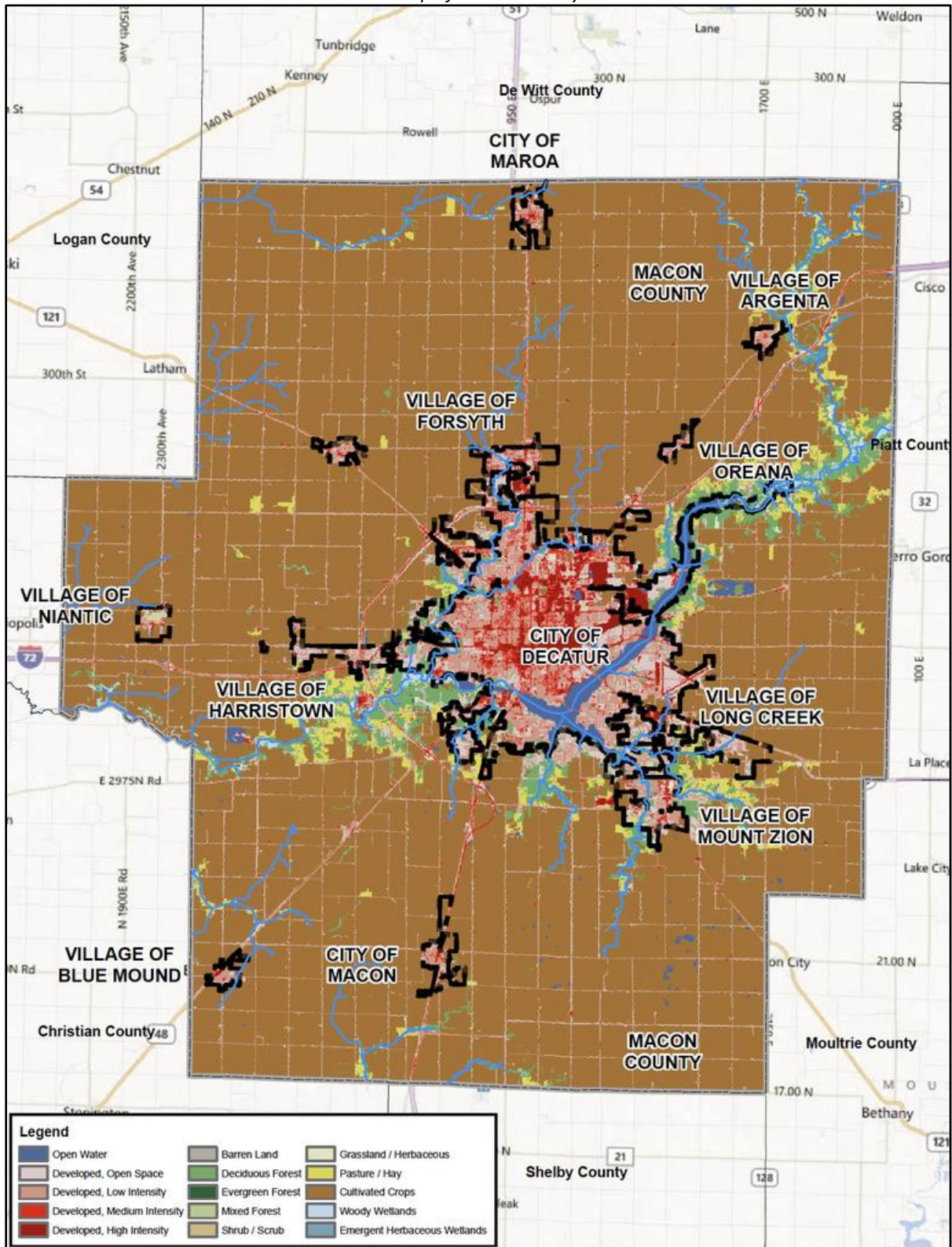
The nine projects represent an investment of almost \$67 million and improve safety, mobility and quality of life while sustaining and creating jobs in the area.

The nine projects are:

- Interstate 72 from the Sangamon County line to 1.5 miles west of U.S. 51: Resurfacing of the highway
- North Wyckles Road over I-72: deck overlay.
- U.S. 36 over U.S. 51: Painting of the bridge carrying Route 36 over Route 51
- Old U.S. Business Route 51 from I-72 to Illinois Route 121: Resurfacing, bridge joint replacement and ADA improvements (including sidewalk ramps)
- U.S. Route 36 from Illinois Route 48 to Church Street and West Eldorado Street from Illinois Route 48 to U.S. Route 36: Road resurfacing, traffic signal modernization, bridge joint replacement and ADA improvements.

- Illinois Route 121 from U.S. Route 36 through Mt. Zion: Road resurfacing, traffic signal modernization, bridge joint replacement and ADA improvements.
- Old U.S. Business Route 51 from Cleveland Avenue in Decatur to U.S. Route 51, two miles south of Elwin Road: Road resurfacing, bridge deck overlay and bridge joint replacement.
- U.S. Route 36 near Airport Road to just west of Illinois Route 32: Road resurfacing
- William Street/Illinois Route 105 bridge over Lake Decatur: Replacement of the bridge superstructure

Exhibit 3-3. Map of Macon County Land Use



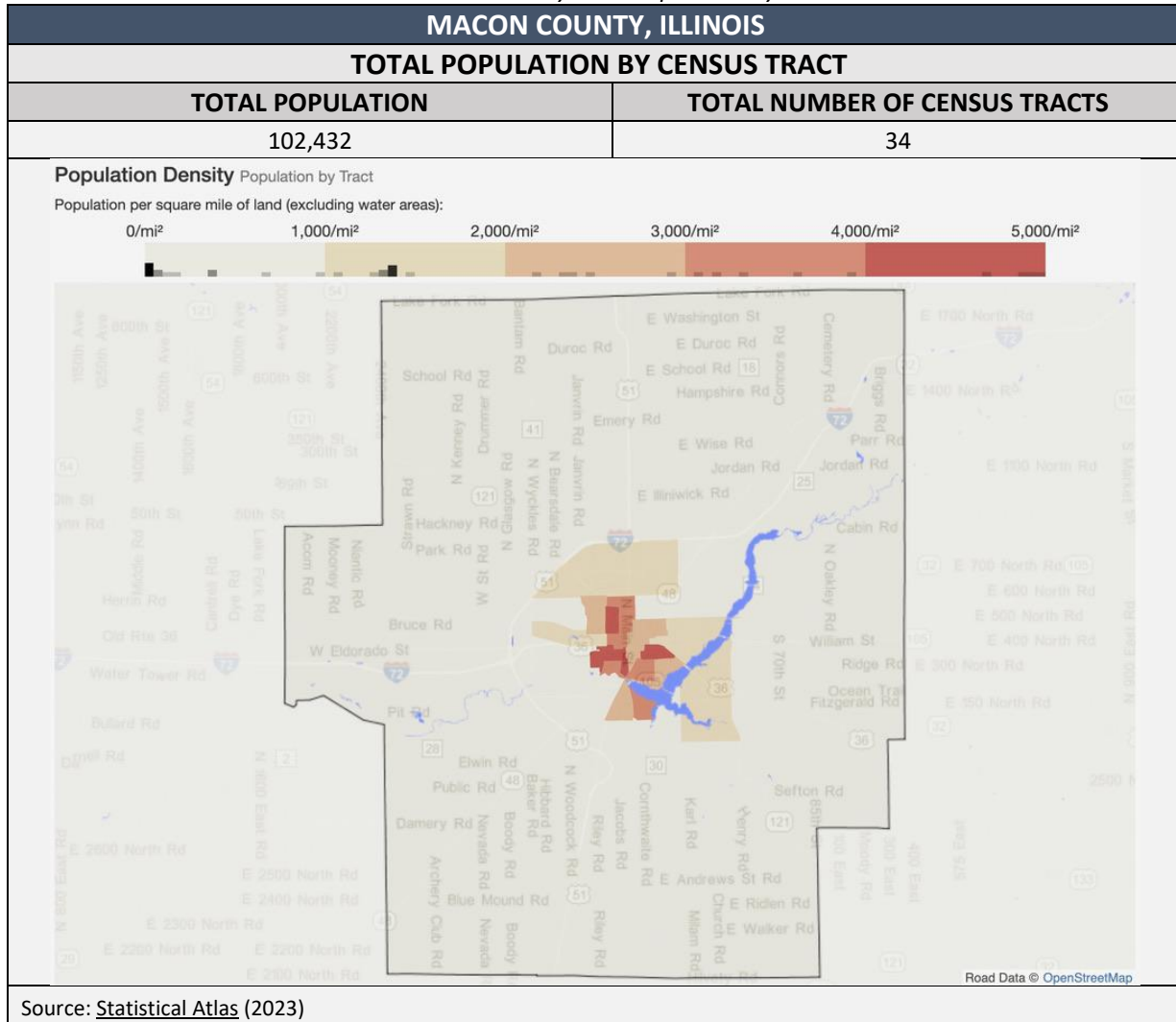
3.6 Demographics

3.6.1 Population and Population Density

As of 2023, Macon County is the 19th largest county in Illinois, with a total population of 102,432 (US Census Bureau, 2023). The average population density is estimated to be 179 people per square mile, compared to the Illinois average of 230.8 people per square mile (US Census Bureau, 2023).

Exhibit 3-4 illustrates Macon County's total population by census tract. Macon County's population density increases towards the central portion of the County as shown in the exhibit (Statistical Atlas, 2023).

Exhibit 3-4. Macon County Total Population By Census Tract



3.6.2 Income and Socioeconomic Status

From 2017-2021, the median income of households in Macon County, Illinois was \$55,954 and an estimated 17.1% of people are reported to be in poverty (US Census Bureau, 2023).

3.6.3 Race and Ethnicity

Macon County consists of 76.8% white, 18.3% Black or African American, 0.3% American Indian and Alaska Native, 1.2% Asian, 0.1% Native Hawaiian and Other Pacific Islander, 2.6% Hispanic or Latino, % and 3.4% Two or more races (US Census Bureau, 2023).

Table 3-2. Macon County Population Estimates

Census Year	Population Estimate
2000	114,499
2010	110,768
2011	110,699
2012	102,432
2013	109,596
2014	108,562
2015	107,398
2016	106,411
2022	102,432
Source: US Census Bureau	

3.6.4 Language

Among people at least five years old living in Macon County between 2017-2021, 3.9% spoke a language other than English at home (US Census Bureau, 2023).

3.6.5 Education

Between 2017-2021 in Macon County, 91.7% of people 25 years and over had at least graduated from high school and 23.5% had a bachelor's degree or higher (US Census Bureau, 2023).

The total school enrollment in Macon County, Illinois was 25,428 in 2017-2021. Nursery school enrollment was 2,004 and kindergarten through 12th grade enrollment was 17,420. College or graduate school enrollment was 597 (Statistical Atlas, 2023).

3.7 Community Risk Index

According to FEMA, Macon County has a Community Risk Index Rating of **“Relatively Moderate”** and a Community Risk Index Score of **“15.80”**. The average Community Risk Index Rating in Illinois is **9.87**, while the US national average is **10.60** (FEMA National Risk Index, 2023).

The Risk Index score is based on the following components: Social Vulnerability, Community Resilience, and Estimate Annual Loss (EAL), with EAL based on Exposure, Annualized Frequency, and Historic Loss Ratio (HLR) factors, for a total of five risk factors (FEMA National Risk Index, 2023).

Each risk factor contributes to either the likelihood or consequence aspect of risk and can be classified as one of two risk types: risk based on geographic location or risk based on the nature and historical occurrences of natural hazards. The five risk factors are summarized in Table 3-3. (FEMA National Risk Index, 2023).

Table 3-3. FEMA National Risk Index: Risk Components & Factors

FEMA NATIONAL RISK INDEX				
RISK COMPONENTS & FACTORS				
<i>Risk Component</i>	<i>Risk Factors</i>	<i>Risk Factor Description</i>	<i>Risk Contribution</i>	<i>Risk Type Assignment</i>
Social Vulnerability	Social Vulnerability	Consequence Enhancer	Consequence	Geographic Risk
Community Resilience	Community Resilience	Consequence Reducer	Consequence	Geographic Risk
Expected Annual Loss	Exposure	Expected Consequence	Consequence	Natural Hazard Risk
Expected Annual Loss	Annualized Frequency	Probability of Occurrence	Likelihood	Natural Hazard Risk
Expected Annual Loss	Historic Loss Ratio	Expected Consequence	Consequence	Natural Hazard Risk

3.8 Community Resilience

According to FEMA, Macon County has a Community Resilience Rating of **“Relatively High”** and a Community Resilience Score of **“57.71”**. The average Community Resilience Rating in Illinois is **56.70**, while the US national average is **54.59** (FEMA National Risk Index, 2023).

Community resilience is defined as the ability of a community to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions (FEMA National Risk Index, 2023).

The “Community Resilience Score” and “Community Resilience Rating” represent the relative level of a community’s resilience compared to all other communities at the same level. The Community Resilience Score is inversely proportional to a community’s risk. A higher Community Resilience Score results in a lower Risk Index Score (FEMA National Risk Index, 2023).

3.9 Social Vulnerability and Underserved Populations

According to FEMA, Macon County has a Social Vulnerability Rating of **“Relatively Moderate”** and a Social Vulnerability Score of **“42.77”**. The average Social Vulnerability Rating in Illinois is **35.15**, while the US national average is **38.35** (FEMA National Risk Index, 2023).

Social vulnerability is defined as the susceptibility of social groups to the adverse impacts of natural hazards, including disproportionate death, injury, loss, or disruption of livelihood (FEMA National Risk Index, 2023).

The “Social Vulnerability Score” and “Rating” represent the relative level of a community’s social vulnerability compared to all other communities at the same level. A community’s Social Vulnerability Score is also proportional to a community’s risk. A higher Social Vulnerability Score results in a higher Risk Index Score (FEMA National Risk Index, 2023).

Social vulnerability is also one of five components included in the formulation of the “National Risk Index Score”, in addition to Community Resilience, Estimated Annual Loss (EAL) based on Exposure, Annualized Frequency, and Historic Loss Ratio (HLR) factors (FEMA National Risk Index, 2023).

Table 3-4 Neighborhoods At-Risk illustrates at-risk populations in Macon County as compared to U.S. percentages and the differences thereof.

Table 3-4. Macon County Neighborhoods At-Risk Table (2017-2021)

NEIGHBORHOODS AT-RISK TABLE				
MACON COUNTY, ILLINOIS (2017–2021)				
Indicators 2021*	Macon County Population	Macon County Percentage	U.S. Percentage	Percent Difference (Macon County vs. U.S.)
People under 5 years	6,404	6.1%	5.9%	0.2%
People over 65 years	20,706	19.8%	16.0%	3.8%
People of color (including Hispanic)	2,532	24.6%	40.6%	(-16%)
People who don’t speak English well	300	0.3%	4.1%	(-3.8%)
People without a high school degree	5,926	8.3%	11.1%	(-2.8%)
Families in poverty	2,714	10.5%	8.9%	1.6%
Housing units that are rentals	13,353	30.9%	35.4%	(-4.5%)
Households with no car	4,102	9.5%	8.3%	1.2%
People with disabilities	14,828	14.5%	12.6%	1.9%
People without health insurance	4,840	4.7%	8.5%	(-3.8%)
High Reliability: Data with coefficients of variation (CVs) < 12% are in black to show that the sampling error is small. Medium Reliability: Data with CVs between 12 & 40% are in orange. These values should be interpreted with caution. Low Reliability: Data with CVs > 40% are displayed in red to indicate that the estimate is considered very unreliable. * ACS 5-year estimates: 2021 represents average characteristics from 2017-2021. CITATION: U.S. Department of Commerce. 2022. Census Bureau, American Community Survey Office, Washington D.C., reported by Headwaters Economics’ Neighborhoods at Risk, headwaterseconomics.org/par.				
Source: Neighborhoods At Risk (2023)				

Table 3-5 illustrates 14 (out of 34) census tracts in Macon County which are identified as “disadvantaged” (US Council on Environmental Quality, 2023). The total population of these 14 census tracts is 31,633 which is 30.88% of the total Macon County population (US Census Bureau, 2023).

According to the US Council on Environmental Quality (USCEQ), a community is identified as “disadvantaged” if it is located in a census tract that is at or above the threshold for one or more

environmental, climate, or other burdens, *and* at or above the threshold for associated socioeconomic burdens, including poverty and language barriers.

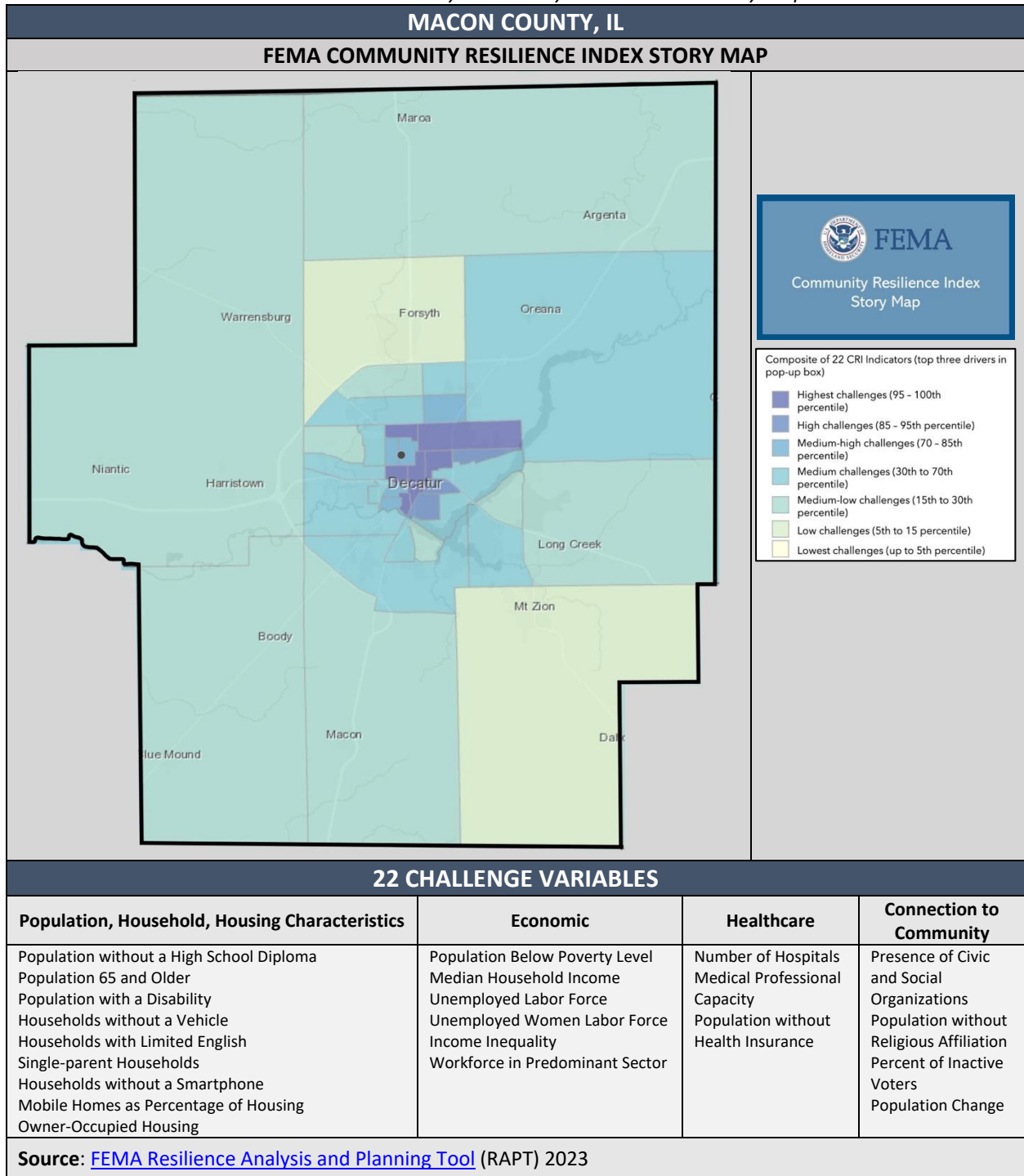
Each census tract in Table 3-5 is further identified in (Appendix C), illustrating specific socioeconomic burdens to each census tract.

Table 3-5. Macon County Disadvantaged Census Tracts

MACON COUNTY, ILLINOIS		
CLIMATE & ECONOMIC JUSTICE SCREENING TOOL - DISADVANTAGED CENSUS TRACTS		
CENSUS TRACT 2010 ID	CENSUS TRACT POPULATION	LOW INCOME TRACT?
17115000200	2611	YES
17115000300	3501	YES
17115000400	1121	YES
17115000500	2906	YES
17115000600	1909	YES
17115000900	1700	YES
17115001000	1039	YES
17115001100	3375	YES
17115001802	2165	YES
17115001900	1949	YES
17115002000	3921	YES
17115002100	1150	YES
17115002903	4286	YES
17115003100	2222	YES
Total Population in Disadvantaged Census Tracts: 31,633		
The Climate and Economic Justice Screening Tool (CEJST) highlights disadvantaged census tracts across all 50 states, the District of Columbia, and the U.S. territories. Communities are considered disadvantaged: • If they are in census tracts that meet the thresholds for at least one of the tool's categories of burden, or • If they are on land within the boundaries of Federally Recognized Tribes. The CEJST tool uses datasets as indicators of burdens. The burdens are organized into categories. A community is highlighted as disadvantaged if it is located in a census tract that is: (1) At or above the threshold for one or more environmental, climate, or other burdens, and, (2) At or above the threshold for an associated socioeconomic burden. In addition, a census tract that is completely surrounded by disadvantaged communities and is at or above the 50% percentile for low income is also considered disadvantaged.		
Source: U.S. Council on Environmental Quality - Climate & Economic Justice Screening Tool (2023)		

Exhibit 3-5 illustrates the Macon County Community Resilience Index Story Map. This map shows each participating jurisdiction with density mapping used to identify community areas that are overburdened by the 22 challenges identified by the FEMA Community Resilience Challenges Index.

Exhibit 3-5. Macon County Community Resilience Index Story Map



3.10 Housing Trends

Between 2017-2021, Macon County had approximately 49,678 total housing units with an owner-occupied housing unit rate of 69.1%. In addition, Macon County had 13,353 rental units and 1,049 manufactured homes (US Census Bureau, 2023).

In 2021, the median home value in Macon County was \$105,900 demonstrating a \$17,600 increase in value since 2017. Macon County median home values are shown below as compared to Illinois and United States averages according to the (US Census Bureau, 2023):

Home Values 2021

- Macon County Median Home Value: \$105,900
- Illinois Median Home Value: \$212,600
- U.S. Median Home Value: \$244,900

Home Values 2017

- Macon County Median Home Value: \$88,300
- Illinois Median Home Value: \$195,300
- U.S. Median Home Value: \$217,600

3.11 Economy

3.11.1 Employment and Industry

In 2021 in Macon County, 59.0% of the population 16 and over were employed, with a mean travel time to work of 18.5 minutes (US Census Bureau, 2023).

Table 3-6 illustrates the percentages of Macon County employed within different industry categories, and the comparison to US population percentages.

Table 3-6. Macon County Occupational Percentages

MACON COUNTY, ILLINOIS		
POPULATION PERCENTAGE BY OCCUPATION		
Population Percentage by Occupation	Macon County	US
Agriculture, forestry, fishing, hunting	1.80%	1.30%
Mining, quarrying, oil and gas extraction	0.00%	0.60%
Construction	6.00%	6.20%
Manufacturing	18.00%	10.40%
Wholesale trade	2.00%	2.70%
Retail trade	11.50%	11.60%
Transportation and warehousing	4.80%	4.10%
Utilities	1.90%	0.90%
Information	1.60%	2.10%
Finance and insurance	3.40%	4.70%
Real estate, rental, leasing	1.60%	1.90%
Professional, scientific, technical services	2.70%	6.70%
Management of companies	0.20%	0.10%
Administrative, support, waste management services	3.60%	4.30%
Educational services	7.70%	9.30%
Health care and social assistance	14.80%	13.80%
Arts, entertainment, recreation	1.60%	2.20%
Accommodation, food services	7.30%	7.40%
Other services	5.20%	4.90%
Public administration	4.30%	4.80%
Source: (Best Places, 2023)		

As a municipality, Macon County is a major employer with approximately 500 full-time employees and over 100 permanent part-time, temporary and seasonal workers. Employees include members of some bargaining units (AFSCME, FOP, and others), contract employees and at-will employees (Macon County, IL, 2023).

Since 2021, “Macon County has seen the job market increase by 1.7%. Future job growth over the next ten years is predicted to be 23.5%, which is lower than the US average of 33.5%” (Best Places, 2023).

3.12 Critical Infrastructure and Key Resources

Critical facilities are commonly considered to be police stations, fire and rescue facilities, hospitals, shelters, schools, nursing homes, water supply and waste treatment facilities and other structures the community identifies as essential to the health and welfare of the population and that are especially important following a disaster.

Exhibit 3-6 illustrates a map of critical facilities in Macon County.

Exhibit 3-6. Critical Infrastructure in Macon County

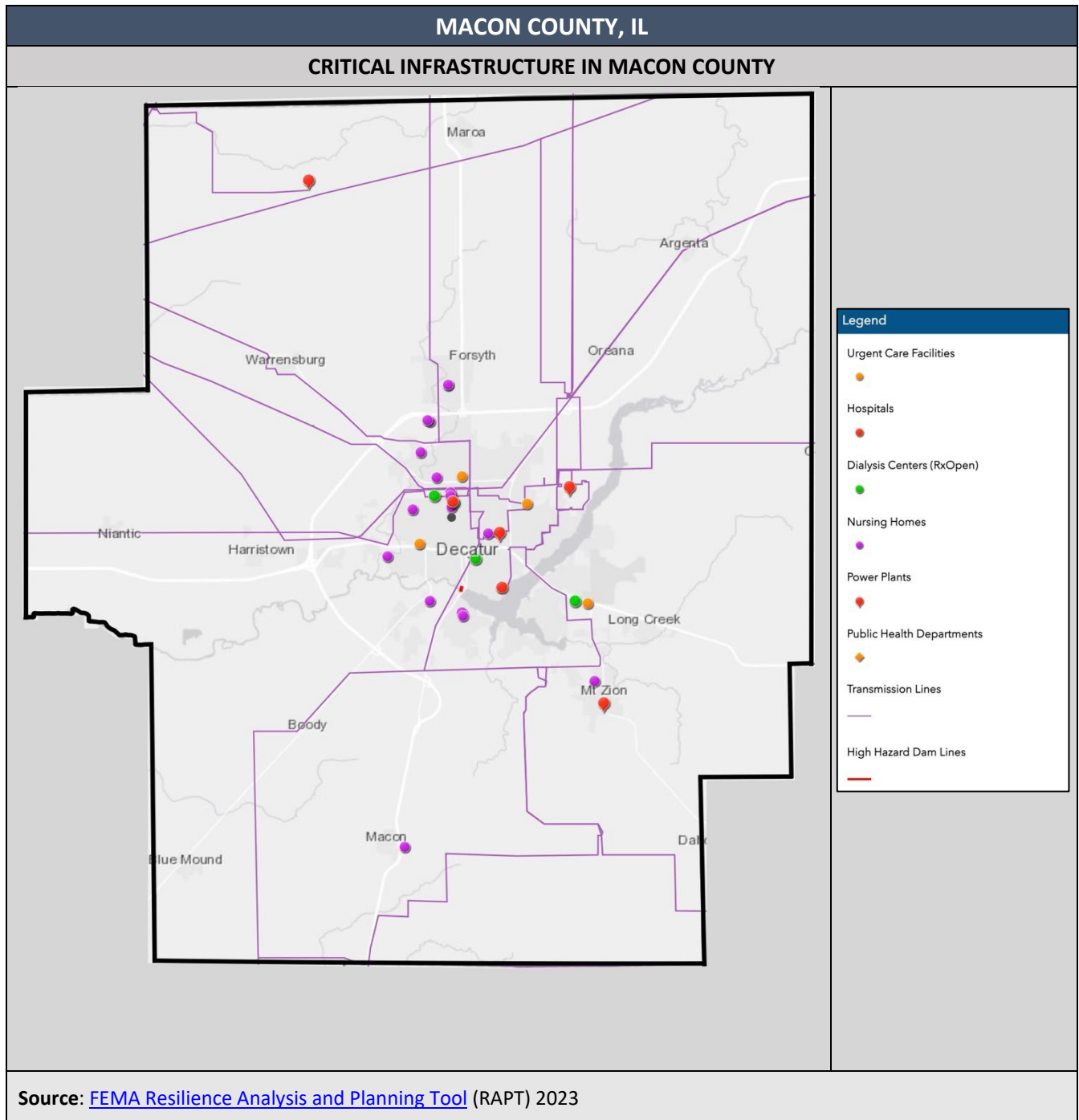


Exhibit 3-7. Emergency Response Facilities in Macon County

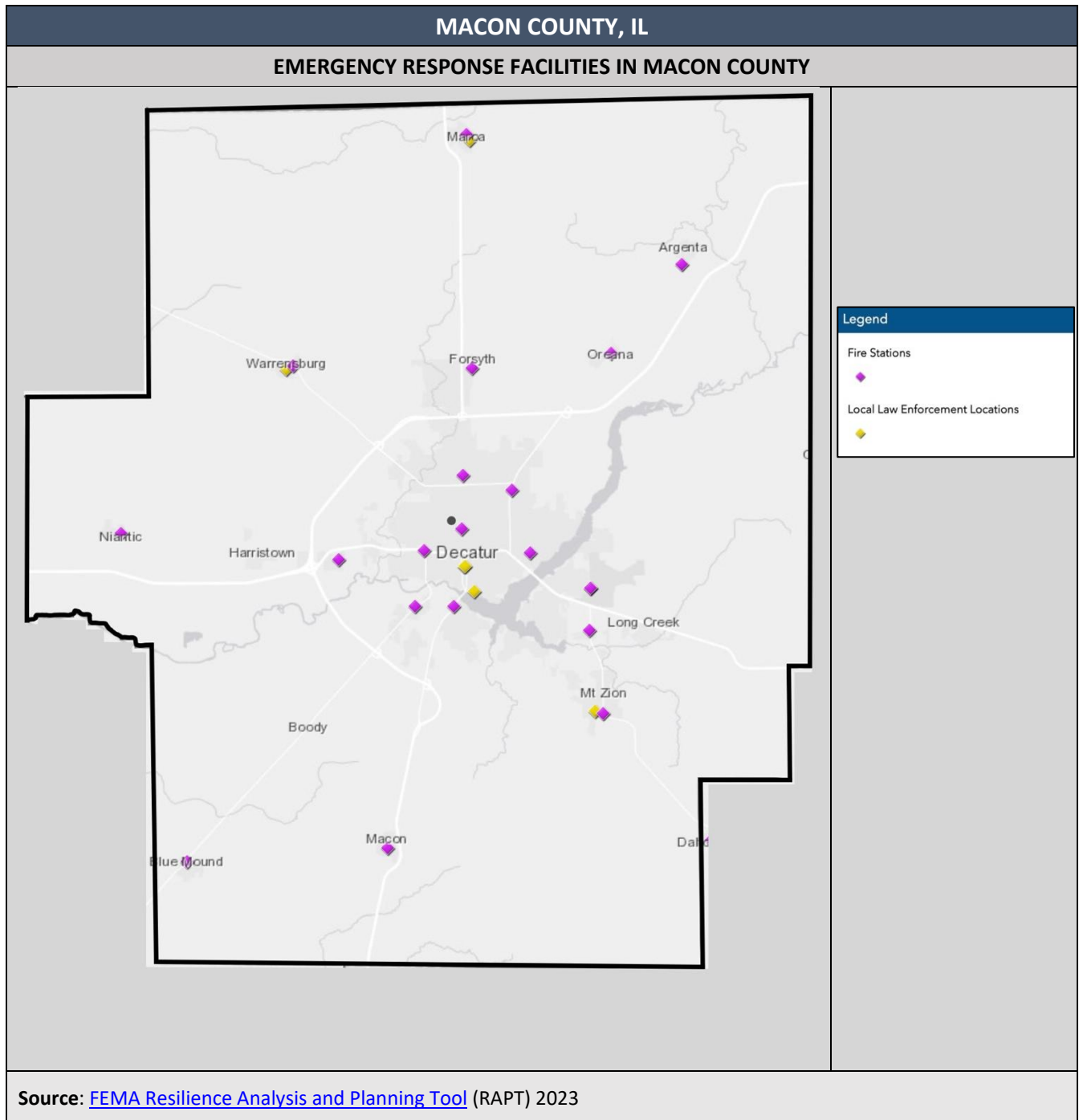
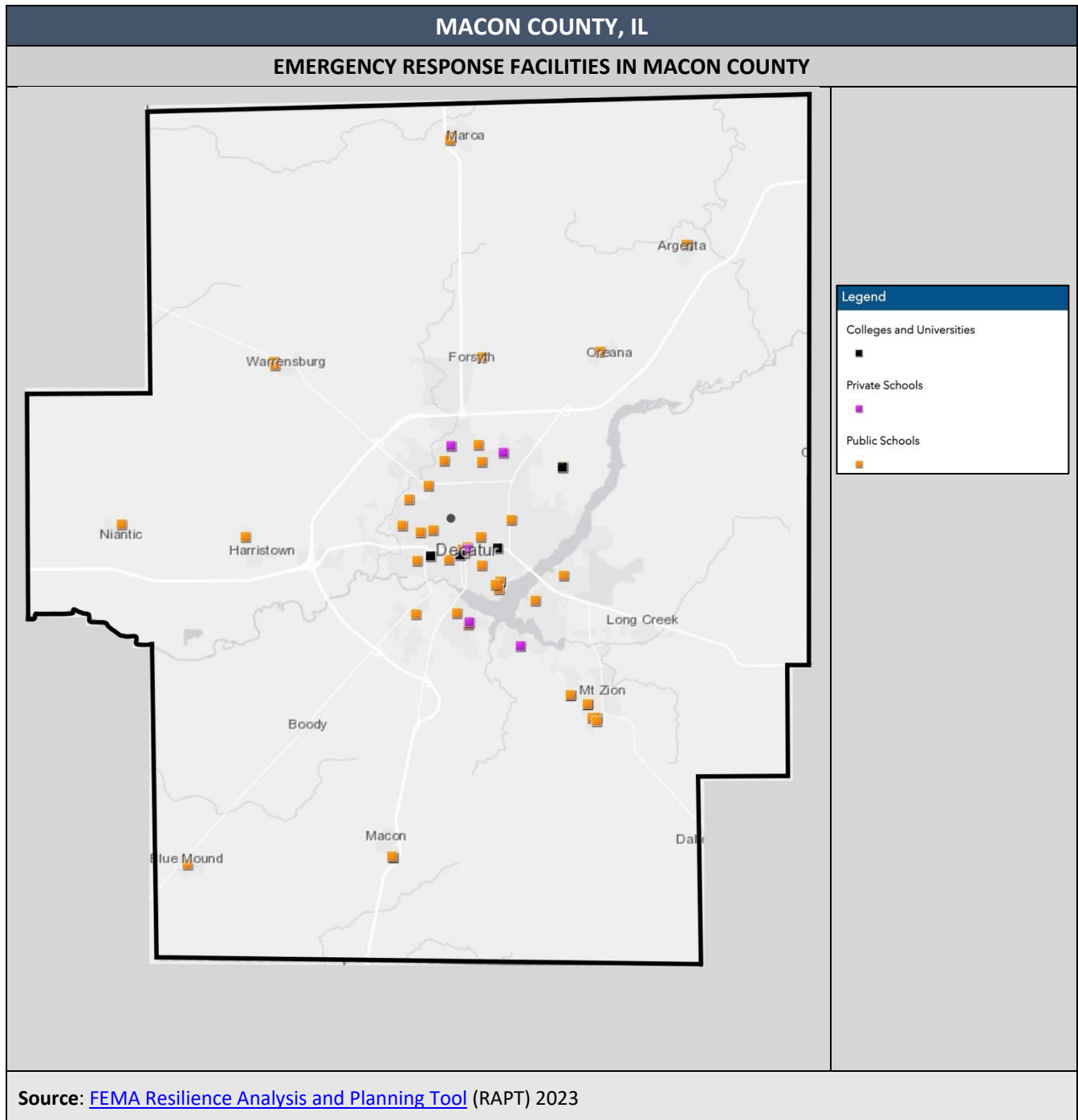


Exhibit 3-8. Schools and Universities in Macon County



3.12.1 Vulnerability of Essential Facilities and Utilities

The table below lists the essential facility counts and total exposure in Macon County. Total exposure represents the estimated replacement cost of the building and contents of each facility.

Essential Facility types included are:

- Emergency Operation Centers (EOCs)
- Police Facilities
- Fire Facilities
- Schools
- Medical Centers

Table 3-7. Macon County Vulnerability of Essential Facilities

MACON COUNTY, ILLINOIS						
VULNERABILITY AND EXPOSURE OF ESSENTIAL FACILITIES						
EOC	FIRE	POLICE	SCHOOLS	MEDICAL	TOTAL FACILITIES	TOTAL EXPOSURE (2021 USD)
1	20	6	58	3	88	\$2,491,943,108

3.13 Hazard Mitigation-related Laws

The Disaster Mitigation Act of 2000 (DMA 2K) emphasizes the importance of strong state and local planning processes and comprehensive program management and creates the framework for state, local, tribal, and territorial governments to engage in hazard mitigation planning to receive certain types of non-emergency disaster assistance. The Federal Emergency Management Agency (FEMA) has promulgated rules for implementation in 44 CFR Parts 201 and 206.

3.14 References

- Best Places. (2023, March 20). *Best Places*. Retrieved from Climate in Macon County, Illinois: <https://www.bestplaces.net/climate/county/illinois/macon>
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US Census Bureau. (2023, March 13). *Macon County Quick Facts*. Retrieved from US Census Bureau: <https://www.census.gov/quickfacts/fact/table/maconcountyillinois/PST045221>

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Chapter 4: Risk Assessment

Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from hazards. It allows emergency management personnel to establish early response priorities by identifying potential hazards and vulnerable assets.

The risk assessment for this hazard mitigation plan update evaluates the risk of hazards prevalent in the planning area and meets requirements of the DMA (44 CFR, Section 201.6(c)(2)).

4.1 Identified Hazards

Some hazards are a threat to all geographic areas while others (e.g., flooding) are more limited in their extent. A thorough analysis was conducted to determine which hazards are of concern in Macon County as part of the Plan update.

Macon County hazards were identified using a number of resources, including:

- Hazard planning documents developed by state, federal, and private agencies.
- National Weather Service weather data from the past 50 years.
- Data from the United States Geological Survey (USGS).

Hazards that have been identified as significant in this county and that will be considered in this Plan are listed below.

Identified Hazards

- Tornadoes
- Extreme Heat
- Drought
- Earthquakes
- Floods
 - Riverine Flooding
 - Urban/Flash Flooding
- High Hazard Dams & Levees
- Severe Summer Weather
 - Hailstorms
 - High Winds
- Severe Winter Weather
 - Blizzards
 - Winter Storms
- HAZMAT Incident
- Nuclear Event

Per FEMA’s mandate to address all natural hazards, the following natural hazards were not included because these hazards do not directly impact Macon County due to geographic location. The State of Illinois does not consider Macon County to be at risk for a wildfire (IEMA, 2018), and has been excluded.

- Hurricane
- Sea Level Rise
- Storm Surge
- Tsunami
- Volcanic Eruption
- Snow Avalanche
- Landslide/Mudslide
- Wildfire

4.1.1 Presidential Disaster (DR) & Emergency Declarations (EM) in Macon County

Table 4-1 below presents a list of all disaster and emergency declarations that have occurred in Macon County, according to the FEMA through September 2023. This list presents the foundation for identifying what hazards pose the greatest risk within Macon County.

A major disaster declaration covers any natural hazard, including hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought; and any fire, flood, or explosion, regardless of the cause. Federal assistance for recovery and future hazard mitigation can be made available to affected counties. Emergency declarations supplement state, local and Indian tribal government efforts in providing emergency services, such as the protection of lives, property, public health, and safety, or to lessen or avert the threat of a catastrophe. The total amount of assistance provided for in a single emergency may not exceed \$5 million. The President can declare an emergency for any occasion or instance when the President determines federal assistance is needed.

While severe storms have been the most significant natural hazard Macon has experienced, flooding, tornados, and winter storms have all created damage that has received a federal disaster declaration over the past years. Table 4-1 lists the presidential, or federal, disaster declarations for the County since 1967.

Table 4-1. State and Federal Disaster Declarations for Macon County

Incident Type	Declaration Title	Declaration Date	FEMA Disaster Number	Location	Declaration Type
Tornado	Tornadoes	1974-04-	427	IL	DR
Flood	Severe Storms & Flooding	1974-06-10	438	IL	DR
Flood	Severe Storms & Flooding	1979-04-30	583	IL	DR
Severe Storm	Severe Storms and Tornadoes	1996-04-23	1110	IL	DR
Snowstorm	Winter Storm	1999-01-08	3134	IL	EM
Tornado	Severe Storms, Tornadoes and Flooding	2002-05-21	1416	IL	DR

Hurricane	Hurricane Katrina Evacuation	2005-09-07	3230	IL	EM
Severe Ice Storm	Severe Winter Storm	2007-02-09	1681	IL	DR
Winter Weather	Winter Weather	2011-01-31	-	IL	State Disaster Proclamation
High Wind, Tornadoes, Torrential Rain	High Wind, Tornadoes, Torrential Rain	2011-04-25	-	IL	State Disaster Proclamation
Heavy Snowfall, Frigid Temperatures	Heavy Snowfall, Frigid Temperatures	2014-01-06	-	IL	State Disaster Proclamation
Winter Storm	Winter Storm	2019-01-29	-	IL	State Disaster Proclamation
Biological	COVID-19	2020-03-13	3435	IL	EM
Biological	COVID-19 Pandemic	2020-03-26	4489	IL	DR
Winter Storm	Winter Storm	2021-02-16	-	IL	State Disaster Proclamation
Winter Storm	Winter Storm	2022-02-01	-	IL	State Disaster Proclamation
Severe Storm	Severe Storms and Flooding	2023-08-15	4728	IL	DR

4.2 Risk Assessment Methodology

4.2.1 Probability of Occurrence

The probability of occurrence of a hazard is indicated by a probability factor based on the likelihood of annual occurrence:

- **High**—Significant hazard event is likely to occur annually (Probability Factor = 3)
- **Medium**—Significant hazard event is likely to occur within 25 years (Probability Factor = 2)
- **Low**—Significant hazard event is likely to occur within 100 years (Probability Factor = 1)
- **Unlikely**—There is little to no probability of significant occurrence, or the recurrence interval is greater than every 100 years (Probability Factor = 0)

The assessment of hazard frequency is generally based on past hazard events in the area.

4.2.2 Extent

Extent was assessed in two categories: extent/intensity and catastrophic potential of the hazard. Numerical impact factors were assigned as follows:

Extent/Intensity—Extent is defined as the range of anticipated intensities of the identified hazards. Extent is most commonly expressed using various scientific scales, such as the Enhanced Fujita scale.

- **High**—Historical and/or probabilistic models/studies for this hazard indicate the possibility of a high-intensity incident (Extent Factor = 3)
- **Medium**—Historical and/or probabilistic models/studies for this hazard indicate the possibility of a medium-intensity incident (Extent Factor = 2)
- **Low**—Historical and/or probabilistic models/studies for this hazard indicate the possibility of a low-intensity incident (Extent Factor = 1)
- **Unlikely**—Historical and/or probabilistic models/studies for this hazard indicate the possibility of little to no intensity (Extent Factor = 0)

Catastrophic Factor—The potential that an occurrence of this hazard could be catastrophic.

- **High**—High potential that this hazard could be catastrophic (Extent Factor = 3)
- **Medium**—Medium potential that this hazard could be catastrophic (Extent Factor = 2)
- **Low**—Low potential that this hazard could be catastrophic (Extent Factor = 1)
- **Unlikely**—Virtually no potential that this hazard could be catastrophic (Extent Factor = 0)

Each category was assigned a weighting factor to reflect its significance, consistent with those typically used for measuring the benefits of hazard mitigation actions: a weighting factor of 3 was assigned for *Extent/Intensity* and its potential for *Catastrophe*.

4.2.3 Vulnerability

Vulnerabilities were assessed in three categories: population exposure, property exposure, and exposure based on changes in development. Numerical impact factors were assigned as follows:

People—Values were assigned based on the percentage of the total population exposed to the hazard event.

- **High**—30% or more of the population is exposed to this hazard (Vulnerability Factor = 3)
- **Medium**—15% to 29% of the population is exposed to this hazard (Vulnerability Factor = 2)
- **Low**—14% or less of the population is exposed to this hazard (Vulnerability Factor = 1)
- **No Vulnerability**—None of the population is exposed to this hazard (Vulnerability Factor = 0)

Property Exposed—Values were assigned based on the percentage of the total property value exposed to the hazard event.

- **High**—25% or more of the total assessed property value is exposed to the hazard (Vulnerability Factor = 3)
- **Medium**—10% to 24% of the total assessed property value is exposed to the hazard (Vulnerability Factor = 2)

- **Low**—9% or less of the total assessed property value is exposed to the hazard (Vulnerability Factor = 1)
- **No Vulnerability**—None of the total assessed property value is exposed to the hazard (Vulnerability Factor = 0)

Changes in Development Factor—Changes in development since the previous Plan was approved have increased or decreased the community’s vulnerability/exposure to this hazard.

- **High**—Changes in development have significantly increased the vulnerability/exposure of the community to this hazard (Vulnerability Factor = 3)
- **Medium**—Changes in development have increased the vulnerability/exposure of the community to this hazard, but not significantly (Vulnerability Factor = 2)
- **Low**—Changes in development have minimally increased the vulnerability/exposure of the community to this hazard (Vulnerability Factor = 1)
- **No Vulnerability**—Changes in development have had no effect and/or have decreased the vulnerability/exposure of the community to this hazard (Vulnerability Factor = 0)

Each category was assigned a weighting factor to reflect its significance, consistent with those typically used for measuring the benefits of hazard mitigation actions: a weighting factor of 3 was assigned for *People*, and a weighting factor of 1 was assigned for *Property Exposed* and *Changes in Development*.

4.2.4 Impact

Hazard impacts were assessed in eight categories: population and life/safety, underserved/equity, property damages, economic, environmental, essential operations, future development, and climate change. Numerical impact factors were assigned as follows:

Population and Life/Safety—Values were 1). assigned based on best available data (historical and probabilistic) for populations vulnerable to the hazard event, and 2). are likely to experience adverse impacts from the hazard incident.

- **High**—Populations exposed to this hazard are likely to experience significant adverse impacts (Impact Factor = 3)
- **Medium**—Populations exposed to this hazard are likely to experience some adverse impacts (Impact Factor = 2)
- **Low**—Populations exposed to this hazard are likely to experience minimal adverse impacts (Impact Factor = 1)
- **No impact**—Populations exposed to this hazard are not likely to experience significant adverse impacts (Impact Factor = 0)

Underserved/Equity—Values were 1). assigned based on best available data for underserved populations vulnerable to the hazard event, and 2). are likely to experience

adverse/disproportionate impacts from the hazard incident resulting in greater disparity in equity.

- **High**—Underserved populations exposed to this hazard are likely to experience significant adverse/disproportionate impacts (Impact Factor = 3)
- **Medium**—Underserved populations exposed to this hazard are likely to experience some adverse/disproportionate impacts (Impact Factor = 2)
- **Low**—Underserved populations exposed to this hazard are likely to experience minimal adverse/disproportionate impacts (Impact Factor = 1)
- **No impact**—Underserved populations exposed to this hazard are not likely to experience significant adverse/disproportionate impacts (Impact Factor = 0)

Property Damages—Values were assigned based on the expected total property damages incurred from a hazard incident. It is important to note that values represent estimates of the loss from a major incident based on historical data or probabilistic models/studies.

- **High**—More than \$5,000,000 in property damages is expected from a single major hazard event, or damages are expected to occur to 15% or more of the property value within the jurisdiction (Impact Factor = 3)
- **Medium**—More than \$500,000, but less than \$5,000,000 in property damages is expected from a single major hazard event, or expected damages are expected to more than 5%, but less than 15% of the property value within the jurisdiction (Impact Factor = 2)
- **Low**—Less than \$500,000 in property damages is expected from a single major hazard event, or less than 5% of the property value within the jurisdiction (Impact Factor = 1)
- **No impact**—Little to no property damage is expected from a single major hazard event (Impact Factor = 0)

Economic Factor—An estimation of the impact, expressed in terms of dollars, on the local economy is based on a loss of business revenue, crops, worker wages and local tax revenues or on the impact on the local gross domestic product (GDP).

- **High**—Where the total economic impact is likely to be greater than \$10 million (Impact Factor = 3)
- **Medium**—Total economic impact is likely to be greater than \$100,000, but less than or equal to \$10 million (Impact Factor = 2)
- **Low**—Total economic impact is not likely to be greater than \$100,000 (Impact Factor = 1)
- **No Impact**—Virtually no significant economic impact (Impact Factor = 0)

Environmental Factor—Environmental impact from a single major hazard event requiring outside resources and support; and/or repair, clean-up, restoration, and/or preservation work.

- **High**— Environmental impact from a single major hazard event is likely to be significant, requiring extensive outside resources and support; and/or repair, clean-up, restoration, and/or preservation work (Impact Factor = 3)
- **Medium**—Environmental impact from a single major hazard event is likely to be localized, requiring some outside resources and support; and/or repair, clean-up, restoration, or preservation work (Impact Factor = 2)
- **Low**— Environmental impact from a single major hazard event is likely to be minimal, requiring little to no outside resources and support; and/or minimal repair, clean-up, restoration, or preservation work (Impact Factor = 1)
- **No impact**— No environmental impacts from a single major hazard event is likely (Impact Factor = 0)

Essential Operations Factor—Impact on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.

- **High**—Significant impact on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event (Impact Factor = 3)
- **Medium**—Some impact on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event (Impact Factor = 2)
- **Low**—Minimal impact on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event (Impact Factor = 1)
- **No Impact**—No impact on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event (Impact Factor = 0)

Future Development Factor—The potential that future development will have on increasing or decreasing the impact/consequence of this hazard.

- **High**—Future development trends will significantly increase the impact/consequence of this hazard (Impact Factor = 3)
- **Medium**—Future development trends will increase the impact/consequence of this hazard, but not significantly (Impact Factor = 2)
- **Low**—Future development trends will minimally increase impact/consequence of this hazard (Impact Factor = 1)
- **No Impact**—Future development trends will not increase the impact/consequence of this hazard, and/or may even decrease the impact/consequence of this hazard (Impact Factor = 0)

Climate Change Factor—The potential that Climate Change will increase the risk of this hazard (i.e., type, location, and range of anticipated intensities of the identified hazard and impacts).

- **High**—Climate Change trends will significantly increase the risk of this hazard and its impacts (Impact Factor = 3)
- **Medium**—Climate Change trends will increase the risk of this hazard and its impacts, but not significantly (Impact Factor = 2)
- **Low**—Climate Change trends will minimally increase the risk of this hazard and its impacts (Impact Factor = 1)
- **No Impact**—Climate Change trends will not increase the risk of this hazard and its impacts (Impact Factor = 0)

Each category was assigned a weighting factor to reflect its significance, consistent with those typically used for measuring the benefits of hazard mitigation actions: a weighting factor of 3 was assigned for *Population and Life Safety* and *Underserved/Equity*, and a weighting factor of 2 was assigned for *Property Damages*. A weighting factor of 1 was assigned for *Economic, Environmental, Essential Operations, Future Development, and Climate Change*.

4.3 FEMA NRI Risk Scores

The National Risk Index (NRI) is a dataset and online tool to help illustrate the United States communities most at risk for 18 natural hazards: Avalanche, Coastal Flooding, Cold Wave, Drought, Earthquake, Hail, Heat Wave, Hurricane, Ice Storm, Landslide, Lightning, Riverine Flooding, Strong Wind, Tornado, Tsunami, Volcanic Activity, Wildfire, and Winter Weather. Because not all hazards are applicable to the County, only those hazards with a defined risk to the County are included.

The National Risk Index leverages available source data for Expected Annual Loss due to these 18 hazard types, Social Vulnerability, and Community Resilience to develop a baseline relative risk measurement for each United States county and Census tract. These measurements are calculated using average past conditions, but they cannot be used to predict future outcomes for a community. The National Risk Index is intended to fill gaps in available data and analyses to better inform federal, state, local, tribal, and territorial decision makers as they develop risk reduction strategies.

4.3.1 Social Vulnerability

Social Vulnerability measures the susceptibility of social groups to the adverse impacts of natural hazards, including disproportionate death, injury, loss, or disruption of livelihood.

Per the FEMA National Risk Index, Macon County has a Social Vulnerability Rating of “**Relatively Moderate**” and a Social Vulnerability Score of “**42.77**” (FEMA, 2023).

The “Social Vulnerability Score” and “Rating” represent the relative level of a community’s social vulnerability compared to all other communities at the same level. A community’s Social

Vulnerability Score is also proportional to a community's risk. A higher Social Vulnerability Score results in a higher Risk Index Score (FEMA, 2023).

Social vulnerability is also one of five components included in the formulation of the "National Risk Index Score", in addition to community resilience, estimated annual loss (EAL) based on exposure, annualized frequency, and historic Loss Ratio (HLR) factors (FEMA, 2023).

Table 4-2. Social Vulnerability FEMA NRI Score

MACON COUNTY, IL FEMA NRI SOCIAL VULNERABILITY SCORE	
Social Vulnerability Score	Social Vulnerability Rating
42.77	Relatively Moderate
<i>Social Vulnerability is measured using the Social Vulnerability Index (SoVI) published by the University of South Carolina's Hazards and Vulnerability Research Institute (HVRI).</i>	
Source: hazards.fema.gov/nri/social-vulnerability	

4.3.2 Community Resilience

Community Resilience measures a community's ability to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions.

Table 4-3. Community Resilience FEMA NRI Score

MACON COUNTY, IL FEMA NRI COMMUNITY RESILIENCE SCORE	
Community Resilience Score	Community Resilience Rating
57.71	Relatively High
<i>Community Resilience is measured using the Baseline Resilience Indicators for Communities (HVRI BRIC) published by the University of South Carolina's Hazards and Vulnerability Research Institute (HVRI).</i>	
Source: hazards.fema.gov/nri/community-resilience	

4.3.3 Community Resilience Challenges Index (CRCI) Percentile

Table 4-4. Community Resilience Challenges Index (CRCI) Percentile

MACON COUNTY, IL FEMA CRCI PERCENTILE
Community Resilience Challenges Index Percentile
77.0 / 100%
<i>The FEMA CRCI index provides a relative composite value by county and by census tract, measured as an average of counts of standard deviations from the national mean for each indicator. The 2023 update to the FEMA CRCI uses the most currently available census data, the 2017-2021 ACS 5-year estimates, and is updated annually.</i>
Source: https://fema.maps.arcgis.com/apps/webappviewer/index.html?id=90c0c996a5e242a79345cdbc5f758fc6

4.3.4 Expected Annual Loss

Table 4-5. Expected Annual Loss FEMA NRI Score (All Natural Hazards)

MACON COUNTY, IL FEMA NRI EXPECTED ANNUAL LOSS SCORE	
Expected Annual Loss Score	Expected Annual Loss Rating
18.45	Relatively Moderate
<i>Expected Annual Loss scores are calculated using an equation that combines values for exposure, annualized frequency, and historic loss ratios (Expected Annual Loss = Exposure × Annualized Frequency × Historic Loss Ratio).</i>	
Source: hazards.fema.gov/nri/expected-annual-loss	

4.3.5 FEMA National Risk Index Score

Table 4-6. Overall FEMA NRI Score

MACON COUNTY, IL FEMA OVERALL NRI SCORE	
FEMA Overall NRI Score	FEMA Overall NRI Rating
15.80	Relatively Moderate
<i>Risk Index scores are calculated using an equation that combines scores for Expected Annual Loss due to natural hazards, Social Vulnerability and Community Resilience. (Expected Annual Loss X Social Vulnerability / Community Resilience = Risk Index).</i>	
Source: hazards.fema.gov/nri/determining-risk	

4.4 Overall Risk Scores

The following tables represent the new overall risk scores for Macon County based on the described methodology above. Following a data-driven quantitative assessment, the planning team utilized subject matter knowledge and expertise and further refined the scores. FEMA NRI Scores, as appropriate and applicable, were used to inform the analysis.

4.4.1 Macon County Overall Risk Scores

Table 4-7. 2023 Hazard Risk Scores for Macon County

	Probability	Consequence				Total Risk
Hazard Event	Probability Factor	Sum of Weighted Extent Factors	Sum of Weighted Vulnerability Factors	Sum of Weighted Impact Factors	Consequence Score	Total Risk Score (Probability x Consequence)
Tornadoes	3	12	5	24	41	60
Flood: Urban/Flash Flooding	3	9	11	18	38	56
Severe Winter Storms: Blizzards	3	12	11	14	37	55
Severe Winter Storms: Heavy Snow	3	12	11	12	35	52
Flood: Riverine Flooding	2	15	7	27	49	49
Severe Winter Storms: Ice Storms	2	15	15	15	45	46
Hazardous Materials Accident	2	12	8	24	44	45
Severe Summer Storms: Thunderstorms	3	3	13	13	29	45
Severe Summer Storms: High Winds	2	12	15	14	41	42
Drought	2	15	9	16	40	41
Severe Winter Storms: Extreme Cold	2	12	11	13	36	38
Severe Summer Storms: Hail	2	6	15	15	36	38
Extreme Heat	2	9	9	17	35	37
Severe Summer Storms: Lightning	2	3	11	12	26	29
High Hazard Dams	1	15	5	27	47	26
Nuclear Accident	1	15	5	23	43	24
Earthquakes	1	3	15	11	29	18

Table 4-8. Hazard Risk Scores Legend

Probability Factor		Sum of Weighted Extent Factors		Sum of Weighted Vulnerability Factors		Sum of Weighted Impact Factors		Consequence Score		Total Risk Score	
1	Low (L)	0–6	Low (L)	0–6	Low (L)	0–12	Low (L)	0–25	Low (L)	0–24	Low (L)
2	Medium (M)	7–12	Medium (M)	7–12	Medium (M)	13–26	Medium (M)	26–50	Medium (M)	25–59	Medium (M)
3	High (H)	13–18	High (H)	13–18	High (H)	27–39	High (H)	51–75	High (H)	60–100	High (H)
* The Legend – specifically the assignment of low, medium, and high—provides an additional means to <u>qualitatively</u> assess the probability factor, sum of weighted factors, and the total risk scores for each hazard.											

Probability Factor	Sum of Weighted Extent Factors	Sum of Weighted Vulnerability Factors	Sum of Weighted Impact Factors	Consequence Score	Total Risk Score
<i>The Consequence Score represents the sum of the Extent, Vulnerability, and Impact Factors.</i> <i>The Total Risk Score is a measure of Probability and Consequence.</i>					

Note: If you are accessing the Microsoft Word version of this Plan, double click on the icon below to access the full assessment. The first tab includes the assessment, and the second tab includes the final scores.



MaconCounty.NHM
P.HazardRankings.xl

4.5 Tornadoes

4.5.1 Hazard Description

A violently rotating column of air touching the ground, usually attached to the base of a thunderstorm. Some tornadoes are clearly visible, while rain or nearby low-hanging clouds obscure others. Tornadoes develop extremely rapidly and may dissipate just as quickly. Most tornadoes are on the ground for less than 15 minutes and have wind speeds of 112 mph or less. The most violent tornadoes are capable of tremendous destruction with wind speeds that may reach 300 miles per hour with damage paths more than one mile wide and 50 miles long (National Oceanic and Atmospheric Administration, 2023).

4.5.2 Hazard Location

A tornado could occur anywhere in Macon County.

4.5.3 Hazard Extent/Intensity

The Enhanced Fujita Scale, also known as the “EF-Scale,” measures tornado strength and associated damages. This Enhanced Fujita Scale is illustrated in Table 4-9. The EF-Scale is an update to the earlier Fujita scale that was published in 1971. It classifies United States tornadoes into six intensity categories based upon the estimated maximum winds occurring within the wind vortex. The EF-Scale has become the definitive metric for estimating wind speeds within tornadoes based upon the damage done to buildings and structures since it was implemented through the National Weather Service in 2007.

Table 4-9. Enhanced Fujita Scale and Associated Damage

EF-Scale Number	Wind Speed (MPH)	Type of Damage Possible
EFO	65-85	Minor damage: Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e., those that remain in open fields) are always rated EFO.
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	Extreme damage: Sturdy frame houses leveled off foundations and swept away; automobile-sized missiles fly more than 100 m (300 ft.); steel reinforced concrete structure badly damaged; high-rise buildings have significant structural deformation.

