Received electronically 09/10/2026

First Reading 10/06/2026

RESOLUTION 11-2026

A RESOLUTION OF THE COMMON COUNCIL OF THE CITY OF AUBURN TO ADOPT THE DEKALB COUNTY MULTI-HAZARD MITIGATION PLAN UPDATE

Summary

The attached resolution proposes to adopt the DeKalb County Multi-Hazard Mitigation Plan Update.

_____ Recorder's Office

_____ Auditor's Office or

__X__ Clerk's Office or

_____ Other: Assessor or

_____ Publish Public Hearing

_____

_____ Publish O/R after adoption

_____

RESOLUTION 11-2026

A RESOLUTION OF THE COMMON COUNCIL OF THE CITY OF AUBURN TO ADOPT THE DEKALB COUNTY MULTI-HAZARD MITIGATION PLAN UPDATE

WHEREAS the Common Council of the City of Auburn recognizes the threat that natural hazards pose to people and property within the City of Auburn; and

WHEREAS, DeKalb County has prepared a multi-hazard mitigation plan, hereby known as DeKalb County Multi-Hazard Mitigation Plan Update, June 2026, and attached hereto as Exhibit A, in accordance with federal laws, including the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended; the National Flood Insurance Act of 1968, as amended; and the National Dam Safety Program Act, as amended; and

WHEREAS, DeKalb County Multi-Hazard Mitigation Plan Update, June 2026, identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Auburn from the impacts of future hazards and disasters; and

WHEREAS, adoption by the Common Council of the City of Auburn demonstrates its commitment to hazard mitigation and achieving the goals outlined in the DeKalb County Multi-Hazard Mitigation Plan Update, June 2026.

NOW, THEREFORE, BE IT RESOLVED BY THE COMMON COUNCIL OF THE CITY OF AUBURN, INDIANA:

1. The Common Council of the City of Auburn adopts the DeKalb County Multi-Hazard Mitigation Plan Update, June 2026.

2. This Resolution shall be in full force and effect from and after its passage and any and all necessary approval by the Mayor.

ADOPTED BY THE COMMON COUNCIL OF THE CITY OF AUBURN, INDIANA, ON THE 6th DAY OF October, 2026.

James Finchum, Councilmember

ATTEST:

Lorrie K. Pontius
Clerk-Treasurer

Presented by me to the Mayor of the City of Auburn, Indiana, this me this 6th day of October, 2026.

Lorrie K. Pontius, Clerk-Treasurer

APPROVED AND SIGNED by me this 6th day of October, 2026.

David E. Clark, Mayor

VOTING:	AYE	NAY
Natalie DeWitt		
James Finchum		
Rod Williams		
Dan Braun		
Dave Bundy		
Kevin Webb		
Emily Prosser		

Exhibit A

DeKalb County Multi-Hazard Mitigation Plan Update, June 2026

DeKalb County Multi-Hazard Mitigation Plan

June 2026

Prepared for:

DeKalb County EMA
3399 County Road 34
Waterloo, IN 46793



Prepared by:

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Burke Project No. 19R.240085

CBB
BURKE

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION 1

CHAPTER 2: PLANNING PROCESS 3

2.1 Schedule 4

2.2 Planning Committee and Involvement of Other Interested Parties 4

2.3 Public Involvement 6

CHAPTER 3: COMMUNITY INFORMATION 9

3.1 Critical and Essential Infrastructure 10

3.2 Community Capacity 11

CHAPTER 4: RISK ASSESSMENT 13

4.1 Hazard Identification 13

4.1.1 Hazard Selection 13

4.1.2 Hazard Ranking 14

4.2 Hazard Profiles 16

4.2.1 Drought 17

4.2.2 Earthquake 22

4.2.3 Extreme Temperatures 26

4.2.4 Fires and Wildfire 31

4.2.5 Flood 35

4.2.6 Hailstorm, Thunderstorm, and Windstorm 48

4.2.7 Landslide, Land Subsidence, and Fluvial Erosion Hazard 52

4.2.8 Tornado 56

4.2.9 Winter Storms and Ice 60

4.2.10 Dam and Levee Failure 65

4.2.11 Hazardous Material Incident 71

4.3 Hazard Summary 75

CHAPTER 5: MITIGATION STRATEGY 79

5.1 Mitigation Goal 79

5.2 Mitigation Practices 79

5.2.1 Existing Mitigation Practices 80

5.2.2 Proposed Mitigation Practices 82

CHAPTER 6: IMPLEMENTATION PLAN.....93
6.1 Building Protection.....93
6.2 Communications.....93
6.3 Emergency Preparedness and Warning.....94
6.4 Floodplain Management.....94
6.5 Power Back-Up Generators.....95
6.6 Public Education and Outreach.....95
6.7 Safe Rooms and Community Shelters.....96
6.8 Stormwater.....96
CHAPTER 7: PLAN MAINTENANCE PROCESS.....97
7.1 Monitoring, Evaluating, and Updating The Plan.....97
7.2 Incorporation Into Existing Planning Mechanisms.....98
7.3 Continued Public Involvement.....99
REFERENCES.....101

LIST OF FIGURES

Figure i: Disaster Life Cycle.....v
Figure 1: Disaster Life Cycle.....1
Figure 2: NFIP/CRS.....3
Figure 3: DeKalb County Location.....9
Figure 4: DeKalb County Courthouse.....10
Figure 5: U.S. Drought Monitor Classification Descriptions.....17
Figure 6: Drought Occurrences from January 1, 2020 - December 31, 2024.....18
Figure 7: Annual Maximum Temperatures from 1895 - 2024.....19
Figure 8: Crop Failure Caused by Drought.....20
Figure 9: Earthquake Risk Areas in the US.....22
Figure 10: DeKalb County Liquefaction Potential Areas.....23
Figure 11: NWS heat Index Chart.....26
Figure 12: Extreme Heat Effects by Heat Index.....27
Figure 13: Wind Chill Guide.....27
Figure 14: Extreme Cold.....28
Figure 15: Excessive heat.....29
Figure 16: Barn Fire in DeKalb County (2024).....32
Figure 17: Local Structure Fire in DeKalb County (2022).....33
Figure 18: Indiana Flash Flood from June 2021.....35
Figure 19: Stream Gage locations in DeKalb County.....36
Figure 20: Average Precipitation Trend.....39
Figure 21: DeKalb County Flood Map [9/29/2006].....40
Figure 22: Annual Average Precipitation Rise.....41
Figure 23: Extreme Precipitation Events in Indiana.....41
Figure 24: Sample of Flood Designated Areas in DeKalb County.....46

Figure 25: Damage from High Thunderstorm Winds 50
Figure 26: Fluvial Erosion Hazard in St. Joe along St. Joseph River 52
Figure 27: Expected Annual Loss from Landslides in DeKalb County 53
Figure 28: Siren Locations in DeKalb County 59
Figure 29: Winter Storm Impacts 61
Figure 30: Annual Minimum Temperatures from 1895 - 2024 61
Figure 31: Sample of Non-Levee Embankments South of Waterloo 67
Figure 32: Hamilton Lake Breach Inundation Area 68
Figure 33: DeKalb County Transportation Map 71
Figure 34: Hazardous Material Spill 73

LIST OF TABLES

Table i: CPRI Ranking for All Hazards vii
Table 1: DeKalb County MHMP Planning Team 4
Table 2: Critical and Essential Facilities 10
Table 3: Hazards Selected 14
Table 4: Determination of Weighted Value for Communities 16
Table 5: DeKalb County Fire Calls 32
Table 6: DeKalb County USGS Gage 36
Table 7: Repetitive Loss Properties and Number of Claims 38
Table 8: Insurance Premiums and Coverage 38
Table 9: DeKalb County Participation in NFIP 42
Table 10: DeKalb County Building Inventory Utilizing Best Available Data 44
Table 11: Critical Infrastructure in the Flood Zones 44
Table 12: Structures in the 1.0% AEP and Number of Flood Insurance Policies 45
Table 13: Dates of Most Recent Floodplain Ordinance 45
Table 14: Summary of Parcels and Essential Structures in the FEH Zone 54
Table 15: Enhanced Fujita Scale for Tornados 56
Table 16: Summary of Hypothetical Tornado Damages 58
Table 17: Critical Infrastructure within Hypothetical Tornado 58
Table 18: Dams in DeKalb County 66
Table 19: All CPRI Scores Combined 75
Table 20: Hazard Reference Table 76
Table 21: Proposed Mitigation Measures 83
Table 22: MHMP Incorporation Process 99

EXHIBITS

Exhibit 1: Critical and Essential Infrastructure
Exhibit 2: DeKalb County Flood Map
Exhibit 3: Hypothetical Tornado Map

APPENDICES

Appendix 1: Acronyms
Appendix 2: CRS Checklist
Appendix 3: Planning Committee Meeting Agendas and Summaries
Appendix 4: Public Participation and Involvement of Other Interested Parties
Appendix 5: Critical Infrastructure by Community
Appendix 6: Community Capability Assessment
Appendix 7: Disaster and Emergency Declarations
Appendix 8: CPRI (Calculated Risk Priority Index)
Appendix 9: USGS Stream Gage Locations and Major Waterways
Appendix 10: NCDC Hazard Data
Appendix 11: 2020 Mitigation Actions Status
Appendix 12: Potential Funding Sources
Appendix 13: Implementation Checklist

EXECUTIVE SUMMARY

The Federal Emergency Management Agency (FEMA) defines the disaster life cycle as the process through which emergency managers respond to disasters when they occur; help people and institutions recover from them; reduce the risk of future losses; and prepare for emergencies and disasters. In **Figure i** each phase in the Emergency Management Lifecycle; Mitigate, Prepare, Respond, and Recover has a description of the phase as well as a time frame within the disaster cycle. Although each of the phases is visually tied to a specific time period within the life cycle of the disaster, mitigation can take place throughout much of the disaster life cycle. The DeKalb County Multi-Hazard Mitigation Plan (MHMP) update focuses on the mitigation activities that may be implemented throughout the disaster life cycle.



Figure i: Disaster Life Cycle

According to FEMA, mitigation is most effective when it is based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs. The MHMP planning process identifies hazards, the extent that they affect the municipality, and formulates mitigation practices to ultimately reduce the social, physical, and economic impact of the hazards.

The overall goals of the DeKalb County MHMP, which align closely with the State of Indiana MHMP, are:

- Lessen the impacts of disasters and enhance community resilience.
- Minimize the loss of life and injuries caused by disasters.
- Promote mitigation activities both prior to and following a disaster.

To achieve the stated goals the community strategy includes the following:

1) Lessen the impacts of disasters and enhance community resilience by:
   a. Supporting resilience opportunities within the community
   b. Incorporating the MHMP into local ordinances, local planning efforts, and the community comprehensive plans
   c. Evaluating and strengthening collaboration among organizations
   d. Making sure essential facilities can withstand disasters
   e. Supporting the NFIP
   f. Identifying opportunities to reduce repetitive loss incidents

2) Minimize the loss of life and injures caused by disasters by:
   a. Improving warning systems for the residents
   b. Developing public awareness and outreach programs
   c. Improving shelter availability
   d. Developing a program of affordable housing that is resilient to flooding
   e. Improving education and training for emergency personnel and officials
   f. Developing ways to provide education, awareness, and warning of disasters to the underserved populations.

3) Promote mitigation activities prior to and following a disaster by:
   a. Ensuring better communication between federal, state, and local officials
   b. Seizing opportunities to buy out properties, floodproof buildings, or improve building codes

c. Conducting new studies and/or research opportunities to reduce impacts from disasters and prepare for future events anticipating the impacts of our changing climate.
d. Conducting outreach efforts to educate community members about the risks and hazards in their area as well as encouraging the implementation of a variety of mitigation actions.

For National Flood Insurance Program (NFIP) communities to be eligible for future mitigation funds, they must either adopt their own MHMP or participate in the development of a multi-jurisdictional MHMP. Further, it is required that local jurisdictions review, revise, and resubmit the MHMP every five years. The following are incorporated communities that have provided information, attended meetings, and participated in the planning process, the planning process used to update the DeKalb County MHMP satisfies the requirements of a multi-jurisdictional plan.

- DeKalb County
- City of Auburn
- City of Butler
- City of Garrett
- Town of Altona
- Town of Ashley
- Town of Corunna
- Town of Hamilton
- Town of St. Joe
- Town of Waterloo

During planning committee meetings, those in attendance revisited the latest edition of the DeKalb County MHMP and identified new critical facilities and local hazards; reviewed the State's mitigation goals and updated the local mitigation goals; reviewed the most recent local hazard data, vulnerability assessment, and maps; evaluated the effectiveness of existing mitigation measures and identified new mitigation projects; and reviewed materials for public participation. Keeping in mind the ever-changing climate, the team also examined the needs of underserved populations that may be more vulnerable to the impacts of the listed hazards. Meetings were conducted with key groups such as city planners, health department specialists, representatives of organizations serving the underserved populations and various emergency responders. Their information has been incorporated into this MHMP update. This plan update will examine each of the hazards with data from the past five years, where possible.

The review of hazards and risks is based on the methodology described in the Local Mitigation Planning Policy Guide FP 206-21-0002, effective April 19, 2023. The plan identifies the hazards assessed, the nature of each hazard including historic occurrences, vulnerabilities, and the relationship to other hazards. Using a ranking tool known as the Calculated Risk Priority Index (CPRI), the planning team scored each of the hazards. **Table i** lists the hazards in the plan and the ranking of each. The CPRI scores reflect the hazards of most concern by the planning team members.

Table i: CPRI Ranking for All Hazards

Hazard	2025 Rank	CPRI Score
Fires and Wildfire	1	3.15
Hailstorm, Thunderstorm, and Windstorm	2	2.92
Hazardous Material Incident	3	2.90
Winter Storms and Ice	4	2.89
Tornado	5	2.88
Drought	6	2.76
Extreme Temperatures	7	2.65
Flood	8	2.09
Earthquake	9	1.88
Dam and Levee Failure	10	1.63
Landslide, Land Subsidence, and Fluvial Erosion	11	1.36

The plan concludes with a discussion about mitigation actions. The MHMP lists a variety of mitigation actions the planning team members would like to accomplish within the next five years to enhance the resilience of DeKalb County. In addition, it celebrates the mitigation successes from the previous MHMP plans and community actions which contribute to mitigating the various risks and hazards identified.

Lastly, this MHMP is a living document which has a five-year life span. During the next five years, DeKalb County and the incorporated communities that adopt this plan will work to complete the mitigation actions as well as regularly noting items for the next plan update. The county EMA and planning team members will also use tools contained in the appendices, or similar documents, to track progress, and note changes that may impact community resilience.

CHAPTER 1: INTRODUCTION

DISASTER LIFE CYCLE

The Federal Emergency Management Agency (FEMA) defines the disaster life cycle as the process through which emergency managers respond to disasters when they occur; help people and institutions recover from them; reduce the risk of future losses; and prepare for emergencies and disasters. The disaster life cycle, shown in **Figure 1** includes four phases:



Figure 1: Disaster Life Cycle

Mitigation – to prevent or to reduce the effects of disasters (building codes and zoning, vulnerability analyses, public education)
Preparedness – planning, organizing, training, equipping, exercising, evaluation and improvement activities to ensure effective coordination and the enhancement of capabilities (preparedness plans, emergency exercises/training, warning systems)
Response – the mobilization of the necessary emergency services and first responders to the disaster area (search and rescue; emergency relief)
Recovery – to restore the affected area to its previous state (rebuilding destroyed property, re-employment, and the repair of other essential infrastructure)

The DeKalb County Multi-Hazard Mitigation Plan (MHMP) focuses on the mitigation phase of the disaster life cycle. According to FEMA, mitigation is most effective when it is based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs. Recent reviews of grant programs have determined for every $1 spent on mitigation efforts, between $6 and $10 are saved within the community on efforts following disasters. The MHMP planning process identifies hazards, the extent that they affect the municipality, and formulates mitigation practices to ultimately reduce the social, physical, and economic impact of the hazards.

The following chapters will address the planning process used to complete the updating of the existing MHMP, basic community information to orient the reader to the county and the incorporated communities, a discussion of nine natural and two manmade hazards detailing their recent occurrence and risks posed to the county , a discussion of the mitigation strategy, outline of the implementation plan and a discussion of how the plan will be maintained. Images and tables in **bold** are linked within the document as well as being linked in the table of contents. By clicking on these bolded features while holding the control key, the document will automatically move to item identified in the bold text.

CHAPTER 2: PLANNING PROCESS

REQUIREMENT 44 CFR 201.6 (d)(3):

A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding.

According to the Code of Federal Regulations (44 CFR §201.1(b)), the purpose of mitigation planning is for State, local, and Indian tribal governments to identify the natural hazards that impact them, to identify actions and activities to reduce any losses from those hazards, and to establish a coordinated process to implement the plan, taking advantage of a wide range of resources.

A FEMA-approved MHMP is required to apply for and/or receive project grants under the Building Resilient Infrastructure and Communities (BRIC), Hazard Mitigation Grant Program (HMGP), and Flood Mitigation Assistance (FMA). Additional detailed studies may need to be completed prior to applying for these grants even though this plan meets the requirements of Disaster Mitigation Act (DMA) 2000 and eligibility requirements of the above listed grant programs. Acronyms referenced throughout this plan are contained in **Appendix 1**.

The NFIP requires participating communities to adopt either their own MHMP or participate in the development of a multi-jurisdictional MHMP to be eligible for future mitigation funds. The Indiana Department of Homeland Security (IDHS) and the United States Department of Homeland Security (US DHS)/FEMA Region V offices administer the MHMP program in Indiana. Local jurisdictions are required to review, revise, and resubmit the MHMP every five years. The MHMP updates must demonstrate that progress has been made in the last five years to fulfill the commitments outlined in the previously approved MHMP. The update may validate the information in the previously approved MHMP or may be a major rewrite depending on community needs and planning guidance. The updated MHMP is not intended to be an annex to the previously approved plan; it stands on its own as a complete and current MHMP. The DeKalb County MHMP update is a multi-jurisdictional planning effort led by the DeKalb County Emergency Management Agency (EMA). This plan was prepared in partnership with DeKalb County (referred to in this document as county), the cities of Auburn, Butler, and Garrett (referred to in this document as cities), and the towns of Altona, Ashley, Corunna, Hamilton, St. Joe, and Waterloo (referred to in this document as towns).

Representatives from these communities attended the committee meetings, providing valuable information about their community, reviewing, and commenting on the draft MHMP, and assisting with local adoption of the updated plan. As each of the jurisdictions had an equal opportunity for participation and representation in the planning process, the process used to update the DeKalb County MHMP satisfies the requirements of DMA 2000 in which multi-jurisdictional plans may be accepted.



Figure 2: NFIP/CRS

The Community Rating Service (CRS) program is a voluntary incentive program that recognizes and encourages community floodplain activities that exceed the minimum NFIP requirements. As a result, flood insurance premiums are discounted to reflect the reduced flood risk resulting from community actions that meet the three goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote education and awareness of flood insurance. Savings on flood insurance premiums are proportional to the points assigned to various activities. A minimum of 500 points is required to be a participating community within the CRS program and receive a 5% flood insurance premium discount. Class 10, or communities with 0-499 points, are non-participating communities and do not receive a discount on flood insurance. This MHMP could contribute as many as 374 points toward participation in the CRS. Throughout this

plan, activities that could count toward CRS points are identified with the NFIP/CRS logo (**Figure 2**). **Appendix 2** breaks down how this MHMP can contribute toward participation in the CRS.

2.1 Schedule

REQUIREMENT §201.6(c)(1):

The plan shall document the planning process used to prepare the plan, including how it was prepared, who was involved in the process, and how the public was involved.

Preparation for the DeKalb County MHMP update began when IDHS notified the county of the FEMA grant award and availability of grant funds. The plan update process began immediately upon the hiring of Chrispher B. Burke Engineering, LLC. The planning process to update the 2020 MHMP took 19 months. This included a review period by IDHS and FEMA for the draft MHMP update, and time for DeKalb County and communities to adopt the final MHMP update.

2.2 Planning Committee and Involvement of Other Interested Parties

In August 2024, the EMA began to compile a list of planning committee members to guide the MHMP update planning process. Committee members were contacted through their personal contact info and were relayed information on the meeting time and location. These individuals were specifically invited to serve on the committee because they were knowledgeable of local hazards; had been involved in hazard mitigation activities; had the tools necessary to reduce the impact of future hazard events; and/or served as a representative on the prior planning committee in 2020. The surrounding counties of Allen, LaGrange, Noble, and Steuben were invited to attend the team meetings and were given an opportunity to provide input and feedback to the plan throughout the planning process and during draft review. While the EMA Directors from Noble, Steuben, and Whitley counties attended, no comments or corrections were received from the neighboring EMA offices. **Table 1** lists the individuals that actively participated on the committee and the entity they represented.

Table 1: DeKalb County MHMP Planning Team

Name	Agency	Title	Community Representing
Alyssa Clark	DeKalb County Health Dept.	Deputy Registered Nurse	DeKalb County
Angela Snyder	Town of St. Joe	Clerk/Treasurer	St. Joe
Ann Carpenter	Noble County EMA	Deputy Director	Neighboring EMA
Ann Finchum	Auburn Main Street	Executive Director	Auburn
Anthony Clark	GIS Department	GIS Coordinator	DeKalb County
Beth McMaken	Town of Altona	Clerk	Altona
Brady Thomas	DeKalb County Sheriff	Sheriff	DeKalb County
Brent Shull	Town of Hamilton	Town Manager	Hamilton
Brett Steffen	Parkview Emergency Medical Services (EMS)	Emergency Responder	Auburn
Brian Humbarger	Central Communications	Director	Auburn
Brooke Norton	Parkview EMS	EMS Supervisor	Auburn
Cheryl Lynch	DeKalb County Health Dept	Director/County Nurse	DeKalb County
Chris Gaumer	DeKalb County Development Services	Director/Zoning Admin	DeKalb County
Dan Fox	Parkview - DeKalb Hospital	Safety Coordinator	Auburn
Dana Hedrick	DeKalb County Courthouse	Clerk	DeKalb County
David Barrand	Ashley-Hudson Fire Dept.	Fire Chief	Ashley
Doug Cox	Auburn Fire Department	Fire Chief	Auburn
Edward Scott	Whitley County EMA	Deputy Director	Neighboring EMA

Name	Agency	Title	Community Representing
Elysia Rodgers	Purdue Extension	Director	Auburn
Gabe Creech	Noble County EMA	Director	Neighboring EMA
Gerald Kline	Garrett Police Department	Chief	Garrett
James Cadaret	City of Auburn Building and Planning Department	City Planner	Auburn
Jarrett Braden	Development Services	GIS Coordinator/Analyst	Auburn
Jason Meek	DeKalb EMA/DHS	Director	Waterloo
Joni Humbarger	DeKalb County Treasurer	Treasurer	DeKalb County
Jenny Buchs	Waterloo Public Library	Director	Waterloo
Joe Molargik	Auburn City Fire Department	Deputy Chief	Auburn
Julie McCormick	DeKalb Hospital	President	Auburn
Kathleen Mulligan	St. Joseph School	Principal	Garrett
Lee Greenamyer	Steuben County EMA	Director	Neighboring EMA
Mike Hartman	Butler City	Mayor	Butler
Mike Mayberry	Town of Corunna	Board Member	Corunna
Mike VanZile	DeKalb EMA/DHS	Deputy Director	Waterloo
Nick Stephan	Garrett Public Library	Executive Director	Garrett
Peggy Barrand	Ashley Community Center	Clerk	Ashley
Rick Ring	DeKalb County Council	Council Member	DeKalb County
Rodney Renkenberger	Maumee River Basin Commission	Executive Director	Neighboring County
Russ Couchman	DeKalb County Airport	Manager	DeKalb County
Ryan Abbott	DeKalb County Eastern Schools	Superintendent	DeKalb County
Ryan Shambaugh	Auburn Building, Planning and Development	Administrator	Auburn
Sandi Wilcox	DeKalb County Treasurer	Deputy Treasurer	DeKalb County
Sarah Dempsey	Butler Public Library	Director	Butler
Sean Miller	Auburn Police Department	Captain	Auburn
Tanya Young	Community Foundation	Executive Director	Auburn
Valerie Simmons	Eckhart Public Library	Director	Auburn

Members of the committee participated in the MHMP update through various team meetings as well as outside group meetings where mitigation opportunities are supported or addressed. During the MHMP team meetings, the committee:

- Reviewed the State's mitigation goals and updated the local mitigation goals
- Reviewed the most recent local hazard data, vulnerability assessment, and maps
- Evaluated and ranked the hazards based on probability of occurrence, impact, warning time, and duration of the hazard event
- Revisited existing (in the prior MHMP) critical and essential infrastructure and identified new critical infrastructure and local hazards
- Evaluated the effectiveness of existing mitigation measures and identified new mitigation projects
- Reviewed materials for public participation

A sign-in sheet recorded those present at each meeting to document participation. Meeting agendas and summaries are included in **Appendix 3**. Members of the committee also reviewed a draft MHMP, provided comments and suggestions, and assisted with adoption of the DeKalb County MHMP update.

2.3 Public Involvement

The DeKalb County EMA Director kept the public up to date about the planning process by regularly reporting on the planning effort at public commissioner's meetings, LEPC meetings, and other events. A draft of the DeKalb County MHMP Update was posted to the Official Website of the DeKalb County Indiana for public review and comment. A media release indicating the posting of the draft MHMP and the ability to comment was submitted for release. No comments or corrections were received from the public or the committee. The media release, web page posting, and any comments received are included in **Appendix 4**.

As previously mentioned, neighboring EMAs were invited to review the draft plan during the period of public review and comment. No comments or corrections were received from the neighboring EMAs.

2.4 Plans, Studies, Reports, and Technical Information

Requirement 201.6(c)(1)

The plan shall include a review and incorporation, if appropriate, of existing plans, studies, reports, and technical information

During the development of the DeKalb County MHMP update, several relevant sources of information were reviewed either as a document or through discussions with local personnel. This exercise was completed to gather updated information since the development of the previous DeKalb County MHMP, and to assist the committee in developing potential mitigation measures to reduce the social, physical, and economic losses associated with hazards affecting DeKalb County.

This planning effort included the review of community specific plans and studies for incorporation in this plan update. For the purposes of this planning effort, the following materials (among others) were discussed and utilized:

- MHMP DeKalb County (2020)
- DeKalb County Comprehensive Plan (2017)
- DeKalb County GIS data
- City of Butler Comprehensive Plan (2001)
- DeKalb County Ordinances
- Ordinances for the cities of Auburn, Butler, and Garrett
- Ordinances for the towns of Altona, Ashley, Corunna, Hamilton, and Waterloo
- Maumee River Basin Commission Flood Mitigation Master Plan (2014)
- Flood Insurance Rate Maps and Flood Insurance Studies – FEMA and INFIP

The above plans and ordinances target many of the same issues and plans included in this report. The MHMP has and continues to be used to inform decision makers during preparation of various documents in the county. This MHMP planning effort sought to use existing plans to inform the planning team about mitigation actions that would support the community development, as outlined in the comprehensive plan, and to support and/or enhance existing ordinances. The DeKalb County Building Department has jurisdiction over all unincorporated areas of the county and over all incorporated areas of the county besides the city of Auburn. The city of Auburn has its own building department.

In addition to local agencies and offices such as those listed above, several regional and state agencies were contacted and subsequently provided data for this planning effort. Those contacts, and the information they provided, include:

- Indiana Department of Natural Resources, Division of Water – *Flood insurance policies, claims, and payment information; NFIP Participation; DNR listed Dams and associated records; Dam Breach Inundation App; and IN Floodplain Information Portal*
- Indiana Department of Natural Resources, Other Divisions – *Mining Records*
- Indiana Geologic Survey and Water – *Earthquakes in Indiana; Liquefaction Potential Map: Karst Regions and Maps of Karst locations*
- Indiana Geographic Information Office - *IndianaMap*
- Indiana Department of Homeland Security – *Current Fire and Building Code Information*
- FEMA, Region V – Repetitive loss structure counts and insurance payments and FIRM Maps and Flood Studies
- Midwest Regional Climate Center – Climate Trends; County specific climate reports
- National Weather Service –- Confirmation of Winter Storm Severity Index (WSSI) tool; local storm reports; weather event photos



The CRS program credits NFIP communities with a maximum of 170 points: up to 15 points for organizing a planning committee composed of staff from various departments; up to 120 points for involving the public in the planning process; and up to 35 points for coordinating among other agencies and departments to resolve common problems relating to flooding and other known natural hazards.

