Williamson County, Illinois

Multi-Hazard Mitigation Plan

A 5-year Update to the Countywide MHMP originally adopted in 2009

A 2023 Update to the 2009 County-wide MHMP
July 2023 - July 2028

FEMA IEMA WILLIAMSON COUNTY EMA GREATER EGYPT REGIONAL PLANNING & DEVELOPMENT COMMISSION

Williamson County, Illinois

Multi-Hazard Mitigation Plan

County Adoption Date: 05/02/2023

Written and prepared by Greater Egypt Regional Planning and Development Commission

Kelsey Bowe, Environmental Planner
Tyler Carpenter, GIS & Environmental Planning Director
Gabrielle Reed, Environmental Planner
Noah Scalero, Environmental Planner

Primary Contact

Brian Burgess
Director, Williamson County Emergency Management Agency
407 North Monroe Street, Marion, IL 62959
Office: 618-998-2123

Secondary Contact

Pat Creek
Deputy Director, Williamson County Emergency Management Agency
407 North Monroe Street, Marion, IL 62959
Office: 618-998-2123

Contents

List of Figures

List of Tables

Acronyms

ASCE	American Society of Civil Engineers	**HMGP**	Hazard Mitigation Grant Program
ASDSO	Association of Dam Safety Officials	**IBC**	International Building Code
BRIC	Building Resilient Infrastructure and Communities	**IDPH**	Illinois Department of Public Health
CARES	Coronavirus Aid, Relief, and Economic Security Act	**IEMA**	Illinois Emergency Management Agency
CDC	Centers for Disease Control	**IEPA**	Illinois Environmental Protection Agency
CDMS	Comprehensive Data Management System	**INDR**	Illinois Department of Natural Resources
CISA	Cybersecurity & Infrastructure Security Agency	**IPCC**	Intergovernmental Panel on Climate Change
CNEOS	Center for NEO Studies	**ISGS**	Illinois State Geological Survey
COVID-19	Coronavirus Disease-19	**ITTF**	Illinois Terrorism Task Force
CRS	Community Rating System	**MCS**	Mesoscale Convection System
CUSEC	The Central U.S. Earthquake Consortium	**MHMP**	Multi-Hazard Mitigation Plan
DI	Damage Indicators	**NASA**	National Aeronautics and Space Administration
DMA	Disaster Mitigation Act of 2000	**NEO**	Near Earth Object
DOD	Degrees of Damage	**NFIP**	National Flood Insurance Program
DRA	Delta Regional Authority	**NMSZ**	New Madrid Seismic Zone
EAP	Emergency Action Plan	**NOAA**	National Oceanic and Atmospheric Administration
EF	Enhanced Fujita (Tornado Scale)	**NORS**	National Outbreak Reporting System
EPCRA	Federal Emergency Planning and Community Right to Know Act of 1986	**NPDP**	National Performance of Dams Program
FAST	Fixing America's Surface Transportation Act of 2015	**NRCS**	National Resources Conservation Service
FEMA	Federal Emergency Management Agency	**NWS**	National Weather Service
FERC	Federal Energy Regulatory Commission	**PDM**	Pre-Disaster Mitigation Grant Program
FMAG	Fire Management Assistance Grant Program	**US EPA**	United States Environmental Protection Agency
GERPDC	Greater Egypt Regional Planning and Development Commission	**USACE**	United States Army Corps of Engineers
GIS	Geographic Information System	**USDA**	United States Department of Agriculture
HAB	Harmful Algal Bloom	**USFWS**	United States Fish and Wildlife Service
Hazus-MH	Hazus Multi Hazard (modeling software)	**USGS**	United States Geological Survey
HHPD	Rehabilitation of High Hazard Potential Dam Grant Program	**WVSZ**	Wabash Valley Seismic Zone

1. Introduction

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. (Stafford Act Title 44, Chapter 1, Part 201).

Hazard mitigation planning is required by the Disaster Mitigation Act of 2000 (DMA), which replaced the Stafford Act. Local, tribal, territorial, and state governments must adopt hazard mitigation plans and update them every five years in order to be eligible for the following Federal Emergency Management Agency (FEMA) grant and insurance programs:

- Hazard Mitigation Grant Program (HMGP)
- Building Resilient Infrastructure and Communities (BRIC)
- Fire Management Assistance Grant Program (FMAG)
- Public Assistance Grant Program (PA)
- Pre-Disaster Mitigation Grant Program (PDM)
- Rehabilitation of High Hazard Potential Dam Grant Program (HHPD)
- National Flood Insurance Program (NFIP)

While this planning process is required for natural hazards, planning partners were encouraged to include any hazards in this plan that pose potential threats to their communities. In addition to FEMA funding, having Multi-Hazard Mitigation Plans (MHMP) in place can streamline the process of applying for other federal, state, and local disaster mitigation and relief funding opportunities.

In order to help communities plan for natural hazards, FEMA developed Hazus Multi Hazard (MH), a geographic information system (GIS) based software that models earthquakes, floods, and other natural hazards. This software can estimate physical and economic losses and social impacts, help communities identify high risk areas, and provide the necessary information to create mitigation strategies for these natural hazards. Hazus-MH uses data from the US Census Bureau and allows for manual editing and additions of data. This ensures accuracy and relevancy to the county.

This Multi-Hazard Mitigation Plan, adopted by Williamson County and all jurisdictions within, fulfills the requirement of the DMA, which amended Section 322 of the Stafford Act, 42 U.S.C. 5165. The First MHMP for Williamson County was adopted in 2009. This will be the second update to the original plan.

2. Planning Process

Hazard Mitigation is any sustained action taken to reduce or eliminate long-term risk to human life and property from a natural hazardous event. Hazard Mitigation Planning involves communities in a four-step process to identify risks and vulnerabilities to natural hazards and develop long-lasting strategies that lead to the development of a comprehensive approach to risk reduction and an effective mitigation plan[1].

- Organize resources
- Assess risks
- Develop a mitigation plan
- Implement the plan and monitor progress

Planning Timeline

The planning process was completed by Greater Egypt Regional Planning and Development Commission (Greater Egypt) and the Williamson County Planning Team. The planning team consists of at least 1 member representing each jurisdiction within the county. The planning timeline involved partner and public meetings, the writing and review of the plan, finalization of plan and adoption by the county and all jurisdictions, and state and federal review and approval.

Figure 2.1: MHMP planning timeline for 2021-2022

Mitigation Planning Timeline	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
	1	2	3	4	5	6	7	8	9	10	11	12	13
Meetings: Goals and Objectives													
Meetings: Public involvement													
Meetings: Mitigation Activities													
Write Plan													
Review Plan													
Finalize Plan													
Print Plan													
State/ Federal Review													

[1] Illinois Emergency Management Agency, "Mitigation Planning".

Meeting 1: Goals and Objectives

- *Greater Egypt presented the planning process and review the responsibilities of planning partners*
- *Greater Egypt presented historical, current, and possible hazards that are a threat to the county. Maps of risk areas within the county and southern Illinois were included in presentation.*
- *Greater Egypt reviewed the Hazus-MH hazard modeling process and reviewed essential and critical facilities data.*
  - *Planning partners were given the option to review and edit these datasets to provide the most accurate flood and earthquake models.*
- *Planning partners participated in a hazard ranking exercise to determine which hazards have the highest severity and probability of occurring.*
  - *The top ranked hazards from this exercise were modeled using Hazus-MH and other GIS based software to estimate physical damage, economic loss, and social impacts if the hazard occurred.*

Meeting 2: Public Involvement

- *Meeting 2 consisted of a review of hazard rankings, preliminary hazard models, and an introduction to the mitigation strategies exercise.*
  - *The public was notified of this meeting through a series of newspaper press releases (see Appendix 4 for full list of press releases).*
- *The public was encouraged to provide their input in the planning process, including providing suggestions of any additional hazards to include in the plan and any mitigation strategies*

Meeting 3: Mitigation Strategies

- *Greater Egypt reviewed the finalized hazard ranking list and summarized the mitigation strategies that were provided by planning partners.*
- *Planning partners provided final comments and ideas for mitigation strategies.*
- *This will be the final opportunity to provide mitigation strategies and update the Hazus essential facilities list*

Meeting 4 (optional): Plan Review

- *If requested by the planning team, Greater Egypt hosted a 4th meeting to review the final MHMP before each jurisdiction adopts the plan.*
  - *This will be the final opportunity for planning partners to request any edits and additions to the MHMP.*

2.1. Responsibilities of Planning Partners

The planning partners are vital to completion of the MHMP, knowledge and expertise of local leaders is necessary to identify hazards and develop mitigation strategies. FEMA also requires the participation of partners in order for the plan to be approved and adopted.

There are 58 participating jurisdictions in Williamson County. At least 1 member representing each jurisdiction is required to participate in the planning process. Planning partners were actively involved in the following activities (* indicates required participation):

Attend at least two meetings during the planning process*
Complete a hazard ranking exercise for your jurisdiction*
Propose two mitigation strategies for each hazard*
Assist with meeting match requirements*
Review and provide comments on drafts of the full plan
Assist in coordinating public involvement
Review and update the county datasets
Submit photographs, GIS files, and any other data relating to natural hazards, the county, or jurisdictions to improve the detail of the MHMP

The full list of Planning Team members can be found in Appendix 1.

2.2. Neighboring Communities

Greater Egypt organized Planning Teams and wrote Multi-Hazard Mitigation Plans for the 5 Counties of its planning district: Franklin, Jackson, Jefferson, Perry, and Williamson. The EMA coordinators of these counties were in contact with each other and Greater Egypt throughout the planning process. EMA Coordinators, other County staff, and other jurisdictions attended meetings and assisted in planning for multiple counties. Meeting attendance can be found in appendix 5, other planning activities are recorded in county match documents and can be available upon request.

2.3. Review of Technical Documents

The planning process included review of local, state, federal, and academic resources. The 2015 Williamson County Multi-Hazard Mitigation Plan was reviewed and incorporated into this updated version. Hazard background information is cited in footnotes throughout this Plan. GIS data sources are provided on every map. Data tables have sources listed below each table. Detailed GIS data can also be requested from Greater Egypt at any time from https://greateregypt.org/gis-services/