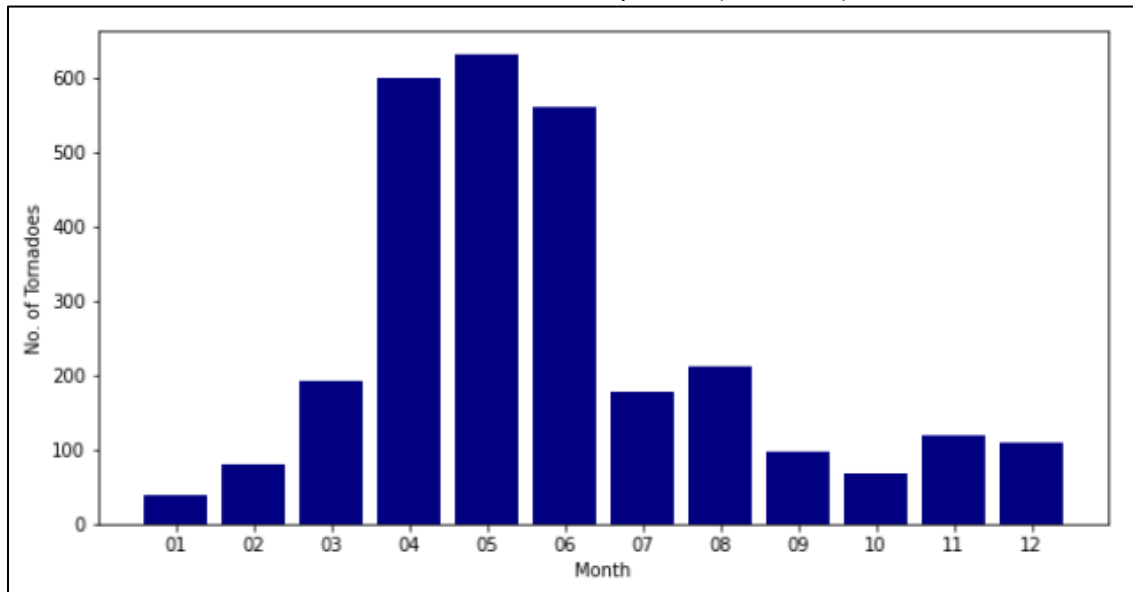
4.5.4 Probability and Frequency

Tornadoes can occur at any time in Illinois, however, 66% of historical events between 1950-2017 occurred in April, May, and June as seen in Exhibit 4-1. In the 2018 Illinois Natural Hazard Mitigation Plan (IEMA, 2018), Macon County had 61 of the 2,687 tornadoes recorded in Illinois between 1950 and 2017. This ranks Macon County 12th in the State for the highest normalized number of tornadoes per 100 square miles.

Given that Macon County has an area of approximately 580 square miles, the odds of a tornado hitting any particular square mile in the county in a given year would be approximately 0.7 divided by 580, or roughly a 0.0012% chance. This is a rough estimate based on historical data and does not necessarily reflect the likelihood of a tornado hitting any particular square mile in a given year.

Between 1950 and 2021, Macon County experienced 69 tornadic events which averages to 0.97 tornadic events per year during that time. The most severe intense tornado was an EF4. Given the geographic location and probabilistic models, this would suggest that an EF5 would be possible in Macon County.

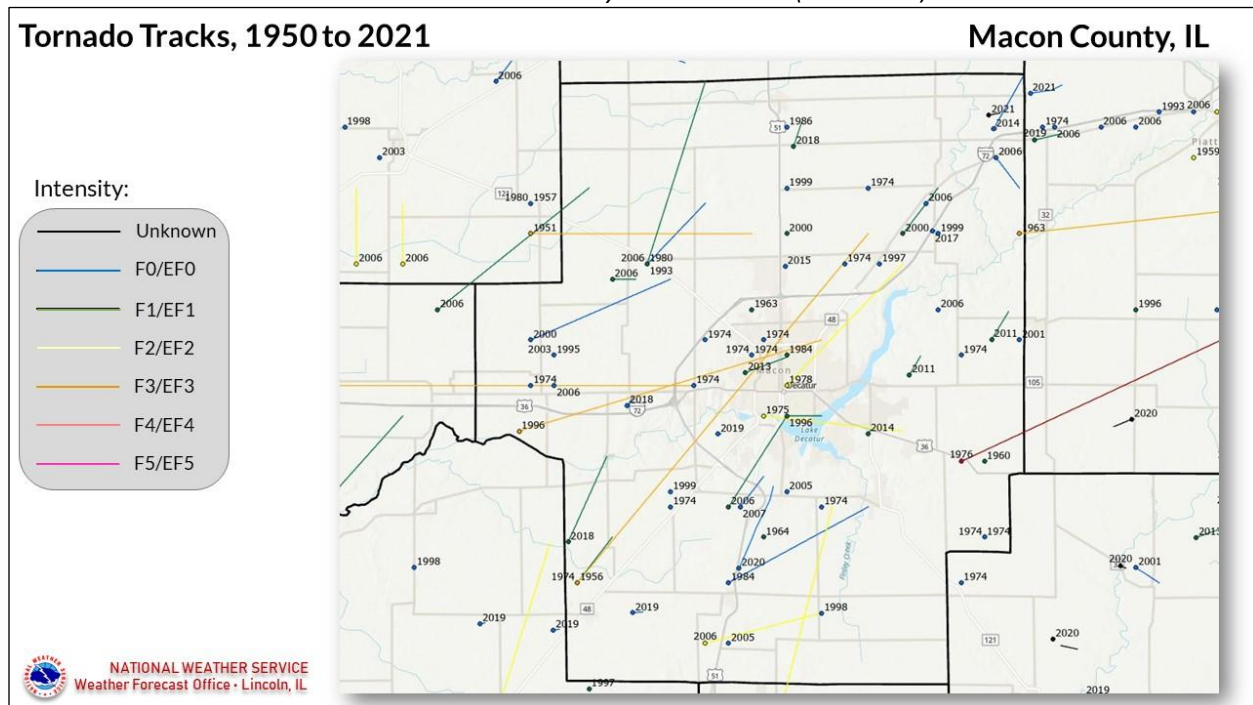
Exhibit 4-1. Illinois Tornadoes by Month (1950-2021)



Source: 2023 IL Natural Hazard Mitigation Plan

The tracks of 69 tornadoes from 1950 to 2021 can be seen in Exhibit 4-2.

Exhibit 4-2. Macon County Tornado Tracks (1950-2021)



4.5.5 Significant Past Incidents

“About 1,200 tornadoes hit the U.S. yearly. Since official tornado records only date back to 1950, we do not know the actual average number of tornadoes that occur each year. Plus, tornado spotting and reporting methods have changed a lot over the last several decades” (NOAA

National Severe Storms Laboratory, 2023). Tornadoes come in all shapes and sizes and can occur anywhere in the U.S. at any time of the year. In the southern states, peak tornado season is March through May, while peak months in the northern states are during the summer months.

Table 4-10 shows the recorded tornado events for Macon County from 2001 to 2021, as recorded by NOAA's National Climate Data Center (National Oceanic and Atmospheric Administration, 2023). Between 2001 to 2021, Macon County recorded one EF2 event and 10 EF1 events. During this time there were no events EF3 or greater. There were also no deaths attributed to the tornadoes shown in Table 4-10, however there were four injuries.

2006 (EF2): This tornado completely destroyed a large barn, causing debris to be blown more than a mile to the northeast. It also damaged trees and did minor damage to a roof. A map illustrating the path of this tornado can be seen in Exhibit 4-3 below (National Oceanic and Atmospheric Administration, 2023).

Exhibit 4-3. Macon County Tornado (EF2) 04/02/2006

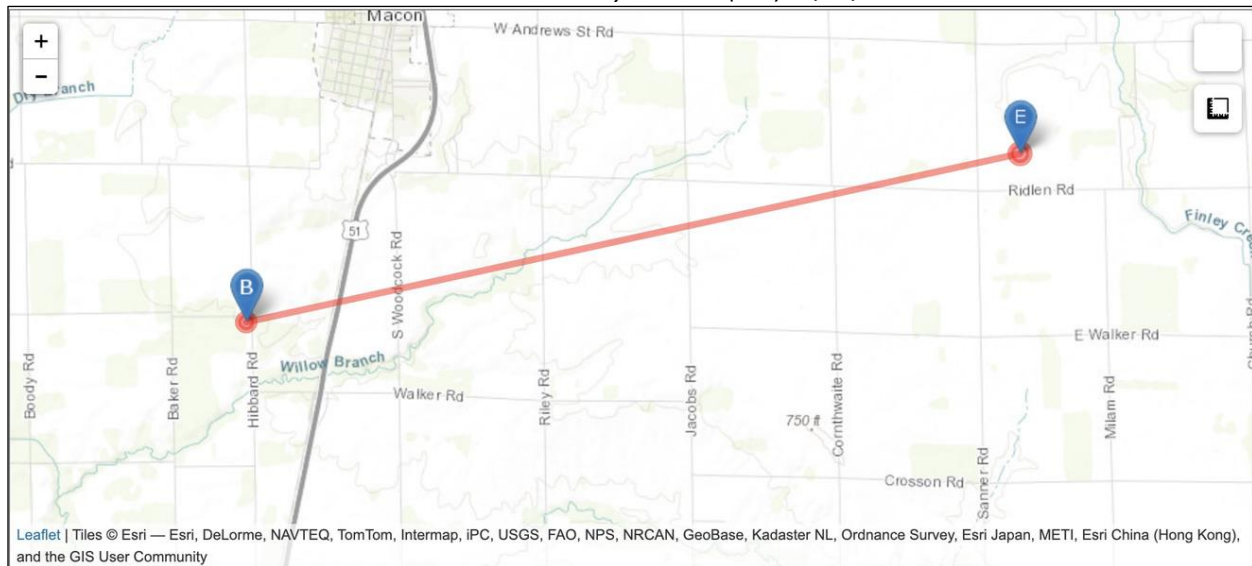


Table 4-10. Tornadoic Activity in Macon County, Illinois (2001-2021)

Location	County	State	Date	Time	T.Z.	Mag	Dth	Inj	PrD	CrD
Totals:							0	4	1.370M	250.00K
NIANTIC	MACON CO.	IL	06/11/2003	17:30	CST	EF0	0	0	0.00K	0.00K
MACON	MACON CO.	IL	04/22/2005	14:06	CST	EF0	0	0	0.00K	0.00K
ELWIN	MACON CO.	IL	04/22/2005	14:14	CST	EF0	0	0	0.00K	0.00K
MAROA	MACON CO.	IL	03/12/2006	21:14	CST	EF1	0	0	0.00K	0.00K
MAROA	MACON CO.	IL	03/12/2006	21:16	CST	EF1	0	0	0.00K	0.00K
MACON	MACON CO.	IL	04/02/2006	17:30	CST	EF2	0	0	0.00K	0.00K
NIANTIC	MACON CO.	IL	04/02/2006	17:30	CST	EF0	0	0	0.00K	0.00K

ELWIN	MACON CO.	IL	04/02/2006	17:36	CST	EF1	0	3	0.00K	0.00K
WARRENSBURG	MACON CO.	IL	04/16/2006	13:35	CST	EF1	0	0	0.00K	0.00K
ARGENTA	MACON CO.	IL	07/12/2006	13:32	CST	EF0	0	0	0.00K	0.00K
OREANA	MACON CO.	IL	07/26/2006	18:00	CST	EF0	0	0	0.00K	0.00K
ELWIN	MACON CO.	IL	03/01/2007	12:47	CST-6	EF0	0	1	0.00K	0.00K
SANGAMON	MACON CO.	IL	05/25/2011	06:35	CST-6	EF1	0	0	37.00K	0.00K
OAKLEY	MACON CO.	IL	05/25/2011	06:39	CST-6	EF1	0	0	165.00K	0.00K
DECATUR	MACON CO.	IL	05/31/2013	21:03	CST-6	EF1	0	0	100.00K	0.00K
WALKER	MACON CO.	IL	10/13/2014	14:56	CST-6	EF1	0	0	500.00K	0.00K
(DEC)DECATUR ARPT	MACON CO.	IL	10/13/2014	15:12	CST-6	EF1	0	0	25.00K	250.00K
NEWBURG	MACON CO.	IL	10/13/2014	15:29	CST-6	EF0	0	0	10.00K	0.00K
FORSYTH	MACON CO.	IL	07/11/2015	20:25	CST-6	EF0	0	0	0.00K	0.00K
ARGENTA	MACON CO.	IL	05/10/2017	18:49	CST-6	EF0	0	0	15.00K	0.00K
BLACKLAND	MACON CO.	IL	12/01/2018	17:53	CST-6	EF1	0	0	8.00K	0.00K
HARRISTOWN	MACON CO.	IL	12/01/2018	18:03	CST-6	EF0	0	0	325.00K	0.00K
MAROA	MACON CO.	IL	12/01/2018	18:31	CST-6	EF1	0	0	25.00K	0.00K
BLUE MOUND	MACON CO.	IL	05/29/2019	15:50	CST-6	EF0	0	0	150.00K	0.00K
KNIGHTS	MACON CO.	IL	08/21/2019	18:59	CST-6	EF0	0	0	0.00K	0.00K
MACON	MACON CO.	IL	05/17/2020	15:06	CST-6	EF0	0	0	0.00K	0.00K
NEWBURG	MACON CO.	IL	06/25/2021	17:01	CST-6	EFU	0	0	10.00K	0.00K
Totals:							0	4	1.370M	250.00K

4.5.6 Vulnerability and Impacts

Life Safety: People can inadvertently put their lives in danger during a tornado or have little or no warning. Some of the ways tornadoes can impact life safety include the following:

- **Injuries and Fatalities:** Tornadoes can cause injuries and fatalities due to flying debris, collapsing buildings, and the sheer force of the winds. These injuries and casualties can occur to people caught in the tornado's path or those in poorly constructed or unprotected buildings.
- **Structural Damage:** Tornadoes can destroy or severely damage buildings, making them unsafe for occupants. People may become trapped in collapsed structures, leading to life-threatening situations.

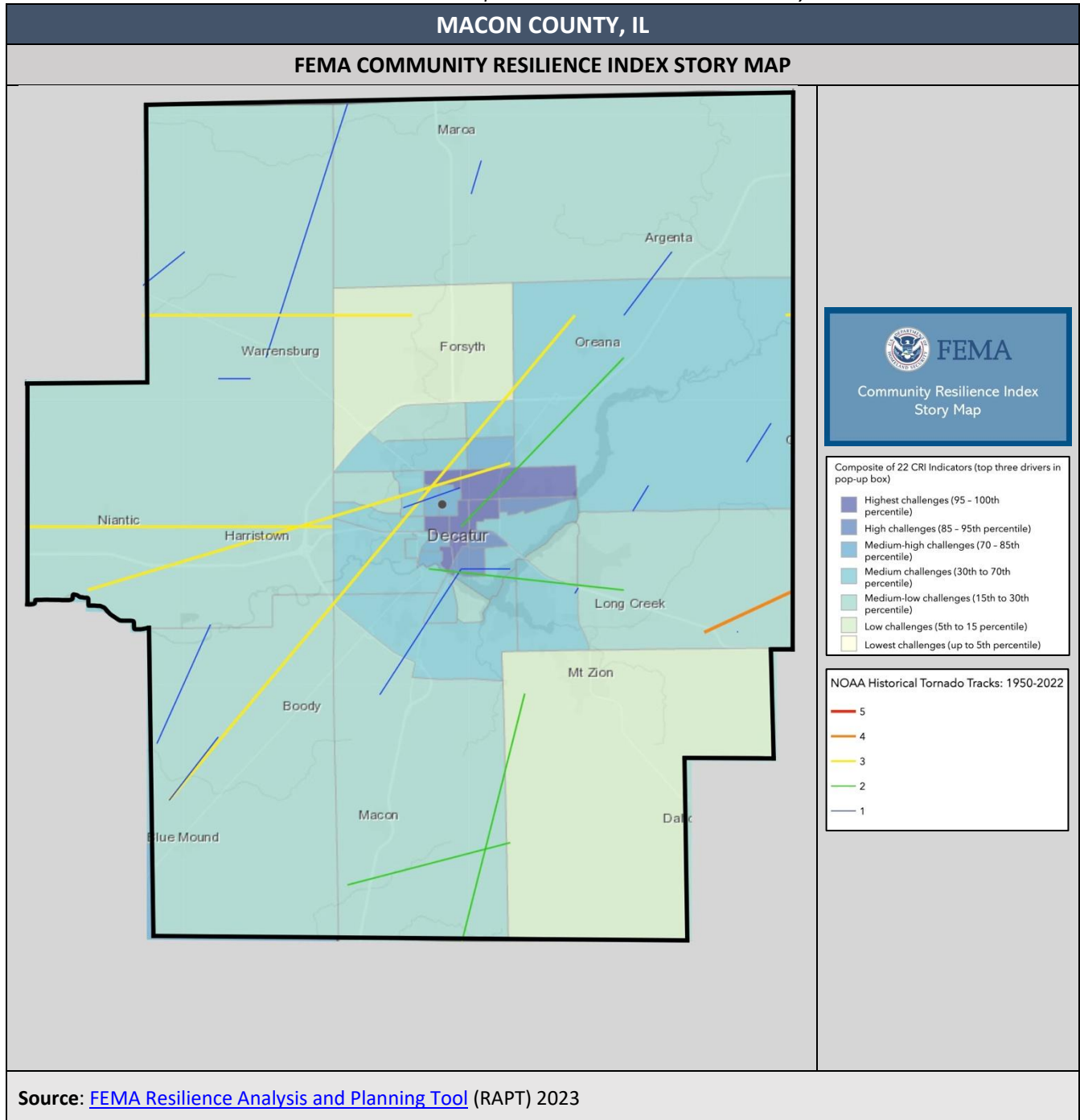
- Power Outages: Tornadoes can disrupt power lines and electrical infrastructure, causing widespread power outages. This can impact medical facilities, emergency services, and the ability to communicate during and after the tornado.
- Communication Disruptions: Tornadoes can damage communication infrastructure, including cell towers and landline networks. This can hinder emergency responders' ability to coordinate and provide assistance.
- Transportation Disruptions: Tornadoes can block roads with debris, making it challenging for emergency responders to reach affected areas quickly. Limited transportation options can also hinder the evacuation of residents in the tornado's path.
- Displacement and Homelessness: Tornadoes can render homes uninhabitable, leading to the displacement of residents. Finding temporary shelter for those affected becomes a critical concern for local authorities.
- Health Risks: After a tornado, there may be health risks related to exposure to the elements, contaminated water, and other hazards. Injuries sustained during the tornado may also lead to secondary health issues without prompt medical attention.
- Psychological Impact: Tornadoes can have a lasting psychological impact on survivors, causing stress, anxiety, and trauma. Mental health support becomes essential for affected individuals and communities.

According to FEMA, tornadoes can also disproportionately impact disadvantaged or challenged communities in the following ways:

- Lack of Preparedness: Low-income communities may lack the resources and infrastructure necessary for effective disaster preparedness and response. This can include limited access to early warning systems, emergency shelters, or communication tools.
- Inadequate Shelter: Many disadvantaged communities may have substandard housing or lack access to safe and sturdy buildings. This can lead to a higher risk of injury or death during tornadoes, as inadequate shelter may not provide adequate protection from the storm's fury.
- Limited Mobility: Some residents of disadvantaged communities may have limited mobility due to disabilities, lack of transportation, or other factors. This can make it more challenging for them to seek shelter or evacuate quickly when tornado warnings are issued.
- Health Vulnerabilities: Individuals with pre-existing health conditions or those who rely on medical equipment that requires electricity may face greater risks during tornadoes, especially if power outages occur.
- Language and Cultural Barriers: Communities with a significant non-English-speaking population or cultural differences may face challenges in receiving and understanding emergency alerts and instructions, which can hinder their ability to respond effectively.
- Economic Impact: Tornadoes can devastate local economies, and disadvantaged communities may have fewer resources to recover and rebuild. This can result in prolonged hardships and displacement for residents.

The FEMA Community Resilience Challenges Index (CRCI) provides a relative assessment of a community's potential resilience and gives insights into population and community characteristics from which to build emergency operations plans and targeted outreach strategies. Exhibit 4-4 illustrates the impact of EF1 to EF5 tornadoes to CCRI tracts in Macon County.

Exhibit 4-4. Tornado Impacts to CRCI Tracts in Macon County



Property Damage and Critical Facilities: According to FEMA, tornadoes can impact property damage and critical infrastructure in different ways. Some of the most common impacts are as follows:

- **Structural Damage:** Tornadoes have the potential to cause extensive structural damage to residential, commercial, and industrial buildings. High winds and flying debris can lead to roofs being torn off, walls collapsing, and the destruction of entire structures. This can result in severe property damage and financial losses.
- **Debris Accumulation:** Tornadoes often leave behind a trail of debris, including trees, vehicles, and building materials. This debris can obstruct roads, making it difficult for emergency responders to access affected areas and delaying recovery efforts.
- **Infrastructure Damage:** Tornadoes can damage critical infrastructure, such as power lines, water and sewage systems, transportation networks (roads, bridges, and airports), and communication systems (cell towers, telephone lines). Disruptions to these systems can have cascading effects, hindering emergency response and recovery.
- **Power Outages:** Tornadoes frequently cause power outages by knocking down electrical lines and damaging substations. Extended power outages can affect not only residents but also essential services like hospitals, emergency response centers, and water treatment plants.
- **Water Supply Issues:** Tornadoes may damage water treatment facilities and distribution systems, leading to water supply disruptions or contamination concerns. This can impact public health and further complicate disaster response efforts.
- **Transportation Disruptions:** Tornadoes can block or damage roads, bridges, and railways, making transportation challenging. This can impede the movement of emergency vehicles, supplies, and personnel.
- **Environmental Impact:** Tornadoes can cause environmental damage by releasing hazardous materials, damaging ecosystems, and contaminating soil and water sources. Cleanup and mitigation of these environmental hazards can be costly and time-consuming.

Although tornadoes strike at random, making all buildings vulnerable, three types of structures are more likely to suffer damage:

- Manufactured homes,
- Homes on crawlspaces (more susceptible to lift), and
- Buildings with large spans include airplane hangars, gymnasiums, and factories.

Residents living in manufactured homes are more vulnerable than people in permanent homes. According to the community profile, Macon County has approximately 1,049 manufactured homes which could be impacted by a tornadic event (US Census Bureau, 2023).

Exhibit 4-5 illustrates tornadic impact to manufactured home areas in Macon County.

In areas subject to extreme wind events, those responsible for public safety—including building owners, schools, hospitals, and neighborhood associations—should consider building accessible community safe rooms. In addition, people who live or work in structures with inadequate protection, such as manufactured homes or buildings with long-span roofs, also should discuss the option of building a community safe room or shelter (FEMA, 2021).

Because a tornado can hit anywhere in the county, all structures are susceptible to being hit. Schools are a particular concern, though, for two reasons:

- Many people are present, either during school or as a storm shelter.
- They have large span areas, such as gyms and theaters.

Exhibit 4-6 illustrates tornadic impact to critical infrastructure in Macon County. Exhibit 4-7 illustrates tornadic impacts to schools and universities (key resources) in Macon County.

Exhibit 4-5. Tornadic Impacts to Manufactured Homes in Macon County

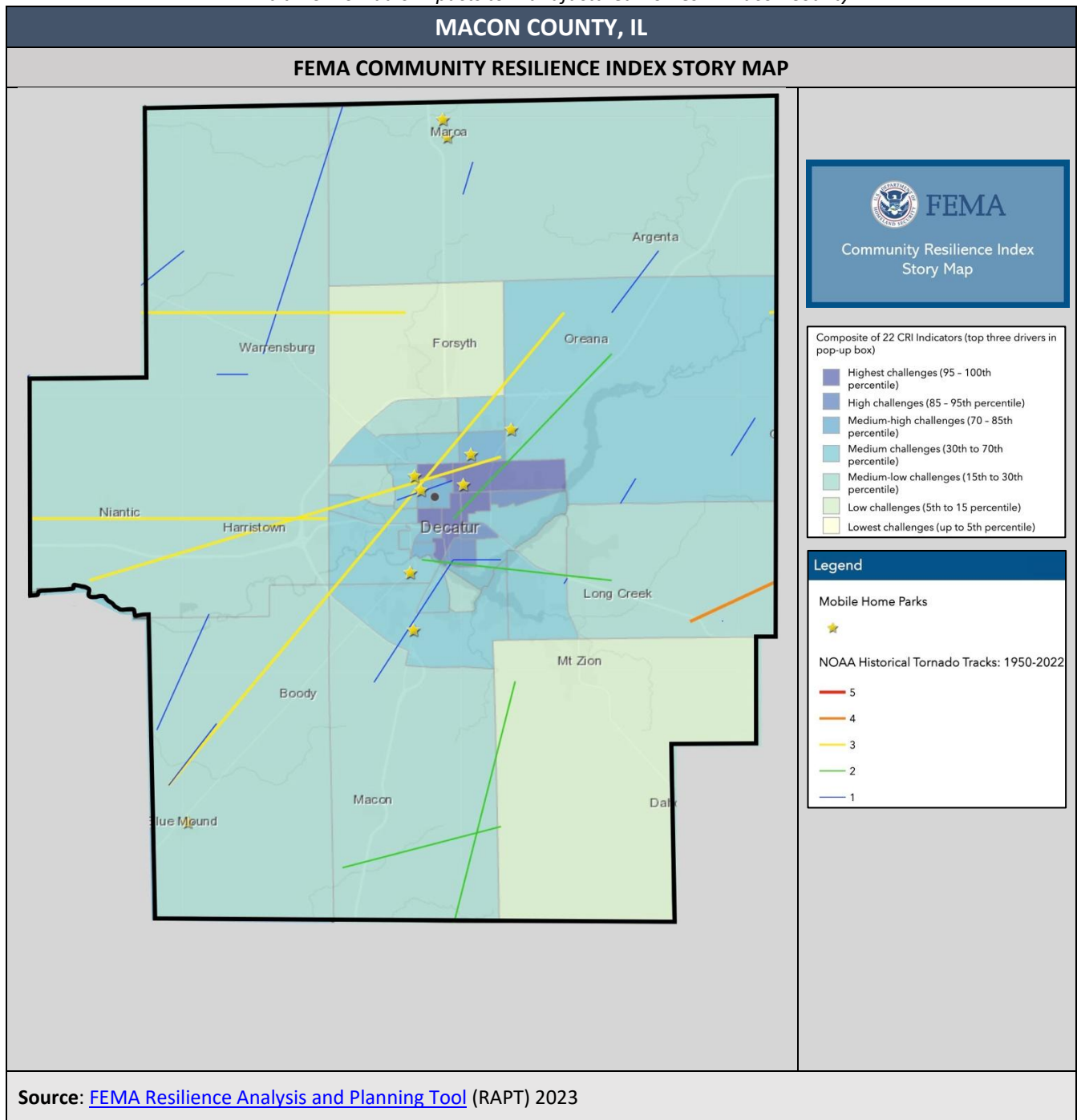


Exhibit 4-6. Tornadoic Impacts to Critical Infrastructure in Macon County

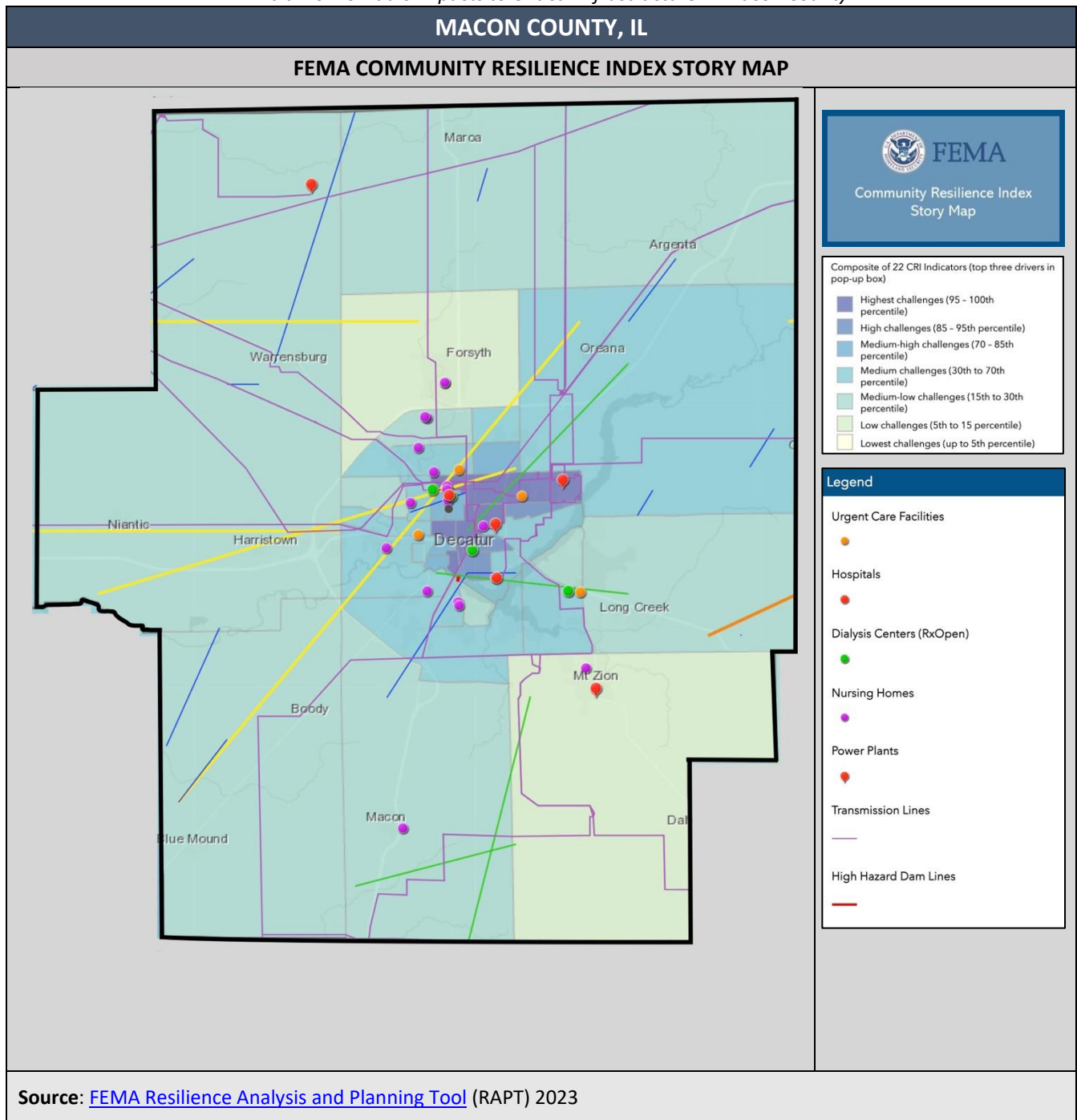
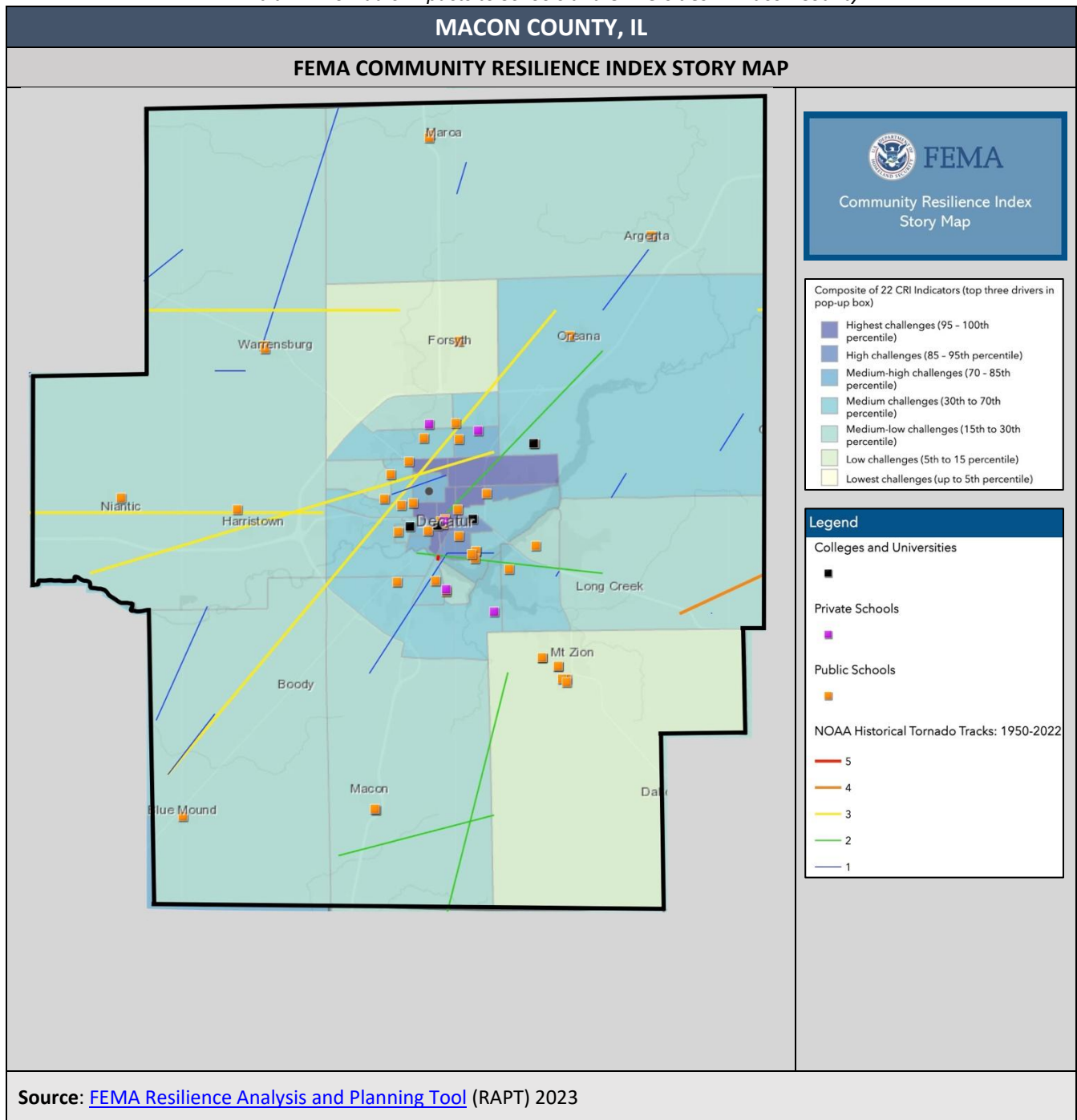


Exhibit 4-7. Tornadoic Impacts to Schools and Universities in Macon County



Economy: No data exists demonstrating the economic impact of past tornadoes on Macon County. However, significant historic events in Illinois and the U.S. have shown to impact stores and small business, including undue loss of revenue.

Changes in Development and Impact of Future Development: No data exists demonstrating the impact of tornadoes on future development in Macon County. However, tornadoes in Illinois and the U.S. have shown to influence changes in building codes and zoning laws to ensure that structures are built to withstand high winds and other severe weather events. It should be noted, however, that the state does not have a uniform standard building code and is thus unable to regulate building construction in the state. This is something that must happen at the local level, as noted in Chapter 5 of this plan.

Additionally, tornados can lead to changes in emergency management plans to better prepare for future disasters. For example, storm shelters and warning systems may be installed to provide better protection for residents during severe weather.

Effects of Climate Change on Severity of Impacts: The impact of climate change on severe weather in the Midwest – severe thunderstorms, hail, and tornadoes – is less well known than for hazards such as heatwaves. Researchers have begun to address the complexity and uncertainty around climate change impacts to severe weather in Illinois. Overall, the frequency of storm environments conducive to producing severe weather, such as strong winds or tornadoes, have increased in frequency across much of the Midwest and mid-south over the past 40-50 years (IEMA, 2023).

In a 2021 thesis study, pseudo-global warming (PGW) methodology was used to analyze two historical tornadic events within environments influenced by anthropogenic climate change (ACC). In the findings of this study, weather research and forecasting modeling (WRF) suggested that more convective and intense storms would occur under ACC. In addition, accumulated precipitation also generally increased, and more areas received measurable rainfall, where instances of extreme rainfall – more than 100 mm – increased by more than 50% on average (Woods, 2021).

Climate Change Impact on Tornadic Events in Macon County:

Exhibit 4-8. 25-Year Climate Projections for Macon County

25-YEAR CLIMATE PROJECTIONS FOR MACON COUNTY, IL	
HIGHER EMISSIONS (RCP8.5)	
Macon County is expected to experience a 99% increase in extremely hot days within 25 years.	
By 2048, Macon County is expected to experience 18 more days that reach above 95°F (from 18 days to 37 days per year).	
LOWER EMISSIONS (RCP4.5)	
Macon County is expected to experience a 74% increase in extremely hot days within 25 years.	
By 2048, Macon County is expected to experience 12 more days that reach above 95°F (from 16 days to 28 days per year).	
Source: Neighborhoods at Risk (Macon County) (2023)	

Jurisdiction-specific Hazard Impact/Vulnerability: Only those jurisdictions uniquely affected by tornado are included. If a jurisdiction was not included, it denotes the hazard impact or vulnerability to tornado is not significant and/or is adequately addressed at the county level. Jurisdictions completed the following form as part of the Plan update:

<https://integratedsolutions.wufoo.com/forms/macon-county-hazards/>

Table 4-11. Macon County Jurisdiction-specific Hazard Impact/Vulnerability

Jurisdiction	Affected Jurisdictions' Hazard Impact/Vulnerability Considerations
Forsyth	Shadow Ridge and Greyhawn may have siren gaps.
Long Creek	There are gaps in warning siren coverage. Additional upkeep and maintenance may be needed.
Macon	Gap in siren coverage exists for the Hogan Hills subdivision. The trailer/mobile home park at 400 W. Dunn & 400 W. Cole is uniquely vulnerable.
Niantic	The Niantic community is uniquely vulnerable due to not having an adequate shelter/safe room for the community during a tornado.
Warrensburg	There is a gap in warning siren coverage on the east side of town (east of Rt 121).
Blue Mound Township	There are modular homes throughout the township. Some of these homes are in open areas, such as west of Boody.

4.5.7 FEMA NRI Expected Annual Loss Estimates

Table 4-12. Macon County Expected Annual Loss Table

MACON COUNTY, IL EXPECTED ANNUAL LOSS TABLE FOR TORNADIC EVENTS							
Annualized Frequency	Population	Population Equivalence	Building Value	Agriculture Value	Total Value	Expected Annual Loss Score	Risk Index Rating
0.7	0.15	\$1,163,771	\$2,352,658	\$3,811	\$3,520,240	29.26	Relatively High
Annualized Frequency: The natural hazard annualized frequency is defined as the expected frequency or probability of a hazard occurrence per year. Annualized frequency is derived either from the number of recorded hazard occurrences each year over a given period or the modeled probability of a hazard occurrence each year. Population: Population exposure is defined as the estimated number of people determined to be exposed to a hazard according to a hazard type-specific methodology. Expected Annual Loss Scores are calculated using an equation that combines values for exposure, annualized frequency, and historic loss ratios (Expected Annual Loss = Exposure × Annualized Frequency × Historic Loss Ratio). Source: hazards.fema.gov/nri/expected-annual-loss							
Source: FEMA National Risk Index (2023)							

4.5.8 FEMA Hazard-Specific Risk Index Table

Table 4-13. Macon County Hazard Specific Risk Index Table

MACON COUNTY, IL FEMA HAZARD SPECIFIC RISK INDEX - TORNADO	
Risk Index Score	Risk Index Rating
29.11 / 100	Relatively High
<i>FEMA Hazard-Type Risk Index Scores are calculated using data for only a single hazard type and reflect a community's relative risk for only that hazard type.</i>	
<i>FEMA Hazard-Type Risk Index Ratings are a qualitative rating that describe the community in comparison to all other communities at the same level, ranging from “Very Low” to “Very High.”</i>	
Source: FEMA National Risk Index (2023)	

4.6 Extreme Heat

4.6.1 Hazard Description

According to the NOAA, extreme heat is defined as a period of excessively hot and humid weather that can cause heat-related illnesses and even death. NOAA defines extreme heat as a period of two or more days of high heat and humidity with temperatures above 90°F (32°C) or heat index values above 105°F (40.6°C). The heat index is a measure of how hot it feels to the human body when air temperature and humidity are combined. Extreme heat can occur in different regions and climates and can have serious impacts on human health, particularly for vulnerable populations such as the elderly, children, and those with pre-existing health conditions (NOAA, 2023).

4.6.2 Hazard Location

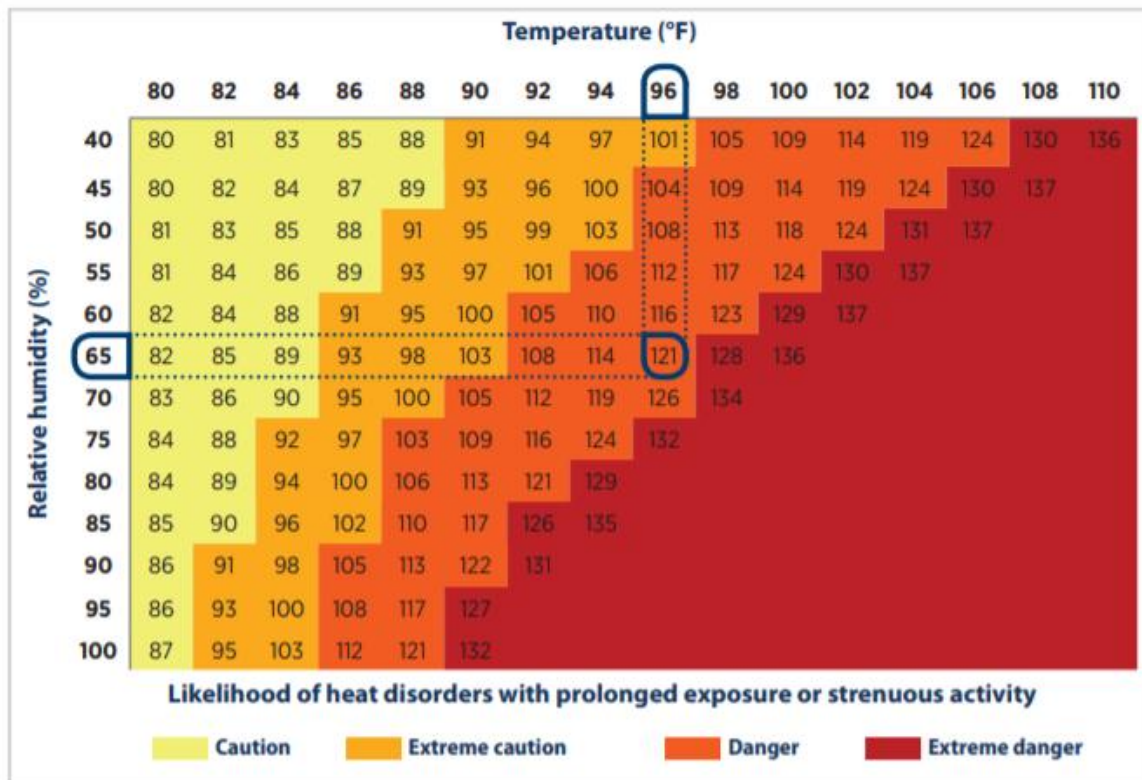
Extreme heat events can occur anywhere in Macon County.

4.6.3 Hazard Extent/Intensity

When an extreme heat event occurs, the National Weather Service (NWS) may issue an excessive heat warning, an excessive heat watch, a heat advisory, or a heat outlook. The NWS defines these as the following:

- “Excessive Heat Warning – Take Action. An Excessive Heat Warning is issued within 12 hours of the onset of extremely dangerous heat conditions. The general rule of thumb for this Warning is when the maximum heat index temperature is expected to be 105° or higher for at least two days and nighttime air temperatures will not drop below 75°; however, these criteria vary across the country, especially for areas not used to extreme heat conditions. If you don't take precautions immediately when conditions are extreme, you may become seriously ill or die (NOAA, 2023).
- Excessive Heat Watches—Be Prepared. Heat watches are issued when conditions are favorable for an excessive heat event in the next 24 to 72 hours. A Watch is used when the risk of a heat wave has increased but its occurrence and timing is still uncertain (NOAA, 2023).
- Heat Advisory – Take Action. A Heat Advisory is issued within 12 hours of the onset of extremely dangerous heat conditions. The general rule of thumb for this Advisory is when the maximum heat index temperature is expected to be 100° or higher for at least two days, and nighttime air temperatures will not drop below 75°; however, these criteria vary across the country, especially for areas that are not used to dangerous heat conditions. Take precautions to avoid heat illness. If you don't take precautions, you may become seriously ill or even die (NOAA, 2023).
- Excessive Heat Outlooks are issued when the potential exists for an excessive heat event in the next 3-7 days. An Outlook provides information to those who need considerable lead-time to prepare for the event (NOAA, 2023).

Exhibit 4-9. National Oceanic and Atmospheric Administration National Weather Service Heat Index



4.6.4 Probability and Frequency

“The number of Americans currently exposed to extreme heat, (defined as having a maximum heat index of greater than 125°F) is 8 million. However, due to the anticipated warming during the next three decades, that number is expected to increase to 107 million people over 30 years. The developing "Extreme Heat Belt" forms a region of vulnerability from northern Texas to Illinois, and includes the cities of St. Louis, Kansas City, Memphis, Tulsa, and Chicago (Wilson B, 2022)”.

On average, the U.S. has been experiencing warming summers throughout the past decade. This warming is correlated to recent changes in climate. Without big steps to reduce greenhouse gas emissions, the average number of extremely hot days in the United States is projected to more than triple from the year 2050 to 2100 (CDC, 2023).

Exhibit 4-10 demonstrates national heat wave characteristics over time while Exhibit 4-11 explains why the occurrence of extreme heat events are becoming more frequent around the world (CDC, 2023).

Exhibit 4-10. Heat Wave Characteristics in the United States by Decade, 1961–2021

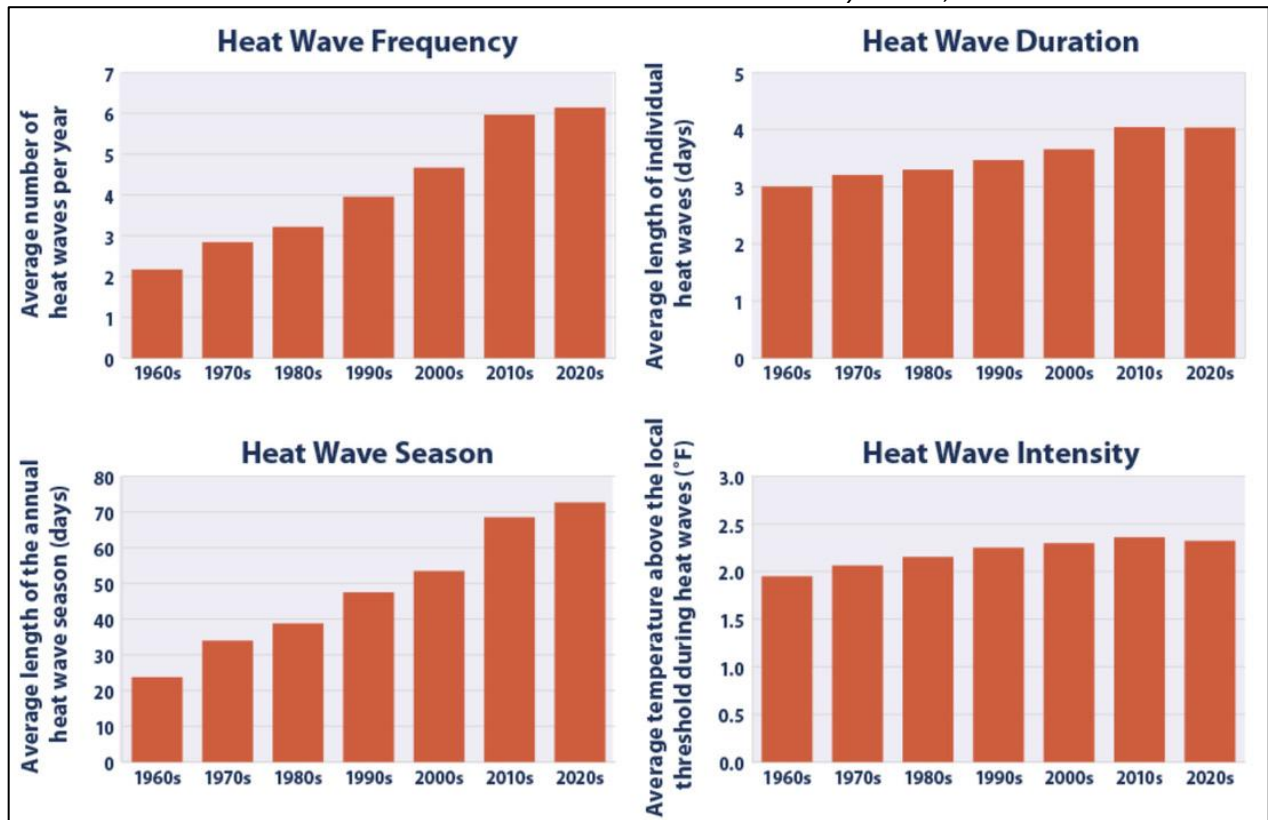
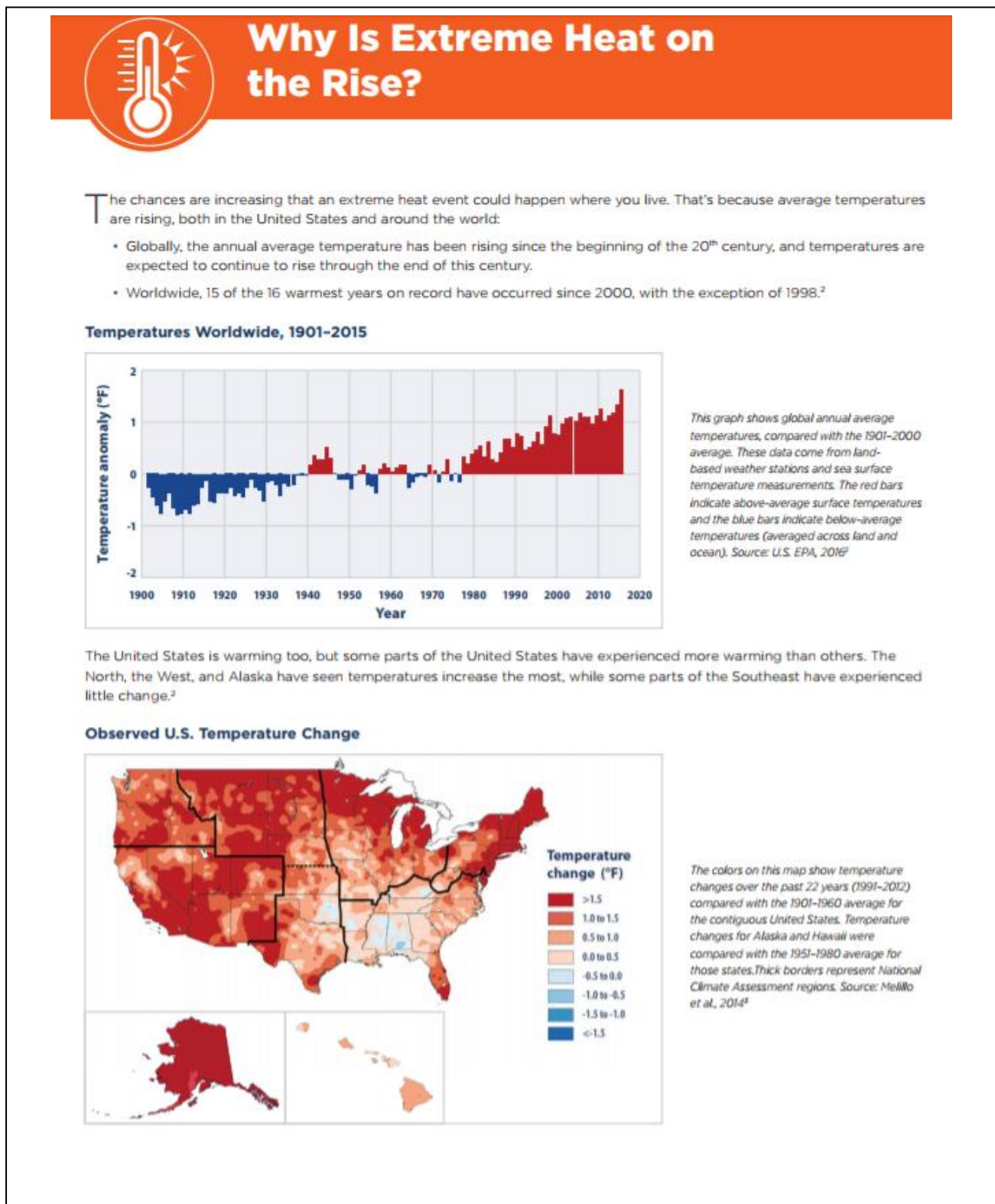


Exhibit 4-11. EPA and CDC - Climate Change and Extreme Heat



4.6.5 Past Events

Illinois experienced an intense heat wave during the first week of July 2012. High temperatures at Chicago O'Hare Airport reached 102°F on the 4th, 103°F on the 5th and 6th and 98° on the 7th. July 6th tied with July 13th, 1995, as the second warmest average daily temperature for a single day. July 6, 2012, had a high of 103° and a low of 82° for an average of 92.5° (NOAA, 2023).

Table 4-14 shows the recorded extreme heat events for Macon County from 1950 to 2022, as recorded by NOAA's National Climate Data Center. From 1950 to 2022, Macon County has had recorded four events with no associated injuries or deaths.

Table 4-14. Extreme Heat Activity in Macon County, Illinois (1950-2022)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
MACON (ZONE)	MACON (ZONE)	IL	08/03/2010	12:00	CST-6	Excessive Heat		0	0	0.00K	0.00K
MACON (ZONE)	MACON (ZONE)	IL	08/09/2010	14:00	CST-6	Excessive Heat		0	0	0.00K	0.00K
MACON (ZONE)	MACON (ZONE)	IL	06/29/2012	13:45	CST-6	Excessive Heat		0	0	0.00K	0.00K
MACON (ZONE)	MACON (ZONE)	IL	07/01/2012	00:00	CST-6	Excessive Heat		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

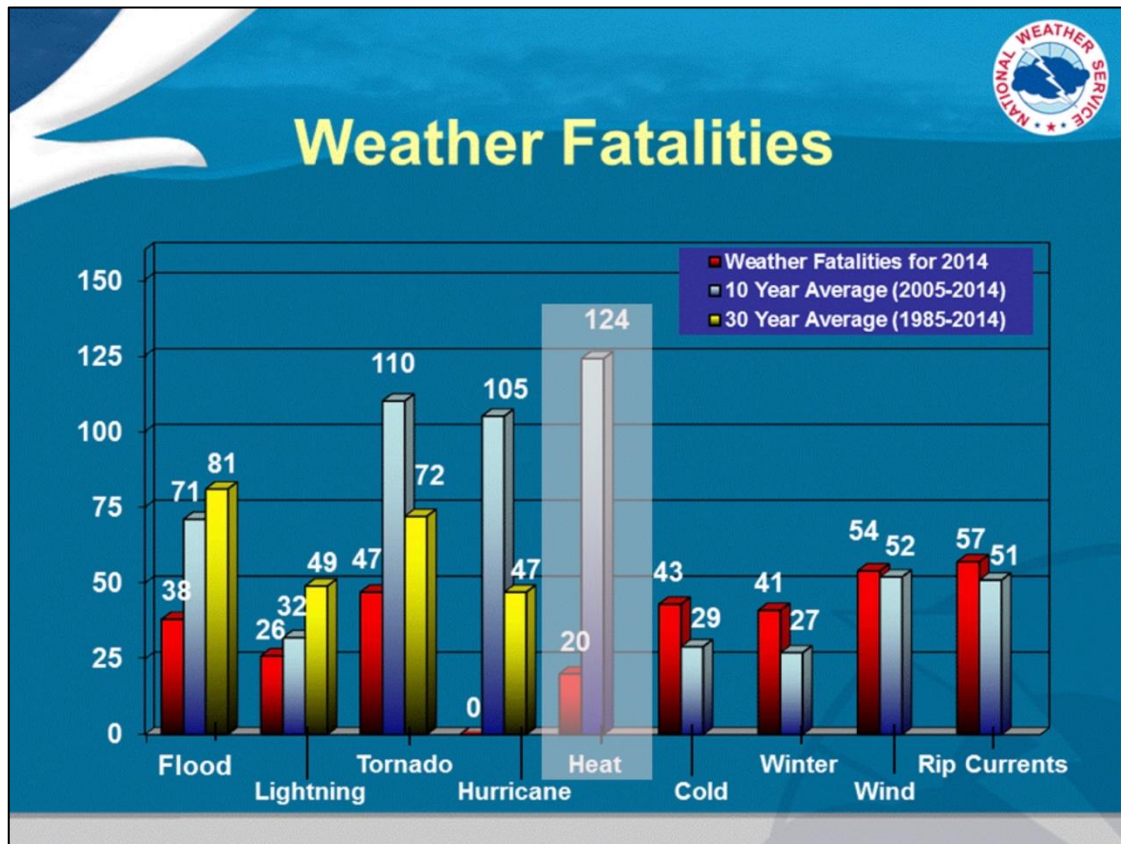
4.6.6 Vulnerability and Impacts

Life Safety and Public Health: According to the Centers for Disease Control and Prevention (CDC), extreme heat is a serious threat to life safety and health. The CDC provides extensive information on this topic and outlines some of the ways that extreme heat can affect health and safety. For instance, high temperatures can cause heat exhaustion, leading to heat stroke if left untreated. Symptoms of heat exhaustion include heavy sweating, weakness, dizziness, headache, nausea, and vomiting. Extreme heat can also cause dehydration, leading to kidney damage, seizures, and even coma. Furthermore, it can stress the heart and blood vessels, increasing the risk of heart attack and stroke, particularly in people with preexisting cardiovascular conditions. Heat can also worsen respiratory problems such as asthma and chronic obstructive pulmonary disease (COPD), increasing the risk of respiratory infections.

Additionally, extreme heat can exacerbate other health issues, including diabetes, mental health, and skin conditions. In some severe cases, heat can cause death, particularly in vulnerable populations such as the elderly, young children, and those with preexisting health conditions. To stay safe during extreme heat, the CDC recommends staying hydrated, avoiding outdoor activities during the hottest part of the day, wearing loose, lightweight clothing, and seeking out air-conditioned environments when possible.

As seen in Exhibit 4-12, The National Weather Service has identified excessive heat as the leading weather-related killer in the United States. This is especially true in urban centers (such as Decatur), where population density, the urban heat island, and building construction exacerbate the effects of excessive heat. A combination of high heat and humidity can lead to heat related illness, including heat cramps, heat exhaustion, and heat stroke (NOAA, 2023).

Exhibit 4-12. Weather Fatalities in the United States



The NWS has identified several public health impacts of extreme heat events including:

- Heat cramps, heat exhaustion, and heatstroke: Extreme heat can cause a range of heat-related illnesses, from mild heat cramps to severe heatstroke, which can be life-threatening.
- Respiratory problems: High heat and humidity can worsen air quality, leading to an increase in respiratory problems such as asthma and allergies.
- Cardiovascular problems: Extreme heat can put stress on the cardiovascular system, increasing the risk of heart attacks, strokes, and other cardiovascular problems.
- Renal problems: Extreme heat can cause dehydration, which can lead to kidney problems, including acute kidney injury.
- Mental health: Extreme heat events can also have psychological impacts, leading to stress, anxiety, and depression.
- Power outages: Extreme heat events can put a strain on the power grid, leading to power outages, which can impact the availability of air conditioning and other essential services.

As extreme heat events become more common, and more severe, the U.S. Environmental Protection Agency and the CDC estimate that deaths due to extreme heat events will increase.

According to FEMA, extreme heat can disproportionately impact disadvantaged or challenged communities in the following ways:

- Heat Vulnerability: Residents of disadvantaged communities may be more vulnerable to extreme heat due to factors such as age, pre-existing health conditions, or limited access to healthcare. They may also lack air conditioning or live in homes with poor ventilation, increasing their risk of heat-related illnesses.
- Heat Islands: Urban areas, where many disadvantaged communities are located, can experience higher temperatures due to the urban heat island effect. Asphalt, concrete, and limited green spaces absorb and retain heat, making these areas hotter than surrounding regions.
- Limited Access to Cooling Centers: Disadvantaged communities may have limited access to cooling centers or public facilities where individuals can seek relief from extreme heat. This can leave residents with few options to escape dangerously high temperatures.
- Financial Constraints: Low-income households may struggle to afford the increased energy costs associated with running air conditioning or cooling systems during heatwaves. This can lead to discomfort, health risks, and potential utility shutoffs.
- Limited Mobility: Some residents of disadvantaged communities may have limited mobility, making it difficult for them to leave their homes or access transportation to cooler areas during extreme heat events.
- Community Infrastructure: The quality of community infrastructure, including housing and public spaces, may be inadequate to cope with extreme heat. Insufficient green spaces, poor building design, and limited access to shade can exacerbate heat-related challenges.
- Social Isolation: Disadvantaged individuals may experience social isolation, reducing their support networks during extreme heat events. This isolation can impact their ability to seek help or assistance.
- Language and Cultural Barriers: Communities with non-English-speaking populations or cultural differences may face challenges in receiving and understanding heat advisories and instructions, hindering their ability to respond effectively.