CHAPTER 3: COMMUNITY INFORMATION



Figure 3: DeKalb County Location

DeKalb County was originally inhabited by the Potawatomi Indians. It was established in 1837 and was named in honor of General De Kalb, a revolutionary officer who was killed in the battle of Camden. The county is part of northeast Indiana and sits just north of Fort Wayne. The County is also positioned two to three hours from Columbus, Dayton, Detroit, and Indianapolis and contains a mix of urban, suburban, and rural areas. It is bordered on the east by Ohio and hosts the yearly St. Joe Pickle Fest.

DeKalb County grew slowly before the 1920's. The growth of Ft. Wayne enabled DeKalb to develop more substantially. As a result of the county's proximity to Fort Wayne and several urban areas DeKalb County grew to be more populated than most Indiana rural counties surrounding Allen County.

Over 11,000 people commute into or out of the county. In the event of a disaster these people may flee home causing roadways to become congested. As roads become congested the likelihood of accidents rises which may put further pressure on emergency services.

DeKalb County, like many other Indiana counties, is aging faster than the state average. With a median age of 39.2, they are older than the state median age of 38.2. The county also has higher percentages of Preschool age children at 6.1%, School age children at 17.4%, Older Adults at 25%, and Seniors at 18.2%. This trend may indicate that as adults leave the school system, they leave the county and then return as they grow older. However, unlike many rural Indiana counties, DeKalb is experiencing a population growth of 2.5%. This population growth can be utilized to make the county more resilient in the future.

DeKalb County is mainly low and flat but is lower near the St. Joseph River and higher in the northwest part of the county. The total area of DeKalb County is 363.85 square miles of which 1.03 square miles is water. The county is divided into 15 townships, and the City of Auburn serves as the county seat. The location of the county within the State of Indiana is identified in **Figure 3**.

Top Ten Employers within DeKalb County

1. Rieke Corp
2. Steel Dynamics
3. Therma Tru
4. Carlex Glass
5. Walmart Distribution Center
6. Walmart Supercenter
7. Vulcraft 7961
8. Ti Fluid Systems
9. CSX Transportation
10. Vulcraft Division of Nucor Corporation

3.1 CRITICAL AND ESSENTIAL INFRASTRUCTURE

REQUIREMENT §201.6(c)(2)(ii)(A):

The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas….

Critical facilities, critical infrastructure, and essential facilities are the assets, systems, and networks, whether physical or virtual, so vital to local governments and the United States that their incapacitation or destruction would have a debilitating effect on security, economic security, public health or safety, or any combination thereof.



Figure 4: DeKalb County Courthouse

These structures are vital to the community's ability to provide essential services and protect life and property; are critical to the community's response and recovery activities; and/or are the facilities, the loss of which, would have a severe economic or catastrophic impact. The operation of these facilities becomes especially important following a hazard event.

Utilizing information from the DeKalb County EMA and GIS Department Offices alongside FEMA data, **Table 2** shows the 298 critical and essential facilities for the MHMP update. There may be insufficient data to accurately list all critical and essential facilities in the county. **Figure 4** shows the DeKalb County Courthouse, which is considered one of the critical facilities.

Table 2: Critical and Essential Facilities

Critical and Essential Facilities					
Facility Type	**Count**	**Facility Type**	**Count**	**Facility Type**	**Count**
Airport/Heliport	2	Assisted Living	6	Comm. Tower	67
Comms. Center	1	Dams	9	Emergency Management	3
EMS	3	Emergency Shelter	25	Fire Department	9
Government Building	19	HazMat Storage	86	Hospital / Urgent Care	3
Jail	1	Large Employer	23	Law Enforcement	7
School	21	Water Tower	13		

Information provided by the EMA, DeKalb County GIS, and the MHMP planning committee members was utilized to identify the types and locations of critical structures throughout DeKalb County. Draft maps were provided to the planning committee and EMA, along with the planning committee for their review and all comments were incorporated into the maps and associated databases.

Exhibit 1 illustrates the critical infrastructure identified throughout the unincorporated DeKalb County and the individual municipalities. **Appendix 5** lists the critical structures in DeKalb County by community. Non-critical structures include residential, industrial, commercial, and other structures not meeting the definition of a critical facility and are not required for a community to function. The development of this MHMP focused only on critical and essential structures; non-critical structures are neither mapped nor listed.

3.2 COMMUNITY CAPACITY

REQUIREMENT §201.6(c)(3):

The plan shall document each participant's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs

The Indiana Fire Prevention and Building Safety Commission is tasked with the establishment and maintenance of fire and building safety codes throughout the state. The commission is also responsible for reviewing variance requests, code modification proposals, and orders enforcing the fire and building safety law. Only the commission is permitted to adopt codes for the state thus prohibiting local communities from adopting codes other than those adopted by the state. All jurisdictions of the state are required to follow the state adopted fire safety and building laws.

The State of Indiana is presently working with subject matter experts to update the current fire and building safety codes to more recent International Code Council versions. Due to the hearing and adoptions processes this is a multi-year effort. It is hoped that within the next five years updated fire safety and building codes will be adopted to assist the community in becoming more resilient. In all cases, local floodplain ordinances are anticipated to be updated within the next five-year cycle using the state model ordinance to guide their process.

Local building officials serve as the local authority for building construction matters within their jurisdiction. Within DeKalb County, the county and the city of Auburn have a Building Commissioner who administers the building codes and zoning ordinances for the county. For all other communities, the State Building Inspector serves as the "code official" for commercial building construction. **Appendix 6** lists the local building official as well as other key positions in each jurisdiction.

Due to the small population of Altona, Corunna, Hamilton, and St. Joe, community capacity for new projects is limited and there may be activities which are shared with the county. Additionally, some authorities may be shared between one person or may not be directly addressed.

DeKalb County has ordinances relevant to floodplain regulations, stormwater, subdivisions, water conservation, and zoning. Many of the communities within DeKalb County have most if not all the same ordinances as the county. As a very rural county, community leaders take advantage of grant funding to help address non-budgeted activities. The planning team identified multiple community-wide needs that will be addressed in **Chapter 5**. As needs for capacity building are identified, the communities and their leadership work together to ensure the challenges are addressed.

CHAPTER 4: RISK ASSESSMENT

REQUIREMENT §201.6(c)(2):

The risk assessment shall provide the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessment must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

A risk assessment measures the potential loss from a hazard incident by assessing the vulnerability of buildings, infrastructure, and people in a community. It identifies the characteristics and potential consequences of hazards, how much of the community may be affected by a hazard, and the impact on community assets. The risk assessment conducted for DeKalb County and the communities within is based on the methodology described in the Local Mitigation Planning Handbook published by FEMA in 2023 and is incorporated into the following sections:

Section 4.1: Hazard Identification lists the natural, technological, and political hazards selected by the planning committee as having the greatest direct and indirect impact on the county as well as the system used to rank and prioritize the hazards.

Section 4.2: Hazard Profile for each hazard, discusses 1) historic data relevant to the county where applicable; 2) vulnerability in terms of number and types of structures, repetitive loss properties (flood only), estimation of potential losses, and impact based on an analysis of development trends; and 3) the relationship to other hazards identified by the planning committee.

Section 4.3: Hazard Summary provides an overview of the risk assessment process; a table summarizing the relationship of the hazards; and a composite map to illustrate areas impacted by the hazards.

4.1 HAZARD IDENTIFICATION

4.1.1 Hazard Selection

The MHMP planning committee reviewed the list of natural and technological hazards in the 2020 DeKalb County MHMP and discussed recent events and the potential for future hazard events. The committee identified those hazards which affected DeKalb County and each community selecting the hazards to study in detail as part of this planning effort. As shown in **Table 3**, these hazards include dam failure; drought; earthquake; extreme temperatures; fires and wildfire; flooding; hailstorm, thunderstorm, and windstorm; hazardous material incident; landslide, land subsidence, and fluvial erosion; tornado, and winter storms and ice. Since the COVID pandemic, the Health Department continues to develop plans and policies to better respond to and reduce the spread of both routine human disease-causing organisms as well as zoonotic diseases and changes in that field.

Table 3: Hazards Selected

Type of Hazard	List of Hazards	MHMP	
		Previous Plan	Current Plan
Natural	Drought	Yes	Yes
	Earthquake	Yes	Yes
	Extreme Temperatures	Yes	Yes
	Fires and Wildfire	Yes	Yes
	Flood	Yes	Yes
	Hailstorm, Thunderstorm, and Windstorm	Yes	Yes
	Landslide, Land Subsidence, and Fluvial Erosion	Yes	Yes
	Winter Storms and Ice	Yes	Yes
	Tornado	Yes	Yes
Technological	Dam and Levee Failure	Yes	Yes
	Hazardous Material Incident	Yes	Yes

4.1.2 Hazard Ranking

The planning committee ranked the selected hazards in terms of importance and potential for disruption to the community using a modified version of the CPRI. CPRI is a tool by which individual hazards are evaluated and ranked according to an indexing system. The CPRI value (as modified by Burke) can be obtained by assigning varying degrees of risk probability, magnitude/severity, warning time, and the duration of the incident for each event, and then calculating as index value based on a weighted scheme. For ease of communication, simple graphical scales are used.

Probability:



Probability is defined as the likelihood of the hazard occurring over a given period. The probability can be specified in one of the following categories:

- Unlikely – incident is possible, but not probable, within the next 10 years
- Possible – incident is probable within the next five years
- Likely - incident is probable within the next three years
- Highly Likely – incident is probable within the next calendar year

Magnitude / Severity:



Magnitude/severity is defined by the extent of the injuries, shutdown of critical infrastructure, the extent of property damage sustained, and the duration of the incident response. The magnitude can be specified in one of the following categories:

- Negligible – few injuries OR critical infrastructure shutdown for 24 hours or less OR less than 10% property damaged OR average response duration of less than six hours
- Limited – few injuries OR critical infrastructure shut down for more than one week OR more than 10% property damaged OR average response duration of less than one day
- Significant – multiple injuries OR critical infrastructure shut down of at least two weeks OR more than 25% property damaged OR average response duration of less than one week
- Critical – multiple deaths OR critical infrastructure shut down of one month or more OR more than 50% property damaged OR average response duration of less than one month

Warning Time:



Warning time is defined as the length of time before the event occurs and can be specified in one of the following categories:

- More than 24 hours
- 12-24 hours
- 6-12 hours
- Less than six hours

Duration:



Duration is defined as the length of time that the actual event occurs. This does not include response or recovery efforts. The duration of the event can be specified in one of the following categories:

- Less than six hours
- Less than one day
- Less than one week
- Greater than one week

Calculating the CPRI:



The following calculation illustrates how the index values are weighted and how the CPRI value is calculated. CPRI = (Probability x 0.45) + (Magnitude/Severity x 0.30) + (Warning Time x 0.15) + (Duration x 0.10). For the purposes of this planning effort, the calculated risk is defined as:

- **Low** if the CPRI value is between 1 and 2
- **Elevated** if the CPRI value is between 2 and 3
- **Severe** if the CPRI value is between 3 and 4

The CPRI value provides a means to assess the impact of one hazard relative to other hazards within the community. A CPRI value for each hazard was determined for each incorporated community in DeKalb County, and then a weighted CPRI value was computed based on the population size of each community. **Table 4** presents each community, population, and the weight applied to individual CPRI values to arrive at a combined value for the entire county. Weight was calculated based on the average percentage of each community's population in relation to the total population of the county. Thus, the results reflect the relative population influence of each community on the overall priority rank.

Table 4: Determination of Weighted Value for Communities

Community	Population (2024)	% of Total Population	Weighted Value
DeKalb County (w/o incorporated communities)	17,060	38.5%	0.39
City of Auburn	13,989	31.6%	0.32
City of Butler	2,669	6.0%	0.06
City of Garrett	6,663	15.0%	0.15
Town of Altona	219	0.5%	0.01
Town of Ashley	679	1.5%	0.02
Town of Corunna	239	0.5%	0.01
Town of Hamilton	238	0.5%	0.01
Town of St. Joe	417	1.0%	0.01
Town of Waterloo	2,157	4.9%	0.05
Total	**44,330**	**100.0%**	**1.00**

4.2 HAZARD PROFILES

The hazards studied for this report are not equally threatening to all communities throughout DeKalb County. While it would be difficult to predict the probability of an earthquake or tornado affecting a specific community, it is much easier to predict where the most damage would occur in a known hazard area such as a floodplain or near a facility utilizing an extremely hazardous substance (EHS). The magnitude and severity of the same hazard may cause varying levels of damage in different communities.

In the past six years Indiana has had four FEMA disaster declarations and one FEMA emergency declaration. DeKalb County was included in one disaster declaration and the FEMA emergency declaration. The full list disaster declarations can be seen in **Appendix 7**with the county name emboldened where it was included in the declaration.

In addition, the US Small Business Administration (SBA) had disaster declarations for 29 Indiana events. Of all these events in Indiana, DeKalb County was included in one. The full list of all disasters and emergency declarations can be found in **Appendix 7**.

This section describes each of the hazards that were identified by the planning committee for detailed study as a part of this MHMP Update. The discussion is divided into the following subsections:

- **Hazard Overview** provides a general overview of the causes, effects, and characteristics that the hazard represents
- **Historic Data** presents the research gathered from local and national courses on the hazard extent and lists historic occurrences and probability of future incident occurrence
- **Assessing Vulnerability** describes, in general terms, the current exposure, or risk, to the community regarding potential losses to critical infrastructure and the implications to future land use decisions and anticipated development trends. Impacts on specific populations of communities are also addressed within this section
- **Relationship to Other Hazards** explores the influence one hazard may have upon another

4.2.1 Drought

Overview

Drought, in general, means a moisture deficit extensive enough to have social, environmental, or economic effects. Drought is not a rare and random climate incident; rather, it is a normal, naturally recurring feature of climate. Drought may occur in all climactic zones, but its characteristics vary significantly from one region to another. Drought is a temporary aberration and is different from aridity, which is restricted to low rainfall regions.

There are four academic approaches to examining droughts; these are meteorological, hydrological, agricultural, and socio-economic. Meteorological drought is based on the degree, or measure, of dryness compared to a normal, or average amount of dryness, and the duration of the dry period. Hydrological drought is associated with the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply. Agricultural drought is related to agricultural impacts; and focuses on precipitation shortages, differences between actual and potential evapo-transpiration, soil water deficits, reduced ground water or reservoir levels, and crop yields. Socioeconomic drought relates the lack of moisture to community functions in the full range of societal functions, including power generation, the local economy, and food source.

Figure 5 from the U.S. Drought Monitor, describes the rationale to classify the severity of droughts.

Category	Description	Possible Impacts
D0	Abnormally Dry	Going into drought: • Short-term dryness slowing planting, growth of crops or pastures Coming out of drought: • Some lingering water deficits • Pastures or crops not fully recovered
D1	Moderate Drought	• Some damage to crops, pastures • Streams, reservoirs, or wells low • Some water shortages developing or imminent • Voluntary water-use restrictions requested
D2	Severe Drought	• Crops or pasture losses likely • Water shortages common • Water restrictions imposed
D3	Extreme Drought	• Major crop/pasture losses • Widespread water shortages and/or restrictions
D4	Exceptional Drought	• Exceptional and widespread crop/pasture losses • Shortages of water in reservoirs, streams, and wells creating water emergencies

Figure 5: U.S. Drought Monitor Classification Descriptions

Location

As rain patterns change there are periodic times when the county is deemed "Abnormally Dry" or D0. Most of these instances are resolved quickly as sufficient rain arrives and the soil rehydrates. On occasion, the rain is insufficient to address the dryness and weather conditions cause the soil to further dry out, stressing crops and reducing lake levels. Drought may occur in all climactic zones, but its characteristics vary significantly from one region to another. Although drought declarations may be made for portions of the county, the entire county is vulnerable to the impacts of drought.

Extent and History

Drought is a temporary aberration and is different from aridity, which is restricted to low rainfall regions. **Figure 6**, developed based on data gathered from the U.S. Drought Monitor, shows the distribution of weeks in drought over the January 1, 2020 through December 31, 2025 period.

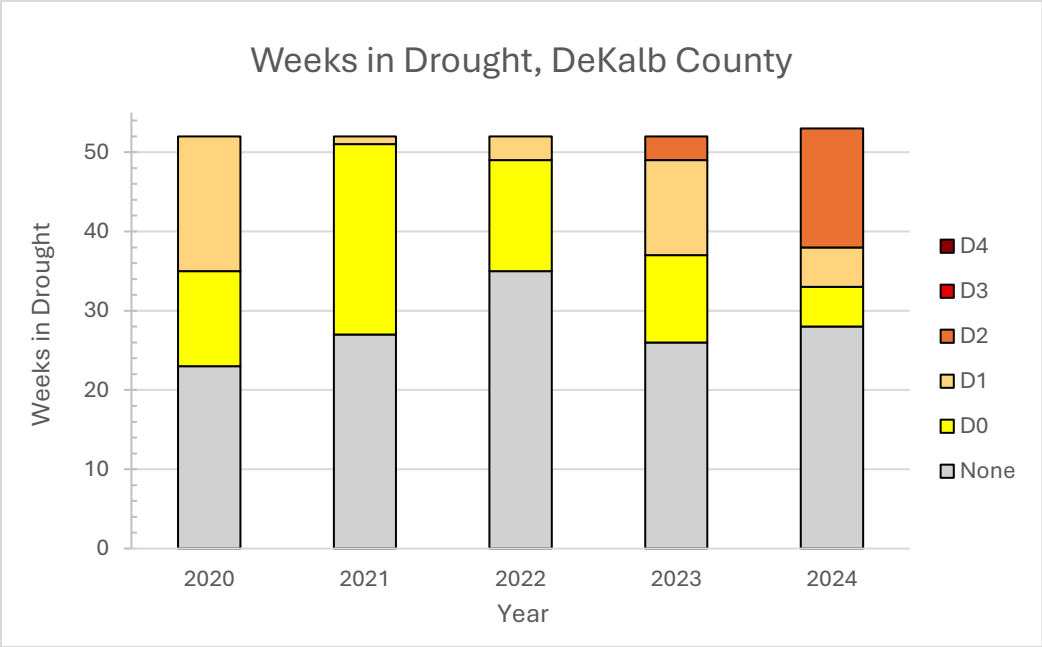


Figure 6: Drought Occurrences from January 1, 2020 - December 31, 2024

Probability

The planning committee, utilizing the CPRI, determined the overall risk of drought throughout DeKalb County is "Elevated." The impact of drought was determined to be the same for all communities and unincorporated areas throughout the county due to the possible agricultural impacts and impacts to water wells. The committee agreed that a drought is "Highly Likely" (to occur within the next year) to "Likely" (to occur within the next three years), and the magnitude of drought is anticipated to be "Limited" on average. Further it is anticipated that with the enhanced weather forecasting abilities, the warning time for a drought is greater than 24 hours and the duration will be greater than one week. A CPRI summary for drought is shown in **Appendix 8**.

According to the National Drought Mitigation Center, scientists have difficulty predicting droughts more than one month in advance due to numerous variables such as precipitation, temperature, soil moisture, topography, and air-sea interactions. Further anomalies may also enter the equation and create more dramatic droughts or lessen the severity of droughts.

Future Conditions

Climate change has a significant role in the drought conditions. **Figure 7** charts the annual maximum temperatures and shows trends utilizing data from the National Centers for Environmental Information (NCEI).

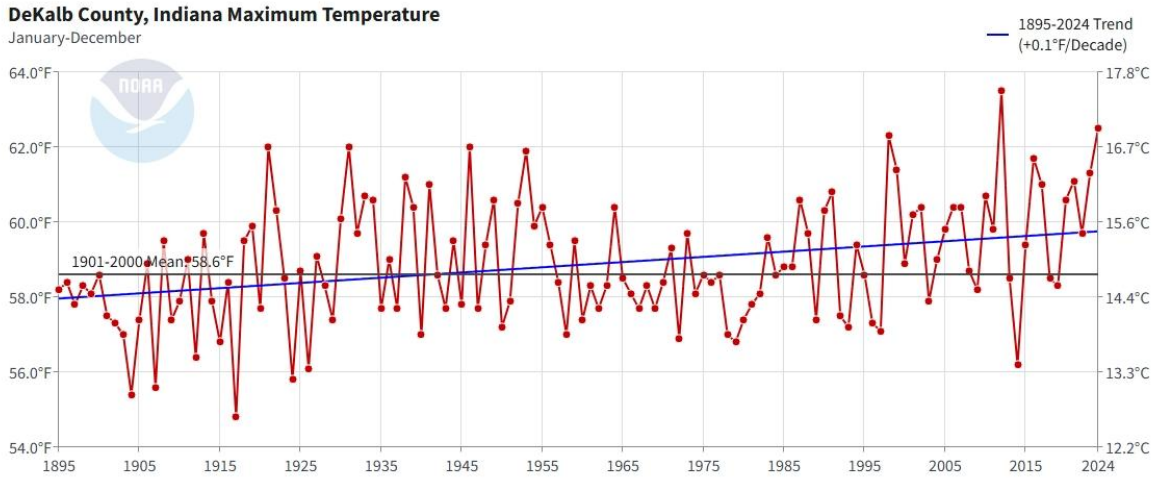


Figure 7: Annual Maximum Temperatures from 1895 - 2024

According to National Oceanic Atmospheric Administration (NOAA) NCEI the State Climate Summary for Indiana the following observations have been observed based upon climate change:

- The temperatures have risen almost 2°F since the middle of the 19th Century.
- Temperatures in the 2000's have been higher than any other historical period except during the most recent interglacial period, or over 100,000 years ago.

This is also verified in the Indiana Climate Change Impacts Assessment report from Purdue University. "This assessment documents that significant changes in Indiana's climate have been underway for over a century, with the largest changes occurring in the past few decades." The authors wrote, "These projections generally suggest that the trends that are already occurring will continue, and the rates of these changes will accelerate. They indicate that Indiana's climate will warm dramatically in the coming decades, particularly in summer. Both the number of hot days and the hottest temperatures of the year are projected to increase markedly."

The assessment also notes that seasonal shifts in precipitation may lead to seasonal short-term droughts. In either scenario, changes in precipitation are not anticipated to relieve the area of a probability of a drought occurring.

Prior to municipalities expanding, provisions and considerations should be given regarding the potential additional demand for both water usage and fire response efforts. Following such expansion or development plans, alternative water sources should be explored.

Vulnerability

This type of hazard will generally affect entire counties and even multi-county regions at one time. Within DeKalb County, direct and indirect effects from a lengthy period of drought may include:

Direct Effects:



Figure 8: Crop Failure Caused by Drought

- Urban, developed areas, and local wildlife areas may experience revenue losses from decreased tourism; landscaping companies, golf courses revenue losses due to lack of growth and plant death; restrictions on industry cooling and processing demands; reduced incomes for businesses dependent on crop yields, and increased potential for fires
- Rural areas within the county may experience revenue losses from reductions in decreased livestock and crop yields as well as increased incidence of field fires (**Figure 8**)
- Loss of tree canopy due to increased susceptibility to pests and diseases
- Citizens served by drinking water wells or surface water supplies may be impacted during low water periods and may require drilling of deeper wells or loss of water service for a period
- According to Purdue's Indiana Climate Change Impacts Assessment, climate change will cause temperatures to rise, and rainfall patterns to shift, which will make managing multiple water needs increasingly difficult. This could result in more drought conditions

Indirect Effects:

- Loss of income of employees from businesses and industry affected; loss of revenue to support services (food service, suppliers)
- Loss of revenue from recreational or tourism sectors associated with reservoirs, streams, and other open water venues
- Lower yields from domestic gardens increase the demand on purchasing produce and increased domestic water usage for landscaping
- Increased demand for emergency responders and firefighting resources due to grass fires and increased medical calls for people having respiratory issues because of increased dust amounts
- Drought conditions could make it more difficult for the underserved population as many of them do not have air conditioning, which makes breathing more difficult and air quality conditions can become compromised

Potential Impacts

It is difficult to estimate the potential losses associated with a drought for DeKalb County because of the nature and complexity of this hazard and the limited data on past occurrences. However, for the purpose of this MHMP update, a scenario was used to estimate the potential crop loss and associated revenue lost due to a drought similar to that experienced during the drought of record from 1988. By using figures reported by the United States Department of Agriculture (USDA) National Agricultural Statistics Service, it can be approximated that Dekalb would produce roughly 12M bushels of corn and 3M bushels of soybeans. Using national averages of $4.26 per bushel of corn and $11.11 per bushel of soybeans, the estimated total crop receipts for 2023 would be $85M. Using the range of crop yield decreases reported in 1988 and 1989, just after the 1988 drought period (50%-86%) and assuming a typical year, economic losses could range between $43M-$73M; depending on the crop produced and the market demand.

Relationship to Other Hazards

Discussions with the planning committee were held regarding the similar effects of prolonged periods of extreme heat and the similar impacts that may be experienced during these times. Planning and mitigation efforts for one hazard may benefit the other. It is anticipated that rural areas of the county may be more susceptible to brush and rangeland or woodland fires during a drought, while urban areas may experience these impacts in areas where several abandoned buildings or overgrown lots exist, and this may lead to increased losses associated with a fire.

4.2.2 Earthquake

Overview

An earthquake is a sudden, rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. Earthquakes strike suddenly, without warning. Ground shaking from earthquakes can collapse buildings and bridges; disrupt gas, electric, and phone service; and sometimes trigger landslides, avalanches, flash floods, fires, and huge destructive ocean waves (tsunamis). Buildings with foundations resting on unconsolidated landfill and other unstable soil, and trailers and homes not tied to their foundations are at risk because they can move off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths, injuries, and extensive property damage.

Location

There are 45 states and territories in the United States at moderate to very high risk from an earthquake, and they are located in every region of the country (**Figure 9**). California experiences the most frequent damaging earthquakes; however, Alaska experiences the greatest number of large earthquakes – most located in uninhabited areas. The largest earthquakes felt in the United States were along the New Madrid Fault in Missouri, where a three-month long series of quakes from 1811 to 1812 occurred over the entire Eastern United States, with Missouri, Tennessee, Kentucky, Indiana, Illinois, Ohio, Alabama, Arkansas, and Mississippi experiencing the strongest ground shaking. Several smaller historic faults are located throughout the state of Indiana.

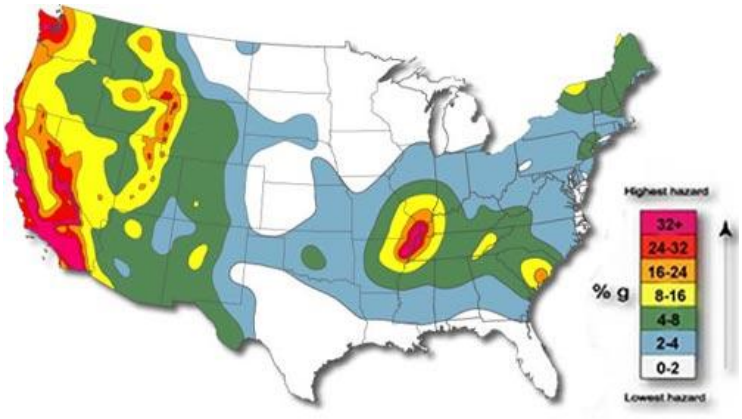


Figure 9: Earthquake Risk Areas in the US

Extent and History

The nearest known areas of concern for DeKalb County are the Wabash Seismic Zone (stretching from southeast Indiana to western Indiana), and the New Madrid Fault Zone (located southwest of Indiana and occasionally affecting Southwest portions of the state).

According to Indiana Geological Survey, there have been three earthquakes that have occurred in or near DeKalb County. The first occurred in LaGrange County near Topeka on January 26, 2012, and had a magnitude of 3.0. The second occurred east of Ft. Wayne in Ohio on June 12, 2015, with a magnitude of 2.6. The most recent occurred just across the Ohio border on December 29, 2024, with a magnitude of 2.9. There were no damages reported in local news sources for any of the listed earthquakes.