3. Williamson County Profile

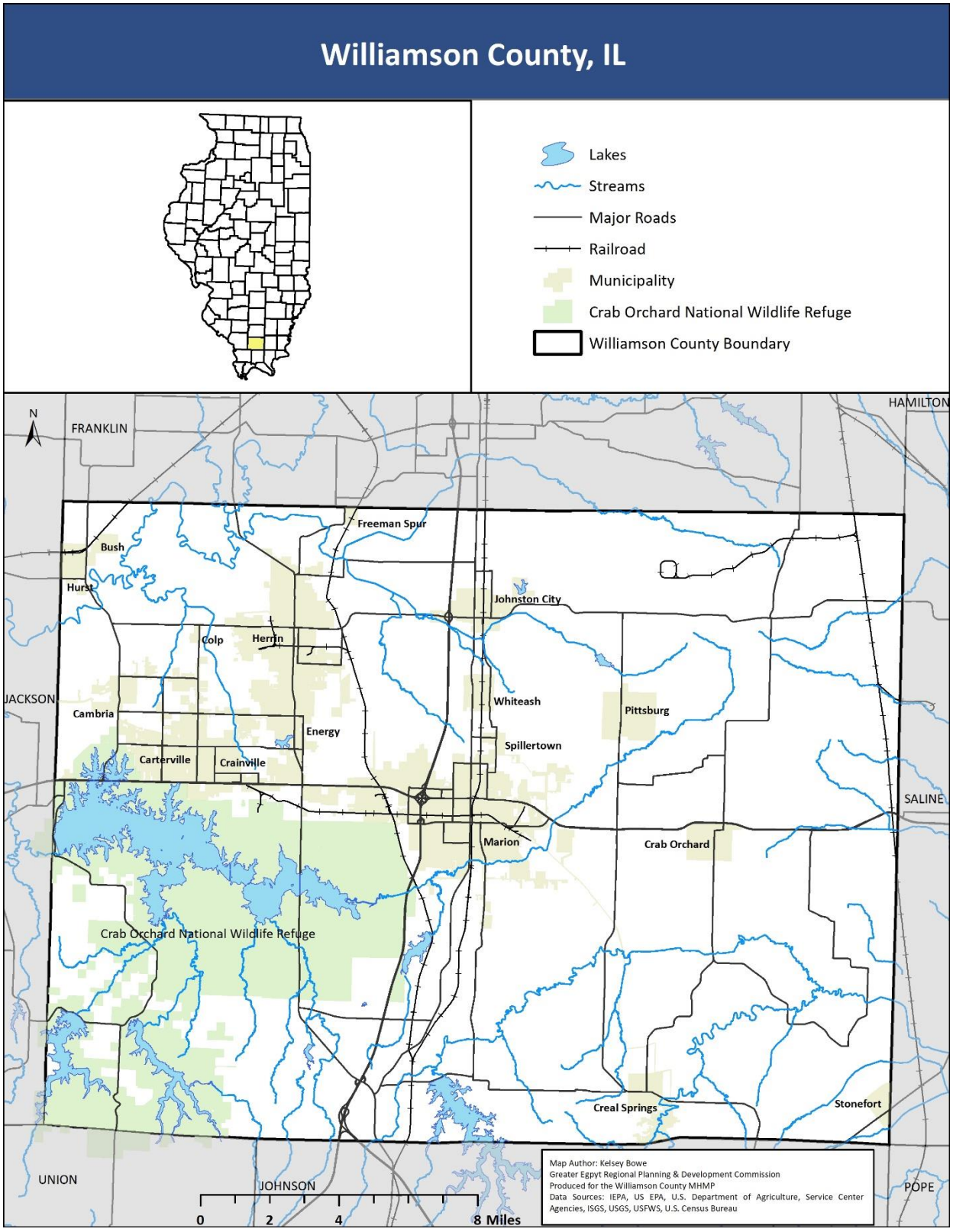
3.1. County Background

Williamson County is located in Southern Illinois and is one of the more populous counties in the region. It is bordered by Franklin County to the north, Jackson to the west, Union and Johnson to the south, and Saline County to the east. It is located roughly 120 miles southeast of St. Louis, MO and 180 miles south of Springfield, IL.

Williamson County was founded in 1839 when Franklin County was divided in two. The county was named after Hugh Williamson, who was a signatory to the U.S. Constitution. The county seat was placed in Marion, named after General Francis Marion, where it resides today.

Williamson County is optimally located along Interstate 57 and Route 13 which are major corridors in the region. Development is concentrated in Marion, Carterville, and Herrin. Marion boasts many restaurants, retail stores, lodging, and entertainment options. The county is home to large manufacturers, vast retail sectors, health services, and tourism. Aisin and Pepsi MidAmerica are the larger manufacturing employers in the region. The county contains Crab Orchard National Wildlife Refuge and Shawnee National Forest, which bring outdoor recreationists to the county. John A. Logan college is also located in the county and is a top employer in the region.

Figure 3.1


Williamson County, IL
Lakes
Streams
Major Roads
Railroad
Municipality
Crab Orchard National Wildlife Refuge
Williamson County Boundary
N
FRANKLIN
HAMILTON
JACKSON
SALINE
UNION
JOHNSON
POPE
Freeman Spur
Bush
Hurst
Johnston City
Colp
Herrin
Whiteash
Pittsburg
Cambria
Energy
Spillertown
Carterville
Crainville
Marion
Crab Orchard
Crab Orchard National Wildlife Refuge
Creal Springs
Stonefort
0
2
4
8 Miles
Map Author: Kelsey Bowe
Greater Egpyt Regional Planning & Development Commission
Produced for the Williamson County MHMP
Data Sources: IEPA, US EPA, U.S. Department of Agriculture, Service Center Agencies, ISGS, USGS, USFWS, U.S. Census Bureau

3.2. Demographics

Based on the 2020 decennial census, Williamson County has 67,153 residents. This is an increase of 796 persons, or 0.01% from the 2010 population. Williamson County is divided into twelve precincts: West Marion, East Marion, Stonefort, Southern, Lake Creek, Herrin, Grassy, Creal Springs, Crab Orchard, Corinth, Carterville, and Blairsville. The population by township within Williamson County can be seen in Table 3.1. According to the U.S. Census Bureau, 91.6% of residents in Williamson County are white, 4.6% are Black or African American, 2.7% are Hispanic or Latino, and 1.3% are Asian. A full breakdown of race and Hispanic origins for Williamson County is displayed in Table 3.2.

Table 3.1 - Williamson County 2020 Population Estimate by Precinct

Precinct	Population
Grassy	676
Corinth	966
Stonefort	1,147
Crab Orchard	1,487
Creal Springs	2,475
Southern	3,745
Lake Creek	4,135
Blairsville	5,799
Carterville	9,799
East Marion	10,471
West Marion	11,722
Herrin	14,731

Source: U.S. Census Bureau

Table 3.2 - Race and Hispanic Origin of Population in Williamson County

Race and Hispanic Origins	Percentage of Population
American Indian and Alaska Native alone	0.39
Asian alone	1.16
Black or African American alone	4.27
Two or more races	5.63
Hispanic or Latino	2.65
White alone, not Hispanic or Latino	86.66
White alone	87.71
Native Hawaiian and Pacific Islander	0.01
Some other race	0.82

Source: U.S. Census Bureau

3.3. Economy and Industry

Williamson County is advantageously positioned to major thoroughfares with Interstate 57 running north to south and Route 13 running east to west through the center of the county. Strategically located at the convergence of these major corridors is Marion, IL. Marion contains many restaurants, retail stores, and accommodations which cater to the many people traveling along the major Interstate.

Table 3.3 displays the industries in Williamson County by the estimated number of people employed per industry. Health care, retail trade, education, manufacturing, and accommodation & food services are some of the largest sectors of employment. Large educational employers in the county include John A. Logan College, Marion Unit School District, Herrin Unit School District, and Carterville Unit School District. Heartland Regional Medical Center, Shawnee Health Service, and the Veterans Administration are the larger healthcare employers in the county. Aisin, an auto parts manufacturer, and Pepsi MidAmerica are the larger manufacturing employers.

According to the U.S. Census Bureau, Williamson County has a median household income of $58,097. Roughly 12.1% of the population is below the poverty line – the national poverty rate is 11.4%.

Table 3.3 - Number of People Employed by Major Industries in Williamson County

Industry	Estimated Number of Employees
Health Care & Social Assistance	5607
Retail Trade	3635
Educational Services	3292
Manufacturing	2598
Accommodation & Food Services	2337
Public Administration	1779
Mining, Quarrying, Oil & Gas	465

Source: U.S. Census Bureau ACS 5-year Estimate

3.4. Land Use and Development Trends

Before European settlement, Williamson County was covered by deciduous forest with small areas of prairie. Over recent centuries, the land cover has been transformed by agriculture, mining, and urban development. Widespread agriculture throughout the county and the urban development along the Route 13 corridor are the largest changes to Williamson County's land use. Primary agricultural enterprises are corn, soy, winter wheat, hay, and oats. Some deciduous forest still remains, particularly in the southwest portion of the county near Devil's Kitchen and Little Grassy Lakes (See figure 3.3).

The coal mining industry was a driving economic force in Williamson County during the 19th and 20th centuries. Whilst the coal industry has dwindled in the area in recent decades, ramifications of historic mining are still present today. There are portions of Williamson County that have been left unsuitable for development or agriculture as a result of abandoned strip mines, particularly along Route 13 through the center of the county.

New urban development is primarily occurring in the Marion region, however there is also residential development in Carterville and Herrin. The lists below highlight recent economic and housing development in Williamson County[2]. None of the developments include structures within the flood hazard zone.

Downtown Marion

- Updates to downtown square and businesses
- New City Hall building

Projects: NEW Large Employers

- FedEx Distribution Center 300+ new jobs
- Readerlink brought over 100+ jobs and is making full use of the former Circuit City
- [Williamson County] – Saline River Farms, 400 jobs
- Walker's Bluff Casino

Existing Businesses – Investment & Expansion

- Anderson Warehouse expansion into former mall space
- Black Diamond Family of Businesses – acquisition of Rent One Park, Oasis Outdoors Home Center
- La Fiesta is getting a new home
- Coming soon – expecting another expansion at Aisin

Projects: New Small Employers

- Texas Roadhouse
- Southern Illinois Rejuvenation Center
- Aspire Yoga
- AST Primary Care
- Interstate Tire Pros
- Pure Pet

[2] Information provided by Williamson County Assessor's Office and City of Marion Department of Business Development

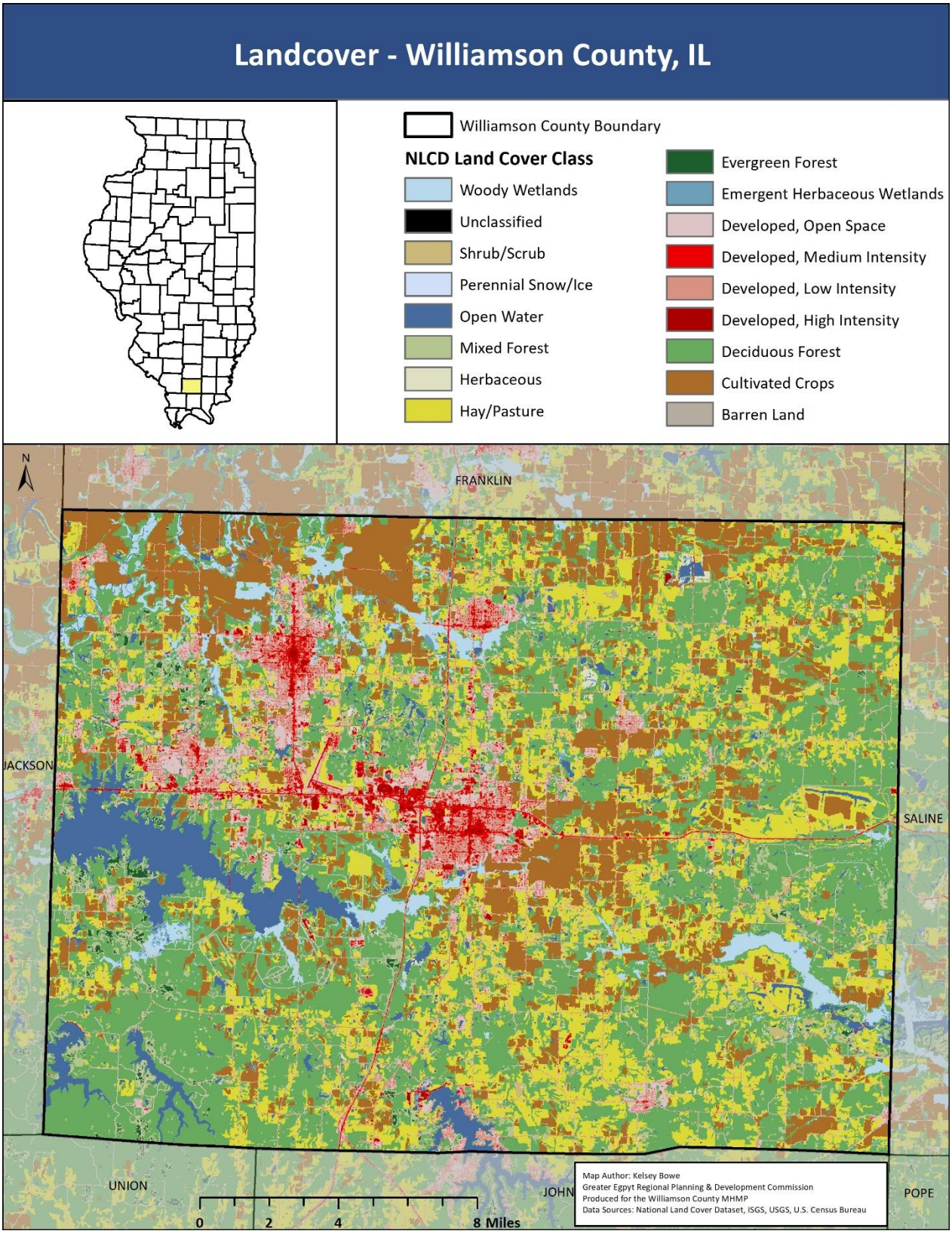
- Oasis Motorsports
- Heartland Regional Medical Plaza
- Olive Garden – spring construction
- Coming soon – Sonic