Exhibit 3-5 in the Community Profile section illustrates the Macon County Community Resilience Index Story Map. This map shows each participating jurisdiction with density mapping used to identify community areas that are overburdened by the 22 challenges identified by the FEMA Community Resilience Challenges Index.

Property Damage and Critical Infrastructure: Heat has little or no impact on structures. The demand on electric utilities will be elevated, given higher use of cooling systems.

Economy: No data exists demonstrating the economic impacts of past extreme heat events on Macon County. However, historic events have demonstrated that extreme heat can have significant impacts on agricultural production.

Changes in Development and Impact of Future Development: Given that heat has little or no impact on structures, there is no anticipated impact of extreme heat to future development.

Effects of Climate Change on Severity of Impacts: In the United States, heat waves have become more frequent, more intense, and longer lasting over the past few decades, and this trend is expected to continue with ongoing climate change. According to the National Climate Assessment, the frequency of heat waves in the Midwest has increased since the 1960s, and the length of the heat waves has also increased (US Environmental Protection Agency, 2023).

While climate change contributes to the increasing frequency and intensity of extreme heat events, other factors such as land-use changes and urbanization can also play a role in local climate impacts (US Environmental Protection Agency, 2023).

Climate Change Related to Extreme Heat in Macon County:

Exhibit 4-13. 25-Year Climate Projections for Macon County

25-YEAR CLIMATE PROJECTIONS FOR MACON COUNTY, IL	
HIGHER EMISSIONS (RCP8.5)	
Macon County is expected to experience a 99% increase in extremely hot days within 25 years.	
By 2048, Macon County is expected to experience 18 more days that reach above 95°F (from 18 days to 37 days per year).	
LOWER EMISSIONS (RCP4.5)	
Macon County is expected to experience a 74% increase in extremely hot days within 25 years.	
By 2048, Macon County is expected to experience 12 more days that reach above 95°F (from 16 days to 28 days per year).	
Source: Neighborhoods at Risk (https://nar.headwaterseconomics.org/17115/explore/climate)	

Table 4-15. Future Climate Indicators for Macon County

FUTURE CLIMATE INDICATORS FOR MACON COUNTY, IL							
Indicator	Modeled History (1976-2005)	Early Century (2015-2044)		Mid Century (2035-2064)		Late Century (2070-2099)	
		Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions
	Min-Max	Min-Max	Min-Max	Min-Max	Min-Max	Min-Max	Min-Max
Temperature Thresholds							
Annual Days With Maximum Temperature >90	25 days	55 days	58 days	67 days	77 days	78 days	110 days
	25-35	36-88	41-80	42-110	51-107	45-120	72-141

Annual Days With Maximum Temperature >95	6 days	21 days	24 days	30 days	40 days	40 days	74 days
	5-8	8-55	10-49	11-85	17-79	15-96	30-119
Annual Days With Maximum Temperature >100	1 day	5 days	6 days	10 days	14 days	15 days	41 days
	0-1	1-27	1-20	1-53	2-51	2-53	7-93
Annual Days With Maximum Temperature >105	0 days	1 day	1 day	2 days	3 days	4 days	16 days
	0-0	0-10	0-4	0-27	0-16	0-38	1-67
Annual Temperature							
Annual Single Highest Temperature °F	99°F	102°F	103°F	104°F	105°F	106°F	111°F
	97-100°	98-114°	99-107°	99-124°	101-112°	101-125°	104-119°
Annual Highest Maximum Temperature Averaged Over a 5-Day Period	94°F	98°F	98°F	100°F	101°F	101°F	106°F
	93-95°	95-105°	95-102°	96-111°	97-107°	96-113°	100-114°
Cooling Degree Days (CDD)	1188 degree-days	1,607 degree-days	1,658 degree-days	1,821 degree-days	2,003 degree-days	2,036 degree-days	2,767 degree-days
	1132-1270	1,341-2,061	1,411-1,980	1,460-2,608	1,643-2,577	1,541-2,914	2,015-3,696
Source: Climate Mapping for Resilience and Adaptation (2023)							

Jurisdiction-specific Hazard Impact/Vulnerability: *Only those jurisdictions uniquely affected by extreme heat are included. If a jurisdiction was not included, it denotes the hazard impact or vulnerability to extreme heat is not significant and/or is adequately addressed at the county level. Jurisdictions completed the following form as part of the Plan update:*

<https://integratedsolutions.wufoo.com/forms/macon-county-hazards/>

Table 4-16 Macon County Jurisdiction-specific Hazard Impact/Vulnerability

Jurisdiction	Affected Jurisdictions' Hazard Impact/Vulnerability Considerations
Long Creek	Our community is vulnerable to extreme heat. The frequency of power outages in our municipality is high. Our organization needs a back-up generator to ensure continuity of services and operations.

4.6.7 FEMA NRI Expected Annual Loss Estimates

Table 4-17. Macon County Expected Annual Loss Table

MACON COUNTY, IL FEMA NRI EXPECTED ANNUAL LOSS TABLE FOR EXTREME HEAT EVENTS							
Annualized Frequency	Population	Population Equivalence	Building Value	Agriculture Value	Total Value	Expected Annual Loss Score	Risk Index Rating
3 events per year	0.24	\$1,803,278	\$5,148	\$30,294	\$1,838,720	29.70	Relatively High
Annualized Frequency: The natural hazard annualized frequency is defined as the expected frequency or probability of a hazard occurrence per year. Annualized frequency is derived either from the number of recorded hazard occurrences each year over a given period or the modeled probability of a hazard occurrence each year. Population: Population exposure is defined as the estimated number of people determined to be exposed to a hazard according to a hazard type-specific methodology. Expected Annual Loss scores are calculated using an equation that combines values for exposure, annualized frequency, and historic loss ratios (Expected Annual Loss = Exposure × Annualized Frequency × Historic Loss Ratio). Source: hazards.fema.gov/nri/expected-annual-loss							
Source: FEMA National Risk Index (2023)							

4.6.8 FEMA Hazard-Specific Risk Index Table

Table 4-18 Macon County Hazard Specific Risk Index Table

MACON COUNTY, IL FEMA HAZARD SPECIFIC RISK INDEX – EXTREME HEAT	
Risk Index Score	Risk Index Rating
26.63 / 100	Relatively High
FEMA Hazard-Type Risk Index Scores are calculated using data for only a single hazard type and reflect a community's relative risk for only that hazard type. FEMA Hazard-Type Risk Index Ratings are a qualitative rating that describe the community in comparison to all other communities at the same level, ranging from “Very Low” to “Very High.”	
Source: FEMA National Risk Index (2023)	

4.7 Drought

4.7.1 Hazard Description

The National Oceanic and Atmospheric Administration (NOAA) defines drought as "a deficiency of precipitation over an extended period of time, usually a season or more, resulting in a water shortage for some activity, group, or environmental sector" (NOAA, 2023).

Drought can be caused by a variety of factors, including changes in weather patterns, climate variability, and human activities such as overuse of water resources. The impacts of drought can be far-reaching, affecting agriculture, ecosystems, and human populations that rely on water for drinking, sanitation, and other purposes (NOAA, 2023).

4.7.2 Hazard Location

Drought could occur anywhere in Macon County.

4.7.3 Hazard Extent/Intensity

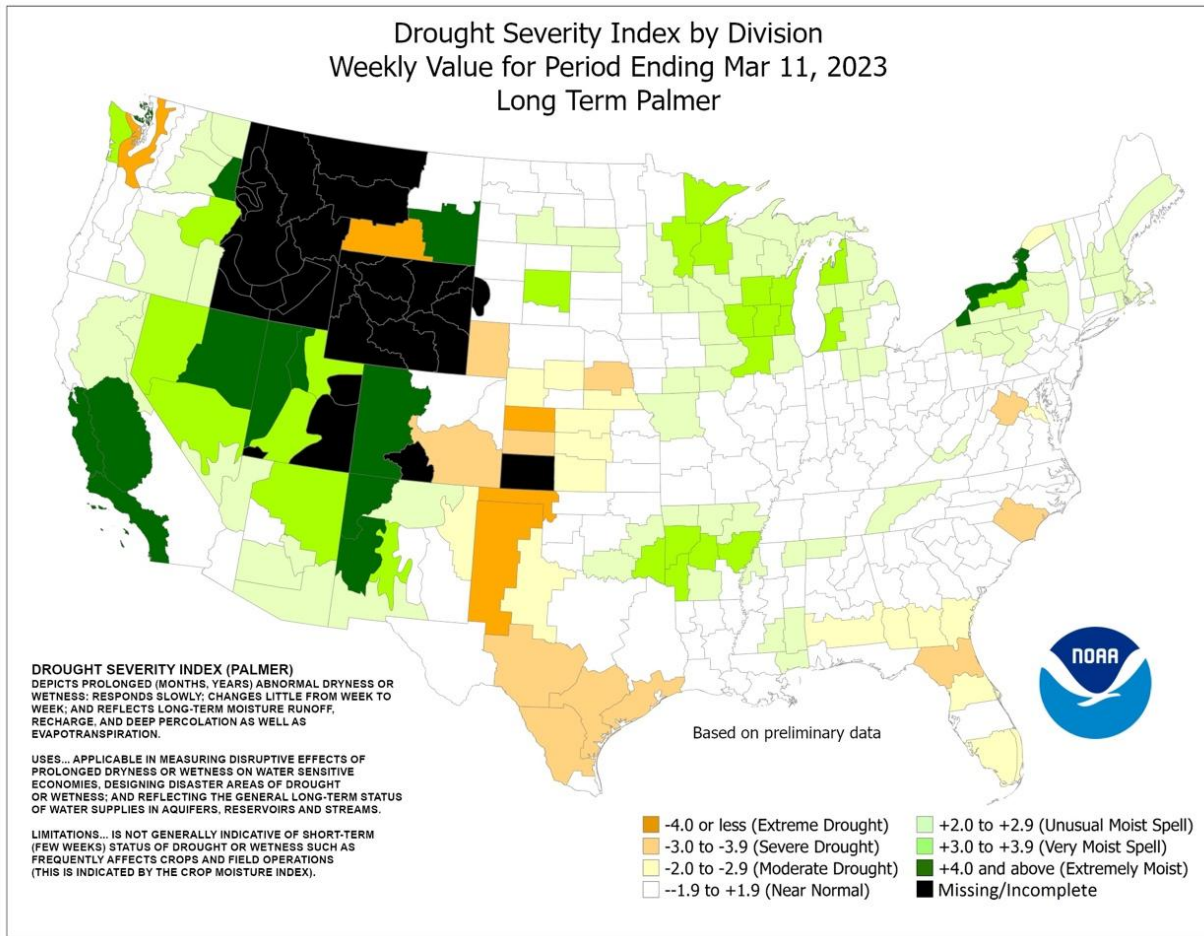
The Palmer Drought Severity Index (PDSI), shown in Exhibit 4-14, is a means of quantifying drought in terms of the prolonged and abnormal moisture deficiency or excess. This index indicates general conditions and not local variations caused by isolated rain (NOAA, 2023).

The PDSI is an important climatological tool for evaluating the scope, severity, and frequency of prolonged periods of abnormally dry or wet weather. It can be used to help delineate disaster areas and indicate the availability of irrigation water supplies, reservoir levels, range conditions, amount of stock water, and potential intensity of forest fires. The PDSI provides a comparison of moisture deficiency and moisture excess on a numerical scale that usually ranges from positive five to negative five. Positive values reflect excess moisture supplies, while negative values indicate moisture demands in excess of supplies.

Exhibit 4-14. Palmer Drought Severity Index (PDSI)

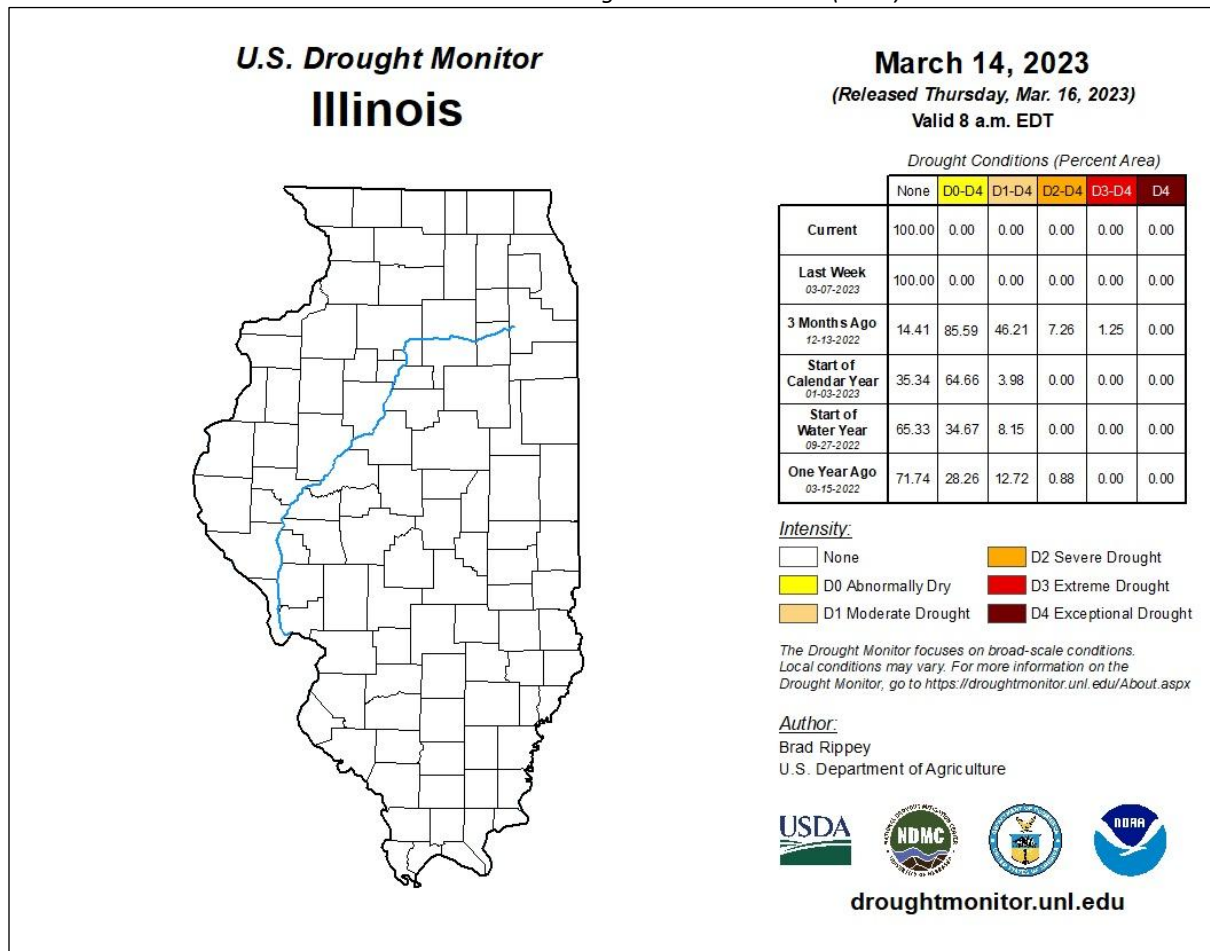
extreme drought	severe drought	moderate drought	mid- range	moderately moist	very moist	extremely moist
						
-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.99	+3.00 to +3.99	+4.00 and above

Exhibit 4-15. U.S. Drought Severity Index by Division



The National Drought Mitigation Center also rates drought throughout the nation by intensity using a D0 (Abnormally Dry) to D4 (Exceptional Drought) scale, as seen in Exhibit 4-16 in the map of Illinois.

Exhibit 4-16. U.S. Drought Monitor – Illinois (2023)

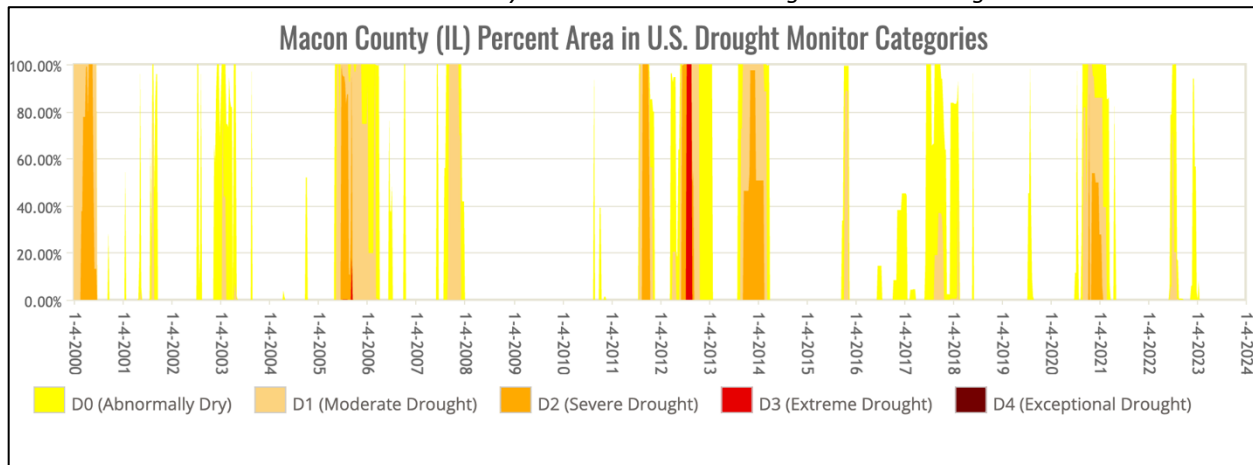


4.7.4 Probability and Frequency

Meteorological drought can begin and end rapidly, while hydrological drought takes much longer to develop and then recover (NOAA, 2023). Many different indices have been developed over the decades to measure drought in these various sectors. The U.S. Drought Monitor depicts drought integrated across all time scales and differentiates between agricultural and hydrological impacts, while the NOAA uses the Palmer Drought Severity Index to determine drought conditions.

The percent area of Macon County in US Drought Monitor categories (over time) can be observed in Exhibit 4-17.

Exhibit 4-17. Macon County Percent Area in US Drought Monitor Categories



4.7.5 Past Events

In September 2012, extreme (D3) to exceptional (D4) drought conditions occurred when remnants of Hurricane Issac brought widespread rain totals of 2 to 4 inches from September 1st through 3rd. This was followed by additional rainfall throughout the month that resulted in much of the area being downgraded to the Moderate Drought category (D1) or better (NOAA, 2023).

Eight west-central Illinois counties along and northwest of a Marshall to Lincoln line remained in the Severe Drought category (D2) through the end of the month. Total crop losses from the extended drought across central and southeast Illinois was estimated to be \$1.2 billion dollars (NOAA, 2023).

Table 4-19 shows the four USDA Drought Declaration events recorded between 2012-2022. Table 4-20 shows drought events in Macon County from 1950 to 2022, as documented by NOAA's National Climate Data Center, showing seven events with no associated injuries or deaths.

Table 4-19. USDA Drought Declaration Events (2012-2022)

MACON COUNTY, IL				
USDA DROUGHT DISASTER DECLARATION EVENTS (2012-2022)				
Crop Disaster Year	County	State	Designation Number	Description of Disaster
2012	Macon	Illinois	S3311	Drought
2015	Macon	Illinois	S3865	excessive rainfall and flooding
2019	Macon	Illinois	S4508	excessive moisture, flooding, and flash flooding
2021	Macon	Illinois	S5097	Excessive Moisture and Flash Flooding
Source: US Department of Agriculture (2023)				

Table 4-20. Drought Activity in Macon County, Illinois (1950-2022)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Dth	Inj	PrD	CrD
Totals:							0	0	0.00K	46.300M
MACON (ZONE)	MACON (ZONE)	IL	06/19/2012	00:00	CST-6	Drought	0	0	0.00K	0.00K
MACON (ZONE)	MACON (ZONE)	IL	07/01/2012	00:00	CST-6	Drought	0	0	0.00K	0.00K
MACON (ZONE)	MACON (ZONE)	IL	08/01/2012	00:00	CST-6	Drought	0	0	0.00K	0.00K
MACON (ZONE)	MACON (ZONE)	IL	09/01/2012	00:00	CST-6	Drought	0	0	0.00K	46.300M
MACON (ZONE)	MACON (ZONE)	IL	09/24/2013	00:00	CST-6	Drought	0	0	0.00K	0.00K
MACON (ZONE)	MACON (ZONE)	IL	10/01/2013	00:00	CST-6	Drought	0	0	0.00K	0.00K
MACON (ZONE)	MACON (ZONE)	IL	11/01/2013	00:00	CST-6	Drought	0	0	0.00K	0.00K
Totals:							0	0	0.00K	46.300M

4.7.6 Vulnerability and Impacts

Life Safety and Public Health: Droughts affect life safety and public health in several ways. Health problems can arise from poor water quality, poor food quality, and increased dust in the air. In addition, droughts make the occurrence of fires more likely, spread more quickly, and more difficult to put out. In addition, poor air quality and a lack of water may reduce residents' engagement in recreational activities, reducing overall mental and physical well-being (National Drought Mitigation Center, 2023).

Property Damage and Critical Infrastructure: Droughts significantly impact natural resources, and the animals that inhabit them. These effects include sometimes destroying natural habitats, increasing the likelihood of soil erosion, affecting wildlife migration patterns, and reducing the health of animals (National Drought Mitigation Center, 2023). In addition, the National Drought Mitigation Center, has identified several infrastructure sectors that could be directly, and sometimes even severely impacted, by a drought:

- Farmers may lose money if a drought destroys their crops.
- If a farmer's water supply is too low, the farmer may have to spend more money on irrigation or to drill new wells.
- Businesses that depend on farming, like companies that make tractors and food, may lose business when drought damages crops or livestock.
- People who work in the timber industry may be affected when wildfires destroy stands of timber.
- Businesses that sell boats and fishing equipment may not be able to sell some of their goods because drought has dried up lakes and other water sources.
- Power companies that normally rely on hydroelectric power (electricity that's created from the energy of running water) may have to spend more money on other fuel sources if drought dries up too much of the water supply. The power companies' customers would also have to pay more.
- Water companies may have to spend money on new or additional water supplies.
- People might have to pay more for food. (National Drought Mitigation Center, 2023).

Economy: Macon County's economy is directly influenced by the agricultural sector and so any significant losses related to agriculture would impact the economic vitality of Macon County and neighboring jurisdictions.

Changes in Development and Impact of Future Development: No data exists demonstrating the impact of drought on future development in Macon County. However, excessive drought can result in water shortages and increased competition for limited water resources, which can limit the ability of developers to expand projects within the county.

Effects of Climate Change on Severity of Impacts: According to Center for Climate and Energy Solutions (C2ES), climate change is causing more extreme weather events, including more extreme drought. C2ES explains that warmer temperatures cause more evaporation, turning water into vapor in the air, and causing drought in some areas of the world. Places prone to drought are expected to become even drier over the next century (Center for Climate And Energy Solutions, 2023).

Per the 2023 Illinois Natural Hazard Mitigation Plan, drought is one of the most challenging hazards to define, identify, and manage because of its complex and diverse interactions and impacts and its relatively slow onset and demise. Projections of changes in drought are, therefore, highly dependent on the impact of interest (e.g., agricultural drought vs. hydrologic drought). Total annual precipitation in Illinois has increased by 3 to 6 inches over the past 100 years and has increased in all four seasons. The combination of this long-term change and natural climate variability has significantly limited drought frequency, severity, and extent in Illinois since the 1990s. As measured by the Palmer Drought Severity Index (PDSI), Illinois has experienced fewer extreme droughts since 1965 than during the period from 1895 to 1965, when extreme droughts were more common and more intense. Drought risk in Illinois is not only related to precipitation; changes in temperature also play an important role. Increasing temperatures have led to more atmospheric demand for evaporation from plants and soils. The combination of short-term dryness and very high evaporative demand can rapidly deplete soil moisture and induce crop or ecosystem stress, sometimes resulting in a flash drought. The relatively quick onset and intensification of flash drought reduce time available for preparation, communication, and management for impact mitigation. The combination of increasing growing season temperatures and more variable precipitation have caused a change in the characteristics of drought in Illinois, with shorter-duration, but high severity and relatively quickly intensifying droughts, such as those in 2012 (statewide) and 2021 (northern Illinois).

Climate Change Impact on Drought in Macon County: Higher temperatures, increasing variation in precipitation patterns, and changes in lake levels are likely to increase the vulnerability of cities to extreme events (including flooding, drought, heat waves, and more intense urban heat island effects), compounding already existing stressors. Drought has been identified as a slow-moving stressor that contributes to acute and chronic mental health impacts such as anxiety and depression.

Exhibit 4-18. 25-Year Climate Projections for Macon County

25-YEAR CLIMATE PROJECTIONS FOR MACON COUNTY, IL	
HIGHER EMISSIONS (RCP8.5)	
Macon County is expected to experience a 99% increase in extremely hot days within 25 years.	
By 2048, Macon County is expected to experience 18 more days that reach above 95°F (from 18 days to 37 days per year).	
LOWER EMISSIONS (RCP4.5)	
Macon County is expected to experience a 74% increase in extremely hot days within 25 years.	
By 2048, Macon County is expected to experience 12 more days that reach above 95°F (from 16 days to 28 days per year).	
Source: Neighborhoods at Risk (https://nar.headwaterseconomics.org/17115/explore/climate)	

Table 4-21. Future Climate Indicators for Macon County

FUTURE CLIMATE INDICATORS FOR MACON COUNTY, IL							
Indicator	Modeled History (1976-2005)	Early Century (2015-2044)		Mid Century (2035-2064)		Late Century (2070-2099)	
		Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions
	Min-Max	Min-Max	Min-Max	Min-Max	Min-Max	Min-Max	Min-Max
Precipitation							
Average Annual Total Precipitation	38"	39"	39"	39"	40"	40"	41"
	36-39	37-43	33-42	34-44	35-43	34-44	34-36
Days Per Year With Precipitation	181 days	179 days	178 days	178 days	177 days	177 days	173 days
	177-187	163-189	161-189	159-195	152-193	162-190	135-198
Days Per Year With No Precipitation	184 days	186 days	187 days	187 days	188 days	188 days	192 days
	178-189	176-202	176-204	170-206	172-213	175-203	168-230
Maximum Number Of Consecutive Dry Days	13 days	14 days	14 days	14 days	14 days	14 days	15 days
	11-15	11-16	12-16	11-17	12-18	12-18	11-20
Temperature Thresholds							
Annual days with Maximum temperature > 90*	25 days	55 days	58 days	67 days	77 days	78 days	110 days
	25-35	36-88	41-80	42-110	51-107	45-120	72-141
Annual days with Maximum temperature > 100*	1 day	5 days	6 days	10 days	14 days	15 days	41 days
	0-1	1-27	1-20	1-53	2-51	2-53	7-93
Source: Climate Mapping for Resilience and Adaptation (2023)							

Jurisdiction-specific Hazard Impact/Vulnerability: Only those jurisdictions uniquely affected by drought are included. If a jurisdiction was not included, it denotes the hazard impact or vulnerability to drought is not significant and/or is adequately addressed at the county level. Jurisdictions completed the following form as part of the Plan update:

<https://integratedsolutions.wufoo.com/forms/macon-county-hazards/>

Table 4-22. Macon County Jurisdiction-specific Hazard Impact/Vulnerability

Jurisdiction	Affected Jurisdictions' Hazard Impact/Vulnerability Considerations
Decatur	Lake Decatur is a major water supplier for major industries and residents in Decatur. Due to the importance of this resource, a Lake Level Drought Action Plan has been created.
Macon	At times there is an excess demand on the water system.
Blue Mound Township	Droughts may increase the potential for fires in the township.
Friends Creek	Farmers in the township are uniquely impacted by drought.

4.7.7 FEMA NRI Expected Annual Loss Estimates

Table 4-23. Macon County Expected Annual Loss Table

MACON COUNTY, IL EXPECTED ANNUAL LOSS TABLE FOR DROUGHT EVENTS							
Annualized Frequency	Population	Population Equivalence	Building Value	Agriculture Value	Total Value	Expected Annual Loss Score	Risk Index Rating
3 events per year	N/A	N/A	N/A	\$562,031	\$562,031	13.21	Relatively Moderate
Annualized Frequency: The natural hazard annualized frequency is defined as the expected frequency or probability of a hazard occurrence per year. Annualized frequency is derived either from the number of recorded hazard occurrences each year over a given period or the modeled probability of a hazard occurrence each year. Population: Population exposure is defined as the estimated number of people determined to be exposed to a hazard according to a hazard type-specific methodology. Expected Annual Loss scores are calculated using an equation that combines values for exposure, annualized frequency, and historic loss ratios (Expected Annual Loss = Exposure × Annualized Frequency × Historic Loss Ratio). Source: hazards.fema.gov/nri/expected-annual-loss							
Source: FEMA National Risk Index (2023)							

4.7.8 FEMA Hazard-Specific Risk Index Table

Table 4-24. Macon County Hazard Specific Risk Index Table

MACON COUNTY, IL FEMA HAZARD SPECIFIC RISK INDEX - DROUGHT	
Risk Index Score	Risk Index Rating
13.75 / 100	Relatively Moderate

*FEMA Hazard-Type **Risk Index Scores** are calculated using data for only a single hazard type and reflect a community's relative risk for only that hazard type.*

*FEMA Hazard-Type **Risk Index Ratings** are a qualitative rating that describe the community in comparison to all other communities at the same level, ranging from “Very Low” to “Very High.”*

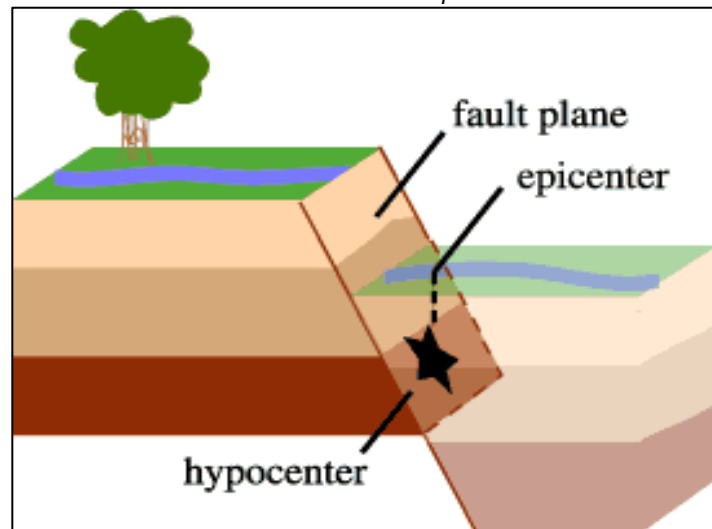
Source: FEMA [National Risk Index](#) (2023)

4.8 Earthquakes

4.8.1 Hazard Description

An earthquake is what happens when two blocks of the earth suddenly slip past one another. The surface where they slip is called the fault or fault plane. The location below the earth's surface where the earthquake starts is called the hypocenter, and the location directly above it on the surface of the earth is called the epicenter (US Geological Survey, 2023). This phenomenon is illustrated in Exhibit 4-19.

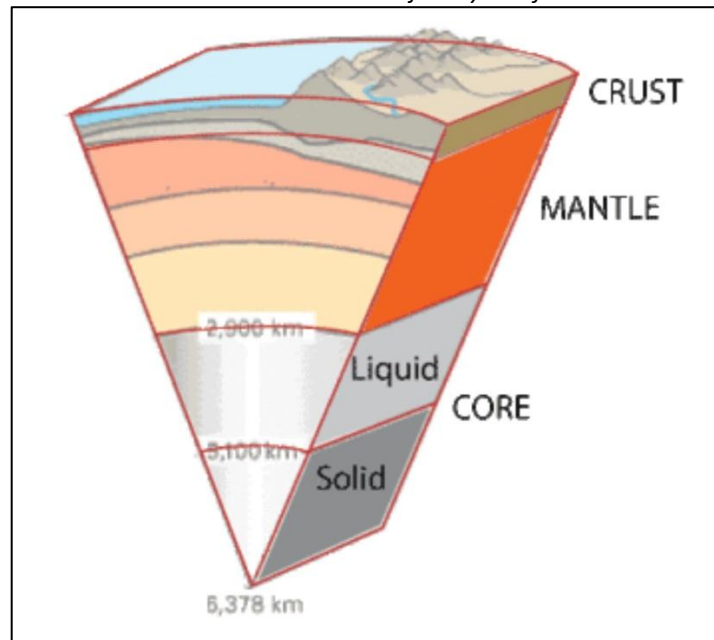
Exhibit 4-19. Earthquake



The earth has four major layers as shown in

Exhibit 4-20. These layers are the inner core, outer core, mantle, and crust. The crust and the top of the mantle make up a thin skin on the surface of our planet. But this skin is not all in one piece – it is made up of many pieces like a puzzle covering the surface of the earth. Not only that, but these puzzle pieces keep slowly moving around, sliding past one another, and bumping into each other. We call these puzzle pieces tectonic plates, and the edges of the plates are called the plate boundaries. The plate boundaries are made up of many faults, and most of the earthquakes around the world occur on these faults. Since the edges of the plates are rough, they get stuck while the rest of the plate keeps moving. Finally, when the plate has moved far enough, the edges unstuck on one of the faults and there is an earthquake (US Geological Survey, 2023).

Exhibit 4-20. The Four Major Layers of Earth



Sometimes an earthquake has foreshocks. These are smaller earthquakes that happen in the same place as the larger earthquake that follows. Scientists can't tell that an earthquake is a foreshock until the larger earthquake happens. The largest, main earthquake is called the mainshock. Mainshocks always have aftershocks that follow. These are smaller earthquakes that occur afterwards in the same place as the mainshock. Depending on the size of the mainshock, aftershocks can continue for weeks, months, and even years after the mainshock (US Geological Survey, 2023).

4.8.2 Hazard Location

An earthquake could occur anywhere in Macon County.

4.8.3 Hazard Extent/Intensity

The severity of an earthquake can be expressed in terms of both *intensity* and *magnitude*. However, the two terms are quite different, and they are often confused. Intensity is based on the observed effects of ground shaking on people, buildings, and natural features. It varies from place to place within the disturbed region depending on the location of the observer with respect to the earthquake epicenter. Magnitude is related to the amount of seismic energy released at the hypocenter of the earthquake. It is based on the amplitude of the earthquake waves recorded on instruments which have a common calibration. The magnitude of an earthquake is thus represented by a single, instrumentally determined value (US Geological Survey, 2023).

Earthquake strength has traditionally been measured using the Richter scale, developed by Charles Richter in 1935. The Richter scale went through numerous adjustments since its conception and was eventually replaced by the "Moment Magnitude Scale" for earthquakes

larger than 3.5; however, most still refer to both scales as the Richter scale. The Richter magnitude scale, used as an indicator of the force of an earthquake, measures the magnitude, intensity, and energy released by an earthquake with seismographs. Each whole number increase in magnitude represents a tenfold increase in measured amplitude; as an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value. It is important to note that the Richter Magnitude Scale is not used to express damage (US Geological Survey, 2023).

Exhibit 4-21. The Richter Scale

THE RICHTER SCALE	
Magnitude	Description
< 2.0	Micro earthquakes, not felt.
2.0 - 2.9	Minor earthquakes, generally not felt, but are recorded.
3.0 - 3.9	Minor earthquakes, often felt, but rarely causes damage.
4.0 - 4.9	Light earthquakes, noticeable shaking of indoor items, rattling noises, and significant damage is unlikely.
5.0 - 5.9	Moderate earthquakes, can cause major damage to poorly constructed buildings over small regions, and possible slight damage to well-designed buildings.
6.0 - 6.9	Strong earthquakes, can be destructive in areas up to about 99 miles across in populated regions.
7.0 - 7.9	Major earthquakes, can cause serious damage over larger regions.
8.0 - 8.9	Great earthquakes, can cause serious damage in regions several hundred miles across.
9.0 - 9.9	Great earthquakes, devastating in areas several thousands of miles across.
10 <	Massive earthquakes, never recorded, widespread devastation across vast regions.

The effect of an earthquake on the Earth's surface is called the intensity. The intensity scale consists of a series of certain key responses such as people awakening, movement of furniture, damage to chimneys, and finally - total destruction. The Modified Mercalli (MM) Intensity Scale is the common intensity scale used in the United States. This scale is composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction. It does not have a mathematical basis; instead, it is an arbitrary ranking based on observed effects. The Modified Mercalli Intensity value assigned to a specific site after an earthquake has a more meaningful measure of severity to the non-scientist than the magnitude because intensity refers to the effects actually experienced at that place (US Geological Survey, 2023).

Exhibit 4-22 below illustrates abbreviated descriptions of the 12 levels of Modified Mercalli Intensity:

Exhibit 4-22. Modified Mercalli Intensity Scale

MODIFIED MERCALLI INTENSITY SCALE	
Level of Intensity	Observed Earthquake Effects
I	Not felt except by a very few under especially favorable conditions.
II	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.

IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Earthquakes can trigger other types of ground failures which could contribute to the damage. These include landslides, dam failures, and liquefaction. In the last situation, shaking can mix groundwater and soil, liquefying and weakening the ground that supports buildings and severing utility lines. This is a special problem in floodplains where the water table is relatively high, and the soils are more susceptible to liquefaction (US Geological Survey, 2023).

4.8.4 Probability and Frequency

The number of earthquakes in the central U.S. has increased dramatically over the past decade. Between the years 1973–2008, there was an average of 25 earthquakes of magnitude three and larger in the central and eastern United States. Since 2009, at least 58 earthquakes of this size have occurred each year, and at least 100 earthquakes of this size every year since 2013 (US Geological Survey, 2023).

Exhibit 4-23 illustrates peak ground accelerations having a 2% probability of being exceeded in 50 years, for a firm rock site. The long-term national seismic hazard map is based on the most recent USGS models for the conterminous U.S. (2018), Hawaii (1998), and Alaska (2007). These models are based on seismicity and fault-slip rates and consider the frequency of earthquakes of various magnitudes. In Macon County, the hazard may be greater than shown, because site geology may amplify ground motions (US Geological Survey, 2018).

Exhibit 4-23. Long-term National Seismic Hazard Map 2018

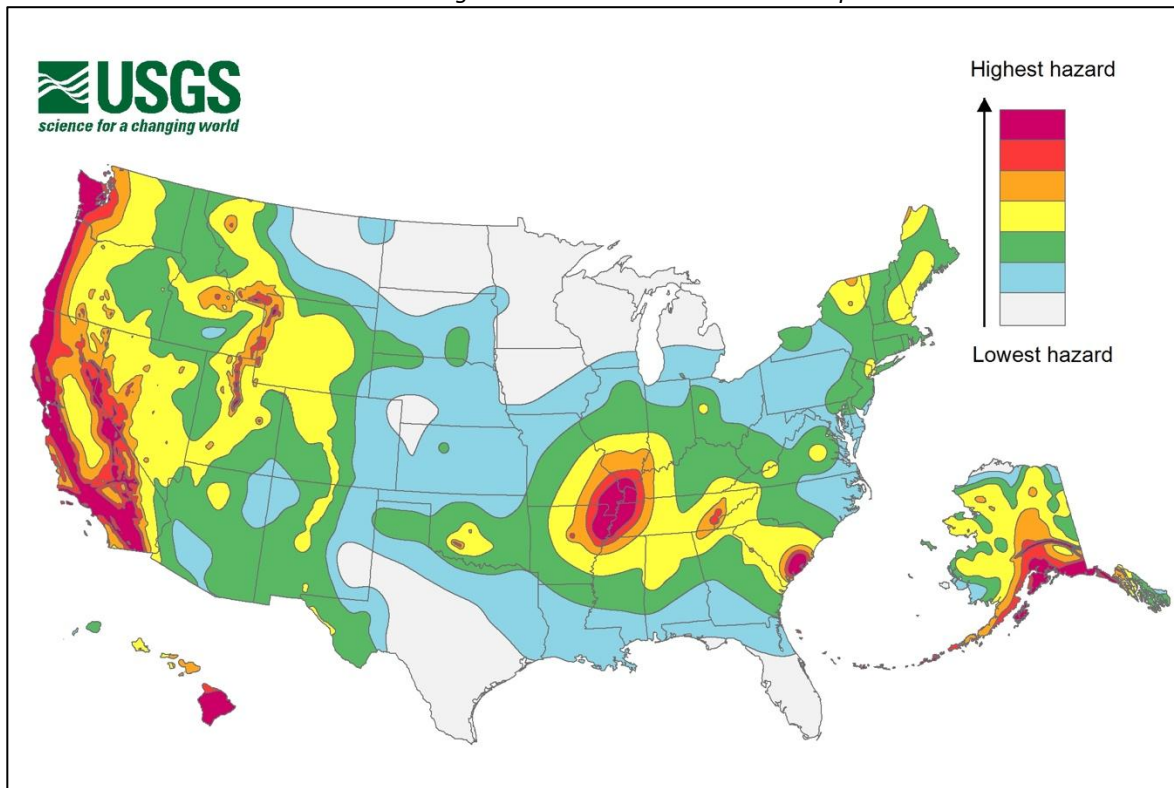
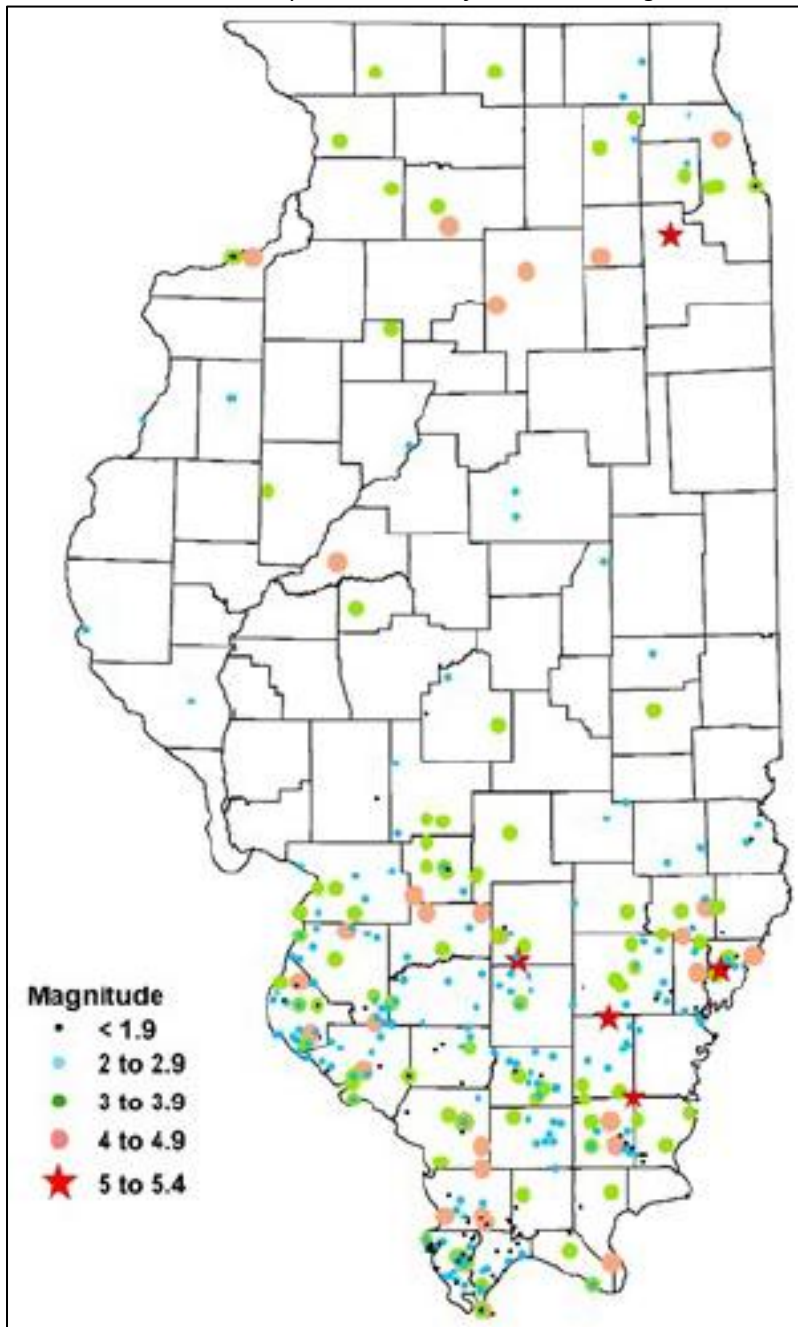


Exhibit 4-24. Earthquakes in Illinois from 1795 through 2023

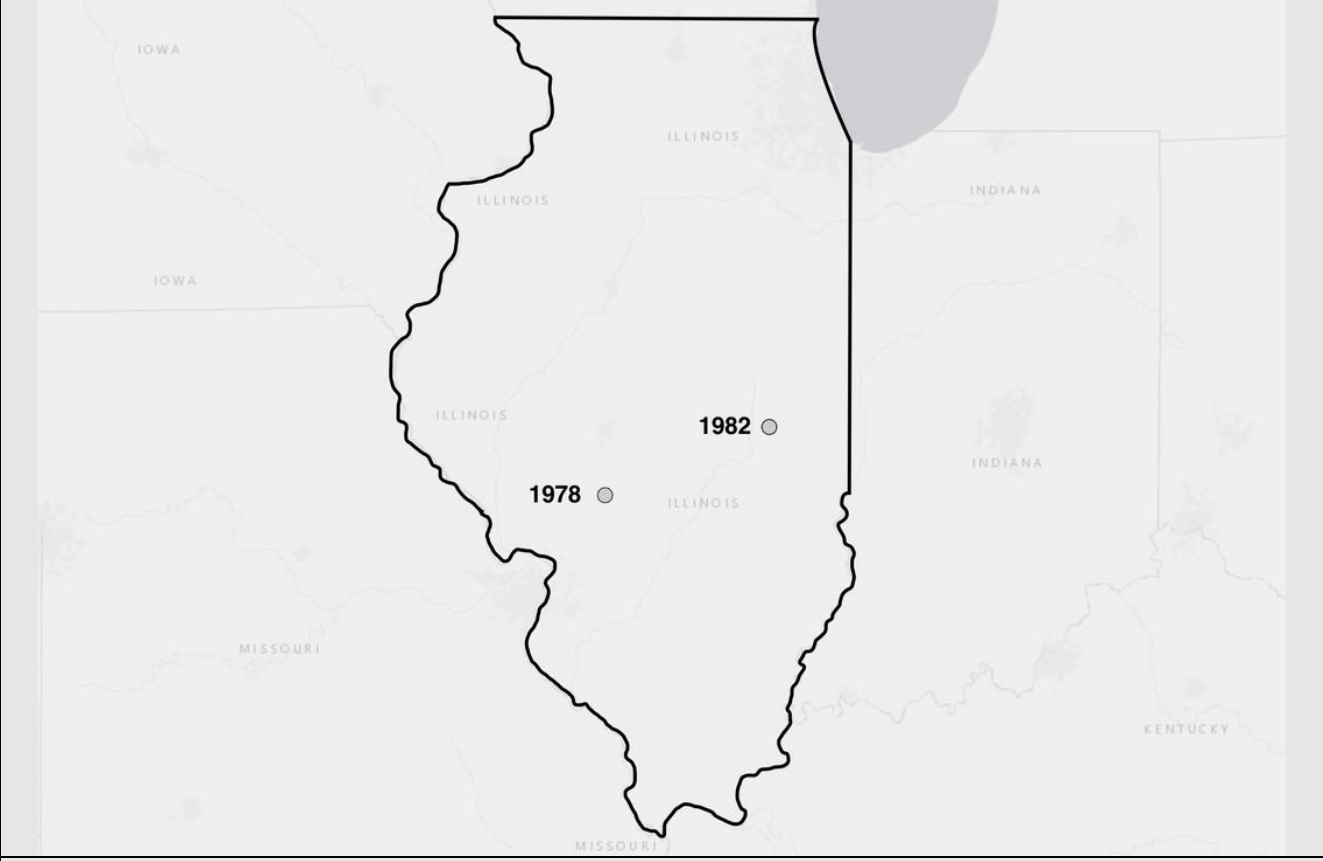


4.8.5 Past Events

Exhibit 4-25 shows recorded earthquake events in Central Illinois from 1950 to 2023, as recorded by U.S. Geological Survey's (USGS) Earthquake Hazards Program (USGS, 2023). From 1950 to 2023, Central Illinois has had two events with no associated injuries or deaths.

Exhibit 4-25. Earthquake Events in Central Illinois (1950-2023)

MACON COUNTY, IL PAST EARTHQUAKE EVENTS IN CENTRAL ILLINOIS U.S. GEOLOGICAL SURVEY						
Date	Time	Location	Proximity to Macon County	Latitude/ Longitude	Magnitude	Depth
1978-02-16	09:25:37 (UTC)	4 km E of Tuscola, Illinois	58KM	39.800°N 88.230°W	M 2.7	5KM
1982-07-01	00:40:39 (UTC)	4 km SSW of Waggoner, Illinois	114KM	39.340°N 89.670°W	M 2.6	5KM



Source: [US Geological Survey \(2023\)](#)

4.8.6 Vulnerability and Impacts

Life Safety and Public Health: While injury and loss of life are important factors in other parts of Illinois when assessing earthquakes, they are of low concern for Macon County. During an earthquake, injuries are expected to be few. However, should a major earthquake impact Southern Illinois, there exists the potential for damage to natural gas pipelines. This would be of greatest concern in the winter in Central Illinois.

Property Damage and Critical Infrastructure: Generally, wood frame buildings and structures on solid ground fare best during an earthquake. Wood frame buildings are flexible enough to

withstand ground shaking and swaying. Evaluations of recent earthquakes found that damage was primarily caused to:

- Unreinforced masonry structures.
- Older buildings with some degree of deterioration.
- Buildings without foundation ties.
- Multi-story structures with open or “soft” first floors.

Most building codes have standards related to the first three concerns. This means that the most threatened buildings are older ones (built before current codes), masonry ones, and taller ones with open first floors.

In addition to the building type, damage is related to the underlying soils. Buildings on solid ground fare better, while those on loose or sandy soils will suffer more from shaking. These can be found in floodplains. If there is enough water present, the shaking can liquefy the underlying soils, which removes the support under the foundation.

HAZUS Risk Analysis:

- **Scenario:** Probabilistic M5.0 event
- **Casualties**
 - Hazus estimates that there will be zero casualties. HAZUS estimates that no people will be displaced or require temporary shelter.
- **Building Damage**
 - Hazus estimates that about zero buildings will be at least moderately damaged. There are an estimated zero buildings that will be damaged beyond repair.
- **Essential Facility Damage**
 - Zero essential facilities are expected to be moderately or completely damaged.
 - Hospitals: 3 – No damages expected
 - Schools: 53 – No damages expected
 - EOCs: 1 – No damages expected
 - Police Stations: 6 – No damages expected
 - Fire Stations: 20 – No damages expected
- **Economic Loss**
 - The total economic loss estimated for the earthquake is 0.01 (millions of dollars), which includes building and lifeline related losses based on the region’s available inventory.
- **Transportation and Utility Lifeline Losses**
 - There are no losses computed by Hazus for business interruption due to lifeline outages.
- **Building-Related Losses**
 - The total building-related losses were 0.00 (millions of dollars); 0% of the estimated losses were related to the business interruption of the region.

Economy: No data exists demonstrating the economic impact of earthquakes on Macon County. However, past earthquakes have resulted in repair costs associated with damaged infrastructure and buildings, lost productivity due to business disruptions, and increased demand for emergency services and supplies.

Changes in Development and Impact of Future Development: No data exists demonstrating the impact of earthquakes on future development in Macon County. However, past earthquakes have shown to impact zoning regulations and building codes which require developers to build structures that are more resistant to seismic activity.

Illinois does not have statewide building codes, but local buildings codes under home rule, making areas of the state without strong building codes more vulnerable to earthquakes. Smaller communities in particular may have no or limited building codes due to the lack of expertise and personnel to create and enforce them. Illinois, including Macon County, has many small communities.

Effects of Climate Change on Severity of Impacts: The exact nature and extent of this impact is still being studied and is not fully understood as it pertains to climate change.

4.8.7 FEMA NRI Expected Annual Loss Estimates

Table 4-25. Macon County Expected Annual Loss Table

MACON COUNTY, IL EXPECTED ANNUAL LOSS TABLE FOR EARTHQUAKE EVENTS							
Annualized Frequency	Population	Population Equivalence	Building Value	Agriculture Value	Total Value	Expected Annual Loss Score	Risk Index Rating
0.105% chance	0.01	\$90,295	\$774,494	N/A	\$864,789	8.36	Relatively Low
Annualized Frequency: The natural hazard annualized frequency is defined as the expected frequency or probability of a hazard occurrence per year. Annualized frequency is derived either from the number of recorded hazard occurrences each year over a given period or the modeled probability of a hazard occurrence each year. Population: Population exposure is defined as the estimated number of people determined to be exposed to a hazard according to a hazard type-specific methodology. Expected Annual Loss scores are calculated using an equation that combines values for exposure, annualized frequency, and historic loss ratios (Expected Annual Loss = Exposure × Annualized Frequency × Historic Loss Ratio). Source: hazards.fema.gov/nri/expected-annual-loss							
Source: FEMA National Risk Index (2023)							

4.8.8 FEMA Hazard-Specific Risk Index Table

Table 4-26. Macon County Hazard Specific Risk Index Table

MACON COUNTY, IL FEMA HAZARD SPECIFIC RISK INDEX – EARTHQUAKE	
Risk Index Score	Risk Index Rating
7.16 / 100	Relatively Low
<i>FEMA Hazard-Type Risk Index Scores are calculated using data for only a single hazard type and reflect a community's relative risk for only that hazard type.</i>	
<i>FEMA Hazard-Type Risk Index Ratings are a qualitative rating that describe the community in comparison to all other communities at the same level, ranging from "Very Low" to "Very High."</i>	
Source: FEMA National Risk Index (2023)	

4.9 Flooding

4.9.1 Hazard Description

A flood is a natural event for rivers and streams and occurs when a normally dry area is inundated with water. Excess water from snowmelt or rainfall accumulates and overflows onto the stream banks and adjacent floodplains.

Floods are considered hazards when people and property are affected. In Illinois, flooding occurs commonly and can occur during any season of the year from a variety of sources.

Riverine flooding originates from a body of water, typically a river, creek, or stream, as water levels rise onto normally dry land. Water from snowmelt, rainfall, freezing streams, ice flows, or a combination thereof, causes the river or stream to overflow its banks onto adjacent floodplains. Winter flooding usually occurs when ice in the rivers creates dams or streams freeze from the bottom up during extreme cold spells. Spring flooding is usually the direct result of melting winter snowpacks, heavy spring rains, or a combination of the two.

Urban flooding, as defined in the Urban Flooding Awareness Act, is “the inundation of property in a built environment, particularly in more densely populated areas, caused by rainfall overwhelming the capacity of drainage systems, such as storm sewers. ‘Urban flooding’ does not include flooding in undeveloped or agricultural areas. ‘Urban flooding’ includes (i) situations in which stormwater enters buildings through windows, doors, or other openings, (ii) water backup through sewer pipes, showers, toilets, sinks, and floor drains, (iii) seepage through walls and floors, and (iv) the accumulation of water on property or public rights-of-way. Urban flooding is characterized by its repetitive, costly, and systemic impacts on communities, regardless of whether or not these communities are located within formally designated floodplains or near any body of water. These impacts include damage to buildings and infrastructure, economic disruption, and negative effects on health and safety (IL Department of Natural Resources, 2015, p. 2).

A watershed is defined as the area of land that drains to a particular waterbody, such as a river, lake, or ocean. It is a geographic region that collects and channels precipitation and surface water to a common outlet, which could be a stream, river, or other waterbody. Watersheds can vary in size, from a small drainage basin that encompasses only a few acres to a large river basin that spans thousands of square miles. The health and quality of a watershed are critical for the sustainability of the ecosystem and the organisms that depend on it, including humans (US Environmental Protection Agency, 2023).

A healthy watershed is one in which natural land cover supports:

- Dynamic hydrologic and geomorphologic processes within their natural range of variation,
- Habitat of sufficient size and connectivity to support native aquatic and riparian species, and

- Physical and chemical water quality conditions able to support healthy biological communities.

Natural vegetative cover in the landscape, including the riparian zone, helps maintain the natural flow regime and fluctuations in water levels in lakes and wetlands. This, in turn, helps maintain natural geomorphic processes, such as sediment storage and deposition, which form the basis of aquatic habitats. Connectivity of aquatic and riparian habitats in the longitudinal, lateral, vertical, and temporal dimensions helps ensure the flow of chemical and physical materials and movement of biota among habitats.

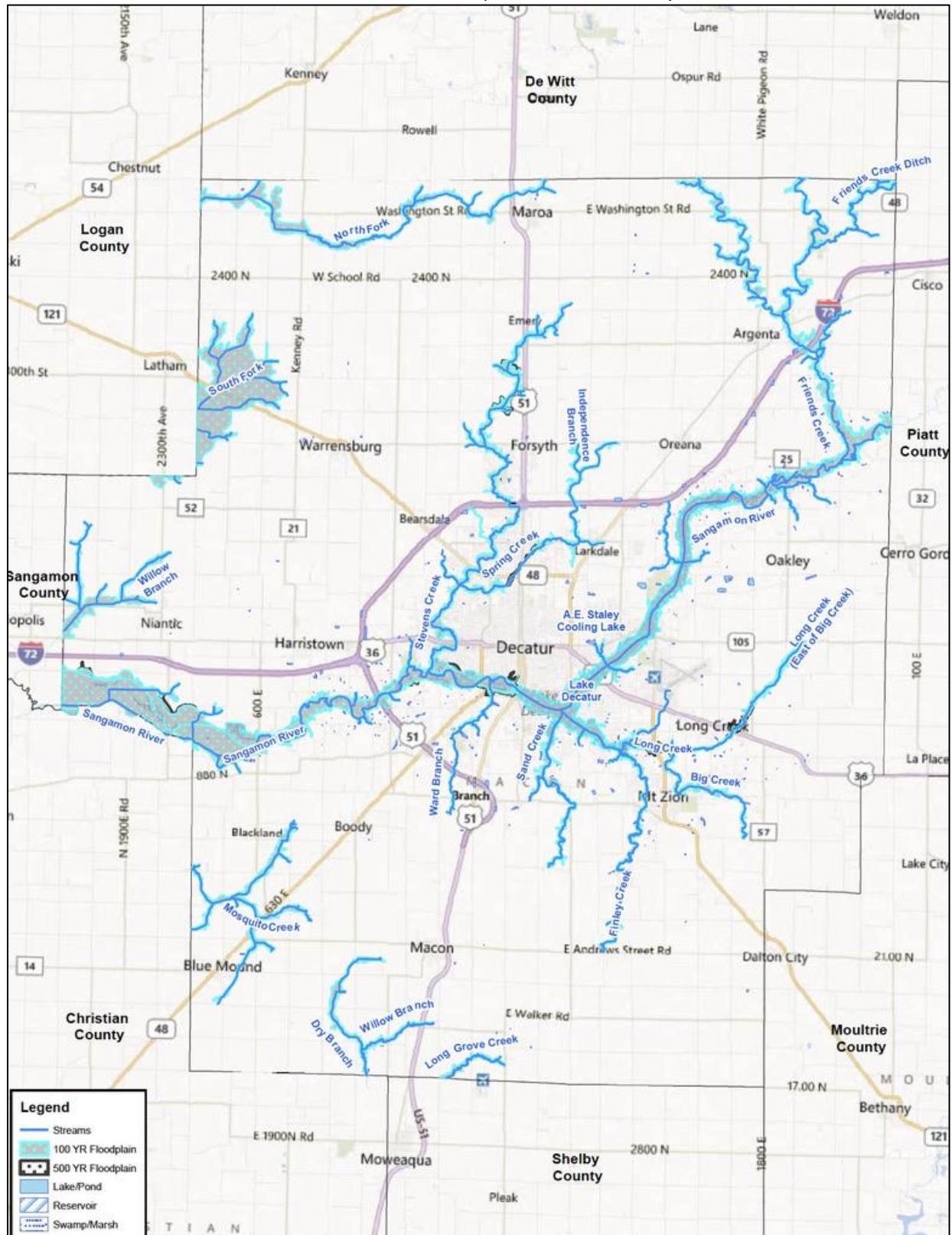
A healthy watershed has the structure and function in place to support healthy aquatic ecosystems. Key components of a healthy watershed include:

- Intact and functioning headwater streams, floodplains, riparian corridors, biotic refugia, instream habitat, and biotic communities.
- Natural vegetation in the landscape; and
- Hydrology, sediment transport, fluvial geomorphology, and disturbance regimes expected for its location.