Additionally, some soils in Indiana are highly susceptible to liquefaction during earthquake conditions. Liquification occurs when water saturated soils temporarily lose their strength and act like a fluid. This process can trigger landslides, cause buildings to sink into the ground, and can destroy roads and bridges. According to IndianaMap some areas within DeKalb County have a moderate liquification potential. **Figure 10** shows the county's liquefaction potential. The entire

county is moderately at risk for its soils liquefying and some small portions of the county are rated as high.

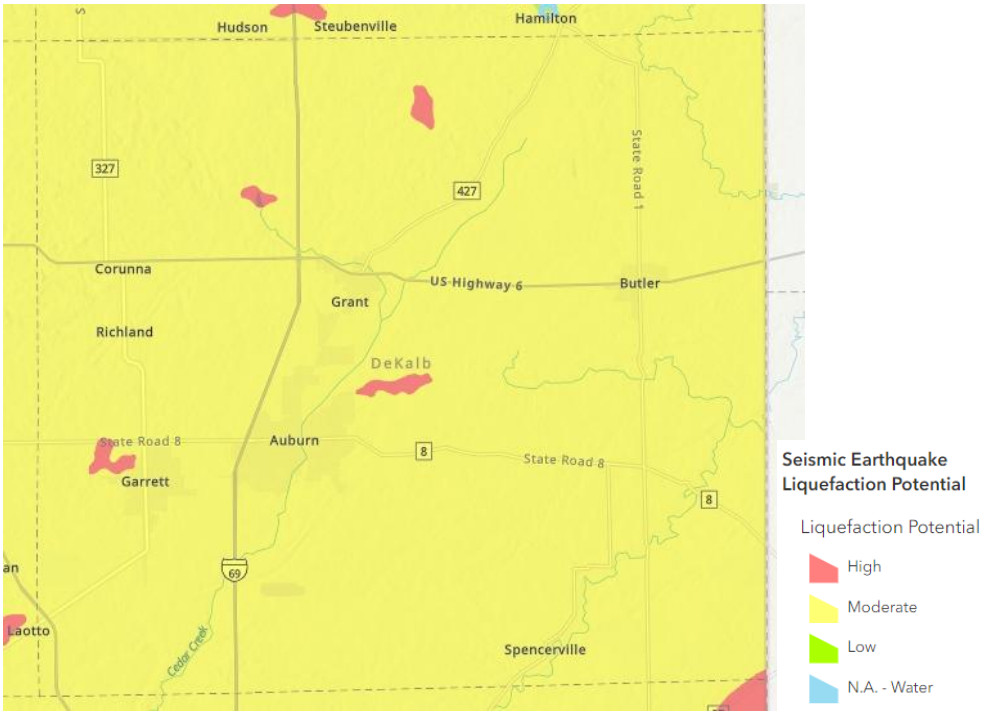


Figure 10: DeKalb County Liquefaction Potential Areas

Probability

Based on historical earthquake data, local knowledge of previous earthquakes, and that DeKalb County has not been directly impacted by an earthquake, the committee determined that the probability of an earthquake occurring in DeKalb County or any of the communities is "Possible", with the exception for the Town of Ashley which estimated it was "Unlikely". Should an earthquake occur, the impacts associated with this hazard are anticipated to be "Negligible" in all areas of the county. As with all earthquakes, it was determined that the residents of DeKalb County would have little to no warning time (less than six hours) and that the duration of the event would be expected to be less than six hours. A CPRI summary for earthquake is shown in **Appendix 8**.

Future Conditions

While the occurrence of an earthquake in or near to DeKalb County may not be the highest priority hazard studied for the development of the plan, it is possible that residents, business owners, and visitors may be affected should an earthquake occur anywhere within the state. For that reason, DeKalb County should continue to provide education and outreach regarding earthquakes and earthquake insurance along with education and outreach for other hazards. As the county and the communities within grow and develop, the proper considerations for the potential of an earthquake to occur may help to mitigate social, physical, or economic losses in the future.

It can be anticipated that while all structures in DeKalb County will remain at risk of earthquake damage and effects, new construction or redevelopment may reduce the overall risks. As redevelopment or growth occurs, the new construction may be significantly sturdier. Further, as blighted or abandoned areas are addressed, those communities and the county are less susceptible to economic and physical damage associated with earthquakes. Since the last planning effort, no significant development has occurred within the county.

Vulnerability

Earthquakes generally affect broad areas and potentially many counties at one time. Within DeKalb County, direct and indirect effects from an earthquake may include:

Direct Effects:

Urban areas may experience more damage due to the number of structures, the multi-story nature of the structures, and critical infrastructure (fire houses, cell phone towers, health care facilities) located in these areas.

- Rural areas may experience losses associated with agricultural structures such as barns and silos
- Bridges buried utilities (gas lines, water lines, pipelines), and other infrastructure may be affected throughout the county and municipalities
- The homeless or underserved population will need to be checked on, especially if they seek shelter under bridges or structures that are not stable

Indirect Effects:

- DeKalb County may be called upon to provide emergency response personnel to assist in the areas with more damage
- Provide shelter for residents of areas with more damage
- Delays in delivery of goods or services originating from areas more affected by the earthquake or originating at locations beyond the damaged areas, but that would have to be re-routed to avoid damaged areas

Potential Impacts

To determine the losses associated with an earthquake, the Hazards US Multi-Hazard (HAZUS-MH) software was utilized in the DeKalb County MHMP update. HAZUS-MH is a nationally standardized risk modeling methodology which identifies areas with an elevated risk for natural hazards and estimates physical, economic, and social impacts of earthquakes, hurricanes, floods, and tsunamis. For this plan, an arbitrary earthquake scenario placed a magnitude 5.0 within the county.

Per the HAZUS-MH scenario noted above the following is anticipated to be:

- Total economic losses are anticipated to be near $1.7B with moderate damage to 4,673 buildings, which is over 23% of the buildings, of which 295 are anticipated to be damaged beyond repair.

- There are 35 critical facilities (two hospital, 16 schools, one EOC, 6 Police Stations, and 10 Fire Stations) with eight facilities having at least 50% or more damage and nine facilities with functionality of greater than 50% on day one.

- No damages to bridges, highways, or tunnels are anticipated

- All other transportation segments (railways, buses, and ports) would be expected to remain undamaged except for one railway facility. No airports would have at least moderate damage.

- The utilities (one potable water, eight wastewater, zero natural gas, one oil system, zero electrical power, and two communication) would have at least zero potable water, seven

wastewater, zero natural gas, one oil system, and one communication with at least moderate damage. There would be 214 water leaks, 107 wastewater leaks, zero natural gas leaks and 53 water breaks, 27 wastewater breaks, and zero natural gas breaks.

- There would be over 400K tons of debris generated of which 39% would be brick/wood and the remaining being reinforced concrete/steel. It would take over 16K truckloads (@25 tons/truck).

- The model estimates 403 households would be displaced and 204 people will seek temporary shelter.

- Residential occupancies would be anticipated to sustain the largest level of damage, representing 34% of total damages.

- No fires due to the earthquake were anticipated.

The HAZUS-MH model computes anticipated economic losses for the hypothetical earthquake due to direct building losses and business interruption losses. Direct building losses are the costs to repair or to replace the damage caused to the building and contents, while the interruption losses are associated with the inability to operate a business due to the damage sustained. As businesses are damaged or destroyed many will be forced to close until repairs have been made. These closures often generate economic losses that can affect the business, their employees, the local jurisdiction, and Indiana.

The HAZUS-MH Earthquake Model allows local building data to be imported into the analysis. However, these local data are imported as "general building stock," meaning that the points are assigned to a census tract rather than a specific XY coordinate. HAZUS performs the damage analysis as a county wide analysis and reports losses by census tract. While the results of the hypothetical scenario appear to be plausible, care should be taken when interpreting these results.

Relationship to Other Hazards

Hazardous materials incidents may occur because of damage to material storage containers or transportation vehicles involved in road crashes or train derailments. Further, dam failures, flash floods, landslides, or levee breaks may occur following an earthquake or associated aftershocks due to the shifting of the soil in these hazard areas. These types of related hazards may have greater impacts on DeKalb County communities than the earthquake itself. It is not expected that earthquakes will be caused by other hazards studied within this plan.

4.2.3 Extreme Temperatures

Overview

Extreme Heat

Extreme heat is defined as a temporary elevation of average daily temperatures that hover 10 degrees or more above the average high temperature for the region for the duration of several weeks. According to the NWS, "The Heat Index" or the "Apparent Temperature" is an accurate measure of how hot it really feels when the relative humidity is added to the actual air temperature." To find the heat index temperature, refer to the heat index chart in **Figure 11**. As an example, if the air temperature is 96°F and the relative humidity is 65%, the heat index (how hot it feels) is 121°F.

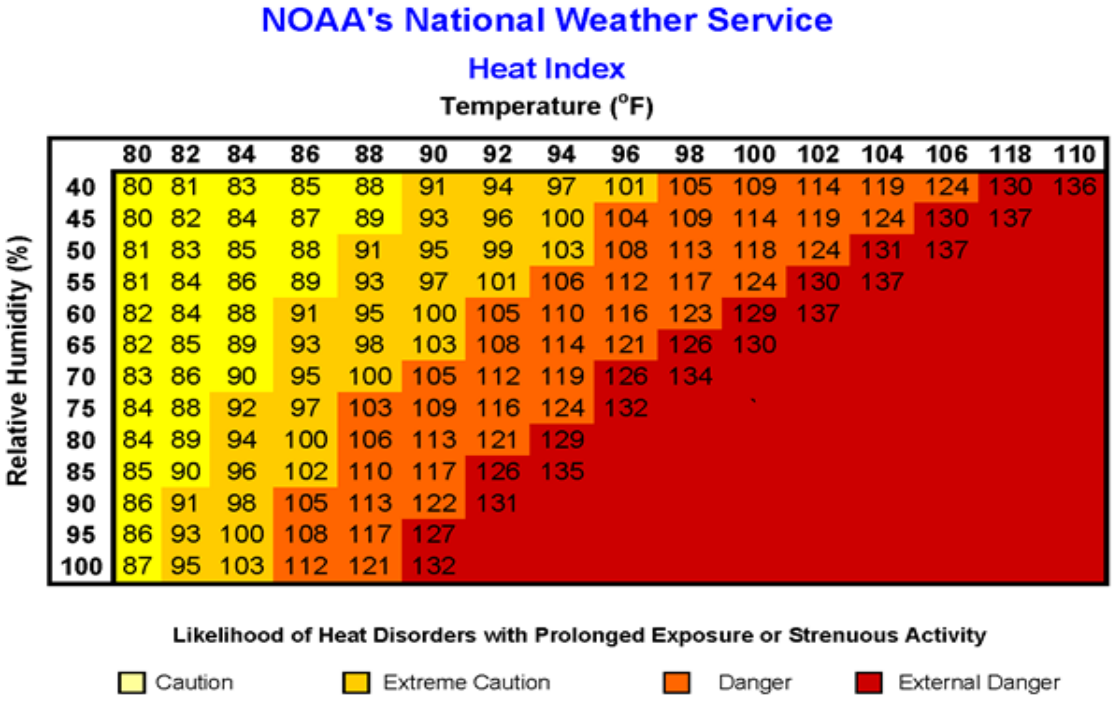


Figure 11: NWS heat Index Chart

The NWS has three levels of excessive heat notifications:

1. A heat advisory means that temperatures of at least 100°F or heat index values of at least 105°F are expected
2. An excessive heat watch means that heat index values are expected to reach or exceed 110°F and not fall below 75°F for at least a 48-hour period
3. An excessive heat warning means that heat index values are expected to reach or exceed 110°F and not fall below 75°F for at least a 48-hour period, beginning in the next 24 hours. A warning may also be issued for extended periods with afternoon heat index values of 105°F-110°F

It is important to also note that these heat index values were devised for shady, light wind conditions. Exposure to full sunshine may increase heat index values by up to 15°F. Further, high winds, particularly with very hot, dry air, can also be extremely hazardous.

As **Figure 12** indicates, there are four cautionary categories associated with varying heat index temperatures. Each category provides a heat index range along with effects on the human body. People with underlying health issues, the very old or very young, may be impacted at lower temperatures since their systems are less likely to be able to compensate for the heat and humidity.

Classification	Heat Index	Effect on the body
Caution	80°F - 90°F	Fatigue possible with prolonged exposure and/or physical activity
Extreme Caution	90°F - 103°F	Heat stroke, heat cramps, or heat exhaustion possible with prolonged exposure and/or physical activity
Danger	103°F - 124°F	Heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity
Extreme Danger	125°F or higher	Heat stroke highly likely

Figure 12: Extreme Heat Effects by Heat Index

Additionally, as later discussed in **Section 4.2.9** (Winter Storms and Ice), over time the minimum temperature in the county is increasing. This increase will exacerbate any heat as it lessens the cooling capacity of the nighttime. This might put more stress on people at night as they will not be able to cool off as much.

Extreme Cold

Extreme cold is defined as a temporary, yet sustained, period of extremely low temperatures. The jet stream winds are strongest during the winter months when continental temperature extremes are greatest. When the jet stream pulls arctic cold air masses over portions of the United States, temperatures can drop below 0° F for one week or more. Sustained extreme cold poses a physical danger to all individuals in a community and can affect infrastructure function as well.

Temperature (F)

Wind Speed (MHP)	30	25	20	15	10	5	0	-5	-10	-15	-20	-25
5	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40
10	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47
15	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51
20	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55
25	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58
30	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60
35	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62
40	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64
45	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65
50	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67
55	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68
60	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69

Frostbite Occurs in 120 minutes or less	Frostbite occurs in 30 minutes or less
Frostbite occurs in 10 minutes or less	Frostbite occurs in 5 minutes or less

Figure 13: Wind Chill Guide

In addition to strictly cold temperatures, the wind chill temperature (WCT) must also be considered when planning for extreme temperatures. The WCT, according to the NWS, is how cold people and animals feel when outside and it is based on the rate of heat loss from exposed skin. **Figure 13** identifies the Wind Chill Guide and how the same ambient temperature may feel vastly different in varying wind speeds.

Extent and History

The effects of extreme temperatures extend across large regions, typically affecting several counties, or states, during a single event. According to the NCDC for the period of January 1, 2020, to May 31, 2025, there have been zero excess heat events and two extreme cold/wind chill events.

The NWS reported wind chills ranging from -25 to-35°F in DeKalb County on January 14, 2024. Two years earlier on December 23, 2022, an extremely cold event ushered in wind chills ranging from -25 to -40°F with wind gusts going up to 50 miles per hour (mph). Although the committee members recall several hot days with heat indexes greater than 100 in the past five years, neither NCDC nor the local NWS Office website have any reports. No damage or losses associated with the prolonged cold temperatures or heat events were reported. **Appendix 10** provides the NCDC information regarding extreme temperatures that have been reported within the county.

Probability

It is difficult to predict the probability that an extreme temperature event will affect DeKalb County residents within any given year. However, based on historic knowledge and information provided by the community representatives, an extreme temperature event is "Likely" to Highly Likely" (likely within the year to next three years) to occur within the county and if an event did occur, it would result in "Limited" magnitude. **Appendix 8** identifies the CPRI for extreme temperatures-both heat and cold events for all communities in DeKalb County.

Assessing Vulnerability

As noted above, this type of hazard will generally affect entire counties and even multi-county regions at one time; however, certain portions of the population may be more vulnerable to extreme temperatures. For example, outdoor laborers, very young and very old populations, low-income populations, and those in poor physical condition are at an increased risk to be impacted during these conditions.

By assessing the demographics of DeKalb County, a better understanding of the relative risk that extreme temperatures may pose to certain populations can be gained.

- 18.2% of the county's population is over 65 years of age
- 6.1% of the population is below the age of five
- 11.3% of the population is living below the poverty rate



Figure 14: Extreme Cold

People within these demographic categories are more susceptible to social or health related impacts associated with extreme heat (**Figure 15**). Families below the poverty line are less likely to have functioning air conditioning in their homes. Because of high energy costs those who do have air conditioning may be less likely to use the units in a way to benefit their health and well-being. The same factors are key when looking at heating sources in cold temperatures (**Figure 14**). Elderly people and those living below the poverty line are more likely to rely on alternative heating sources because of the cost of energy. These alternative heating sources are frequently the cause of carbon monoxide poisoning and/or house fires.



Figure 15: Excessive heat

Within DeKalb County, direct and indirect effects from a prolonged period of extreme temperature may include:

Direct Effects:

- Direct effects are primarily associated with health risks to the elderly, infants, people with chronic medical disorders, lower income families, outdoor workers, and athletes. Health risks can range from heat exhaustion or mild hypothermia to death due to heat stroke, amputations due to frost bite or death due to severe hypothermia

Indirect Effects:

- Increased need for cooling or warming shelters
- Increased medical emergency response efforts
- Increased energy demands for heating or cooling

Estimating Potential Losses

This hazard is not typically as damaging to structures or critical and essential facilities as it is to populations, so monetary damages associated with the direct effects of the extreme temperature are not possible to estimate accurately.

Indirect effects:

- Increased expenses for facilities such as healthcare or emergency services due to the increased number of calls and people seeking assistance
- Manufacturing facilities where temperatures are normally elevated may need to alter work hours or experience loss of revenue if forced to limit production during the heat of the day.
- Energy suppliers may experience demand peaks during the hottest and/or coldest portions of the day.
- Extreme cold indirect effects include pipes freezing resulting in loss of access to water for industrial processes as well as personal hygiene, sanitation and hydration of livestock and people. These effects may disproportionately impact vulnerable populations (elderly people and children) within DeKalb County

Future Considerations

As more citizens are experiencing economic difficulties, local power suppliers along with charitable organizations have implemented programs to provide cooling and heating mechanisms to residents in need. Often, these programs are donation driven and the need for such assistance must be demonstrated. As susceptible populations increase, and/or as local economies are stressed, such programs may become more necessary to protect the county's at-risk populations. Additionally, the increase in the number of unsheltered homeless in the area calls for innovative approaches to addressing heating and cooling needs after traditional business hours when this population is particularly susceptible.

The Indiana Climate Change Impacts Assessment identifies several temperature related considerations of which communities should be aware and begin planning to avoid further impacts. For example, rising temperatures will increase the number of extreme heat days, thereby increasing the potential for heat related illnesses, potential hospitalizations, and medication costs to vulnerable populations. In addition, added days of extreme heat will impact agriculture, manufacturing, and potentially, water sources. Increasing greenspaces within the cities and towns not only provide benefits of stormwater control, carbon sequestration, and air pollution filtration, but also are great for reducing the energy from the sun reaching the ground surface, thus cooling the area. Future community planning should include the incorporation of heat tolerant green infrastructure to lessen the impacts of extreme heat upon the community.

New construction associated with development of residential areas often brings upgraded and more efficient utilities such as central heating and air units further reducing vulnerabilities to the aging populations in those municipalities mentioned above. Conversely, new developments associated with industrial or large commercial structures in the inner-urban centers often result in increased heat over time, which may cause additional stress to labor-related populations. Since the last planning effort, there has not been significant residential or commercial development within the county.

Relationship to Other Hazards

While extreme temperatures may be extremely burdensome on the power supplies in DeKalb County, the committee concluded that this type of hazard is not expected to cause any of the other hazards studied. It is anticipated that due to prolonged extreme temperatures, primarily long periods of elevated temperatures, citizens may become increasingly agitated and irritable, and this may lead to a disturbance requiring emergency responder intervention.

4.2.4 Fires and Wildfire

Overview

A wildfire, also known as a forest fire, vegetation fire, or a bushfire, is an uncontrolled fire in wildland areas and is often caused by lightning; other common causes are human carelessness and arson. Small wildfires may be contained to areas less than one acre, whereas larger wildfires can extend to areas that cover several hundred or even thousand acres. Weather conditions can determine the nature and severity of a wildfire event. Very low moisture and windy conditions can help to exacerbate combustion in forested or brush areas and turn a small brush fire into a major regional fire event in a very short period. Wildfires can be very devastating for residents and property owners.

A structural fire is an incident where a fire starts within a structure and is largely contained to that structure. Causes of structure fires can be related to electrical shorts, carelessness with ignition sources and/or alternative heating sources, poor storage of flammable materials, as well as arson. These types of fires can be deadly if no warning or prevention measures are present. The most dangerous aspect of structural fires is the production of toxic gases and fumes that can quickly accumulate in enclosed areas of structures and asphyxiate those who might be in the structure.

Problems associated with structural fires are compounded when high-rise buildings catch fire because high-rise fires hinder the ability of rescue workers to fight the fire, reach impacted building occupants, and evacuate impacted occupants. These operations can be complicated as the height of the structure increases and the occupancy changes within the structure. Rescue efforts are more complicated when people with disabilities are involved with structure fires. Lastly, structural collapse is another concern associated with high-rise fires especially when people are trapped and severely injured. However, it is important to note that the concern associated with structural collapse, is not limited to high-rise buildings; the collapse of smaller residential buildings can also lead to severe injury and death.

Combating a structure fire and or wildfire is extremely dangerous. If weather conditions change suddenly, the fire may change course and/or increase in strength potentially overtaking neighboring structures and firefighters, causing severe injury or death. Fires can travel at speeds greater than 45 mph. Members of the homeless community, hunters or campers may also be in the area of the fires with no means to escape. Fire response capabilities are limited by the ever-dwindling number of volunteer firefighters able to respond, especially during "normal working hours." This further increases the risks for first responders and community members alike.

Extent and History

According to the NCDC there have been no reported wildfire events for the period of January 1, 2020, to May 31, 2025. Committee members did not provide additional information or examples of locally significant wildfire events.

A photo of a structure fire from DeKalb County is provided in **Figure 16**. Structure fires can cause wildfires and brush fires most commonly through a process called spotting. This occurs when burning particles, embers, or firebrands, are carried by the wind to start new fires elsewhere. Although Indiana has a very low to relatively low risk of wildfires (FEMA National Risk Index), damage to structures, contents, crops, forests, and vehicles is significant for each municipality on an annual basis. Additionally, wildfires can cause long-term issues such as environmental damage and chronic illnesses. These effects, according to the United States Geological Service (USGS), cause the annual cost of wildfires in the US to be $425B.

Although there have been no reports of wildfires or grass fires, it is important for rural areas to be diligent about fire safety and reporting. Due to the often spread out, and woodsy makeup of rural areas, fires can have longer periods of going unreported when compared to urban/more dense areas. This could allow the fires to worsen before local fire departments have a chance to put them out leading to more damage to crops or property and increasing the number of injuries or deaths.



Figure 16: Barn Fire in DeKalb County (2024)

The NCDC does not report structure fires; therefore, local sources were utilized to provide information regarding residential and business fires. Residential fires have been the most common fire hazard affecting DeKalb County in the last several years. Information provided in **Table 5** highlights the number of fire calls to which local fire departments responded during the time period January 2020 through December 2024. Based on conversations with fire representatives, damage to structures, contents, crops, forests, and vehicles is significant for each municipality on an annual basis. Social losses, such as being unable to work following a residential structure fire or losses associated with a business fire should also be considered as an impact.

Table 5: DeKalb County Fire Calls

Department	2020-2024
Ashley-Hudson Volunteer Fire Rescue	440
Auburn Fire Department	3,740
Butler Volunteer Fire Department	1,293
Concord Volunteer Fire Department	35
Corunna Volunteer Fire Department	484
Garrett Volunteer Fire Department	1,155
Hamilton Fire Department	59
Jackson Volunteer Fire Corporation – Dekalb County	610
Laotto Volunteer Fire Department	778
Spencerville Volunteer Fire Department	11
Waterloo-Grant Township Fire Department	827

Probability

DeKalb County contains some managed land, predominantly around its lakes and river like the St. Joseph River Public Access Site. The planning committee determined the probability of a fire to occur within the county to be "Highly Likely" to "Likely" throughout the county, with the overall risk from fire being "Severe." **Appendix 8** identifies the CPRI rankings for fire in DeKalb County.

Assessing Vulnerability

Physical, economic, and social losses impact not only the property owner whose property was damaged by the fire, but also the community. Typically, a structural fire is limited to one or two structures, as the fire response focuses on extinguishment as well as containment thus preventing the fire from spreading to neighboring structures as seen in **Figure 17**. This type of action works to reduce the magnitude and severity. Nonetheless, the loss of or damage to historic structures, town squares, etc. takes a toll on the community spirit as well as the financial and physical loss.



Figure 17: Local Structure Fire in DeKalb County (2022)

A large portion of the county is rural, which is also susceptible to brush and crop fires, especially in times of drought. Since agriculture is a big source of income for the community, field fires, especially during harvest season, or barn fires after crops have been stored have an immense impact.

Direct and indirect effects of fires and wildfires within DeKalb County may include:

Direct Effects:

- Loss of structures (residential, high-rise buildings, as well as agricultural)
- Loss of vital equipment (industrial and agricultural)
- Loss of forests
- Loss of natural resources and wildlife

Indirect Effects:

- Loss of revenue as businesses may be closed
- Loss of revenue from reduced tourist activities in the county including DeKalb counties managed lands
- Increased emergency response times based on safety of roads
- Loss of income if dependent on crop production or timber harvest

Estimating Potential Losses

Given the nature and complexity of a potentially large hazard such as a wildfire, it is difficult to quantify potential losses to property and infrastructure. As a result, all critical and non-critical structures and infrastructure may be at some degree of risk.

Monetary damages associated with the direct effects of the fires are difficult to estimate, other than utilizing historic information as provided. Indirect effects would cause increased efforts associated with emergency response services as wildfires are difficult to contain and may accelerate very quickly. Further, multi-level business or residential structures place increased risks to those who work or live within those structures or nearby structures.

Future Considerations

As populations increase and community growth increases, the need to respond to fire will remain an important municipal effort. As new construction or re-development occurs, especially new or existing critical infrastructure, it is important to ensure that these new structures are equipped to deal with the potential risks associated with this hazard. Those may include increased risk for wooden or flammable outer structures and potential lengthy power outages. With the adverse impacts of extreme temperatures and drought upon the heavily forested areas, consideration must be given to mitigating fire risks for structures that are built in the rural areas to limit losses should a wildland fire take place.

In addition, increased populations require increased housing. Many urban communities develop large multi-family residential structures, or apartment complexes, where structures are not only in close proximity to each other but also house a large number of citizens. As communities age, some structures may become abandoned, significantly increasing the risk of fire due to potential vagrant populations and lack of maintenance. These areas should be considered at risk and potentially demolished to avoid such risk and potential hazard.

Firefighting responses can be slowed due to the limited numbers of volunteers available at various times of the day. Increasing numbers of people working outside of the community in which they reside limits volunteer presence to outside of normal working hours. Recruitment initiatives will need to be considered as the firefighting needs and staffing levels change.

Fires can also result in substantial indirect costs. Increased emergency response times, loss of work or the inability to get to work, as well as business interruption, are possible indirect effects of a fire and how it may affect those businesses related to cropland or natural resource areas.

Relationship to Other Hazards

Fires may certainly result in a hazardous materials incident if storage structures are within the path of the fire. Material storage containers farther away from the burn path may become damaged by high winds and embers resulting in a spill or release of materials. Fires may result from lightning either alone or associated with a thunderstorm. Typical wind speeds during a thunderstorm may also exacerbate the impacts from any ignitions from the lightning.

4.2.5 Flood

Overview

A flood, as defined by the NFIP, is a general and temporary condition of partial or complete inundation or two or more acres of normally dry land area or of two or more properties from overflow of inland or tidal waters, or unusual and rapid accumulation or runoff of surface waters from any sources, or a mudflow. Floods can be slow or fast rising but generally develop over a period of days.

The traditional benchmark for riverine or coastal flooding is a 1% Annual Exceedance Probability (AEP), formerly known as the 100-year flood. This is a benchmark used by FEMA to establish a standard of flood protection in communities throughout the country. The 1% AEP is referred to as the "regulatory" or "base" flood. Another term commonly used, the "100-year flood", can be misleading. It does not mean that only one flood of that size will occur every 100 years, but rather there is a 1% chance of a flood of that intensity and elevation happening during any given event. In other words, the regulatory flood elevation has a 1% chance of being equaled, or exceeded, in any given event and it could occur more than once in a relatively brief time period. The area impacted by the 1% AEP flood event is called the Special Flood Hazard Area (SFHA).