Table 3.4 – New housing developments in Williamson County

Name of Housing Development	# Of Units (existing and proposed)
Southern Meadows	174
Lincoln Village	112
Market Street Complex	22
East Main Street	65
West Cherry Street	in development, will contain offices and housing units

Source: City of Marion

Figure 3.2


Landcover - Williamson County, IL
Williamson County Boundary
NLCD Land Cover Class
Woody Wetlands
Unclassified
Shrub/Scrub
Perennial Snow/Ice
Open Water
Mixed Forest
Herbaceous
Hay/Pasture
Evergreen Forest
Emergent Herbaceous Wetlands
Developed, Open Space
Developed, Medium Intensity
Developed, Low Intensity
Developed, High Intensity
Deciduous Forest
Cultivated Crops
Barren Land
N
FRANKLIN
JACKSON
SALINE
UNION
JOHN
POPE
0
2
4
8 Miles
Map Author: Kelsey Bowe
Greater Egpyt Regional Planning & Development Commission
Produced for the Williamson County MHMP
Data Sources: National Land Cover Dataset, ISGS, USGS, U.S. Census Bureau

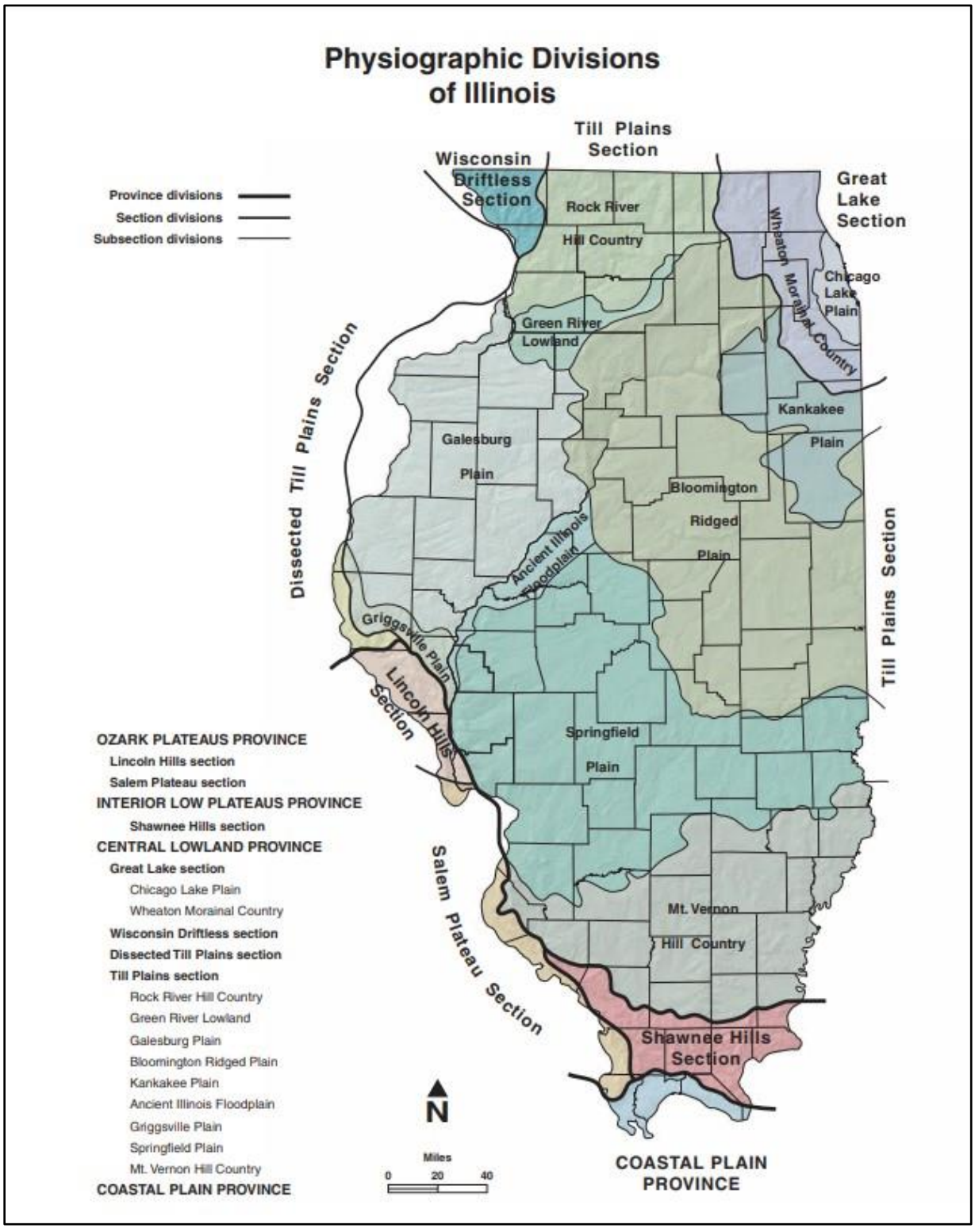
3.5. Climate

Williamson County lies close to the border of Köppen climate classification Dfa (humid continental) and Köppen classification Cfa (humid subtropical). Summers are humid and warm, while winters are cool and wet. The warmest months are June – September with average highs reaching 89F and lows in the mid to high 60's. Average highs in the winter are well above freezing: the average high in January is 40F and the low is 24F. However, this region is subject to wildly variable weather, often leading to weeks of stifling heat in the summer and/or very cold conditions in the winter. Average annual precipitation is 43.18 inches. Though daytime highs in the winter are often above freezing, cold spells with significant snowfall and/or ice buildup are not uncommon in the winter. For details on climate change, see section 4.1.2

3.6. Topography & Hydrology

Williamson County straddles the border of the Till Plains and the Shawnee Hills physiographic divisions of Illinois. The northern three quarters of Williamson County resides in the Mt Vernon Hill Country division of the Till Plains region, while the southern portion of Williamson lies beyond the southern terminus of historic glaciations. The Till Plains topography resulted from the deposition of unsorted glacial sediments during the final stages of the Wisconsin glaciation and is characterized by low rolling hills and relatively shallow alluvial valleys. Because the Shawnee hills physiographic division was untouched by glaciers, the topography in the southern portion of Williamson County is characterized by larger, rolling hills and steeper stream valleys which often contain exposed sandstone. The southwest corner of Williamson County reaches elevations of around 650 ft above sea level, while the northwest corner dips to approximately 370 ft above sea level.

Figure 3.3



Source: Illinois State Geological Survey

Williamson County is drained by two HUC 8 Watersheds - The Big Muddy (HUC ID: 07140106) and the Saline watershed (HUC ID: 05140204). The Big Muddy watershed covers large portions of Franklin, Jackson, Williamson, Perry, Washington, and Jefferson Counties. It also drains small portions of Union, Johnson, and Hamilton Counties. The Big Muddy watershed drains the western portion of Williamson County via Lake Creek, Pond Creek, Hurricane Creek, and others before converging with the Big Muddy River which ultimately meets with the Mississippi River south of Grand Tower, IL. The major lakes within the watershed include Arrowhead, Johnston City, Herrin Old, Herrin New, Crab Orchard, Little Grassy, Devil's Kitchen, and the Marion Reservoir.

The southeastern portion of Williamson County is drained by the Saline Watershed (HUC ID: 05140204). This watershed is comprised of the south, middle, and north forks of the Saline River, which flow southeast until converging with the Ohio River. Other streams in the watershed include Sugar Creek, Little Saline River, Maple Branch, Caney Creek, and Larkin Creek, among others. Lake of Egypt is the major lake within the watershed.