A stream's flow regime refers to its characteristic pattern of flow magnitude, timing, frequency, duration, and rate of change. The flow regime plays a central role in shaping aquatic ecosystems and the health of biological communities. Alteration of natural flow regimes (e.g., more frequent floods) can reduce the quantity and quality of aquatic habitat, degrade aquatic life, and result in the loss of ecosystem services (US Environmental Protection Agency, 2023).

4.9.2 Hazard Location

Exhibit 4-27. FEMA Floodplains in Macon County



4.9.3 Hazard Extent/Intensity

The NFIP classifies floods through the use of recurrence intervals as seen in Table 4-27.

Table 4-27. NFIP Flood Recurrence Intervals

Flood Recurrence Interval	Chance of occurrence during any given year
5 year	20%
10 year	10%
50 year	2%
100 year	1%
500 year	0.20%

The federal standard for floodplain management under the National Flood Insurance Plan (NFIP) is the 100-year floodplain. This area is chosen using historical data such that in any given year there is a 1% chance of a “base flood (also known as 100-year flood or regulatory flood). A base flood is one that covers or exceeds the 100-year floodplain. A 500-year floodplain is an area with at least a .2% chance of flood occurrence in any given year.

When surface water runoff introduced into streams and rivers exceeds the capacity of the natural or constructed channels to accommodate the flow, water overflows the stream banks, spilling out into adjacent low-lying areas. Riverine flooding occurs as a consequence (FEMA, 2023).

Riverine flooding can cause two types of floods: overbank flooding and flash floods. Overbank flooding is the “increase in volume of water within a river channel and the overflow of water from the channel onto the adjacent floodplain (FEMA, 2023).

Flash floods are the most dangerous kind of floods because they combine the destructive power of a flood with incredible speed and unpredictability. Flash floods occur when excessive water fills normally dry creeks or riverbeds along with currently flowing creeks and rivers, causing rapid rises of water in a short amount of time. They can happen with little or no warning (FEMA, 2023).

The extent for flash flooding in Macon County can range from a few inches of water to multiple feet (historical reported range from 2 to 3 feet in low-lying areas).

Additionally, a levee or dam failure can also produce a flash flood. Flooding is one of the most common natural hazards that occur within Macon County, and within the United States.

4.9.4 Probability and Frequency

Riverine Flooding: From 1957 through 2023, 23 major floods in Illinois resulted in State or Federal Disaster Declarations (FEMA, 2023).

Urban/Depressional Flooding: The frequency of urban flooding is dependent on seasonal weather patterns. Urban flooding is usually caused by inadequate drainage following heavy rainfall or rapid snowmelt. Urban flooding is more likely to occur in spring when thunderstorms and snow melt are more prominent.

Urban areas (such as Decatur) are typically connected to municipal sewer systems (stormwater and/or sanitary sewer). Understanding this, it is more probable that urban flooding will occur within this area. Additionally, as development continues within Decatur, an increase in urban flooding may occur.

National Flood Insurance Program (NFIP) Participation

All Macon County communities are known to have adopted local ordinances and/or site plan review standards that regulate construction and land uses within designated floodplains.

Policies In-Force: According to FEMA, Macon County communities has 101 insurance policies in-force, totaling \$24,277,000.

Table 4-28. Summary of NFIP Policies and Claims

Community Name (Number)	Policies In-Force	Total Coverage	Total Written Premium + FPF
Village of Argenta (170942)	1	\$553,000	\$724
Village of Blue Mound (170946)	1	\$235,000	\$725
City of Decatur (170429)	52	\$13,113,000	\$53,021
Village of Forsyth (171017)	20	\$ 4,925,000	\$20,069
Village of Long Creek (171016)	1	\$ 350,000	\$631
Macon County (170928)	12	\$ 2,408,000	\$10,194
Village of Mount Zion (170962)	1	\$ 210,000	\$490
Unknown (Unknown)	13	\$2,483,000	\$14,183
----- Totals -----	101	\$24,277,000	\$100,037
Source: FEMA as of 08/31/2023			

Table 4-29. NFIP Participation

Community Name	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date	CRS Participation	Opportunity to and Reason for not participating in NFIP
Macon County	09/08/78	12/04/84	06/07/17	12/04/84	No	-
Village of Argenta	01/12/79	06/16/11	06/16/11	08/24/12	No	-
Village of Blue Mound	11/03/78	07/18/85	06/16/11 (M)	07/18/85	No	-
City of Decatur	05/24/74	08/01/79	06/07/17	08/01/79	No	-
Village of Forsyth	09/08/78	12/04/84	06/07/17	01/06/88	No	-
Village of Harristown	-	-	-	-	-	Flood risk is low. Not within the 100-year floodplain. Will explore participation in future updates, if appropriate, based on further analysis.
Village of Long Creek	09/08/78	12/04/84	06/16/11	12/16/02	No	-
City of Macon	-	-	-	-	No	Flood risk is low. Not within the 100-year floodplain. Will explore participation in future updates, if appropriate, based on further analysis.
City of Maroa	-	06/16/11	06/16/11	-	No	Sanction Date: 06/16/12 Lack of capacity. Will explore participation in future updates, if appropriate, based on further analysis.
Village of Mount Zion	03/02/79	09/18/85	06/16/11	09/18/85	No	-
Village of Niantic	-	-	-	-		Lack of capacity. Will explore participation in future updates, if appropriate,

						based on further analysis.
Village of Oreana	-	-	-	-		Flood risk is low. Not within the 100-year floodplain. Will explore participation in future updates, if appropriate, based on further analysis.
Village of Warrensburg	-	-	-	-		Flood risk is low. Not within the 100-year floodplain. Will explore participation in future updates, if appropriate, based on further analysis.

4.9.5 Past Events

Table 4-30 provides a summary of all flood events that have occurred within Macon County from 2010 to 2022. Historical summaries of select floods from Table 4-30 are provided immediately following the table.

Table 4-30. Macon County Recorded Flood and Flash Flood Events (2010-2022)

Location	County	State	Date	Time	Type	Dth	Inj	PrD	CrD
Totals:						0	0	20.075M	0.00K
NIANTIC	MACON CO.	IL	06/12/2010	15:45	Flash Flood	0	0	0.00K	0.00K
HEMAN	MACON CO.	IL	06/22/2010	09:30	Flash Flood	0	0	0.00K	0.00K
NIANTIC	MACON CO.	IL	07/24/2010	21:00	Flash Flood	0	0	75.00K	0.00K
NIANTIC	MACON CO.	IL	05/31/2013	21:30	Flash Flood	0	0	0.00K	0.00K
NIANTIC	MACON CO.	IL	06/01/2013	00:00	Flash Flood	0	0	0.00K	0.00K
HEMAN	MACON CO.	IL	06/22/2013	14:30	Flash Flood	0	0	0.00K	0.00K
HEMAN	MACON CO.	IL	07/10/2013	09:00	Flash Flood	0	0	0.00K	0.00K
HEMAN	MACON CO.	IL	02/20/2014	17:15	Flash Flood	0	0	0.00K	0.00K
KNIGHTS	MACON CO.	IL	06/04/2014	02:30	Flash Flood	0	0	0.00K	0.00K

WARRENSBURG	MACON CO.	IL	08/26/2014	20:00	Flash Flood	0	0	20.000M	0.00K
PRAIRIE HALL	MACON CO.	IL	12/26/2015	23:00	Flash Flood	0	0	0.00K	0.00K
PRAIRIE HALL	MACON CO.	IL	12/27/2015	04:00	Flood	0	0	400.00K	0.00K
NIANTIC	MACON CO.	IL	05/19/2017	03:00	Flash Flood	0	0	0.00K	0.00K
HARRISTOWN	MACON CO.	IL	06/22/2020	16:20	Flash Flood	0	0	0.00K	0.00K
BEARSDALE	MACON CO.	IL	06/22/2020	16:20	Flash Flood	0	0	0.00K	0.00K
BEARSDALE	MACON CO.	IL	08/02/2022	08:37	Flash Flood	0	0	0.00K	0.00K
MT ZION	MACON CO.	IL	08/03/2022	20:44	Flash Flood	0	0	0.00K	0.00K
MT ZION	MACON CO.	IL	08/03/2022	20:44	Flood	0	0	0.00K	0.00K
BEARSDALE	MACON CO.	IL	09/03/2022	22:00	Flash Flood	0	0	0.00K	0.00K
FORSYTH	MACON CO.	IL	09/04/2022	14:30	Flash Flood	0	0	0.00K	0.00K
Totals:						0	0	20.075M	0.00K

2010: A thunderstorm produced a heavy downpour with more than 1.50 of rain in 30 minutes across central Macon County, including the city of Decatur. Numerous streets were flooded, and the roof of a food pantry collapsed, which damaged the contents of the building.

2014: A severe thunderstorm produced 2.00 to 3.00 of rain within one hour in parts of central Macon County, including the cities of Decatur and Mt. Zion. The flash flooding resulted in the closure of numerous streets and viaducts in Decatur, as well as basement flooding to numerous homes and businesses. The flash flooding also impacted several rural roads from Harristown through Decatur to Mt. Zion. The flooding subsided by late evening.

2015: An extended period of heavy rain during the late evening of December 26th in Macon County combined with an already saturated ground to produce flash flooding. Rainfall amounts ranged from 3.00 to 3.50 inches in less than six hours, with the heaviest rain in the southern half of the county. Most rural roads and state highways were flooded and impassable. Locations from Blue Mound through Macon toward Dalton City and south toward the county line with Christian and Shelby County were the most impacted. The flooding continued through all of December 27th. Additional rainfall of 2.30 to 2.70 from December 28th into the 29th aggravated the flooding situation significantly, and spread into the central part of the county, resulting in basement flooding in many parts of Decatur. Nearly every road between State Route 48 and 121 in southern Macon County was flooded for about three days. The flood water finally subsided by the afternoon of December 30th.

4.9.6 Vulnerability and Impacts

Life Safety and Public Health: Safety and health concerns during a flood range greatly. One of the primary issues communities' experiences, especially during flash floods, are vehicles getting stuck and/or swept away by rapidly moving waters. These scenarios also present danger to first responders and bystanders attempting to rescue vehicle occupants.

According to FEMA:

- Six inches of water will reach the bottom of most passenger cars, causing loss of control and potential stalling.
- A foot of water will float many vehicles.
- Two feet of rushing water will carry away most vehicles, including SUVs and pickups.

Just as it is recommended for vehicles to stay away from standing and/or moving flood waters, the same is recommended for individuals. Flood waters can be both unsanitary and dangerous. When individuals do get stuck within flood waters, some experience heart attacks and other medical conditions while trying to free themselves from the water. Contact with flood waters can increase the possibility of contracting a communicable disease (and other medical issues as a result of pollutants, chemicals, waste, and an increased number of insects) (CDC, 2023).

When receding, flood waters can also saturate the ground which leads to infiltration into sanitary sewer lines. When wastewater treatment facilities are flooded, there is often nowhere for the treated sewage to be discharged or inflowing sewage to be stored. Infiltration and lack of treatment lead to overloaded sewer lines which back up into low-lying areas and some homes. Even though diluted by flood waters, raw sewage can be a breeding ground for bacteria, such as *E. coli*, and other disease-causing agents. Because of this threat, tetanus shots are given to people affected by a flood (CDC, 2023).

Stagnant water is often a perfect breeding ground for insects, specifically mosquitoes, known to carry and distribute various types of diseases. Standing water also creates mold, which can be a health issue to everyone, but is an extreme hazard to those with breathing issues, children, and the elderly. If forced-air systems are affected by floods, and are not subsequently cleaned properly, individuals may inadvertently breathe in pollutants. If the water system loses pressure, a boil order may be issued to protect people and animals from contaminated water (CDC, 2023).

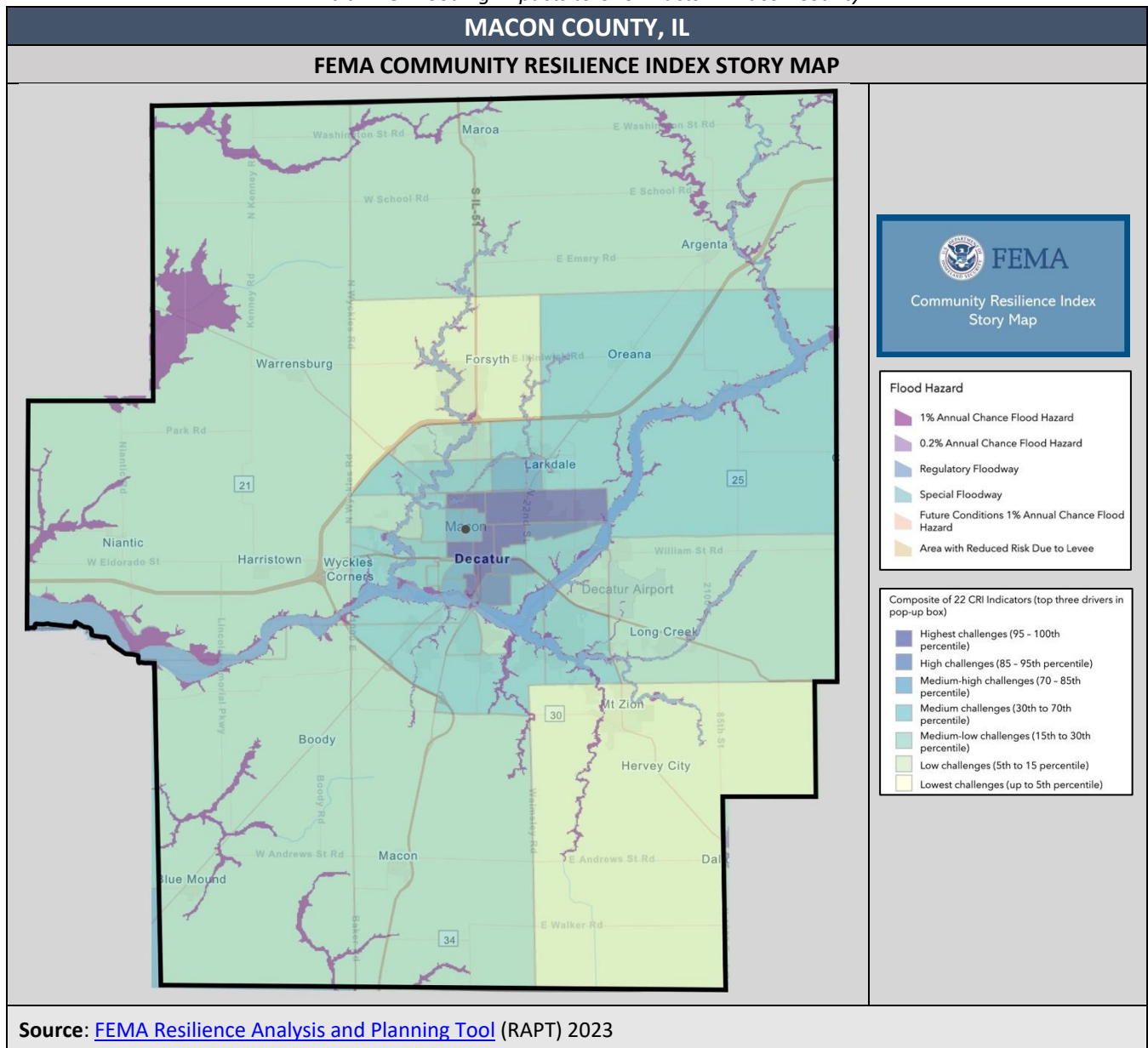
The force of flood waters can damage gas lines, which creates the potential for secondary hazards such as gas leaks and fires. This force, along with standing water, can also damage the structural integrity of buildings, which can cause injuries if issues go unnoticed or unrepaired. While fires have not resulted from flooding within Macon County, history shows that floods can prevent fire departments and protection agencies from successfully combating and sometimes even accessing a fire, allowing it to spread (CDC, 2023).

According to FEMA, flooding can also disproportionately impact disadvantaged or challenged communities in the following ways:

- Lack of Resilience Infrastructure: Disadvantaged communities often lack the infrastructure necessary to mitigate flood impacts, such as well-maintained levees, flood barriers, and stormwater management systems. The absence of these protective measures can make these areas more susceptible to flooding and its consequences.
- Inadequate Housing: Residents of disadvantaged communities may be more likely to live in substandard housing or low-lying areas that are prone to flooding. Such housing may lack flood-resistant construction and may not provide adequate protection during floods.
- Limited Financial Resources: These communities often have fewer financial resources to prepare for, respond to, and recover from flooding. This can lead to difficulties in purchasing flood insurance, repairing flood-damaged homes, or accessing emergency resources.
- Health Vulnerabilities: Residents of disadvantaged communities may have higher rates of pre-existing health conditions or limited access to healthcare services. Flooding can exacerbate these health vulnerabilities, especially if contaminated floodwater spreads diseases or disrupts medical care.
- Transportation Challenges: Limited access to reliable transportation can hinder evacuation efforts during flooding events, placing residents in these areas at greater risk. Public transportation options may be insufficient or inaccessible, leaving residents stranded.
- Information Access: Disadvantaged communities may have limited access to timely and accurate information about flood risks and preparedness measures. This lack of information can lead to delayed or inadequate responses to flood warnings.
- Environmental Justice Concerns: Flooding can lead to the release of hazardous materials, contaminating soil and water. Disadvantaged communities are more likely to be located near industrial sites or toxic facilities, exacerbating environmental justice concerns.
- Community Disruption: Flooding can displace residents from their homes, disrupting communities and increasing social and economic hardships. The process of recovery and rebuilding may take longer in these areas due to limited resources.

The FEMA Community Resilience Challenges Index (CRCI) provides a relative assessment of a community's potential resilience and gives insights into population and community characteristics from which to build emergency operations plans and targeted outreach strategies. Exhibit 4-28 illustrates the impact of flooding to CRCI tracts in Macon County.

Exhibit 4-28. Flooding Impacts to CRCI Tracts in Macon County



Property Damage and Critical Infrastructure: A HAZUS analysis was conducted for a 100-year flood to examine the exposure and damages of buildings to flooding.

100-year Flood Analysis:

Building Damage

Hazus estimates that about 35 buildings will be at least moderately damaged. This is over 78% of the total number of buildings in the scenario. There are an estimated 4 buildings that will be completely destroyed.

Essential Facility Damage

Zero essential facilities are expected to be moderately or completely damaged.

Debris Generation

Hazus estimates that a total of 1,122 tons of debris will be generated. Of the total amount, Finishes debris (dry wall, insulation, etc.) comprises 63% of the total, Structural debris (wood, brick, etc.) comprises 22% of the total, and Foundation debris (concrete slab, concrete block, rebar, etc.) comprises 15%. If the debris tonnage is converted into an estimated number of truckloads, it will require 45 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Shelter Requirements

Hazus estimates 211 households (or 632 people) will be displaced due to the flood. Of these, 237 people will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 61.10 (millions of dollars), which represents 2.67% of the total replacement value of the scenario buildings.

Building-Related Losses

The total building-related losses were 41.14 (millions of dollars); 33% of the estimated losses were related to the business interruption of the region. Residential occupancies made up 53.56% of the total loss.

Repetitive Loss Properties:

There are several different definitions of a “repetitive loss property.” The current FEMA definition of a repetitive loss property is:

“Repetitive Loss Structure: An NFIP-insured structure that has had at least two paid flood losses of more than \$1,000 each in any 10-year period since 1978.” (FEMA, 2023).

Additionally, the definitions of a severe repetitive loss building and severe repetitive loss property are:

“Severe Repetitive Loss Building: Any building that:

1. Is covered under a Standard Flood Insurance Policy made available under this title.
2. Has incurred flood damage for which:
 - a. Four or more separate claim payments have been made under a Standard Flood Insurance Policy issued pursuant to this title, with the amount of each such claim exceeding \$5,000 and with the cumulative amount of such claims payments exceeding \$20,000; or
 - b. At least two separate claims payments have been made under a Standard Flood Insurance Policy, with the cumulative amount of such claim payments exceeding the fair market value of the insured building on the day before each loss” (FEMA, 2023).

“Severe Repetitive Loss Property: Either a severe repetitive loss building or the contents within a severe repetitive loss building, or both” (FEMA, 2023).

Macon County currently has sixteen (16) single family residence repetitive loss properties. The majority of these properties are in the City of Decatur and are caused by flooding from Lake Decatur, Stevens Creek, or Big Creek.

Table 4-31. Macon County Repetitive Loss Properties

County	Number of Repetitive Loss Properties	Total Losses	Total Insurance Claims Paid (\$)	Average Insurance Claim Paid (\$)
Macon County	16	37	540,917.36	14,619.39

Source: IEMA, 2023

FEMA encourages the mitigation of severe repetitive loss and repetitive loss properties through the distribution of mitigation grants, the NFIP’s Increased Cost of the Compliance program, and the Community Rating System (CRS) program. Depending on the number of repetitive loss properties within a CRS community, the community may be required to develop a specific plan to determine the causes of the repetitive claims and ways to mitigate the causes of the repetitive claims. At a minimum, each CRS community must conduct an annual outreach project to these properties advising the owners of their location in the regulatory floodplain, property protection measures, and any funding options for property protection and flood insurance.

FEMA offers several programs to support communities in identifying and addressing the root causes of their repetitive losses. One such program is the Community Rating System (CRS), which this Plan fulfills the requirements for as outlined in Chapter 5.

Flooding can also disproportionately impact property damage and critical infrastructure within disadvantaged or challenged communities. Here are some of the ways in which flooding can affect these communities more severely:

- **Housing Vulnerability:** Disadvantaged communities often have a higher percentage of residents living in substandard or poorly constructed housing. These homes are more susceptible to flood damage, leading to significant property losses and displacement of residents.
- **Limited Insurance Coverage:** Residents in disadvantaged communities may be less likely to have flood insurance, either due to affordability issues or lack of awareness. This leaves property owners financially vulnerable when flooding occurs, resulting in a heavier burden of property damage.
- **Inadequate Infrastructure:** Critical infrastructure, such as roads, bridges, sewage systems, and utilities, may be subpar or outdated in disadvantaged areas. Flooding can damage or disrupt these systems, impeding emergency response efforts and hindering recovery.
- **Healthcare Facilities:** These communities may have limited access to healthcare facilities and services. Flooding can damage or inundate healthcare facilities, making it challenging for residents to access medical care during and after a flood event.

- Schools and Education: Flood damage to schools can disrupt education for children in these communities. It may take longer for schools to reopen, affecting students' academic progress and overall well-being.
- Economic Impact: Flooding can devastate local economies, including small businesses, which are often the backbone of disadvantaged communities. Loss of income and job displacement can have long-lasting economic consequences.
- Transportation Disruptions: Inadequate transportation infrastructure can be overwhelmed by floodwaters, making it difficult for residents to evacuate or access emergency services. This can also impede the delivery of essential supplies and aid.
- Environmental Justice: Disadvantaged communities may be more likely to be located near industrial or hazardous sites, which can release pollutants during flooding events, further exacerbating environmental justice concerns.

Exhibit 4-29 illustrates flooding impact to critical infrastructure in Macon County.

Exhibit 4-29. Flooding Impacts to Critical Infrastructure in Macon County

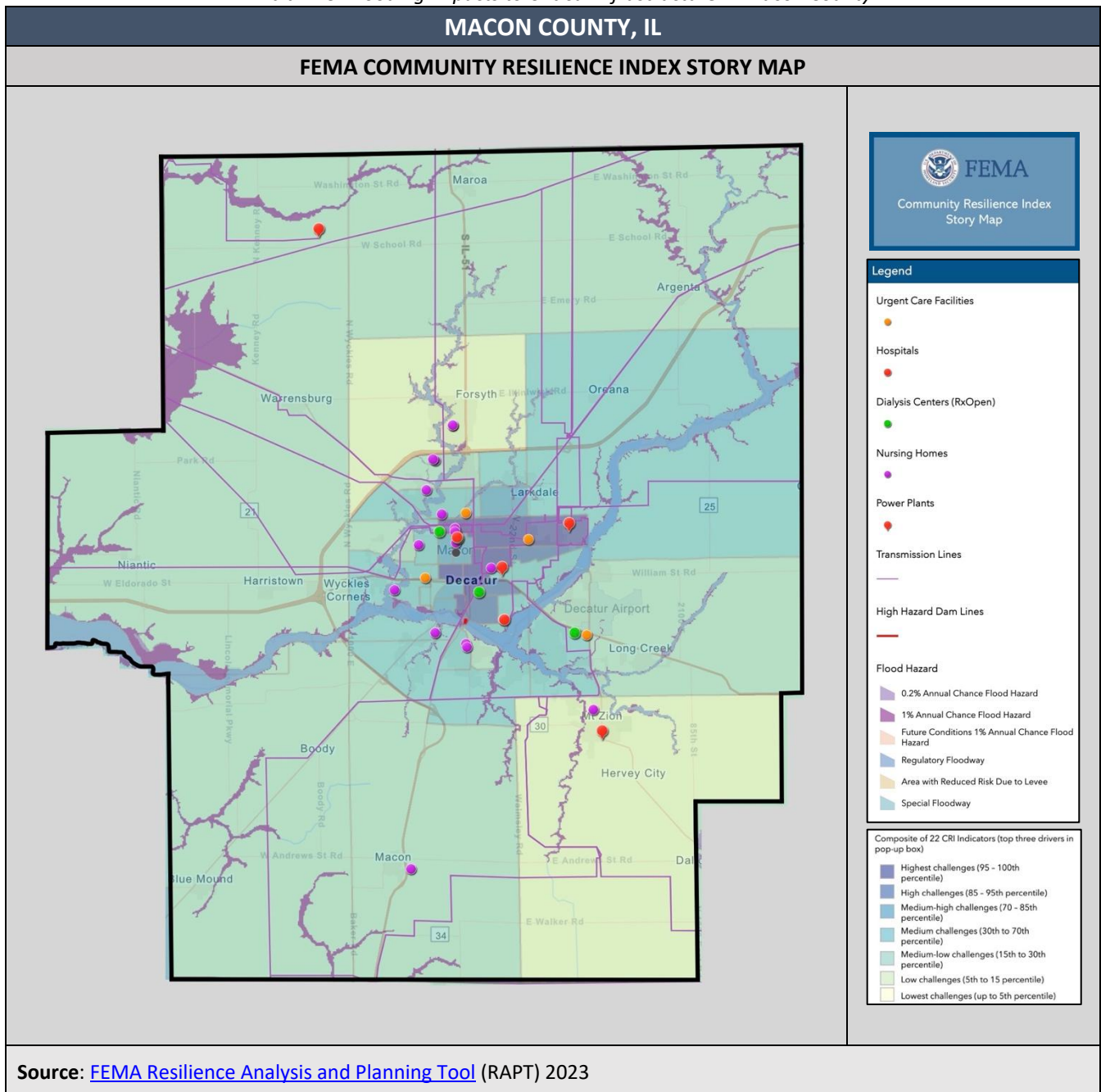
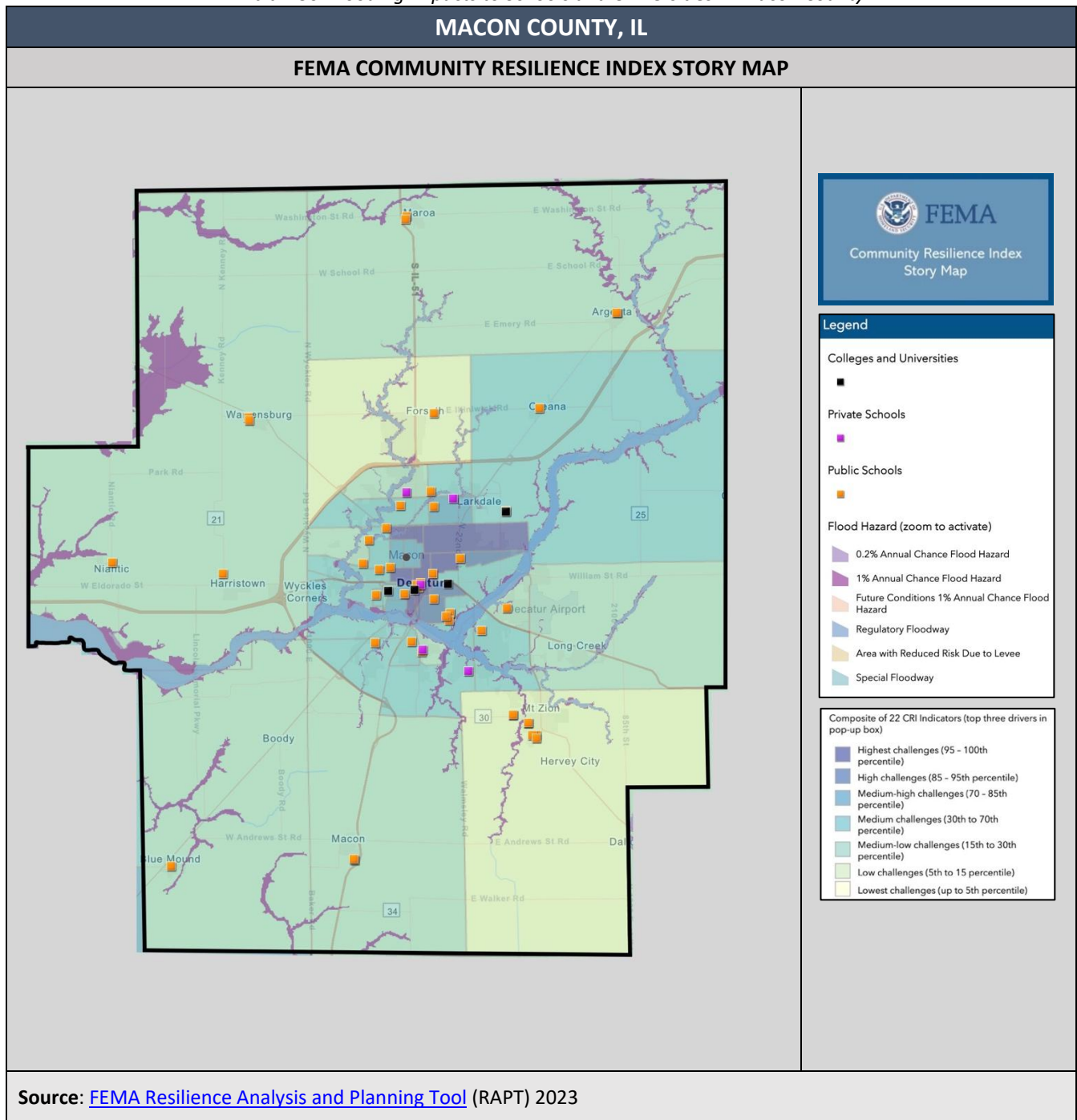


Exhibit 4-30 illustrates flooding impact to schools and universities in Macon County.

Exhibit 4-30. Flooding Impacts to Schools and Universities in Macon County



Economy: Flooding can have several different impacts to the Macon County economy. One potential impact is damage to businesses and infrastructure. Flooding can damage or destroy buildings, equipment, and inventory, which can disrupt operations and result in significant financial losses for businesses. Infrastructure such as roads, bridges, and utilities can also be damaged, which can impede transportation and communication networks, and further disrupt the operations of businesses and other economic activity.

Another potential economic impact includes property values and insurance rates. Properties located in flood-prone areas may see a decline in value, and insurance rates may increase as the risk of flooding becomes higher. This can make it more difficult for homeowners and businesses to secure loans and other forms of financing.

Changes in Development and Impact of Future Development: The risks associated with flooding are directly related to the population and infrastructure located within the boundaries of the riverine floodplains. Development should be limited in these potential impact areas. Infrastructure improvements should also consider potential impacts. Existing floodplain and construction regulations are in place to help reduce the impacts from flooding. Storm water infrastructure should also be looked at to determine the impact from flash flooding. This infrastructure does not always take into effect the growth of a community. An increase in impervious surfaces (e.g., concrete parking lots) may cause increased storm water runoff during short rain events.

Effects of Climate Change on Severity of Impacts: Heavy precipitation leads to both riverine flooding and flash floods as the ground fails to absorb the high volume of precipitation that falls in a short period. Increasing annual precipitation contributes to sustained flooding (Neighborhoods At Risk, 2023).

Exhibit 4-31 illustrates 25-year precipitation projections for Macon County, while Table 4-32 illustrates future climate indicators for Macon County.

Exhibit 4-31. 25-Year Precipitation Projections for Macon County

25-YEAR PRECIPITATION PROJECTIONS FOR MACON COUNTY, IL	
HIGHER EMISSIONS (RCP8.5)	
Macon County is expected to experience a 15% increase in heavy precipitation within 25 years.	
By 2048, Macon County is expected to experience 0.7 more days of heavy precipitation per year (from 4.4 days to 5.1 days per year).	
LOWER EMISSIONS (RCP4.5)	
Macon County is expected to experience a 9% increase in heavy precipitation within 25 years.	
By 2048, Macon County is expected to experience 0.04 more days of heavy precipitation per year (from 4.4 days to 4.9 days per year).	
Source: Neighborhoods at Risk (https://nar.headwaterseconomics.org/)	

Table 4-32. Future Climate Indicators for Macon County

FUTURE CLIMATE INDICATORS FOR MACON COUNTY, IL							
Indicator	Modeled History (1976-2005)	Early Century (2015-2044)		Mid Century (2035-2064)		Late Century (2070-2099)	
		Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions
	Min-Max	Min-Max	Min-Max	Min-Max	Min-Max	Min-Max	Min-Max
Precipitation:							
Annual Average Total Precipitation	38"	39"	39"	39"	40"	40"	41"
	36-39	37-43	33-42	34-44	35-43	34-44	34-46
Days Per Year With Precipitation (Wet Days)	181 days	179 days	178 days	178 days	177 days	177 days	173 days
	177-187	163-189	161-189	159-195	152-193	162-190	135-198
Maximum Period of Consecutive Wet Days	12 days	12 days	12 days	12 days	12 days	12 days	12 days
	11-13	10-13	10-14	10-14	10-14	11-14	10-15
Annual Days With:							
Annual Days With Total Precipitation > 1 inch	4 days	5 days	5 days	5 days	5 days	5 days	6 days
	3-5	4-6	3-6	3-6	4-7	3-7	4-8
Annual Days With Total Precipitation > 2 inches	0 days	0 days	0 days	0 days	0 days	0 days	1 day
	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Annual Days With Total Precipitation > 3 inches	0 days	0 days	0 days	0 days	0 days	0 days	0 days
	0-0	0-0	0-0	0-0	0-0	0-0	0-0
Annual Days That Exceed 99 th Percentile Precipitation	5 days	6 days	6 days	6 days	7 days	7 days	8 days
	5-6	6-7	6-6	6-7	6-7	6-7	7-8
Days With Maximum Temperature Below 32°F	28 days	21 days	20 days	18 days	16 days	15 days	9 days
	25-31	13-27	16-26	10-26	9-24	8-24	2-19
Source: Climate Mapping for Resilience and Adaptation (2023)							

Jurisdiction-specific Hazard Impact/Vulnerability: Only those jurisdictions uniquely affected by floods are included. If a jurisdiction was not included, it denotes the hazard impact or vulnerability to floods is not significant and/or is adequately addressed at the county level. Jurisdictions completed the following form as part of the Plan update:

<https://integratedsolutions.wufoo.com/forms/macon-county-hazards/>

Table 4-33. Macon County Jurisdiction-specific Hazard Impact/Vulnerability

Jurisdiction	Affected Jurisdictions' Hazard Impact/Vulnerability Considerations
Argenta	Insufficient infrastructure (Oldweiler Ct. & Water St. ; Park St.) lacks capacity during flooding events. Storm sewers carry run-off from fields & seem inadequate to carry the amount of water needed.
Blue Mound	Excessive flooding at Dunbar St. and Depray St.
Decatur	City underpasses experience frequent flooding (examples include: Jasper St., Grand St., Condit St.). Sanitary storm sewers need upsizing and improvements. Improvements are being made.
Forsyth	The following locations experience frequent flooding: Stevens Creek subdivisions; Oakland Ave (runoff from Hickory Point Golf Course); Phillip Circle (runoff from fields).
Harristown	The following locations experience frequent flooding: Main street and Fieldcrest area. Maintaining ditches along State roads in the Village may mitigate this issue.
Long Creek	Municipality has many intersections and subdivisions that constantly flood.
Macon	The following locations experience frequent flooding: Woodcock Rd between Andrews St. & Gabriel Rd; Ruby Street. Sanitary Sewer System is vulnerable due to excess water to sanitary treatment plan and backups.
Maroa	The following locations experience frequent flooding: Wood Street; Main Street and Washington Street experience flash flooding during heavy rains due to the age and size of drainage system; Oak St.; Chestnut St.; Walnut St.; Lake Fork Creek. The northeast and southeast parts of the community are susceptible to flooding.
Niantic	Vulnerability to riverine-based flooding.
Oreana	The following locations experience frequent flooding: West Plains Dr. (due to drainage problems).
Blue Mound Township	The following locations experience frequent flooding: Meridian Rd; Public Rd at Katie Dr.; Pleasant View Rd at Mosquito Creek Rd; Boody Rd at Spring Creek (south of Potrafka St.); various creeks and ditches drain slowly and/or flood residential properties.

4.9.7 FEMA NRI Expected Annual Loss Estimates

Table 4-34. Macon County Expected Annual Loss Table

MACON COUNTY, IL EXPECTED ANNUAL LOSS TABLE FOR FLOODING EVENTS						
Annualized Frequency	Population	Population Equivalence	Building Value	Agriculture Value	Expected Annual Loss Score	Risk Index Rating
1.4 events per year	0.03	\$241,995	\$903,318	\$112,992	13.59	Relatively Moderate
Annualized Frequency: The natural hazard annualized frequency is defined as the expected frequency or probability of a hazard occurrence per year. Annualized frequency is derived either from the number of recorded hazard occurrences each year over a given period or the modeled probability of a hazard occurrence each year. Population: Population exposure is defined as the estimated number of people determined to be exposed to a hazard according to a hazard type-specific methodology. Expected Annual Loss scores are calculated using an equation that combines values for exposure, annualized frequency, and historic loss ratios (Expected Annual Loss = Exposure × Annualized Frequency × Historic Loss Ratio). Source: hazards.fema.gov/nri/expected-annual-loss						
Source: FEMA National Risk Index (2023)						

4.9.8 FEMA Hazard-Specific Risk Index Table

Table 4-35. Macon County Hazard Specific Risk Index Table

MACON COUNTY, IL FEMA HAZARD SPECIFIC RISK INDEX – FLOODING	
Risk Index Score	Risk Index Rating
13.52 / 100	Relatively Moderate
FEMA Hazard-Type Risk Index Scores are calculated using data for only a single hazard type and reflect a community's relative risk for only that hazard type. FEMA Hazard-Type Risk Index Ratings are a qualitative rating that describe the community in comparison to all other communities at the same level, ranging from “Very Low” to “Very High.”	
Source: FEMA National Risk Index (2023)	

4.10 High Hazard Dams and Levees

4.10.1 Hazard Description

A dam is defined as a barrier constructed across a watercourse for storage, control, or diversion of water. Dams typically are constructed of earth, rock, concrete, or mine tailings.

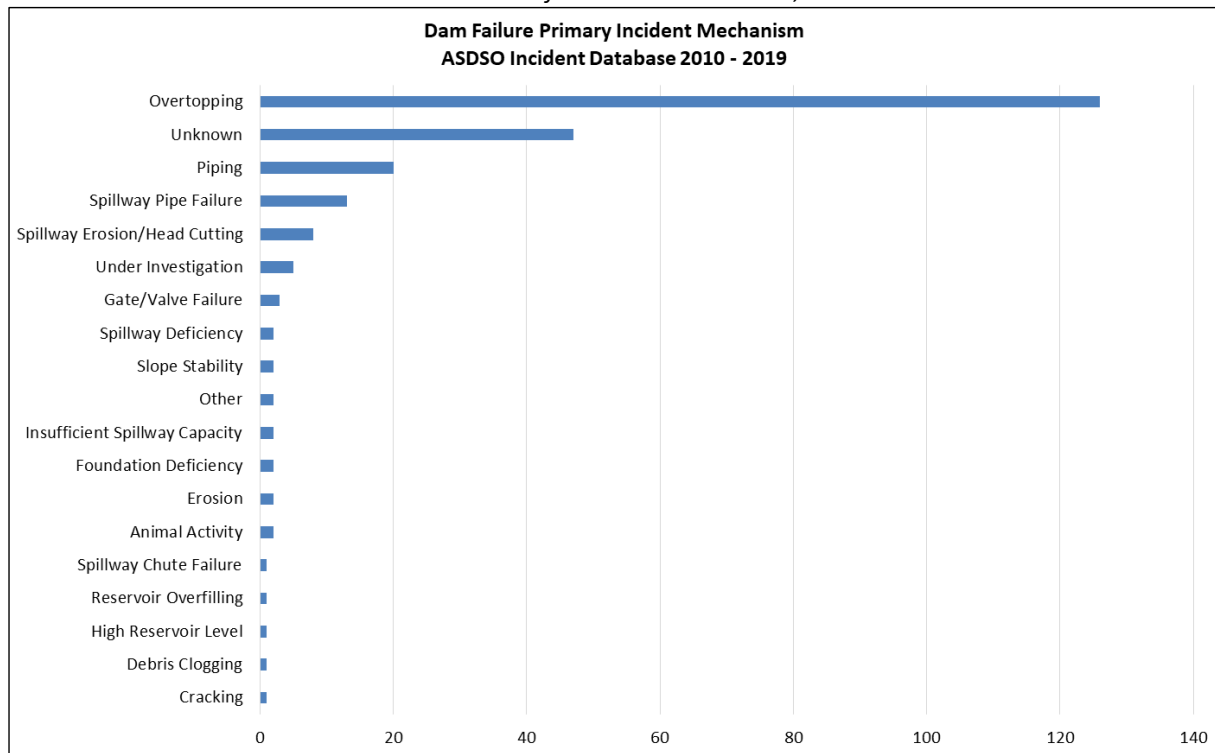
Levees are built to hold back flood waters only up to some maximum level, often the 100-year (1% annual probability) flood event. When that maximum is exceeded by more than the design safety margin, the levee will be overtopped or otherwise fail, inundating communities in the land previously protected by that levee. It has been suggested that climate change, land-use shifts, and some forms of river engineering may be increasing the magnitude of large floods and the frequency of levee failure situations.

Dam Failure: Failure characterized by the sudden rapid and uncontrolled release of impounded water or liquid-borne solids. It is recognized that there are lesser degrees of failure and that any malfunction or abnormality outside the design assumptions and parameters that adversely affect a dam's primary function of impounding water could be considered a failure.

The Causes of Dam Failure: Dam failures are most likely to happen for one of five reasons (ASDSO, 2023):

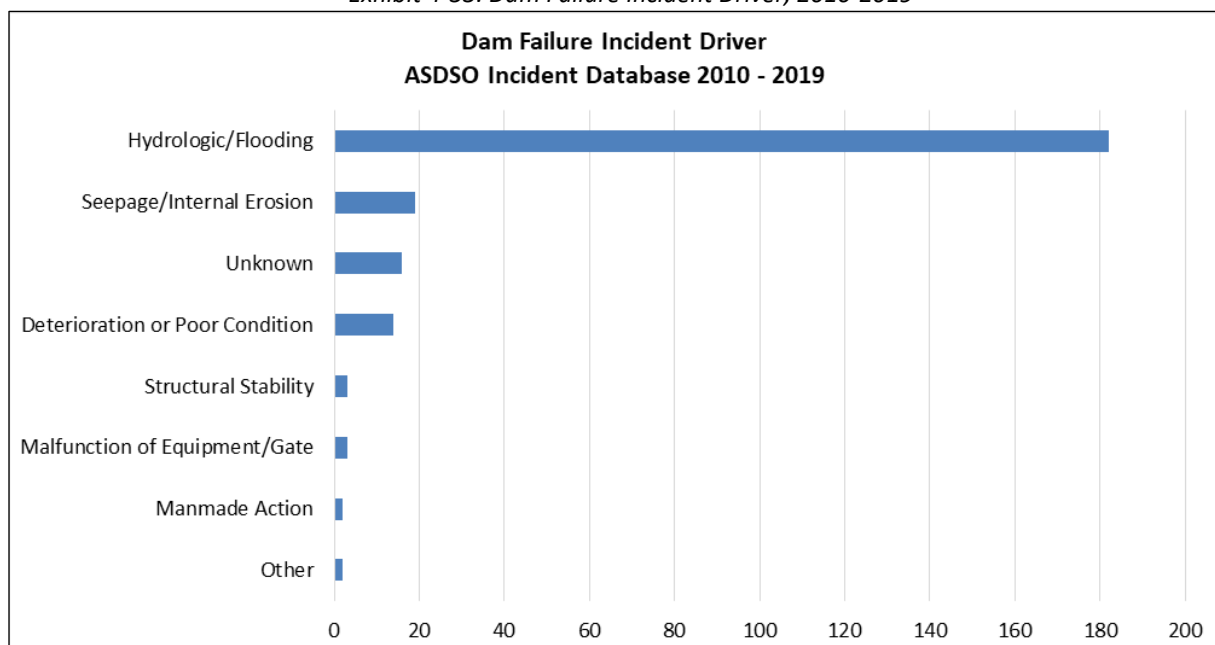
1. Overtopping caused by water spilling over the top of a dam. Overtopping of a dam is often a precursor of dam failure. National statistics show that overtopping due to inadequate spillway design, debris blockage of spillways, or settlement of the dam crest account for approximately 34% of all U.S. dam failures.
2. Foundation defects, including settlement and slope instability, cause about 30% of all dam failures.
3. Cracking caused by movements like the natural settling of a dam.
4. Inadequate maintenance and upkeep.
5. Piping is when seepage through a dam is not properly filtered, and soil particles continue to progress, and form sink holes in the dam. Another 20% of U.S. dam failures have been caused by piping (internal erosion caused by seepage). Seepage often occurs around hydraulic structures, such as pipes and spillways; through animal burrows; around roots of woody vegetation; and through cracks in dams, dam appurtenances, and dam foundations.

Exhibit 4-32. Causes of Dam Failure Incidents, 2010-2019**



**** From the ASDSO Dam Incident Database, dam failure incidents for the years 2010 through 2019. Incident data mostly obtained from the state dam safety programs and/or media reports. The incident data is not inclusive of all dam safety incidents.**

Exhibit 4-33. Dam Failure Incident Driver, 2010-2019



Levees and Levee Failure: Failure can be grouped into six main failure mechanisms: bearing failure, sliding failure, slump or spreading failure, seepage failure, erosion failure, and over topping (Moss and Eller, 2007). Although, when the water level exceeds the design standard for the level, it is not strictly a failure. Many levees have been constructed to meet the criteria for a 1% annual chance flood (a.k.a. 100-year flood). These levees are not designed to withstand a greater event, which may occur less frequently, but is expected to occur.

In Illinois, there are 2,923 levee structures and 576 levee systems totaling 1,951 miles of levees. The average age of levees in the U.S. is 55 years and in Illinois, the average age is 64. In Macon County, there are two Levee Systems.

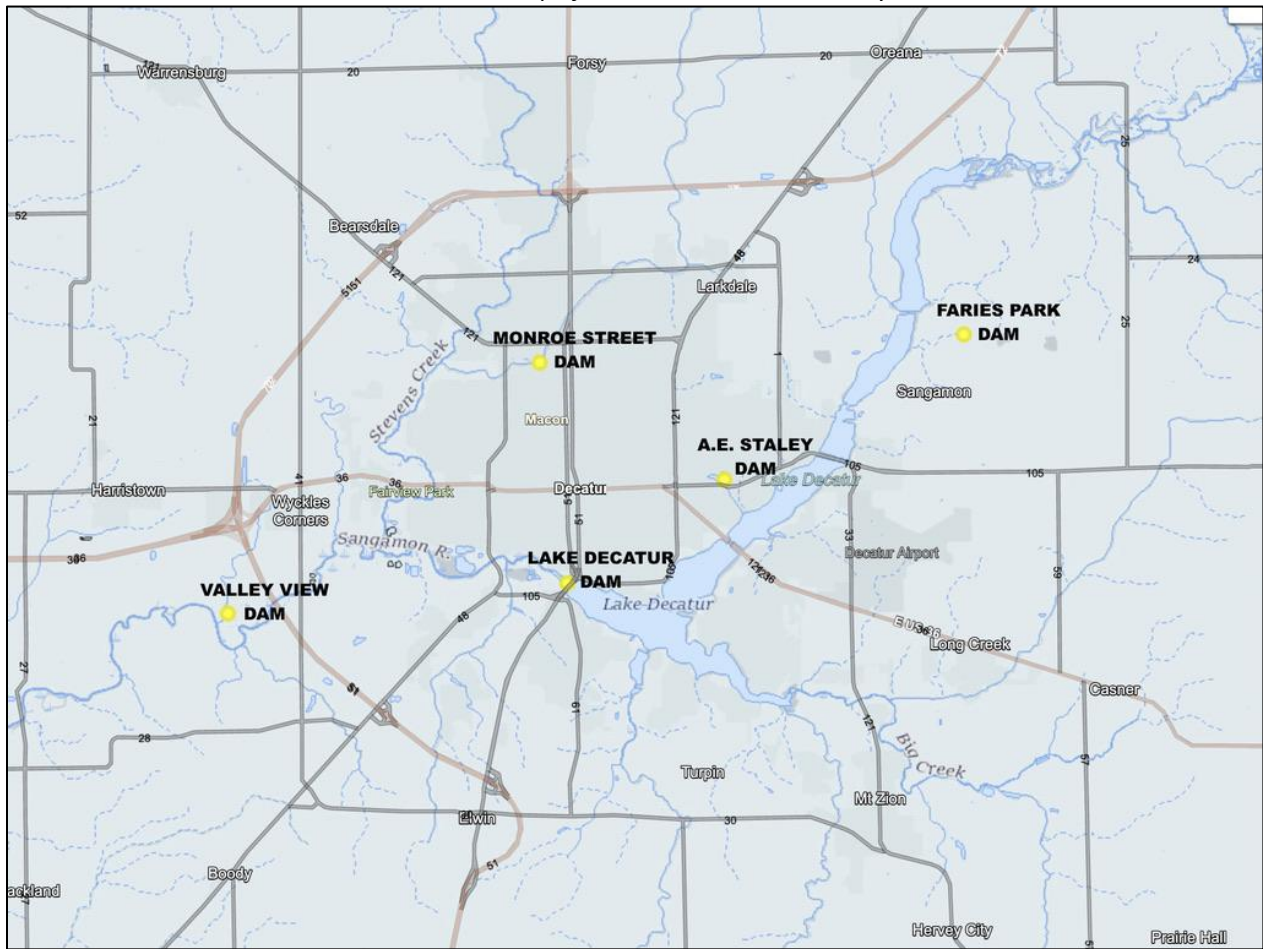
4.10.2 Hazard Location

Dams: There are three state-regulated dams and two private dams in Macon County as listed in Table 4-36. Three of these dams are classified as “high” or “significant” risk, which means they have sufficient downstream populations to warrant the classification. A map of these dams shown in Exhibit 4-34 illustrates the location of each dam within Macon County.

Table 4-36. List of Dams Within Macon County

Name	National ID#	Location	Owner	Year Built	Primary Purpose	Height (feet)	Storage Capacity (acre-feet)	Max Discharge (cubic feet/sec)	Hazard Potential Classification
Lake Decatur Dam	IL00146	Macon, Illinois	City of Decatur	1922	Recreation, Water Supply	33	57,520	64,000	High Hazard
Faries Park Dredge Disposal Dam	IL50316	Macon, Illinois	City of Decatur	1994	Debris Control	29	3,900	300	High Hazard
A.E. Staley Cooling Lake Dam	IL50515	Macon, Illinois	A.E. Staley Company	1944	Other, Water Supply	22	193	-	Significant Hazard
Monroe Street Dam	IL50091	Macon, Illinois	City of Decatur	1991	Flood Risk Reduction	16	182	4,400	Low Hazard
Valley View Dam	IL50584	Macon, Illinois	Private	-	Flood Risk Reduction	12	65	-	Low Hazard
Source: National Inventory of Dams (2023)									

Exhibit 4-34. Map of Dams Within Macon County



Levees: In Illinois, there are 2,923 levee structures and 576 levee systems totaling 1,951 miles of levees. The average age of levees in the U.S. is 55 years and in Illinois the average age is 64.

As seen in

Table 4-37, there is one Levee System totaling 5.93 miles of levee in Macon County. This levee structure was built in 1963 and has not been screened at the time of this Plan. Exhibit 4-35 illustrates a map view of the levee.

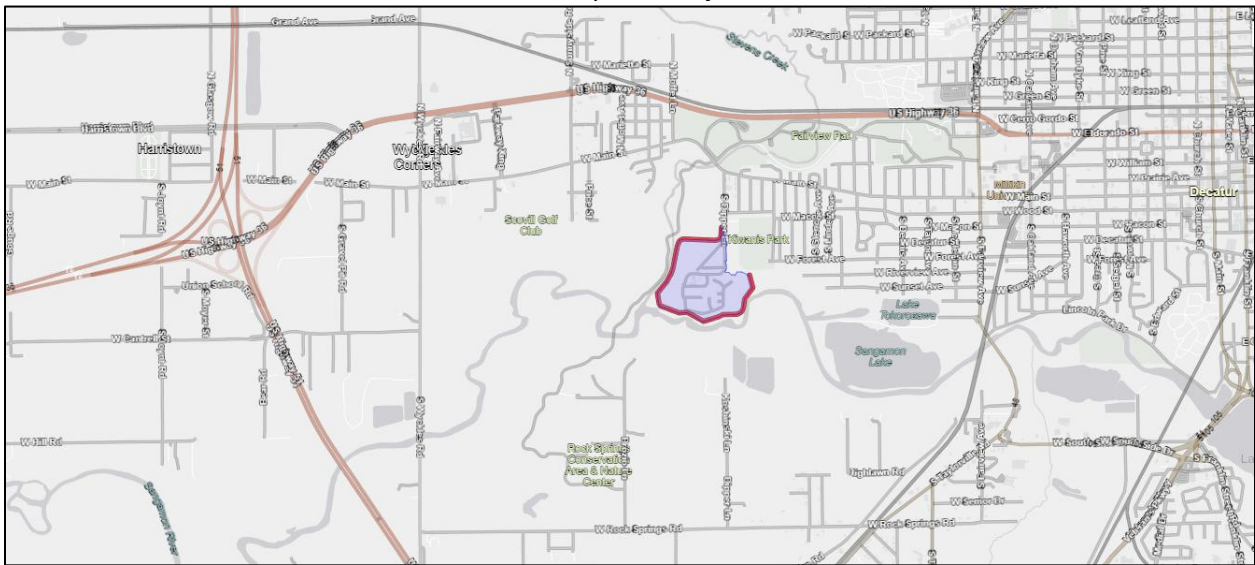
Table 4-37. List of Levees within Macon County

Name	System ID#	Location	Levee Safety Action Classification	People at Risk (protected by Levee)	Structures at Risk (protected by Levee)	Property Value	Total Miles	Length of Embankment (miles)	Length of Floodwall (miles)
Waddell-Ulrich Levee	260005000209	Illioipolis, Macon County, Illinois	Not Screened	0	0	\$0.00	5.93	5.93	-
Sanitary District of Decatur Levee	1505001260	Decatur, IL	Not Screened	0	2	\$0.00	1.22	1.22	-

Exhibit 4-35. Waddell-Ulrich Levee



Exhibit 4-36. Sanitary District of Decatur Levee



4.10.3 Hazard Extent/Intensity

Dams: Existing dam classification systems are numerous and vary within and between both federal and state agencies. Although differences in classification systems exist, they share a common thread: each system attempts to classify dams according to the potential impacts from a dam failure or mis-operation, should it occur. The hazard potential classification does not reflect in any way on the current condition of the dam (e.g., safety, structural integrity, flood routing capacity).

State and private classifications are the two primary dam hazard potential classification systems utilized in Macon County. Illinois dam classifications are defined under Ill. Admin. Code tit. 17, § 3702.30), and used to permit construction, operation, and maintenance of dams by the IDNR Division of Water Resource Management (DWRM). Federal dam safety hazard classifications can be found in FEMA's *Federal Guidelines for Dam Safety Hazard Potential Classification System for Dams* publication.

According to Title 17 Illinois Administrative Code (IAC), dams are categorized by Illinois state dam safety regulators in one of three classes according to the degree of threat to life and property in the event of dam failure:

Class I: "Dams that are located where failure has a high probability to cause loss of life or substantial economic loss more than that which would naturally occur downstream of the dam if the dam had not failed. A dam has a high probability for causing loss of life or substantial economic loss if it is located where its failure may cause additional damage to such structures as a home, hospital, a nursing home, a highly traveled roadway, a shopping center, or similar type facilities where people are normally present downstream of a dam." Similar to that of FEMA High Hazard Potential.

Class II: “Dams located where failure has a moderate probability for causing loss of life or may cause substantial economic loss more than that which would naturally occur downstream of the dam if the dam had not failed. A dam has a moderate probability for causing loss of life or substantial economic loss if it is located where its failure may cause additional damage to such structures as a water treatment facility, a sewage treatment facility, a power substation, a city park, a U.S. Route, or Illinois Route highway, a railroad or similar type of facilities where people are downstream of the dam for only a portion of the day or on a more sporadic basis.” Similar to FEMA Significant Hazard Potential.

Class III: “Dams located where failure has a low probability for causing loss of life, where there are no permanent structures for human habitation, or minimal economic loss more than that which would naturally occur downstream of the dam if the dam had not failed. A dam has a low probability for causing loss of life or minimal economic loss if it is located where its failure may cause additional damage to agricultural fields, timber areas, township roads or similar type areas where people are seldom present and where there are few structures.” Similar to FEMA Low Hazard Potential.

FEMA categorizes dams “according to the degree of adverse incremental consequences of a failure or mis-operation of a dam. The National Inventory of Dams uses the federal classification system. Dams are federally categorized into Low, Significant and High Hazard Potential based on the probable loss of human life and the impacts on economic, environmental, and lifeline interests. Improbable loss of life exists where persons are only temporarily in the potential inundation area.

1. **Low Hazard Potential:** dams where failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner’s property.
2. **Significant Hazard Potential:** dams where failure or mis-operation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns.
3. **High Hazard Potential:** dams where failure or mis-operation will probably cause loss of human life.

Levees: The Levee Safety Action Classification (LSAC) is one of the many tools used to better inform stakeholders and residents of the residual risk in their communities.

The LSAC is neither a levee rating or grade, it is a classification system designed to take into account the probability of the levees being loaded (Hazard), existing condition of the levee, the current and future maintenance of the levee (Performance), and the Consequences if a levee were to fail or be overwhelmed (US ACE, 2023). Exhibit 4-37 illustrates the Levee Safety Action Classification Table.

In Macon County, the two levees have no classification and have been identified as “Not Screened”.

Exhibit 4-37. Levee Safety Classification

USACE LEVEE SAFETY ACTION CLASSIFICATION TABLE*		
RISK	ACTIONS FOR LEVEE SYSTEMS AND LEVEED AREAS IN THIS CLASS (ADAPT ACTIONS TO SPECIFIC LEVEE SYSTEM CONDITIONS.)	RISK CHARACTERISTICS OF THIS CLASS
VERY HIGH (1)	Based on risk drivers, take immediate action to implement interim risk reduction measures. Increase frequency of levee monitoring; communicate risk characteristics to the community within an expedited timeframe; verify emergency plans and flood inundation maps are current; ensure community is aware of flood warning systems and evacuation procedures; and, recommend purchase of flood insurance. Support risk reduction actions as very high priority.	Likelihood of inundation due to breach and/or system component malfunction in combination with loss of life, economic, or environmental consequences results in very high risk.
HIGH (2)	Based on risk drivers, implement interim risk reduction measures. Increase frequency of levee monitoring; communicate risk characteristics to the community within an expedited timeframe; verify emergency plans and flood inundation maps are current; ensure community is aware of flood warning and evacuation procedures; and, recommend purchase of flood insurance. Support risk reduction actions as high priority.	Likelihood of inundation due to breach and/or system component malfunction in combination with loss of life, economic, or environmental consequences results in high risk.
MODERATE (3)	Based on risk drivers, implement interim risk reduction measures as appropriate. Verify risk information is current and implement routine monitoring program; assure O&M is up to date; communicate risk characteristics to the community in a timely manner; verify emergency plans and flood inundation maps are current; ensure community is aware of flood warning and evacuation procedures; and, recommend purchase of flood insurance. Support risk reduction actions as a priority.	Likelihood of inundation due to breach and/or system component malfunction in combination with loss of life, economic, or environmental consequences results in moderate risk.
LOW (4)	Verify risk information is current and implement routine monitoring program; assure O&M is up to date; communicate risk characteristics to the community as appropriate; verify emergency plans and flood inundation maps are current; ensure community is aware of flood warning and evacuation procedures; and, recommend purchase of flood insurance. Support risk reduction actions to further reduce risk to as low as practicable.	Likelihood of inundation due to breach and/or system component malfunction in combination with loss of life, economic, or environmental consequences results in low risk.
VERY LOW (5)	Continue to implement routine levee monitoring program, including operation and maintenance, inspections, and monitoring of risk. Communicate risk characteristics to the community as appropriate; verify emergency plans and flood inundation maps are current; ensure community is aware of flood warning and evacuation procedures; and recommend purchase of flood insurance.	Likelihood of inundation due to breach and/or system component malfunction in combination with loss of life, economic, or environmental consequences results in very low risk.
NO VERDICT	Not enough information is available to assign an LSAC.	