Log and ice jam flooding is a concern for the more populated areas. Although log jams can occur at any time of the year, ice jams are predominantly and early or late winter occurrence when air temperature rises after freezing temperatures which allow lake and river ice to form. Flooding occurs when pieces of ice either jam up against stationary sheets of ice or against structures in the river such as bridge pylons. The jammed ice can form a dam causing water levels behind it to rise causing localized flooding and pushing large pieces of ice out of the stream. The greatest challenge with ice jams is the lack of good science to predict when the jams will form and where jam formation is likely. With the variations in temperatures in late winter and early spring ice jams are becoming more common. Log jams, like ice jams, accumulate in low flow areas and near bridges and similar structures located in the stream, causing water levels to rise. Bridges and culverts are most frequently impacted since water flow is easily blocked at these locations forcing water outside of the riverbanks into neighborhoods and businesses.

Extent and History

According to the NCDC for the period of January 1, 2020, to May 31, 2025, there have been zero flash floods and zero traditional riverine floods.



Figure 18: Indiana Flash Flood from June 2021

While the NWS did not provide any reports of floods during this time period, multiple community members recalled floods within the county. These floods were typically localized flooding within developed areas. One instance, occurred in July of 2025 and led to flooding of multiple blocks of the city of Auburn. As communities are further developed it is likely that flooding will worsen unless directly addressed by stormwater infrastructure. There were no damages, injuries, or deaths mentioned from these events.

Flash floods can be more dangerous than riverine floods due to their rapid speed and onset. **Figure 18** shows how flash floods can surprise people and increase the potential for injuries and deaths.

In DeKalb County there are three primary waterways:

- St. Joseph River
- Cedar Creek
- Fish Creek

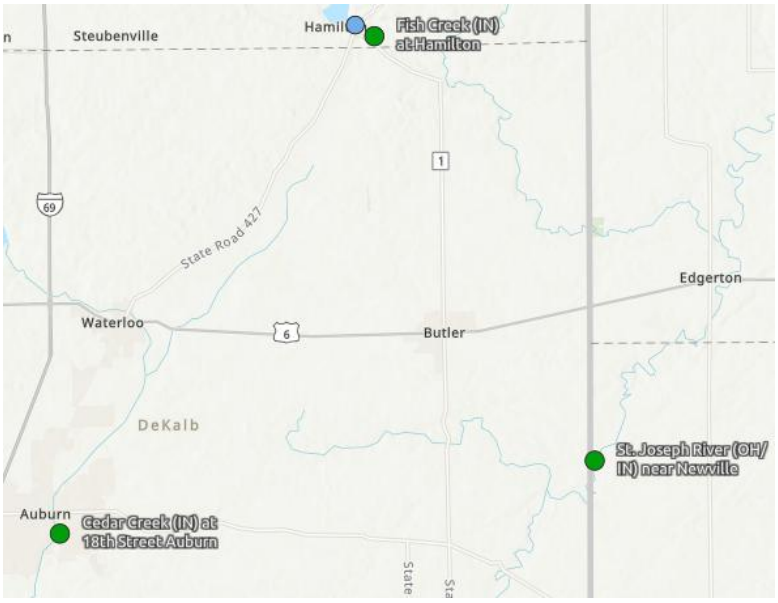


Figure 19: Stream Gage locations in DeKalb County

The county is situated in three major drainage basins, the northern portion is located within the St. Joseph (MI) basin, the central is located in the St. Joseph (OH) basin, and the southern portion is located within the Maumee basin. There are 66 other major waterways in DeKalb County including Bear Creek, Little Cedar Creek, Sycamore Creek, and Tustison Creek. **Appendix 9** lists of major waterways and stream gages.

Stream gages are utilized to monitor surface water elevations and/or discharges at key locations and time periods. Some such gages are further equipped with NWS's National Water Prediction Service (NWPS) capabilities. These gages have the potential to provide valuable information regarding historical high and low water stages, hydrographs representing current and forecasted stages, and a map of the surrounding areas likely to be flooded. Within DeKalb County, there is one USGS gage along Cedar Creek in Auburn which is shown in Error! Reference source not found. **Table 6** provides information regarding the county's gages. While there is only one gage within DeKalb County there are three additional gages that could give relevant information. There are two gages on the Steuben County side of the town of Hamilton, Fish Creek at Hamilton and Hamilton Lake at Hamilton. The third gage is located across the border into Defiance County, Ohio. This gage is named St. Joeseph River (OH/IN) near Newville. These gages could be utilized to provided an early warning before flooding reaches the communities of DeKalb County.

Table 6: DeKalb County USGS Gage

Site Number	Site Name	Flood Levels				Crests	
		Major	Moderate	Minor	Action	Recent	Historic
04179520	Cedar Creek at 18th Street Auburn	12Ft.	10Ft.	9Ft.	6Ft.	7.96Ft. 2020	12.30Ft. 2009

A watershed management plan (WMP) is a strategy for achieving water quality goals by characterizing the watershed, setting goals and actions steps, and developing an implementation plan to address documented problems. Ultimately, the purpose of the WMP is to guide resource managers, watershed coordinators, policy makers, community organizations, and other relevant stakeholders in restoring and protecting the waterbodies within a given watershed. According to Indiana Department of Environmental Management's (IDEM) WMP website, there are six plans that cover DeKalb County:

- Cedar Creek WMP 01-383
- Maumee River (Upper) WMP 2-21
- Pigeon Creek WMP 10-86
- Pigeon Creek WMP 2014 Update
- St. Joseph (Lower)-Bear Creek WMP 5-73
- St. Joseph (Middle) WMP 10-65

Appendix 6 lists which watershed management plans apply to which jurisdiction. To help mitigate flooding problems within the Maumee River Basin, Christopher B. Burke Engineering completed a Flood Mitigation Master Plan for the Maumee River Basin Commission.

Flood insurance is key for flood recovery. Any property having received two insurance claim payments for flood damages totaling at least $1,000, paid by the NFIP within any 10-year period since 1978, is defined as a repetitive loss property. These properties are important to the NFIP because they account for approximately one-third of the country's flood insurance payments. **Table 7** identifies the number of repetitive properties and claims in DeKalb County per community, as provided by FEMA through the OpenFEMA Dataset: NFIP Multiple Loss Properties – v1. The database divides residential properties into four major categories: single family, two to four units often referred to as duplexes or similar buildings, 5 or more units such as an apartment structure and mobile or manufactured homes. The one residential structure listed in the table was classified as a single family residence. The non-residential occupancies are commercial or mixed-use buildings where the primary use is commercial or non-habitational. The non-residential occupancies are divided into four major categories as well. Business (not otherwise specified), non-residential building, non-residential unit within a muti-unit building, and non-residential mobile home. The three non-residential structures listed in the table are categorized as non-residential buildings. Condominiums insured by the association is a separate category of properties. No association insured condominiums were listed in the dataset for DeKalb County.

Table 7: Repetitive Loss Properties and Number of Claims

Community	# Repetitive Loss Properties	Number of Repetitive Loss Properties by Occupancy							Total # of claims
		Residential				Non-Residential			
		Single	2-4 Units	5+ Units	Mobile / Mfg. Home	Business	Building	Unit	
DeKalb County	0	0	0	0	0	0	0	0	0
City of Auburn	4	1	0	0	0	0	3	0	10
City of Butler	0	0	0	0	0	0	0	0	0
City of Garrett	0	0	0	0	0	0	0	0	0
Town of Altona	0	0	0	0	0	0	0	0	0
Town of Ashley	0	0	0	0	0	0	0	0	0
Town of Corunna	0	0	0	0	0	0	0	0	0
Town of Hamilton	0	0	0	0	0	0	0	0	0
Town of St. Joe	0	0	0	0	0	0	0	0	0
Town of Waterloo	0	0	0	0	0	0	0	0	0
TOTAL	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**

There have been several claims made for damages associated with flooding in DeKalb County since 1978. Since 1978 in the City of Auburn, for example, there have been 25 total NFIP claims resulting in $228K in payments. **Table 8** further indicates the current premiums and coverage totals for individual communities.

Table 8: Insurance Premiums and Coverage

Community	Flood Insurance Premiums	Flood Insurance Coverage
DeKalb County	$20,897	$4.36M
City of Auburn	$41,930	$7.35M
City of Butler	$1,741	$0.25M
City of Garrett	$0	$0
Town of Altona	$0	$0
Town of Ashley	$0	$0
Town of Corunna	$0	$0
Town of Hamilton	$0	$0
Town of St. Joe	$0	$0
Town of Waterloo	$1,703	$0.20M
TOTAL	**$66,271**	**$12.15M**

Probability

As determined by the committee, the probability of flooding occurring throughout DeKalb County is "Possible." The town of Waterloo rated the probability as "Likely," or to occur within the next three

years. This is largely based on recent experiences with the rivers and streams near the communities. The committee also determined that an accurate warning time would be from six to 12 hours up to over 24 hours based on the terrain and nature of the waterways in the county, forecasting methods, and local knowledge of stream activities. Finally, the duration of such an event is anticipated to last less than a week. Overall, the risk associated with flooding for DeKalb County is elevated. A summary of the flooding CPRI is shown in **Appendix 8**.

Assessing Vulnerability

Flood events may affect substantial portions of DeKalb County at one time as river systems and areas with limited drainage cover much of the county and the incorporated communities. With an increase in high volume rain events, the low-lying roads within the county are vulnerable to frequent inundation isolating and/or restricting access to some parts of the county. The average annual rainfall today is 39.48 inches in DeKalb County, however, according to the NCEI the annual rainfall for the county is increasing by 0.28 inches per decade. See **Figure 20** for precipitation trends from 1895-2024.

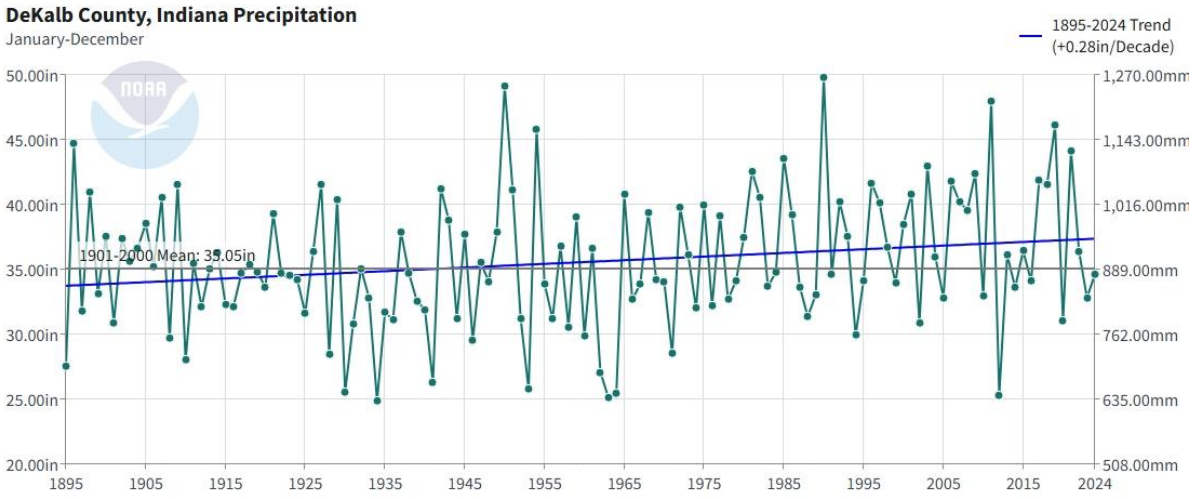


Figure 20: Average Precipitation Trend

NFIP floodplain maps are used to understand flood risk and to determine requirements for flood insurance and construction. The NFIP floodplain map tiles for DeKalb County are provided in **Appendix 6**. An overview of the current aggregated FEMA flood maps is provided within **Figure 21**. A similar map of the DeKalb County floodplain including critical and essential facilities is available in **Exhibit 2**.

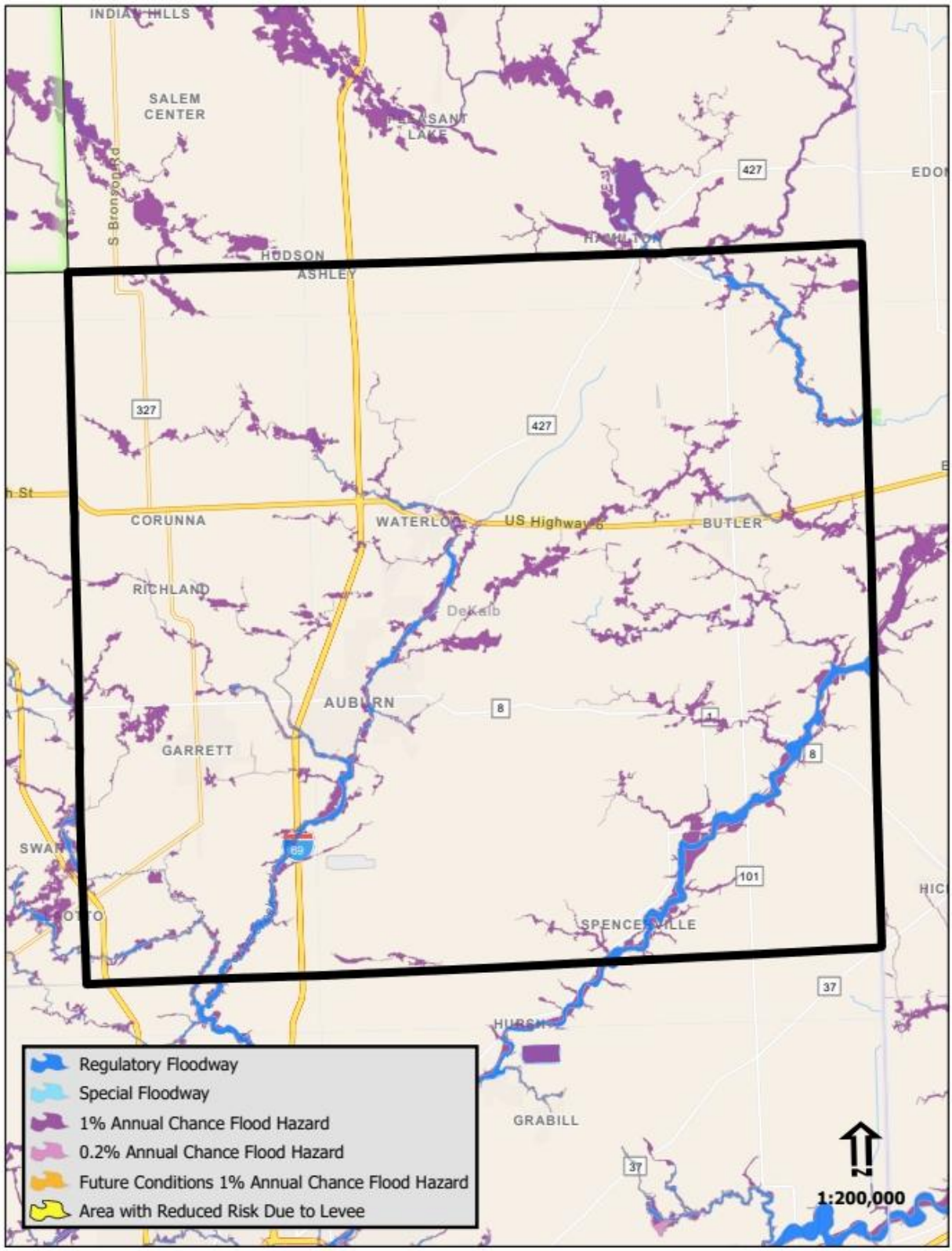


Figure 21: DeKalb County Flood Map [9/29/2006]

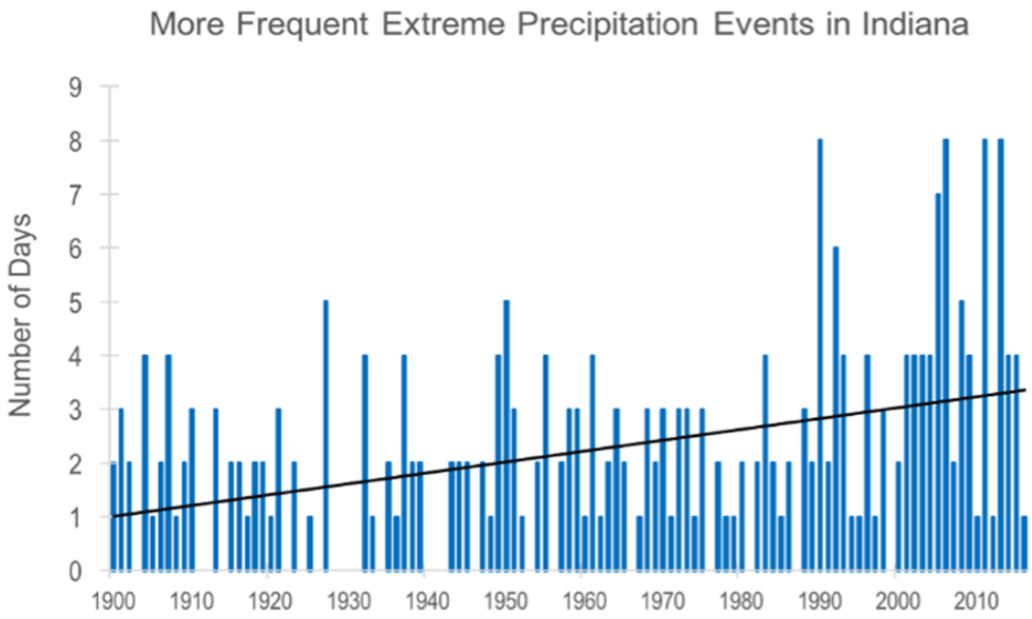


Figure 23: Extreme Precipitation Events in Indiana

Purdue University's Indiana Climate Change Impacts Assessment Report analyzed the increased frequency of short duration high volume rain events, also known as extreme precipitation events, in Indiana. According to the report, an extreme rain event occurs when more than 0.86 inches of rain falls in a day. Since 1900, the number of days per year with extreme rain has been increasing by 0.2 days per decade on average. However, most of that increase has occurred since 1990. The northwestern part of the state has seen the largest increase – a rate of about 0.4 days per decade. In **Figure 23** the trend line shows an increase in the number of days where the rainfall exceeds 99th percentile. This ever-increasing trend is resulting in more frequent flash flood and overland flood events.

Indiana has experienced an increase in the number of rain events, especially extreme rain events, while the overall duration of rain has decreased. This has led to Indiana receiving more rain in shorter amounts of time.

This is also verified in the Indiana Climate Change Impacts Assessment report from Purdue University. The assessment found that the annual average precipitation rates for Indiana have increased by 4.2 inches in the northeast portion of the state and 8.1 inches in the southeast portion of the state since 1895. (**Figure 22**). In the report, the authors wrote, "This assessment documents that significant changes in Indiana's climate have been underway for over a century, with the largest changes occurring in the past few decades. These projections suggest that the trends that are already occurring will continue, and the rates of these changes will accelerate.

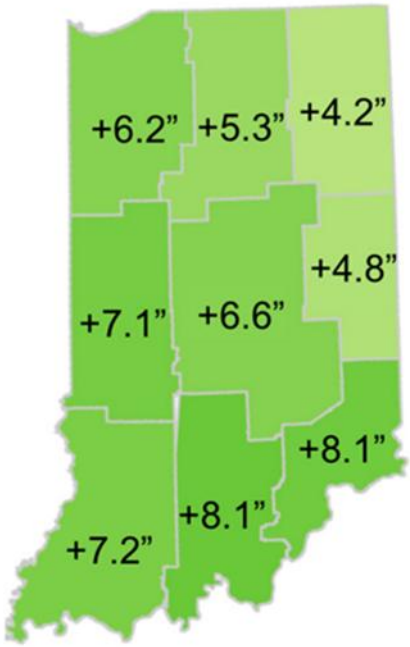


Figure 22: Annual Average Precipitation Rise

DeKalb County has a flood inundation map library for the gage along Cedar Creek at 18th Street in the city of Auburn. This map library may be utilized to predict areas of flooding

within the town of Winamac based on a selected gage height. When set to the major action level, or 12Ft, the map library identifies areas with potential for flooding when the gage reaches 12Ft. Additionally, the map library conducts a Hazus loss estimate which estimates $1.8M in building damages when the gage reaches its major action level.

As outlined in **Table 9**, most communities in DeKalb County participate in the NFIP. The towns of Ashley and Corunna have chosen not to participate as they do not have properties with potential for riverine flooding.

Table 9: DeKalb County Participation in NFIP

Identification Number	Community Name	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date	Regular-Emergency Program Date
180044	DeKalb County	12/6/1974	1/5/1989	9/29/2006	1/5/1985
180046	City of Auburn	12/21/1973	7/18/1983	9/29/2006	7/18/1983
180047	City of Butler	10/3/1975	8/19/1985	9/29/2006(M)	8/19/1985
180048	City of Garrett	5/10/1974	2/11/76	(NSFHA)	2/11/1976
180045	Town of Altona	9/20/1974	8/19/1985	9/29/2006(M)	8/19/1985
	Town of Ashley	Non-participating Community			
	Town of Corunna	Non-participating Community			
180248	Town of Hamilton	9/6/1974	8/19/1986	12/17/2013	8/19/1986
180049	Town of St. Joe	12/7/1973	9/29/2006	9/29/2006	1/3/1985
180050	Town of Waterloo	1/4/1974	9/4/1985	9/29/2006	9/4/1985

Dekalb County; the cities of Auburn, Butler, and Garrett; and the towns of Altona, Ashley, Corunna, Hamilton, St. Joe, and Waterloo do not participate in the CRS program which entitles those residents in SFHA to receive a discount on flood insurance premiums based on the community participation in floodplain management practices that exceed the minimum requirements of NFIP. These practices and the community's participation could reduce future potential flood damage and encourage efficient floodplain management.

Many of the flood risk areas are located within the boundaries of the disadvantaged and underserved population census blocks. With less financial capacity to mitigate flooding becomes an additional burden on the communities. Flash flooding does not allow the advanced warning to be able to protect property and seek shelter out of harm's way, thus increasing vulnerability throughout the county, especially the underserved and disadvantaged community members.

Within DeKalb County, direct and indirect effects of a flood event may include:

Direct Effects:

- Decreased income and value of properties and contents due to damage by increased water
- Increased costs associated with additional response personnel, evacuations, and sheltering needs
- Increased potential impacts to infrastructure and buildings located within the SFHA
- Increased cleanup costs for more frequent flash flood impacts
- Decreased productivity of land due to Loss of topsoil and deposition of sand from flood inundation of farm fields
- Loss of topsoil and deposition of sand due to flood inundation of farm fields

Indirect Effects:

- Increased response times for emergency personnel when roads are impassable
- Increased costs associated with personnel carrying out evacuations in needed areas
- Increased risk of explosions and other hazards associated with floating propane tanks or other debris
- Increased economic loss associated with missed work or school due to closures or recovery activities
- Decreased revenue due to cancellation of special events in impacted areas or water related activities that become too dangerous due to high water
- Increased expenditures for debris removal costs and return local drainage to normal function
- Difficulty notifying the underserved populations which may not have access to radio, television, or social media of evacuations

Estimating Potential Losses

Critical and non-critical structures located in regulated floodplains, poorly drained areas, or low-lying areas are most at risk for damage associated with flooding. For this planning effort, a GIS desktop analysis methodology was utilized to estimate flood damage.

For the GIS desktop analysis method, an analysis was completed utilizing the effective digital FIRMs (DFIRMs) overlaid upon a modified building inventory developed with information provided by DeKalb County. Structures located within each flood zone were tallied using GIS analysis techniques.

In the assessment, any structure listed as less than 400 ft^2 in area or classified in the Assessor's database as a non-habitable structure was assumed to be an outbuilding. It was assumed that a building was located on a parcel if the value listed in the "Assessed Value (Improvements)" showed a value greater than zero dollars. Parcels that intersected any portion of the FEMA flood zones were considered to be flood prone, and subsequently, further analyzed separately from parcels without structures. Structure values were calculated using the 2021 FEMA Hazus Inventory Technical Manual and took into account the value of the building and the contents of the building. Occasionally, some counties will have buildings that have not been classified and are therefore unable to be included in this assessment. DeKalb county and the communities listed in the assessment had zero unclassified structures.

To estimate anticipated damages associated with each flood zone in DeKalb County and communities, it was estimated that 25% of structures in the flood zones would be destroyed, 35% of structures would be 50% damaged, and 40% of structures would be 25% damaged. **Table 10** identifies the estimated losses associated with structures in the floodway, the 1% AEP outside of the

floodway, and the 0.2% AEP outside the 1% AEP areas by community within DeKalb County. Table 10 only shows communities with structures within the flood hazard layers, all others are omitted.

Table 10: DeKalb County Building Inventory Utilizing Best Available Data

Community	Floodway		1% AEP Outside of Floodway		0.2% AEP Outside of 1% AEP boundaries	
	#	$	#	$	#	$
DeKalb County	58	$9.37M	18	$4.13M	55	$6.86M
City of Auburn	54	$7.40M	71	$8.49M	0	$0
City of Butler	0	$0	7	$0.83M	0	$0
City of Garrett	0	$0	0	$0	0	$0
Town of Altona	0	$0	0	$0	0	$0
Town of Hamilton	0	$0	0	$0	0	$0
Town of St. Joe	1	$0.16M	0	$0.16M	0	$0
Town of Waterloo	1	$0.16M	0	$0	0	$0
Total	**114**	**$17.09M**	**96**	**$13.61M**	**55**	**$6.86M**

Utilizing the same GIS information and process, critical infrastructure within each of the flood hazard areas in DeKalb County was assessed and are included in **Table 11**. These buildings are included in the overall number of structures and damage estimate information provided in **Table 10**.

Table 11: Critical Infrastructure in the Flood Zones

Community	Floodway	1% AEP Outside of Floodway	0.2% AEP Outside of 1% AEP Floodplain
DeKalb County			
City of Auburn			Astral at Auburn (Assisted Living)
City of Butler			
City of Garrett			
Town of Altona			
Town of Hamilton			
Town of St. joe			
Town of Waterloo			

Utilizing the information in **Table 11** regarding the number of structures within each of the flood hazard areas, it is also important to note the number of flood insurance policies within each area in DeKalb County. **Table 12** provides the comparison between the number of structures in the 1.0% AEP and the number of flood insurance policies. It is also important to note that flood insurance is voluntary unless the property owner carries a federally subsidized mortgage; insurance coverage may be discontinued when the mortgage is completed.

Table 12: Structures in the 1.0% AEP and Number of Flood Insurance Policies

Community	# Structures in 1.0% AEP including Floodway	# Policies
DeKalb County	131	26
City of Auburn	125	37
City of Butler	7	2
City of Garrett	0	0
Town of Altona	0	0
Town of Hamilton	0	4
Town of St. Joe	1	0
Town of Waterloo	1	2
Total	**265**	**71**

Future Considerations

As the municipalities within DeKalb County grow in population and redevelop, it can be anticipated that the number of critical and non-critical infrastructure will also increase accordingly. DeKalb County; the cities of Auburn, Butler, and Garrett; and the towns of Altona, Hamilton, St. Joe, and Waterloo have adopted floodplain ordinances which help to keep structures out of areas of highest risk. **Table 13** is a compilation of the most recent ordinance dates for each community.

Table 13: Dates of Most Recent Floodplain Ordinance

Community	Date Floodplain Ordinance Adopted
DeKalb County	2/27/2017
City of Auburn	7/17/2018
City of Butler	9/5/2006
City of Garrett	8/15/2006
Town of Altona	9/4/2006
Town of Ashley	
Town of Corunna	
Town of Hamilton	10/13/2013
Town of St. Joe	9/28/2006
Town of Waterloo	9/12/2006

Most of the listed communities discourage critical facilities such as schools, medical facilities, community centers, municipal buildings, and other critical infrastructure from being located within the 1% AEP floodplain. New structures must also be protected to that level along with flood-free access to reduce the risk of damage caused by flooding and to ensure that these critical infrastructures will be able to continue functioning during major flood events. Flooding due to poor drainage, low-lying land, or flash flooding is also an important consideration. It will be important for recognition of potential flood impacts to residents and businesses in these areas to be coupled with proper planning for future development and redevelopment of the flood zones. This would also include studying the Best Available Data Layer and inundation areas mapped through the development of the Indiana Floodplain Portal as well as studies of all the streams with one square mile or drainage area or greater **Figure 24**.