Figure 3.4

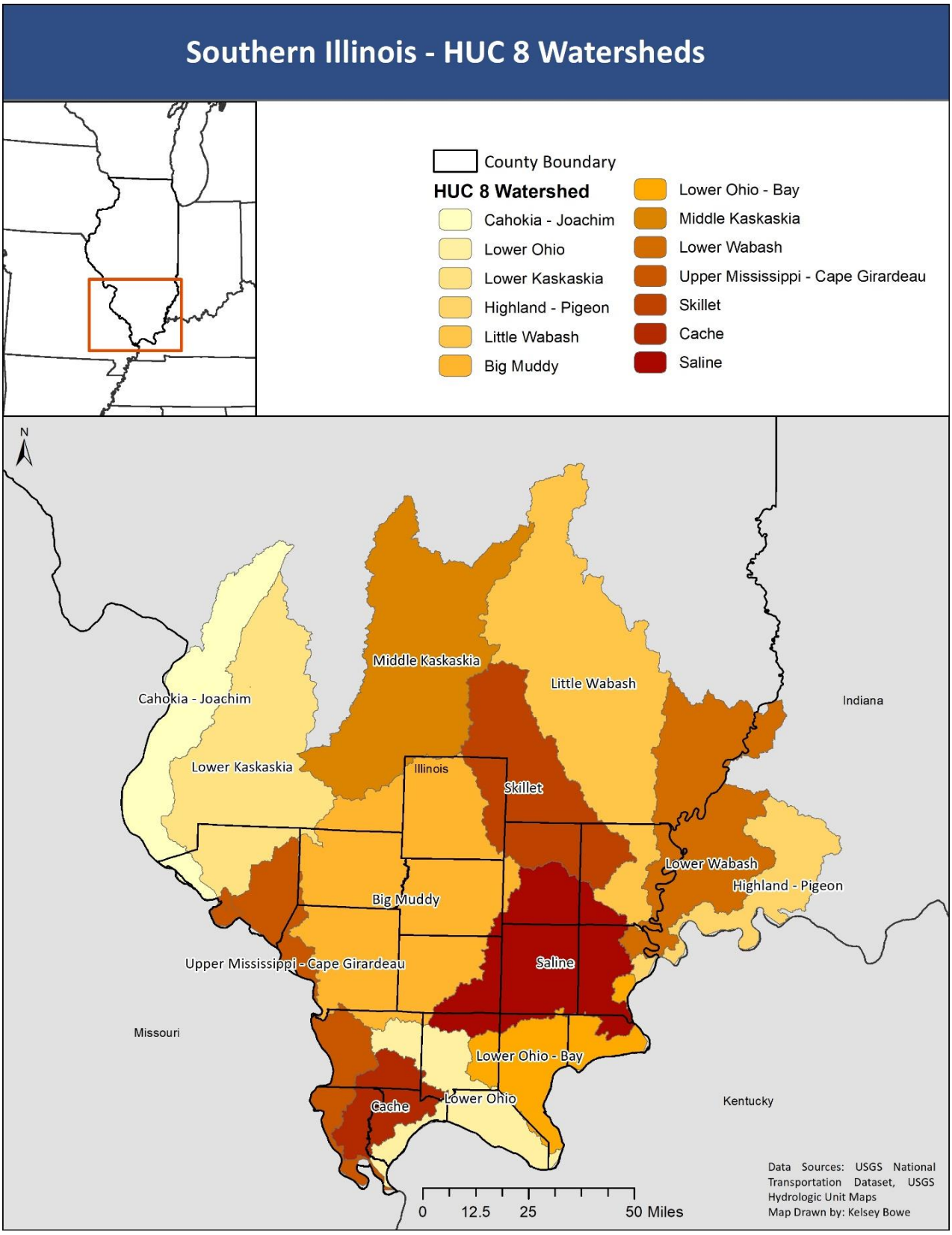
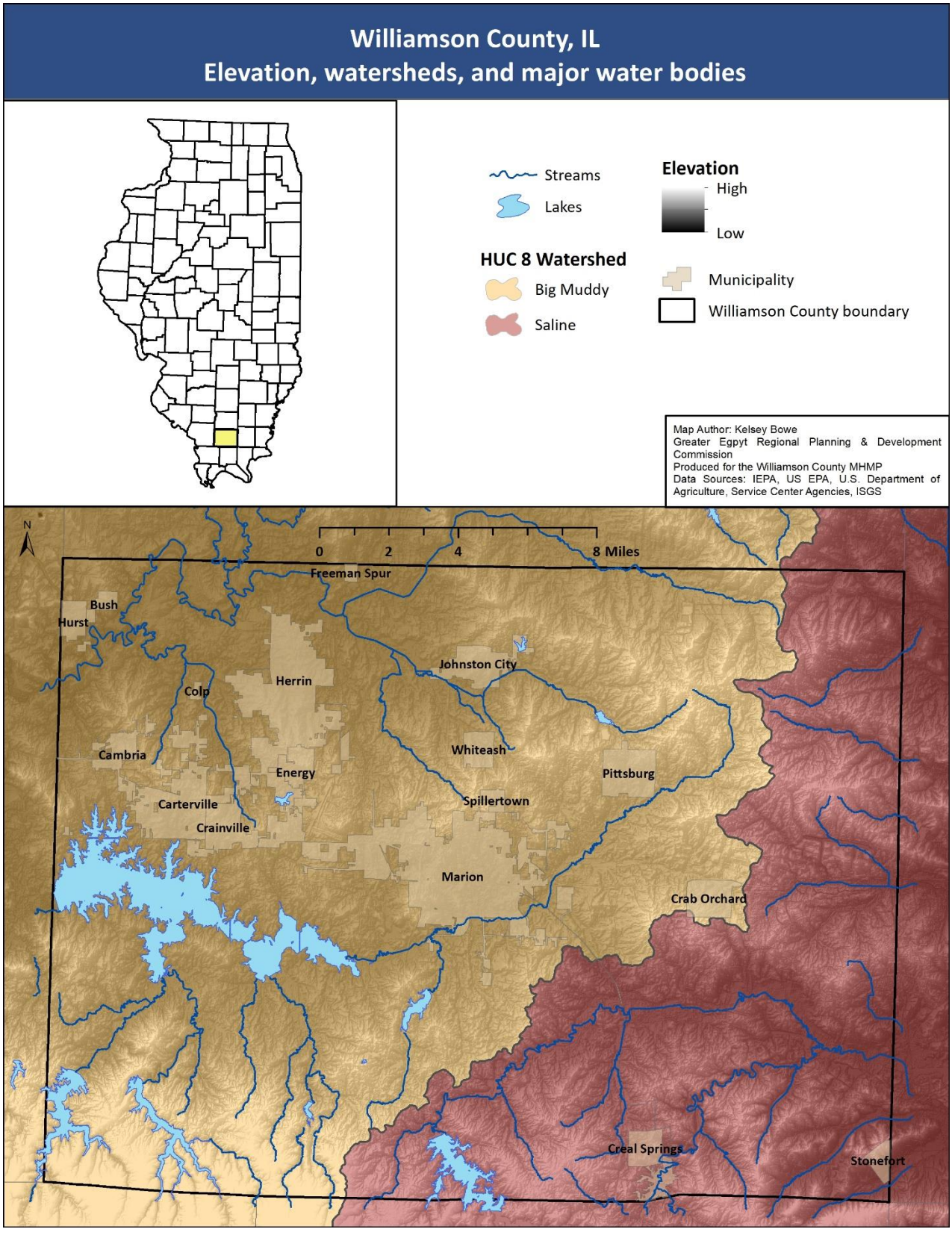

Southern Illinois - HUC 8 Watersheds
County Boundary
HUC 8 Watershed
Cahokia - Joachim
Lower Ohio
Lower Kaskaskia
Highland - Pigeon
Little Wabash
Big Muddy
Lower Ohio - Bay
Middle Kaskaskia
Lower Wabash
Upper Mississippi - Cape Girardeau
Skillet
Cache
Saline
N
Middle Kaskaskia
Little Wabash
Cahokia - Joachim
Indiana
Lower Kaskaskia
Illinois
Skillet
Lower Wabash
Highland - Pigeon
Big Muddy
Upper Mississippi - Cape Girardeau
Saline
Missouri
Lower Ohio - Bay
Cache
Lower Ohio
Kentucky
0
12.5
25
50 Miles
Data Sources: USGS National Transportation Dataset, USGS Hydrologic Unit Maps
Map Drawn by: Kelsey Bowe

Figure 3.5


Williamson County, IL
Elevation, watersheds, and major water bodies
Streams
Lakes
Elevation
High
Low
HUC 8 Watershed
Big Muddy
Saline
Municipality
Williamson County boundary
Map Author: Kelsey Bowe
Greater Egpyt Regional Planning & Development Commission
Produced for the Williamson County MHMP
Data Sources: IEPA, US EPA, U.S. Department of Agriculture, Service Center Agencies, ISGS
N
0 2 4 8 Miles
Freeman Spur
Bush
Hurst
Johnston City
Herrin
Colp
Cambria
Whiteash
Energy
Pittsburg
Carterville
Spillertown
Crainville
Marion
Crab Orchard
Creal Springs
Stonefort

4. Hazards

4.1. Introduction

The following section will contain hazard definitions, examples of potential extent and impacts that may occur, details on historic occurrences within Williamson County, and relevant maps and figures. When possible, all historic occurrences encompass hazard events from 1950-2021, but some databases may be missing records.

4.1.1. Relevant FEMA definitions

Hazard Extent: Strength or magnitude of hazard. Can be measured on scientific scales (Tornado EF Scale, Palmer drought severity index, etc.), measurements of the hazard (flood height, snow depth, etc.), or other factors such as duration and speed of onset.

Hazard Impacts: Consequences/effects of the hazard on a community and its assets. Examples include number of injuries/deaths, dollar amount of property/crop damage, number of days without power, etc.

Essential and Critical Facilities: The FEMA Hazus Software designates important facilities and infrastructure into two categories, which will be used throughout the plan:

Essential:

- Emergency Operations Centers
- Police stations
- Fire stations
- Schools
- Hospitals

Critical:

- Transportation – Airports, train & bus stations, ports, highways, railways, and bridges
- Utilities – wastewater treatment, potable water storage, water/sewer lines, gas pipelines, power plants (does not include power lines)
- Communication - TV & Radio Stations
- Dams*
- Military Facilities*
- User Defined**

*While Hazus has designated space for dams and military spaces, they are not currently part of the default datasets provided and were therefore not included in the hazard models.

**The user defined category is space for a community to input their own structures into Hazus, the Williamson County Planning Team included ambulance stations and in this category.

A complete list of Williamson County's essential and critical facility data can be found in Appendix 2.

4.1.2. Emerging Hazard – Climate Change

Global average temperature has increased by 1.8°F from 1901 to 2016. Evidence consistently points to human related activities, mainly greenhouse gas emissions, as the cause[3]. Climate change is no longer a future problem as effects are being felt in the present time around the world, and events and trends associated with climate change are only expected to continue to increase in number of events and in severity[4] .

Our planet is a complex system of natural ecosystems and human infrastructure, and climate change can drive many different outcomes within a small area. In the Midwest, climate change is driving more dramatic shifts in seasonal hydrologic regimes. Areas are experiencing severe storms, floods, and extreme heat waves within generally short time periods. All of these factors can decrease infrastructure stability, agriculture productivity, water and air quality, and general community resiliency to natural hazards. Southern Illinois currently encompasses regions within Köppen-Geiger climate types Dfa (hot-summer humid continental) and Cfa (humid subtropical), but future models suggest most of the state will be classified as Cfa by 2071[5]. Figures 4.1 and 4.2 show the Köppen-Geiger climate classifications of Illinois and surrounding areas for present day (based on data from 1980-2016) and projected climate types for the future (based on 32 different climate models for years 2071-2100).

Illinois joined the U.S. Climate Alliance in January 2019. This is a bipartisan coalition of 24 governors with commitment to implementing policies that advance the goals the Paris Agreement, track and report progress of each state to the global community, and advance new and existing policies to promote clean energy and reduce carbon pollution.[6]

This Multi-Hazard Mitigation Plan will contain a sub section within each chapter, when relevant, to discuss the risks associated with climate change related increases of the specific hazard.

[3] Hayhoe, K. et al., 2018: Our Changing Climate. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II U.S. Global Change Research Program, Washington, DC, USA, pp. 72–144.
[4] Gray, E. and Merzdorf J. "Earth's Freshwater Future: Extreme Floods and Drought", NASA Global Climate Change, 2019.
[5] Beck, H.E., N.E. Zimmermann, T.R. McVicar, N. Vergopolan, A. Berg, E.F. Wood: Present and future Köppen-Geiger climate classification maps at 1-km resolution, Scientific Data 5:180214, doi:10.1038/sdata.2018.214 (2018).
[6] Igusky, K., "Illinois Governor J. B. Pritzker Joins U.S. Climate Alliance", United States Climate Alliance, 2019.

Table 4.1: Key to the Köppen-Geiger climate classifications

	1: Af Tropical, rainforest
	2: Am Tropical, monsoon
	3: Aw Tropical, savannah
	4: BWh Arid, desert, hot
	5: BWk Arid, desert, cold
	6: BSh Arid, steppe, hot
	7: BSk Arid, steppe, cold
	8: Csa Temperate, dry summer, hot summer
	9: Csb Temperate, dry summer, warm summer
	10: Csc Temperate, dry summer, cold summer
	11: Cwa Temperate, dry winter, hot summer
	12: Cwb Temperate, dry winter, warm summer
	13: Cwc Temperate, dry winter, cold summer
	14: Cfa Temperate, no dry season, hot summer
	15: Cfb Temperate, no dry season, warm summer
	16: Cfc Temperate, no dry season, cold summer
	17: Dsa Cold, dry summer, hot summer
	18: Dsb Cold, dry summer, warm summer
	19: Dsc Cold, dry summer, cold summer
	20: Dsd Cold, dry summer, very cold winter
	21: Dwa Cold, dry winter, hot summer
	22: Dwb Cold, dry winter, warm summer
	23: Dwc Cold, dry winter, cold summer
	24: Dwd Cold, dry winter, very cold winter
	25: Dfa Cold, no dry season, hot summer
	26: Dfb Cold, no dry season, warm summer
	27: Dfc Cold, no dry season, cold summer
	28: Dfd Cold, no dry season, very cold winter
	29: ET Polar, tundra
	30: EF Polar, frost