*LEVEE RISK IS THE RISK THAT EXISTS DUE TO THE PRESENCE OF THE LEVEE SYSTEM, AND THIS IS THE RISK USED TO INFORM THE DECISION ON THE LSAC ASSIGNMENT. THE INFORMATION PRESENTED IN THIS TABLE DOES NOT REFLECT THE OVERTOPPING WITHOUT BREACH RISK ASSOCIATED WITH THE PRESENCE OR OPERATION OF THE LEVEE SYSTEM.

4.10.4 Probability and Frequency

Dams: A dam can fail at any time, given the right circumstances. However, the probability of future occurrence is for regulated dams can be reduced due to proactive preventative action in compliance with IDNR-OWR's dam safety program. Illinois' dam safety program provides for

safety recommendations for signs, buoys, and short and long-term structural modifications – including dam removal.

As a dam ages, the likelihood of failure increases as undesirable woody vegetation on the embankment, deteriorated concrete, inoperable gates, and corroded outlet pipes become problems. Since dam failures are often exacerbated by flooding, the probability of dam failures can be associated with projected flood frequencies.

Levees: Accurate mapping of the risks of flooding behind levees, and determining probability, depends on knowing the condition and level of protection the levees actually provide. FEMA and the U.S. Army Corps of Engineers are working together to make sure that flood hazard maps clearly reflect the flood protection capabilities of levees, and that the maps accurately represent the flood risks posed to areas situated behind them. Levee owners— usually states, communities, or in some cases private individuals or organizations—are responsible for ensuring that the levees they own are maintained according to their design.

4.10.5 Past Events

There are no available records of dam or levee failures in Macon County. The State of Illinois experienced levee failures in 1993 and 2008. In 1993, 17 levee systems either failed, were overtopped, or were intentionally breached along the Mississippi River and the Illinois River just north of where it meets the Mississippi River. Over 237,000 acres along the rivers were flooded.

4.10.6 Vulnerability and Impacts

Life Safety and Public Health: Dam or levee failure can have severe impacts on life safety and public health. One of the most significant risks is the potential for injuries or fatalities resulting from the sudden release of water, which can cause rapid flooding. This danger is especially prevalent for people residing downstream or in low-lying areas. In addition to physical harm, dam or levee failure can also lead to displacement, forcing people near the affected area to evacuate their homes and disrupting their daily lives. However, the detrimental effects of such disasters are not limited to physical displacement alone.

Property Damage and Critical Infrastructure: Dam or levee failures can have extensive impacts on property damage and critical infrastructure. These failures lead to rapid and extensive flooding, causing significant property damage as floodwaters inundate homes, businesses, and various structures. Infrastructure like roads and bridges can be damaged or rendered impassable, disrupting transportation networks and access. Critical facilities such as electrical substations, water treatment plants, and communication centers may be submerged, resulting in power outages, water supply contamination, and communication disruptions. Moreover, environmental damage, economic consequences, social disruption, water supply contamination, community displacement, and the continued threat of additional flooding all contribute to the far-reaching impact of dam or levee failures on property and critical infrastructure.

Economy: No data exists demonstrating the economic impact of past dam failure events on Macon County. However, past events have shown to impact water supply, and could lead to costly repairs.

Changes in Development and Impact of Future Development: Future buildings' exposure to dam and levee failure would remain much the same as existing buildings if they are constructed in the inundation area. Future development is achieved by providing accurate stormwater and floodplain-related regulatory and zoning information to support effective and efficient development in Macon County.

Effects of Climate Change on Severity of Impacts: Heavy precipitation leads to both riverine flooding and flash floods as the ground fails to absorb the high volume of precipitation that falls in a short period. Increasing annual precipitation contributes to sustained flooding (Neighborhoods At Risk, 2023).

Exhibit 4-38 illustrates 25-year precipitation projections for Macon County, while Table 4-38 illustrates future climate indicators for Macon County.

Exhibit 4-38. 25-Year Precipitation Projections for Macon County

25-YEAR PRECIPITATION PROJECTIONS FOR MACON COUNTY, IL	
HIGHER EMISSIONS (RCP8.5)	
Macon County is expected to experience a 15% increase in heavy precipitation within 25 years.	
By 2048, Macon County is expected to experience 0.7 more days of heavy precipitation per year (from 4.4 days to 5.1 days per year).	
LOWER EMISSIONS (RCP4.5)	
Macon County is expected to experience a 9% increase in heavy precipitation within 25 years.	
By 2048, Macon County is expected to experience 0.04 more days of heavy precipitation per year (from 4.4 days to 4.9 days per year).	
Source: Neighborhoods at Risk (https://nar.headwaterseconomics.org/)	

Table 4-38. Future Climate Indicators for Macon County

FUTURE CLIMATE INDICATORS FOR MACON COUNTY, IL							
Indicator	Modeled History (1976-2005)	Early Century (2015-2044)		Mid Century (2035-2064)		Late Century (2070-2099)	
		Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions
	Min-Max	Min-Max	Min-Max	Min-Max	Min-Max	Min-Max	Min-Max
Precipitation:							
Annual Average Total Precipitation	38"	39"	39"	39"	40"	40"	41"
	36-39	37-43	33-42	34-44	35-43	34-44	34-46
Days Per Year With Precipitation (Wet Days)	181 days	179 days	178 days	178 days	177 days	177 days	173 days
	177-187	163-189	161-189	159-195	152-193	162-190	135-198

<i>Maximum Period of Consecutive Wet Days</i>	12 days	12 days	12 days	12 days	12 days	12 days	12 days
	11-13	10-13	10-14	10-14	10-14	11-14	10-15
Annual Days With:							
<i>Annual Days With Total Precipitation > 1 inch</i>	4 days	5 days	5 days	5 days	5 days	5 days	6 days
	3-5	4-6	3-6	3-6	4-7	3-7	4-8
<i>Annual Days With Total Precipitation > 2 inches</i>	0 days	0 days	0 days	0 days	0 days	0 days	1 day
	0-1	0-1	0-1	0-1	0-1	0-1	0-1
<i>Annual Days With Total Precipitation > 3 inches</i>	0 days	0 days	0 days	0 days	0 days	0 days	0 days
	0-0	0-0	0-0	0-0	0-0	0-0	0-0
<i>Annual Days That Exceed 99th Percentile Precipitation</i>	5 days	6 days	6 days	6 days	7 days	7 days	8 days
	5-6	6-7	6-6	6-7	6-7	6-7	7-8
<i>Days With Maximum Temperature Below 32°F</i>	28 days	21 days	20 days	18 days	16 days	15 days	9 days
	25-31	13-27	16-26	10-26	9-24	8-24	2-19
Source: Climate Mapping for Resilience and Adaptation (2023)							

Jurisdiction-specific Hazard Impact/Vulnerability: *Only those jurisdictions uniquely affected by dam failure are included. If a jurisdiction was not included, it denotes the hazard impact or vulnerability to dam failure is not significant and/or is adequately addressed at the county level. Jurisdictions completed the following form as part of the Plan update:*

<https://integratedsolutions.wufoo.com/forms/macon-county-hazards/>

Jurisdiction	Affected Jurisdictions' Hazard Impact/Vulnerability Considerations
Decatur	Emergency plans exist for Oakley Sediment Basin Dam and Lake Decatur Dam. These dams pose a risk to the community.

4.11 Severe Summer Storms

4.11.1 Hazard Description

In this *Plan*, severe summer storms are considered to be hailstorms and high wind events.

Hailstorms: Hail is a form of precipitation that occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into balls of ice. Hail can damage aircraft, homes, and cars, and can be deadly to livestock and people. Table 4-39 outlines the potential sizes of hail and provides a description of physical items for comparison (NOAA, 2023).

Hailstones grow by colliding with supercooled water drops. Supercooled water will freeze on contact with ice crystals, frozen raindrops, dust, or some other nuclei. Thunderstorms that have a strong updraft keep lifting the hailstones up to the top of the cloud where they encounter more supercooled water and continue to grow. The hail falls when the thunderstorm's updraft can no longer support the weight of the ice, or the updraft weakens. The stronger the updraft the larger the hailstone can grow (NOAA, 2023).

Hailstones can have layers like an onion if they travel up and down in an updraft, or they can have few or no layers if they are balanced in an updraft. One can tell how many times a hailstone traveled to the top of the storm by counting the layers. Hailstones can begin to melt and then re-freeze together forming large and very irregularly shaped hail (NOAA, 2023).

Table 4-39. National Weather Service Hail Descriptions

Description	Diameter (inches)
Pea	0.25
Marble or Mothball	0.50
Penny or Dime	0.75
Nickel	0.88
Quarter	1.00
Half Dollar	1.25
Walnut or Ping Pong Ball	1.50
Golf ball	1.75
Hen's Egg	2.00
Tennis Ball	2.50
Baseball	2.75
Tea Cup	3.00
Grapefruit	4.00
Softball	4.50

High Winds: High winds are defined as sustained winds with speeds of 40 miles per hour (mph) or greater, or wind gusts with speeds of 58 mph or greater. High winds can have a significant impact on weather conditions and can cause damage to structures, trees, and power (NOAA, 2023).

4.11.2 Hazard Location

Severe summer storms (hail or high winds) could occur anywhere in Macon County.

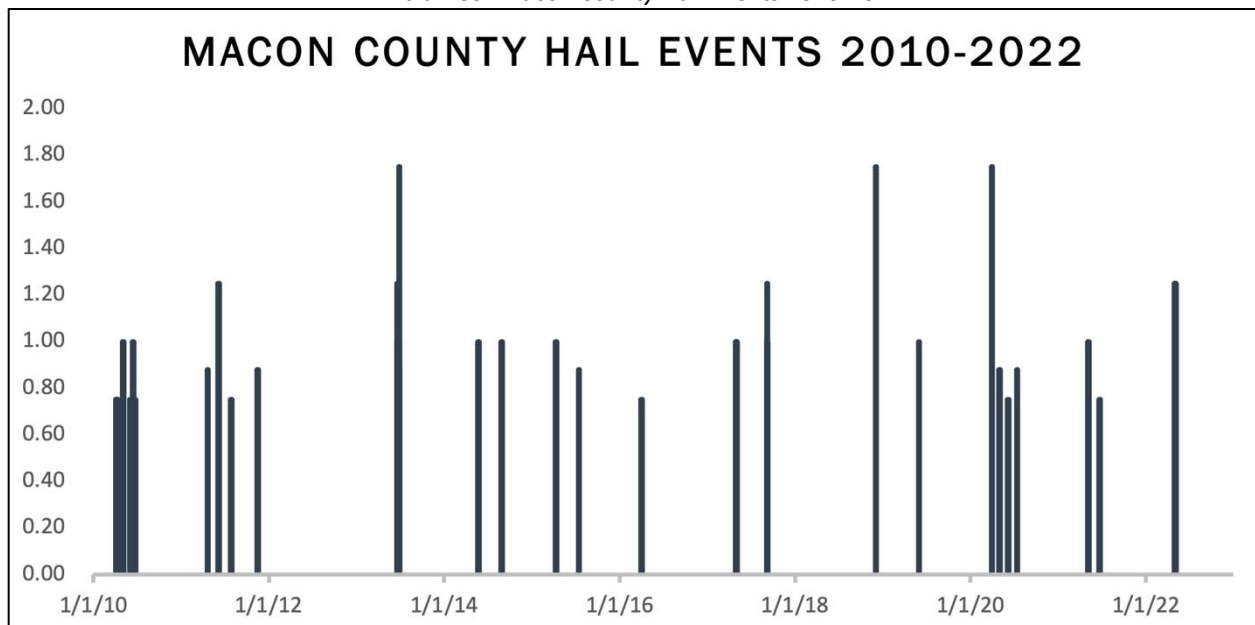
4.11.3 Hazard Extent/Intensity

Severe summer storms vary in intensity and magnitude in Macon County. It is estimated that approximately five storms each year have the hailstorms and/or high winds to be considered a severe thunderstorm.

4.11.4 Probability and Frequency

Hail: Macon County averaged 2.93 hail events annually between 2010-2022. Exhibit 4-39 illustrates frequency over time.

Exhibit 4-39. Macon County Hail Events 2010-2022



Between 1950-2022, Macon County recorded four events of Hail 2.00" or Larger:

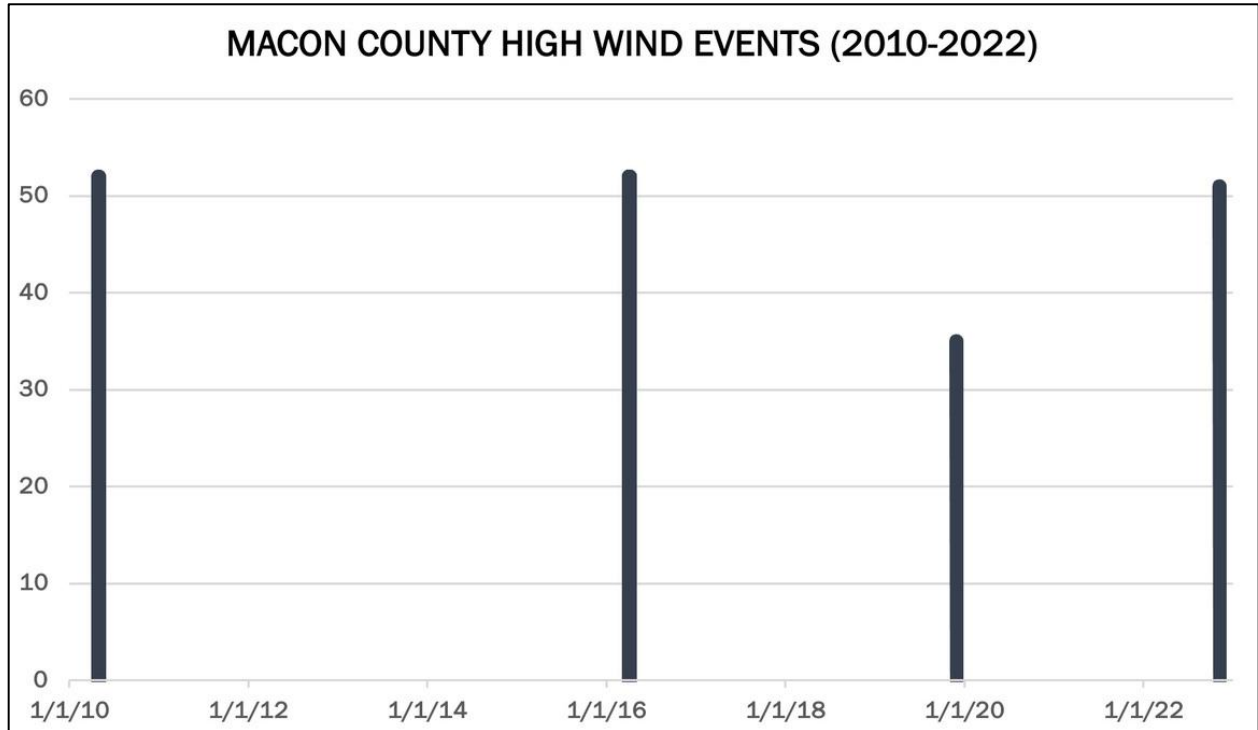
3. June 22, 1960: Oreana: 3.50"
4. April 22, 1963: Decatur: 2.00"
5. April 18, 1996: 4 miles southeast of Niantic: 2.25"

6. August 17, 2000: Warrensburg: 2.00"

Between 1950-2022, Macon County experienced an annual frequency of 0.052 events of Hail 2.00" or Larger.

High Winds: Macon County has averaged 0.42 high wind events annually between 2010-2022. Exhibit 4-40 below illustrates this frequency over time. Table 4-40 illustrates all high wind events recorded in Macon County between 2010-2022.

Exhibit 4-40. Macon County High Wind Events 2010-2022



4.11.5 Past Events

Hail: Table 4-40 illustrates all hail events in Macon County between 2010-2022. During this time there were 38 events recorded with no associated deaths or injuries.

Table 4-40. Hail Activity in Macon County, Illinois (2010-2022)

Location	County	State	Date	Time	T.Z.	Size	Dth	Inj	PrD	CrD
Totals:							0	0	0.00K	0.00K
LONG CREEK	MACON CO.	IL	04/05/2010	16:31	CST-6	0.75 in.	0	0	0.00K	0.00K
DECATUR	MACON CO.	IL	04/07/2010	13:29	CST-6	0.75 in.	0	0	0.00K	0.00K
OAKLEY	MACON CO.	IL	05/03/2010	13:24	CST-6	1.00 in.	0	0	0.00K	0.00K
MT ZION	MACON CO.	IL	06/02/2010	01:59	CST-6	0.75 in.	0	0	0.00K	0.00K
DECATUR	MACON CO.	IL	06/12/2010	13:39	CST-6	1.00 in.	0	0	0.00K	0.00K
MT ZION	MACON CO.	IL	06/21/2010	02:56	CST-6	0.75 in.	0	0	0.00K	0.00K

MT ZION	MACON CO.	IL	04/19/2011	17:50	CST-6	0.88 in.	0	0	0.00K	0.00K
MAROA	MACON CO.	IL	06/04/2011	19:15	CST-6	1.25 in.	0	0	0.00K	0.00K
MT ZION	MACON CO.	IL	07/26/2011	14:48	CST-6	0.75 in.	0	0	0.00K	0.00K
ARGENTA	MACON CO.	IL	11/14/2011	13:14	CST-6	0.88 in.	0	0	0.00K	0.00K
FORSYTH	MACON CO.	IL	06/18/2013	12:40	CST-6	0.75 in.	0	0	0.00K	0.00K
DECATUR	MACON CO.	IL	06/18/2013	13:00	CST-6	1.00 in.	0	0	0.00K	0.00K
MT ZION	MACON CO.	IL	06/18/2013	13:15	CST-6	1.25 in.	0	0	0.00K	0.00K
FORSYTH	MACON CO.	IL	06/24/2013	17:15	CST-6	0.88 in.	0	0	0.00K	0.00K
MACON	MACON CO.	IL	06/25/2013	18:33	CST-6	1.00 in.	0	0	0.00K	0.00K
OAKLEY	MACON CO.	IL	06/25/2013	19:30	CST-6	1.75 in.	0	0	0.00K	0.00K
ARGENTA	MACON CO.	IL	05/21/2014	14:14	CST-6	1.00 in.	0	0	0.00K	0.00K
ARGENTA	MACON CO.	IL	08/26/2014	18:25	CST-6	1.00 in.	0	0	0.00K	0.00K
MT ZION	MACON CO.	IL	04/08/2015	03:07	CST-6	1.00 in.	0	0	0.00K	0.00K
MT ZION	MACON CO.	IL	07/13/2015	23:45	CST-6	0.88 in.	0	0	0.00K	0.00K
DECATUR	MACON CO.	IL	03/30/2016	14:05	CST-6	0.75 in.	0	0	0.00K	0.00K
KNIGHTS	MACON CO.	IL	04/29/2017	16:54	CST-6	1.00 in.	0	0	0.00K	0.00K
MT ZION	MACON CO.	IL	04/29/2017	17:00	CST-6	1.00 in.	0	0	0.00K	0.00K
MT ZION	MACON CO.	IL	09/04/2017	16:26	CST-6	1.00 in.	0	0	0.00K	0.00K
MT ZION	MACON CO.	IL	09/04/2017	16:26	CST-6	1.25 in.	0	0	0.00K	0.00K
LONG CREEK	MACON CO.	IL	09/04/2017	16:28	CST-6	1.00 in.	0	0	0.00K	0.00K
NIANTIC	MACON CO.	IL	12/01/2018	17:58	CST-6	1.75 in.	0	0	0.00K	0.00K
MACON	MACON CO.	IL	05/29/2019	16:12	CST-6	1.00 in.	0	0	0.00K	0.00K
BLUE MOUND	MACON CO.	IL	03/28/2020	10:40	CST-6	1.75 in.	0	0	0.00K	0.00K
NIANTIC	MACON CO.	IL	04/28/2020	18:48	CST-6	0.88 in.	0	0	0.00K	0.00K
DECATUR	MACON CO.	IL	06/03/2020	22:47	CST-6	0.75 in.	0	0	0.00K	0.00K
MT ZION	MACON CO.	IL	07/11/2020	21:10	CST-6	0.88 in.	0	0	0.00K	0.00K
MACON	MACON CO.	IL	05/03/2021	18:18	CST-6	1.00 in.	0	0	0.00K	0.00K
MT ZION	MACON CO.	IL	06/19/2021	02:31	CST-6	0.75 in.	0	0	0.00K	0.00K
MT ZION	MACON CO.	IL	04/30/2022	18:02	CST-6	1.25 in.	0	0	0.00K	0.00K
MT ZION	MACON CO.	IL	04/30/2022	18:18	CST-6	1.25 in.	0	0	0.00K	0.00K
LONG CREEK	MACON CO.	IL	04/05/2010	16:31	CST-6	0.75 in.	0	0	0.00K	0.00K
DECATUR	MACON CO.	IL	04/07/2010	13:29	CST-6	0.75 in.	0	0	0.00K	0.00K
Totals:							0	0	0.00K	0.00K

High Winds: Table 4-41 illustrates all high wind events in Macon County between 2010-2022. During this time there were five events with no recorded deaths or injuries.

Table 4-41. High Wind Events in Macon County, Illinois (2010-2022)

Location	County	State	Date	Time	T.Z.	Wind Magnitude	Dth	Inj	PrD	CrD
Totals:							0	0	0.00K	0.00K
MACON (ZONE)	MACON (ZONE)	IL	04/29/2010	13:30	CST-6	52 kts. EG	0	0	0	12.00K
MACON (ZONE)	MACON (ZONE)	IL	04/02/2016	09:00	CST-6	52 kts. EG	0	0	0	15.00K
MACON (ZONE)	MACON (ZONE)	IL	04/02/2016	09:00	CST-6	52 kts. EG	0	0	0	2.00K

MACON (ZONE)	MACON (ZONE)	IL	11/27/2019	04:30	CST-6	35 kts. ES	0	0	0	0.00K
MACON (ZONE)	MACON (ZONE)	IL	11/05/2022	10:20	CST-6	51 kts. MG	0	0	0	0.00K
Totals:							0	0	0.00K	29.00K

4.11.6 Vulnerability and Impacts

All assets located in Macon County can be considered at risk from severe summer storms. This includes 100 percent of the county's population and all buildings and infrastructure within the county.

Life Safety and Public Health: Hail and high wind events can significantly impact public health and safety. These events pose several risks, including injuries resulting from falling hailstones or flying debris, as well as damage caused by trees or power lines knocked over by strong winds. Power outages are another potential consequence of high winds, which can leave individuals without electricity for extended periods. This can pose a significant threat to health and safety, as medical devices that require electricity may become non-functional, and heating or cooling homes during extreme temperatures becomes challenging.

Additionally, high winds can damage water treatment plants and distribution systems, leading to water contamination. The resulting health hazards include the spread of water-borne diseases, emphasizing the need to prepare for and mitigate the potential impacts of hail or high wind events.

Property Damage and Critical Infrastructure: Hail and high winds weather hazards can have significant impacts on property damage and critical infrastructure. One of the most significant consequences of hailstorms is property damage. Hailstones, which can range in size from small pellets to golf ball-sized or larger, can cause dents, cracks, and breakage to cars, roofs, windows, and other structures.

Similarly, high winds can knock down trees, power lines, and other structures, causing additional property damage. Additionally, hail can cause significant damage to crops, particularly those that are still developing, leading to a loss of yield and revenue for farmers. High winds can also damage critical infrastructure such as buildings, bridges, and power lines, resulting in power outages, transportation disruptions, and other issues that can impact communities. Hail and high winds can also make travel difficult or dangerous, resulting in accidents, delays, and cancellations.

Economy: No data exists demonstrating the economic impact of past severe summer storms on Macon County.

Changes in Development and Impact of Future Development: There is no impact based on current development trends.

Effects of Climate Change on Severity of Impacts: With increasing global surface temperatures, the possibility of increased intensity of storms will likely occur. As more water vapor is evaporated

into the atmosphere it becomes fuel for more powerful storms to develop (US Geological Society, 2023).

Exhibit 4-41 illustrates 25-year precipitation projections for Macon County, while Table 4-42 illustrates future climate indicators for Macon County.

Exhibit 4-41. 25-Year Climate Projections for Macon County

25-YEAR CLIMATE PROJECTIONS FOR MACON COUNTY, IL	
HIGHER EMISSIONS (RCP8.5)	
Macon County is expected to experience a 99% increase in extremely hot days within 25 years.	
By 2048, Macon County is expected to experience 18 more days that reach above 95°F (from 18 days to 37 days per year).	
LOWER EMISSIONS (RCP4.5)	
Macon County is expected to experience a 74% increase in extremely hot days within 25 years.	
By 2048, Macon County is expected to experience 12 more days that reach above 95°F (from 16 days to 28 days per year).	
Source: Neighborhoods at Risk (https://nar.headwaterseconomics.org/17115/explore/climate)	

Table 4-42. Future Climate Indicators for Macon County

FUTURE CLIMATE INDICATORS FOR MACON COUNTY, IL							
Indicator	Modeled History (1976-2005)	Early Century (2015-2044)		Mid Century (2035-2064)		Late Century (2070-2099)	
		Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions
	Min-Max	Min-Max	Min-Max	Min-Max	Min-Max	Min-Max	Min-Max
Temperature Thresholds							
Annual Days With Maximum Temperature >90	25 days	55 days	58 days	67 days	77 days	78 days	110 days
	25-35	36-88	41-80	42-110	51-107	45-120	72-141
Annual Days With Maximum Temperature >95	6 days	21 days	24 days	30 days	40 days	40 days	74 days
	5-8	8-55	10-49	11-85	17-79	15-96	30-119
Annual Days With Maximum Temperature >100	1 day	5 days	6 days	10 days	14 days	15 days	41 days
	0-1	1-27	1-20	1-53	2-51	2-53	7-93
Annual Days With Maximum Temperature >105	0 days	1 day	1 day	2 days	3 days	4 days	16 days
	0-0	0-10	0-4	0-27	0-16	0-38	1-67

Annual Temperature							
Annual Single Highest Temperature °F	99°F	102°F	103°F	104°F	105°F	106°F	111°F
	97-100°	98-114°	99-107°	99-124°	101-112°	101-125°	104-119°
Annual Highest Maximum Temperature Averaged Over a 5-Day Period	94°F	98°F	98°F	100°F	101°F	101°F	106°F
	93-95°	95-105°	95-102°	96-111°	97-107°	96-113°	100-114°
Cooling Degree Days (CDD)	1188 degree-days	1,607 degree-days	1,658 degree-days	1,821 degree-days	2,003 degree-days	2,036 degree-days	2,767 degree-days
	1132-1270	1,341-2,061	1,411-1,980	1,460-2,608	1,643-2,577	1,541-2,914	2,015-3,696
Source: Climate Mapping for Resilience and Adaptation (2023)							

Jurisdiction-specific Hazard Impact/Vulnerability: *Only those jurisdictions uniquely affected by severe summer storms are included. If a jurisdiction was not included, it denotes the hazard impact or vulnerability to severe summer storms is not significant and/or is adequately addressed at the county level. Jurisdictions completed the following form as part of the Plan update:*

<https://integratedsolutions.wufoo.com/forms/macon-county-hazards/>

Table 4-43. Macon County Jurisdiction-specific Hazard Impact/Vulnerability

Jurisdiction	Affected Jurisdictions' Hazard Impact/Vulnerability Considerations
Decatur	There may be a need to remove trees from boulevards. Increasing green space and reducing elevated vegetation may also reduce the impact of severe weather.
Forsyth	Parks and outdoor activities are uniquely vulnerable to severe weather.
Long Creek	The flat terrain and inconsistent weather patterns make our community more vulnerable to high winds and severe weather.
Macon	The following are vulnerable to severe weather and lightning: Water Tower and Communications Equipment. The trailer/mobile home park at 400 W. Dunn & 400 W. Cole are more vulnerable to severe weather.
Niantic	The Niantic community is vulnerable due to not having adequate shelter for the community during a severe thunderstorm.
Blue Mound Township	There are modular homes throughout the township. Some of these homes are in open areas, such as west of Boody. Severe weather could potentially damage the Boody Water Tower.

4.11.7 FEMA NRI Expected Annual Loss Estimates

Table 4-44. Macon County Expected Annual Loss Table

MACON COUNTY, IL EXPECTED ANNUAL LOSS TABLE FOR HAIL EVENTS							
Annualized Frequency	Population	Population Equivalence	Building Value	Agriculture Value	Total Value	Expected Annual Loss Score	Rating
3.3 events per year	0.00	\$36,341	\$1,725,456	\$13,131	\$1,774,928	29.80	Relatively High
MACON COUNTY, IL EXPECTED ANNUAL LOSS TABLE FOR HIGH WINDS EVENTS							
Annualized Frequency	Population	Population Equivalence	Building Value	Agriculture Value	Total Value	Expected Annual Loss Score	Rating
4.4 events per year	0.07	\$512,721	\$319,660	\$20,389	\$852,770	36.23	Relatively High
Annualized Frequency: The natural hazard annualized frequency is defined as the expected frequency or probability of a hazard occurrence per year. Annualized frequency is derived either from the number of recorded hazard occurrences each year over a given period or the modeled probability of a hazard occurrence each year. Population: Population exposure is defined as the estimated number of people determined to be exposed to a hazard according to a hazard type-specific methodology. Expected Annual Loss scores are calculated using an equation that combines values for exposure, annualized frequency, and historic loss ratios (Expected Annual Loss = Exposure × Annualized Frequency × Historic Loss Ratio). Source: hazards.fema.gov/nri/expected-annual-loss							
Source: FEMA National Risk Index (2023)							

4.11.8 FEMA Hazard-Specific Risk Index Table

Table 4-45. Macon County Hazard Specific Risk Index Table

MACON COUNTY, IL FEMA HAZARD SPECIFIC RISK INDEX – HAIL EVENTS	
Risk Index Score	Risk Index Rating
27.25 / 100	Relatively High
MACON COUNTY, IL FEMA HAZARD SPECIFIC RISK INDEX – HIGH WINDS EVENTS	
Risk Index Score	Risk Index Rating
20.89 / 100	Relatively Moderate
FEMA Hazard-Type Risk Index Scores are calculated using data for only a single hazard type and reflect a community's relative risk for only that hazard type. FEMA Hazard-Type Risk Index Ratings are a qualitative rating that describe the community in comparison to all other communities at the same level, ranging from "Very Low" to "Very High."	
Source: FEMA National Risk Index (2023)	

4.12 Severe Winter Storms

4.12.1 Hazard Description

In this *Plan*, severe winter storms are considered to be blizzards and winter storm events.

4.12.2 Hazard Location

Severe winter storms could occur anywhere in Macon County.

4.12.3 Hazard Extent/Intensity

The magnitude or severity of a severe winter storm depends on several factors, including a region's climatological susceptibility to snowstorms, snowfall amounts, snowfall rates, wind speeds, temperatures, visibility, storm duration, topography, time of occurrence during the day and week (e.g., weekday versus weekend), and time of season.

4.12.4 Probability and Frequency

Blizzard: Macon County averaged 0.17 blizzard events annually between 2010-2022.

Winter Storm: Macon County averaged 0.25 winter storm events annually between 2010-2022.

4.12.5 Past Events

Blizzard: Table 4-46 illustrates all blizzard events in Macon County between 2010-2022. During this time there were two events recorded with no associated deaths or injuries.

Table 4-46. Blizzard Events in Macon County, Illinois (2010-2022)

Location	County	State	Date	Time	T.Z.	Type	Dth	Inj	PrD	CrD
Totals:							0	0	100.00K	0.00K
MACON (ZONE)	MACON (ZONE)	IL	02/01/2011	10:30	CST-6	Blizzard	0	0	100.00K	0.00K
MACON (ZONE)	MACON (ZONE)	IL	12/20/2012	15:00	CST-6	Blizzard	0	0	0.00K	0.00K
Totals:							0	0	100.00K	0.00K

Winter Storm: Table 4-47 illustrates all winter storm events in Macon County between 2010-2022. During this time there were three events recorded with no associated deaths or injuries.

Table 4-47. Winter Storm Events in Macon County, Illinois (2010-2022)

Location	County	State	Date	Time	T.Z.	Type	Dth	Inj	PrD	CrD
Totals:							0	0	0.00K	0.00K
MACON (ZONE)	MACON (ZONE)	IL	02/24/2016	05:00	CST-6	Winter Storm	0	0	0.00K	0.00K
MACON (ZONE)	MACON (ZONE)	IL	02/02/2022	01:00	CST-6	Winter Storm	0	0	0.00K	0.00K
MACON (ZONE)	MACON (ZONE)	IL	12/22/2022	10:00	CST-6	Winter Storm	0	0	0.00K	0.00K
Totals:							0	0	0.00K	0.00K

4.12.6 Vulnerability and Impacts

All of Macon County is vulnerable to severe winter storms. Severe winter storms can lead to power outages, downed trees and branches, hypothermia, injuries, and loss of life. Climate data maintained by the Illinois State Water Survey indicates that between 1900 and 2000, Illinois can expect to receive a six inch or more snowfall within a 48-hour period at least twice a year. In Illinois, severe winter storm losses since 1950 average an estimated \$102 million, annually. Severe weather storms can immobilize large areas with rural areas being particularly impacted by impassable roads.

Life Safety and Health: Blizzards and winter storms can pose significant threats to life safety and public health. Extreme cold and wind chill can lead to hypothermia and frostbite, which can be life-threatening if left untreated. Additionally, winter storms can create slippery and icy conditions, increasing the risk of slips, trips, and falls that can result in injuries like fractures and head trauma. The hazardous driving conditions caused by heavy snowfall and icy roads increase the risk of car accidents, which can lead to injuries and fatalities. The use of fuel-burning appliances such as heaters and generators during power outages can result in carbon monoxide poisoning, which can be fatal. Winter storms can also cause power outages, which can lead to food spoilage, loss of heat, and other hazards. Emergency services can also be disrupted during winter storms, making it difficult for first responders to reach those in need and for hospitals to provide care. Furthermore, winter storms can exacerbate existing health conditions such as asthma and heart disease and increase the risk of respiratory infections.

Property Damage and Critical Infrastructure: Blizzards and winter storms can impact property damage and critical infrastructure. Heavy snow and ice accumulation can cause significant damage to roofs and buildings, leading to potential collapses. Additionally, snow and ice can weigh down trees, causing them to break or fall and potentially damaging power lines and other infrastructure. This can cause power outages, leaving people without electricity for extended periods.

Winter storms can also cause transportation disruptions such as flight cancellations, highway closures, and train delays, potentially leading to economic impacts. Extreme cold temperatures can cause pipes to freeze and burst, leading to water damage and potentially contaminating water supplies. Lastly, snow and ice can damage communication infrastructure such as cell towers and fiber-optic cables, potentially disrupting communication systems. These impacts on property damage and critical infrastructure can also have long-lasting effects on individuals and communities.

Economy: While no data exists demonstrating the economic impact of past severe winter storms on Macon County, loss of power means businesses and manufacturing concerns must close. Loss of access due to snow or ice-covered roads has a similar effect. There are also impacts when people cannot get to work, school, or the store.

Changes in Development and Impact of Future Development: There is no impact based on current development trends.

Effects of Climate Change on Severity of Impacts: According to the Environmental Defense Fund (EDF), more snowfall during snowstorms is an expected effect of climate change. EDF further explains that a warmer planet is evaporating more water into the atmosphere, resulting in more precipitation in the form of heavy snowfall or downpour (Environmental Defense Fund, 2023).

Exhibit 4-42 illustrates 25-year precipitation projections for Macon County, while Table 4-48 illustrates future climate indicators for Macon County.

Exhibit 4-42. 25-Year Climate Projections for Macon County

25-YEAR PRECIPITATION PROJECTIONS FOR MACON COUNTY, IL	
HIGHER EMISSIONS (RCP8.5)	
Macon County is expected to experience a 15% increase in heavy precipitation within 25 years.	
By 2048, Macon County is expected to experience 0.7 more days of heavy precipitation per year (from 4.4 days to 5.1 days per year).	
LOWER EMISSIONS (RCP4.5)	
Macon County is expected to experience a 9% increase in heavy precipitation within 25 years.	
By 2048, Macon County is expected to experience 0.04 more days of heavy precipitation per year (from 4.4 days to 4.9 days per year).	
Source: Neighborhoods at Risk (https://nar.headwaterseconomics.org/)	

Table 4-48. Future Climate Indicators for Macon County

FUTURE CLIMATE INDICATORS FOR MACON COUNTY, IL							
Indicator	Modeled History (1976-2005)	Early Century (2015-2044)		Mid Century (2035-2064)		Late Century (2070-2099)	
		Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions
	Min-Max	Min-Max	Min-Max	Min-Max	Min-Max	Min-Max	Min-Max
Precipitation:							
Annual Average Total Precipitation	38"	39"	39"	39"	40"	40"	41"
	36-39	37-43	33-42	34-44	35-43	34-44	34-46
Days Per Year With Precipitation (Wet Days)	181 days	179 days	178 days	178 days	177 days	177 days	173 days
	177-187	163-189	161-189	159-195	152-193	162-190	135-198
Maximum Period of Consecutive Wet Days	12 days	12 days	12 days	12 days	12 days	12 days	12 days
	11-13	10-13	10-14	10-14	10-14	11-14	10-15
Annual Days With:							
Annual Days With Total	4 days	5 days	5 days	5 days	5 days	5 days	6 days
	3-5	4-6	3-6	3-6	4-7	3-7	4-8

Precipitation > 1 inch							
Annual Days With Total Precipitation > 2 inches	0 days	0 days	0 days	0 days	0 days	0 days	1 day
Annual Days With Total Precipitation > 3 inches	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Annual Days That Exceed 99 th Percentile Precipitation	0 days	0 days	0 days	0 days	0 days	0 days	0 days
Days With Maximum Temperature Below 32°F	0-0	0-0	0-0	0-0	0-0	0-0	0-0
	5 days	6 days	6 days	6 days	7 days	7 days	8 days
	5-6	6-7	6-6	6-7	6-7	6-7	7-8
	28 days	21 days	20 days	18 days	16 days	15 days	9 days
	25-31	13-27	16-26	10-26	9-24	8-24	2-19
Source: Climate Mapping for Resilience and Adaptation (2023)							

Jurisdiction-specific Hazard Impact/Vulnerability: Only those jurisdictions uniquely affected by severe winter storms are included. If a jurisdiction was not included, it denotes the hazard impact or vulnerability to severe winter storms is not significant and/or is adequately addressed at the county level. Jurisdictions completed the following form as part of the Plan update:
<https://integratedsolutions.wufoo.com/forms/macon-county-hazards/>

Table 4-49. Macon County Jurisdiction-specific Hazard Impact/Vulnerability

Jurisdiction	Affected Jurisdictions' Hazard Impact/Vulnerability Considerations
Forsyth	The library does not have back-up generator.
Niantic	The Niantic community is more vulnerable to this hazard due to not having an adequate shelter for the community during extreme weather incidents.
Warrensburg	Large percentage of power infrastructure is above ground.

4.12.7 FEMA NRI Expected Annual Loss Estimates

Table 4-50. Macon County Expected Annual Loss Table

MACON COUNTY, IL EXPECTED ANNUAL LOSS TABLE FOR SEVERE WINTER WEATHER EVENTS							
Annualized Frequency	Population	Population Equivalence	Building Value	Agriculture Value	Total Value	Expected Annual Loss Score	Rating
1.8 events per year	0.00	\$32,579	\$60,765	\$378	\$93,722	24.42	Relatively Moderate
Annualized Frequency: The natural hazard annualized frequency is defined as the expected frequency or probability of a hazard occurrence per year. Annualized frequency is derived either from the number of recorded							

hazard occurrences each year over a given period or the modeled probability of a hazard occurrence each year.
Population: Population exposure is defined as the estimated number of people determined to be exposed to a hazard according to a hazard type-specific methodology.

Expected Annual Loss scores are calculated using an equation that combines values for exposure, annualized frequency, and historic loss ratios ($\text{Expected Annual Loss} = \text{Exposure} \times \text{Annualized Frequency} \times \text{Historic Loss Ratio}$).
 Source: hazards.fema.gov/nri/expected-annual-loss

Source: FEMA [National Risk Index](https://www.fema.gov/national-risk-index) (2023)

4.12.8 FEMA Hazard-Specific Risk Index Table

Table 4-51. Macon County Hazard Specific Risk Index Table

MACON COUNTY, IL FEMA HAZARD SPECIFIC RISK INDEX – WINTER WEATHER EVENTS	
Risk Index Score	Risk Index Rating
19.51 / 100	Relatively Moderate
<i>FEMA Hazard-Type Risk Index Scores are calculated using data for only a single hazard type and reflect a community's relative risk for only that hazard type.</i>	
<i>FEMA Hazard-Type Risk Index Ratings are a qualitative rating that describe the community in comparison to all other communities at the same level, ranging from “Very Low” to “Very High”.</i>	
Source: FEMA National Risk Index (2023)	

4.13 Hazardous Materials (HAZMAT) Incident

4.13.1 Hazard Description

Substances that, because of their chemical or physical characteristics, are hazardous to humans and living organisms, property, and the environment are regulated by the U.S. Environmental Protection Agency (EPA) and, when transported in commerce, by the U.S. Department of Transportation (DOT). EPA regulations address “hazardous substances” and “extremely hazardous substances.”

The EPA chooses to specifically list hazardous substances and extremely hazardous substances rather than providing objective definitions. Hazardous substances, as listed, are generally materials that, if released into the environment, tend to persist for long periods and pose long-term health hazards for living organisms. They are primarily chronic rather than acute health hazards.

Regulations require that spills of these materials into the environment in amounts at or above their individual “reportable quantities” must be reported to the EPA. Extremely hazardous substances, on the other hand, while also generally toxic materials, are acute health hazards that, when released, are immediately dangerous to the life of humans and animals and can cause serious damage to the environment. There are currently 355 specifically listed extremely hazardous substances listed along with their individual threshold planning quantities (TPQ) (eCFR, 2022).

When facilities have these materials in quantities at or above the TPQ, they must submit “Tier II” information to appropriate state and/or local agencies to facilitate emergency planning.

DOT regulations provide the following definition for the term “hazardous material”: A hazardous material is “a substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce” and has been designated as hazardous under section 5103 of federal hazardous materials transportation law (49 U.S.C. 5103). The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (see 49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions in part 173 of subchapter C of the same chapter (U.S. Compliance, 2020).

When a substance meets the DOT definition of a hazardous material, it must be transported under safety regulations providing for appropriate packaging, communication of hazards, and proper shipping controls.

In addition to EPA and DOT regulations, the National Fire Protection Association (NFPA) develops codes and standards for the safe storage and use of hazardous materials. These codes and standards are generally adopted locally and include the use of the NFPA 704 standard for

communication of chemical hazards in terms of health, fire, instability (previously called “reactivity”), and other special hazards (such as water reactivity and oxidizer characteristics). While somewhat differently defined by the above organizations, the term “hazardous material” may be generally understood to encompass substances that have the capability to harm humans and other living organisms, property, and/or the environment. There is also no universally accepted, objective definition of the term “hazardous material event.” A useful working definition, however, might be framed as “any actual or threatened uncontrolled release of a hazardous material, its hazardous reaction products, or the energy released by its reactions that poses a significant risk to human life and health, property, and/or the environment.”

4.13.2 Hazard Location

Hazardous materials are widely used, stored, and transported; a hazardous material release incident could take place almost anywhere. Moreover, many hazardous materials are used, stored, and transported in very large quantities, so the impacts of a release incident may be widespread and powerful. Hazardous material incidents usually occur on major highways and railways.

4.13.3 Hazard Extent/Intensity

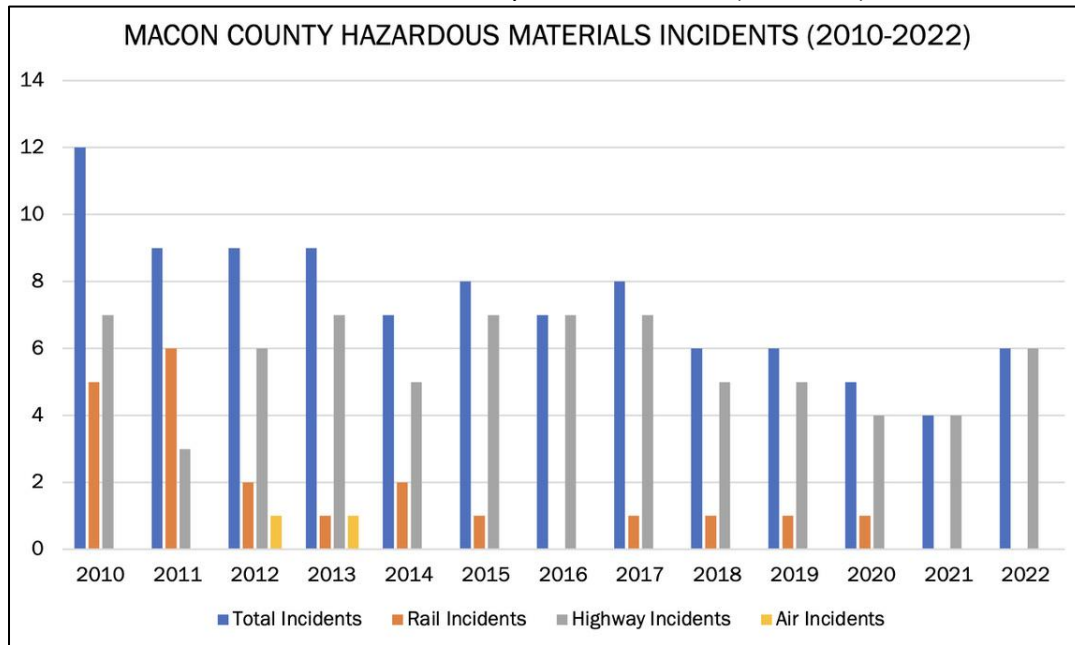
Diamond-shaped NFPA 704 signs ranking the health, fire, and instability hazards on a numerical scale from zero (least) to four (greatest) along with any special hazards are usually required to be posted on chemical storage buildings, tanks, and other facilities. Similar NFPA 704 labels may also be required on individual containers stored and/or used inside facilities.

4.13.4 Probability and Frequency

Macon County has averaged 7.38 HAZMAT incidents annually between 2010-2022. Most releases are due to packages that contain hazardous substances leaking or becoming damaged in transit, which are usually controlled and cleaned up quickly.

Exhibit 4-43 illustrates frequency over time.

Exhibit 4-43. Macon County HAZMAT Incidents (2010-2022)



4.13.5 Past Events

Table 4-52 illustrates totals of HAZMAT transportation incidents by type between 2010-2022 in Macon County. The IEMA FOIA/HAZMAT Tool can be utilized to obtain all incidents reported for Macon County, which include transportation and fixed facility incidents. These 94 incidents between 2018-2023 are included in Appendix D.

- Link: <https://public.iema.state.il.us/FOIAHazmatSearch/>

Table 4-52. Total Macon County HAZMAT Transportation Incidents by Type

MACON COUNTY, ILLINOIS HAZMAT INCIDENT SUMMARY					
Year	Rail Incidents	Highway Incidents	Air Incidents	Total Fatalities	Total Damages
2010	5	7	0	0	\$4,840
2011	6	3	0	0	\$75,450
2012	2	6	1	0	\$4,000
2013	1	7	1	0	\$12,259
2014	2	5	0	0	\$10,400
2015	1	7	0	0	\$144,500
2016	0	7	0	0	\$2,500
2017	1	7	0	0	\$23,349
2018	1	5	0	0	\$10,800
2019	1	5	0	0	\$16,127
2020	1	4	0	0	\$41,300
2021	0	4	0	0	\$3,400
2022	0	6	0	0	\$0

TOTAL	21	73	2	0	\$348,925
Source: US D.O.T. Pipeline and Hazardous Materials Safety Administration (2023)					

4.13.6 Vulnerability and Impacts

Life Safety and Public Health: HAZMAT incidents can have significant impacts on life safety and public health in several ways. Chemical exposure is a serious concern during HAZMAT incidents, as it can cause health effects such as skin irritation, respiratory problems, and even death. Fire and explosions are also a risk, potentially causing injury or death to individuals in the surrounding area. In addition to immediate impacts, HAZMAT incidents can cause long-lasting environmental and health effects through contamination of air, water, and soil.

Property Damage and Critical Infrastructure: HAZMAT incidents can cause severe damage to property and critical infrastructure including structural damage to buildings and other structures in the surrounding area, especially if there is an explosion or fire. Severe incidents can also result in contamination of property, including homes, businesses, and other structures. In addition, transportation infrastructure such as roads, bridges, and rail lines can be damaged, disrupting transportation and commerce. HAZMAT incidents can also cause disruption of utilities such as power, water, and gas, which can impact businesses and individuals in the surrounding area. These damages can result in significant economic losses and take a considerable amount of time and resources to recover from.

Economy: No data exists demonstrating the economic impact of past HAZMAT incidents on Macon County.

Changes in Development and Impact of Future Development: There is no impact based on current development trends.

Effects of Climate Change on Severity of Impacts: There is no impact of climate change to HAZMAT events.

Jurisdiction-specific Hazard Impact/Vulnerability: *Only those jurisdictions uniquely affected by HAZMAT events are included. If a jurisdiction was not included, it denotes the hazard impact or vulnerability to HAZMAT events is not significant and/or is adequately addressed at the county level. Jurisdictions completed the following form as part of the Plan update:*

<https://integratedsolutions.wufoo.com/forms/macon-county-hazards/>

Table 4-53. Macon County Jurisdiction-specific Hazard Impact/Vulnerability

Jurisdiction	Affected Jurisdictions' Hazard Impact/Vulnerability Considerations
Argenta	Semi-trucks carrying hazardous materials on Route 48 pass through commercial and residential areas. Railroad exists but is not currently in use. If it is utilized in the future, it may pose a risk to the community.

Blue Mound	Semi-trucks carrying hazardous materials on Route 48 pass through commercial and residential areas. Norfolk Southern Railroad is a potential vulnerability.
Decatur	There are major railyards and industries within our City. Examples include, but are not limited to: ADM, Carbon Sequestration in the ground, Primient.
Forsyth	The following increase the risk of a HAZMAT incident: Highway 20, Highway 51, Buckeye Terminal (not in use now), and Pipelines.
Harristown	There are two pipelines in the community. Buckeye Terminal LLC is west of the Village of Harristown. This facility stores gasoline and other fuels for distribution by tanker trucks.
Macon	US Route 51
Maroa	US Route 51
Warrensburg	Railroad passes through the center of town, as well as, Route 121. There is propane distribution with large propane tank. Fuel storage for bulk service exists in a residential area.
Blue Mound Township	Agricultural chemicals may pose a potential vulnerability. Trains run through the township increasing the risk of a HAZMAT incident.
Friends Creek	Agricultural chemicals may pose a potential vulnerability.
Illini Township	Railroad runs through the township.

4.14 Nuclear Event

4.14.1 Hazard Description

A “nuclear event” is defined as an incident involving a nuclear reaction, nuclear fission or nuclear fusion. Such an incident must involve “fissionable” materials, defined as materials containing isotopes with nuclei capable of splitting. Further, the most probable incidents involve “fissile” materials, defined as materials containing isotopes capable of sustaining a nuclear fission chain reaction. Such reactions release heat, radiation, and radioactive contamination in extremely large quantities relative to the amount of material reacting. Examples of nuclear events include nuclear weapons detonations, nuclear reactor incidents, and nuclear (fissile) material production, handling, or transportation incidents. A nuclear detonation as a part of an attack scenario is, perhaps, the ultimate technological disaster. The hazards are well-known and vividly described in FEMA publications. They include shock wave, enormous heat, and the spread of fallout (radioactive contamination). Other nuclear events would not involve a nuclear blast, but still have the potential to produce widespread and long-term consequences as exemplified by the 1986 Chernobyl accident. Of primary concern is the release of radioactive contamination in the form of airborne gases and particulate material. This radioactive material has the potential travel great distances and particulate material eventually is deposited in the environment and incorporated into the food chain. Such contamination may remain hazardous for many years. Direct radiation exposure is also a hazard in relatively close proximity to a nuclear event as is exposure to high thermal energy. Nuclear events are virtually always caused by intentional or unintentional human actions.

According to the United States Nuclear Regulatory Commission (NRC), the closest nuclear facility to Macon County, Illinois is the Clinton Power Station. It is located in DeWitt County, Illinois, approximately 24 miles southeast of Decatur, Illinois, which is the largest city in Macon County. The Clinton Power Station is a nuclear power plant that generates electricity for the central Illinois area.

4.14.2 Hazard Location

A nuclear event can impact all of Macon County.

4.14.3 Hazard Extent/Intensity

Hazards related to a nuclear event are:

- **Bright FLASH** can cause temporary blindness for less than a minute.
- **BLAST WAVE** can cause death, injury, and damage to structures several miles out from the blast.
- **RADIATION** can damage cells of the body. Large exposures can cause radiation sickness.
- **FIRE AND HEAT** can cause death, burn injuries, and damage to structures several miles out.

- **ELECTROMAGNETIC PULSE (EMP)** can damage electrical power equipment and electronics several miles out from the detonation and cause temporary disruptions further out.
- **FALLOUT** is radioactive, visible dirt and debris raining down from several miles up that can cause sickness to those who are outside.

4.14.4 Probability and Frequency

The probability of a nuclear event in Macon County is dependent on a variety of factors, including the presence of the Clinton Power Station, the level of safety and security measures in place, and the overall risk of natural disasters or other events that could trigger a nuclear incident. While the risk of a nuclear event cannot be completely eliminated, measures can be taken to mitigate the risk and ensure the safety and well-being of individuals and communities.

4.14.5 Past Events

There have been no major nuclear events recorded in Macon County.

4.14.6 Vulnerability and Impacts

Life Safety and Public Health: Nuclear events can have significant impacts on life safety and public health. These impacts can include radiation exposure, which can lead to a range of acute and chronic health effects such as radiation sickness, cancer, and genetic damage. Additionally, evacuations and displacement for extended periods of time can have significant social, economic, and health impacts on affected individuals and communities.

Environmental contamination resulting from a nuclear event can also lead to long-term environmental impacts that can affect public health and the ecosystem. Lastly, psychological impacts such as anxiety, stress, and trauma can occur. Damage to critical infrastructure including power plants, hospitals, and transportation networks can have long-lasting effects on public health and safety.

Property Damage and Critical Infrastructure: A nuclear incident can have significant impacts on property damage and critical infrastructure, including direct damage to structures and equipment (within the immediate vicinity of the incident), caused by the blast, fire, or radiation. Moreover, a nuclear incident can release radioactive materials into the environment, contaminating property and making it unsafe for human use. Nuclear contamination can be expensive and challenging to clean up and affected structures may need to be demolished or decontaminated.

Nuclear incidents can also disrupt critical infrastructure such as power plants, water treatment facilities, and transportation networks, leading to significant economic and social impacts that may take extended periods of time to repair and restore. The perceived risk of a nuclear incident

can also lead to a loss of property value in affected areas, having significant financial impacts on individuals, communities, and local governments that rely on property tax revenues.

Economy: No data exists demonstrating the economic impact of past nuclear events on Macon County.

Impact of Future Development: There is no impact based on current development trends.

Effects of Climate Change on Severity of Impacts: There is no impact of climate change to nuclear events.

Jurisdiction-specific Hazard Impact/Vulnerability: *Only those jurisdictions uniquely affected by nuclear events are included. If a jurisdiction was not included, it denotes the hazard impact or vulnerability to nuclear events is not significant and/or is adequately addressed at the county level. Jurisdictions completed the following form as part of the Plan update:*

<https://integratedsolutions.wufoo.com/forms/macon-county-hazards/>

Table 4-54. Macon County Jurisdiction-specific Hazard Impact/Vulnerability

Jurisdiction	Affected Jurisdictions' Hazard Impact/Vulnerability Considerations
Argenta	Located close enough to nuclear power plant to be impacted if there is an incident.
Decatur	DeWitt County - Nuclear Power Plant. Contamination of drinking water or streams.
Forsyth	Within range of Clinton Power Station
Macon	Clinton Power Plant located in DeWitt County which adjoins Macon County.
Maroa	The close proximity of the City of Maroa to the Clinton Excelon Nuclear power station, as well as the Maroa Countryside Fire Protection District station having the designation of Nuclear Incident Command Center creates a direct impact upon the City of Maroa during an emergency.
Oreana	Within 30 minutes of Clinton Nuclear Power Plant.
Warrensburg	Depending on wind direction, impact by catastrophic failure in Clinton.
Blue Mound Township	S/SW winds from Clinton/Excelon Nuclear Power Plant
Friends Creek	Located in the northern part of Macon County, which is about 10 miles from the Clinton Nuclear Power Plant

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Chapter 5: Capabilities and Integration of Mitigation Measures

5.1 Overview

Preventative activities keep problems related to natural hazards from escalating and ensure new developments have reduced vulnerability to hazards. The information within this Chapter primarily focuses on building codes, planning and zoning, comprehensive plans, capital improvement plans, in addition to related studies and publications.

This capability assessment examines the existing studies, plans, programs, and policies that have incorporated hazard mitigation and other proactive measures into processes at the local and county levels. The purpose of the capability assessment is to highlight successes, identify shortcomings, and lay the groundwork for possible improvement.

5.2 Building Codes

Updating and adopting new building codes, as well as addressing the effectiveness of these codes, can be one of the best ways to conduct mitigation. When properly designed and constructed, many buildings can withstand the impacts of high winds, a flood, or a tornado. Many communities in Illinois are working with various versions of the International Codes published by the International Code Council, Inc. (ICC). These codes include:

- International Building Code (IBC)
- International Residential Code (IRC)
- International Fire Code (IFC)
- International Mechanical Code (IMC)
- International Fuel Gas Code (IFGC)
- International Existing Building Code (IEBC)
- International Wildland-Urban Interface Code (IWUIC)
- International Property Maintenance Code (IPMC)
- International Swimming Pool and Spa Code (ISPSC)
- International Zoning Code (IZC)

Additionally, Illinois communities are required by the State to enforce the Illinois Energy Efficient Building Code, Illinois State Plumbing Code, and the Illinois Accessibility Code.

All new commercial construction after July 1, 2011, must comply with the current (2021) or most recent preceding edition (2018) of the International Building Code. However, this requirement does not apply to any area that has adopted its own building code and registered that code adoption with the Capital Development Board (CDB) in accordance with the Illinois Building Commission Act. Illinois Senate Bill 2368 takes effect on 1/1/2024 and will require beginning 1/1/2025 that code-enforcing jurisdictions enforce requirements equal to the stringency of the 3 most recent IBC and IRC editions (2021, 2018, or 2015), and will require construction to conform

to one of the two most recent IBC and IRC editions (2021 or 2018) in non-code-enforcing jurisdictions.

5.2.1 Code Administration

Enforcement of code standards is very important to hazard mitigation. Adequate inspections are needed during the course of construction to ensure that the builder understands and implements the requirements. The Building Code Effectiveness Grading Schedule (BCEGS) is a national program used by the insurance industry to determine how well new construction is protected from wind, earthquake and other non-flood hazards. It is similar to the CRS program and the fire insurance rating scheme: building permit programs are reviewed and scored. A class 1 community is the highest rating, and a class 10 community is the most basic rating.

Training of code officials is also very important for code enforcement. Training of code officials and inspectors is a large part of the BCEGS rating for a community. Courses are offered through the building code associations to help local officials understand standards that apply to seismic, wind and flood hazards.

Table 5-1 lists building code adoptions in use within Macon County.