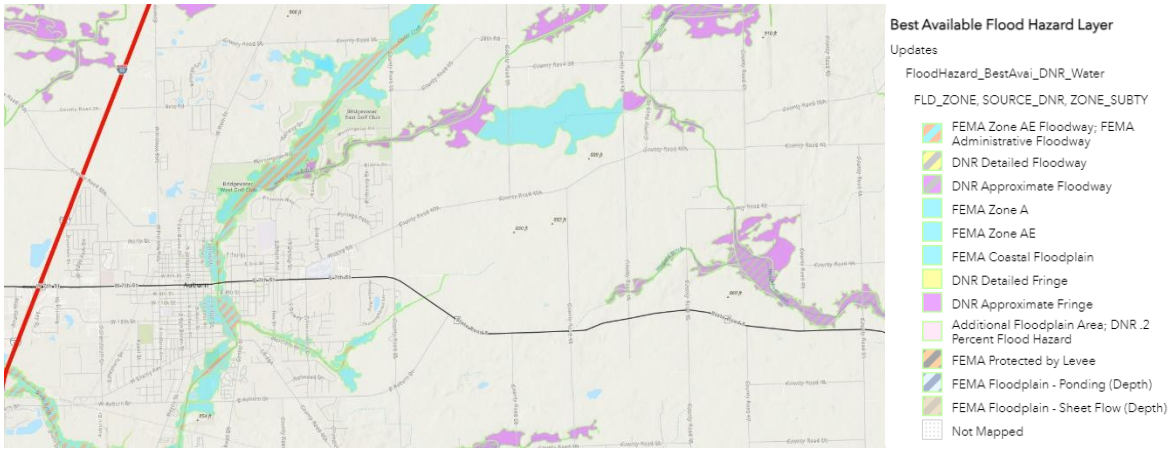


Figure 24: Sample of Flood Designated Areas in DeKalb County

It is important to inform owners and occupants of residences and businesses within the known hazard areas, such as delineated or approximated flood zones and fluvial erosion hazard (FEH) areas, of about the potential impacts from flooding incidents as well as proper methods to protect themselves and their property.

Increased precipitation, as predicted in the Indiana Climate Change Impacts Assessment, is anticipated to come in the form of heavier, shorter events which lead to the increased potential for flooding and stress on infrastructure such as sanitary and storm sewers. Heavy precipitation events are anticipated to occur more frequently as temperatures rise, replacing rain when previously there was snow.

Despite these efforts, the overall vulnerability and monetary value of damages is expected to increase in the area unless additional measures, such as those discussed later in **Chapter 5** of this report, are implemented.

Indirect effects of flooding may include increased emergency response times due to flooded or redirected streets, the danger of dislodged and floating propane tanks causing explosions, and the need for additional personnel to carry out the necessary evacuations. Additional effects may include sheltering needs for those evacuated, and the loss of income or revenue related to business interruptions. Several communities within DeKalb County host numerous special events near to or on the rivers and waterways. These special events may have to be cancelled or postponed due to flooding or high-water levels.

Relationship to Other Hazards

While flooding creates social, physical, and economic losses, it may also cause other hazards to occur. For example, flooding may increase the potential for a hazardous materials incident to occur. Above ground storage facilities may be toppled or become loosened and migrate from the original location. In less severe situations, the materials commonly stored in homes and garages such as oils, cleaners, and de-greasers, may be mobilized by flood waters. Should access roads to hazardous materials handlers become flooded, or if bridges are damaged by flood waters, response times to more significant incidents may be increased, potentially increasing the damage associated with the release.

Increased volumes of water during a flood event may also lead to a dam failure. As the water levels rise in areas protected by dams, at some point, these structures will overtop or will breach leading to even more water being released. These two hazards, flood, and dam failure, when combined, may certainly result in catastrophic damage.

In a similar fashion, a snowstorm or ice storm can also lead to flooding on either a localized or regional scale. When a large amount of snow or ice accumulates, the potential for a flood is increased. As the snow or ice melts, and the ground becomes saturated or remains frozen, downstream flooding may occur. Ice jams near bridges and culverts may also result in flooding of localized areas and potentially damage the bridge or culvert itself.

Repeated flooding may also create impacts associated with landslides along riverbanks and bluff areas. As floodwaters travel through the systems, saturating shorelines and increasing volumes and velocities of water, the natural process of fluvial erosion may be exacerbated. As these processes are increased, structures and infrastructure located on bluffs or in proximity to the river may be at risk.

Flooding in known hazard areas may also be caused by dams that experience structural damage or failures not related to increased volumes or velocities of water. These “sunny day failures,” while not typical, may occur wherever these structures exist throughout the county.

4.2.6 Hailstorm, Thunderstorm, and Windstorm

Overview

Hail occurs when frozen water droplets form inside a thunderstorm cloud and then grow into ice formations held aloft by powerful thunderstorm updrafts, and when the weight of the ice formations become too heavy, they fall to the ground as hail. Hail size ranges from smaller than a pea to as large as a softball, and can be very destructive to buildings, vehicles, and crops. Even small hail can cause considerable damage to young and tender plants. Residents should take cover immediately in a hailstorm, and protect pets and livestock, which are particularly vulnerable to hail, and should be under shelter as well.

Thunderstorms are defined as strong storm systems produced by a cumulonimbus cloud, usually accompanied by thunder, lightning, gusty winds, and heavy rains. All thunderstorms are considered dangerous as lightning is one of the by-products of the initial storm. Although most lightning victims survive, people struck by lightning often report a variety of long-term, debilitating symptoms. Other associated dangers of thunderstorms included tornados, high winds, hail, and flash flooding.

Windstorms or high winds can result from thunderstorm inflow and outflow, or downburst winds when the storm cloud collapses, and can result from strong frontal systems, or gradient winds (high- or low-pressure systems). High winds are speeds reaching 50 mph or greater, either sustained or gusting.

Extent, History, and Location

In DeKalb County, the NCDC indicates five hailstorms and 24 thunderstorm/windstorm events from January 1, 2020, to May 31, 2025.

According to the Midwest Regional Climate Center (MRCC) hail is considered severe if a thunderstorm produces hail stones larger than one inch in diameter, or larger than the size of a quarter. On May 7, 2024 the County and the Town of Corunna both reported hailstones over three inches. On July 23, 2022, the county also reported hail with a diameter of one inch. Of the five instances of hailstorms, there was a reported $285K worth of property damage but no crop damage, injuries, or deaths.

Significant windstorms are characterized by the top wind speeds achieved during the incident. Such high wind events characteristically occur in conjunction with thunderstorms and have historically occurred year-round with the greatest frequency and damage occurring in May, June, and August. Within DeKalb County, NCDC reports only three instances where top wind speeds were 60 mph or greater. Of the total 24 instances of thunderstorms and high wind events, 15 were on different dates. Of those instances there was one reported injury and no deaths. The injury was the result of a tree falling onto the cab of a truck which injured the driver. There were no reports of crop damage associated with these events but there was a reported $451K worth of property damage. $300K of this damage occurred when the Auburn-Garrett Drive-in theater was damaged on August 29, 2022. Many event reports included in the NCDC did not provide descriptive information on the social, physical, and economic losses resulting from individual storms specific to DeKalb County. In local storm reports at the NWS, where damages were reported, narrative descriptions of the event rarely extended beyond reports of damage to broken tree limbs, downed power lines, or roof damage.

The ever-changing climate has impacted the frequency of hailstorms, thunderstorms, and windstorms. Based on information published by NOAA, the average intensity of rain is increasing while the duration of rain events is decreasing. With these circumstances extreme events will be increasing because there will be more rain in a shorter time period. **Appendix 10** provides the NCDC information regarding hailstorms, thunderstorms, and windstorms that have been reported within the county.

Probability

The committee determined the probability of a hailstorm, thunderstorm, or windstorm occurring anywhere throughout DeKalb County is "Highly Likely" and will typically affect broad portions of the county at one time resulting in damages ranging from "Limited" to "Critical." As advancements in technologies such as weather radar systems and broadcast alerts are continually made, the warning time for such incidents may increase. Currently, the committee anticipates that the warning time is anticipated to be between 12 and 24 hours on average, and the duration is expected to last less than six hours to less than one day. The overall risk from hailstorms, thunderstorms, and windstorms is elevated.

Indicative of a regional hazard, the probability, magnitude, warning time, and duration of a hailstorm, thunderstorm, or windstorm are expected to be similar throughout the county. These events are highly unpredictable, and the occurrences are distributed throughout the county, sometimes impacting one community more often or more severely than another. Therefore, the CPRI values reflect the distributed risk and associated priority for a hailstorm, thunderstorm, or windstorm. A CPRI summary is provided in **Appendix 8**.

Specific locations and frequency of hailstorms, thunderstorms, and windstorms are difficult to predict as many of these individual events are without significant warning time and may have impacts on very limited areas or may affect broader areas. However, based on NCDC data and personal experiences of the committee, it was determined that all areas within the county are anticipated to experience a hailstorm, thunderstorm, or windstorm within the calendar year. More likely, these communities will be impacted by several of these hazard events each year. The magnitude is anticipated to be similar based on the number of critical infrastructure and populations of each of the municipalities.

Assessing Vulnerability

The effects of a hailstorm, thunderstorm, or windstorm may be minimal to extensive in nature and may affect small or broad ranges of land area. Within DeKalb County, direct and indirect effects from a hailstorm, thunderstorm, or windstorm may include:

Direct Effects:

- Damages to infrastructure (power lines)
- Damages to individual properties (homes, cars)
- Physical injuries may be experienced by those unable to find shelter during storm events, such as homeless people, hikers and outdoor workers

Indirect Effects:

- Downed power lines due to falling tree limbs as seen in **Figure 25**
- Losses associated with power outages
- Damages sustained from blowing debris
- Cancellation or interruption of special events

Estimating Potential Losses



Figure 25: Damage from High Thunderstorm Winds

Due to the unpredictability of this hazard all critical infrastructure and non-critical structures in DeKalb County are at risk of damage including temporary or permanent loss of function. For hailstorms, thunderstorms, and windstorms, it is not possible to isolate specific critical infrastructure or non-critical structures that would be vulnerable to damage. However, areas where utility lines are above ground and areas where dead or dying trees have not been removed may be at a higher risk of property damage or power outages during hailstorms, thunderstorms, and windstorms. Additionally, mobile homes and accessory buildings such as pole barns and sheds may also be at a higher risk of damage from hailstorms, thunderstorms, and windstorms if not properly anchored to the ground. Homeless individuals and families who have alternative means of sheltering may experience greater losses since the stability of tents and alternative structures does not withstand the damaging forces of the storms.

Future Considerations

As the population of the communities in DeKalb County develops and redevelops, it can be anticipated that the number of structures will also increase. To reduce the vulnerability for damage resulting from a hailstorm, thunderstorm, or windstorm, measures such as proper anchoring are vital. This includes not only roof anchors but also mobile home anchors. Proper tree maintenance, and burial of power lines should be completed. Adoption and enforcement of the current International Building Codes is key to ensuring structures can withstand the power of wind and hailstorms. While measures can be taken to remove existing structures or prevent future structures from being built in known hazard areas such as floodplains and hazardous materials facility buffers, such measures are not applicable to hailstorms, thunderstorms, and windstorms due to the diffuse nature and regional impacts of this hazard.

Indirect effects resulting from a hailstorm, thunderstorm, or windstorm can include power outages caused by downed tree limbs or flying debris, damage resulting from prolonged power outages, and damage to structures or property because of debris.

Relationship to Other Hazards

Hailstorms, thunderstorms, and windstorms may be the precursor for other hazards. For example, hazardous materials incidents can be the result of a hailstorm, thunderstorm, or a windstorm. Material storage containers can become damaged by high winds, debris, or even lightning, and can result in a spill or release of materials. With wind speeds greater than 58 mph, tankers and other transportation vehicles carrying hazardous materials are also at risk while on the road. High winds may also cause gaseous substances to travel farther distances at a much faster rate, increasing the evacuation area necessary to protect residents and visitors of DeKalb County.

Additionally, rainfall typically occurs with a thunderstorm, and this additional precipitation may lead to localized flooding or riverine flooding depending on the amount of rain during the event. Debris from a windstorm may also lead to localized flooding if debris is deposited over drains or if obstructions are created by downed limbs, trees, or other storm related debris. A similar concern due to the potential precipitation would be dam failure. High winds may place debris near spillways, blocking the emergency drainage mechanism for the dams. High winds may also lead to structural damage to a dam or may cause damage to nearby trees or other structures, leading to indirect damage.

The risk of social losses also increases during a hailstorm, thunderstorm, or windstorm, as these hazards often result in downed power lines, utility poles, and trees. Debris such as this may impede traffic patterns and make it difficult for emergency vehicles (fire, emergency medical services (EMA) and police) to pass through affected areas or people may be directly injured because of falling or flying debris.

4.2.7 Landslide, Land Subsidence, and Fluvial Erosion Hazard

Overview

Land subsidence, according to the USGS, is "a gradual settling or sudden sinking of the Earth's surface owing to subsurface movement of earth materials." Further, there are three processes that contribute to subsidence: compaction of aquifer systems, drainage and subsequent oxidation of organic soils, and dissolution and collapse of susceptible rocks.

Another important consideration is FEH. This represents the risk associated with natural stream movements and losses associated with buildings and infrastructure. In some cases, this may be represented by a gradual movement of a stream across a farm field. In other, more extreme instances, homes or other infrastructure may be lost as steep riverbanks or bluffs sluff into the water below.

Location

USGS shows the locations of highly mobile streams or streams whose position changes over time as they carve out the earth surrounding them. USGS's highly mobile streams database shows no mainstreams within DeKalb County that are considered highly mobile. These mainstreams are currently not migrating but could have the potential to in the future. Development along the banks of these waterways could be susceptible to erosion should the river transition to an actively migrating stream.

IndianaMap shows that there are no karst sinkhole areas anywhere in the county and there are no active underground mining operations within the County. Additionally, to date, there have not been any landslides or subsidence events reported in DeKalb County. **Figure 26** shows the FEH corridor around St. Joe along the St. Joseph River and nearby creeks and ditches. The FEH zone is relatively stable and located within the 1% flood event boundaries.

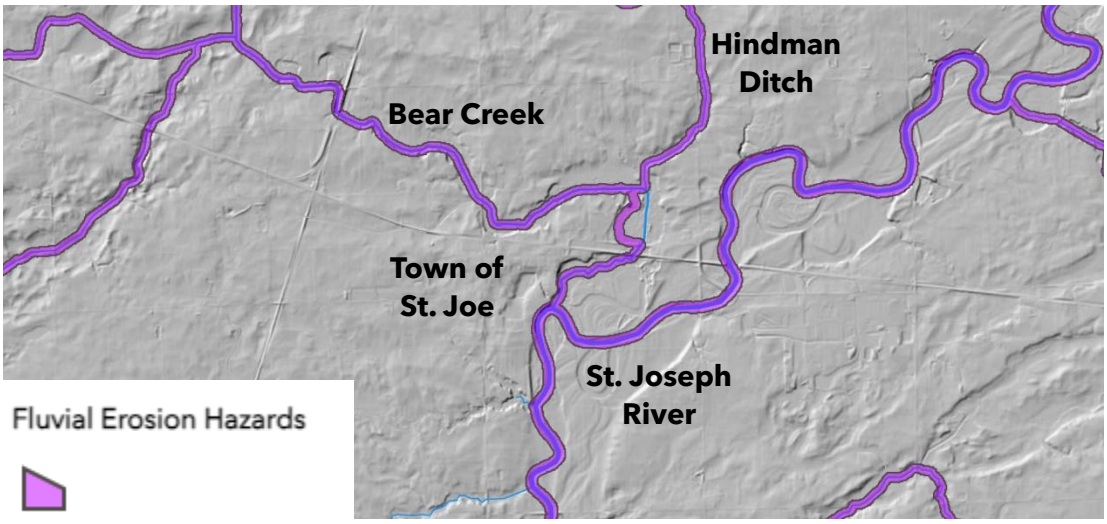


Figure 26: Fluvial Erosion Hazard in St. Joe along St. Joseph River

Extent and History

DeKalb County has no known karst geology. However, even some of the portions that have no known karst are considered at a relatively moderate risk for landslides according to the National Risk Index. The risk index considers expected annual loss as well as vulnerabilities by census tract and community resilience. The risk index for landslide in DeKalb County is shown in **Figure 27**. There is one area on the western side of the city of Auburn which has no expected annual loss. To date there have been no known significant landslides, land subsidence, or fluvial erosion within the county.

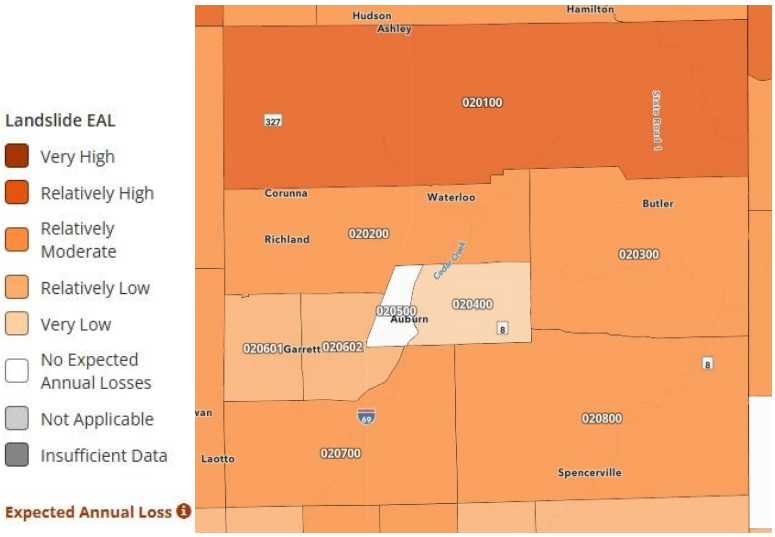


Figure 27: Expected Annual Loss from Landslides in DeKalb County

The risk index expects an annual loss of $21.8K for DeKalb County. The risk index calculates expected annual loss by multiplying exposure (the representative value of buildings, population, or agriculture potentially exposed to landslides), annualized frequency (the frequency or probability of a landslide occurring), and historic loss ratio (represents the estimated percentage of exposed building value, population, or agriculture value expected to be lost due to landslide).

Probability

The committee determined the probability of a landslide or subsidence occurring in DeKalb County is "Unlikely." Any event is expected to result in potentially "Negligible" damages. Currently, the committee estimates that the warning time may largely range from less than six hours to over 24 hours. This may be caused by the complexity of these events, of which, early warning signs can sometimes be spotted before they occur. Additionally, the committee said the duration would range from less than six hours to less than one day. These events are highly unpredictable and the risk, although very low according to the committee, is distributed throughout the county. Therefore, the CPRI values reflect the distributed risk and associated priority for a landslide or subsidence event. A CPRI summary is provided in **Appendix 8**.

Assessing Vulnerability

Within DeKalb County, direct and indirect effects may include:

Direct Effects:

- Damages to infrastructure (power lines, roads, bridges)
- Damages to individual properties (homes, cars)
- Loss of cropland immediately adjacent to the rivers

Indirect Effects:

- Increased response time for emergency vehicles

- Losses associated with affected land (crop loss)
- Potential contamination of groundwater resources
- Loss of business due to roadway access and power loss

Estimating Potential Losses

According to the National Risk Index, expected annual losses have been calculated for the areas in DeKalb County which are at risk of damage including temporary or permanent loss of function. The greatest factor involving the higher risk rating is the potential for larger segments of the population to be exposed to the potential hazard.

In addition, areas where FEH meander belt widths (FEH zones) have been identified, may be at a higher risk of property damage caused by such events. To prepare a community based basic "what-if" scenario, the Indiana FEH GIS layers were overlaid onto parcel data provided by the County. **Table 14** identifies the number of structures and potential damage within the FEH areas.

Table 14: Summary of Parcels and Essential Structures in the FEH Zone

Community	Potential Damages	
	# Parcels	# Essential Facilities
DeKalb County	2530	0
City of Auburn	359	1
City of Butler	10	0
City of Garrett	11	0
Town of Altona	0	0
Town of Ashley	0	0
Town of Corunna	0	0
Town of Hamilton	15	0
Town of St. Joe	19	0
Town of Waterloo	31	0

Future Considerations

As the populations of the communities in DeKalb County grow, it can be anticipated that the number of critical and non-critical structures will also increase. To reduce the vulnerability for damages resulting from a landslide or land subsidence, FEH area GIS layers along with the floodplain information should be integrated into the building permit or approval process. In recent years, no significant development has occurred within these areas of DeKalb County. However, depending on the location, any development may increase the vulnerability to this hazard.

Although the county rivers are considered relatively stable, having little lateral movement annually, extreme precipitation events may cause erosion to take place in previously stable areas. Given this potential it is key the community continues to discourage construction of infrastructure and homes in the meander belt widths for each stream, such as Buck Creek, Cedar Creek, Fish Creek, and St. Joseph River.

As future growth takes place, the indirect effects resulting from a landslide or land subsidence event can cause challenges for the community if transportation routes are damaged, and businesses must

close due to access issues and loss of power. Cascading impacts in smaller counties can have long lasting effects on the local economy, community growth, health, and welfare.

Relationship to Other Hazards

A landslide, subsidence event or FEH event may be the precursor for other hazards. Depending on the location of the event, material storage containers can become damaged resulting in a spill or release of materials and potentially contaminating groundwater reserves. Dam failures may occur in much the same fashion if located in the potential hazard areas, or resulting from heavy saturation following a rainstorm, heavy snow, or rapid snow melt. FEH may result in flooding in areas previously not impacted by flood due to debris clogging drainage ways and loss of earthen berms near the waterways.

Similarly, these types of events may be caused by hail, thunder, or windstorms and their effects on the soils; an earthquake may release the ground enough to set a slide in motion; or a flood may add increased soil saturation or weight to at-risk areas increasing the potential for an event and resulting damages.

4.2.8 Tornado

Overview

A tornado is generated when conditions in a strong cell are produced that exhibit a wall of cool air that overrides a layer of warm air. The underlying layer of warm air rapidly rises, while the layer of cool air drops – sparking the swirling action. The damage from a tornado is a result of the high wind velocity and wind-blown debris. Tornado season is generally from April through June in Indiana, although tornadoes can occur at any time of year. Tornadoes tend to occur in the afternoons and evenings; over 80% of all tornadoes strike between 3:00 pm and 9:00 pm but can occur at any time of day or night.

The classification of tornadoes utilizes the Enhanced Fujita Scale of tornado intensity and damage. Tornado intensity ranges from low intensity (EF0) tornadoes with effective wind speeds of 65-85 mph to high intensity (EF5+) tornadoes with effective wind speeds of 200+ mph (

Table 15).

Table 15: Enhanced Fujita Scale for Tornados

EF-Scale	Windspeed, mph	Character of Damage	Relative Frequency	Typical Damage
EF0	65-85	Light damage	29%	Shallow rooted trees blown over; damage to roofs, gutters, siding
EF1	86-110	Moderate damage	40%	Mobile homes overturned, roofs stripped, windows broken
EF2	111-135	Considerable damage	24%	Large trees snapped, light-object missiles generated, cars lifted
EF3	136-165	Severe damage	6%	Severe damage to large buildings, trains overturned
EF4	166-200	Devastating damage	2%	Whole houses destroyed; cars thrown
EF5	200+	Incredible damage	<1%	High-rise buildings significantly damaged, strong framed homes blown away

Extent, History, and Location

In DeKalb County, the NCDC has recorded zero tornadoes from January 1, 2020, to May 31, 2025. While the NCDC does not have record of any tornadoes within the county over the past five years, many events described tornadoes in neighboring counties. Multiple thunderstorm events that caused high winds within DeKalb County described tornadoes in other counties as the storms moved. There is always a chance of a tornado forming from a supercell storm which can also produce high thunderstorm winds and large hailstones. Tornadoes typically come with high damages to either property or crops and can result in injuries or deaths.

Probablility

The committee estimated the probability of a tornado occurring in DeKalb County would be "Likely" and the magnitude and severity of such an event to be "Significant" on average. However, a few municipalities disagreed saying the probability was "Possible" or "Highly Likely" and saying the magnitude was "Limited" or "Critical." The overall risk index is "Elevated" throughout the county. As with many hazardous events, the committee anticipated a short warning time of typically less than six hours, and a short duration, less than six hours to less than a day. The CPRI summary for tornadoes is shown in **Appendix 8**.

The Indiana State Climate Office estimates that throughout Indiana, there is an average of 20 tornado touchdowns per year. Based on the number of tornado touchdowns previously reported through the NCDC and local weather agencies, the committee determined the risk from a tornado was elevated.

Assessing Vulnerability

As the path of a tornado is not pre-defined, it is difficult to isolate specific critical infrastructure and non-critical structures, or areas of DeKalb County that would be vulnerable to a tornado. Direct and indirect effects from a tornado may include:

Direct Effects:

- Increase damage to older construction including residential and business structures, mobile homes, and accessory structures (pole barns, silos, sheds)
- Damage to structures in the immediate pathway (businesses, residences, warehouses)
- Loss of alternative housing stock nearby
- Damages to above ground utility lines and structures

Indirect Effects:

- Loss of revenue for affected businesses.
- Expenses related to community clean-up and debris removal from public rights of way and public facilities
- Inability for property owners to work while dealing with personal property damages from the tornado and debris removal from high winds
- Affected business owners may experience loss of revenue if they are unable to continue operations following the event. Similarly, if a business is affected and unable to operate, employees may experience a loss of wages during the period of recovery

Estimating Potential Losses

Due to the unpredictability of this hazard, all critical and non-critical structures within the county are at risk of future damage or loss of function. Estimates of potential physical losses were determined through a hypothetical exercise where an EF2 intensity tornado traveled through portions of the county and the communities. This is intended to present a "what-if" scenario of a tornado incident and associated damages. Damage estimates were derived by assuming that 25% of all structures in the path of the tornado would be completely destroyed, 35% of the structures would be 50% damaged, and 40% of the structures would sustain 25% damage. These estimations were also determined utilizing three wind speed zones based on distance from the tornado path. Zone one is

nearest the center of the tornado path, while Zone three is the farthest from the path and with a theoretically lower wind speed. **Table 16** provides summary data for the hypothetical tornado, which is identified on **Exhibit 3**. Tables 16-17 only include communities in the path of the tornado and structures not labeled as unclassified, of which there were none in DeKalb County.

Table 16: Summary of Hypothetical Tornado Damages

Community	Zone 1		Zone 2		Zone 3		Total	
	#	$	#	$	#	$	#	$
DeKalb County	26	$3.86M	13	$1.76M	8	$1.06M	47	$6.68M
City of Auburn	363	$53.37M	253	$43.74M	396	$55.83M	1,012	$152.94M
City of Garrett	412	$56.85M	365	$42.26M	552	$74.18M	1,329	$173.29M
Total	**801**	**$114.08M**	**631**	**$87.76M**	**956**	**$131.07M**	**2,388**	**$332.91M**

Utilizing the same GIS information and process, critical infrastructure within each of the hypothetical tornado zones were identified and are included in

Table 17. These buildings are included in the above table showing the number of structures and damage estimate information.

Table 17: Critical Infrastructure within Hypothetical Tornado

Community	Zone 1	Zone 2	Zone 3
DeKalb County			
City of Auburn	Speedway LLC-7122, WellNow Urgent Care	Ceres Solutions OLD North Central Co-Op, Eaton Corp-R & D Lab, Lassus Station 20	Rieke Corporation, The Home Depot, Inc. Store #2024
City of Garrett		J E Ober Elementary, Garrett-Keyser-Butler Schools	Garrett Middle School, Garrett-Keyser-Butler Schools, Judy A Morrill Recreation Center - JAM

Future Considerations

The communities within DeKalb County host numerous events each year in addition to the regular tourist attractions and outdoor recreation opportunities which attract thousands of guests. Due to this, it is imperative that the EMA place continued importance on the need to maintain their outdoor warning siren coverage and support alternative notification methods for people who are unable to hear the outdoor warning sirens or may not be tuned in to local media. Because of the dispersed population concentration, coverage is limited to the more densely populated portions of the county. The existing outdoor warning siren locations are identified in **Figure 28**.