Figure 4.1

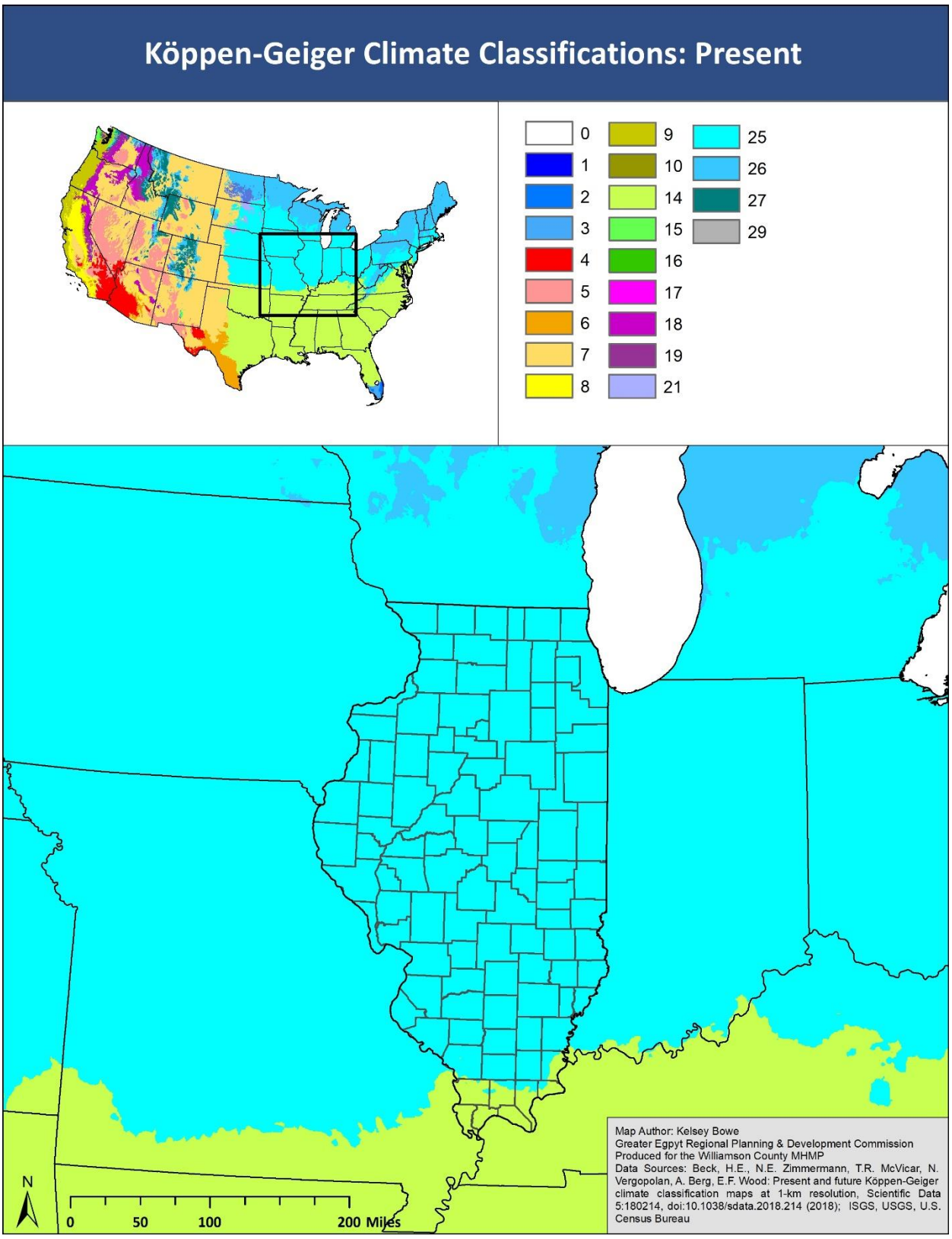
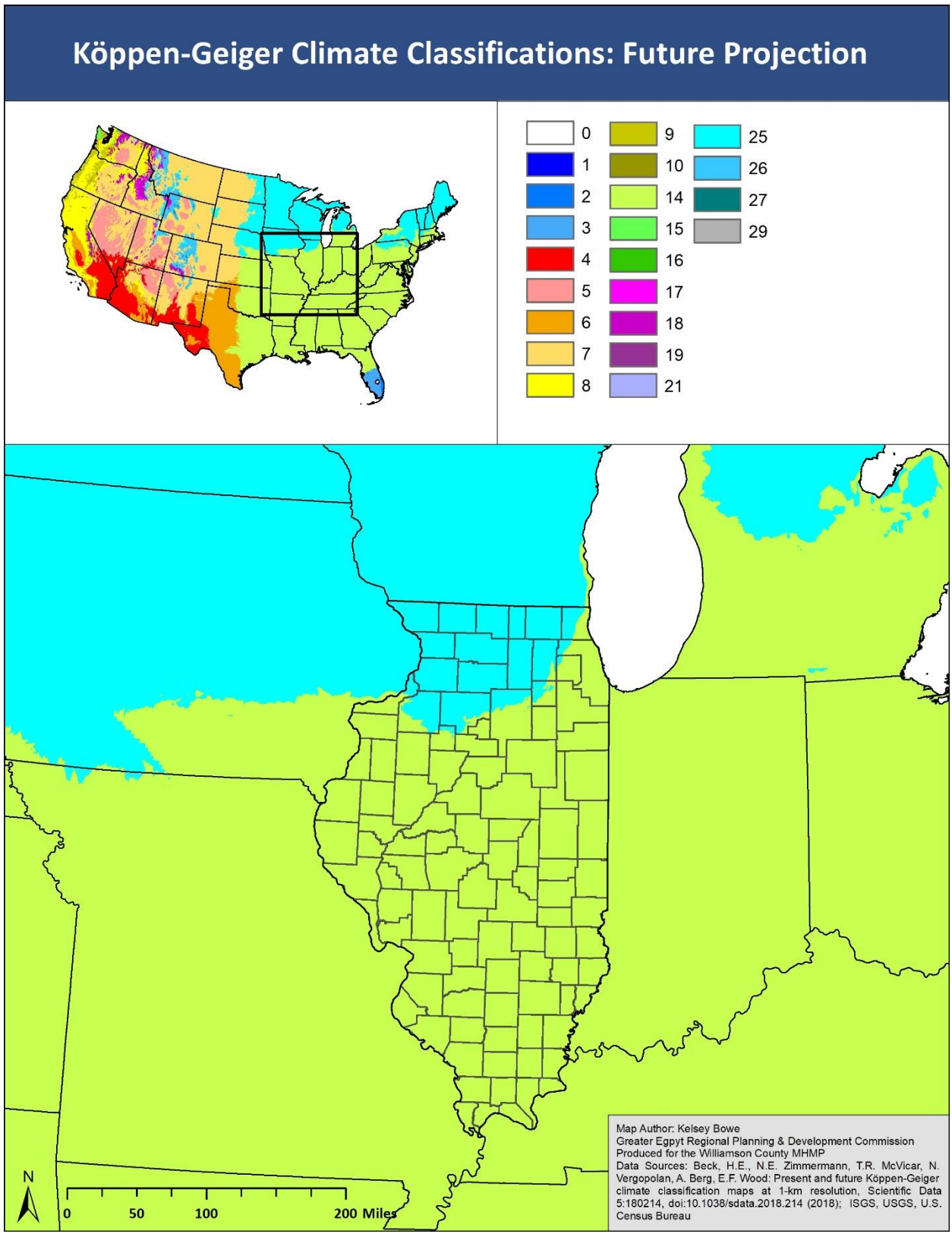

Köppen-Geiger Climate Classifications: Present
0
1
2
3
4
5
6
7
8
9
10
14
15
16
17
18
19
21
25
26
27
29
N
0
50
100
200 Miles
Map Author: Kelsey Bowe
Greater Egpyt Regional Planning & Development Commission
Produced for the Williamson County MHMP
Data Sources: Beck, H.E., N.E. Zimmermann, T.R. McVicar, N. Vergopolan, A. Berg, E.F. Wood: Present and future Köppen-Geiger climate classification maps at 1-km resolution, Scientific Data 5:180214, doi:10.1038/sdata.2018.214 (2018); ISGS, USGS, U.S. Census Bureau

Figure 4.2


Köppen-Geiger Climate Classifications: Future Projection
0
1
2
3
4
5
6
7
8
9
10
14
15
16
17
18
19
21
25
26
27
29
N
0
50
100
200 Miles
Map Author: Kelsey Bowe
Greater Egpyt Regional Planning & Development Commission
Produced for the Williamson County MHMP
Data Sources: Beck, H.E., N.E. Zimmermann, T.R. McVicar, N. Vergopolan, A. Berg, E.F. Wood: Present and future Köppen-Geiger climate classification maps at 1-km resolution, Scientific Data 5:180214, doi:10.1038/sdata.2018.214 (2018); ISGS, USGS, U.S. Census Bureau

4.1.3. Williamson County Hazard Rankings

Hazards were ranked using the risk priority index equation:

$$\boldsymbol{Risk\ Index = probability * severity}$$

Where probability is how likely a hazard event will occur on a scale of 1-4:

Table 4.2

Probability	Characteristics
4 – Highly Likely	Event is probable within the next calendar year. These events have occurred, on average, once every 1-2 years in the past.
3 – Likely	Event is probable within the next 10 years. Event has a 10-15% chance of occurring in any given year. These events have occurred, on average, once every 3-10 years in the past.
2 – Possible	Event is probable within the next 50 years. Event has a 2-10% chance of occurring in any given year. These events have occurred, on average, once every 10-50 years in the past.
1 – Unlikely	Event is probable within the next 200 years. Event has a 0.5-2% chance of occurring in any given year. These events have occurred, on average, once every 50-200 years in the past.

Severity is the degree to which a hazard will cause injuries/deaths, affect functionality of essential and critical facilities, and cause property damage and/or utility disruptions on a scale of 2-8:

Table 4.3

Severity	Characteristics
8 – Catastrophic	Multiple deaths. Complete shutdown of facilities for 30 or more days. More than 50% of property is severely damaged.
4 – Critical	Injuries and/or illnesses result in permanent disability. Complete shutdown of critical facilities for at least 14 days. More than 25% of property is severely damaged.
2 – Limited	Injuries and/or illnesses do not result in permanent disability. Complete shutdown of critical facilities for more than seven days. More than 10% of property in severely damaged.
1 – Negligible	Injuries and/or illnesses are treatable with first aid. Minor quality of life lost. Shutdown of critical facilities and services for 24 hours or less. Less than 10% of property is severely damaged.

Hazards were then ranked in order of highest to lowest risk index; weighted by how many jurisdictions included the hazard in their list.

The Williamson County Planning Team members completed a hazard ranking exercise for their jurisdictions. The final County hazard list was determined by the Williamson County EMA and was approved with no objections at Meeting 3:

1. Tornados & Derechos
2. Disease Outbreak, Epidemics, & Pandemics
3. Earthquakes
4. Severe Thunderstorms
5. Severe Winter Weather
6. Flooding
7. Ground Failure (mine subsidence)
8. Hazardous Materials Release
9. Terrorism (including Active Shooter & Cyberattack)
10. Dam & Levee Failure
11. Wildland Fires

Hazard rankings by jurisdiction can be found in appendix 3.

4.1.4. Disaster Declarations

Covid-19 was declared a nationwide emergency on March 13, 2020 by President Trump, pursuant to section 501(b) of the Stafford Act, this declaration removed the need for individual governors to apply. All 50 states and five territories were covered under this initial declaration, on February 2, 2021 and March 29, 2021, the Navajo nation and Poarch Band of Creek Indians were also approved for Coronavirus Disease-19 (COVID-19) disaster declarations under President Biden.

No other disaster declarations have been made for Williamson County, Illinois from 2016-2021.

4.2. Tornados and Derechos

4.2.1. Hazard Description

Tornados are violently rotating columns attached to the base of a cloud and extend to the ground. Tornados are most often produced at the trailing end of strong supercell thunderstorm systems; though the process of tornado formation is not fully understood[7]. Tornadoes can be brutally destructive when they move through densely populated areas. Severe tornados can reach winds speeds in excess of 300mph and cause paths of destruction 1 mile wide and more than 50 miles long. Due to the power of the rotating winds, buildings and human life are at great risk during a strong tornado.