Table 5-1. Building Codes Used in Macon County

	Building Code Residential	Building Code Commercial
Macon County	2015	2015
Argenta	2009	2009
Blue Mound	No Data	No Data
Decatur	2015	2015
Forsyth	2015	2015
Harristown	2006	2003
Long Creek	2008	2006
Macon	2012	2012
Maroa	2015	2015
Mt. Zion	2015	2015
Niantic	2000	2000
Oreana	No Data	No Data
Warrensburg	2006	2006

** Information is based on best available county data. Source: National Building Code Adoption Tracking Portal*

5.3 Planning and Regulatory Capabilities

Planning and zoning activities, such as land use plans, transportation plans, subdivision ordinances, zoning code and economic re-development plans, can be used to direct development away from hazardous areas. For example, comprehensive land use plans can designate floodplains and wetlands as areas for open space, wetlands, or low-density residential. Table 5-3 shows the communities in Macon County with adopted comprehensive plans, zoning

ordinances, and subdivision ordinances. The table also highlights communities where flood or other hazards are addressed.

5.3.1 Comprehensive Plans

Comprehensive Plans are the primary tools used by communities to address future development. They can reduce future flood-related damages by indicating open space or low-density development within floodplains and other hazardous areas. Natural hazards should be emphasized in specific land use recommendations.

5.3.2 Capital Improvement Plans

Communities use Capital Improvement Plans or Community Investment Programs to guide major public expenditures for the next five to 20 years. Capital expenditures can include roadways, water and sewer lines, floodplain open space acquisition, and retrofitting existing public structures to withstand hazards.

Table 5-3 illustrates Macon County communities' efforts to integrate hazard mitigation, hazards, and other mitigation considerations into their comprehensive or related community-wide plans.

5.3.3 Other Plans, Studies, and Reports

The following plans, studies and reports were reviewed as part of the plan update process.

Table 5-2. Plans, Studies, and Reports

Plan, Study and/or Report	Contribution to the Multi-Hazard Mitigation Plan and Evidence of Plan Integration with Hazards and Mitigation
2023 Illinois Natural Hazard Mitigation Plan	Many of the changes to 2023 IL Natural Hazard Mitigation Plan were designed to enable local jurisdictions, organizations, and regions to pull out specific pieces for use in their own planning, grant development and mitigation efforts. These elements were leveraged to inform the update of the Macon County Multi-Hazard Mitigation Plan.
2013 Macon County Multi-Hazard Mitigation Plan	Foundational document for the plan update
Decatur/Macon County Comprehensive Plan	Future development and trends; plan and goal alignment Future iterations of this plan will more clearly integrate hazard risk reduction and mitigation.
Sustainable Decatur	Plan and goal alignment regarding sustainability
2045 Long Range Transportation Plan	Future development and trends; Areas of concern; Environmental mitigation and potential projects The environmental mitigation and potential projects thoroughly address the impact of flooding on these upcoming projects.
2022 Decatur and Macon County Comprehensive Economic Development Strategy	Trends; Community data; Plan and goal alignment

Plan, Study and/or Report	Contribution to the Multi-Hazard Mitigation Plan and Evidence of Plan Integration with Hazards and Mitigation
2019 Friends Creek Watershed Resource Inventory & Plan	Watershed, geology, soils, and climate
2021 Lake Decatur Watershed Management Plan: Long-term Strategy	Watershed, geology, soils, and climate; mitigation strategies
Macon County Conservation District: 10-year Master Plan	Mitigation strategies This plan addresses opportunities for hazard mitigation

5.3.4 Plan Integration & Opportunities to Expand and Improve

Table 5-3 illustrates Macon County communities' efforts to integrate hazard mitigation, hazards, and other mitigation considerations into their comprehensive or related community-wide plans.

The information in the table is based on the best available data. Opportunities to expand or improve do not indicate a community is out of compliance, but suggests that future updates to a specific plan or ordinance may consider further integration of hazard-related risks and mitigation efforts.

Table 5-3. Macon County Planning and Land Use Ordinances

Community	Comprehensive Plan Published on Public-Facing Web site	Mitigation and/or Hazards Included in Comprehensive Plan (or related plan)	Capital Improvement Plan(s) Published on Public-Facing Web site	Mitigation and/or Hazards Included in Capital Improvement Plan(s)	Flood hazards or drainage provisions in Zoning & Subdivision Ordinances
Macon County	2009	Yes	Yes	Yes	Yes
Argenta	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Yes
Blue Mound	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve
Decatur	2009	Yes	Yes	Yes	Yes
Forsyth	2015	Opportunity to expand/improve	Yes	Yes	Yes
Harristown	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Yes
Long Creek	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve
Macon	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Yes
Maroa	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Yes
Mt. Zion	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Yes
Niantic	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Yes
Oreana	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Yes
Warrensburg	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Opportunity to expand/improve	Yes

5.4 Financial Capabilities

Financial capabilities are the resources that a jurisdiction has access to or is eligible to use to fund mitigation actions. This section provides a summary of what funding sources a community may have access to. It is understood that some governments have access to recurring sources of revenue beyond property, sales, and incomes taxes, such as stormwater utility or development impact fees.

The primary funding mechanisms used to implement hazard mitigation projects are FEMA’s three Hazard Mitigation Assistance (HMA) programs. The grant program includes Hazard Mitigation Grant Program (HMGP), Building Resilient Infrastructure and Communities (BRIC), and Flood Mitigation Assistance (FMA). These competitive grant programs are intended to provide funding for eligible mitigation measures that reduce loss. Adoption of this plan will increase participants’ eligibility for federal grants to develop hazard mitigation plans.

Table 5-4. Macon County Financial Capabilities

Community	Capital Improvements Project Funding	Authority to Levy Taxes/Bonds for Specific Purposes	FEMA BRIC	FEMA HMGP	FEMA FMA
Macon County	Yes	Yes	Yes	Yes	Yes
Argenta	Yes	Yes	Yes	Yes	Yes
Blue Mound	Yes	Yes	Yes	Yes	Yes
Decatur	Yes	Yes	Yes	Yes	Yes
Forsyth	Yes	Yes	Yes	Yes	Yes
Harristown	Yes	Yes	Yes	Yes	No
Long Creek	Yes	Yes	Yes	Yes	Yes
Macon	Yes	Yes	Yes	Yes	No
Maroa	Yes	Yes	Yes	Yes	No
Mt. Zion	Yes	Yes	Yes	Yes	Yes
Niantic	Yes	Yes	Yes	Yes	No
Oreana	Yes	Yes	Yes	Yes	No
Warrensburg	Yes	Yes	Yes	Yes	No

5.5 Warning, Education, and Outreach Capabilities

Emergency services measures protect people during and after a disaster. A good emergency management program addresses all hazards and all phases of a disaster.

When a threat is identified, Macon County Emergency Management Agency, municipalities, and/or entities such as the NWS notify the public.

The National Weather Service issues notice to the public using two levels of notification:

- *Watch*: conditions are right for flooding, thunderstorms, tornadoes, or winter storms
- *Warning*: a flood, tornado, etc., has started or has been observed

The communities in Macon County have the capability to disseminate a more specific warning in a variety of ways. The following are the more common notification methods:

- Outdoor warning sirens
- Commercial or public radio or TV stations
- IPAWS mass cell phone notification
- Community notification systems
- NOAA Weather Radio
- Door-to-door contact
- Mobile public address systems
- E-mail notifications

5.5.1 Macon County Emergency Alert and Notification System

This mass notification system is designed to provide emergency alert information to the citizens of Macon County, Illinois, as well as other important community news to residents of communities participating in the system. This system enables the County to provide critical information quickly in a variety of situations, such as severe weather, unexpected road closures, missing persons and evacuations of buildings or neighborhoods. The Villages of Argenta, Decatur, Forsyth, Harriestown, Long Creek, Maroa, Mt. Zion, Oreana, and Warrensburg participated in the funding for this system and thereby have the ability to send information to their residents as well, using this system.

5.5.2 Outdoor Warning Siren System

The Macon County Emergency Management Agency tests the outdoor warning siren system that can be used to alert the public to an emergency. These sirens provide coverage for nearly all of the City of Decatur, and Macon County. Through public education activities, citizens are instructed to listen to local EAS radio (WSOY 1340) and television (WAND 17) stations for information on why the sirens are sounding and for instructions on what actions to take. Outdoor warning sirens in the Decatur \ Macon County area are equipped with two warning signals: a three-to-five-minute steady "alert" tone, used for local tornado warnings and other vital emergencies, and a three-minute wavering or intermittent sound indicating an enemy attack. No all-clear signal is used in Decatur \ Macon County.

Weather Alert Radios on channel 162.400, can be used through the National Weather Service to broadcast precise local weather emergency information to the public.

5.5.3 Volunteers

The Macon County Emergency Management Agency is supported heavily by volunteers. Dedicated individuals who would like to assist Macon County Emergency Management Agency are required to fill out an extensive volunteer application (https://www.maconcountymema.org/Volunteer%20Application%202016_05_06.pdf).

5.5.4 StormReady Community

Macon County was designated by the National Weather Service (NWS) as a StormReady community. StormReady is a nationwide volunteer community preparedness program that started in 1999 in Tulsa, Oklahoma. Macon County has always taken a pro-active approach to

hazardous weather operations; however, this designation lets residents, business owners and visitors know that the County is committed to safety and preparedness.

5.5.5 NFIP Participation Activities and Continued Compliance

Participating jurisdictions will continue to comply with the NFIP by implementing mitigation projects and activities that enforce this ordinance to reduce future flood risks to new construction within the SFHA. At this time no new construction is planned within the base floodplain.

Table 5-5. NFIP Participation Activities

Community Name	NFIP-related Activities	Opportunities to Expand and Improve NFIP Activities
Macon County	Floodplain management ordinance meets NFIP criteria. Review new Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and exceed federal standards and present both for adoption. Enforce flood ordinance to ensure new development does not increase flood vulnerability or create unintended exposures to flooding. Continue to make elected officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in the floodplain. Active participation in the Hazard Mitigation Plan. Permit review, as applicable. GIS flood mapping. Buy out of three properties on Kruse Road in 2018. Culvert improvements at Kruse Road.	Public education and outreach regarding the benefits of the NFIP program. Explore CRS participation.
Village of Argenta	Floodplain management ordinance meets NFIP criteria. Review new Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and exceed federal standards and present both for adoption. Enforce flood ordinance to ensure new development does not increase flood vulnerability or create unintended exposures to flooding. Continue to make elected officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in the floodplain. Active participation in the Hazard Mitigation Plan. Permit review, as applicable.	Public education and outreach regarding the benefits of the NFIP program. Explore CRS participation.
Village of Blue Mound	Floodplain management ordinance meets NFIP criteria. Review new Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and exceed federal standards and present both for adoption. Enforce flood ordinance to ensure new development does not increase flood vulnerability or create unintended exposures to flooding.	Public education and outreach regarding the benefits of the NFIP program.

	Continue to make elected officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in the floodplain. Active participation in the Hazard Mitigation Plan. Permit review, as applicable.	Explore CRS participation.
City of Decatur	Floodplain management ordinance meets NFIP criteria. Review new Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and exceed federal standards and present both for adoption. Enforce flood ordinance to ensure new development does not increase flood vulnerability or create unintended exposures to flooding. Continue to make elected officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in the floodplain. Active participation in the Hazard Mitigation Plan. Permit review, as applicable. GIS flood mapping.	Public education and outreach regarding the benefits of the NFIP program. Explore CRS participation.
Village of Forsyth	Floodplain management ordinance meets NFIP criteria. Review new Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and exceed federal standards and present both for adoption. Enforce flood ordinance to ensure new development does not increase flood vulnerability or create unintended exposures to flooding. Continue to make elected officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in the floodplain. Active participation in the Hazard Mitigation Plan. Permit review, as applicable.	Public education and outreach regarding the benefits of the NFIP program. Explore CRS participation.
Village of Long Creek	Floodplain management ordinance meets NFIP criteria. Review new Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and exceed federal standards and present both for adoption. Enforce flood ordinance to ensure new development does not increase flood vulnerability or create unintended exposures to flooding. Continue to make elected officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in the floodplain. Active participation in the Hazard Mitigation Plan. Permit review, as applicable.	Public education and outreach regarding the benefits of the NFIP program. Explore CRS participation.
Village of Mount Zion	Floodplain management ordinance meets NFIP criteria. Review new Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and exceed federal standards and present both for adoption. Enforce flood ordinance to ensure new development does not increase flood vulnerability or create unintended exposures to flooding.	Public education and outreach regarding the benefits of the NFIP program.

	Continue to make elected officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in the floodplain. Active participation in the Hazard Mitigation Plan. Permit review, as applicable.	Explore CRS participation.
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5.6 Administrative and Technical Capabilities & Support

Administrative and technical capabilities refer to the jurisdiction's staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. It also refers to the ability to access and coordinate these resources effectively.

Table 5-6. Macon County Administrative and Technical Capabilities

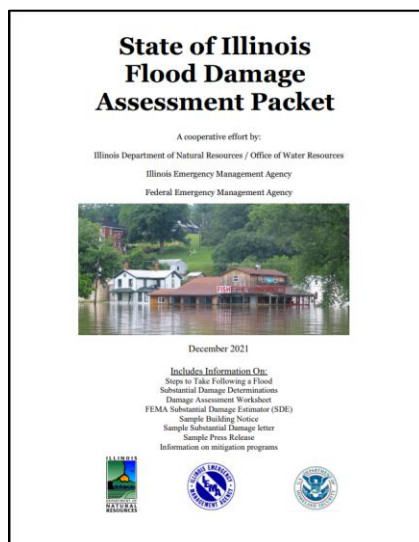
Community	Grant Writers and Management	Planners/Engineers	GIS/ Mapping	Floodplain Mgt and NFIP Compliance
Macon County	Yes	Yes	Yes	Yes
Argenta	Opportunity to expand/improve	Opportunity to expand /improve	Opportunity to expand /improve	Yes
Blue Mound	Opportunity to expand/improve	Opportunity to expand /improve	Opportunity to expand /improve	Yes
Decatur	Yes	Yes	Yes	Yes
Forsyth	Opportunity to expand/improve	Yes	Yes	Yes
Harristown	Opportunity to expand/improve	Opportunity to expand /improve	Opportunity to expand /improve	Opportunity to expand /improve
Long Creek	Opportunity to expand/improve	Opportunity to expand /improve	Opportunity to expand /improve	Yes
Macon	Opportunity to expand/improve	Opportunity to expand /improve	Opportunity to expand /improve	Opportunity to expand /improve
Maroa	Opportunity to expand/improve	Yes	Yes	Opportunity to expand /improve
Mt. Zion	Opportunity to expand/improve	Yes	Yes	Yes
Niantic	Opportunity to expand/improve	Opportunity to expand /improve	Opportunity to expand /improve	Opportunity to expand /improve
Oreana	Opportunity to expand/improve	Opportunity to expand /improve	Opportunity to expand /improve	Opportunity to expand /improve
Warrensburg	Opportunity to expand/improve	Opportunity to expand /improve	Opportunity to expand /improve	Opportunity to expand /improve

5.6.1 Capability to Implement the Substantial Improvement/Substantial Damage Provisions for NFIP Communities in Macon County

Damage Estimates are a part of the National Flood Insurance Program (NFIP). If a community participates in the NFIP, part of the responsibility of the local participating community is to perform damage estimates. These estimates are performed using a FEMA Substantial Damage Estimate software program. This program is used by the Illinois Department of Natural Resources to assist local communities in determining damage estimates as it relates to the NFIP. The IDNR is tasked with assisting local communities with the training and deployment of the SDE program. Local building officials/Stormwater management and floodplain managers for each participating jurisdiction are responsible for ensuring that the substantial improvement/substantial damage provisions are implemented following a flood related event within their respective jurisdiction. The local officials will ensure that all NFIP criteria/requirements are implemented and met following a flood event, local officials will work with FEMA to ensure proper documentation/designations are made and properly recorded for structures deemed substantially damaged during an event.

Illinois Association for Floodplain and Stormwater Management (IAFSM) Rapid Assistance Flood Team (RAFT) assist communities in times of flooding or other natural disasters. Members of the RAFT are all active in the IAFSM. Members are all Certified Floodplain Managers. They represent local, state and federal government, the private sector, and other professional disciplines. RAFT members all have experience and training in post-flood responsibilities. RAFT members are all volunteers and have agreed to assist other communities in times of need.

For those NFIP communities in the County, ongoing training and education will be a point of emphasis in implementing the substantial improvement/substantial damage provisions. The following resource is available to these communities: <https://dnr.illinois.gov/content/dam/soi/en/web/dnr/waterresources/documents/il-damage-assess-packet-march-2020.pdf>



Chapter 6: Mitigation Goals & Changes in Priority

The mitigation strategy includes the development of goals and prioritized hazard mitigation actions. Goals are long-term policy statements and global visions that support the mitigation strategy.

6.1 Community Priorities

The following topics were identified by the planning team to be of priority for the county and participating jurisdictions:

- Life Safety
- Public Health
- Critical Infrastructure Maintenance and Protection
- Public Information and Warning
- Public Outreach, Education, and Awareness
- Equitable outcomes for underserved communities and socially vulnerable populations
- Inter-governmental Coordination
- Public-Private Partnerships
- Repetitive Loss Properties
- Climate Change

6.2 Goals and Guidelines

6.2.1 Mitigation Goals

The following goals (shown in order of importance) were developed by the planning team for the purpose of guiding and directing the Plan in accordance with governmental requirements, community priorities, and changing circumstances. These goals were compared with other Macon County and County Plans to ensure aligning viewpoints are used regionally.

Goal 1. Life Safety: Prioritize the health and safety of Macon County residents from the impacts of natural hazards.

Goal 2. Preventative Actions: Reduce risks through regulations, including building codes, limiting development within hazardous areas, and integrating mitigation strategies into local planning or capital improvement projects.

Goal 3. Property Protection. Reduce exposure to hazards through building or parcel-specific activities, such as structure/building acquisition, and protecting critical infrastructure and community lifelines within Macon County by identifying and reducing impacts of natural hazards through activities such as floodproofing and retrofitting.

Goal 4. Emergency Services. Reduce impacts of natural hazards by building response and recovery capabilities that are implemented during a disaster.

Goal 5. Structural Projects. Minimize the impacts of natural hazards on key structures in Macon County through the implementation of mitigation projects, such as detention basins, tornado shelters, advanced warning systems, etc.

Goal 6. Public Information, Outreach and Awareness. Strengthen relationships between the public sector, private sector entities, leaders from underserved communities, and residents to enhance community resilience through a whole-community approach, with specific emphasis on achieving equitable outcomes for all communities, including underserved communities and socially vulnerable populations. Assist all residents and community stakeholders to prepare for risks and protective measures to better protect themselves and their property.

6.2.2 Mitigation Guidelines

The following guidelines were developed by the planning team for purpose of achieving the goals and to facilitate the development of hazard mitigation action items in Chapter 7:

- **Guideline 1.** Prioritize hazard mitigation projects on the hazards that pose the greatest threat to the community.
- **Guideline 2.** Promote public education strategies for the community around the need to take steps to protect themselves, their families, and their property.
- **Guideline 3.** Create and foster public-private partnerships and relationships with leaders from underserved communities to accomplish hazard mitigation activities and equitable outcomes for all communities, including underserved communities and socially vulnerable populations.
- **Guideline 4.** Encourage interdepartmental and multi-jurisdictional collaboration and shared resources when developing and conducting hazard mitigation exercises and projects.
- **Guideline 5.** Strive to improve and expand communication/coordination between public works and emergency services before, during, and after a disaster response.
- **Guideline 6.** Seek County, State, and Federal support for mitigation projects.

6.3 Changes in Priority

Mitigation priorities have not significantly changed for either Macon County or the participating jurisdictions since the update of the last plan. However, for the 2023/24 plan update, mitigation goals for Macon County and the entire planning area were significantly updated to better align with the County's current strategic framework, current federal priorities, ongoing sustainability and climate change efforts in jurisdictions, and a more concerted focus on achieving equitable outcomes for all communities, including underserved communities and socially vulnerable

populations. The plan also underwent a rewrite to better align with new mitigation plan requirements.

Also, for past mitigation projects identified in previous iterations of the plan, a **2023 Status Update and Changes in Priority** section was included for each past action. A description of the update and changes in priority were included, if appropriate and applicable. The table below provides an example of how mitigation projects were captured for each jurisdiction.

Mitigation Project:					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority:					

Chapter 7: Mitigation Action Plan

The findings, conclusions, and recommendations presented in Chapters 1 through 6 of the Macon County Multi-Hazard Mitigation Plan have been collated into this Action Plan. In addition, the guidelines and goals developed by the Steering Committee, and presented in Chapter 6, set the context for these Action Items. The Action Plan presented in this chapter establishes an overall direction for the county regarding hazard mitigation. The Action Plan is the most essential part of this Plan as it incorporates an awareness of local risks, resources, needs and plans a path forward.

7.1 Mitigation Action Plan

The Action Plan helps to prioritize mitigation initiatives according to a benefit/cost analysis of the proposed projects and their associated costs (44 CFR, Section 201.6(c)(3)(iii)). The action plan also provides the framework for how the proposed projects and initiatives will be implemented and administered over the next five years.

7.1.1 Mitigation Strategy/Action Timeline Parameters

While the preference is to provide definitive project completion dates, this is only possible for some mitigation strategies/actions. Therefore, the parameters for the timeline (Projected Completion Date) are as follows:

- **Short-term**—To be completed in one to five years
- **Long-term**—To be completed in greater than five years
- **Ongoing**—Currently being implemented under existing programs but without a definite completion date

7.1.2 Mitigation Strategy/Action Benefit Parameters

Benefit ratings are defined as follows:

- **High**—The project will provide an immediate reduction of risk exposure for life and property.
- **Medium**—The project will have a long-term impact on reducing risk exposure for life and property, or the project will provide an immediate reduction in the risk exposure for property.
- **Low**—Long-term benefits of the project are difficult to quantify in the short term.

7.1.3 Mitigation Strategy/Action Estimated Cost Parameters

While the preference is to provide definitive costs (dollar figures) for each mitigation strategy/action, this is only possible for some mitigation strategies/action. Therefore, the estimated costs for the mitigation initiatives identified in this Plan are identified as high, medium, or low, using the following ranges:

- **High**—Existing funding will not cover the project's cost; implementation would require new revenue through an alternative source (e.g., bonds, grants, and fee increases).
- **Medium**—The project could be implemented with existing funding but would require a re-apportion of the budget or a budget amendment, or the project cost would have to be spread over multiple years.
- **Low**—The project could be funded under the existing budget. The project is part of or can be part of a current ongoing program.

7.1.4 Mitigation Strategy/Action Prioritization Process

The action plan must be prioritized according to a benefit/cost analysis of the proposed projects and their associated costs (44 CFR, Section 201.6(c)(3)(iii)). The benefits of proposed projects were weighed against estimated costs as part of the project prioritization process. The benefit/cost analysis was not of the detailed variety required by FEMA for project grant eligibility under the Hazard Mitigation Grant Program (HMGP) and Building Resilient Infrastructure and Communities (BRIC) grant program. A less formal approach was used because some projects may not be implemented for multiple years, and associated costs and benefits could change dramatically. Therefore, a review of the apparent benefits versus the evident cost of each project was performed. Parameters were established for assigning subjective ratings (high, medium, and low) to the costs and benefits of these projects.

The priorities are defined as follows:

- **High**—A project that addresses numerous goals or hazards, has benefits that exceed the cost, has funding secured or is an ongoing project, and meets eligibility requirements for the HMGP or BRIC grant program. High-priority projects may be completed in the short term (1 to 5 years).
- **Medium**—A project that addressed multiple goals and hazards, with benefits that exceed costs, and for which funding has not been secured but is grant eligible under HMGP, BRIC, or other grant programs. The project can be completed in the short term once funding is secured. Medium-priority projects will become high-priority projects once funding is secured.

- **Low**—A project that will address a few or no goals, mitigate the risk of one or a few hazards, has benefits that do not exceed the costs or are challenging to quantify, for which funding has not been secured, that is not eligible for HMGP or BRIC grant funding, and for which the timeline for completion is long term. Low-priority projects may qualify for other grant funding sources from other programs.

For many of the strategies identified in this action plan, the participating jurisdictions may seek financial assistance under HMA programs, most requiring detailed benefit/cost analyses. These analyses will be performed on projects at the time of application using the FEMA benefit-cost model. For projects not seeking financial assistance from grant programs that require detailed analysis, the partners reserve the right to define “benefits” according to parameters that meet the goals and objectives of this Plan.

7.2 Mitigation Projects

Listed below are the projects that were developed to address the risks posed. It should be noted that this Plan serves only to recommend mitigation measures. Implementing these recommendations depends on adopting this Plan by the Macon County Board and the city council or board of trustees of each participating municipality. It also depends on the cooperation and support of the designated offices responsible for each action item. In addition, each community was encouraged to include additional community-specific action/project items.

Participating jurisdictions agreed upon mitigation actions that apply to the county and all participating jurisdictions (see 7.3 Mitigation Action Plan & Projects for Macon County & All Participating Jurisdictions). These shared actions, some of which address all hazards, help to meet the following requirement:

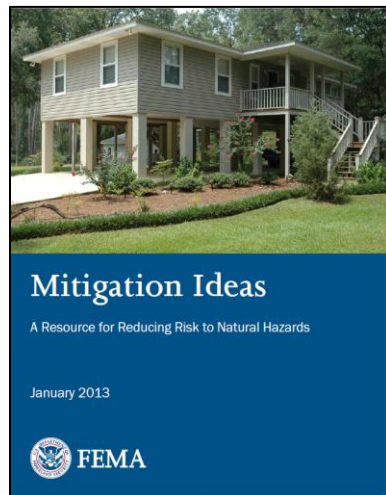
- Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure?
- Does the plan include one or more action(s) per jurisdiction for each hazard identified within the risk assessment?

In addition to the mitigation measures that apply to the county and all participating jurisdictions, most communities identified additional mitigation actions unique to their jurisdiction.

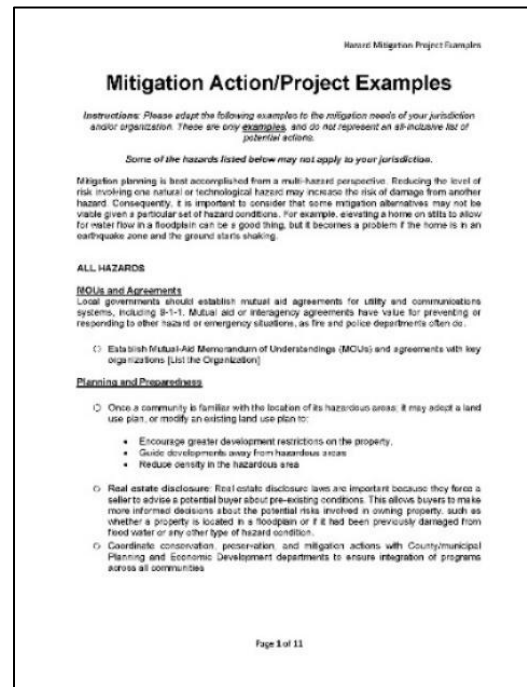
7.2.1 Potential Hazard Mitigation Activities

Plan participants used the following resources to identify mitigation activities. These resources were sent to plan participants prior to the Mitigation Workshop. Hard copies of these resources were available to each participant during the workshop, and they were again sent as a follow-up to the meeting.

FEMA Mitigation Ideas: https://www.fema.gov/sites/default/files/2020-06/fema-mitigation-ideas_02-13-2013.pdf



Mitigation Action/Project Examples Handout:



7.3 Mitigation Action Plan & Projects for Macon County & All Participating Jurisdictions

The projects in this section considered the countywide projects that apply to the county and all participating jurisdictions.

Action 7.3.1

Mitigation Project: Continue to Develop and Implement Public Education Programs on Disaster Awareness					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Macon County and All Participating Jurisdictions	County and Municipal public information offices/officers	High	Ongoing	Low (\$15,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 6	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Having all communities share the same themed information to residents will serve as a force multiplier within the region, increasing public awareness and resiliency, and aligning County government through a “one voice” approach.		High	Local general funds, Staff time
Action/Implementation Plan and Project Description:					
Develop and implement public outreach and education programs on disaster awareness. Macon County EMA will assist participating jurisdictions in their outreach and education efforts. Activities may include:					
• Warning, public information, and education materials. • Family disaster plans and supply kits. • Public education to non-English speaking community members. • Preparedness events. • Web site or content for county and municipality websites. • Content for county and municipal newsletters, brochures, etc.					

Mitigation Project: Continue to Develop and Implement Public Education Programs on Disaster Awareness

- Trainings.

2023 Plan Update Status and Changes in Priority: New Action

Action 7.3.2

Mitigation Project: Participate in NFIP and Community Rating System (CRS) Program

Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Macon County and All Participating Jurisdictions	County and Municipal departments designated for land use and floodplain planning.	High	Ongoing	Low Participating in the Community Rating System program is free. However, costs may be associated with implementing credible activities and staff time for applying and maintaining program status.
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 2, 3, 5, 6	Flood	Participating in the Community Rating System (CRS) program can maintain a community’s good standing in the National Floodplain Insurance Program (NFIP), can lower resident’s insurance premiums, reduce life safety and public health issues, and reduce a community’s vulnerability to hazards.		High	Local general funds, Staff time
Action/Implementation Plan and Project Description:					
Macon County communities will explore participation in the Federal Emergency Management Agency’s Community Rating System.					

Mitigation Project: Participate in NFIP and Community Rating System (CRS) Program

2023 Plan Update Status and Changes in Priority: New Action

Action 7.3.3

Mitigation Project: Participate and Support Floodplain Management Studies

Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Macon County and All Participating Jurisdictions	County and Municipal stormwater administrators, engineers, and public works departments.	High	Ongoing	The costs associated with this action item will be community and project specific.
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 2, 3, 5	Flood	Conducting thorough studies allows for the development of in-depth plans and hazard mitigation projects, reducing life safety and public health issues, and protecting property and critical infrastructure.		High	BRIC, FMA, HMGP, Local General Funds
Action/Implementation Plan and Project Description:					
Macon County and its communities should continue to support floodplain management studies, and review and update watershed plans.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.3.4

Mitigation Project: Powerline/Utility Infrastructure Improvements					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Macon County and All Participating Jurisdictions	Public Works Departments and Utilities	Medium	Ongoing	High
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 2, 3, 5	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes	Retrofit and reinforce utilities		Medium	HMGP, BRIC, Utility Fees
Action/Implementation Plan and Project Description:					
• Pad mounted transformers: elevate above base flood elevation, or lowering and burying them in non-flood, high wind areas • Using multiples poles to support transformers • Burying lines • Replacing poles with a better material (for example wood poles replaced with spun concrete)					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.3.5

Mitigation Project: Assess High Hazard Dams in Macon County that are not county-owned and regulated. Coordinate with dam owners to better understand the vulnerabilities and impacts of these dams on the county.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Macon County and All Participating Jurisdictions	County and Municipal stormwater	Low	Short-term	Medium

Mitigation Project: Assess High Hazard Dams in Macon County that are not county-owned and regulated. Coordinate with dam owners to better understand the vulnerabilities and impacts of these dams on the county.					
		administrators, engineers, and public works departments			
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 2, 3	High Hazard Dams	Understand the threat of dam failure and potential impacts.		Low	Local general funds, Staff time
Action/Implementation Plan and Project Description:					
Assess High Hazard Dams in Macon County that are not county-owned and regulated. Coordinate with dam owners to better understand the vulnerabilities and impacts of these dams on the county.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.3.6

Mitigation Project: Participate In Annual Great Shakeout Earthquake Drill and Support IEMA With Promotion					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Macon County and All Participating Jurisdictions	Macon County EMA	Low	Ongoing	Low
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4	Earthquake	Increase earthquake preparedness and readiness.		Low	Local general funds, Staff time
Action/Implementation Plan and Project Description:					
Participate In Annual Great Shakeout Earthquake Drill and Support IEMA With Promotion					
2023 Plan Update Status and Changes in Priority: New Action					

7.4 Mitigation Action Plan & Projects for Macon County & Unincorporated Areas

Action 7.4.1

Mitigation Project: Retrofit Drainage Systems in Local Townships and Municipalities					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Townships and municipalities	Townships and municipalities	Medium	Ongoing	High
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 2, 3	Flood (Riverine, Urban/Flash Flooding), High Hazard Dams, Severe Summer Storms, Severe Winter Storms	Mitigate property damage		High	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:					
Retrofit drainage systems in local townships and municipalities					
2023 Plan Update Status and Changes in Priority: New Action					

7.5 Mitigation Action Plan & Projects for Argenta

Action 7.5.1

Mitigation Project: Upgrade and Improve Storm Sewer System					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Argenta	Public Works	Medium	2026	High (\$500,000 - \$1,000,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3	Flood (Urban/Flash Flooding)	Mitigate urban-based flooding		High	HMGP and Local General Fund
Action/Implementation Plan and Project Description:					
Upgrade and improve storm sewer system.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.5.2

Mitigation Project: Provide Shelters for Residents After a Natural Disaster					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Argenta	Mayor Macon County EMA	Medium	2025	Low (\$50,000 - \$100,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 5, 6	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms,	Life safety		Low	HMGP and General Fund

Mitigation Project: Provide Shelters for Residents After a Natural Disaster				
	Drought, Extreme Heat, High Hazard Dams, Earthquakes			
Action/Implementation Plan and Project Description:				
Providing shelters for residents after a natural disaster (cots, food, water, supplies)				
2023 Plan Update Status and Changes in Priority: New Action				

Action 7.5.3

Mitigation Project: Critical Facility Secondary Power and Back-Up Generation Assessment and Implementation					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Argenta	Mayor Macon County EMA	High	Short-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Ensuring critical facilities have adequate back-up generation capabilities, including automatic switchover, and heat/air capabilities, helps to reduce potential life safety and public health issues. The benefits of using back-up generation may include preventing an evacuation of a facility and allowing government services to continue.		High	BRIC, HMGP
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.5.4

Mitigation Project: Study, Assess and Implement Safe Room Construction for those Facilities that will Reduce Overall Risk to People and Property.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Argenta	Mayor Macon County EMA	High	Long-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Severe Summer Storms	A safe room is a hardened structure specifically designed to meet the Federal Emergency Management Agency (FEMA) criteria and provide protection in extreme wind events, including tornadoes.		High	HMGP, BRIC
Action/Implementation Plan and Project Description:					
Identify facilities in Macon County that will benefit from the construction of a safe room to save lives and protect property. Safe rooms will be constructed according to FEMA P-361, Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms (2021).					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.5.5

Mitigation Project: Continue Providing Public Outreach About Community Wide Notification System					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Argenta	Mayor Macon County EMA	High	Ongoing	Low
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 6	Tornadoes, Flood, Severe Winter	Prevention, public education, and awareness.		High	HMGP, BRIC, Local General Funds

Mitigation Project: Continue Providing Public Outreach About Community Wide Notification System				
	Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident			
Action/Implementation Plan and Project Description:				
Continue to provide public outreach to encourage all residents to sign up for Community Wide Notification System.				
2023 Plan Update Status and Changes in Priority: New Action				

Action 7.5.6

Mitigation Project: Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Argenta	Mayor Macon County EMA	High	Ongoing	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 5, 6	Tornadoes, Severe Summer Weather	Ensures sirens are operational during a tornado warning to allow time for people in the community to take cover.		High	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:					
Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.5.7

Mitigation Project: Purchase 2 Rain Barrels for Each Household					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	Village of Argenta	Mayor	Low	Short-term	Low (less than \$100,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3	Drought	Mitigate drought		Low	HMGP & Water General Funds
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: Ongoing					

Action 7.5.8

Mitigation Project: Purchase NOAA Radios for Each Household					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	Village of Argenta	Mayor Macon County EMA	Low	Short-term	Low (less than \$100,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 6	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Warning and notification		Medium	HMGP & Water General Funds

Mitigation Project: Purchase NOAA Radios for Each Household					
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: Ongoing					

Action 7.5.9

Mitigation Project: Generator as Back-up for Water Tower & Village Hall					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	Village of Argenta	Mayor Macon County EMA	Medium	Short-term	Low (less than \$100,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
3, 4	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Low (Less than \$100,000)		Low	HMGP & Water General Funds
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: Ongoing; Generator purchased which backs-up water tower and well #3					

7.6 Mitigation Action Plan & Projects for Blue Mound

Action 7.6.1

Mitigation Project: Conduct Drainage System Study					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Blue Mound	Public Works	Medium	Long-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
2, 3	Flood (Urban/Flash Flooding)	Mitigate flooding and damage to roads		High	General Fund, HMGP, BRIC
Action/Implementation Plan and Project Description:					
Conduct drainage system study					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.6.2

Mitigation Project: Update and Improve Building Codes					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Blue Mound	Mayor	Medium	Short-term	Low
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
2	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme	Making sure new buildings are structurally sound and built to mitigate damages		High	Local General Funds

Mitigation Project: Update and Improve Building Codes				
	Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident			
Action/Implementation Plan and Project Description:				
2023 Plan Update Status and Changes in Priority: New Action				

Action 7.6.3

Mitigation Project: Critical Facility Secondary Power and Back-Up Generation Assessment and Implementation					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Blue Mound	Police Department Macon County EMA	High	Short-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Ensuring critical facilities have adequate back-up generation capabilities, including automatic switchover, and heat/air capabilities, helps to reduce potential life safety and public health issues. The benefits of using back-up generation may include preventing an evacuation of a facility and allowing government services to continue.		High	BRIC, HMGP
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.6.4

Mitigation Project: Study, Assess and Implement Safe Room Construction for those Facilities that will Reduce Overall Risk to People and Property.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Blue Mound	Public Works Macon County EMA	High	Long-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Severe Summer Storms	A safe room is a hardened structure specifically designed to meet the Federal Emergency Management Agency (FEMA) criteria and provide protection in extreme wind events, including tornadoes.		High	HMGP, BRIC
Action/Implementation Plan and Project Description:					
Identify facilities in Macon County that will benefit from the construction of a safe room to save lives and protect property. Safe rooms will be constructed according to FEMA P-361, Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms (2021).					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.6.5

Mitigation Project: Continue Providing Public Outreach About Community Wide Notification System					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Blue Mound	Police Department Macon County EMA	High	Ongoing	Low
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 6	Tornadoes, Flood, Severe Winter	Prevention, public education, and awareness.		High	HMGP, BRIC, Local General Funds

Mitigation Project: Continue Providing Public Outreach About Community Wide Notification System				
	Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident			
Action/Implementation Plan and Project Description:				
Continue to provide public outreach to encourage all residents to sign up for Community Wide Notification System.				
2023 Plan Update Status and Changes in Priority: New Action				

Action 7.6.6

Mitigation Project: Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Blue Mound	Mayor Macon County EMA	High	Ongoing	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 5, 6	Tornadoes, Severe Summer Weather	Ensures sirens are operational during a tornado warning to allow time for people in the community to take cover.		High	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:					
Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.6.7

Mitigation Project: Purchase Generator for Village Hall					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	Village of Blue Mound	Blue Mound Village Board	High	Short-term	Low (less than \$100,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Mitigate power outages and ensure continuity of operations		Medium	BRIC, HMGP, General Fund
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: Ongoing; Going to revisit this action					

Action 7.6.8

Mitigation Project: Provide Disaster Preparedness Materials and Brochures; Conduct Town Meetings					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	Village of Blue Mound	Blue Mound Police Department	Medium	Ongoing	Low (less than \$100,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
6	Tornadoes, Flood, Severe Winter	Low (less than \$100,000)		High	General Fund

Mitigation Project: Provide Disaster Preparedness Materials and Brochures; Conduct Town Meetings				
	Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident			
Action/Implementation Plan and Project Description:				
2023 Plan Update Status and Changes in Priority: Ongoing				

7.7 Mitigation Action Plan & Projects for Decatur

Action 7.7.1

Mitigation Project: Improve and Mitigate Flooding of Overpasses					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	City of Decatur	Public Works	High	Long-term (2030)	High (Excess of \$500,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 5	Urban/Flash Flooding, Severe Summer Storms	Mitigate flooding		Medium	BRIC, HMGP
Action/Implementation Plan and Project Description:					
Mitigate flooding of overpasses throughout Decatur, examples include, but are not limited to: Millikin (Main St. and Oakland St.)					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.7.2

Mitigation Project: Remove Trees and Increase Green Spaces					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	City of Decatur	Public Works, City of Administration	Medium	Long-term (2030)	High (Excess of \$500,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 2, 3, 5	Tornadoes, Severe Winter Storms, Severe Summer Storms, Flooding	Mitigate damage to utilities and mitigate flooding		High	BRIC, HMGP
Action/Implementation Plan and Project Description:					

Mitigation Project: Remove Trees and Increase Green Spaces					
Remove trees from setbacks of roadways / increase green spaces and reduce elevated vegetation.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.7.3

Mitigation Project: Critical Facility Secondary Power and Back-Up Generation Assessment and Implementation					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	City of Decatur	Public Works, City of Administration	High	Short-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Ensuring critical facilities have adequate back-up generation capabilities, including automatic switchover, and heat/air capabilities, helps to reduce potential life safety and public health issues. The benefits of using back-up generation may include preventing an evacuation of a facility and allowing government services to continue.		High	BRIC, HMGP
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.7.4

Mitigation Project: Study, Assess and Implement Safe Room Construction for those Facilities that will Reduce Overall Risk to People and Property.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	City of Decatur	City of Administration Macon County EMA	High	Long-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Severe Summer Storms	A safe room is a hardened structure specifically designed to meet the Federal Emergency Management Agency (FEMA) criteria and provide protection in extreme wind events, including tornadoes.		High	HMGP, BRIC
Action/Implementation Plan and Project Description:					
Identify facilities in Macon County that will benefit from the construction of a safe room to save lives and protect property. Safe rooms will be constructed according to FEMA P-361, Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms (2021).					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.7.5

Mitigation Project: Continue Providing Public Outreach About Community Wide Notification System					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	City of Decatur	City of Administration Macon County EMA	High	Ongoing	Low
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)

Mitigation Project: Continue Providing Public Outreach About Community Wide Notification System				
1, 4, 6	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Prevention, public education, and awareness.	High	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:				
Continue to provide public outreach to encourage all residents to sign up for Community Wide Notification System.				
2023 Plan Update Status and Changes in Priority: New Action				

Action 7.7.6

Mitigation Project: Emergency Water Wells (4)					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	City of Decatur	Public Works	Medium	Short-term	High (More than \$500,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 2, 4	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials	Adequate City water in the event of another severe drought.		Medium	HMGP & Local General Funds

Mitigation Project: Emergency Water Wells (4)				
	Accident, Nuclear Accident			
Action/Implementation Plan and Project Description:				
2023 Plan Update Status and Changes in Priority: Ongoing				

Action 7.7.7

Mitigation Project: Piping water from Lake Tokowazarwa 1.5 miles to Raw Water Pump Station					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	City of Decatur	Public Works	Medium	Long-term	High (More than \$500,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 5	Drought	Supplemental water supply in the event of another severe drought		Medium	BRIC, HMGP & Local General Funds
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: Ongoing; Currently, engineering firm is looking into the feasibility of this project. Changed title to Raw Water Pump Station instead of Lake Decatur. Also, changed projected completion date from 2030-2031 to 2030-2035.					

Action 7.7.8

Mitigation Project: Flood prone property mitigation / buyout on E. Mound Rd.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	City of Decatur	City Administration, Public Works, Community Development	Medium	Short-term	Medium (\$100,000 - \$500,000)

Mitigation Project: Flood prone property mitigation / buyout on E. Mound Rd.				
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)	Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 5	Flooding (Riverine & Urban/Flash)	Removal of up to 9 residences & one church which are below BFE	Medium	HMGP & Local General Funds
Action/Implementation Plan and Project Description:				
2023 Plan Update Status and Changes in Priority: Ongoing				

Action 7.7.9

Mitigation Project: Implement adequate storm water drainage and retention to reduce repetitive damages to 3 houses in Decatur					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	City of Decatur	City of Decatur & Macon County San. Dist.	High	Short-term	Low (Less than \$100,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 5	Flooding (Riverine & Urban/Flash)	Eliminate repetitive loss of use and value from continued storm water related damages.		High	BRIC, HMGP & Local General Funds
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: Ongoing					

Action 7.7.10

Mitigation Project: Flood Study of Stevens creek between Forsyth and Decatur					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	City of Decatur & Macon County	City of Decatur, Decatur Park	Medium	Short-term	Low (Less than \$100,000)

Mitigation Project: Flood Study of Stevens creek between Forsyth and Decatur					
		District, Village of Forsyth			
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 2	Flooding (Riverine & Urban/Flash)	Identify future mitigation possibilities		Medium	HMGP & Local General Funds
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: Ongoing; Via Forsyth's review					

Action 7.7.11

Mitigation Project: Install additional sirens within the City of Decatur to cover area not currently covered by existing sirens					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	City of Decatur and Macon County	City Administration Macon County EMA	Medium	Short-term	Low (Less than \$100,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
4	Tornadoes	Correct shortfalls in the City siren coverage		Medium	HMGP & Local
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: Ongoing; Upgrading sirens and doing digital enhancement					

Action 7.7.12

Mitigation Project: Site planning for disaster incident at South Water Treatment Plant					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	City of Decatur	Public Works	Low	Short-term	Low (Less than \$100,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 2, 3	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Adequate and timely response planning in the event a natural or manmade incident were to "take down" the City's WTP		Low	HMGP & Local General Funds
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: Ongoing; Training Annually					

7.8 Mitigation Action Plan & Projects for Forsyth

Action 7.8.1

Mitigation Project: Update Building Codes					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Forsyth	Administration	High	2024	Low
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
2	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Ensure construction/building standards result in increased resiliency		High	Local General Funds
Action/Implementation Plan and Project Description:					
Building Codes Adoption - update building codes					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.8.2

Mitigation Project: Critical Facility Secondary Power and Back-Up Generation Assessment and Implementation					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Forsyth	Administration, Public Works	High	Short-term	Medium

Mitigation Project: Critical Facility Secondary Power and Back-Up Generation Assessment and Implementation				
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)	Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Ensuring critical facilities have adequate back-up generation capabilities, including automatic switchover, and heat/air capabilities, helps to reduce potential life safety and public health issues. The benefits of using back-up generation may include preventing an evacuation of a facility and allowing government services to continue.	High	BRIC, HMGP
Action/Implementation Plan and Project Description:				
2023 Plan Update Status and Changes in Priority: New Action				

Action 7.8.3

Mitigation Project: Study, Assess and Implement Safe Room Construction for those Facilities that will Reduce Overall Risk to People and Property.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Forsyth	Public Works, Administration, Macon County EMA	High	Long-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Severe Summer Storms	A safe room is a hardened structure specifically designed to meet the Federal Emergency Management Agency (FEMA) criteria and provide protection in extreme wind events, including tornadoes.		High	HMGP, BRIC
Action/Implementation Plan and Project Description:					

Mitigation Project: Study, Assess and Implement Safe Room Construction for those Facilities that will Reduce Overall Risk to People and Property.					
Identify facilities in Macon County that will benefit from the construction of a safe room to save lives and protect property. Safe rooms will be constructed according to FEMA P-361, Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms (2021).					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.8.4

Mitigation Project: Continue Providing Public Outreach About Community Wide Notification System					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Forsyth	Administration, Macon County EMA	High	Ongoing	Low
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 6	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Prevention, public education, and awareness.		High	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:					
Continue to provide public outreach to encourage all residents to sign up for Community Wide Notification System.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.8.5

Mitigation Project: Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Forsyth	Administration, Macon County EMA	High	Ongoing	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 5, 6	Tornadoes, Severe Summer Weather	Ensures sirens are operational during a tornado warning to allow time for people in the community to take cover.		High	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:					
Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.8.6

Mitigation Project: Acquire future water supply site					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	Village of Forsyth	Public Works	High	Short-term	Low (Less than \$100,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 5	Drought	Water supply		High	HMGP & Local General Funds
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: Ongoing; In the process of installing well 7					

Action 7.8.7

Mitigation Project: CH 20 Storm Sewer PH 1, Reduce flooding in Beaver Creek Estates					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	Village of Forsyth	Public Works	Medium	Short-term	High (More than \$500,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
3, 5	Flooding (Riverine & Urban/Flash)	Mitigate flooding		Medium	HMGP & Local General Funds
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: Ongoing; Constructed new culvert for Beaver Creek					

Action 7.8.8

Mitigation Project: Timber Lane Flood Berm					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	Village of Forsyth	Public Works	Medium	Short-term	Low (Less than \$100,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
3, 5	Flooding (Riverine & Urban/Flash)	Mitigate flooding		Medium	HMGP & Local General Funds
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: Ongoing					

Action 7.8.9

Mitigation Project: Reduce flooding along Stevens Creek					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	Village of Forsyth	Public Works	High	Short-term	High (More than \$500,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
3, 5	Flooding (Riverine & Urban/Flash)	Mitigate flooding		High	BRIC, HMGP & Local General Funds
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: Ongoing					

Action 7.8.10

Mitigation Project: Coordinate planning with Mall for disasters readiness					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	Village of Forsyth	Administration, Macon County EMA	Medium	Ongoing	Low (Less than \$100,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 6	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Disaster readiness and resiliency		Medium	HMGP, Local General Funds & Private Funds

Mitigation Project: Coordinate planning with Mall for disasters readiness
Action/Implementation Plan and Project Description:
2023 Plan Update Status and Changes in Priority: Ongoing

7.9 Mitigation Action Plan & Projects for Harristown

Action 7.9.1

Mitigation Project: Public Outreach, Education, and Support Services					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Harristown	Administration, Macon County EMA	High	Ongoing	Low
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 6	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Community resilience		High	Local General Funds
Action/Implementation Plan and Project Description:					
Continue social media, newsletters, web site, public meetings					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.9.2

Mitigation Project: Improve Storm Drainage System					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Harristown	Public Works	Medium	Short-term (2025)	High (\$500,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
3, 5	Flood (Urban/Flash Flooding)	Mitigate flooding		Medium	BRIC, HMGP, Local General Funds
Action/Implementation Plan and Project Description:					
Storm Drainage System and Drainage System Improvements					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.9.3

Mitigation Project: Critical Facility Secondary Power and Back-Up Generation Assessment and Implementation					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Harristown	Administration	High	Short-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials	Ensuring critical facilities have adequate back-up generation capabilities, including automatic switchover, and heat/air capabilities, helps to reduce potential life safety and public health issues. The benefits of using back-up generation may include preventing an evacuation of a facility and allowing government services to continue.		High	BRIC, HMGP

Mitigation Project: Critical Facility Secondary Power and Back-Up Generation Assessment and Implementation				
	Accident, Nuclear Accident			
Action/Implementation Plan and Project Description:				
2023 Plan Update Status and Changes in Priority: New Action				

Action 7.9.4

Mitigation Project: Study, Assess and Implement Safe Room Construction for those Facilities that will Reduce Overall Risk to People and Property.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Harristown	Administration, Macon County EMA	High	Long-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Severe Summer Storms	A safe room is a hardened structure specifically designed to meet the Federal Emergency Management Agency (FEMA) criteria and provide protection in extreme wind events, including tornadoes.		High	HMGP, BRIC
Action/Implementation Plan and Project Description:					
Identify facilities in Macon County that will benefit from the construction of a safe room to save lives and protect property. Safe rooms will be constructed according to FEMA P-361, Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms (2021).					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.9.5

Mitigation Project: Continue Providing Public Outreach About Community Wide Notification System					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Harristown	Administration, Macon County EMA	High	Ongoing	Low
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 6	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Prevention, public education, and awareness.		High	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:					
Continue to provide public outreach to encourage all residents to sign up for Community Wide Notification System.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.9.6

Mitigation Project: Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Harristown	Administration, Macon County EMA	High	Ongoing	Medium

Mitigation Project: Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County.				
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)	Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 5, 6	Tornadoes, Severe Summer Weather	Ensures sirens are operational during a tornado warning to allow time for people in the community to take cover.	High	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:				
Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County.				
2023 Plan Update Status and Changes in Priority: New Action				

Action 7.9.7

Mitigation Project: Tree Removal to Maintain Utility Path					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	Village of Harristown	Public Works	Medium	Short-term	Low (Less than \$100,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)	Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)	
4	Severe Summer Storms, Severe Winter Storms	Maintain access	Medium		Local General Funds
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: Ongoing					

Action 7.9.8

Mitigation Project: Ditching to ensure storm drainage					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)

Mitigation Project: Ditching to ensure storm drainage					
2014	Village of Harristown	Public Works	Medium	Short-term	Low (Less than \$100,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
3, 5	Flooding (Riverine & Urban/Flash)	Mitigate flooding		Medium	HMGP & Local General Funds
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: Ongoing					

7.10 Mitigation Action Plan & Projects for Long Creek

Action 7.10.1

Mitigation Project: Study and implement improvements to address gaps in warning siren coverage					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Long Creek	Administration, Macon County EMA	High	Ongoing	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1	Tornadoes, Severe Summer Weather	Life safety		High	Local general funds, BRIC, HMGP
Action/Implementation Plan and Project Description:					
Address gaps in our warning sirens. One siren has an occasional electrical shortage.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.10.2

Mitigation Project: Conduct Flood Study and Implement Flood Control and Property Protection Projects					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Long Creek	Administration	High	Ongoing	The costs associated with this action item will be project specific.
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 2, 3, 4, 5, 6	Flooding (Riverine & Urban/Flash)	Flood control and property protection projects can benefit multiple communities by targeting the source of a problem.		High	BRIC, FMA, HMGP, Local funds

Mitigation Project: Conduct Flood Study and Implement Flood Control and Property Protection Projects				
		Enhanced project participation will increase overall benefits (i.e., cost-sharing, resources, etc.).		
Action/Implementation Plan and Project Description:				
Municipality has many intersections and subdivisions that constantly floods due to the amount of rain we receive. Areas is also on flat terrain with some sloped terrain				
2023 Plan Update Status and Changes in Priority: New Action				

Action 7.10.3

Mitigation Project: Critical Facility Back-Up Generation Assessment and Implementation					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Long Creek	Administration, Macon County EMA	High	Ongoing	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 2, 3, 4, 5	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Ensuring critical facilities have adequate back-up generation capabilities, including automatic switchover, and heat/air capabilities, helps to reduce potential life safety and public health issues. The benefits of using back-up generation may include preventing an evacuation of a facility and allowing government services to continue.		Medium	BRIC, HMGP
Action/Implementation Plan and Project Description:					
Power outage rate in our municipality is frequent. Our organization needs a back-up generator for this reason.					

Mitigation Project: Critical Facility Back-Up Generation Assessment and Implementation

2023 Plan Update Status and Changes in Priority: New Action

Action 7.10.4

Mitigation Project: Study, Assess and Implement Safe Room Construction for those Facilities that will Reduce Overall Risk to People and Property.

Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Long Creek	Administration, Macon County EMA	High	Long-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Severe Summer Storms	A safe room is a hardened structure specifically designed to meet the Federal Emergency Management Agency (FEMA) criteria and provide protection in extreme wind events, including tornadoes.		High	HMGP, BRIC
Action/Implementation Plan and Project Description:					
Identify facilities in Macon County that will benefit from the construction of a safe room to save lives and protect property. Safe rooms will be constructed according to FEMA P-361, Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms (2021).					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.10.5

Mitigation Project: Continue Providing Public Outreach About Community Wide Notification System

Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
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Mitigation Project: Continue Providing Public Outreach About Community Wide Notification System					
2023	Village of Long Creek	Administration, Macon County EMA	High	Ongoing	Low
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 6	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Prevention, public education, and awareness.		High	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:					
Continue to provide public outreach to encourage all residents to sign up for Community Wide Notification System.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.10.6

Mitigation Project: Provide back-up generators to water supply systems in the Village of Long Creek					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	Village of Long Creek	Administration	High	Short-term	Medium (\$100,000 - \$500,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Flood, Severe Winter Storms, Severe	Supplemental Power for water supply in the event of severe weather		Medium	HMGP & Local General Funds

Mitigation Project: Provide back-up generators to water supply systems in the Village of Long Creek				
	Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes			
Action/Implementation Plan and Project Description:				
2023 Plan Update Status and Changes in Priority: Ongoing; Plan to have it implemented in the next year.				

7.11 Mitigation Action Plan & Projects for Macon

Action 7.11.1

Mitigation Project: Onsite Generator for Community Center					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	City of Macon	Administration, Macon County EMA	Medium	Short-term (2025)	Low (\$100,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 2, 3, 5	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Backup power		Medium	Building Fund, HMGP, BRIC
Action/Implementation Plan and Project Description:					
Community Center is listed at county level as a shelter. Warming and Cooling Center					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.11.2

Mitigation Project: Update and Improve Sanitary Sewer Collection System					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	City of Macon	Water and Street Superintendents	Medium	Short-term (2028)	High (\$1,000,000 - \$5,000,000)

Mitigation Project: Update and Improve Sanitary Sewer Collection System				
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)	Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 6	Flood (Urban/Flash Flooding)	Mitigate flooding	High	Sanitary Fund / EPA Loans / TIF / EPA Grants
Action/Implementation Plan and Project Description:				
Sanitary sewer collection system update to prevent excess groundwater influx.				
2023 Plan Update Status and Changes in Priority: New Action				

Action 7.11.3

Mitigation Project: Critical Facility Secondary Power and Back-Up Generation Assessment and Implementation					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	City of Macon	Administration, Macon County EMA	High	Short-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Ensuring critical facilities have adequate back-up generation capabilities, including automatic switchover, and heat/air capabilities, helps to reduce potential life safety and public health issues. The benefits of using back-up generation may include preventing an evacuation of a facility and allowing government services to continue.		High	BRIC, HMGP
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.11.4

Mitigation Project: Study, Assess and Implement Safe Room Construction for those Facilities that will Reduce Overall Risk to People and Property.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	City of Macon	Administration, Macon County EMA	High	Long-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Severe Summer Storms	A safe room is a hardened structure specifically designed to meet the Federal Emergency Management Agency (FEMA) criteria and provide protection in extreme wind events, including tornadoes.		High	HMGP, BRIC
Action/Implementation Plan and Project Description:					
Identify facilities in Macon County that will benefit from the construction of a safe room to save lives and protect property. Safe rooms will be constructed according to FEMA P-361, Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms (2021).					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.11.5

Mitigation Project: Continue Providing Public Outreach About Community Wide Notification System					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	City of Macon	Administration, Macon County EMA	High	Ongoing	Low
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)

Mitigation Project: Continue Providing Public Outreach About Community Wide Notification System				
1, 4, 6	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Prevention, public education, and awareness.	High	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:				
Continue to provide public outreach to encourage all residents to sign up for Community Wide Notification System.				
2023 Plan Update Status and Changes in Priority: New Action				

Action 7.11.6

Mitigation Project: Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County. Specifically look at Walsh Park & Hogan Hills					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	City of Macon	Administration, Macon County EMA	Medium	Ongoing	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 5, 6	Tornadoes, Severe Summer Weather	Ensures sirens are operational during a tornado warning to allow time for people in the community to take cover.		Medium	HMGP, BRIC, Local General Funds; TIF Funds
Action/Implementation Plan and Project Description:					
Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County. Specifically look at the following areas: Walsh Park & Hogan Hills					

Mitigation Project: Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County. Specifically look at Walsh Park & Hogan Hills

2023 Plan Update Status and Changes in Priority: Ongoing; Will revisit this action in 2023

Action 7.11.7

Mitigation Project: Implement a tile system for storm water drainage

Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	City of Macon	Water Superintendent	Medium	Short-term	Medium (\$100,000 - \$500,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
3, 5	Flooding (Riverine & Urban/Flash)	Mitigate flooding		Medium	HMGP & TIF Funds
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: Ongoing; Some improvements made					

7.12 Mitigation Action Plan & Projects for Maroa

Action 7.12.1

Mitigation Project: Replace aged, defective storm drain along Oak Street					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	City of Maroa	Engineer	Medium	Short-term	High
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 5	Flood (Urban/Flash Flooding)	Increase drainage for Washington Street		Low	BRIC, HMGP, Local General Funds
Action/Implementation Plan and Project Description:					
Replace damaged storm drainage system along Oak Street.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.12.2

Mitigation Project: Add Additional Storm Warning Sirens to Cover the Entire City					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	City of Maroa	Emergency Services	High	Ongoing	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 5	Tornadoes, Severe Summer Storms	Increase audible coverage of storm warning sirens		Low	BRIC, HMGP
Action/Implementation Plan and Project Description:					
Current siren coverage is not audible to a very large portion of the City population. Add sirens to the East, West, North and South population edges of the City.					