While it can be anticipated that new construction associated with development may be stronger than older or existing construction, existing older structures, barns, pole buildings, silos, and mobile homes remain threatened by tornados. The unincorporated portions of the county will remain vulnerable, especially where the outdoor warning siren coverage is not present. It is impossible to predict the path of a tornado and therefore all current and future development will continue to be at risk for damage. Risks to the citizens of the county may be lessened through participation in mass notification programs, use of weather radios, and turning on the emergency alert feature on cell phones. Having multiple means of warning citizens, businesses and visitors about incoming weather events is critical to continued economic growth and well-being of the communities and the county.

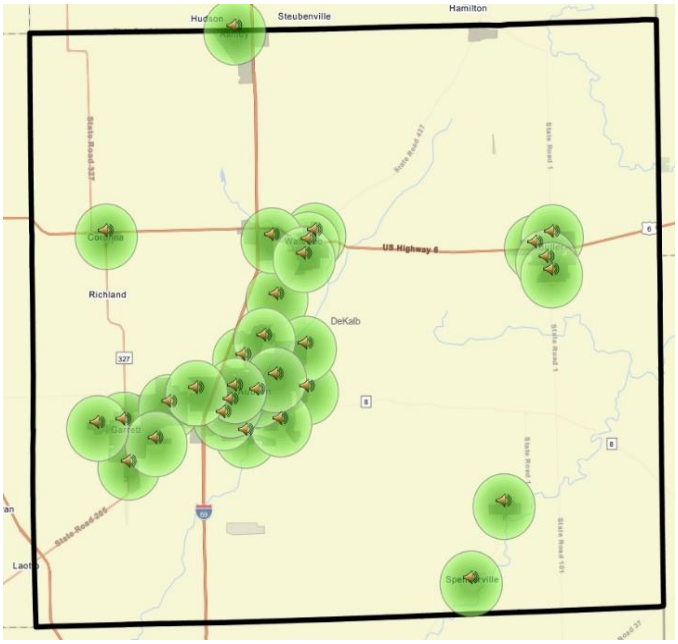


Figure 28: Siren Locations in DeKalb County

Relationship to Other Hazards

Tornadoes may result in a hazardous material incident. Material storage containers can become damaged by high winds and debris can result in a spill or release of materials. As wind speeds increase, the potential for damage to above ground storage containers also increases. Tankers and other transportation vehicles carrying hazardous materials are also at an increased risk while on the road or rail.

Tornadoes may also result in a dam failure as the increased wind speeds, and debris caused by the tornado may directly impact the dam or cause indirect damage by clogging outlet structures or emergency spillways. In addition, tornadoes may lead to structural fires as the destruction path is sometimes long and broad, leading to an increased number of potentially damaged homes, exposed power lines, gas leaks, and substantial amounts of debris.

4.2.9 Winter Storms and Ice

Overview

A winter storm can range from moderate snow over a few hours to blizzard conditions with high winds, ice storms, freezing rain or sleet, heavy snowfall with blinding wind-driven snow, and extremely cold temperatures that can last for several days. Winter storms are typically accompanied by cold temperatures and blowing snow, which can severely reduce visibility. A winter storm is defined as one that drops four or more inches of snow during a 12-hour period, or six or more inches during a 24-hour span.

An ice storm occurs when freezing rain falls from clouds and freezes immediately on contact with a variety of surfaces. All winter storms make driving and walking extremely hazardous. The aftermath of a winter storm can affect a community or region for days, weeks, and even months.

Storm effects such as extreme cold, flooding, snow, and ice accumulation can cause hazardous conditions and hidden problems for people in the affected area. People can become stranded on the road or trapped at home, without utilities or other services, including food, water, and fuel supplies. The conditions may overwhelm the capabilities of a local jurisdiction. Winter storms are considered deceptive killers as they may indirectly cause transportation accidents, and injury and death resulting from exhaustion, overexertion, hypothermia and frostbite from wind chill, and asphyxiation. House fires occur more frequently in the winter due to the use of alternative heat sources, such as space heaters, and lack of proper safety precautions.

Wind chill is a calculation of how cold it feels outside when the effects of temperature and wind speed are combined. On November 1, 2001, the NWS implemented a replacement WCT index for the 2001/2002 winter season. The reason for the change was to improve upon the current WCT index, which was based on the 1945 Siple and Passel Index.

A winter storm watch indicates that severe winter weather may affect your area. A winter storm warning indicates that severe winter weather conditions are on the way. In the event of a blizzard, a winter storm warning will be issued and include the details of the blizzard - that large amount of falling or blowing snow and sustained winds of at least 35 mph are expected for several hours.

Location

DeKalb County is located in northern Indiana where winter storms are common. Such conditions can result in substantial personal and property damage, even death. A large number of winter storm products are available from the NWS such as the WSSI. When a storm is forecast, the NWS can help communities better understand the potential impacts of storm using WSSI. **Figure 29** shows the description of the WSSI impacts. More detailed information with regards to the timing of the storms, etc, is provided as the event gets closer to the forecast area.

Potential Winter Storm Impacts	
	Winter Weather Area **Expect Winter Weather.** • Winter driving conditions. **Drive carefully.**
	Minor Impacts **Expect a few inconveniences to daily life.** • Winter driving conditions. **Use caution while driving.**
	Moderate Impacts **Expect disruptions to daily life.** • Hazardous driving conditions. **Use extra caution while driving.** • Closures and disruptions to infrastructure may occur.
	Major Impacts **Expect considerable disruptions to daily life.** • Dangerous or impossible driving conditions. **Avoid travel if possible.** • Widespread closures and disruptions to infrastructure may occur.
	Extreme Impacts **Expect substantial disruptions to daily life.** • Extremely dangerous or impossible driving conditions. **Travel is not advised.** • Extensive and widespread closures and disruptions to infrastructure may occur. Life-saving actions may be needed.

Figure 29: Winter Storm Impacts

Figure 30: Annual Minimum Temperatures from 1895 - 2024 shows how DeKalb County's minimum temperature is warming at a rate of 0.3°F each decade since roughly 1895. This increase will likely result in the county experiencing less snow and more ice. This tradeoff is due to a greater likelihood of atmospheric temperatures being above freezing which will melt any snow and then refreeze the drops of rain resulting in freezing rain or sleet.

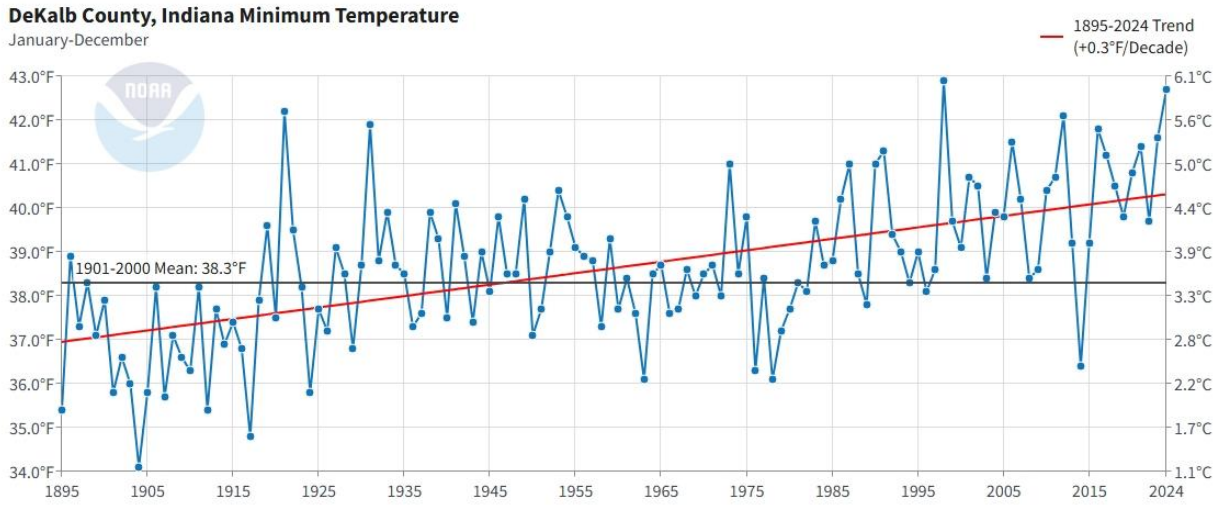


Figure 30: Annual Minimum Temperatures from 1895 - 2024

Extent and History

In DeKalb County, the NCDC has recorded two heavy snows, zero ice storms, zero lake effect snows, three winter storms, and 10 winter weather events from January 1, 2020, to May 31, 2025.

NCDC reports indicated no property damage, no additional crop damage and no injuries, or deaths associated with any of the events. Many narrative descriptions indicated poor travel conditions, numerous power outages and debris associated with the winter weather events. On February 2, 2022, there were reports of 10 to 12 inches of snow accumulation. Most recently, on December 22, 2022, temperatures fell to single digits and wind chills to below 40°F. At the same time, there was between one and three inches of snow and wind gust as high as 50 mph. **Appendix 10** provides the NCDC information regarding winter storms and ice that have been reported within the county.

Probability

The probability, magnitude, warning times, and duration of a snowstorm or ice storm causing disruption to residents and businesses in DeKalb County, as determined by the planning committee, is expected to be mostly consistent throughout the county and communities. It is "Highly Likely" that this type of hazard will occur in the area and will typically affect the entire county, and possibly several surrounding counties at one time, resulting in primarily "Limited" damage. However, representatives from the city of Butler estimated the possibility would be "Likely" and the magnitude would be "Significant." The typical warning time for severe temperatures or several inches of snow associated with a winter storm is usually greater than 24 hours while the duration of the incident is anticipated to be less than one week. A CPRI summary for winter storms and ice is shown in **Appendix 8**.

Based on historical data and the experience of the planning committee, snowstorms have become less common in DeKalb County with the changing climate. However, ice storms bring more extensive challenges to the communities. Actions have been taken to mitigate many impacts from snow and ice storms. Lake effect snowstorms can be less predictable, depositing greater amounts of snow in a contiguous county and lesser amounts in DeKalb County or the opposite. The committee considered only the larger, more detrimental events for this effort.

Assessing Vulnerability

A snowstorm typically affects a large regional area with potential for physical, economic, and social losses. Direct and indirect effects of a snowstorm or ice storm within the County may include:

Direct Effects:

- A higher number of businesses rely on the outside workforce and may experience loss of production as employees may not be able to get to work. The high number of residents traveling to other areas for work results in a loss of income due to the inability to reach their normal worksites
- Rural (county) roads may be impassable
- Increased expenses related to snow removal or brine/sand applications
- Weight of ice and wet snow impacts older structures roofs as well as powerlines
- Large ice and snow events interrupt economic activity within the community

Indirect Effects:

- Loss of revenue as businesses are closed
- Increased emergency response times based on safety of roads
- Loss of income if workers are unable to get to their place of employment
- Delayed impacts due to supply chain disruptions – products not received or shipped on time cause lost wages and revenues
- Cancellation of special events and reduced tourist activities impact the local economy

Estimating Potential Losses

Given the nature and complexity of a regional hazard such as a snowstorm, it is difficult to quantify potential losses to property and infrastructure. As a result, all critical and non-critical structures and infrastructure are at risk from snowstorm and ice storm incidents.

For planning purposes, information collected about snowstorms impacting other communities around the nation is also useful in assessing the potential social, physical, and economic impact that a winter storm could have on communities. In December 2008, Allen County had a wintry combination of freezing rains, snow, and ice. This storm was the largest disaster for Indiana Michigan Power with 110K Allen County customers without power. One thousand six hundred (1.6K) additional crew members were brought in to restore electrical service to the county. According to the Journal Gazette $10M–$12M was spent to clean up the debris, make repairs and labor costs for this event.

While the above example indicates the wide-ranging and large-scale impact that winter storms can have on a community or region, winter storms generally tend to result in less direct economic impacts than many other natural hazards. According to the workshop on the social and economic impacts of weather, which was sponsored by the U.S. Weather Research Program, the American Meteorological Society, the White House Subcommittee on Natural Disaster Relief, and others, winter storms resulted in an average of 47 deaths and more than $1B in economic losses per year between 1988 and 1995. However, these totals account for only 3% of the total weather-related economic loss and only 9% of fatalities associated with all weather-related hazards over the same period.

Future Considerations

As populations increase and communities continue to grow, the need to respond to snowstorms or ice storms will remain an important municipal effort. As new construction or re-development occurs, especially new or existing critical infrastructure, it is important to ensure that these new structures are equipped to deal with the potential risks associated with this hazard. Those may include lengthy power outages and potentially impassable transportation routes, making it difficult to obtain supplies or for passage of response vehicles. These hazard events will typically affect the entire county, perhaps multiple counties, and therefore all developments, current and future, will be at risk for damage associated with snow and ice storms. In addition, there will be a need for additional warming shelters for the underserved populations to take refuge and get warm and safe respite for stranded commuters on their way to or from work. This not only includes daytime available spaces but also overnight accommodation as the winter storms are often accompanied by very cold temperatures and wind chills.

Winter storms can also result in substantial indirect costs. Increased emergency response times, loss of work or the inability to get to work, as well as business interruption, are possible indirect effects of a winter storm. According to a report by the National Center for Environmental Predictions, the cold and snowy winter in late 1977 and early 1978, which impacted several heavily populated

regions of the country, was partially responsible for reducing the nation's Gross Domestic Product (GDP) from an estimated growth rate of between 6% and 7% during the first three quarters of 1977 to approximately -1% in the last quarter of 1977 and 3% during the first quarter of 1978.

Relationship to Other Hazards

Winter storms and ice storms can lead to flooding as the precipitation melts and enters local receiving waters. This increased volume of water on already saturated, or still frozen ground can quickly result in flood-related damage to structures and properties as well as within the stream or river channel. DeKalb County has an increased risk of flooding following heavy precipitation events. The increased flooding may then lead to a dam failure within the same area, further exacerbating the damage.

Hazardous materials incidents may be caused by poor road conditions during winter storms or ice storms. Many hazardous materials are transported by rail or by tanker over highways and interstates. In the more rural areas of the county, or where open areas are more susceptible to snow drifts on roads, the possibility of a traffic related hazardous materials incident may increase due to road obstruction and lack of visibility.

Power outages and other infrastructure failures may also occur during a winter storm. Weight from snow and ice accumulations can directly or indirectly cause power lines to fail. During extreme cold temperatures, power outages may prove deadly for certain populations such as the homeless, the elderly or ill. Power outages in the winter are especially dangerous as families try to generate heat using alternative heat sources. Alternative heating sources may not be safely used or may be placed too close to combustible materials resulting in fires and burn injuries or death.

4.2.10 Dam and Levee Failure

Overview

A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams typically are constructed of earth, rock, concrete, or mine tailings. A dam failure is a collapse, breach, or other failure resulting in downstream flooding.

Of the approximately 80K dams identified nationwide in the National Inventory of Dams (NID), the majority are privately owned. Each regulated dam is assigned a downstream hazard classification based on the potential loss of life and damage to property should the dam fail. The three classifications are high, significant, and low. With changing demographics and land development in downstream areas, hazard classifications of regulated are updated continually. The following definitions of hazard classification currently apply to dams in Indiana:

> High-hazard Dam: a structure, the failure of which may cause the loss of life and severe damage to homes, industrial and commercial buildings, public utilities, major highways, or railroads.
>
> Significant-hazard Dam: a structure, the failure of which may damage isolated homes and highways or cause the temporary interruption of public utility services.
>
> Low-hazard Dam: a structure, the failure of which may damage farm buildings, agricultural land, or local roads.

In Indiana, not all dams are regulated. To be regulated by the IDNR, the dam must meet at least one of the following criteria:

- The dam has a drainage area of more than one square mile.
- The dam is 20 feet in height or greater.
- The dam impounds a volume of more than 100 acre-feet of water.

A dam's classification may be changed to a high-hazard classification through a successful petition by a downstream property owner. If this occurs, then the dam will also be regulated by DNR. Federally owned and operated dams are not under IDNR's jurisdiction. Examples of Federally regulated dams include Federal Energy Regulatory Commission (FERC) and US Army Corps of Engineers (USACE) structures. Although regulations are similar, there are additional requirements based on the regulating agency.

A levee is a flood control structure engineered and designed to hold water away from a building. Levees protect buildings from flooding as well as from the force of water, from scour at the foundation, and from impacts of floating debris. The principle causes of levee failure, like those associated with dam failure, include overtopping, surface erosion, internal erosion, and slides within the levee embankment or the foundation walls. Levees are designed to protect against a particular flood level and may be overtopped during a more severe event. When a levee system fails or is overtopped, the result can be catastrophic and often more damaging than if the levee were not there, due to increased elevation differences and water velocity. The water flowing through the breach continues to erode the levee and increases the size of the breach until it is repaired or water levels on the two sides of the levee have equalized. The FEMA and USACE remind people living and working behind levees that there is always a residual risk when living or working in a facility located behind a levee. Levees reduce the risk of a flood, but do not completely eliminate that risk.

Location

Within DeKalb County, there are seven structures listed in the IDNR dams list. Of the seven in the county, zero are classified as a high hazard dam, two are classified as a significant hazard dam, and five are classified as low hazard dams. **Table 18** shows all the structures listed on the NID.

Table 18: Dams in DeKalb County

State ID	Dam Name	Owner Types	State Regulated Dam	Hazard Potential Classification	IEAP Prepared	Notes
17-2	Cedar Lake Control Structure	Private	No	Low	No	
17-3	McNamara Corporation Lake	Private	No	Low	No	Under Minimum
17-4	Floyd Troyer lake	Private	Yes	Low	No	Approved
17-6	Family Life Center Lake Dam	Private	Yes	Significant	No	
17-8A	Joe Stanczyk Lake Dam (South)	Private	No	Significant	No	Under Minimum
17-8C	Grey Stone Lake Dam "C" West	Private	No	Low	No	Under Minimum
17-9	Story Lake (Control Structure)	State	No	Low	No	

According to the National Levee Database (NLD) managed by the USACE, there are no certified levees systems within the county.

The Indiana Silver Jackets team completed a survey of levee-like features also known as non-levee embankments. The non-levee embankments are not certified or engineered structures. They are earthen structures which act like levees, however, cannot protect the features behind the structures adequately. In fact, non-levee embankments impose lateral constraints on flood flows, reducing the floodplain storage capacity and increasing the flood velocity. These non-levee embankments can cause stream erosion and downstream flooding. Some farms along the rivers and streams rely on these embankments to keep flood waters out of their fields. Non-levee embankments are discussed in the section because they are commonly mistaken to be "real" levees. People frequently build behind these structures with an expectation of safety, but these structures were never intended to provide such protection and their ability to hold back floodwater is unpredictable at best. Non-levee embankments can and often do restrict the movement of water to a certain limitation at which time the structure may fail without warning. IDNR maps the non-levee embankment for DeKalb County. **Figure 31** depicts a sample of the agricultural non-levee embankments south of Waterloo.

Extent and History

There have been no reports of dam failures or partial failures from either local news sources or the planning committee. The first of the two dams classified as significant, 17-6, is expected to have been inspected in November of 2025. The second, 17-8C, does not currently have the next inspection date set in the IDNRs dam database. The county should contact the owners of each dam to confirm the inspections have been completed.



Figure 31: Sample of Non-Levee Embankments South of Waterloo

Probability

Based on the information provided to them and their local knowledge, experience, and expertise, the committee determined the probability of a dam failure is "Unlikely." The magnitude of a dam failure can have "limited" damages. The warning time is from six to 12 hours or from 12 to 24 hours. **Appendix 8** provides a CPRI summary of the planning committee's expectations during a dam failure.

Assessing Vulnerability

The actual magnitude and extent of damage due to a dam or levee failure depends on the nature of the breach, the volume of water that is released, and the width of the floodplain valley to accommodate the flood wave. Due to the conditions beyond the control of the dam or levee owner or engineer, there may be unforeseen structural problems, natural forces, mistakes in operation, negligence, or vandalism that may cause a structure to fail.

Two high hazard dams, owned by the state of Indiana and located in Steuben County, have developed Emergency Action Plans (EAP). FEMA defines EAPs as, "A formal document that identifies potential emergency conditions at a dam and specifies actions to be followed to minimize loss of life and property damage." (**Figure 32**)

shows an example of the potential inundation areas during a worst-case scenario breach of the dam under full maximum pool conditions. While the dam is outside of DeKalb County, a breach of this dam would affect the northeast portion of the county.

Incident and Emergency Action Plans (IEAPs) are now required for all high hazard dams by state law; however, these plans are not mandated for the low and significant hazard structures. Dam owners are, however, encouraged to prepare an IEAP to help identify whom to notify and what actions they may need to take place in the event of an incident or emergency event affecting the dam.

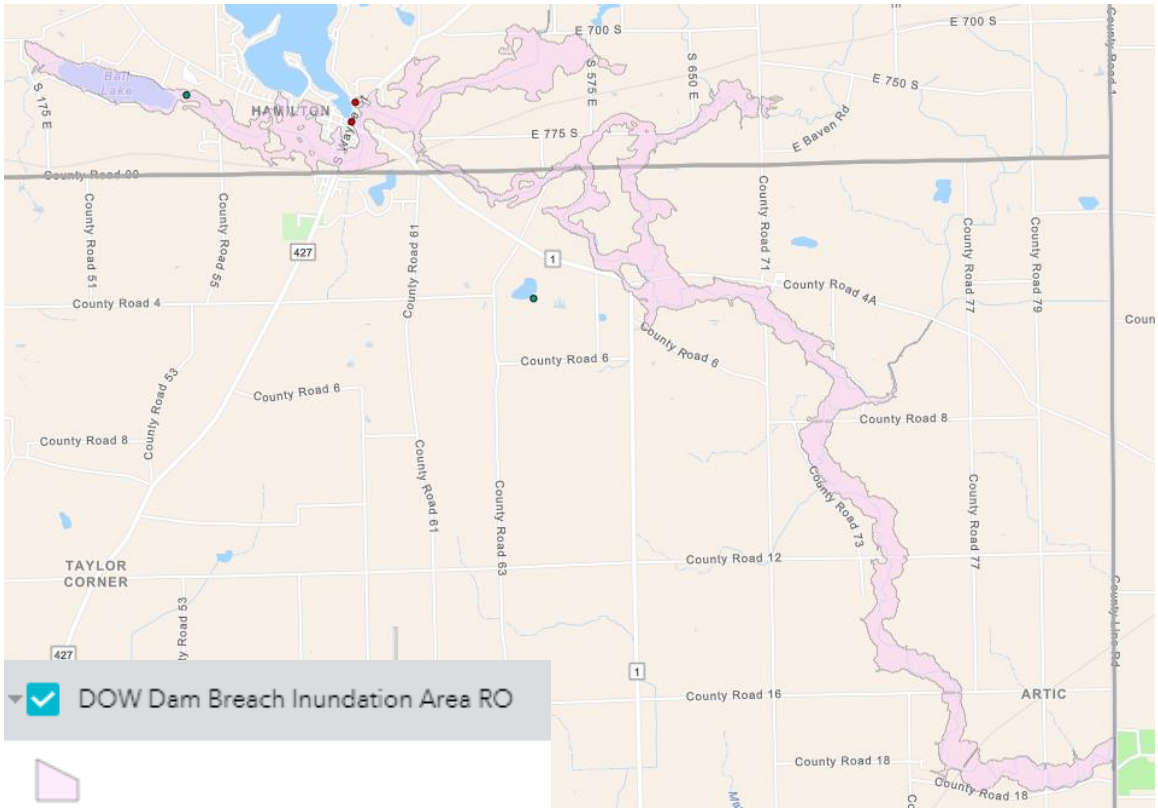


Figure 32: Hamilton Lake Breach Inundation Area

Within DeKalb County, direct and indirect effects from a dam failure may include:

Direct Effects:

- Loss of life and severe damage to downstream homes, industrial and commercial buildings, public utilities, major highways, or railroads
- Loss of use of reservoirs for flood control, recreation, and water supply

Indirect Effects:

- Environmental damage includes altered landscapes, eroded soils, habitat destruction, and loss of wildlife from sudden releases of water
- Water quality impacts if contamination is in the water. This could potentially cause human health problems as well as fish and wildlife injury or death
- Increased response times due to damaged or re-routed transportation routes and/or bridges
- Long lasting economic impacts on the community due to business closures, and relocation of impacted property owners
- Economic impacts also include the cost of property damage, cleanup, and recovery
- Social impacts, such as displacement of people and disruption of communities

Estimating Potential Losses

As of July 1, 2022, the State of Indiana is requiring high hazard dams to have IEAPs developed. These plans have detailed potential dam failure inundation areas identified along with at-risk structures identified. The actual magnitude and extent of damage depends on the type of dam break, the volume of water that is released, and the width of the floodplain valley to accommodate the dam break flood wave. All dam owners are encouraged to develop an IEAP.

The greatest dam or levee failure risk for DeKalb County is a breach of the two high hazard dams in Steuben County or a breach of the two significant hazard dams within the county. The potential inundation path of the high hazard dams shows that the dams could potentially flood State Road 1 and State Road 427.

Utilizing GIS maps and orthoimagery, the infrastructure and other features below this dam can be identified. This imagery will show properties that would be isolated due to the inundation of the roadways leading in and out of the area as well as those properties which would be inundated.

Using the same methods identified in the flood section of this plan the building replacement values were calculated for each community that would be impacted by a sunny-day failure of the Sylvan Lake Dam. The roughly five structures identified to be in the inundation pathway for DeKalb County would cost $817K to replace. Additionally, the entire town of Hamilton is located within the potential inundation area with roughly 112 structures, of which 86% are residential. These structures are estimated to cost $14.3M to replace. Careful consideration should be given to any future development planned for the potential inundation area as it may increase the cost to replace these structures or increase the at-risk population if the Hamilton Lake Dams were to fail.

Future Considerations

As areas near existing levees and dams continue to grow in population, it can be anticipated that the number of critical and non-critical structures could also increase accordingly. Location of these new facilities should be carefully considered, and precautions should be taken to ensure that schools, medical facilities, municipal buildings, and other critical infrastructure are located outside of the delineated or estimated levee and dam failure inundation areas. Also, flood-free access should be provided for these facilities. Using satellite imagery, it was determined that large areas of new development have not yet occurred downstream of the dams in DeKalb County. Until such development or re-development downstream of a dam is prohibited, those areas remain vulnerable to losses and damage associated with a failure of that structure.

It is also particularly important to all downstream communities and property owners that dam IEAPs are developed, kept up-to-date, and routinely exercised to ensure the greatest safety to those within the hazard area. Although not mandated, this is the best management practice for significant and low hazard dams as well.

Relationship to Other Hazards

With the potentially large volumes and velocities of water released during a breach, it can be expected that such a failure would lead to flooding and debris flow within the inundation areas downstream of the dam. Nearby bridges and roads are also in danger of being destroyed or damaged due to a dam failure. Bridges may become unstable, and portions of road surfaces may be washed away. Entire roads may be undermined by the forces of water and debris. Other infrastructure such as utility poles and lines may be damaged as the water and debris flows along.

Buried utility pipes may become exposed due to scouring; all of which may lead to utility failures within the area downstream of the dam failure.

Within DeKalb County many waterways have non-levee embankments built on their banks. These embankments can cause worsened flooding as they restrict the movement of water. Additionally, these embankments cause water to speed up as it is constricted which can increase the risk of flash flooding or cause riverine flooding to become more dangerous and destructive.

Due to flood and debris flow damages, hazardous materials facilities and transportation routes may be damaged resulting in releases. If LP gas tanks are located nearby, they may be torn from their mountings and would become part of the flowing debris as well as leaking their contents from the ruptured service lines.

4.2.11 Hazardous Material Incident

Overview

Hazardous materials are substances that pose a potential threat to life, health, property, and the environment if they are released. These releases create a serious hazard for workers, neighbors, and emergency response personnel. Emergency response to a release of hazardous material may require fire safety, law enforcement, search and rescue, and hazardous materials response units.