Tornado intensity is measured on the Enhanced Fujita (EF) Scale (adopted by the National Weather Service (NWS) in 2007). EF rating is determined by the 3-second wind gust speed (table 4.4). It is important to note these speeds are estimates based on observations from the point of damage after the tornado has passed and are not direct measurements of wind speed. The NWS service uses 28 Damage Indicators (DI) (Table 4.5) on a scale of Degrees of Damage (DOD) to estimate expected, lower, and upper bounds of wind gusts that occurred[8]. The NWS has specific DOD scales for each type of DI and is the only agency with authority to give official EF ratings of tornado events. The scale ranges from EF0, characterized by wind gusts of up to 85 mph with light damage to buildings, to EF5 which is characterized by catastrophic damage and wind gusts over 200 mph.

Derechos are long-lived wind storms continuing in one direction, usually over large areas. To be classified as a derecho, the storm must extend for over 240 miles and reach wind gusts of 58mph[9]. Derechos are a unique weather phenomenon that almost exclusively occur in the eastern United States. They are also seasonal storms, with 70% occurring between May and August[6]. Both tornados and derechos develop from, and are associated with thunderstorms.

[7] "Severe weather 101," The National Severe Storms Laboratory, nssl.noaa.gov.
[8] "A Recommendation for an Enhanced Fujita Scale (EF-scale) Submitted to the National Weather Service and Other Interested Users," WIND SCIENCE AND ENGINEERING CENTER, Texas Tech University, 2004.
[9] "Derecho" National Weather Service

Table 4.4 - Enhanced Fujita Tornado Rating

Enhanced Fujita Number	3-Second Gust Speed (mph)	Selected Degrees of Damage Descriptions
0 Gale	65-85	Loss of <20% roofing material, loss of siding. Loss of rooftop HVAC.
1 Moderate	86-110	Broken glass, loss of >20% roofing material. Manufactured homes overturn but remain intact. Collapse of exterior walls of many types of building. Broken wood electrical poles. Trees uprooted or snapped.
2 Significant	111-135	Houses shift off foundations, collapse of roofs. Manufactured homes destroyed. Collapse of exterior walls of many types of building. Complete destruction of some isolated buildings. Bent or broken steel and concrete electrical poles. Trees snapped and debarked.
3 Severe	136-165	Top floor exterior and interior walls may collapse. Collapse of rigid frames in metal buildings. Damage to wall cladding and roof slabs of institutional buildings (hospitals, courthouses).
4 Devastating	166-200	Collapse of most walls, total destruction of residential houses. Destruction of large buildings such as shopping malls. Significant damage to institutional buildings.
5 Incredible	Over 200	Total destruction of residential houses, destruction of large buildings such as shopping malls. Significant damage to institutional buildings.

Source: National Weather Service/National Oceanic and Atmospheric Administration

Table 4.5 - Damage Indicators used to determine EF tornado rating

DI Number	Damage Indicator
1	Small Barns or Farm Outbuildings (SBO)
2	One- or Two-Family Residences (FR12)
3	Manufactured Home – Single Wide (MHSW)
4	Manufactured Home – Double Wide (MHDW)
5	Apartments, Condos, Townhouses [3 stories or less] (ACT)
6	Motel (M)
7	Masonry Apartment or Motel Building (MAM)
8	Small Retail Building [Fast Food Restaurants] (SRB)
9	Small Professional Building [Doctor's Office, Branch Banks] (SPB)
10	Strip Mall (SM)
11	Large Shopping Mall (LSM)
12	Large, Isolated Retail Building [K-Mart, Wal-Mart] (LIRB)
13	Automobile Showroom (ASR)
14	Automobile Service Building (ASB)
15	Elementary School [Single Story; Interior or Exterior Hallways] (ES)
16	Junior or Senior High School (JHSH)
17	Low-Rise Building [1-4 Stories] (LRB)
18	Mid-Rise Building [5-20 Stories] (MRB)
19	High-Rise Building [More than 20 Stories] (HRB)
20	Institutional Building [Hospital, Government or University Building] (IB)
21	Metal Building System (MBS)
22	Service Station Canopy (SSC)
23	Warehouse Building [Tilt-up Walls or Heavy-Timber Construction](WHB)
24	Transmission Line Towers (TLT)
25	Free-Standing Towers (FST)
26	Free-Standing Light Poles, Luminary Poles, Flag Poles (FSP)
27	Trees: Hardwood (TH)
28	Trees: Softwood (TS)

Source: National Weather Service/National Oceanic and Atmospheric Administration

Table 4.6 Average path size of tornados, based on all tornados reported in the United States from 2007-2013[10]

Enhanced Fujita Number	Average Path Length (miles)	Average Patch Width (feet)
0	1.41	180.12
1	4.41	537.40
2	8.88	1128.94
3	18.08	2415.68
4	32.65	3273.95
5	44.71	5366.79

4.2.2. Geographic Location and Historical Occurrences

Southern Illinois is sometimes included in definitions of "Tornado Alley" and "Dixie Alley", although the terms have no official boundaries and generally refer to the Southcentral and Southeast portions of the U.S. respectively. Both geographic areas have the highest frequency of tornados in the U.S. The infamous Tri-State Tornado of 1925 was one of the worst recorded tornados in the history of the Midwest. It went through Franklin County and others in Illinois on its path from Missouri to Indiana. A rare weather event, the Tri-State Tornado had a path length of 219 miles and a width of ¾ mile. It continued for an estimated 3 ½ hours, and was an F5 on the Fujita scale. This event was the most destructive single tornado in United States history: 695 lives were lost, 2,027 were injured, and 15,000 homes were destroyed.

On May 29, 1982 an F3 tornado travelled through Perry County in southern Illinois, injuring 6 and destroying 9 homes in Conant[11]. An F4 tornado went through Williamson County, IL the same day- killing 10, injuring 181, and damaging 500 homes and 82 businesses[12]. The path in Williamson County was 17 miles long and nearly ¼ mile wide[13].

On December 11-12, 2021, a supercell thunderstorm travelled over 350 miles through Arkansas, Missouri, Tennessee, and Kentucky. 66 Tornados have been confirmed from this storm event, including an EF4 from Craighead County Arkansas to Obion County Tennessee with a path length of 80.3 miles and a max width of 5,249ft, and a second EF4 from Fulton County to Breckenridge County in Kentucky, with a path length of 165.7 miles and a max width of 7,874ft[14]. One EF3 and five EF2 tornados occurred in Illinois from this event; none occurred in Franklin County. 89 deaths and nearly $4 billion in damages occurred across all of the states that were impacted[15].

[10] Elsner, James B et al. "Tornado intensity estimated from damage path dimensions." PloS one vol. 9,9 e107571. 17 Sep. 2014
[11] Koplowitz, H.B., The Southern Illinoisian, "9 of 11 Conant homes ruined" June 1, 1982.
[12] Staff Writers, The Southern Illinoisian, "Marion counts loss, plans future" June 1, 1982.
[13] National Weather Service, "1982 Marion Illinois Tornado".
[14] National Weather Service, "NWS Storm Damage Summaries - Dec 10-11, 2021 Tornado Outbreak".
[15] Wikipedia, "Tornado outbreak of December 10–11, 2021".

There have been two major derechos in Illinois in recent decades; one in May of 2009 in southern Missouri and Illinois, and one in 2020 that went through Nebraska, Iowa, northern Illinois and northern Indiana. The 2009 derecho had recorded wind speeds of 120mph in Murphysboro (Jackson County, IL). Many power outages occurred and there was 1 death from the storm[16]. In 2020 an estimated 850,000 acres of crops were damaged and 2 people were killed in Iowa. In Illinois alone 750,000 homes lost power[17].

From 1950 to 2021, there have been 17 records of tornados in Williamson County.

Table 4.7 – Tornado records for Williamson County, IL

Location	Date	Rating	Deaths	Injuries	Property Damage
	12/18/1957	F4	0	10	2500000
	4/3/1968	F1	0	0	25000
	6/2/1973	F2	0	0	250000
	5/29/1982	F4	10	181	250000000
	11/19/1991	F3	0	16	25000000
MARION	6/12/1998	F1	0	0	100000
PULLEYS MILL	10/18/2004	F1	0	0	25000
CORINTH	5/8/2009	EF1	0	0	0
WOLF CREEK	2/29/2012	EF2	0	0	100000
CREAL SPRINGS	10/31/2013	EF1	0	0	40000
PULLEYS MILL	4/3/2014	EF1	0	0	10000
CRAINVILLE	2/28/2017	EF1	0	0	6000
CARTERVILLE	4/5/2017	EF1	0	0	35000
CRAINVILLE	4/3/2018	EF1	0	0	250000
PITTSBURG	4/3/2018	EF1	0	0	40000
CORINTH	4/3/2018	EF1	0	0	7000
JOHNSTON CITY	6/28/2018	EF0	0	0	35000

Source: NOAA Storm Events Database

4.2.3. Risk

Tornadoes and derechos can occur at any location in the county. Derechos are a seasonal weather phenomenon and typically occur during May-August. Historical tornadoes generally moved from southwest to northeast across the county, although many other tracks are possible. The extent of the hazard varies in terms of the EF rating of the tornado and location and direction of its path.

[16] The Southern Illinoisian
[17] Foley and Funk, "Derecho leaves 2 dead, heavy crop damage across Midwest", The Southern Illinoisian, 8.12.2020.

Structures most at risk of damage in the event of tornados include mobile and manufactured homes, unreinforced masonry structures, and facilities without storm window retrofits. Any homes and facilities constructed before building codes were widely enforced (pre-1970s) are more at risk for wind damage. The 2018 International Building Code (IBC) has wind load and impact resistance requirements for window installations specific for geographic area. The State of Illinois has not adopted statewide building code requirements[18]. Williamson County and some individual municipalities do have building code enforcements, see section 6.2 for all hazard related codes and ordinances.

4.2.4. Climate Change

2021 had an above average number of tornados recorded, with December having a record-breaking number of 193 tornados across the United States[19]. National average tornado frequency has remained relatively constant, but the spatial distribution has been shifting; with positive trends in the Midwest and Southeast, and negative trends in the Great Plains region[20]. The Eastern U.S. is expected to see an increase in days with favorable conditions for severe thunderstorms with the changing climate, which could also lead to an increased risk of tornado occurrence[21].

4.2.5. Hazard Model

ArcGIS was used to simulate an EF4 tornado in Williamson County, IL. A hypothetical path was created with a polyline starting northwest of Cambria and traveling southeast across the county. The damage path goes through parts of Cambria, Carterville, Crainville, Marion, and Crab Orchard. From the tornado path, 4 damage zones were created using the multiple ring buffer tool (table 4.8).

Table 4.8 - Buffer zones and damage estimates used for the EF4 tornado model

Zone	Buffer (feet)	Bridges & hospital damage	All other building damage
1	500	75%	100%
2	1000	50%	80%
3	2150	25%	50%
4	3300	5%	10%

Essential and critical facilities and infrastructure data comes from the IL State dataset from Hazus 5.1, and from local planning partner knowledge. Residential parcel data is from the Williamson County Assessor's Office. Railroad bridges, highway bridges, and hospitals have lower damage percentages since they are generally designed to withstand severe weather better than other infrastructure and buildings. The residential category includes single family

[18] "Building Codes and Regulations", Capital Development Board, Illinois.gov.
[19] NOAA, "Contiguous U.S. ranked fourth warmest during 2021; 20 billion-dollar disasters identified", January 10, 2022.
[20] Gensini, V.A. and Brooks, H.E., Nature, "Spatial trends in United States tornado frequency", 2018.
[21] NASA - Global Climate Change, "Severe thunderstorms and climate change", April 7, 2013.

homes, duplexes, mobile homes, and apartment buildings (Occupancy codes 0040 and 0050). Damage costs could not be determined for residential buildings with the data available.