Mitigation Project: Add Additional Storm Warning Sirens to Cover the Entire City

2023 Plan Update Status and Changes in Priority: New Action

Action 7.12.3

Mitigation Project: Wood Street Drainage

Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	City of Maroa	Engineer	Medium	Short-term	Low (\$50,000 - \$100,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 5	Flood (Urban/Flash Flooding)	Increased drainage		Medium	BRIC, HMGP, Local General Funds
Action/Implementation Plan and Project Description:					
Replace existing aged and faulty drainage system from Wood Street to the outlet on Duroc Rd.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.12.4

Mitigation Project: Dredge, reshape, and fortify Lake Fork Creek

Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	City of Maroa	Engineer	Medium	Short-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 5	Flooding (Riverine & Urban/Flash)	Increased storm run-off drainage		Low	BRIC, HMGP, Local General Funds

Mitigation Project: Dredge, reshape, and fortify Lake Fork Creek					
Action/Implementation Plan and Project Description:					
Dredge, reshape and fortify Lake Fork Creek for storm drainage and sewer treatment outlet					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.12.5

Mitigation Project: Upgrade Citywide Storm Drainage System					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	City of Maroa	Engineer	Medium	Short-term	High
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 5	Flood (Urban/Flash Flooding)	Mitigation of urban flash flooding		Medium	BRIC, HMGP, Local General Funds
Action/Implementation Plan and Project Description:					
Upgrade citywide surface, tile and curbing storm drainage system. Upsize, increase, and add and replace aging stormwater drainage systems.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.12.6

Mitigation Project: Critical Facility Secondary Power and Back-Up Generation Assessment and Implementation					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	City of Maroa	Emergency Services	High	Short-term	Medium

Mitigation Project: Critical Facility Secondary Power and Back-Up Generation Assessment and Implementation				
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)	Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Ensuring critical facilities have adequate back-up generation capabilities, including automatic switchover, and heat/air capabilities, helps to reduce potential life safety and public health issues. The benefits of using back-up generation may include preventing an evacuation of a facility and allowing government services to continue.	High	BRIC, HMGP
Action/Implementation Plan and Project Description:				
2023 Plan Update Status and Changes in Priority: New Action				

Action 7.12.7

Mitigation Project: Study, Assess and Implement Safe Room Construction for those Facilities that will Reduce Overall Risk to People and Property.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	City of Maroa	Emergency Services, County EMA	High	Long-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)	Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)	
1, 3, 4	Tornadoes, Severe Summer Storms	A safe room is a hardened structure specifically designed to meet the Federal Emergency Management Agency (FEMA) criteria and provide protection in extreme wind events, including tornadoes.	High	HMGP, BRIC	
Action/Implementation Plan and Project Description:					

Mitigation Project: Study, Assess and Implement Safe Room Construction for those Facilities that will Reduce Overall Risk to People and Property.

Identify facilities in Macon County that will benefit from the construction of a safe room to save lives and protect property. Safe rooms will be constructed according to FEMA P-361, Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms (2021).

2023 Plan Update Status and Changes in Priority: New Action

Action 7.12.8

Mitigation Project: Continue Providing Public Outreach About Community Wide Notification System

Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	City of Maroa	Emergency Services, Macon County EMA	High	Ongoing	Low
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 6	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Prevention, public education, and awareness.		High	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:					
Continue to provide public outreach to encourage all residents to sign up for Community Wide Notification System.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.12.9

Mitigation Project: Provide back-up generators to city hall					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	City of Maroa	Emergency Services	Medium	Short-term	Medium (\$100,000 - \$500,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	To provide for shelter during frequent power outages.		Low	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: Ongoing; Project is being revisited.					

7.13 Mitigation Action Plan & Projects for Mt. Zion

Action 7.13.1

Mitigation Project: Study, Assess, and Implement Flood Control Measures					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Mt. Zion	Public Works	Medium	Ongoing	High
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 5	Flood	Mitigate flooding		Medium	BRIC, HMGP, Local General Funds
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.13.2

Mitigation Project: Critical Facility Secondary Power and Back-Up Generation Assessment and Implementation					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Mt. Zion	Administration	High	Short-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials	Ensuring critical facilities have adequate back-up generation capabilities, including automatic switchover, and heat/air capabilities, helps to reduce potential life safety and public health issues. The benefits of using back-up generation may include preventing an evacuation of a facility and allowing government services to continue.		High	BRIC, HMGP

Mitigation Project: Critical Facility Secondary Power and Back-Up Generation Assessment and Implementation				
	Accident, Nuclear Accident			
Action/Implementation Plan and Project Description:				
2023 Plan Update Status and Changes in Priority: New Action				

Action 7.13.3

Mitigation Project: Study, Assess and Implement Safe Room Construction for those Facilities that will Reduce Overall Risk to People and Property.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Mt. Zion	Administration, Macon County EMA	High	Long-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Severe Summer Storms	A safe room is a hardened structure specifically designed to meet the Federal Emergency Management Agency (FEMA) criteria and provide protection in extreme wind events, including tornadoes.		High	HMGP, BRIC
Action/Implementation Plan and Project Description:					
Identify facilities in Macon County that will benefit from the construction of a safe room to save lives and protect property. Safe rooms will be constructed according to FEMA P-361, Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms (2021).					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.13.4

Mitigation Project: Continue Providing Public Outreach About Community Wide Notification System					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Mt. Zion	Administration, Macon County EMA	High	Ongoing	Low
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 6	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Prevention, public education, and awareness.		High	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:					
Continue to provide public outreach to encourage all residents to sign up for Community Wide Notification System.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.13.5

Mitigation Project: Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Mt. Zion	Administration, Macon County EMA	High	Ongoing	Medium

Mitigation Project: Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County.				
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)	Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 5, 6	Tornadoes, Severe Summer Weather	Ensures sirens are operational during a tornado warning to allow time for people in the community to take cover.	High	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:				
Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County.				
2023 Plan Update Status and Changes in Priority: New Action				

7.14 Mitigation Action Plan & Projects for Niantic

Action 7.14.1

Mitigation Project: Improve Flood Control					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Niantic	Village of Niantic	Medium	2026	\$100-250K
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Flooding (Riverine & Urban/Flash)	Limit flooding		Medium	Grants / local funding
Action/Implementation Plan and Project Description:					
• Retrofit, replace or upsize culverts • Installing new drainage tile in the village of Niantic. • Retrofit and improve bridge structure.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.14.2

Mitigation Project: Critical Facility Secondary Power and Back-Up Generation Assessment and Implementation					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Niantic	Administration, Macon County EMA	High	Short-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Flood, Severe Winter	Ensuring critical facilities have adequate back-up generation capabilities, including		High	BRIC, HMGP

Mitigation Project: Critical Facility Secondary Power and Back-Up Generation Assessment and Implementation				
	Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	automatic switchover, and heat/air capabilities, helps to reduce potential life safety and public health issues. The benefits of using back-up generation may include preventing an evacuation of a facility and allowing government services to continue.		
Action/Implementation Plan and Project Description:				
2023 Plan Update Status and Changes in Priority: New Action				

Action 7.14.3

Mitigation Project: Continue Providing Public Outreach About Community Wide Notification System					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Niantic	Administration, Macon County EMA	High	Ongoing	Low
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 6	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Prevention, public education, and awareness.		High	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:					

Mitigation Project: Continue Providing Public Outreach About Community Wide Notification System

Continue to provide public outreach to encourage all residents to sign up for Community Wide Notification System.

2023 Plan Update Status and Changes in Priority: New Action

Action 7.14.4

Mitigation Project: Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County.

Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	Village of Niantic	Administration, Macon County EMA	High	Ongoing	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 5, 6	Tornadoes, Severe Summer Weather	Ensures sirens are operational during a tornado warning to allow time for people in the community to take cover.		High	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:					
Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County.					
2023 Plan Update Status and Changes in Priority: Ongoing					

Action 7.14.5

Mitigation Project: Study, Assess and Implement Safe Room Construction for those Facilities that will Reduce Overall Risk to People and Property.

Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
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Mitigation Project: Study, Assess and Implement Safe Room Construction for those Facilities that will Reduce Overall Risk to People and Property.					
2014	Village of Niantic	Administration, Macon County EMA	High	Long-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Severe Summer Storms	A safe room is a hardened structure specifically designed to meet the Federal Emergency Management Agency (FEMA) criteria and provide protection in extreme wind events, including tornadoes.		High	HMGP, BRIC
Action/Implementation Plan and Project Description:					
Identify facilities in Macon County that will benefit from the construction of a safe room to save lives and protect property. Safe rooms will be constructed according to FEMA P-361, Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms (2021).					
2023 Plan Update Status and Changes in Priority: Ongoing					

7.15 Mitigation Action Plan & Projects for Oreana

Action 7.15.1

Mitigation Project: New Drainage Control and Infrastructure for West Plains Area					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Oreana	Public Works	High	Short-term	High
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 5	All Hazards, Flash/Urban Flooding	Health/Wellness of residents; Property Damage		Medium	BRIC, HMGP, Local General Funds
Action/Implementation Plan and Project Description:					
New drainage control and infrastructure for West Plains area					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.15.2

Mitigation Project: Critical Facility Secondary Power and Back-Up Generation Assessment and Implementation					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Oreana	Emergency Services, Administration	High	Short-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme	Ensuring critical facilities have adequate back-up generation capabilities, including automatic switchover, and heat/air capabilities, helps to reduce potential life safety and public health issues. The benefits		High	BRIC, HMGP

Mitigation Project: Critical Facility Secondary Power and Back-Up Generation Assessment and Implementation				
	Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	of using back-up generation may include preventing an evacuation of a facility and allowing government services to continue.		
Action/Implementation Plan and Project Description:				
2023 Plan Update Status and Changes in Priority: New Action				

Action 7.15.3

Mitigation Project: Study, Assess and Implement Safe Room Construction for those Facilities that will Reduce Overall Risk to People and Property.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Oreana	Emergency Services, Administration, Macon County EMA	High	Long-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Severe Summer Storms	A safe room is a hardened structure specifically designed to meet the Federal Emergency Management Agency (FEMA) criteria and provide protection in extreme wind events, including tornadoes.		High	HMGP, BRIC
Action/Implementation Plan and Project Description:					
Identify facilities in Macon County that will benefit from the construction of a safe room to save lives and protect property. Safe rooms will be constructed according to FEMA P-361, Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms (2021).					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.15.4

Mitigation Project: Continue Providing Public Outreach About Community Wide Notification System					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Oreana	Emergency Services, Administration, Macon County EMA	High	Ongoing	Low
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 6	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Prevention, public education, and awareness.		High	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:					
Continue to provide public outreach to encourage all residents to sign up for Community Wide Notification System.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.15.5

Mitigation Project: Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Oreana	Emergency Services, Administration, Macon County EMA	High	Ongoing	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 5, 6	Tornadoes, Severe Summer Weather	Ensures sirens are operational during a tornado warning to allow time for people in the community to take cover.		High	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:					
Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County.					
2023 Plan Update Status and Changes in Priority: New Action					

7.16 Mitigation Action Plan & Projects for Warrensburg

Action 7.16.1

Mitigation Project: Replace two lift stations for sewer plant					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Warrensburg	Village Trustees	High	Short-term	High (\$1,000,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
3	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident, Eliminate sewer failure	Mitigate lift station failure		Low	BRIC, HMGP, Local General Funds
Action/Implementation Plan and Project Description:					
Replace two lift stations for sewer plant.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.16.2

Mitigation Project: Install new and improved Railroad Crossing signals					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Warrensburg	NS RR	Medium	Short-term (2025)	Medium (\$150,000)

Mitigation Project: Install new and improved Railroad Crossing signals				
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)	Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3	Nuclear/HAZMAT Accidents, vehicle accidents	Loss of life	High	NS, Village General Funds
Action/Implementation Plan and Project Description:				
Install new and improved Railroad Crossing signals for both locations in the village.				
2023 Plan Update Status and Changes in Priority: New Action				

Action 7.16.3

Mitigation Project: Critical Facility Secondary Power and Back-Up Generation Assessment and Implementation					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Warrensburg	Administration, Macon County EMA	High	Short-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Ensuring critical facilities have adequate back-up generation capabilities, including automatic switchover, and heat/air capabilities, helps to reduce potential life safety and public health issues. The benefits of using back-up generation may include preventing an evacuation of a facility and allowing government services to continue.		High	BRIC, HMGP
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: New Action					

Mitigation Project: Critical Facility Secondary Power and Back-Up Generation Assessment and Implementation

Action 7.16.4

Mitigation Project: Study, Assess and Implement Safe Room Construction for those Facilities that will Reduce Overall Risk to People and Property.

Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Warrensburg	Administration, Macon County EMA	High	Long-term	Medium
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4	Tornadoes, Severe Summer Storms	A safe room is a hardened structure specifically designed to meet the Federal Emergency Management Agency (FEMA) criteria and provide protection in extreme wind events, including tornadoes.		High	HMGP, BRIC
Action/Implementation Plan and Project Description:					
Identify facilities in Macon County that will benefit from the construction of a safe room to save lives and protect property. Safe rooms will be constructed according to FEMA P-361, Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms (2021).					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.16.5

Mitigation Project: Continue Providing Public Outreach About Community Wide Notification System					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Village of Warrensburg	Administration, Macon County EMA	High	Ongoing	Low
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 6	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Prevention, public education, and awareness.		High	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:					
Continue to provide public outreach to encourage all residents to sign up for Community Wide Notification System.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.16.6

Mitigation Project: Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	Village of Warrensburg	Administration, Village Board,	High	Ongoing	Medium

Mitigation Project: Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County.					
		Macon County EMA			
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 4, 5, 6	Tornadoes, Severe Summer Weather	Ensures sirens are operational during a tornado warning to allow time for people in the community to take cover.		High	HMGP, BRIC, Local General Funds
Action/Implementation Plan and Project Description:					
Conduct a Warning Siren Gap Analysis and Implement Improvements to Tornado Sirens in Macon County.					
2023 Plan Update Status and Changes in Priority: Ongoing					

Action 7.16.7

Mitigation Project: Electronic public information sign					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2014	Village of Warrensburg	Village Board	Medium	Short-term	Low
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
6	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Public information and warning		Medium	General funds
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: Ongoing					

7.17 Mitigation Action Plan & Projects for Townships

Action 7.17.1 Friends Creek Township

Mitigation Project: Reduce agricultural accidents on roads by conducting a study and implementing activities based on findings.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Friends Creek Township	Road District	Medium	Short-term	Low
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 2, 3, 4, 6	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident	Mitigate traffic accidents		Medium	Local General Funds
Action/Implementation Plan and Project Description:					
Research what is needed for cleanup and safety of residents; Educate and inform the public.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.17.2 Friends Creek Township

Mitigation Project: Study areas prone to flooding on township roads and implement findings.					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Friends Creek Township	Road District	Medium	Ongoing	Medium

Mitigation Project: Study areas prone to flooding on township roads and implement findings.				
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)	Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 5	Flood	Mitigate flooding	Medium	Motor fuel and tax levy
Action/Implementation Plan and Project Description:				
Survey areas prone to flooding on township roads. Replace culverts as needed. Cut trees and clean debris in affected areas. Improve roads damaged by overland flooding.				
2023 Plan Update Status and Changes in Priority: New Action				

Action 7.17.3 Blue Mound Township

Mitigation Project: Update outdoor warning siren					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Unincorporated Boody and surrounding area	Blue Mound Township	Medium	Ongoing	Low (\$35,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)	Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)	
1, 6	Tornadoes, Severe Summer Weather	Alerting a larger area through advanced technology	Low	BRIC, HMGP, Local General Funds	
Action/Implementation Plan and Project Description:					
Update outdoor warning system					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.17.4 Blue Mound Township

Mitigation Project: Bridge replacement for aging infrastructure					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Blue Mound Township	Blue Mound Township Road District	Medium	Ongoing	High
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 5	Tornadoes, Flood, Severe Winter Storms, Severe Summer Storms, High Hazard Dams, Earthquakes	Life safety and property protection		Low	Local Funds, BRIC, HMGP
Action/Implementation Plan and Project Description:					
Survey flood areas on township roads. Replace culverts as needed; Cut trees and clean debris in affected areas; Improve roads damaged by running water.					
2023 Plan Update Status and Changes in Priority: New Action					

Action 7.17.5 Long Creek Township

Mitigation Project: Develop supplemental power of water supply					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Long Creek Township	Long Creek Water District	High	Short-term	Medium (\$100,000 - \$500,000)
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 3, 4, 5	Tornadoes, Flood, Severe Winter Storms, Severe	Supplemental power of water supply in the event of severe weather		High	BRIC, HMGP, Local Funds

Mitigation Project: Develop supplemental power of water supply				
	Summer Storms, Drought, Extreme Heat, High Hazard Dams, Earthquakes, Hazardous Materials Accident, Nuclear Accident			
Action/Implementation Plan and Project Description:				
Any substantial action taken to reduce or eliminate long term risk to life and property from a hazard event.				
2023 Plan Update Status and Changes in Priority: New Action				

Action 7.17.6 Long Creek Township

Mitigation Project: Conduct Flood Study and Implement Flood Control and Property Protection Projects					
Year Initiated	Applicable Jurisdiction	Lead Agency/ Organization	Priority and Level of Importance (Low, Medium, High)	Projected Completion Date (Short-term, Long-term, or Ongoing)	Estimated Cost & Analysis (Low, Medium, High)
2023	Long Creek Township	Long Creek Water District	High	Ongoing	The costs associated with this action item will be project specific.
Applicable Goal(s)	Hazard(s) Mitigated	Benefits (Loss Avoided)		Benefit Analysis (Low, Medium, High)	Potential Funding Source(s)
1, 2, 3, 4, 5	Flooding (Riverine & Urban/Flash)	Flood control and property protection projects can benefit multiple communities by targeting the source of a problem. Enhanced project participation will increase overall benefits (i.e., cost-sharing, resources, etc.).		High	BRIC, FMA, HMGP, Local funds
Action/Implementation Plan and Project Description:					
2023 Plan Update Status and Changes in Priority: New Action					

Chapter 8: Plan Maintenance

The Local Emergency Planning Committee (LEPC) will continue to monitor, evaluate, and update the Plan, specifically focusing on progress toward each action item within the Multi-Hazard Mitigation Plan (Plan). The LEPC will dedicate one meeting annually to discuss the report's findings, progress each community has made, issues each community has experienced, and proposed projects. The annual meeting shall also give the LEPC the opportunity to discuss needed revisions/amendments to this Plan.

Developing an annual report and meeting annually to discuss progress keeps the LEPC involved in the Plan maintenance process, formalizes the maintenance process, and provides a level of accountability to work toward accomplishing the action items within the Plan. Macon County EMA and staff assigned shall be responsible for coordinating and overseeing the development of the annual report and its associated meeting. In addition, to continue to encourage community participation, annual meetings shall be open to the public and a public comment period will be incorporated into each meeting.

Per the Federal Emergency Management Agency (FEMA), this Plan shall be updated every five years. Again, Macon County departments and staff assigned shall be responsible for coordinating and overseeing the next Plan update. Macon County coordination will be overseen by Macon County EMA. In addition, it is recommended that the next 5-year update be conducted over the process of one to two years. This will provide the LEPC ample time to meet, develop drafts, involve the public, coordinate with stakeholders, and finalize the Plan.

This chapter describes the Plan maintenance process for Macon County.

8.1 Formal Review Process

The Plan will be reviewed on an annual basis by the LEPC to determine the effectiveness of programs and to reflect changes that may affect mitigation priorities. The Coordinator of the Macon County EMA or designee will be responsible for contacting the LEPC and organizing the review. The LEPC will be responsible for monitoring and evaluating the progress of the mitigation strategies in the Plan. The LEPC will review the goals and action items to determine their relevance to changing situations in the county as well as changes in Federal policy and to ensure they are addressing current and expected conditions. The LEPC will also review the risk assessment portion of the Plan to determine if this information should be updated or modified, given any new available data. The organizations responsible for the various action items will report on the status of the projects, the success of various implementation processes, difficulties encountered, success of coordination efforts, and which strategies should be revised or removed.

The Coordinator of the Macon County EMA or designee will be responsible for ensuring the updating of the Plan. The Coordinator or designee will also notify all holders of the Plan and affected stakeholders when changes have been made. Every five years, the updated Plan will be

submitted to the Illinois Emergency Management Agency (IEMA) and to the Federal Emergency Management Agency for review and approval.

8.2 Continued Public Involvement

Macon County and the LEPC are dedicated to involving the public directly in the review and updates of the Plan. The public will have the opportunity to provide input into Plan revisions and updates. Copies of the Plan will be kept by appropriate county departments and outside agencies.

Public meetings will be held when deemed necessary by the LEPC. The meetings will provide a forum where the public can express concerns, opinions, or new alternatives that can then be included in the Plan. The LEPC, and specifically Macon County EMA, will be responsible for using county resources to publicize the public meetings and maintain public involvement.

To further facilitate continued public involvement in the planning process, Macon County will ensure that:

- Macon County EMA will keep a copy of the Plan on hand at their office for review and comment by the public. The Plan will also be maintained on their website.
- A public meeting will be held annually to provide the public with a forum for discussing concerns, opinions, and ideas with the LEPC.
- Mitigation flyers or mailings that contain mitigation activities and actions that promote reducing damages and risks of natural hazards are developed.

8.3 Monitoring, Evaluation, and Updating the Plan

To ensure the Multi-Hazard Mitigation Plan continues to provide an appropriate path for risk reduction throughout the county, it is necessary to regularly evaluate and update it. The LEPC will be responsible for monitoring the status of the Plan and gathering appropriate parties to report the status of mitigation actions. The LEPC will convene on an annual basis to determine the progress of the identified mitigation actions. The LEPC will also be an active participant in the next Plan update. As the Multi-Hazard Mitigation Plan matures, new stakeholders, specifically those stakeholders and organizations that represent underserved populations and groups in the county, will be identified and encouraged to join the existing LEPC.

Macon County EMA is responsible for contacting LEPC members and organizing the annual meeting. The LEPC's responsibilities include:

- Annually reviewing each goal to determine its relevance and appropriateness.
- Monitor and evaluate the mitigation strategies in this Plan to ensure the document reflects current hazard analyses, development trends, code changes and risk analyses and perceptions.

- Ensure the appropriate implementation of annual status reports and regular maintenance of the Plan.
- Create future action plans and mitigation strategies. These should be carefully assessed and prioritized using benefit-cost analysis (BCA) methodology that FEMA has developed.
- Ensure the public is invited to comment and be involved in mitigation plan updates.
- Ensure that the county complies with all applicable Federal statutes and regulations during the periods for which it receives grant funding, in compliance with 44 CFR.
- Reassess the Plan in light of any major hazard event. The LEPC will convene within 45 days of any major event to review all applicable data and to consider the risk assessment, Plan goals, and action items given the impact of the hazard event.
- Review the Plan in connection to other plans, projects, developments, and other significant initiatives.
- Coordinate with appropriate municipalities and authorities to incorporate regional initiatives that transcend the boundaries of the county.
- Update the Plan every five years and submit for FEMA approval.
- Amend the Plan whenever necessary to reflect changes in State or Federal laws and statutes required in 44 CFR.

8.3.1 The Five-Year Action Plan

This section outlines the implementation agenda that the LEPC should follow five years following adoption of this Plan, and then every five years thereafter. The LEPC is responsible to ensure the Multi-Hazard Mitigation Plan is updated every five years.

The LEPC will consider the following an action plan for the five-year planning cycle. It should be noted that the schedule below can be modified as necessary and does not include any meetings and/or activities that would be necessary following a disaster event (which would include reconvening the LEPC within 45 days of a disaster or emergency to determine what mitigation projects should be prioritized during the community recovery). If an emergency meeting of the LEPC occurs, this proposed schedule may be altered to fit any new needs.

Year 0:

- **2023:** Update Multi-Hazard Mitigation Plan, including a series of meetings & public meetings. Submit 2023 Multi-Hazard Mitigation Plan for FEMA approval.
- **2023:** Work on mitigation actions. Macon County EMA to stay in contact with lead departments and municipalities to keep tabs on project status.

Year 1:

- **January 2024 – December 2024:** Work on mitigation actions. Macon County EMA to stay in contact with lead departments and municipalities to keep tabs on project status. Encourage Plan integration efforts.

- **Fall/Winter 2024:** Reconvene LEPC for an annual meeting. Discuss opportunities for mitigation plan integration with other planning documents. Discuss recent hazards. Update the status of projects. Host a public meeting.

Year 2:

- **January 2025 – December 2025:** Work on mitigation actions. Macon County EMA to stay in contact with lead departments and municipalities to keep tabs on project status. Encourage Plan integration efforts.
- **Fall/Winter 2025:** Reconvene LEPC for an annual meeting. Discuss opportunities for mitigation plan integration with other planning documents. Discuss recent hazards. Update the status of projects. Host a public meeting.

Year 3:

- **January 2026 – December 2026:** Work on mitigation actions. Macon County EMA to stay in contact with lead departments and municipalities to keep tabs on project status. Encourage Plan integration efforts.
- **Summer/Fall 2026:** Apply for Building Resilient Infrastructure and Communities or Hazard Mitigation Grant Program funds to update the next iteration of the mitigation plan.
- **Fall/Winter 2026:** Reconvene LEPC for an annual meeting. Discuss opportunities for mitigation plan integration with other planning documents. Discuss recent hazards. Update the status of projects. Host a public meeting.

Year 4:

- **January 2027 – December 2027:** Work on mitigation actions. Macon County EMA to stay in contact with lead departments and municipalities to keep tabs on project status. Encourage Plan integration efforts. Update 2023 Multi-Hazard Mitigation Plan, including a series of meetings & public meetings.

Year 5:

- **2028/2029:** Submit Multi-Hazard Mitigation Plan for FEMA approval. Repeat.

8.4 Annual Multi-Hazard Mitigation LEPC Planning Meetings

During each annual LEPC meeting, the LEPC will be responsible for a brief evaluation of the 2024 Multi-Hazard Mitigation Plan and to review the progress of mitigation actions.

8.4.1 Plan Evaluation

To evaluate the Plan, the LEPC should answer the following questions:

- Are the goals still relevant?
- Is the risk assessment still appropriate, or has the nature of the hazard and/or vulnerability changed over time?
- Are current resources appropriate for implementing this Plan?
- Have lead agencies participated as originally proposed?
- Has the public been adequately involved in the process? Are their comments being heard?
- Have county departments and participating jurisdictions been integrating mitigation into their planning documents?

If the answer to each of the above questions is “yes,” the Plan evaluation is complete. If any questions are answered with a “no,” the identified gap must be addressed.

8.4.2 Review of Mitigation Actions

Once the Plan evaluation is complete, the LEPC will review the status of the mitigation actions. To do so, the LEPC should answer the following questions:

- Have the mitigation actions been implemented as planned?
- Have outcomes been adequate?
- What problems have occurred in the implementation process?

8.4.3 Meeting Documentation

Each annual LEPC meeting must be documented, including the Plan evaluation and review of mitigation actions. This may be done by survey or other means, as appropriate.

8.5 Implementation through Existing Programs

Hazard mitigation practices must be incorporated within existing plans, projects, and programs. Therefore, the involvement of all departments, private non-profits, private industry, and appropriate jurisdictions is necessary in order to find mitigation opportunities within existing or planned projects and programs. To execute this, the LEPC will assist and coordinate resources

for the mitigation actions and provide strategic outreach to implement mitigation actions that meet the goals identified in this Plan.

It will be the responsibility of each participating jurisdiction to incorporate, where applicable, the mitigation strategy and other information contained in the Plan update into the planning mechanisms identified for their jurisdiction.

The LEPC's annual review will help maintain awareness of the Plan among the participating jurisdictions and encourage active integration of the Plan into their day-to-day operations and planning mechanisms. Any time a mitigation action is slated for implementation by a participating jurisdiction, it will be integrated into their capital improvement plan/budget.

8.6 References

FEMA. (2022). *Local Mitigation Planning Policy Guide*. Retrieved on: March 15, 2023. Retrieved from: https://www.fema.gov/sites/default/files/documents/fema_local-mitigation-planning-policy-guide_042022.pdf

Appendix A: Stakeholder Participation and Documentation

This appendix describes the methods the County used to involve stakeholders in the mitigation planning process.

A.1 Local representatives, participation activities, and planning documents to facilitate the planning process

A.1.1 Plan Participants and Representatives

Jurisdiction	Name	Title	Organization
Macon County	Tammy Schneider	EMA Coordinator	Macon County EMA
Macon County	Justin Root	EMA Assistant	Macon County EMA
Macon County	Tamara Wilcox	County Administrator	Macon County
Macon County	Jerry Culp	Executive Director	Macon County Conservation District
Macon County	Tracy Sumpter	Director	Macon County Planning and Zoning
Macon County	Ralf Pansch	Director	Macon County Mental Health Board
Macon County	Tim Stock	Executive VP	Macon County Farm Bureau
Macon County	Michelle Loutrel	Director	Decatur Memorial Hospital
Macon County	Debra Kraft	Board Member	Macon County Board
Macon County	Kent Newton	Executive Director	Sanitary District of Decatur
Macon County	James Keith	Director of Community Impact	United Way of Decatur & Mid-IL
Macon County	Alicia Marin	Hispanic Resource	United Way of Decatur & Mid-IL
Macon County	Nick Tsiakals	Safety Engineer	Primient LLC
Macon County	Edmund Turudra	Safety Engineer	Primient LLC
Argenta	Cindy Luedke	Mayor	Village of Argenta
Argenta	Sherry Koszesza	Treasurer	Village of Argenta
Blue Mound	Chad Lamb	Chief	Village of Blue Mound
Blue Mound	Scott Younger	Mayor	Village of Blue Mound
Blue Mound Township	Marcia Potrafka	Supervisor	Blue Mound Township
Decatur	Dan Kline	Deputy Fire Chief	City of Decatur
Decatur	Julie Moore-Wolfe	Mayor	City of Decatur
Decatur	Jennifer Gunter	Watershed and Lake Manager	City of Decatur
Decatur	Byron Bowman	Municipal Services Manager	City of Decatur

Decatur	Andrew Taylor	Economic Development Officer - EDC - School Board Member	Decatur Public School District
Forsyth	Jill Applebee	Mayor	Village of Forsyth
Forsyth	Kim Taylor	Administration Assistant	Village of Forsyth
Harristown	Evelyn Deverell	Mayor	Village of Harristown
Harristown	Kevin Vessels	Trustee	Village of Harristown
Harristown	Les Jenkins	Trustee	Village of Harristown
Harristown	Steve Gambrill	Fire Chief	Harristown FPD
Harristown	Jonathon Closs	Supervisor of Public Works	Village of Harristown
Long Creek	Cheryl Smith	Mayor	Village of Long Creek
Long Creek	Jordan Wright	Clerk	Village of Long Creek
Macon	Charlie Dunmire	Water Operator	City of Macon
Maroa	Ted Agee	City Administrator	City of Maroa
Maroa	Mike Hoffman	Superintendent of Public Works	City of Maroa
Maroa	Jamie Zombro	Road Commissioner / Fire Chief	Maroa Fire - Maroa Township
Maroa	Tony Norton	Fire Captain	Maroa Fire - Maroa Township
Maroa	JD Peasley	Assistant Chief	Maroa Countryside FPD
Maroa	Ryan Wilkey	Mayor	City of Maroa
Mt. Zion	Julie Miller	Village Administrator	Village of Mt. Zion
Mt. Zion	Adam Skundberg	Chief of Police	Village of Mt. Zion
Mt. Zion	Luke Williams	Mayor	Village of Mt. Zion
Niantic	Collin Hiser	Fire Chief	Niantic Fire Department
Oreana	Austin Welker	Public Works Director	Village of Oreana
Oreana	Aaron Keathley	Mayor	Village of Oreana
Oreana / Warrensburg	Gregory Wheeler	Chief of Police	Warrensburg / Oreana PD
Warrensburg / Illini Township	Kirk Riley	Mayor / Supervisor for Illini Township	Village of Warrensburg
Illini Township	Brian Gilman	Supervisor	Illini Township
Friends Creek Township	Peggy Manning	Supervisor	Friends Creek Township
Mt. Zion Township	John Trusner	Supervisor	Mt. Zion Township
County (Unincorporated)	Kevin Bird	Principal	Hickory Point Township

A.1.2 Mitigation Workshops



Macon County
Hazard Mitigation Plan Update 2023
Macon County, Illinois

Workshop Agenda

Wednesday, April 12, 2023 (9:00 a.m. to 12:00 p.m.)
Macon County Emergency Management Agency, 282 E. Macon Street, Decatur, IL 62523

Introductions

Overview of mitigation: Why mitigate?

How the mitigation plan can benefit my community

Overview of key mitigation plan elements & plan process

New FEMA guidance that will affect the 2023 update

Risk Summary/Risk Assessment Discussion

Jurisdiction/Agency Hazard Summary

Mitigation Goals Discussion

New and Ongoing Mitigation Actions/Projects

Project schedule and key dates

1

A.1.2.1 Mitigation Workshop Documentation

- SIGN-IN SHEET: Hazard Mitigation Plan Update -
 April 12, 2023 (9:00 a.m. to 12:00 p.m.) | Macon County Emergency Management Agency, 282 E. Macon Street, Decatur, IL 62523

Hazard Mitigation Planning Meeting - Workshop				
Name	Organization	Title	Phone	E-mail
George Detella	ISC	MAN. DIR.	630-885-5979	george.detella@isc-usa.com
Jill Applebee	Village of Grafton	Admin	217-519-3137	japplebee@grafton.il.gov
Austin Post	EMA	Admin ASST	217-424-1327	apost@maconcounty.org
Gregory Wheeler	Village of Danversburg	Chief of Police	217-672-3611	ChiefWheeler@WPDeputy.com
Janifer Guter	City of Decatur	Waterford Lake Manager	217-450-2136	jguter@decatur.il.gov
LES JENKINS	Decatur	Trustee	217-791-7147	ljenkins5431@yahoo.com
Debra Craft	Macon Co Board	Bd. member	217-519-0285	dcraft@macon.il.us
Tamara Wilcox	Macon Co	Admin	217-972-7599	twilcox@maconcountyil.org
Ted Agee	City of Macon	City Administrator	217-454-5951	macon.ted.agee@gmail.com
Scott Younger	Blue Mound	Mayor	217-972-1287	skonger@bluemoundil.com
Marcia Patrafla	Blue Mound Township	Supervisor	217-454-2107	BlueMoundTownship@gmail.com
Cindy Luelke	Argenta	Mayor	217-855-8008	argenta.mayor@gmail.com
Peggy Manning	Friends Creek Twp	Supervisor	217-620-3146	FriendsCreekTownship@gmail.com
CHARLE OWNING	CITY OF MACON	WATER SUPER.	217-493-2271	msconil@unmic.org
Melissa Rome	ISC	Senior Consultant	217-474-3406	melissa.rome@isc-usa.com
(Virtual)		Senior Consultant		
Dan Anderregg	ISC	Senior Consultant		dan.anderegg@isc-usa.com

3

- SIGN-IN SHEET: Hazard Mitigation Plan Update -
April 12, 2023 (9:00 a.m. to 12:00 p.m.) | Macon County Emergency Management Agency, 282 E. Macon Street, Decatur, IL 62523

Hazard Mitigation Planning Meeting - Workshop				
Name	Organization	Title	Phone	E-mail
George Detella	ISC	MAN. DIR.	630-885-5949	george.detella@i-s-c.com
Jill Applebee	Village of Argyle	Admin	217-519-3137	japplebee@argyle.il.gov
Justin Post	EMA	Admin ASST	217-424-1327	post@maconcounty.org
Gregory Wheeler	Village of Warsawburg	Chief of Police	217-672-3611	ChiefWheeler@Warsburg.com
Janet Guter	City of Decatur	Waterford Lake Manager	217-450-2136	janet.guter@il.gov
Les Jenkins	Deerstown	Trustee	217-791-7147	jenkins5431@yahoo.com
Debra Craft	Macon Co Board	Bd. member	217-519-0285	dkraft@macon.il.us
Tamara Wilcox	Macon Co	Admin	217-972-7599	twilcox@maconcountyil.org
Ted Agee	City of Macon	City Administrator	217-454-5951	macon.ted.agee@gmail.com
Scott Younger	Blue Mound	Mayor	217-922-1287	skyoungers@bluemoundil.com
Marcia Patrafla	Blue Mound Township	Supervisor	217-454-2107	BlueMoundTownship@gmail.com
Cindy Luedke	Argenta	Mayor	217-855-8008	argenta.mayor@gmail.com
Peggy Manning	Friends Creek Twp	Supervisor	217-620-3146	friendscreek.township@gmail.com
CHARLE DUNN	CITY OF MACON	WATER SUPER.	217-493-2271	msconil@unmic.org
Melissa Rome	ISC	Senior Consultant	217-474-3406	melissa.rome@i-s-c.com
Dan Anderregg (Virtual)	ISC	Senior Consultant		dan.anderegg@i-s-c.com

A.1.2.2 Workshop Attendee List

Name	Organization	Title
Jill Applebee	Village of Forsyth	Administrator
Kim Taylor	Village of Forsyth	Administration Assistant
Justin Root	Macon County EMA	Admin Asst.
Tammy Schneider	Macon County EMA	EMA Coordinator
Gregory Wheeler	Village of Warrensburg / Oreana	Chief of Police
Jennifer Gunter	City of Decatur	Watershed and Lake Manager
Byron Bowman	City of Decatur	Municipal Services Manager
Les Jenkins	Harristown	Trustee
Evelyn Deverell	Village of Harristown	Mayor
Debra Kraft	Macon County Board	Board Member
Tamara Wilcox	Macon County	Administrator
Ted Agee	City of Maroa	City Administrator
Mike Hoffman	City of Maroa	Supt. Public Works
Scott Younger	Blue Mound	Mayor
Marcia Potrafka	Blue Mound Township	Supervisor
Cindy Luedke	Village of Argenta	Mayor
Sherry Koszesza	Village of Argenta	Treasurer / Clerk
Peggy Manning	Friends Creek Township	Supervisor
Charlie Dunmire	City of Macon	Water Supervisor
Kirk Riley	Village of Warrensburg / Illini Township	Mayor
Alicia Marin	United Way	Hispanic Resource
James Keith	United Way	Director of County Dept.
Daiko Abe	ISC	Director of Operations
George DeTella	ISC	Managing Director
Melissa Rome	ISC	Senior Consultant
Daniel Anderegg	ISC	Senior Consultant

A.1.2.3 Workshop Photos





A.1.3 Mitigation Webinar Participation

Name	Organization	Title
Tamara Wilcox	Macon County	County Administrator
Marcia Potrafka	Blue Mound	Supervisor Blue Mound Township
Chad Lamb	Blue Mound	Chief
Scott Younger	Blue Mound	Mayor
Charlie Dunmire	Macon	Water Operator
Teg Agee	Maroa	City Administrator
Mike Hoffman	Maroa	Superintendent of Public Works
Kevin Bird	County (Unincorporated)	Principal at Hickory Point Township
Cindy Luedke	Argenta	Mayor
Kirk Riley	Warrensburg	Mayor
Teg Agee	City of Maroa	City Administrator
Mike Hoffman	City of Maroa	Superintendent of Public Works
Jamie Zombro	Maroa Fire (Maroa Township)	Road Commissioner, Fire Chief
Tony Norton	Maroa Fire (Maroa Township)	Fire Captain

Jill Applebee	Forsyth	Village Administrator
Evelyn Deverell	Harristown	Mayor
John Trusner	Mt. Zion	Administrator
Jerry Culp	Macon County Conservation District	Executive Director
Austin Welker	Village of Oreana	Public Works Director
Michelle Loutrel	Decatur Memorial Hospital	Director
Ralf Pansch	Macon County Mental Health Board	Executive Director
Cheryl Smith	Long Creek	Mayor
Debra Kraft	Board Member	County Board

A.1.4 Mitigation Participation Crosswalk

Jurisdiction	Webinar Attendance	2022-2023 Hazard Mitigation Plan Workshop	Other Participating Activities (Public Survey)	Hazard Analysis	New Mitigation Action	Reviewed/Updated Past Mitigation Project(s), as applicable
Macon County	X	X	X	X	X	X
Argenta	X	X	X	X	X	X
Blue Mound	X	X	X	X	X	X
Decatur		X	X	X	X	X
Forsyth	X	X	X	X	X	X
Harristown	X	X	X	X	X	X
Long Creek	X		X	X	X	X
Macon		X	X	X	X	X
Maroa	X	X	X	X	X	X
Mt. Zion			X	X	X	X
Niantic			X	X	X	X
Oreana	X	X	X	X	X	X
Warrensburg	X	X	X	X	X	X
Decatur Sanitary District	NA	NA	NA	NA	NA	X
Macon County Conservation	NA	NA	NA	NA	NA	X

Appendix B: Public Involvement Activities and Documentation

Below are samples of public information and public involvement activities that were used during the development of the *Macon County Multi-Hazard Mitigation Plan*, including:

- Survey Results
- Public Meeting Announcements / News Releases
- Outreach Activities

Jurisdiction	Date	Outreach Activity	Method of Sharing
Macon County	2/22/2023	Macon County Webinar	Macon County Website
Macon County	5/16/2023	Press Release for Spanish and General Public Meeting	Press Release
Macon County	5/18/2023	Public Meeting (Spanish Meeting and General Public Meeting)	Multiple Social Media posts and event creations
Macon County	5/18/2023	Survey for the Public	Social Media Posts

B.1 Survey

Note: If you are accessing the Microsoft Word version of this Plan, double-click on the icon below to access the survey report and findings. If you are using the PDF version of the Plan, please access the “Attachments” feature in Adobe PDF and click the corresponding file. This is the redacted version.



MaconCounty2023-
HazardMitigationQu

B.2 Public Meeting Announcements/News Releases


Macon County Emergency Management Agency
 May 16 at 3:41 PM · 🌐

Macon County Mitigation Plan Update
PUBLIC MEETING INFORMATION




Macon County
 Emergency Management Agency (EMA)
 222 E Macon Street
 Decatur, IL 62523
 Telephone: (317) 424-1330

that wants to proactively initiate mitigation projects using BRIC dollars, or for a community that needs HMP funding following a presidentially declared disaster.

For more information about this plan and meeting, please contact EMA Coordinator, Tammy D. Schneider at tdschneider@maconcountyema.org or call (317) 424-1330.

FOR IMMEDIATE RELEASE

Contact:
 Tammy D. Schneider
 EMA Coordinator
 Macon County EMA
 Phone: (317) 424-1330 | Email: tdschneider@maconcountyema.org

PUBLIC MEETING TO INFORM RESIDENTS ABOUT POTENTIAL DISASTERS THAT COULD IMPACT THE COUNTY

MACON COUNTY, ILLINOIS – Macon County EMA will be hosting a public information and planning session to gather input from Macon County residents regarding potential emergencies and disasters that could impact the County. These sessions are part of the Multi-Jurisdiction All-Hazard Mitigation Plan, which is undergoing a mandatory 5-year update. There will be two options for the public meeting. One of the options will be for Spanish-Speaking Residents. The public meetings will be held on the following date and location:

Public Meeting for Macon County Spanish-Speaking Residents

- Date: June 5, 2023 at 4:30 PM
- Location: Macon County Office Building, County Board Room, 141 S. Main St. Suite 501, Decatur IL 62523

General Public Meeting:

- Date: June 5, 2023 at 6:00 PM
- Location: Macon County Office Building, County Board Room, 141 S. Main St. Suite 501, Decatur IL 62523

👍 6

2 comments 6 shares

👍 Like 💬 Comment ➦ Share


Macon County Emergency Management Agency created an event.
 6d · 🌐



**HAZARD MITIGATION PLAN UPDATE
PUBLIC MEETINGS**

MON, JUN 5 AT 6 PM

Public Meeting Hazard Mitigation Plan Update
 141 S Main St, Decatur IL Ste 501
 1 person going

☆ Interested

👍 Like 💬 Comment ➦ Share


 Write a comment...

🗨️ 😊 📷 📺 🎭



B.3 Public Meeting Documentation



Macon County
Hazard Mitigation Plan Update 2023
Macon County, Illinois

Public Meeting Agenda

Date: June 5, 2023
Macon County Office Building, County Board Room
141 S. Main St. Suite 501, Decatur, IL 62523

Introductions

Overview of mitigation: Why mitigate?

How the mitigation plan can benefit my community

Preliminary Questionnaire Findings

Hazard/Risk Discussion

Hazard Summary Worksheet

Identify New Mitigation Ideas/Initiatives

Closing Remarks

Macon County, Illinois

4:30
Spanish mtg.

[illegible]

Hazard Mitigation Planning Meeting – Public Meeting

[illegible]



County of Macon

**Macon County
Emergency Management Agency (EMA)**

**282 E Macon Street
Decatur, IL 62523
Telephone: (217) 424-1330**

FOR IMMEDIATE RELEASE

Contact:

Tammy D. Schneider

EMA Coordinator

Macon County EMA

Phone: (217) 424-1330 | Email: tdschneider@maconcountyema.org

PUBLIC MEETING TO INFORM RESIDENTS ABOUT POTENTIAL DISASTERS THAT COULD IMPACT THE COUNTY

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- Date: June 5, 2023 at 4:30 PM
- Location: Macon County Office Building, County Board Room, 141 S. Main St. Suite 501, Decatur IL 62523

General Public Meeting:

- Date: June 5, 2023 at 6:00 PM
- Location: Macon County Office Building, County Board Room, 141 S. Main St. Suite 501, Decatur IL 62523

The meeting will provide the public an opportunity to review the potential hazards that could occur within the County and will request input for the various mitigation measures intended to eliminate or reduce the negative impact of those hazards.

The U.S. Federal government requires local and state governments to have a FEMA-Approved Multi-Hazard Mitigation Plan as established by the Disaster Mitigation Act of 2000 in order to qualify for Building Resilient Infrastructure and Communities (BRIC) and Hazard Mitigation Grant Program (HMGP) project grant dollars. These programs are critical sources of Federal funding, especially for a community

that wants to proactively initiate mitigation projects using BRIC dollars, or for a community that needs HMGP funding following a presidentially declared disaster.

For more information about this plan and meeting, please contact EMA Coordinator, **Tammy D. Schneider** at tdschneider@maconcountyma.org or call (217) 424-1330.

-###-

B.4 Public Outreach Activities



The Official Government Website of Macon County, Illinois

Home Departments Property Tax Info Voter & Election Info Questions & Answers Financial Reports Vital Records

Calendar Legal Holidays Emergency Alerts Announcements Minutes & Agendas Employment Search Downloads

County Code of Ordinances

2023 Macon County Illinois Hazard Mitigation Project (HMP)



Webinar

2023 – Macon County Illinois Hazard Mitigation Project (HMP)

[Webinar – HMP Project Overview 02.21.2023 \(recorded\)](#)

Related Posts



2023 Macon County Illinois Hazard Mitigation Project (HMP)



Webinar

2023 – Macon County Illinois Hazard Mitigation Project (HMP)

[Webinar – HMP Project Overview 02.21.2023 \(recorded\)](#)

February 22, 2023



B.5 Draft Review of Hazard Mitigation Plan and Outreach

A dedicated web site was utilized for the draft review of the plan, which was made available to the public.



The Official Government Website of Macon County, Illinois



[Home](#)
[Departments](#)
[Property Tax Info](#)
[Voter & Election Info](#)
[Questions & Answers](#)
[Financial Reports](#)
[Vital Records](#)
[Calendar](#)
[Legal Holidays](#)
[Emergency Alerts](#)
[Announcements](#)
[Minutes & Agendas](#)
[Employment](#)
[Search](#)
[Downloads](#)
[County Code of Ordinances](#)

EMA 2024 Macon County Multi-Hazard Mitigation Plan



2024 Macon County Multi-Hazard Mitigation Plan

2023/2024 Plan Update

Macon County Emergency Management Agency (EMA) in conjunction with the participating cities, villages and townships completed the 5-year update of the Macon County Multi-Hazard Mitigation Plan. Macon County Emergency Management Agency (EMA) is dedicated to involving the public directly in the review and update of the plan.

A draft of the plan can be accessed by clicking the link below. Upon state and FEMA approval, the final draft of the plan will replace the draft version of the plan.

PDF LINK TO PLAN: [2024 Macon County Multi-Hazard Mitigation Plan](#)

To further facilitate continued public involvement in the planning process, the public has the opportunity to provide continual feedback and input. As future needs and concerns arise, or if you would like to provide feedback regarding the latest version of the Macon County Multi-Hazard Mitigation Plan, please use the form below to provide your comments.

LINK TO FORM: [Comment form Macon County Mitigation Plan](#)

[Click here to read full announcement](#)

[Back to Homepage](#)



Macon County Broadband Survey – Internet Connectivity
February 2, 2024



EMA 2024 Macon County Multi-Hazard Mitigation Plan
January 25, 2024



Decatur Urbanized Area Transportation Study Public notice Transportation Improvement Plan (DUATS)
January 5, 2024

The opportunity to review the draft plan was also publicized on the County's home page.

We need your help! Please participate in a Broadband Internet access survey. Macon County growing through connectivity. [Click here to go to broadband survey](#)



The Official Government Website of Macon County, Illinois



[Home](#)
[Departments](#)
[Property Tax Info](#)
[Voter & Election Info](#)
[Questions & Answers](#)
[Financial Reports](#)
[Vital Records](#)
[Calendar](#)
[Legal Holidays](#)
[Emergency Alerts](#)
[Announcements](#)
[Minutes & Agendas](#)
[Employment](#)
[Search](#)
[Downloads](#)
[County Code of Ordinances](#)

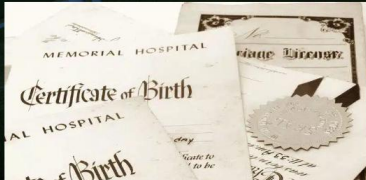


> Voter and Election Information



> Emergency Alerts





Quick Links

- > [Circuit Clerk](#)
- > [Circuit Court](#)
- > [County Clerk](#)
- > [Elections](#)
- > [GIS](#)
- > [Maps](#)
- > [Planning & Zoning](#)
- > [Property Tax](#)
- > [Recorded Documents & Plats](#)
- > [Recorder](#)
- > [Sheriff](#)
- > [States Attorney](#)
- > [Supervisor of Assessments](#)
- > [Treasurer](#)

County News & Announcements

[View All >](#)



Macon County Broadband Survey – Internet Connectivity
February 2, 2024



EMA 2024 Macon County Multi-Hazard Mitigation Plan
January 25, 2024



Decatur Urbanized Area Transportation Study Public notice Transportation Improvement Plan (DUATS)
January 5, 2024

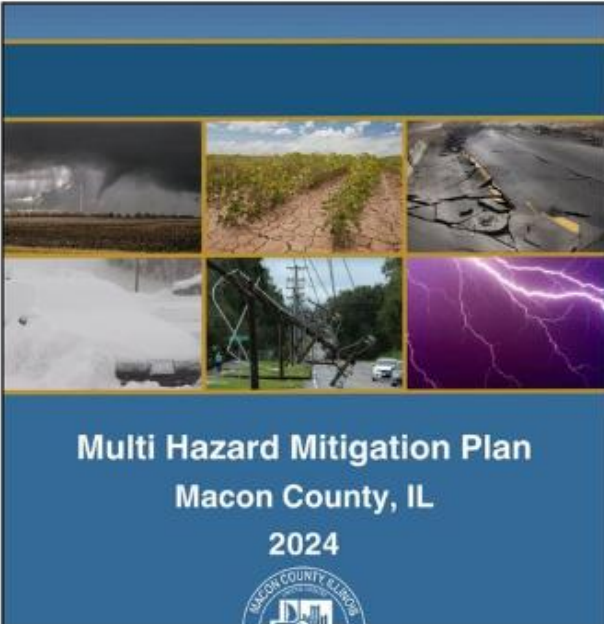


Tema Macon
4d · 

Update: Macon County Hazard Mitigation Plan

You may access the plan at the link provided. We encourage feedback to ensure we accurately capture public concerns.

What is Hazard Mitigation and why is a plan important?
It is planning with the mission of reducing loss of life and property by minimizing the impact of disasters. Our local planning team identified natural disaster risks and vulnerabilities that are common to our area. Leadership from our communities, and participating agencies, developed long-term strategies and projects for protecting people and property from similar events.



Macon County Emergency Management Agency, in conjunction with key stakeholders in the County and participating jurisdictions, have updated the County's multi-hazard mitigation plan. We want to share this plan with you. The latest version of the plan will be maintained here: [2024 Macon County MHP \(PublicVersion\).pdf](#)

Continued Stakeholder/Public Involvement

To further facilitate continued stakeholder/public involvement in the planning process, stakeholders have the opportunity to provide continual feedback and input. As future needs and concerns arise, or if you would like to provide feedback regarding the latest version of the Macon County Multi-Hazard Mitigation Plan, please use the form below to provide your comments.

LINK TO FORM: <https://www.gratisolutions.us/foia/comment-form-macon-county-mitigation-plan>

This information can also be accessed on the County website: <https://maconcounty.il.gov/departments/ema/>

Questions or Comments?
If you would like to get in touch with the project team, please use the following contact information:

Tammy D. Schneider
Coordinator, Macon County EMA
282 E. Macon St.
Decatur IL, 62523
217-424-1327 Office

Again, thank you for your support.

 Like

 Comment


Write a comment...