As materials are transported for treatment, disposal, or transport to another facility, all infrastructure, facilities, and residences near the transportation routes are at an elevated risk of being affected by a hazardous materials release. Often these releases can cause serious harm to DeKalb County and its residents if proper and immediate actions are not taken. Most releases are the result of human error or improper storage and corrective actions to stabilize these incidents may not always be feasible or practical in nature.

Railways often transport materials that are classified as hazardous and preparations need to be made and exercised for situations such as derailments, train/vehicle crashes, and/or general leaks and spills from transport cars.

Location

During conversations with committee members and through information provided by local news outlets, it was noted that numerous small and moderately sized incidents involving manufacturing facilities and transportation routes have occurred since the development of the original MHMP. However, the number of SARA Title III Tier II facilities utilizing, storing, and/or manufacturing chemicals has decreased over the years as facilities reduce the amount hazardous materials on site. Both Tier II and other chemical facilities as well as businesses and industries rely on just in time delivery which results in an increase in the number of delivery vehicles transporting hazardous materials across the county. Major highways and transportation routes in DeKalb County are:



Figure 33: DeKalb County Transportation Map

- Interstate 69 runs north and south through the county
- US Route 6
- State Roads 1, 3, 4, 8, 101, 205, 327, 427

There are a few major railroads that are in the county including railroads transporting commerce. They include the following:

- CSX Railroad
- NS Railroad
- Fort Wayne to Detroit Railroad

The volume of traffic increases the potential for incidents. (**Figure 33Figure 33: DeKalb County Transportation Map**) DeKalb County does have a hazardous materials response capacity and has mutual aid hazardous materials response capabilities.

Extent and History

According to Indiana Department of of Environmental Management from January 1, 2020 to May 31, 2025 there have been 52 reported spills in DeKalb County. On July 18, 2023, 100 gallons of diesel were spilt in Dekalb County. On October 2, 2024, two gallons of sulfuric acid were spilt in the town of Ashley. On November 6, 2024, a SARA Title III Release occurred releasing 372 pounds of ferrous chloride into the city of Butler. IDEM and local news sources did not discuss any details of any Dekalb County spills. However, it is likely that some of these spills involved mutual aid, long-term cleanup, and road closures. All hazardous material incidents require emergency response.

Probability

According to the committee, the probability of a hazardous materials release or incident on average is "Likely" in all areas due to the number transportation routes within and through county. "Limited" damages are anticipated to result from an incident. The level of damage is dependent upon the location of the event. As with hazards of this nature, a short warning time of less than six hours and a short duration, less than a day or less than a week is anticipated in the event of a hazardous materials incident. A CPRI summary is shown in **Appendix 8**.

Vulnerability

Within DeKalb County, direct and indirect effects from a hazardous material incident may include:

Direct Effects:

- Acute or chronic health issues due to chemical exposure
- Closure of impacted railroad crossings
- Possible crop or livestock damage from chemical exposure
- Damage to infrastructure from leaks, accidents, or recovery operations
- Expense of decontamination and reconstruction of affected structures

Indirect Effects:

- Loss of revenue or production while testing, recovery, and/or reconstruction occurs
- Anxiety or stress related to the event
- Potential evacuation of neighboring structures or facilities
- Evacuation and/or relocation of homeless persons living in the impacted area
- Added expenses detouring traffic around incident location
- Expenses incurred due to response, testing, and cleaning of the affected areas

While the possibility of an incident occurring may be possible, the vulnerability of DeKalb County has been lowered due to the enactment of SARA Title III national, state, and local requirements. SARA Title III, also known as the Emergency Planning and Community Right to Know Act (EPCRA), establishes requirements for planning and training at all levels of government and industry. EPCRA also establishes provisions for citizens to have access to information related to the type and quantity of hazardous materials being utilized, stored, transported, or released within their communities.

One local result of SARA Title III is the formation of the LEPC. This committee has the responsibility for preparing and implementing emergency response plans (ERP), cataloging Safety Data Sheets

(SDS) formerly known as Material Safety Data Sheets (MSDS), creating chemical inventories of local industries and businesses, and reporting materials necessary for compliance.

In DeKalb County, some facilities are subject to SARA Title III provisions due to the presence of listed hazardous materials in quantities at or above the minimum threshold established by the act. These facilities are also required to create and distribute emergency plans and facility maps to local emergency responders such as the LEPC, fire departments, and police departments. With this knowledge on hand, emergency responders and other local government officials can be better prepared to plan for an emergency and the response it would require, and to better prevent serious effects on the community involved.

Additionally, it is important monitor nearby metropolitan areas, such as Fort Wayne, as hazardous materials coming to and from Fort Wayne may move through the county and increase the number of hazardous material incidents.

Estimating Potential Losses



Figure 34: Hazardous Material Spill

The very nature of these events makes predicting the extent of their damage very difficult. A small-scale spill or release might have a minor impact and would require only minimal response efforts. Another slightly larger incident might result in the disruption of business or traffic patterns, and in this situation, might require active control response measures to contain a spill or release, such as in **Figure 34**. However, even small, or moderate events could potentially grow large enough that mass evacuations or shelter in place techniques are needed, multiple levels of response are utilized, and additional hazards such as structural fires or additional hazardous materials releases (or explosions) may occur. Given the unpredictable nature of hazardous materials incident, an estimate of potential losses was not generated.

Future Considerations

Additional facilities, both critical and non-critical in nature, may be affected if a hazardous materials release were to occur along a transportation route. All the state roads are traveled by carriers of hazardous materials. As businesses and industries increase in the area, the increased use of these routes will increase the number of transportation related incidents.

By restricting development within the known hazardous materials facility buffer zones, future losses associated with a hazardous materials release can be reduced. Critical infrastructure should be especially discouraged from being located within these areas. Further, by restricting construction in these zones, the number of potentially impacted residents may also be reduced, lowering the risk for social losses, injuries, and potential deaths. Future construction of hazardous materials facilities should be located away from critical infrastructure such as schools, medical facilities, municipal buildings, and daycares. Such construction would likely reduce the risk to highly populated

buildings and populations with physical or social, emotional, or behavioral challenges or considerations such as children, the elderly, and medically fragile individuals.

Many facilities constructed within close proximity to a hazardous materials facility are similar due to local zoning ordinances. This reduces the risk and vulnerability of some populations. However, there are several facilities and numerous transportation routes located throughout each of the communities making current and future development at risk for losses associated with a hazardous materials release.

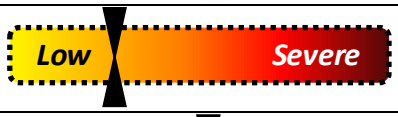
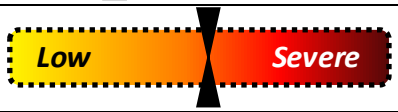
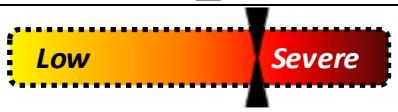
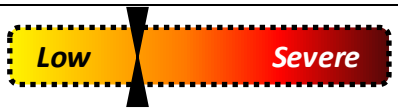
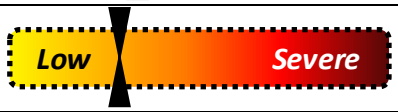
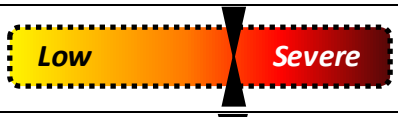
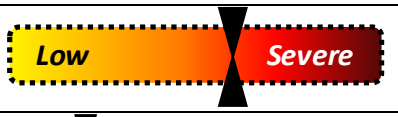
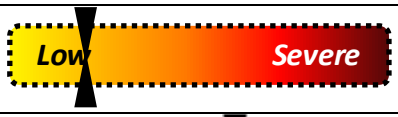
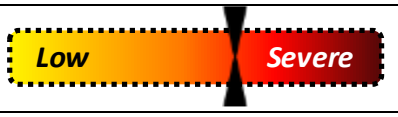
Relationship to Other Hazards

Dependent on the nature of the release, conditions may exist where a fire or spark ignites a flammable or explosive substance. As the fire spreads throughout the facility or the area, structural or property damage will increase. If the hazardous substances are in enclosed containers such as railroad tank cars, cylinders, other containers, or near heat generating events such as a fire, explosion becomes a risk as well. Response times to a hazardous materials incident may be prolonged until all necessary information is collected detailing the type and amount of chemicals potentially involved in the incident. Depending on the nature of the incident, further delays may take place until qualified hazardous materials responders with the appropriate response and monitoring equipment can be transported to the incident location. While this may increase structural losses, it may decrease social losses such as injuries or even deaths.

4.3 Hazard Summary

For the development of this MHMP, the committee utilized the CPRI method to prioritize the hazards which have affected DeKalb County. Hazards were assigned values based on the probability or likelihood of occurrence, the magnitude or severity of the incident, as well as warning time and duration of the incident itself. A weighted CPRI was calculated based on the percent of the county's population present in the individual communities. **Table 19** summarizes the CPRI values for the various hazards studied within this MHMP and their ranking.

Table 19: All CPRI Scores Combined

Type of Hazard	List of Hazards	Weighted Average CPRI	Ranking
Natural	Drought		2.76
	Earthquake		1.88
	Extreme Temperatures		2.65
	Fires and Wildfire		3.15
	Flood		2.09
	Hailstorm, Thunderstorm, and Windstorm		2.92
	Landslide, Land Subsidence, and Fluvial Erosion		1.36
	Tornado		2.88
	Winter Storms and Ice		2.89
Technological	Dam and Levee Failure		1.63
	Hazardous Material Incident		2.90

It is important to understand the cause-and-effect relationship between the hazards selected by the committee. **Table 20** can be utilized to identify those relationships. For example, a winter storm (along

the side of the table) can result in a flood (along the top of the table). In a similar fashion, a hazardous materials incident (along the top of the table) can be caused by an earthquake; flood; tornado; or a winter storm or ice storm (along the side of the table).

Table 20: Hazard Reference Table

EFFECT → / CAUSE ↓	Drought	Earthquake	Extreme Temperatures	Fires and Wildfire	Flood	Hail, Thunder, and Wind	Landslide, Subsidence, and FEH	Tornado	Winter Storms and Ice	Dam and Levee Failure	HazMat Incident
Drought				X							
Earthquake				X			X			X	X
Extreme Temperatures											X
Fires and Wildfire											X
Flood							X			X	X
Hail, Thunder, and Wind				X	X		X			X	X
Landslide, Subsidence, and FEH					X					X	X
Tornado				X						X	X
Winter Storms and Ice					X					X	X
Dam and Levee Failure					X		X				X
HazMat Incident				X							

As a method of better identifying the potential relationships between hazards, the community exhibits can be referenced to indicate the proximity of one or more known hazard areas such as the delineated floodplains and the locations of EHS facilities. For this reason, many of the communities in DeKalb County may be impacted by more than one hazard at a time, depending on certain conditions. It can be anticipated that if a flood were to occur within these areas, there would be a potentially increased risk

of a facility experiencing a hazardous materials incident. These areas may also be at a greater risk of a dam or non-levee embankment failure.

Future development in areas where multiple known hazard areas (dam failure inundation areas, floodplains and surrounding hazardous materials facilities) overlap should undergo careful design, review, and construction protocol to reduce the risk of social, physical, and economic losses due to a hazard incident. While it may certainly be difficult, critical infrastructure should not be constructed within these regions.

The ever-changing climate can also have a significant impact on these hazards. According to NCEI Information the State Climate Summary for Indiana the following observations have been observed based upon climate change:

- The global average temperatures have risen over 1.5°F since the beginning of the 20th Century. Temperatures in the 21st century have been higher than any other historical period with the exception of the early 1930s Dust Bowl era
- Indiana has experienced increases in the number and intensity of rain events while the individual duration of the rain events has been decreasing
- Extreme events are increasing, especially flooding

CHAPTER 5: MITIGATION STRATEGY

This section identifies the overall goal for the development and implementation of the DeKalb County MHMP. A summary of existing and proposed mitigation practices discussed by the committee is also provided.

5.1 MITIGATION GOAL

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

The committee reviewed the mitigation goals as outlined within the previous DeKalb County MHMP and determined that the goals remain valid and effective. In summary, the overall goal of the DeKalb County MHMP is to reduce the social, physical, and economic losses associated with hazard incidents through emergency services, natural resource protection, prevention, property protection, public information, and structural control mitigation practices. The three specific goals to achieve the overall goal of the plan are:

1) Lessen the impacts of disasters and enhance community resilience
2) Minimize the loss of life and injuries caused by disasters
3) Promote mitigation activities both prior to and following a disaster

5.2 MITIGATION PRACTICES

REQUIREMENT §201.6(c)(3)(ii):

[The mitigation strategy shall include a] section that identifies and analyzed a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

REQUIREMENT §201.6(c)(3)(iii):

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

In 2005, the Multi-Hazard Mitigation Council conducted a study about the benefits of hazard mitigation. This study examined grants over a 10-year period (1993-2003) aimed at reducing future damages from earthquakes, wind, and floods. It found that mitigation efforts were cost-effective at reducing future losses; resulted in significant benefits to society; and represented significant potential savings to the federal treasury in terms of reduced hazard-related expenditures. This study found that every $1 spent on mitigation efforts resulted in an average of $4 savings for the community. The study also found that FEMA mitigation grants are cost-effective since they often lead to additional non-federally funded mitigation activities and have the greatest benefits in communities that have institutionalized hazard mitigation programs.

A more recent (2019) study by the National Institute of Building Sciences, reviewed over 20 years of federally funded mitigation grants, not only from FEMA but also from the US Economic Development Administration (EDA) and the US Department of Housing and Urban Development (HUD). From this broadened review, it has been determined that for every $1 spent on mitigation through federal grants, $6 is saved on disaster costs. In addition, it was determined that by adopting all the building codes put forth in the 2015 International Code, $11 can be saved for every $1 invested. Lastly, by designing and construction buildings which exceed select items in the 2015 International Code, $4 can be saved for every $1 invested in those changes.

Six primary mitigation practices defined by FEMA are:

- **Emergency Services** – measures that protect people during and after a hazard
- **Natural Resource Protection** – opportunities to preserve and restore natural areas and their function to reduce the impact of hazards
- **Prevention** – measures that are designed to keep the problem from occurring or getting worse
- **Property Protection** – measures that are used to modify buildings subject to hazard damage rather than to keep the hazard away
- **Public Information** – those activities that advise property owners, potential property owners, and visitors about the hazards, ways to protect themselves and their property from the hazards
- **Structural Control** – physical measures used to prevent hazards from reaching a property

5.2.1 Existing Mitigation Practices

As part of this planning effort, committee members were provided a copy of the prior MHMP's mitigation actions. Committee members reviewed those actions and were asked to consider any and all other mitigation actions based on the hazards discussed in the first meeting. At the second planning committee meeting, the committee discussed the strengths and weaknesses of existing mitigation practices and made recommendations for improvements, as well as suggested new practices. The committee also examined practices employed by neighboring communities assessing the viability of those actions within DeKalb County. The following is a summary of existing hazard mitigation practices within DeKalb County. Mitigation measures that were included in the previous DeKalb County MHMP are noted as such. A list of the former mitigation actions included in the previous MHMP and their status may be found in **Appendix 11**.

Emergency Services

- One stream gage within the county is utilized for flood monitoring, forecasting, and flood warnings for the various streams in the county.
- Current facility maps and response plans have been filed for SARA Title III facilities (2020 Action)
- The DeKalb County LEPC maintains a list of personnel certified to OSHA Technician Level III to respond to hazardous material incidents
- Realistic trainings and exercises are utilized to better prepare emergency personnel for disasters
- DeKalb County has outdoor warning sirens and maintains them in operational condition. The sirens are operated and are regularly tested using a centralized system.
- The DeKalb County EMA maintains current facility maps for SARA Title III facilities to prepare for potential hazardous material incidents

Natural Resource Protection

- Six watershed management plans have been developed to protect and restore the watershed
- DeKalb County and all communities with the exception of the towns of Ashley and Corunna have water conservation ordinances
- DeKalb County, the cities of Garrett and Butler, and the towns of Hamilton, St. Joe, and Waterloo have stormwater ordinances to protect water quality

Prevention

- Reciprocal agreements have been developed for structural inspections following hazard events (2020 Action)
- Trees on public property and rights-of-ways are regularly maintained to prevent reduce the risk of downed utility lines and falling limbs (2020 Action)
- Priority snowplow areas have been designated to prevent accidents on commonly traveled roads (2020 action)

Property Protection

- Critical and essential facilities located within the SFHA are elevating their first floor to or above the Flood Protection Grade (FPG) (2020 Action)
- The DeKalb County Building Department enforces the Indiana building code to ensure structures can withstand hazard events (2020 Action)
- Non-residential structures in known hazard areas within DeKalb County are protected from flooding through acquisition, relocation, elevation, or flood proofing (2020 Action)
- Drainage system maintenance, including repair and replacement of culverts, occurs routinely throughout the county

Public Information

- IDNR is completing an updated flood insurance study within DeKalb (2020 Action)
- The DeKalb County EMA continues to implement best management practices identified in the Stormwater Quality Management Plan (SWQMP) (2020 Action)
- Two dynamic message boards have been installed on I-69 to alert motorists of hazards. Continue to maintain and install additional message boards as funding permits (2020 Action)
- Weather radios are encouraged at all businesses, critical and essential facilities, and residences (2020 Action)
- Social media is utilized to inform residents of hazard information (2020 Action)
- The DeKalb County EMA participates in Severe Weather Awareness Week and Flood Safety Awareness Week (2020 Action)
- The DeKalb County EMA provides information about hazards when community members are focusing on hazards (2020 Action)
- Countywide snow advisory levels have been developed along with designated snow routes with the cities of Auburn, Butler, and Garrett (2014 Action)

Structural Control

- Construction of new critical and essential facilities is now located out of the SFHA, except for when no other locations are available (2020 Action)

5.2.2 Proposed Mitigation Practices

After reviewing existing mitigation practices, the committee reviewed mitigation ideas for each of the hazards studied and identified which of these they felt best met their needs as a community according to selected social, technical, administrative, political, and legal criteria. The following identifies the key considerations for each evaluation criteria:

- **Social** – mitigation projects will have community acceptance, they are compatible with present and future community values, and do not adversely affect one segment of the population
- **Technical** – mitigation projects will be technically feasible, reduce losses in the long-term, and will not create more problems than they solve
- **Administrative** – mitigation projects may require additional staff time, alternative sources of funding, and have some maintenance requirements
- **Political** – mitigation projects will have political and public support
- **Legal** – mitigation projects will be implemented through the laws, ordinances, and resolutions that are in place
- **Economic** – mitigation projects can be funded in current or upcoming budget cycles
- **Environmental** – mitigation projects may have negative consequences on environmental assets such as wetlands, threatened or endangered species, or other protected natural resources

Table 21 lists a summary of all proposed mitigation practices identified for all hazards, as well as information on the local status, local priority, benefit-cost ratio, project location, and responsible entities. Because of the large number of funding opportunities, a list of potential funding sources can be found in **Appendix 12**. The proposed mitigation practices were assigned a priority by the planning team. Projects identified to be of "high" local priority may be implemented within five years from final plan adoption. Projects identified to be of "medium" local priority may be implemented within five-ten years from final plan adoption, and projects identified by the committee to be of "low" local priority may be implemented within 10+ years from final plan adoption. However, depending on availability of funding, some proposed mitigation projects may take longer to implement.

As part of the process to identify potential mitigation projects, the planning committee weighed the benefit derived from each mitigation practice against the estimated cost of that practice. This basic benefit-cost ratio was based on experience and professional judgement and was utilized to identify the mitigation practices as having a high, moderate, or low benefit-cost ratio. Preparing detailed benefit-cost ratios was beyond the scope of this planning effort and the intent of the MHMP.

The update of this MHMP is a necessary step of a multi-step process to implement programs, policies, and projects to mitigate the effect of hazards in DeKalb County. The intent of this planning effort was to identify the hazards and the extent to which they affect the county and to determine what type of mitigation strategies or practices may be undertaken to mitigate these hazards. A FEMA-approved MHMP is required to apply for and/or receive project grants under BRIC, HMGP, and FMA. Although this MHMP meets the requirements of DMA 2000 and eligibility requirements of these grant programs additional detailed studies may need to be completed prior to applying for these grants. **Chapter 6** of this plan includes an implementation plan for all high priority mitigation practices identified by the committee.



The CRS program credits NFIP communities a maximum of 97 points for setting goals to reduce the impact of flooding and other known natural hazards (2 points); identifying mitigation projects that include activities for prevention, property protection, natural resource protection, emergency services, structural control projects, and public information (up to 95 points).

Table 21: Proposed Mitigation Measures

Mitigation Practice	Prior Plan or New	Mitigation Strategy	Hazard Addressed	Proposed Enhancements / Status	Priority	Benefit-Cost Ratio	Potential Primary Funding Source	Potential Responsible Entity
Communications 1. Within the city of Auburn, continue building mass notification app to inform community members about important information	New	☐ Emergency Services ☒ Nat. Res. Protection ☒ Prevention ☒ Property Protection ☐ Public Information ☒ Structural Control	Drought; Earthquake; Extreme Temperatures; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure; Hazardous Material Incident	1. Consider integrating hazard resilience information into the app	High	High	Local Funding	City of Auburn 911 EMA
2. Update and maintain GIS enabled public alert systems or county communications facility	Prior		Drought; Earthquake; Extreme Temperatures; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure; Hazardous Material Incident	2. Continue to explore methods for reverse 911, texting notifications, rapid SOS, and school alerting	High		State Funding Local Funding	DeKalb County GIS DeKalb County Central Communications Department EMA
3. Expand communications backup for simulcast towers within the county	New		Drought; Earthquake; Extreme Temperatures; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure; Hazardous Material Incident	3. Identify potential funding sources for installations and upgrades	High		SHSP Grant AFG Grant	EMA
4. Explore methods for radio encryption for the Auburn Police Department	New		Drought; Earthquake; Extreme Temperatures; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure; Hazardous Material Incident	4. Explore funding options for police radio encryption	High		HSGP Grant HMGP Grant	City of Auburn Police Chief Cory Heffelfinger EMA

Mitigation Practice	Prior Plan or New	Mitigation Strategy	Hazard Addressed	Proposed Enhancements / Status	Priority	Benefit-Cost Ratio	Potential Primary Funding Source	Potential Responsible Entity
5. Promote communication across multiple channels throughout the county	New		Drought; Earthquake; Extreme Temperatures; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure; Hazardous Material Incident	5. Prevent communication from being entirely digitally based	High		SHSP Grant EMPG Grant	Ashley-Hudson Volunteer Fire Rescue Chief Dave Barrand; Auburn Fire Department Chief Doug Cox; Butler Volunteer Fire Department Chief; Concord Volunteer Fire Department Chief Mike Georgi; Corunna Volunteer Fire Department Chief Sean Harrel; Garrett Volunteer Fire Department Chief Doug Castator; Hamilton Fire Department Chief Danny Lingo; Jackson Volunteer Fire Corporation Chief Josh Fike; Laotto Volunteer Fire Department Chief Jay Squadrito; Spencerville Volunteer Fire Department Chief Julie Rotz; Waterloo-Grant Township Fire Department Chief Kirby Hobbs DeKalb County EMS Director Brett Steffen DeKalb County Sheriff Brady Thomas; City of Auburn Police Chief Cory Heffelfinger; City of Butler Police Chief Matt Traster; City of Garrett Police Chief Mark Heffelfinger; Town of Ashley Police Department Chief Scott Barnhart; Town of Hamilton Police Chief Jeremy Warner; and Town of Waterloo Police Chief Jay Oberholzer EMA
6. Develop a committee to combine hazard data into a package rather than continuing single agency data releases	New		Drought; Earthquake; Extreme Temperatures; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure; Hazardous Material Incident	6. Explore publishing hazard data packages through multiple channels	Moderate		Local Funding	EMA

Mitigation Practice	Prior Plan or New	Mitigation Strategy	Hazard Addressed	Proposed Enhancements / Status	Priority	Benefit-Cost Ratio	Potential Primary Funding Source	Potential Responsible Entity
<u>Emergency Preparedness and Warning</u> 1. Implement and maintain a voluntary immunization program for all emergency responders, inspection staff, and families	New	☒ Emergency Services ☒ Nat. Res. Protection ☒ Prevention ☒ Property Protection ☒ Public Information ☐ Structural Control	Drought; Earthquake; Extreme Temperatures; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure; Hazardous Material Incident	1. Explore expanding the immunization program	High	High to Moderate	PA Grant CDC Grants	DeKalb County Health Department Director Cherly Lynch EMA
2. Explore training options for the Auburn, Ashley, and Waterloo Fire Departments	Prior		Fire and Wildfire; Hazardous Material Incident	2. Identify funding to fulfill current vision of training including regional facility for hazardous material incident training and hazardous material technology training	High		AFG Grants Local Funding	Ashley-Hudson Volunteer Fire Rescue Chief Dave Barrand; Auburn Fire Department Chief Doug Cox; and Waterloo-Grant Township Fire Department Chief Kirby Hobbs EMA
3. Explore the creation of a communicable disease plan discussing both animal and human-based diseases to promote resiliency prior to an event occurring	New		Drought; Earthquake; Extreme Temperatures; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure; Hazardous Material Incident	3. Identify funding and consider which diseases may be the greatest risk to Dekalb County	High		CDC Grant Local Funding	DeKalb County Health Department Director Cherly Lynch EMA
4. Increase emergency services, fire department, police department staffing	New		Earthquake; Extreme Temperatures; Fires and Wildfire; Flood; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure; Hazardous Material Incident	4. Identify potential funding sources for additional staffing	High		SAFER Grant CHP Grant	Ashley-Hudson Volunteer Fire Rescue Chief Dave Barrand; Auburn Fire Department Chief Doug Cox; Butler Volunteer Fire Department Chief; Concord Volunteer Fire Department Chief Mike Georgi; Corunna Volunteer Fire Department Chief Sean Harrel; Garrett Volunteer Fire Department Chief Doug Castator; Hamilton Fire Department Chief Danny Lingo; Jackson Volunteer Fire Corporation Chief Josh Fike; Laotto Volunteer Fire Department Chief Jay Squadrito; Spencerville Volunteer Fire Department Chief Julie Rotz; Waterloo-Grant Township Fire Department Chief Kirby Hobbs DeKalb County EMS Director Brett Steffen DeKalb County Sheriff Brady Thomas; City of Auburn Police Chief Cory Heffelfinger; City of Butler Police Chief Matt Traster; City of Garrett Police Chief Mark Heffelfinger; Town of Ashley Police Department Chief Scott Barnhart; Town of Hamilton Police Chief Jeremy Warner; and Town of Waterloo Police Chief Jay Oberholzer EMA

Mitigation Practice	Prior Plan or New	Mitigation Strategy	Hazard Addressed	Proposed Enhancements / Status	Priority	Benefit-Cost Ratio	Potential Primary Funding Source	Potential Responsible Entity
5. Identify shortfalls of current realistic training and exercises and implement changes as necessary	Prior		Earthquake; Extreme Temperatures; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure; Hazardous Material Incident	5. Identify goals for each training and exercise to help build specific skills	Moderate		AFG Grants Local Funding	EMA
6. Prepare and distribute information on "Ready-Go Kits" for homes and businesses to ensure preparedness in a hazard events	Prior		Earthquake; Fires and Wildfire; Flood; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure	6. Utilize Ready.Gov schedule to continue monthly outreach calendar	Moderate		EMPG Grant HSGP Grant	American Red Cross (ARC) EMA
7. Increase the number of firefighters on a shift from three to six at the city of Butler fire department	New		Fire and Wildfire	7. Identify funding to have three shifts of six firefighters	Moderate		AFG Grants Local Funding	Butler Volunteer Fire Department Chief EMA
8. Continue developing the school safety plan	New		Drought; Earthquake; Extreme Temperatures; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure; Hazardous Material Incident	8. Explore potential methods to further protect schools and students	Moderate		School Violence Prevention Program PA Grant	DeKalb County Sheriff Brady Thomas DeKalb Central Schools Superintendent Steve Teders; DeKalb Eastern Schools Superintendent Ryan Abbott; Garrett Schools Superintendent Dan Durrwachter; Hamilton Schools Superintendent William Reichhart; and Lakewood Park Schools Superintendent Roy Andrews EMA
9. Create large attendance event plans	New		Earthquake; Extreme Temperatures; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Tornado; Winter Storms and Ice; Dam and Levee Failure	9. Identify large event leaders and work together to promote safety	Moderate		Local Funding	EMA
10. Install additional outdoor warning sirens, maintained by jurisdiction as needed	Prior		Hailstorm, Thunderstorm, and Windstorm; Tornado	10. Implement outdoor warning sirens in accordance with county requirements	Low		HMGP Grant NGWSGP Grant	EMA
11. Explore adopting an ordinance to require developers to install outdoor warning sirens	Prior		Hailstorm, Thunderstorm, and Windstorm; Tornado	11. Explore potential need of develop-based outdoor warning sirens throughout the county	Low		Local Funding	DeKalb County Board of Commissioners President Jim Miller EMA
12. Where appropriate, continue to encourage burying new and retrofitted utilities to reduce exposure to hazards	Prior		Flood; Hailstorm, Thunderstorm, and Windstorms; Tornado; Winter Storms and Ice	12. Update and maintain locations of utilities in known hazard areas	Low		BRIC Grant GRIP Grant	DeKalb County Utility Companies EMA