Tables 4.10-4.13 show the results and damage cost estimates for each buffer zone, table 4.9 shows the total damage cost estimates. Figure 4.3 shows the tornado path for Williamson County. Figure 4.4 shows the path in detail through Cambria, Carterville, and Crainville. Figure 4.5 shows the path in detail through Marion.

Table 4.9 – Total Damage Cost Estimates for EF4 Tornado Model

Total		
Category	**# Damaged**	**Total Cost of Damage**
highway bridges	28	45,672,158.21
railroad bridges	3	5,489,852.97
residential buildings	4532	
essential facilities	15	23,022,020.66
critical facilities	6	59,468,047.10
TOTAL		133,652,078.94

Figure 4.3

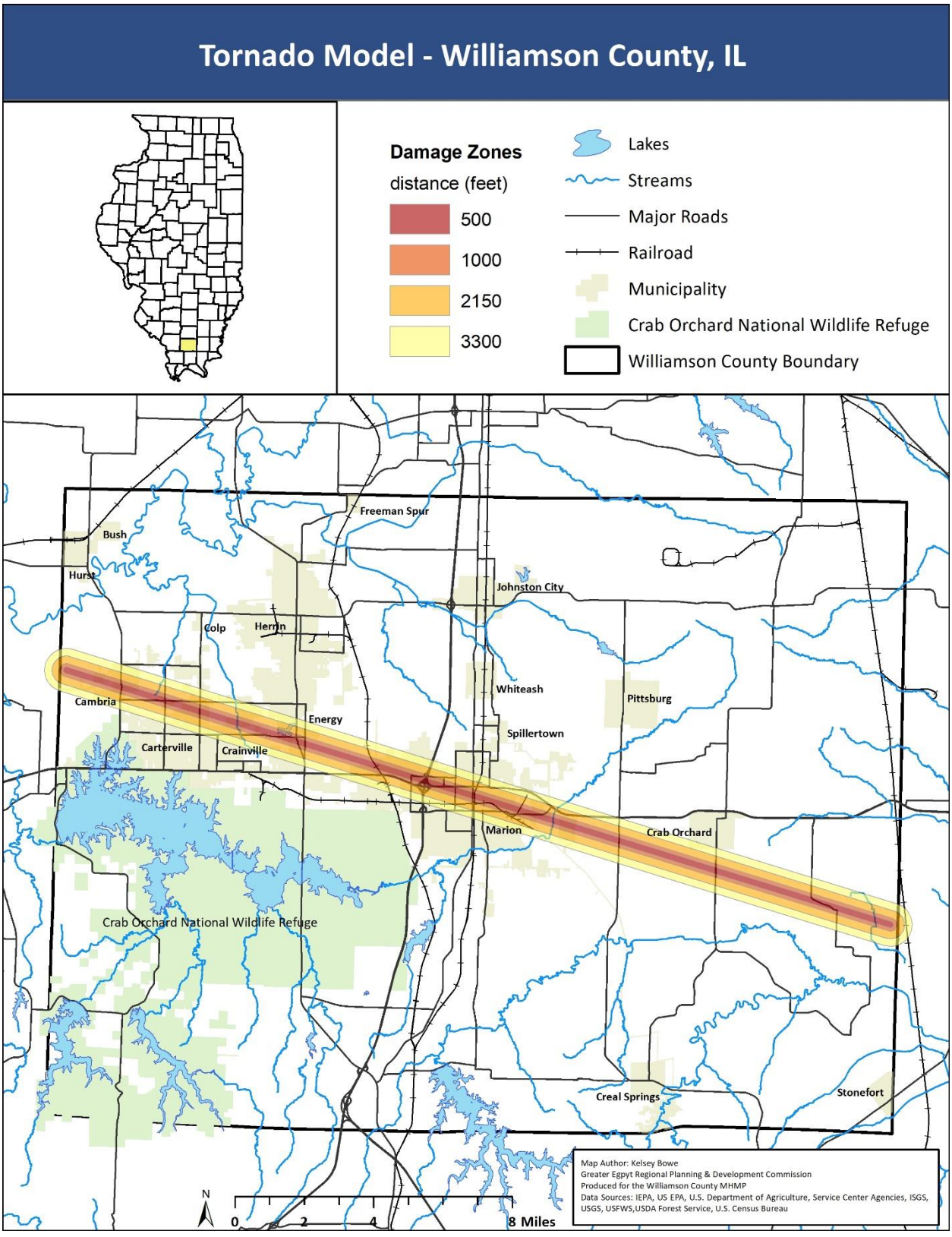

Tornado Model - Williamson County, IL
Damage Zones
distance (feet)
500
1000
2150
3300
Lakes
Streams
Major Roads
Railroad
Municipality
Crab Orchard National Wildlife Refuge
Williamson County Boundary
Freeman Spur
Bush
Hurst
Johnston City
Colp
Herrin
Whiteash
Pittsburg
Cambria
Energy
Spillertown
Carterville
Crainville
Marion
Crab Orchard
Crab Orchard National Wildlife Refuge
Creal Springs
Stonefort
N
0
2
4
8 Miles
Map Author: Kelsey Bowe
Greater Egpyt Regional Planning & Development Commission
Produced for the Williamson County MHMP
Data Sources: IEPA, US EPA, U.S. Department of Agriculture, Service Center Agencies, ISGS, USGS, USFWS,USDA Forest Service, U.S. Census Bureau

Table 4.10

Zone 1		
Category	**# Damaged**	**Total Cost of Damage**
highway bridges	5	30,193,103.18
railroad bridges	1	3,921,323.55
residential buildings	601	NA
Cambria STP		15,000,000.00
Vine Broadcasting, inc.		111,000.00
Clear Channel Broadcasting		111,000.00
Veterans Airport of Southern Illinois		13,175,647.10

Table 4.11

Zone 2		
Category	**# Damaged**	**Total Cost of Damage**
highway bridges	6	8,529,718.30
railroad bridges	0	0.00
residential buildings	655	NA
Williamson County Emergency Operations Center - Primary		2,237,224.02
Williamson County Fire Protection District Station 1		2,237,224.02
Marion Police Department		2,237,224.02
Marion Water Department		29,570,400.00

Table 4.12

Zone 3		
Category	**# Damaged**	**Total Cost of Damage**
highway bridges	9	6,778,966.13
railroad bridges	1	1,307,107.85
residential buildings	1598	NA
Carterville Intermediate School		2,520,375.00
Jefferson Elementary School		3,788,000.00
Washington Elementary School		1,361,000.00
Cambria Police Department		1,398,265.02
Williamson County Sheriff's Department		1,398,265.02
Cambria Fire Department		1,398,265.02
Marion Fire Department		1,398,265.02
Williamson County Emergency Operations Center - Secondary		1,398,265.02
United Medical Response Division 4		464,478.00

Table 4.13

Zone 4		
Category	**# Damaged**	**Total Cost of Damage**
highway bridges	8	170,370.61
railroad bridges	1	261,421.57
residential buildings	1678	NA
Heartland Regional Medical Center		625,864.50
Carterville Fire Department		279,653.00
Carterville Police Department		279,653.00
Crainville STP		1,500,000.00

Figure 4.4

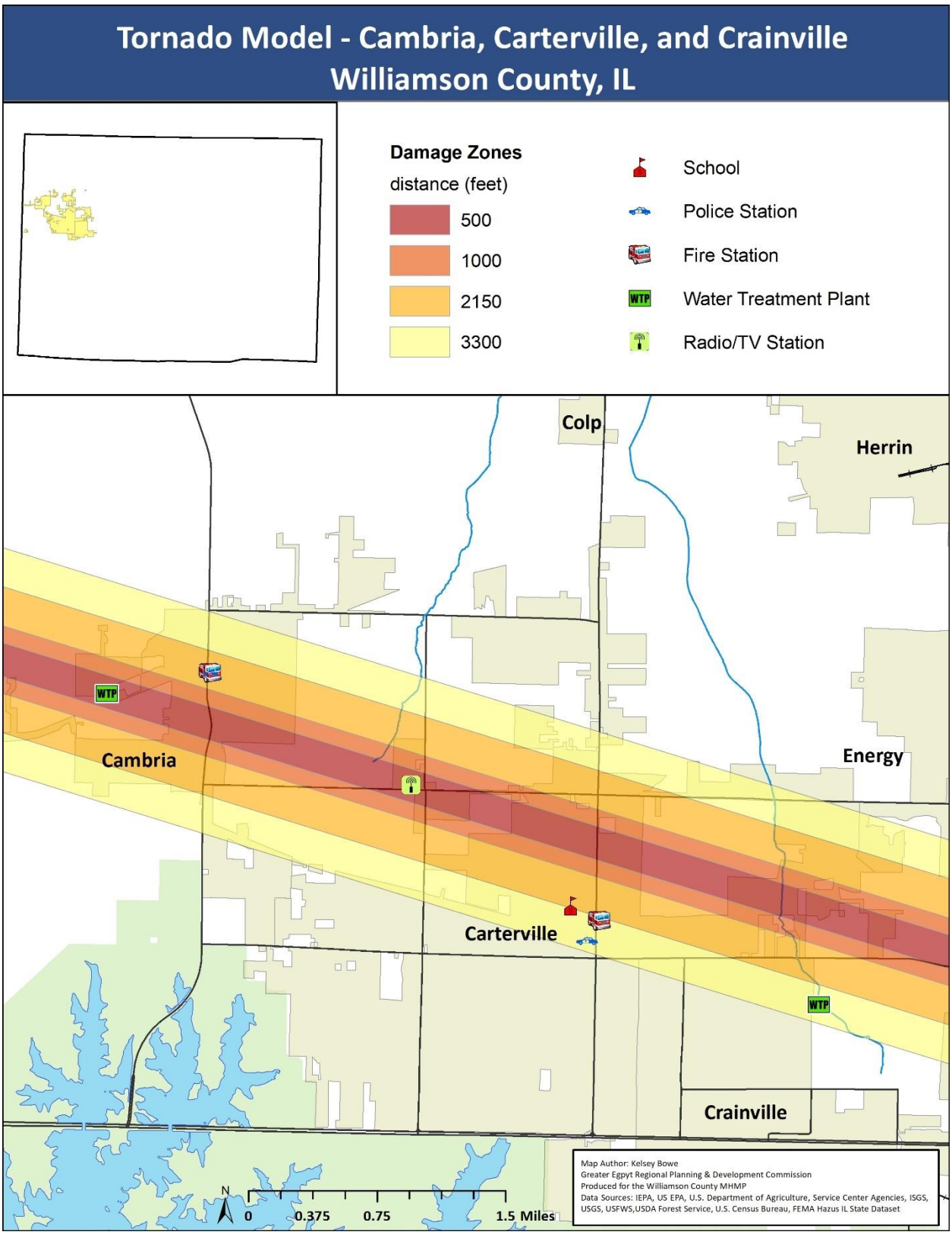
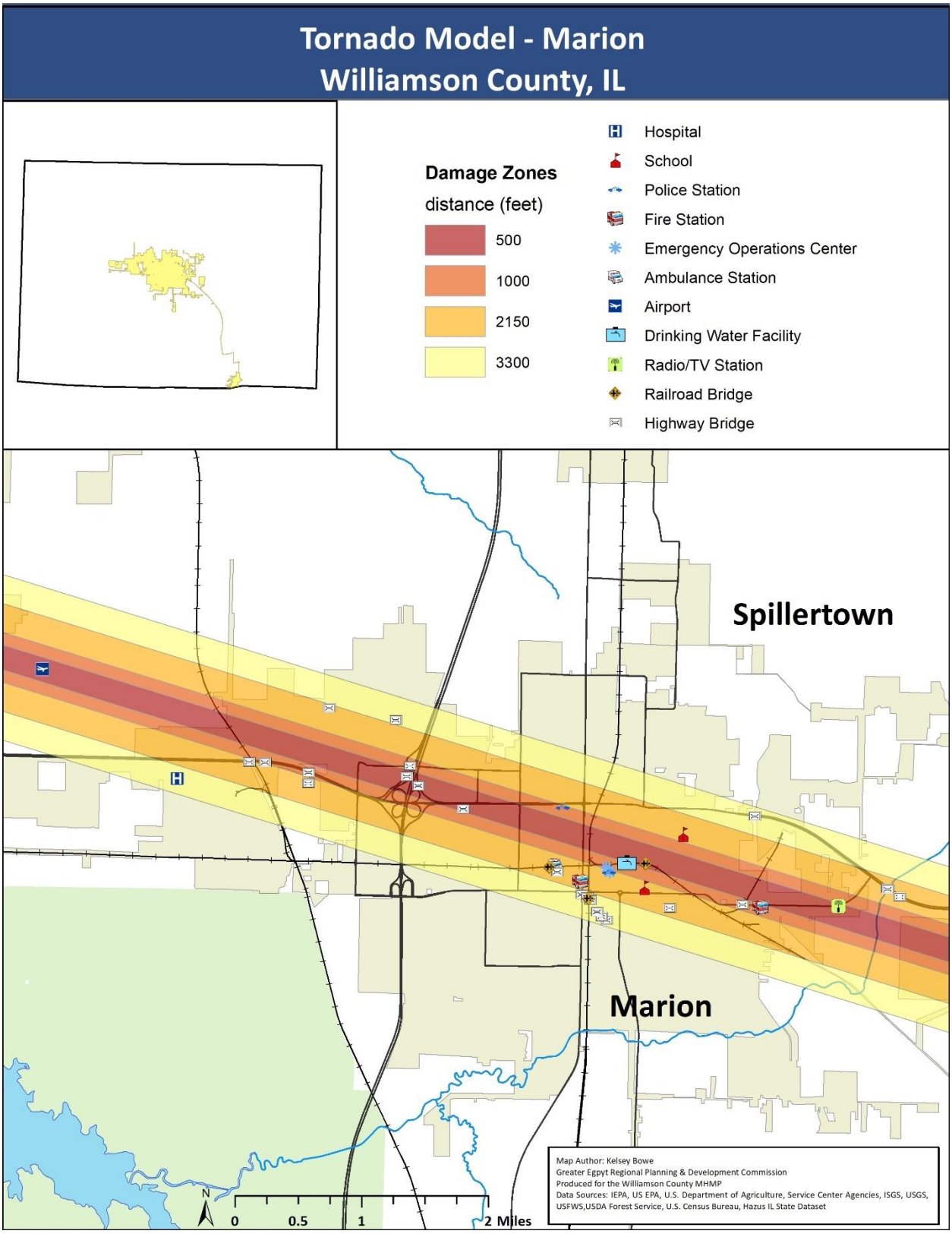