Appendix C: Disadvantaged Communities

Exhibit C-1. Macon County Census Tract 17115000200

MACON COUNTY, ILLINOIS		
CLIMATE & ECONOMIC JUSTICE SCREENING TOOL - DISADVANTAGED CENSUS TRACT		
CENSUS TRACT 2010 ID	CENSUS TRACT POPULATION	LOW INCOME TRACT?
17115000200	2,611	YES
<		

Exhibit C-2. Macon County Census Tract 17115000300

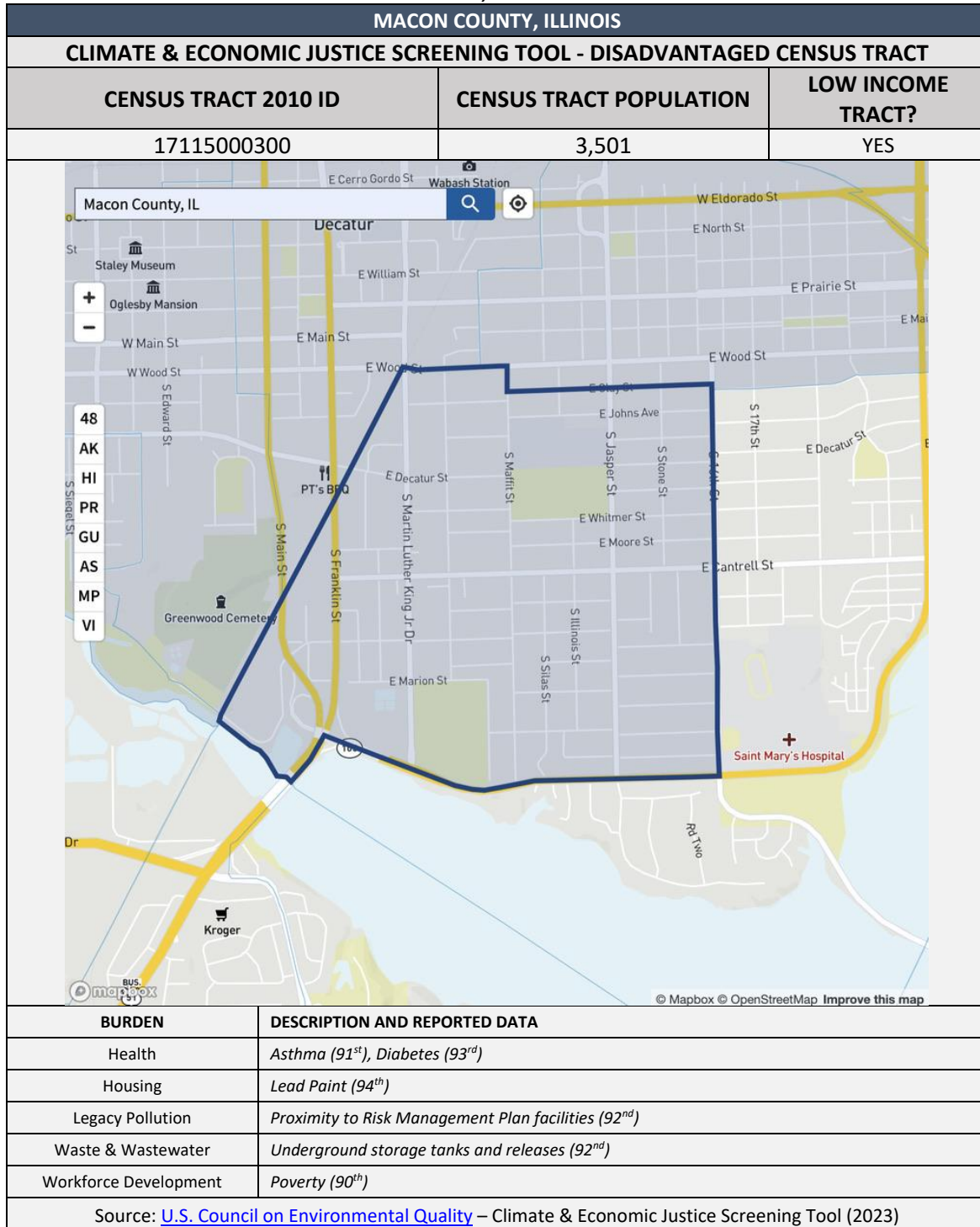


Exhibit C-3. Macon County Census Tract 17115000400

MACON COUNTY, ILLINOIS		
CLIMATE & ECONOMIC JUSTICE SCREENING TOOL - DISADVANTAGED CENSUS TRACT		
CENSUS TRACT 2010 ID	CENSUS TRACT POPULATION	LOW INCOME TRACT?
17115000400	1,121	YES
</		

Exhibit C-4. Macon County Census Tract 17115000500

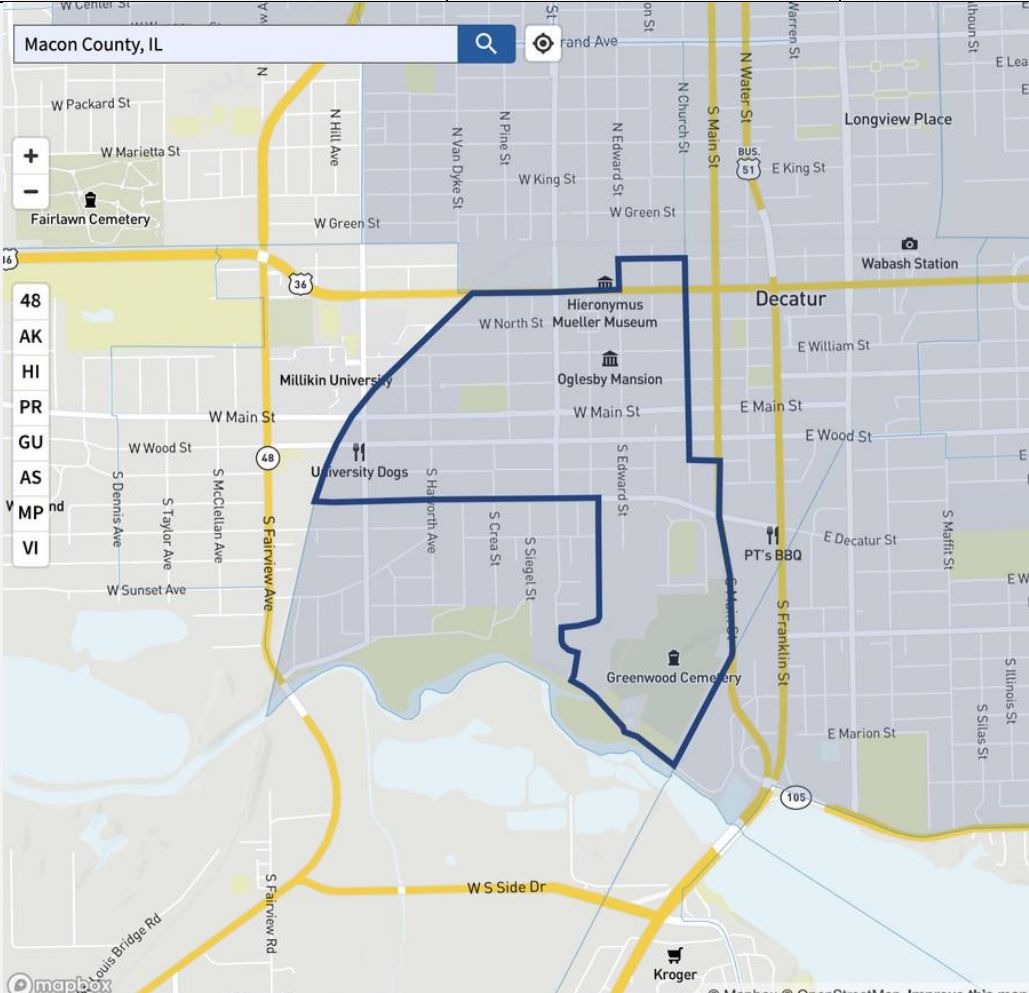
MACON COUNTY, ILLINOIS		
CLIMATE & ECONOMIC JUSTICE SCREENING TOOL - DISADVANTAGED CENSUS TRACT		
CENSUS TRACT 2010 ID	CENSUS TRACT POPULATION	LOW INCOME TRACT?
17115000500	2,906	YES
		
BURDEN	DESCRIPTION AND REPORTED DATA	
Health	Asthma (96 th), Low Life Expectancy (96 th)	
Workforce Development	Low Median Income (93 rd), Poverty (97 th), People 25+ With Less Than High School Diploma (17%)	
Source: U.S. Council on Environmental Quality – Climate & Economic Justice Screening Tool (2023)		

Exhibit C-5. Macon County Census Tract 17115000600

MACON COUNTY, ILLINOIS		
CLIMATE & ECONOMIC JUSTICE SCREENING TOOL - DISADVANTAGED CENSUS TRACT		
CENSUS TRACT 2010 ID	CENSUS TRACT POPULATION	LOW INCOME TRACT?
17115000600	1,909	YES
<		

Exhibit C-6. Macon County Census Tract 17115000900

CLIMATE & ECONOMIC JUSTICE SCREENING TOOL - DISADVANTAGED CENSUS TRACT		
CENSUS TRACT 2010 ID	CENSUS TRACT POPULATION	LOW INCOME TRACT?
17115000900	1,700	YES

BURDEN	DESCRIPTION AND REPORTED DATA
Energy	Energy Cost (92 nd)
Housing	Lack of Indoor Plumbing (94 th)
Housing	Housing Cost (95 th), Lead Paint (96 th), and Historic Underinvestment (access to home loans)
Workforce Development	Unemployment (97 th), People 25+ With Less Than High School Diploma (19%)

Source: [U.S. Council on Environmental Quality](#) – Climate & Economic Justice Screening Tool (2023)

Exhibit C-7. Macon County Census Tract 17115001000

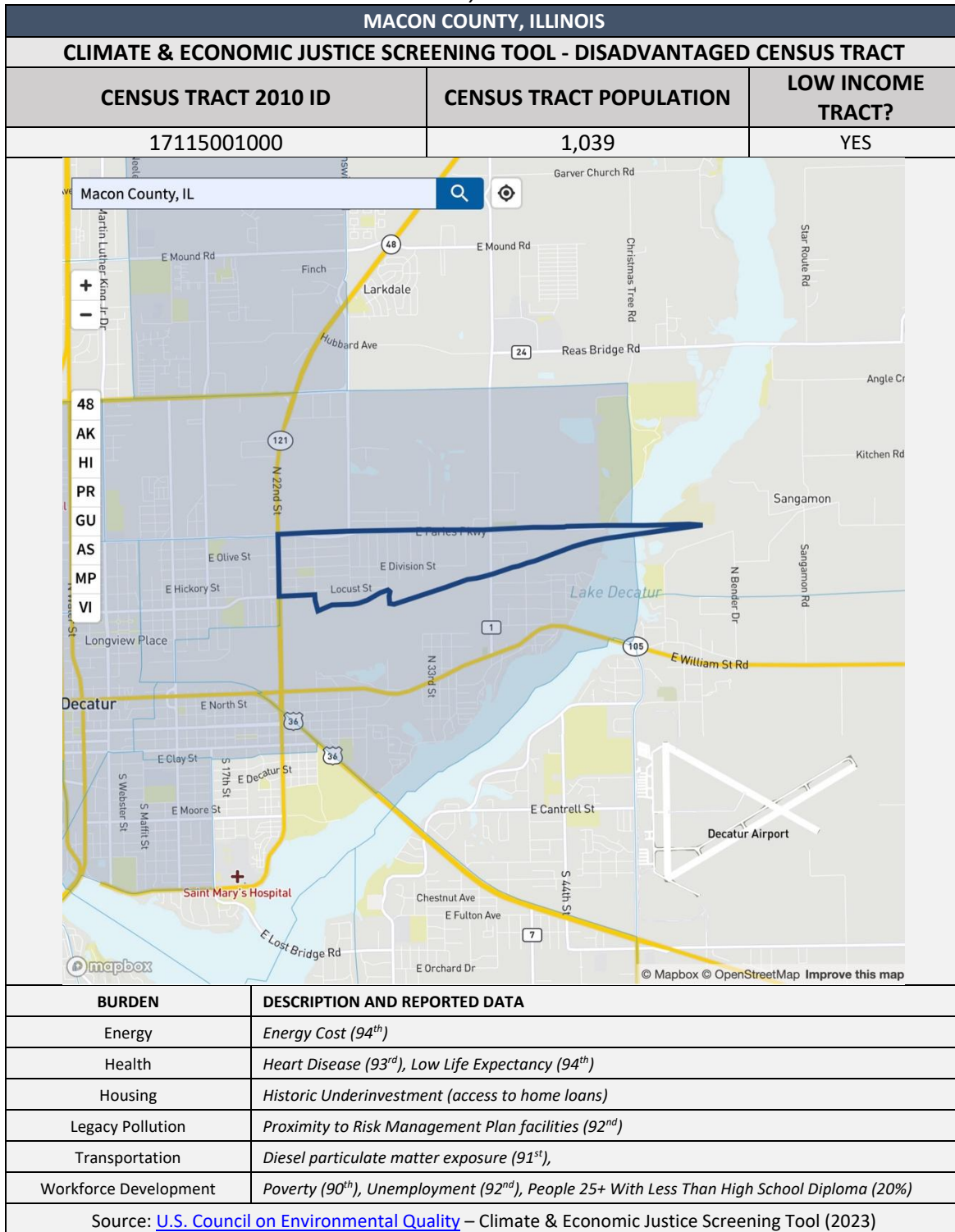


Exhibit C-8. Macon County Census Tract 17115001100

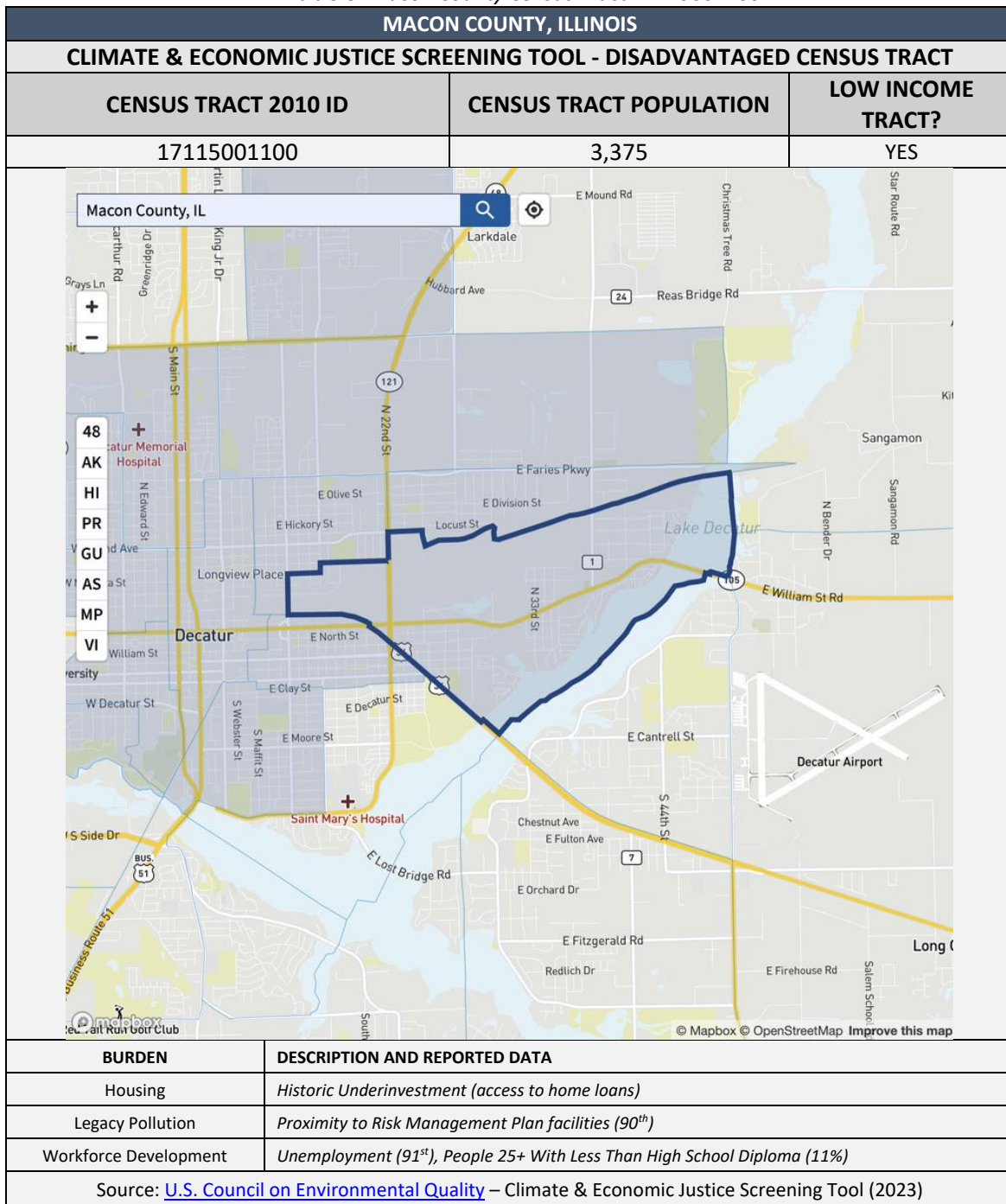


Exhibit C-9. Macon County Census Tract 17115001802

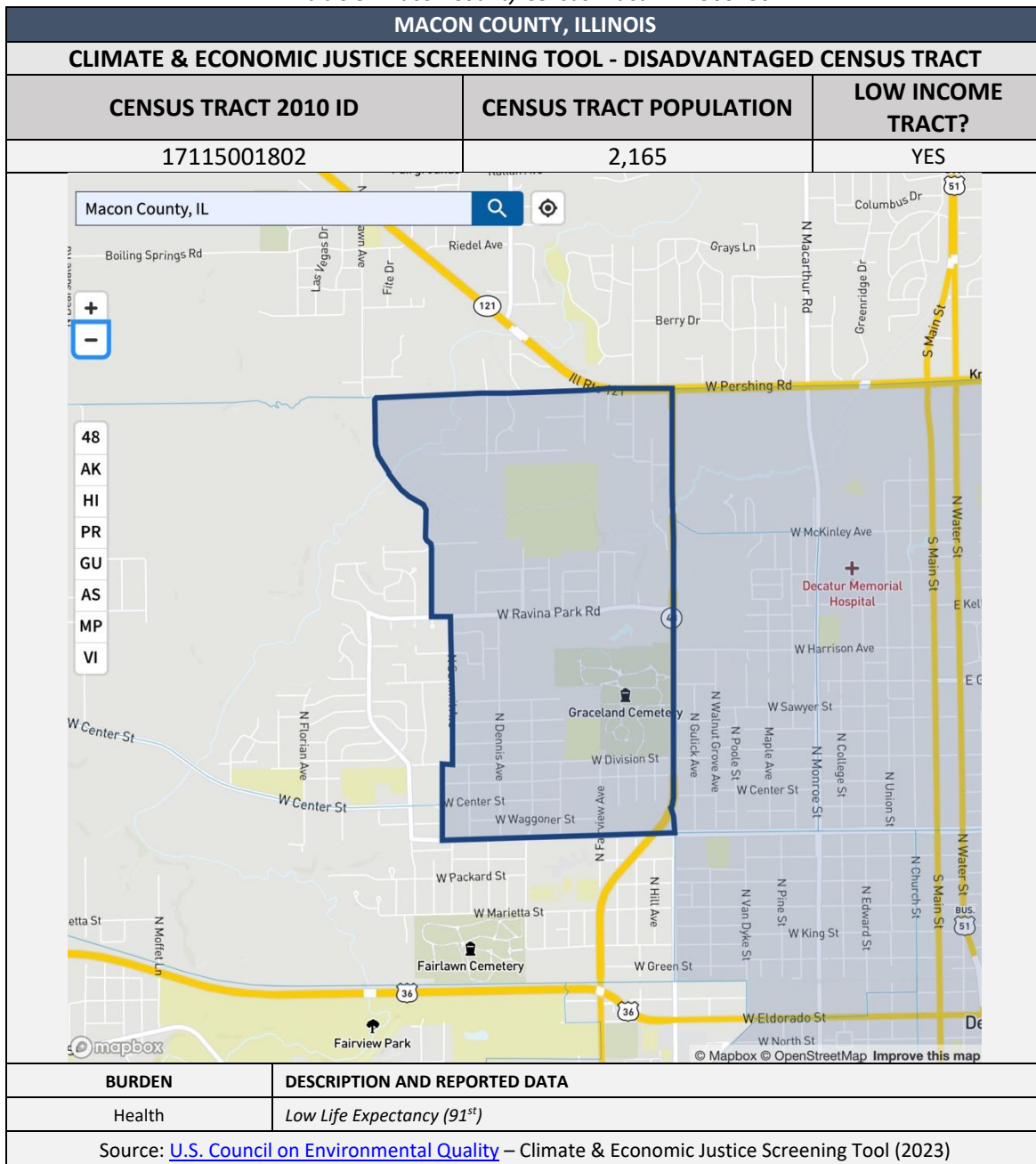


Exhibit C-10. Macon County Census Tract 17115001900

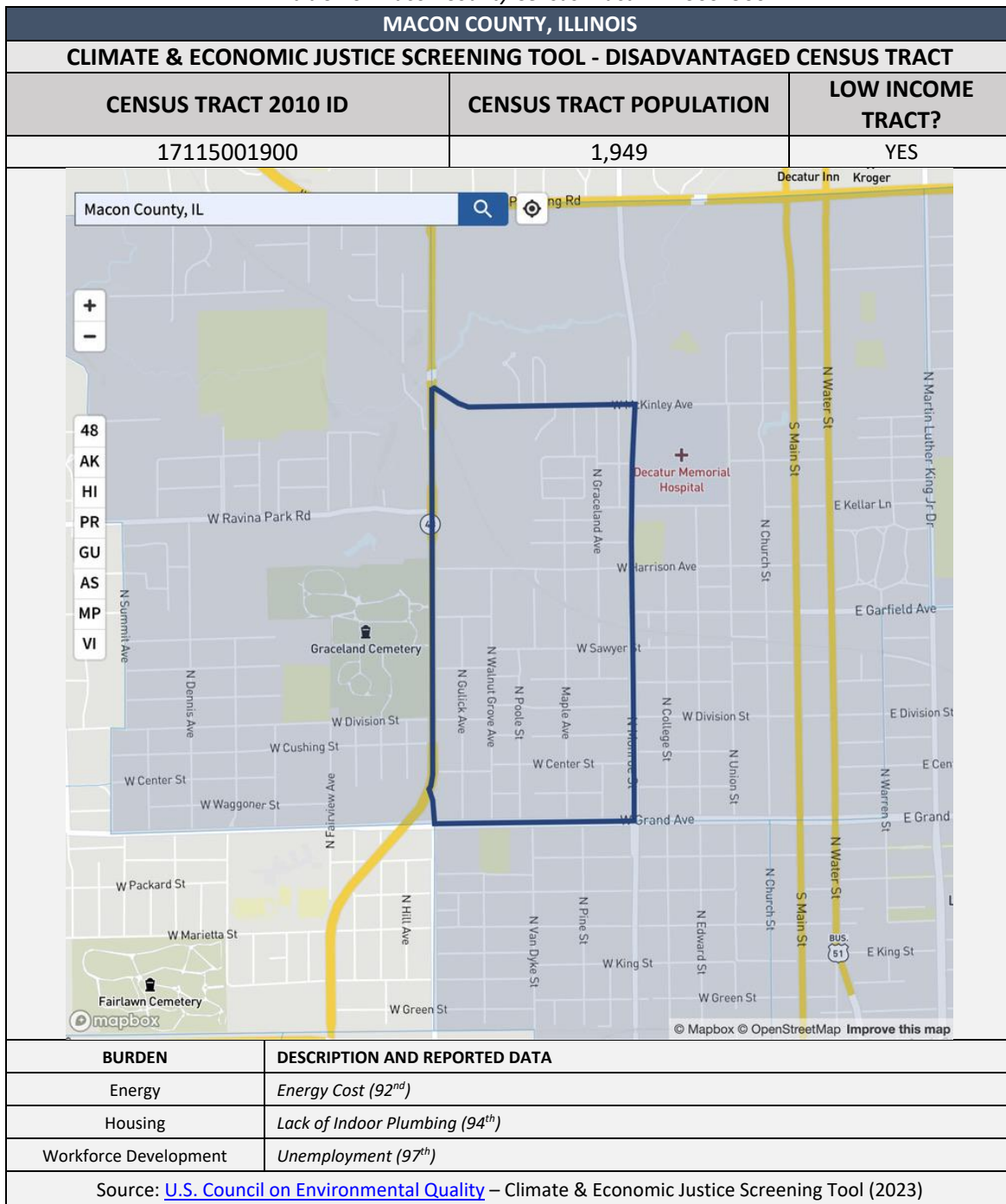


Exhibit C-11. Macon County Census Tract 17115002000

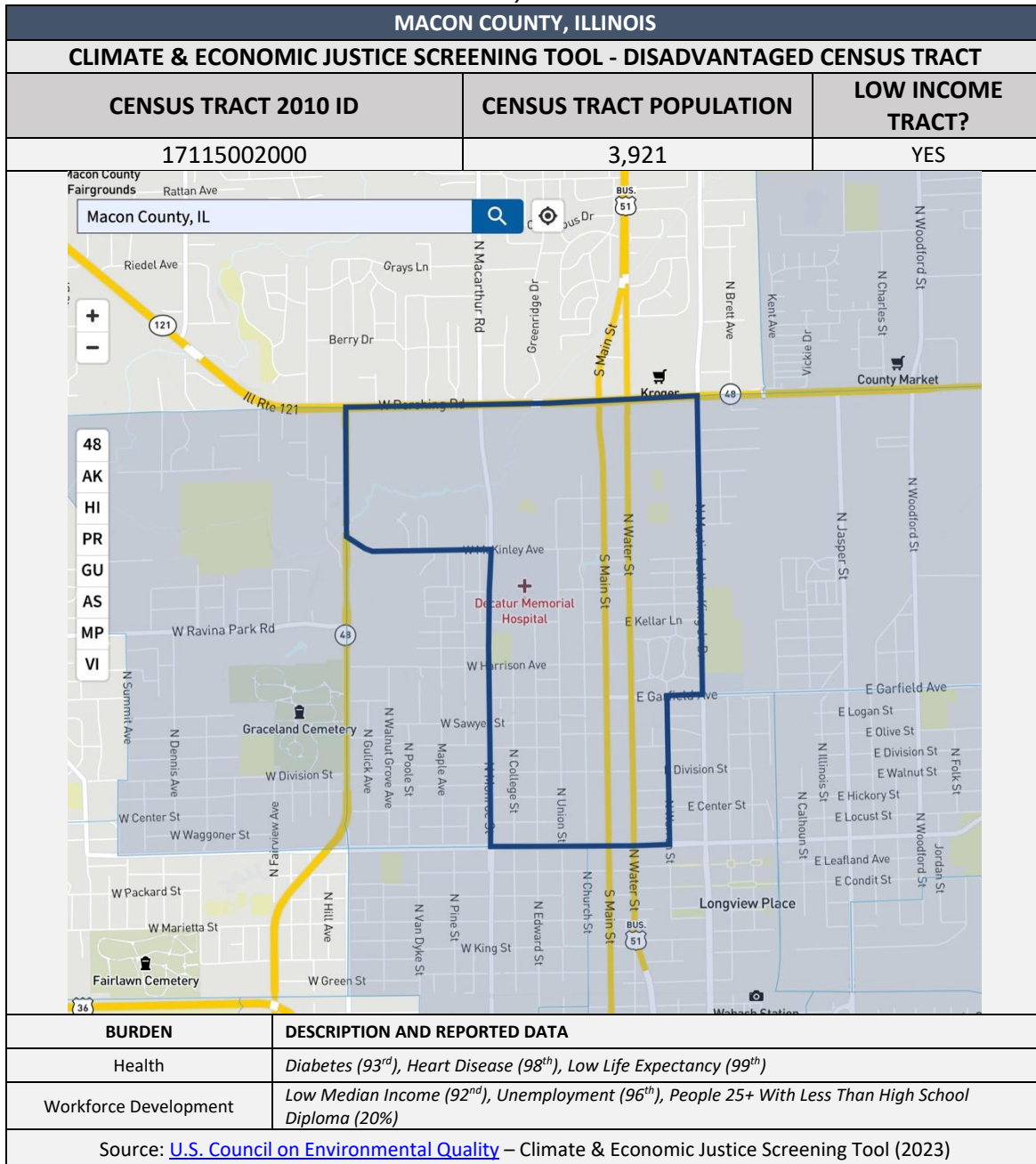


Exhibit C-12. Macon County Census Tract 17115002100

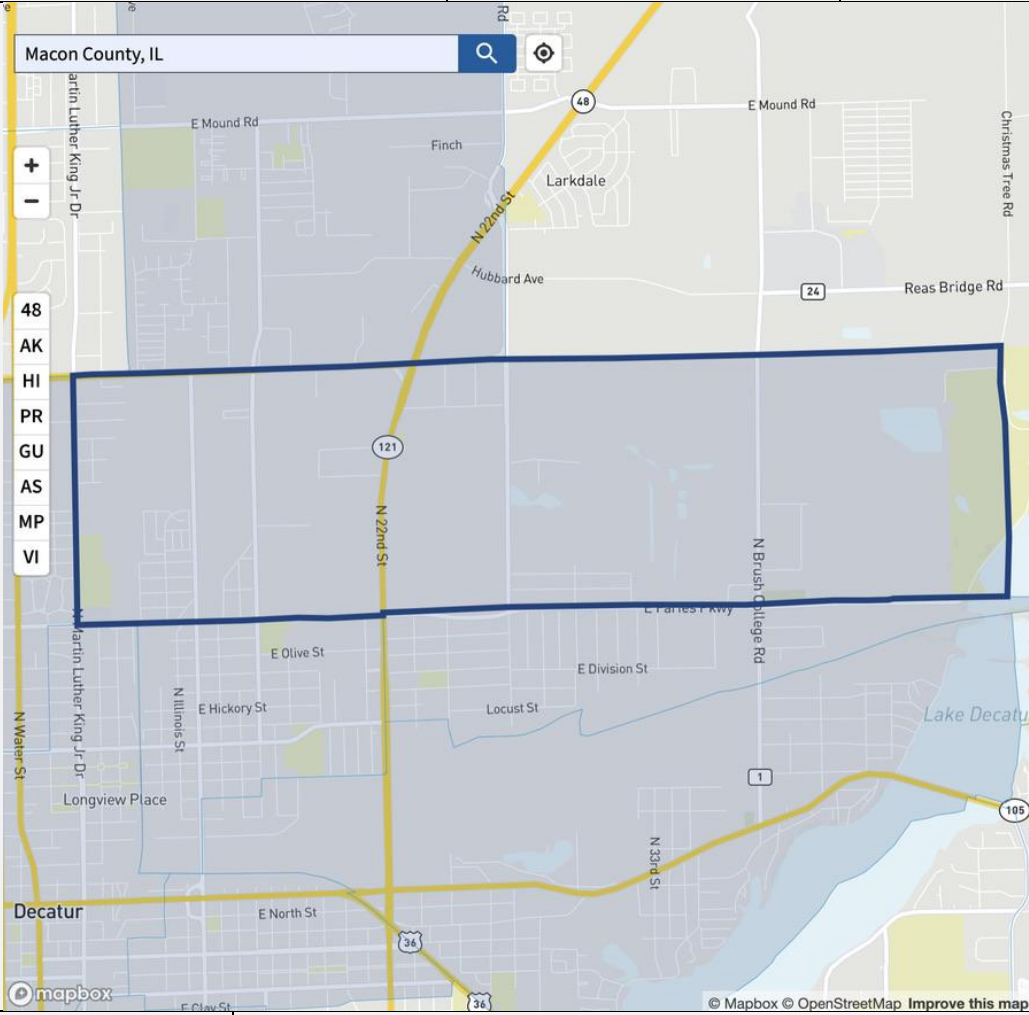
MACON COUNTY, ILLINOIS		
CLIMATE & ECONOMIC JUSTICE SCREENING TOOL - DISADVANTAGED CENSUS TRACT		
CENSUS TRACT 2010 ID	CENSUS TRACT POPULATION	LOW INCOME TRACT?
17115002100	1,150	YES
		
BURDEN	DESCRIPTION AND REPORTED DATA	
Energy	Energy Cost (95 th)	
Health	Low Life Expectancy (94 th)	
Housing	Lack of Indoor Plumbing (96 th)	
Legacy Pollution	Proximity to Risk Management Plan facilities (92 nd), Formerly Used Defense Sites	
Waste & Wastewater	Underground storage tanks and releases (96 th)	
Workforce Development	Low Median Income (90 th), Unemployment (96 th), People 25+ With Less Than High School Diploma (14%)	
Source: U.S. Council on Environmental Quality – Climate & Economic Justice Screening Tool (2023)		

Exhibit C-13. Macon County Census Tract 17115002903

MACON COUNTY, ILLINOIS		
CLIMATE & ECONOMIC JUSTICE SCREENING TOOL - DISADVANTAGED CENSUS TRACT		
CENSUS TRACT 2010 ID	CENSUS TRACT POPULATION	LOW INCOME TRACT?
17115002903	4,286	YES
Macon County, IL		

Exhibit C-14. Macon County Census Tract 17115003100

MACON COUNTY, ILLINOIS		
CLIMATE & ECONOMIC JUSTICE SCREENING TOOL - DISADVANTAGED CENSUS TRACT		
CENSUS TRACT 2010 ID	CENSUS TRACT POPULATION	LOW INCOME TRACT?
17115003100	2,222	YES
17115003100 </		

Appendix D: HAZMAT Incidents

The IEMA FOIA/HAZMAT Tool can be utilized to obtain all incidents reported for Macon County.

- Link: <https://public.iema.state.il.us/FOIAHazmatSearch/>

MACON COUNTY, ILLINOIS											
HAZARDOUS MATERIALS INCIDENTS (2018-2023)											
Incident Number	Incident Location City	County	Type	Area Involved	Media or medium into which the release occurred	Material	Container Type	Amount Released	Cause of Release	Date/ Time Incident Occurred	Number of People Evacuated
H-2023-1030	Decatur	Macon	Leak or spill	Fixed Facility	Ground, Water	Sulfuric Acid 93%	Above ground storage tank	37000 pounds	under investigation	12/25/2023 3:00	0
H-2023-0891	Decatur	Macon	Leak or spill	Fixed Facility	Ground, Water	Ansulite 3-6% Araff	Above ground storage tank	estimated less than 100 gallons	accidental	10/27/2023 10:00	0
H-2023-0876	Decatur	Macon	Leak or spill	Fixed Facility		PFAS firefighting foam	foam suppression system	unknown	inadvertent fire system trip	10/20/2023 21:30	0
H-2023-0762	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Ansulite 353	Tank with piping	300 Gallons	Inadvertent Release	9/13/2023 14:45	None
H-2023-0760	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Ansulite	Tank and piping system	600 Gallons	Inadvertent	9/12/2023 7:30	None
H-2023-0745	Decatur	Macon	Explosion	Fixed Facility	Unknown	AFFF (Exact type unknown) fire fighting foam	Fire Suppression System	Unknown, under investigation	Suspected discharge of fire fighting foam system after explosion. Cause of explosion is under investigation.	9/10/2023 19:00	
H-2023-0728	Decatur	Macon	Leak or spill	Rail	Ground	Diesel	Fuel Tank Pump	40 Gallons	Possible Ruptured Pipe	9/6/2023 6:58	None
H-2023-0710	Decatur	Macon	Leak or spill	Fixed Facility	Ground, Water	AR-AFFF		800 gallons	Under investigation-inadvertant trip of firefighting foam system	8/29/2023 9:00	0
H-2023-0405	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Diesel Fuel	Saddle Tank	75 Gallons	Fuel over fill	5/18/2023 18:00	0
H-2023-0226	Decatur	Macon	Leak or spill	Rail	Ground	Black Strap molasses	tank car	200 gallons	Defective gasket leading to an open valve.	3/23/2023 0:30	0
H-2023-0156	Decatur	Macon	Leak or spill	Rail	Ground	Locomotive Lube Oil	Railcar (Locomotive)	50 Gallons	Oil spilled out of test port on locomotive and leaked onto the ground.	2/27/2023 6:00	0

H-2023-0152	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Diesel	Storage Tank	200 Gallons	Employee Error	2/25/2023 12:00	None
H-2023-0059	Decatur	Macon	Leak or spill	Rail	Ground	diesel fuel	Truck	75 gallons	punctured tank (not caused by NS equipment)	1/23/2023 10:30	0
H-2022-1123	Decatur	Macon	Leak or spill	Fixed Facility	Ground, Water	Aerofoam XLX 3%	Fire Suppression System	700 Gallons (Early Estimate)	Automatic Discharge of PFAS Fire Fighting Form due to false fire alarm activation due to a steam release.	12/22/2022 2:00	0
H-2022-1116	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Diesel	Saddle Tank	30 Gallons	Puncture of saddle tank	12/19/2022 13:00	None
H-2022-1034	Decatur	Macon	Leak or spill	Fixed Facility	Ground, Water	Universal Gold 13AR AFFF NMS 420, Chemguard Ultraguard 3% AR-AFFF	firefighting system	350 gallons	sensor line breakage	11/21/2022 2:35	0
H-2022-0964	Warrensburg	Macon	Leak or spill	Highway	Ground	Diesel Fuel	Saddle Tank	unknown	Vehicle Accident	10/29/2022 5:30	6
H-2022-0966	Warrensburg	Macon	Leak or spill	Highway	Ground	Gasoline	Truck (Semi-Tanker truck)	2,500 Gallons	Semi-tractor and trailer rollover accident resulted in a release of gasoline to the ditch.	10/29/2022 5:15	4 (evacuation has ended)
H-2022-0905	Oakley	Macon	Leak or spill	Highway	Ground	Motor Oil & Diesel	oil pan/diesel fuel lines	15 gallons motor oil/ 20 gallons of diesel	vehicle accident	10/13/2022 5:00	0
H-2022-0923	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Ansulite AFFF 3%	Foam Fire Suppression System	110 Gallons	Automatic Discharge of PFAS Fire Fighting Form due to false fire alarm activation due to a steam release.	10/5/2022 7:30	0
H-2022-0826	Decatur	Macon	Leak or spill		Ground	Diesel Fuel and Hydraulic Fluid	Saddle Tank and Motor	175 gallons each fluid	Fire	9/19/2022 0:52	0
H-2022-0827	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Petroleum Products from Vehicles	Vehicle Tanks	100 Gallons	Fire	9/19/2022 0:00	None
H-2022-0811	Decatur	Macon	Gas or vapor cloud	Fixed Facility	Air	Anhydrous Ammonia	Tank	50-100 Lbs	Cutting into equipment and found substance still in equipment	9/14/2022 11:30	200 Employees
H-2022-0781	Decatur	Macon	Leak or spill	Waterway	Water	engine oil and unleaded gasoline	Vehicle	unknown	single vehicle accident	9/5/2022 22:24	0

H-2022-0733	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Engine Oil	Locomotive	200 Gallons	Catastrophic engine failure	8/21/2022 4:30	0
H-2022-0693	Niantic	Macon	Leak or spill	Highway	Ground	Diesel Fuel	Truck (Saddle tanks)	75 - 80 gallons	Semi truck roll over accident /no other vehicles involved.	8/4/2022 7:25	0
H-2022-0510	Decatur	Macon	Leak or spill	Rail	Ground	Locomotive Lube Oil	Locomotive Prime Mover	100 Gallons	Turbocharger explosion resulted in a release of locomotive lube oil	6/8/2022 4:00	0
H-2022-0422	Decatur	Macon	Leak or spill	Rail	Ground	Grain Meal Product	Grain Car	40 Lbs	Bottom Door on the Car did not completely Seal	5/13/2022 8:00	None
H-2022-0353	Decatur	Macon	Leak or spill	Highway	Ground, Water	Gasoline	Truck	Approximately 10 gallons	Caused by vehicle fire	4/22/2022 14:18	0
H-2022-0324	Macon	Macon	Gas or vapor cloud	Fixed Facility	Air	Natural Gas	Pipeline	Unknown	Grain Silo overturning	4/14/2022 16:10	0
H-2022-0316	Decatur	Macon	Leak or spill	Highway	Ground	Hydraulic Fluid	Truck (Semi-tractor Dump Trailer)	5-10 Gallons	Single vehicle semi-tractor and trailer accident resulted in a release of hydraulic fluid.	4/13/2022 8:00	0
H-2022-0107	Decatur	Macon	Leak or spill	Rail	Ground	diesel fuel	locomotive	50 gals	broken fitting	2/8/2022 22:30	0
H-2022-0044	Macon	Macon	Leak or spill	Fixed Facility	Ground	Coalmine water	Pipeline	unknown	failure of air release valve	1/13/2022 13:39	0
H-2021-0643	Dalton City	Macon	Leak or spill	Waterway	Water	Assorted car fluids	Automobile tanks	Unknown	Accident	7/9/2021 7:40	None
H-2021-0573	Decatur	Macon	Leak or spill	Rail	Ground	Locomotive Lube Oil	Railcar (Locomotive Oil Sump)	~ 20 Gallons, maybe less.	Sump on locomotive overflowed, release was confined to the track mat.	6/17/2021 9:30	0
H-2021-0348	Decatur	Macon	Leak or spill	Highway	Ground	Diesel	Saddle Tank	Unknown	Rollover Accident Single Vehicle	4/14/2021 8:00	None
H-2021-0347	Decatur	Macon	Leak or spill	Highway	Ground, Water	Diesel	Saddle Tank	Unknown	Accident	4/14/2021 8:00	None
H-2021-0160	Decatur	Macon	Gas or vapor cloud	Fixed Facility	Air	Anhydrous Ammonia	Tank	unknown/ active release	Under Investigation	2/21/2021 13:36	0
H-2020-1125	Decatur	Macon	Leak or spill	Air	Air, , Water	Sodium Hydroxide	Pipe Leak	2591 Gallons	Corrosion from pipe and pipe Burst	12/27/2020 3:00	None
H-2020-1093	Decatur	Macon	Leak or spill			acetone	Railcar	1 gallon	equipment failure	12/21/2020 2:43	0
H-2020-1000	Argenta	Macon	Leak or spill	Highway	Ground	Hydraulic Fluid	Tractor	less than 3 gallons	Cap fell off	11/20/2020 16:30	0
H-2020-0746	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Bleach	Plastic Tote	Unknown	Punctured tote with at fork truck	8/31/2020 22:40	0
H-2020-0656	Decatur	Macon	Leak or spill	Fixed Facility	Ground	sodium hypochloride	transfer pipe	exceeded the RQ of 100 pounds	leak in flange	7/31/2020 9:30	0

H-2020-0605	Decatur	Macon	Gas or vapor cloud	Fixed Facility	Air	Anhydrous Ammonia	Chiller	Unknown Excess of 100 Lbs	Mechanical Failure	7/15/2020 16:40	None
H-2020-0550	Decatur	Macon	Leak or spill	Fixed Facility	Ground	diesel fuel	Truck	Unknown	road debris	6/29/2020 15:30	0
H-2020-0523	Decatur	Macon	Leak or spill	Highway	Ground	diesel fuel	fuel line on pump truck	5 gallons	cracked fuel line	6/19/2020 16:30	none
H-2020-0519	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Diesel Fuel	Truck (Semi tanker trailer)	300 Gallons	Hose failure during product transfer.	6/18/2020 9:00	0
H-2020-0160		Macon	Leak or spill	Highway	Ground, Water	Diesel Fuel	Fuel tank	35-45 gallons	single vehicle accident	2/22/2020 4:30	0
H-2020-0112	Decatur	Macon	Leak or spill	Highway	Ground, Water	UIVIS N46 (Hydraulic Fluid)	Truck (Hydraulic system on a compactor truck)	41 Gallons	Blown hydraulic line resulted in a release of hydraulic fluid.	2/5/2020 9:30	0
H-2020-0094	Decatur	Macon	Leak or spill	Rail	Ground	feed pellets	Railcar	200 lbs.	car derailed during switching operations causing the bottom hatch door to make contact with the ground causing it to partially open	2/1/2020 19:30	0
H-2020-0064	Mount Zion	Macon	Leak or spill	Highway	Ground, Water	Deisel	Saddle Tank Semi	30 Gallons	Tank fell off due to rust	1/24/2020 5:10	None
H-2020-0068	Mount Zion	Macon	Leak or spill	Highway	Ground, Water	Diesel	Truck (Saddle tank)	50-100 Gallons (Estimate)	Mechanical failure resulted in the Saddle falling off the truck and hitting the pavement.	1/24/2020 5:00	0
H-2019-1284	Decatur	Macon	Leak or spill	Fixed Facility	Ground	water with Sodium Hydroxide	concrete containment structure	unknown at this time	pumped out of the structure inadvertently	12/18/2019 12:30	none
H-2019-1154	Decatur	Macon	Leak or spill	Highway	Ground	Diesel Fuel	Saddle Tank	40 gallons	Road Debris struck and punctured tank	11/10/2019 12:50	0
H-2019-1141	Maroa	Macon	Gas or vapor cloud	Acreage	Air	anhydrous ammonia	nurse tank on truck	unknown	equipment malfunction	11/6/2019 14:55	0
H-2019-1068	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Diesel	Saddle Tank	50 Gallons	Unknown	10/16/2019 1:30	None
H-2019-0985	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Diesel Fuel	diesel engine	20 gallons	busted fuel line	9/22/2019 0:30	0
H-2019-0907	Decatur	Macon	Leak or spill	Fixed Facility	Ground	7% Hydrochloric Acid	storage tank	Unknown by caller	broken pipe	9/2/2019 10:00	0
H-2019-0826		Macon	Leak or spill	Rail	Ground	lube oil	locomotive	3 gallons	mechanical failure	8/9/2019 13:00	0

H-2019-0753		Macon	Leak or spill	Rail	Ground	furnace coke	Railcar	500 pounds	unknown	7/22/2019 8:00	0
H-2019-0523	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Diesel Fuel	Above ground storage tank	estimate 500 gallons, believe most is on-site, calling in as a precaution	water tank unzipping and it knocked over two diesel tanks	5/28/2019 2:30	none
H-2019-0480	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Food Grade Vegetable Oil	Railcar	1 gallon	loose manway top cover	5/14/2019 15:00	0
H-2019-0475	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Soybean Oil (Food Grade)	Railcar (Tank car)	2 Gallons	Unknown, under investigation	5/14/2019 12:30	0
H-2019-0283	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Bleach	Above ground storage tank	60 Gallons	Crack in pipe from the tank	3/24/2019 7:30	None
H-2019-0254	Decatur	Macon	Fire	Fixed Facility	Ground	hydraulic fluid	hose on machinery	20-40 gals.	fire	3/13/2019 16:50	0
H-2019-0142	Harristown	Macon	Leak or spill	Fixed Facility	Ground	Gasoline	Truck	20-30 Gallons	Loading valve did not close	2/14/2019 2:39	0
H-2019-0075	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Diesel Fuel and Locomotive Lube Oil	Railcar (Locomotive Crankcase)	>50 Gallons	Fuel line failed which caused diesel fuel to flow into the crankcase which resulted in the crankcase overflowing.	1/25/2019 11:15	0
H-2019-0076	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Diesel	Product pipeline	Unknown	Pipe Leak	1/14/2019 9:40	0
H-2018-1223	Decatur	Macon	Leak or spill	Rail	Ground	Hydrochloric acid	Railcar	unknown, but in excess of R.Q.	blown gasket or expansion joint	12/31/2018 12:45	0
H-2018-1199	Decatur	Macon	Leak or spill	Highway	Ground, Water	Diesel Fuel	Saddle tank	35 gallons	Traffic accident	12/21/2018 0:49	None.
H-2018-1186	Decatur	Macon	Leak or spill	Rail	Ground	Animal Feed Pellets	Railcar (Covered Hopper)	100 Lbs	Bottom Hopper gate was opened.	12/17/2018 14:40	Ch
H-2018-1180	Decatur	Macon	Leak or spill	Waterway	Water	Motor Oil and Hydraulic Fluid	Vehicles	Less than 10 gallons	Vehicle went into the lake	12/14/2018 14:00	0
H-2018-1177	Decatur	Macon	Water Involvement	Waterway	Ground, Water	Diesel Fuel and Motor Oil	Truck (Saddle tank and engine crankcase)	<10 Gallons of diesel and 4.5 gallons of engine oil.	Single Vehicle Semi-tractor and trailer accident.....Truck drove off the side of the road to avoid an accident with an automobile.	12/14/2018 7:41	0
H-2018-1138	Decatur	Macon	Leak or spill	Highway	Ground, Water	Diesel	Truck (Saddle tank)	40-50 Gallons	Single Vehicle Semi-tractor and trailer accident resulted in a release of diesel fuel which impacted	12/5/2018 7:00	0

									a storm sewer. Release was confined to the catch basin.		
H-2018-1142	Decatur	Macon	Leak or spill	Highway	Ground, Water	Diesel	Truck (Saddle tank)	35-40 Gallons	Caller advised that the semi-truck was struck by another vehicle resulting in a puncture to the saddle tank.	12/5/2018 6:45	0
H-2018-1099	Decatur	Macon	Leak or spill	Rail	Ground	Locomotive Lube Oil	Railcar (Locomotive Crankcase)	80 Gallons	Crankcase cover was off.	11/24/2018 13:40	0
H-2018-1072	Elwin	Macon	Leak or spill	Highway	Ground, Water	Diesel and DEF	Truck (Saddle tanks and DEF reservoir)	Unknown	Single Vehicle Semi-tractor and trailer accident resulted in a release of Diesel and DEF. Release may have impacted a nearby stream but that is unconfirmed.	11/12/2018 21:40	0
H-2018-1043	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Lube Oil	tank on locomotive	25 gallons estimated	defective drain back plug	11/6/2018 15:30	none
H-2018-0916	Decatur	Macon	Water Involvement	Waterway	Water	suspected hydraulic oil	dredge	estimated 30 gallons	unknown	9/30/2018 13:29	0
H-2018-0737	Decatur	Macon	Leak or spill	Rail	Ground	corn gluten meal	Railcar	200 pounds	improperly secured hatch	8/7/2018 10:25	0
H-2018-0660	Decatur	Macon	Leak or spill	Rail	Ground	soy bean meal	Railcar	3,000 lbs.	derailment	7/14/2018 15:40	0
H-2018-0646	Decatur	Macon	Leak or spill	Fixed Facility	Ground	glycol	glycol line (heating system)	100 gallons	broken line	7/11/2018 14:00	0
H-2018-0573	Decatur	Macon	Leak or spill	Rail	Ground	Lube Oil	locomotive	2 gallons	mechanical failure but under investigation	6/21/2018 0:30	none
H-2018-0516	Decatur	Macon	Leak or spill	Acreage	Ground	ethanol	Railcar	approximately 1 gal.	unknown	5/31/2018 15:36	0
H-2018-0454	Decatur	Macon	Leak or spill	Rail	Ground	diesel fuel	locomotive	10 gals.	filter housing leak	5/13/2018 18:09	0
H-2018-0434	Boody	Macon	Leak or spill	Highway	Ground	engine oil	Truck	'just a little bit'	accident	5/4/2018 5:30	0
H-2018-0274	Decatur	Macon	Leak or spill	Rail	Ground	Diesel	Railcar (Locomotive)	18 Gallons	Overflow while fuel was being transferred from a tank truck to a locomotive.	3/21/2018 11:45	0
H-2018-0264	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Lube oil	Locomotive	15 gallons	Broken rod in a NS 9219	3/19/2018 6:30	None.

H-2018-0193	Decatur	Macon	Leak or spill	Fixed Facility	Ground	engine lube oil	locomotive sump pit	2 gallons	overflow	2/26/2018 8:00	0
H-2018-0075	Decatur	Macon	Leak or spill	Rail	Ground	motor oil	locomotive	5 gallons	missing test port on oil tank	1/19/2018 12:40	0
H-2018-0020	Decatur	Macon	Leak or spill		Ground	Diesel Fuel	Truck-Saddle Tank	50 gallons or less	Truck struck a curb pulling into parking lot	1/8/2018 10:00	0
H-2018-0014	Decatur	Macon	Leak or spill	Fixed Facility	Ground	Sodium Hypochlorite 18 %	Piping	1487 pounds	Line froze and broke	1/5/2018 7:40	0

The table below highlights the transportation-related HAZMAT incidents.

MACON COUNTY, ILLINOIS								
US DOT HAZARDOUS MATERIALS INCIDENTS (2010-2022)								
Identification Number	Date Of Incident	Incident City	Carrier Reporter Name	Mode Of Transportation	Commodity Long Name	Hazardous Class	Fatalities	Total Damages
UN1789	2/23/10	DECATUR	CN/Illinois Central Railroad	Rail	HYDROCHLORIC ACID, SOLUTION	8	0	\$1,638
UN1789	4/6/10	DECATUR	Norfolk Southern Railway Company	Rail	HYDROCHLORIC ACID, SOLUTION	8	0	\$0
UN1993	4/20/10	WARRENSBURG	LIQUID TRANSPORT CORP	Highway	FLAMMABLE LIQUIDS, N.O.S.	3	0	\$0
UN1956	4/25/10	DECATUR	UNITED PARCEL SERVICE	Highway	COMPRESSED GAS, N.O.S	2.2	0	\$0
UN1203	5/4/10	DECATUR	Norfolk Southern Railway Company	Rail	GASOLINE INCLUDES GASOLINE MIXED WITH ETHYL ALCOHOL, WITH NOT MORE THAN 10% ALCOHOL	3	0	\$0
UN1789	5/24/10	DECATUR	Norfolk Southern Railway Company	Rail	HYDROCHLORIC ACID, SOLUTION	8	0	\$700
UN1203	5/29/10	DECATUR	Norfolk Southern Railway Company	Rail	GASOLINE INCLUDES GASOLINE MIXED WITH ETHYL ALCOHOL, WITH NOT MORE THAN 10% ALCOHOL	3	0	\$0
UN1219	6/17/10	DECATUR	UNITED PARCEL SERVICE	Highway	ISOPROPANOL OR ISOPROPYL ALCOHOL	3	0	\$502
UN1133	7/13/10	DECATUR	UPS GROUND FREIGHT	Highway	ADHESIVE	2	0	\$0
NA3082	9/22/10	DECATUR	UPS GROUND FREIGHT	Highway	OTHER REGULATED SUBSTANCES, LIQUID, N.O.S.	9	0	\$2,000
UN1824	11/15/10	DECATUR	UPS GROUND FREIGHT	Highway	SODIUM HYDROXIDE, SOLUTION	8	0	\$0
UN1075	12/6/10	WARRENSBURG	Ferrellgas, Inc	Highway	LPG	2.1	0	\$0
UN1789	3/12/11	Decatur	Norfolk Southern Railway Company	Rail	HYDROCHLORIC ACID, SOLUTION	8	0	\$700

UN3082	3/14/11	DECATUR	UPS GROUND FREIGHT	Highway	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S.	9	0	\$0
UN1830	4/19/11	DECATUR	ADM Railtard	Rail	SULFURIC ACID	8	0	\$0
NA3077	4/25/11	Decatur	Norfolk Southern Railway Company	Rail	HAZARDOUS WASTE, SOLID, N.O.S.	9	0	\$0
NA3077	4/25/11	DECATUR	Norfolk Southern	Rail	HAZARDOUS WASTE, SOLID, N.O.S.	9	0	\$20,000
UN1789	5/8/11	DECATUR	CN / ILLINOIS CENTRAL RAILROAD	Rail	HYDROCHLORIC ACID, SOLUTION	8	0	\$53,000
UN1823	7/28/11	DECATUR	UPS GROUND FREIGHT	Highway	SODIUM HYDROXIDE, SOLID	8	0	\$1,750
UN2357	10/11/11	DECATUR	Schneider National Bulk Carriers, Inc.	Highway	CYCLOHEXYLAMINE	8	0	\$0
UN1301	10/25/11	Decatur	Norfolk Southern Railway Company	Rail	VINYL ACETATE, STABILIZED	3	0	\$0
UN2800	1/24/12	DECATUR	UNITED PARCEL SERVICE	Air	BATTERIES, WET, NON-SPILLABLE, ELECTRIC STORAGE	8	0	\$0
UN1075	3/10/12	Decatur	Norfolk Southern Railway Company	Rail	PETROLEUM GASES, LIQUEFIED OR LIQUEFIED PETROLEUM GAS	2.1	0	\$0
UN1018	5/1/12	DECATUR	UNITED PARCEL SERVICE	Highway	CHLORODIFLUOROMETHANE OR REFRIGERANT GAS R 22	2.2	0	\$0
UN3082	6/14/12	DECATUR	UPS GROUND FREIGHT	Highway	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S.	9	0	\$0
UN1908	7/9/12	DECATUR	UPS GROUND FREIGHT	Highway	CHLORITE SOLUTION	8	0	\$2,000
UN1170	7/10/12	DECATUR	UPS GROUND FREIGHT	Highway	ETHANOL SOLUTIONS	3	0	\$0
UN1263	8/28/12	DECATUR	UNITED PARCEL SERVICE	Highway	PAINT INCLUDING PAINT, LACQUER, ENAMEL, STAIN, SHELLAC SOLUTIONS, VARNISH, POLISH, LIQUID FILLER AND LIQUID LACQUER BASE	3	0	\$0
UN1789	11/21/12	DECATUR	Norfolk Southern Railway Company	Rail	HYDROCHLORIC ACID	8	0	\$0
UN1992	12/18/12	DECATUR	UPS GROUND FREIGHT	Highway	FLAMMABLE LIQUIDS, TOXIC, N.O.S.	3	0	\$2,000
NA1993	1/22/13	DECATUR	UPS GROUND FREIGHT	Highway	COMPOUNDS, CLEANING LIQUID	3	0	\$0
UN1760	3/6/13	DECATUR	UPS GROUND FREIGHT	Highway	CORROSIVE LIQUIDS, N.O.S.	8	0	\$2,000
UN1170	4/19/13	DECATUR	UPS GROUND FREIGHT	Highway	ETHANOL SOLUTIONS	3	0	\$2,000
UN1710	6/11/13	DECATUR	HOLLAND INC.	Highway	TRICHLOROETHYLENE	6.1	0	\$800
UN1993	7/19/13	DECATUR	UPS GROUND FREIGHT	Highway	FLAMMABLE LIQUIDS, N.O.S.	3	0	\$0

	10/1/13	DECATUR	UNITED PARCEL SERVICE	Air			0	\$0
UN1005	11/6/13	DECATUR	CN / Illinois Central Railroad	Rail	AMMONIA ANHYDROUS	2.2	0	\$7,459
UN3267	11/8/13	DECATUR	UNITED PARCEL SERVICE	Highway	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.	8	0	\$0
UN1950	11/21/13	DECATUR	UPS FREIGHT SERVICES, INC.	Highway	AEROSOLS, FLAMMABLE, (EACH NOT EXCEEDING 1 L CAPACITY)	2.1	0	\$0
UN1292	2/14/14	DECATUR	YRC INC	Highway	TETRAETHYL SILICATE	3	0	\$5,400
UN1824	6/23/14	DECATUR	Truck Transport Inc	Highway	SODIUM HYDROXIDE, SOLUTION	8	0	\$0
UN1987	10/5/14	Decatur	Norfolk Southern Railway Company	Rail	ALCOHOLS, N.O.S.	3	0	\$2,500
UN1090	10/10/14	DECATUR	UNITED PARCEL SERVICE CO.	Highway	ACETONE	3	0	\$0
UN1219	10/31/14	DECATUR	UNITED PARCEL SERVICE CO.	Highway	ISOPROPANOL OR ISOPROPYL ALCOHOL	3	0	\$0
UN1268	12/18/14	DECATUR	UPS FREIGHT	Highway	PETROLEUM DISTILLATES, N.O.S. OR PETROLEUM PRODUCTS, N.O.S.	3	0	\$0
UN3082	12/28/14	Decatur	Norfolk Southern Railway Company	Rail	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S.	9	0	\$2,500
UN1268	1/16/15	Decatur	Norfolk Southern Railway Company	Rail	PETROLEUM DISTILLATES, N.O.S. OR PETROLEUM PRODUCTS, N.O.S.	3	0	\$2,500
UN1993	1/30/15	DECATUR	UPS FREIGHT SERVICES, INC.	Highway	FLAMMABLE LIQUIDS, N.O.S.	3	0	\$0
UN1824	3/12/15	DECATUR	UNITED PARCEL SERVICE CO.	Highway	SODIUM HYDROXIDE, SOLUTION	8	0	\$0
UN1219	4/22/15	DECATUR	UNITED PARCEL SERVICE CO.	Highway	ISOPROPANOL OR ISOPROPYL ALCOHOL	3	0	\$0
UN3264	6/25/15	DECATUR	UNITED PARCEL SERVICE	Highway	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	8	0	\$0
UN1719	7/1/15	DECATUR	UNITED PARCEL SERVICE	Highway	CAUSTIC ALKALI LIQUIDS, N.O.S.	8	0	\$0
UN1950	8/6/15	DECATUR	UNITED PARCEL SERVICE	Highway	AEROSOLS, FLAMMABLE, (EACH NOT EXCEEDING 1 L CAPACITY)	2.1	0	\$0
UN1977	9/2/15	DECATUR	LINDE LLC	Highway	NITROGEN, REFRIGERATED LIQUID (CRYOGENIC LIQUID)	2.2	0	\$142,000
UN3149	1/7/16	Decatur	UNITED PARCEL SERVICE	Highway	HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURES, STABILIZED WITH ACIDS, WATER, AND NOT MORE THAN 5 PERCENT PEROXYACETIC ACID	5.1	0	\$0
UN1090	3/2/16	Decatur	UNITED PARCEL SERVICE	Highway	ACETONE	3	0	\$0
UN1219	5/13/16	Decatur	UNITED PARCEL SERVICE	Highway	ISOPROPANOL OR ISOPROPYL ALCOHOL	3	0	\$0
UN3149	5/18/16	Decatur	UNITED PARCEL SERVICE	Highway	HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURES, STABILIZED WITH ACIDS, WATER, AND NOT MORE THAN 5 PERCENT PEROXYACETIC ACID	5.1	0	\$0

UN1265	6/28/16	Decatur	UNITED PARCEL SERVICE	Highway	PENTANES	3	0	\$0
UN1170	7/29/16	DECATUR	UPS FREIGHT	Highway	ETHANOL SOLUTIONS	3	0	\$2,500
UN1789	11/13/16	Decatur	UNITED PARCEL SERVICE	Highway	HYDROCHLORIC ACID	8	0	\$0
UN1219	2/21/17	Decatur	UNITED PARCEL SERVICE	Highway	ISOPROPANOL OR ISOPROPYL ALCOHOL	3	0	\$0
UN1263	2/28/17	Decatur	UNITED PARCEL SERVICE	Highway	PAINT INCLUDING PAINT, LACQUER, ENAMEL, STAIN, SHELLAC SOLUTIONS, VARNISH, POLISH, LIQUID FILLER AND LIQUID LACQUER BASE	3	0	\$0
UN1830	7/4/17	DECATUR	CN / ILLINOIS CENTRAL RAILROAD	Rail	SULFURIC ACID WITH MORE THAN 51 PERCENT ACID	8	0	\$23,349
UN3149	7/31/17	Decatur	UNITED PARCEL SERVICE	Highway	HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURES, STABILIZED WITH ACIDS, WATER, AND NOT MORE THAN 5 PERCENT PEROXYACETIC ACID	5.1	0	\$0
UN1219	8/4/17	Decatur	UNITED PARCEL SERVICE	Highway	ISOPROPANOL OR ISOPROPYL ALCOHOL	3	0	\$0
UN1824	8/10/17	Decatur	UNITED PARCEL SERVICE	Highway	SODIUM HYDROXIDE, SOLUTION	8	0	\$0
UN1219	9/15/17	Decatur	UNITED PARCEL SERVICE	Highway	ISOPROPANOL OR ISOPROPYL ALCOHOL	3	0	\$0
UN1993	12/5/17	DECATUR	Liquid Transport	Highway	FLAMMABLE LIQUIDS, N.O.S.	3	0	\$0
UN1830	2/19/18	Niantic	UPS FREIGHT	Highway	SULFURIC ACID WITH MORE THAN 51 PERCENT ACID	8	0	\$3,000
UN2922	5/29/18	DECATUR	UPS FREIGHT	Highway	CORROSIVE LIQUIDS, TOXIC, N.O.S.	8	0	\$2,000
UN1170	5/31/18	DECATUR	CSX Transportation, Inc	Rail	ETHANOL SOLUTIONS	3	0	\$3,800
UN1155	6/14/18	DECATUR	UNITED PARCEL SERVICE CO.	Highway	DIETHYL ETHER OR ETHYL ETHER	3	0	\$0
UN1823	8/22/18	Decatur	UPS FREIGHT	Highway	SODIUM HYDROXIDE, SOLID	8	0	\$2,000
UN1760	12/6/18	DECATUR	UNITED PARCEL SERVICE CO.	Highway	CORROSIVE LIQUIDS, N.O.S.	8	0	\$0
UN1263	4/2/19	DECATUR	UNITED PARCEL SERVICE CO.	Highway	PAINT INCLUDING PAINT, LACQUER, ENAMEL, STAIN, SHELLAC SOLUTIONS, VARNISH, POLISH, LIQUID FILLER AND LIQUID LACQUER BASE	3	0	\$0
UN1866	5/29/19	Decatur	UPS FREIGHT	Highway	RESIN SOLUTION, FLAMMABLE	3	0	\$0
UN1830	6/28/19	DECATUR	CN/ILLINOIS CENTRAL RAILROAD COMP	Rail	SULFURIC ACID WITH MORE THAN 51 PERCENT ACID	8	0	\$16,127
UN1263	7/15/19	DECATUR	UPS FREIGHT	Highway	PAINT INCLUDING PAINT, LACQUER, ENAMEL, STAIN, SHELLAC SOLUTIONS, VARNISH, POLISH, LIQUID FILLER AND LIQUID LACQUER BASE	3	0	\$0
UN1005	11/6/19	MAROA	EVERGREEN FS, INC	Highway	AMMONIA ANHYDROUS	2.2	0	\$0

UN1219	12/11/19	DECATUR	UNITED PARCEL SERVICE	Highway	ISOPROPANOL OR ISOPROPYL ALCOHOL	3	0	\$0
UN1263	3/4/20	Decatur	UPS FREIGHT	Highway	PAINT INCLUDING PAINT, LACQUER, ENAMEL, STAIN, SHELLAC SOLUTIONS, VARNISH, POLISH, LIQUID FILLER AND LIQUID LACQUER BASE	3	0	\$0
UN1992	3/27/20	Decatur	UPS FREIGHT	Highway	FLAMMABLE LIQUIDS, TOXIC, N.O.S.	3	0	\$1,500
NA1993	6/18/20	Decatur	KA BULK TRANSPORT, LLC	Highway	DIESEL FUEL	3	0	\$35,800
UN3149	12/11/20	DECATUR	UNITED PARCEL SERVICE	Highway	HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURES, STABILIZED WITH ACIDS, WATER, AND NOT MORE THAN 5 PERCENT PEROXYACETIC ACID	5.1	0	\$0
UN1090	12/21/20	DECATUR	NORFOLK SOUTHERN CORPORATION	Rail	ACETONE	3	0	\$4,000
UN1814	4/30/21	Decatur	UPS FREIGHT	Highway	POTASSIUM HYDROXIDE, SOLUTION	8	0	\$3,400
UN1208	6/30/21	DECATUR	UNITED PARCEL SERVICE CO.	Highway	HEXANES	3	0	\$0
UN1845	10/19/21	DECATUR	UNITED PARCEL SERVICE, INC (OH)	Highway	DRY ICE	9	0	\$0
UN1760	12/8/21	DECATUR	UNITED PARCEL SERVICE CO.	Highway	CORROSIVE LIQUIDS, N.O.S.	8	0	\$0
UN3149	1/8/22	DECATUR	UNITED PARCEL SERVICE CO.	Highway	HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURES, STABILIZED WITH ACIDS, WATER, AND NOT MORE THAN 5 PERCENT PEROXYACETIC ACID	5.1	0	\$0
UN1760	4/13/22	DECATUR	UNITED PARCEL SERVICE CO.	Highway	CORROSIVE LIQUIDS, N.O.S.	8	0	\$0
UN1219	4/30/22	DECATUR	UNITED PARCEL SERVICE CO.	Highway	ISOPROPANOL OR ISOPROPYL ALCOHOL	3	0	\$0
UN1044	8/4/22	DECATUR	UNITED PARCEL SERVICE CO.	Highway	FIRE EXTINGUISHERS CONTAINING COMPRESSED OR LIQUEFIED GAS	2.2	0	\$0
UN1950	8/26/22	DECATUR	UNITED PARCEL SERVICE CO.	Highway	AEROSOLS, POISON, PACKING GROUP III (EACH NOT EXCEEDING 1 L CAPACITY)	2.2	0	\$0
Source: US D.O.T. Pipeline and Hazardous Materials Safety Administration (2023)								

Appendix E: Resolutions of Adoption

Resolutions will be included upon approval and adoption of the Plan.