Mitigation Practice	Prior Plan or New	Mitigation Strategy	Hazard Addressed	Proposed Enhancements / Status	Priority	Benefit-Cost Ratio	Potential Primary Funding Source	Potential Responsible Entity
Power Back Up Generators 1. Encourage power back-up generators in all critical facilities	Prior	☒ Emergency Services ☐ Nat. Res. Protection ☒ Prevention ☒ Property Protection ☐ Public Information ☐ Structural Control	Earthquake; Extreme Temperatures; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure	1. Critical facilities within Ashley and Corunna need generators; Schools and libraries still need generators	High	Moderate	HMGP Grant BRIC Grant	Critical Facility Leaders EMA
2. Inventory available generator locations	New		Earthquake; Extreme Temperatures; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure	2. Contact NIPSCO to identify priority critical care customer list and priority restore list	High		Local Funding	EMA
3. Secure a back-up generator or other alternative power source for the Garrett Public Library	New		Earthquake; Extreme Temperatures; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure	3. Identify funding sources for alternative power sources	High		HMGP Grant BRIC Grant	Garret Public Library Director Nick Stephan EMA
4. Procure a back-up generator for the Waterloo Library to allow the building to serve as a community shelter	New		Earthquake; Extreme Temperatures; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure	4. Secure funding for the library's back-up generator	Moderate		HMGP Grant BRIC Grant	Waterloo Public Library Director Jenny Buchs EMA
Public Education and Outreach 1. Increase hazard preparedness literature at community events, at libraries and public facilities, and on social media	New	☒ Emergency Services ☒ Nat. Res. Protection ☒ Prevention ☒ Property Protection ☒ Public Information ☐ Structural Control	Drought; Earthquake; Extreme Temperatures; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure; Hazardous Material Incident	1a. Consider adding information to community websites (Such as County website, fire departments, and police departments); Utilize premade brochures and Purdue extension information 1b. Identify regular community events and ensure information is distributed	High	Moderate	Local Funding	Auburn Public Library Director Valerie Simmons; Butler Public Library Director Sarah Dempsey; Garret Public Library Director Nick Stephan; and Waterloo Public Library Director Jenny Buchs Public Facility Leaders EMA
2. Work with ARC to drive general hazard outreach	New		Drought; Earthquake; Extreme Temperatures; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure; Hazardous Material Incident	2. Create a group outreach plan between the EMA director and the ARC leadership	High		Local Funding	ARC EMA

Mitigation Practice	Prior Plan or New	Mitigation Strategy	Hazard Addressed	Proposed Enhancements / Status	Priority	Benefit-Cost Ratio	Potential Primary Funding Source	Potential Responsible Entity
3. Coordinate with schools to carry out career training for fire department	New		Fire and Wildfire	3. Explore funding and standup program	High		Local Funding	Ashley-Hudson Volunteer Fire Rescue Chief Dave Barrand; Auburn Fire Department Chief Doug Cox; Butler Volunteer Fire Department Chief; Concord Volunteer Fire Department Chief Mike Georgi; Corunna Volunteer Fire Department Chief Sean Harrel; Garrett Volunteer Fire Department Chief Doug Castator; Hamilton Fire Department Chief Danny Lingo; Jackson Volunteer Fire Corporation Chief Josh Fike; Laotto Volunteer Fire Department Chief Jay Squadrito; Spencerville Volunteer Fire Department Chief Julie Rotz; Waterloo-Grant Township Fire Department Chief Kirby Hobbs DeKalb Central Schools Superintendent Steve Teders; DeKalb Eastern Schools Superintendent Ryan Abbott; Garrett Schools Superintendent Dan Durrwachter; Hamilton Schools Superintendent William Reichhart; and Lakewood Park Schools Superintendent Roy Andrews EMA
Safer Rooms and Community Shelters 1. Develop long and short-term agreements for animal shelters	Prior	☒ Emergency Services ☐ Nat. Res. Protection ☐ Prevention ☐ Property Protection ☒ Public Information ☒ Structural Control	Earthquake; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure; Hazardous Material Incident	1. Community members have identified a large need for domestic animal shelters when preparing for and after hazard events	High	Moderate	Local Funding	EMA DeKalb County Building Commissioner Jeff Martin; City of Auburn Planning and Building Development Administrator Ryan Shambaugh DeKalb County Purdue Extension Representative Elysia Rodgers DeKalb County Animal Control
2. Encourage safe rooms in mobile home parks	Prior		Earthquake; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure; Hazardous Material Incident	2. Continue to enforce code requirement for safe rooms	Low		Indiana Residential Safe Room Program HMA Grant	EMA Mobile Home Park Owners
3. Explore the creation of a safe room in the airport	New		Earthquake; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure; Hazardous Material Incident	3. Identify potential costs or security concerns with using the airport as a safe room	Low		HMA Grant Local Funding	DeKalb County Airport Manager Russ Couchman EMA

Mitigation Practice	Prior Plan or New	Mitigation Strategy	Hazard Addressed	Proposed Enhancements / Status	Priority	Benefit-Cost Ratio	Potential Primary Funding Source	Potential Responsible Entity
4. Explore retrofitting the Garrett Public Library to be a red cross shelter	New		Earthquake; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure; Hazardous Material Incident	4. Identify the feasibility of retrofitting the library to be a shelter	Low		HMA Grant Local Funding	Garret Public Library Director Nick Stephan EMA
Building Protection 1. Explore enforcing stricter code requirements on critical facilities up to the 0.2% AEP floodplain	Prior	☒ Emergency Services ☒ Nat. Res. Protection ☒ Prevention ☒ Property Protection ☐ Public Information ☒ Structural Control	Flood	1. Identify facilities within the 0.2% AEP floodplain	High	Moderate	Local Funding	DeKalb County Floodplain Administrator Chrisopher Gaumer; City of Auburn Floodplain Administrator Ryan Shambaugh; City of Butler Floodplain Administrator Andrew Provines; City of Garrett Floodplain Administrator Madalyn Sade-Bartl; Town of Altona Floodplain Administrator Terry Wahn; Town of Hamilton Floodplain Administrator Brent Shull; Town of St. Joe Floodplain Administrator Randy Drake; and Town of Waterloo Floodplain Administrator Brittanie Hobbs EMA
2. Verify that manufactured homes meet the manufacturer's minimum installation standards	Prior		Flood; Hailstorm, Thunderstorm, and Windstorms; Tornado; Winter Storms and Ice	2. Identify locations where manufactured homes are common and focus efforts accordingly	Moderate		Local Funding	DeKalb County Building Commissioner Jeff Martin EMA
3. Hire an additional inspector to assist with structural inspections following a disaster	New		Earthquake; Fires and Wildfire; Flood; Hailstorm, Thunderstorm, and Windstorm; Landslide, Land Subsidence, and Fluvial Erosion; Tornado; Winter Storms and Ice; Dam and Levee Failure; Hazardous Material Incident	3. Explore funding options for an additional inspector	Low		Local Funding	DeKalb County Building Commissioner Jeff Martin EMA
Community Rating System (CRS) 1. Reduce flood insurance premiums through participation in the CRS Program	Prior	☒ Emergency Services ☒ Nat. Res. Protection ☒ Prevention ☒ Property Protection ☒ Public Information ☐ Structural Control	Flood	1. Explore methods to increase reductions in flood insurance premiums for all communities	Moderate	High	BRIC Grant Local Funding	DeKalb County Floodplain Administrator Chrisopher Gaumer; City of Auburn Floodplain Administrator Ryan Shambaugh; City of Butler Floodplain Administrator Andrew Provines; City of Garrett Floodplain Administrator Madalyn Sade-Bartl; Town of Altona Floodplain Administrator Terry Wahn; Town of Hamilton Floodplain Administrator Brent Shull; Town of St. Joe Floodplain Administrator Randy Drake; and Town of Waterloo Floodplain Administrator Brittanie Hobbs EMA

Mitigation Practice	Prior Plan or New	Mitigation Strategy	Hazard Addressed	Proposed Enhancements / Status	Priority	Benefit-Cost Ratio	Potential Primary Funding Source	Potential Responsible Entity
<u>Floodplain Management</u> 1. Maintain current level of resilience through continued adoption of Maumee River Basin Commission (MRBC), or more restrictive, floodplain ordinances	Prior	☒ Emergency Services ☒ Nat. Res. Protection ☒ Prevention ☒ Property Protection ☒ Public Information ☒ Structural Control	Flood	1. Explore the adoption of floodplain ordinances in the towns of Ashley and Corunna	High	High to Moderate	Local Funding	DeKalb County Floodplain Administrator Chrisopher Gaumer; City of Auburn Floodplain Administrator Ryan Shambaugh; City of Butler Floodplain Administrator Andrew Provines; City of Garrett Floodplain Administrator Madalyn Sade-Bartl; Town of Altona Floodplain Administrator Terry Wahn; Town of Hamilton Floodplain Administrator Brent Shull; Town of St. Joe Floodplain Administrator Randy Drake; and Town of Waterloo Floodplain Administrator Brittanie Hobbs EMA
2. Continue to conduct new Approximate and/or Detailed Flood Insurance Studies of all outdated unnumbered Zone A streams within Dekalb County	Prior		Flood	2. Identify approximate areas to be studied	High		FMA Grant BRIC Grant	DeKalb County Floodplain Administrator Chrisopher Gaumer; City of Auburn Floodplain Administrator Ryan Shambaugh; City of Butler Floodplain Administrator Andrew Provines; City of Garrett Floodplain Administrator Madalyn Sade-Bartl; Town of Altona Floodplain Administrator Terry Wahn; Town of Hamilton Floodplain Administrator Brent Shull; Town of St. Joe Floodplain Administrator Randy Drake; and Town of Waterloo Floodplain Administrator Brittanie Hobbs County Surveyor Glenn Crawford EMA
3. Maintain channels and regulated drains to prevent flooding	Prior		Flood	3. Survey the county for common blockage areas	High		Local Funding	County Surveyor Glenn Crawford DeKalb County Floodplain Administrator Chrisopher Gaumer; City of Auburn Floodplain Administrator Ryan Shambaugh; City of Butler Floodplain Administrator Andrew Provines; City of Garrett Floodplain Administrator Madalyn Sade-Bartl; Town of Altona Floodplain Administrator Terry Wahn; Town of Hamilton Floodplain Administrator Brent Shull; Town of St. Joe Floodplain Administrator Randy Drake; and Town of Waterloo Floodplain Administrator Brittanie Hobbs EMA

Mitigation Practice	Prior Plan or New	Mitigation Strategy	Hazard Addressed	Proposed Enhancements / Status	Priority	Benefit-Cost Ratio	Potential Primary Funding Source	Potential Responsible Entity
4. Increase flood forecasting capabilities within Dekalb County through gage stations and flood alerts	Prior		Flood	4a. Install and maintain a stream gage in Waterloo along Cedar Creek 4b. Determine funding sources to install and maintain additional river gages	Low		HMGP Grant BRIC Grant	DeKalb County Floodplain Administrator Chrisopher Gaumer; City of Auburn Floodplain Administrator Ryan Shambaugh; City of Butler Floodplain Administrator Andrew Provines; City of Garrett Floodplain Administrator Madalyn Sade-Bartl; Town of Altona Floodplain Administrator Terry Wahn; Town of Hamilton Floodplain Administrator Brent Shull; Town of St. Joe Floodplain Administrator Randy Drake; and Town of Waterloo Floodplain Administrator Brittanie Hobbs EMA
5. Continue to identify and protect structures from known hazard areas through acquisition, relocation, elevation, or flood proofing (non-residential)	Prior		Flood	5. Identified locations include E. 11th St. Acquisition (Auburn); Waterloo North and East of Cedar Lane; 2 Regional detention locations North and South of Auburn	Low		HMA Grant Local Funding	DeKalb County Floodplain Administrator Chrisopher Gaumer; City of Auburn Floodplain Administrator Ryan Shambaugh; City of Butler Floodplain Administrator Andrew Provines; City of Garrett Floodplain Administrator Madalyn Sade-Bartl; Town of Altona Floodplain Administrator Terry Wahn; Town of Hamilton Floodplain Administrator Brent Shull; Town of St. Joe Floodplain Administrator Randy Drake; and Town of Waterloo Floodplain Administrator Brittanie Hobbs EMA
<u>Hazardous Materials</u> 1. Identify additional locations for dynamic message boards along roadways	Prior		Hazardous Material Incident	1. Once identified prioritize and install as funds become available	Low		SS4A Grant TSIP Grant	DeKalb County Highway Department Ben Parker EMA
<u>Stormwater</u> 1. Minimize impacts of flooding by diverting or retaining stormwater per county ordinance	Prior	☐ Emergency Services ☒ Nat. Res. Protection ☒ Prevention ☒ Property Protection ☐ Public Information ☒ Structural Control	Flood	1. Identify locations where stormwater runoff may be contributing to flooding	High	Moderate to High	Local Funding	DeKalb County Floodplain Administrator Chrisopher Gaumer; City of Auburn Floodplain Administrator Ryan Shambaugh; City of Butler Floodplain Administrator Andrew Provines; City of Garrett Floodplain Administrator Madalyn Sade-Bartl; Town of Altona Floodplain Administrator Terry Wahn; Town of Hamilton Floodplain Administrator Brent Shull; Town of St. Joe Floodplain Administrator Randy Drake; and Town of Waterloo Floodplain Administrator Brittanie Hobbs EMA

CHAPTER 6: IMPLEMENTATION PLAN

The following is a proposed plan for implementing all high priority mitigation practices identified in this plan. It should be noted that implementation of each of these proposed practices may involve several preparatory or intermediary steps. However, to maintain clarity, not all preparatory or intermediary steps are included.

6.1 BUILDING PROTECTION

Explore enforcing stricter code requirements on critical facilities up to the 0.2% AEP floodplain. Identify facilities within the 0.2% AEP floodplain

- Calculate the potential costs of replacing the identified structures should a 0.2% AEP flood occur
- Decide whether to enforce stricter code requirements
- Breakdown flood costs by community and utilize to promote stricter code requirements

6.2 COMMUNICATIONS

Within the city of Auburn, continue building mass notification app to inform community members about important information. Consider integrating hazard resilience information into the app.

- Calculate the average cost to integrate hazard resilience information
- Decide if the county should move forward with integration
- Regularly reconsider adding information if the city decided not to integrate or regularly review the information to find improvements in communications

Update and maintain GIS enabled public alter systems or county communications facility. Continue to explore methods for reverse 911, texting notifications, rapid SOS, and school alerting.

- Work with community members to decide which method(s) of public alters would be most effective
- Decide on methods of altering the public
- Regularly review methods of public alert and make changes as necessary

Expand communications backup for simulcast towers within the county. Identify potential funding sources for installations and upgrades.

- Identify areas with needed expansions or upgrades
- Once funding has been secured install/upgrade towers
- Regularly review communications capabilities and expand further as needed

Explore methods for radio encryption for the Auburn Police Department. Explore funding options for police radio encryption.

- Identify and rank methods for radio encryption based on cost and feasibility
- Choose the police radio encryption method that is best for the city
- Regularly review the selected police encryption method for improvement

Promote communication across multiple channels throughout the county. Prevent communication from being entirely digitally based.

- Identify current methods of communication within the county
- Explore methods to bolster forms of communication that are lacking
- Communicate with others to encourage communication through multiple methods

6.3 EMERGENCY PREPAREDNESS AND WARNING

Implement and maintain a voluntary immunization program for all emergency responders, inspection staff, and families. Explore expanding the immunization program.

- Identify the number of individuals who participated in the current immunization program
- Based on current participation, decide if an expansion would be effective
- Regularly review the number of participants and encourage more to participate

Explore training options for the Auburn, Ashley, and Waterloo Fire Departments. Identify funding to fulfill current vision of training including regional facility for hazardous material incident training and hazardous material technology training.

- Collaborate with nearby counties to reduce the overall cost of training if necessary
- Identify methods to teach hazardous material response training to fire fighters
- Implement training and identify future improvements to make to training

Explore the creation of a communicable disease plan discussing both animal and human-based diseases to promote resiliency prior to an event occurring. Identify funding and consider which diseases may be the greatest risk to DeKalb County.

- Explore type of communicable diseases that are common within DeKalb County and prioritize them based on impacts to the county and likelihood of an outbreak
- Form a collaborative planning team with multiple agencies to increase the effectiveness of the plan
- Develop the plan with input from the collaborative planning team

Increase emergency services, fire department, police department staffing. Identify potential funding sources for additional staffing.

- Once funding has been secured, prioritize departments based on need for additional staffing
- Hire staff based on the priority list
- Hire additional staff as funding becomes available

6.4 FLOODPLAIN MANAGEMENT

Maintain current level of resilience through continued adoption of Maumee River Basin Commission, (MRBC) or more restrictive, floodplain ordinances. Explore the adoption of floodplain ordinances in the towns of Ashley and Corunna.

- Identify current limitations of the ordinance
- Draft a new ordinance to remedy limitations
- Regularly review the effectiveness of the ordinance and make recommendations for further updates

Continue to conduct new Approximate and/or Detailed Flood Insurance Studies of all outdated unnumbered Zone A streams within Dekalb County. Identify approximate areas to be studied.

- Identify current flood insurance studies that need corrections and prioritize
- Work with FEMA to conduct new flood insurance studies
- Regularly review the counties studies and conduct new studies

Maintain channels and regulated drains to prevent flooding. Survey the county for common blockage areas.

- Survey DeKalb County for common blockage areas and prioritize based on typical severity of blockage and the number of individuals, structures, and fields affected by the blockage
- Establish a team for maintaining the channels and regulated drains after a hazard event
- Regularly identify additional areas of blockages and reprioritize areas

6.5 POWER BACK-UP GENERATORS

Encourage power back-up generators in all critical facilities. Critical facilities within Ashley and Corunna need generators; Schools and libraries still need generators.

- Identify potential funding sources for back-up generators
- Prioritize remaining critical and essential facilities based on need
- As funding becomes available, provide additional generators for the facilities

Inventory available generator locations. Contact NIPSCO to identify priority critical care customer list and priority restore list.

- Using the list of priority critical care customers and priority restore list from NIPSCO prioritize generator locations
- Identify funding sources for additional generators
- As funding becomes available, provide generators to facilities on the priority critical care customer list and the priority restore list

Secure a back-up generator or other alternative power source for the Garrett Public Library. Identify funding sources for alternative power sources.

- Identify cost differences between a back-up generator and other power sources
-
- Based on the needs of the Garrett Public Library, select an alternative power source

6.6 PUBLIC EDUCATION AND OUTREACH

Increase hazard preparedness literature at community events, at libraries and public facilities, and on social media. Consider adding information to community websites (Such as County website, fire departments, and police departments); Utilize premade brochures and Purdue extension information. Identify regular community events and ensure information is distributed.

- Identify sources of hazard literature such as FEMA, NOAA, and NWS
- Identify libraries within the county and supply them with literature
- Regularly supply libraries with additional literature as new sources are found

Work with ARC to drive general hazard outreach. Create a group outreach plan between the EMA director and the ARC leadership.

- Discuss outreach approaches with the ARC
- Select the best outreach approach based on DeKalb County
- Regularly identify new methods to drive outreach within the county

Coordinate with schools to carry out career training for fire department. Explore funding and standup program.

- Identify schools within DeKalb County
- Establish career days with schools and classrooms showcasing the impact that fire fighters have on the community
- Explore implementing a standup program with the schools

6.7 SAFE ROOMS AND COMMUNITY SHELTERS

Develop long and short-term agreements for animal shelters. Community members have identified a large need for domestic animal shelters when preparing for and after hazard events

- Identify animal shelters within DeKalb County
- Coordinate with shelter leaders to develop agreements for the sheltering of community member's pets after hazard events
- Regularly communicate with shelter leaders and encourage them to develop agreements

6.8 STORMWATER

Minimize impacts of flooding by diverting or retaining stormwater per county ordinance. Identify locations where stormwater runoff may be contributing to flooding.

- Identify locations within the county with high stormwater runoff and prioritize
- Identify potential solutions for runoff
- Idnetify potential funding sources to implement solutions

CHAPTER 7: PLAN MAINTENANCE PROCESS

7.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

REQUIREMENT §201.6(c)(4)(i):

[The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

To effectively reduce social, physical, and economic losses in DeKalb County, it is important that implementation of this MHMP be monitored, evaluated, and updated. The EMA Director is ultimately responsible for the MHMP. As illustrated in Section 5.2 Mitigation Practices, this plan contains mitigation program, projects, and policies from multiple departments within each incorporated community. Depending on grant opportunities and fiscal resources, mitigation practices may be implemented independently, by individual communities, or through local partnerships. Therefore, the successful implementation of this MHMP will require the participation and cooperation of the entire committee to successfully monitor, evaluate, and update the DeKalb County MHMP.

The EMA Director will reconvene with the MHMP committee on an annual basis and following a significant hazard incident. The team will examine each mitigation action within the plan to evaluate its effectiveness by answering the following questions:

- Has the nature, magnitude, and/or type of risk changed? If so, what new mitigation actions are needed to address this change?
- Are the current resources appropriate for implementation? If not, what additional resources are needed to address the shortfall?
- Are there implementation problems, such as technical, political, legal, or coordination issues with other agencies? How can these issues be addressed?
- Have the outcomes occurred as expected? If not, is something else needed to achieve the desired outcome?
- Have the agencies and other partners participated as originally proposed? If not, determine why and how the action outcomes can be met?

During the annual meetings, the Implementation Checklist provided in **Appendix 13** will be helpful to track any progress, successes, and problems experienced. This will also be a tool to follow up on the progress made and effectiveness of the planned actions.

The data used to prepare this MHMP was based on "best available data" or data that was readily available during the development of this plan. Because of this, there are limitations to the data. As more accurate data becomes available, updates should be made to the list of essential facilities and infrastructure, the risk assessment, and vulnerability analysis.

DMA 2000 requires local jurisdictions to update and resubmit their MHMP within five years (from the date of FEMA approval) to continue to be eligible for mitigation project grant funding. In DeKalb County, the EMA Director will once again reconvene the MHMP committee for a series of meetings designed to replicate the original planning process. Information gathered following individual hazard incidents and annual meetings will be utilized along with updated vulnerability assessments to assess the risks associated with each hazard common in DeKalb County. These hazards, and associated mitigation goals and practices will be prioritized and detailed as in Section 4.0 this MHMP. Sections 5.0 and 6.0 will be updated to reflect any practices implemented within the interim as well as any additional practices

discussed by the committee during the update process. The plan update process will incorporate new planning guidance and best practices as planning requirements are updated.

Prior to submission of the updated MHMP, at a public meeting, such as the county commissioners meeting, a representative of the planning team will present information about the plan to residents of Dekalb County and will provide them with an opportunity for review and comment of the draft MHMP. A media release will be issued providing information related to the update, the planning process, and details of the public invitation to review and comment on the plan update.

7.2 INCORPORATION INTO EXISTING PLANNING MECHANISMS

REQUIREMENT §201.6(c)(4)(ii):

[The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as the comprehensive or capital improvements, when appropriate.

Over the past five years the county and its communities have developed other planning mechanisms such as a comprehensive plan. The DeKalb County Comprehensive Plan from 2017 discusses multiple topics that relate to this plan. The plan discusses flooding and how the county has adopted the states floodplain model ordinance to prevent development within the floodplain. This will help prevent the county's payments within the NFIP from rising and will mitigate the potential impacts from flooding. Additionally, the plan discusses roadways and their safety. The plan sets a goal to maintain their roadways and upgrade when possible. These measures will help to prevent accidents which could lead to a hazardous materials incident. Lastly, the entirety of plan contains discussions of economic growth and resilience. If the county has more available funds they will be able to complete more of their mitigation actions. This plan aims to identify and mitigate potential hazards for the county which can, in turn, help the county complete their Comprehensive Plan goals.

Many of the mitigation practices identified as part of this planning process are ongoing with some enhancement needed. Where needed, modifications will be proposed for each NFIP communities' planning documents and ordinances during the regularly scheduled update including comprehensive plans, floodplain management plans, zoning ordinances, site development regulations, and permits. Modifications include discussions related to hazardous material facility buffers, floodplain areas, and discouraging development of new essential facilities and infrastructure in known hazard areas.

The MHMP will be used to update stormwater, subdivision and zoning ordinances based upon recommendations from the plan. For example, information in this plan provides documentation to encourage local officials to make changes to reduce release rates, protect floodplains, provide no net loss in SFHA areas, and manage erosion and sediment control. These measures would help mitigate flooding. Recommendations within this plan could initiate new ordinances or studies, such as flood studies, flood response studies, and watershed management studies to protect against floods. The information included in this plan can be helpful in preparing comprehensive plans, transportation plans, and emergency plans to mitigate hazard material impacts and response to hazards such as tornados. These plans also illustrate the importance of planning on the unserved populations and how to develop mitigation efforts that include them in future plans.

In DeKalb County this is a similarly timed process. As the county embarks upon their ordinance updates, information is shared with the cities and towns, and the incorporated communities. Each community then evaluates the materials provided by the county and will seek adoption or incorporation on a similar schedule. This process has worked well in the past and is the anticipated method of future incorporation of materials into plan and ordinance updates. In a similar fashion the updating of comprehensive community plan, park plans, etc. will be able to incorporate at risk population information as well as

mitigation action opportunities. **Table 22** is an example of the process the communities use to incorporate planning elements into other community plans and ordinances.

Table 22: MHMP Incorporation Process

Step	Description of Process Action
1	Adopt MHMP at Commissioner meeting, City Council meeting, or Town Council meeting
2	Identify document update cycles for each of the following:
	a) Comprehensive Plan b) Capital Improvement Plan c) Zoning Ordinances d) Floodplain Ordinance e) Stormwater Plans f) Other plans not listed above
3	Present applicable data to the planning team and team leads for inclusion
4	Highlight applicable mitigation actions to be included in the plan
5	Assist with incorporation and adoption of the plans, as needed.

7.3 CONTINUED PUBLIC INVOLVEMENT

REQUIREMENT §201.6(c)(4)(iii):

[The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

Continued public involvement is critical to the successful implementation of the DeKalb County MHMP. Comments gathered from the public on the MHMP will be received by the EMA Director and forwarded to the MHMP committee for discussion. Education efforts for hazard mitigation will be the focus of the annual Severe Weather Awareness Week as well as incorporated into existing stormwater planning, land use planning, and special projects/studies efforts. Once adopted, a copy of this plan will be available for the public to review in the EMA Office and the DeKalb County website. Periodic reminder notices will be placed on social media to continue to solicit feedback and input on changes for the future plans.

Updates or modifications to the DeKalb County MHMP require public notice, reconvening the planning committee in accordance with FEMA local mitigation planning guidance and meeting with the incorporated community leaders prior to submitting revisions to the individual jurisdictions for approval and re-adoption.



The CRS program credits NFIP communities a maximum of 28 points for adopting the Plan (2 points); establishing a procedure for implementation, review, and updating the Plan; and submitting an annual evaluation report (up to 26 points).

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