Tornado Model - Cambria, Carterville, and Crainville
Williamson County, IL
Damage Zones
distance (feet)
500
1000
2150
3300
School
Police Station
Fire Station
Water Treatment Plant
Radio/TV Station
Colp
Herrin
Cambria
Energy
Carterville
Crainville
WTP
WTP
WTP
N
0
0.375
0.75
1.5 Miles
Map Author: Kelsey Bowe
Greater Egpyt Regional Planning & Development Commission
Produced for the Williamson County MHMP
Data Sources: IEPA, US EPA, U.S. Department of Agriculture, Service Center Agencies, ISGS, USGS, USFWS,USDA Forest Service, U.S. Census Bureau, FEMA Hazus IL State Dataset

Figure 4.5


Tornado Model - Marion
Williamson County, IL
Damage Zones
distance (feet)
500
1000
2150
3300
Hospital
School
Police Station
Fire Station
Emergency Operations Center
Ambulance Station
Airport
Drinking Water Facility
Radio/TV Station
Railroad Bridge
Highway Bridge
Spillertown
Marion
N
0
0.5
1
2 Miles
Map Author: Kelsey Bowe
Greater Egpyt Regional Planning & Development Commission
Produced for the Williamson County MHMP
Data Sources: IEPA, US EPA, U.S. Department of Agriculture, Service Center Agencies, ISGS, USGS, USFWS,USDA Forest Service, U.S. Census Bureau, Hazus IL State Dataset

4.3. Disease Outbreaks, Epidemics, & Pandemics

4.3.1. Hazard Description

This hazard is the spread of various diseases or other health problems that increase at rapid rates. The term disease outbreak is typically used when disease spread is limited to small communities or regions, such as a school system, city, or county; Although it can also be used when referring to large scale disease spread. Epidemics are disease outbreaks that infect people throughout a nation or several nations. Pandemics are disease outbreak at a global scale. Pandemics are usually the result of highly-infectious, rapidly spreading diseases. Disease outbreaks may last days to years, and the effects on public health and the economy may be long lasting and severe.

While disease outbreaks are often the result of contagious (human to human spread) diseases, such as influenza or measles they can stem from other origins. Other sources of disease outbreak include foodborne pathogens (such as E. coli or salmonella), zoonotic disease spread (Animal to human spread, such as Lyme disease and west Nile virus), and public health trends (such as the rise in obesity rates). Some disease outbreaks also become endemic, in which a disease is consistently present but limited to certain regions; or seasonal outbreaks where the same disease will resurface at high rates during certain times of the year.

Examples of pandemics include Spanish Influenza, HIV/AIDs, and most recently, COVID-19. Detailed information regarding COVID-19 is widely available from the Center for Disease Control (CDC), Illinois Department of Public Health (IDPH), and County Health Departments. Disease Outbreaks are not considered a natural hazard by FEMA, and rarely qualify for FEMA emergency funding or grant programs. COVID-19 was declared a federal disaster in all 50 states and relief funding has been distributed through the Coronavirus Aid, Relief, and Economic Security (CARES) Act, 2020 [P.L. 116-136]; the Coronavirus Preparedness and Response Supplemental Appropriations Act, 2020, [P.L. 116-123], and the Families First Coronavirus Response Act, 2020 [P.L. 116-127].

4.3.2. Geographical Location and Historical Occurrences

The Centers for Disease Control (CDC) maintains the National Outbreak Reporting System (NORS) for disease outbreaks in the U.S.

Table 4.14 Disease Outbreaks in Illinois from 2009-2018

Type of Outbreak	# Outbreaks	# Illnesses	# Hospitalizations	# Deaths
Person to person	1221	34456	876	24
Foodborne	603	19635	2958	74
Waterborne	33	1862	107	21
Animal Contact*	58	5065	998	9
Environmental	4	142	5	0
Indeterminate/unknown	23	516	23	1
Total	1942	61676	4967	129

Source: CDC NORS

*The statistics for animal contact does not include diseases from invertebrate vectors such as mosquitos and ticks, nor does it contain diseases spread from animal bites; most cases are salmonella from touching reptiles and poultry.

Table 4.15 Covid-19 cases and deaths in Illinois as of 6/16/22

Covid cases	Confirmed deaths	Probable deaths
3,376,596	33,979	4,413

Source: Illinois Department of Public Health

As of Tuesday, May 17, 2022 Johns Hopkins University data estimates over one million people in the United States have died as a result of COVID-19.

4.3.3. Risk

Since the nature of disease outbreaks vary depending on the type of illness, the risk varies as well. In general, the county has equal risk of an outbreak occurring although facilities such as schools or nursing homes have a higher risk due to the close density of people and vulnerability of children and elderly.

4.4. Earthquakes

4.4.1. Hazard Description

Earthquakes occur when seismic energy in the earth's crust is quickly released, often due to large blocks of crust fracturing or slipping past one another. Tectonic earthquakes often occur along major geologic fault lines. However, earthquakes can also occur in the interior of major plates due to weaknesses in the crust or other factors.

Effects of earthquakes can include perceptible ground shaking, surface faulting, and ground failure. In general, ground shaking will be more vigorous as earthquake magnitude increases. Ground shaking can cause massive damage to buildings and infrastructure; though the amount of damage depends also on soil properties, building specifications, distance from the epicenter, and other factors. Surface faulting, classified as strike-slip, normal, or reverse/thrust, causes displacement of the earth's crust at the surface. This usually leads to a long, narrow zone of displacement, which can be catastrophic to buildings and infrastructure. However, these zones are often quite narrow and impact small areas if they do occur. Ground failure can be induced by liquefaction which is a phenomenon where coarse soils, comprised mainly of silts or sands, act as a liquid due to the seismic shear waves produced by the earthquake. Liquefaction can cause lateral spreads, flow failures, loss of bearing strength, and sand boils – all of which can be destructive to the built environment[22].

The impacts of large earthquakes on more densely populated areas can be severe. Buildings and major infrastructure may collapse, roadways may be impassable due to debris or road failure, and essential facilities may be damaged or unreachable. Injury and loss of life are also possible during an earthquake – often the result of building collapse or falling debris. Due to the possible crippling of transportation and essential facilities, pre-hazard contingency planning is crucial for adequate emergency response in the event of an earthquake.

Earthquakes are measured by intensity, magnitude and energy release. Intensity describes the effects of the earthquake at the surface. Intensity is measured by the Modified Mercalli Intensity Scale (figure 4.6) which ranges from I – XII, where "I" describes an earthquake almost imperceptible to people and "XII" describes extreme damage to the built and natural environments at the surface. Magnitude is a measurement of the physical size of the earthquake, calculated by multiplying the length, width, and slip. Slip is the displacement of the fault. Energy release is a measure of all frequencies of shaking produced for the duration of an earthquake and is estimated using a logarithmic conversion of the magnitude. Magnitude is measured by a logarithmic scale - an increase of a whole number on the magnitude scale represents a tenfold increase in amplitude and 32 times more energy release[23].

[22] Hays, W.W., ed., 1981, Facing Geologic and Hydrologic Hazards - Earth Science Considerations: U.S. Geological Survey Professional Paper
[23] "Earthquake Magnitude, Energy Release, and Shaking Intensity", Earthquake Hazards, USGS.

Figure 4.6

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest,especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Source: U.S. Geological Survey (USGS)

4.4.2. Geographic Location and Historical Occurrences

Southern Illinois lies in the northwest region of the New Madrid Seismic Zone (NMSZ). This zone covers areas of Arkansas, Missouri, Mississippi, Tennessee, Kentucky, and Illinois (figure 4.6) and is characterized by a group of faults deeply buried by river sediment. The geology associated with the New Madrid Seismic zone is known as the Mississippi Embayment. This is underlain by Reelfoot Rift, a deep continental rift system formed roughly 600 million years ago, and by Paleozoic sedimentary rock formed around 570 million years ago. The upper layers of the Mississippi Embayment include marine sedimentary rock from 50-100 million years ago, and even more recently river sediments from 5 million to 60,000 years ago[24].

Historic data suggests that magnitude 7-8 earthquakes have occurred in the NMSZ roughly every 500 years since 900 CE. The worst recorded series of earthquakes occurred in 1811-1812. 3 large earthquakes occurred in December 1811, and January and February of 1812, with hundreds of aftershocks felt throughout the year and into 1813. The epicenter of the third earthquake occurred near and destroyed the town of New Madrid, Missouri. Other damage from the earthquakes and aftershocks included bank failure along the Mississippi River, landsides of surrounding bluffs, uplift and subsidence of large areas, and liquefication of subsurface sediment- resulting in sand blows that covers thousands of square kilometers.

[24] "The New Madrid Seismic Zone", Earthquake Hazards, USGS.

Sections of the Mississippi River are reported to have flown backwards temporarily as a result of uplift.

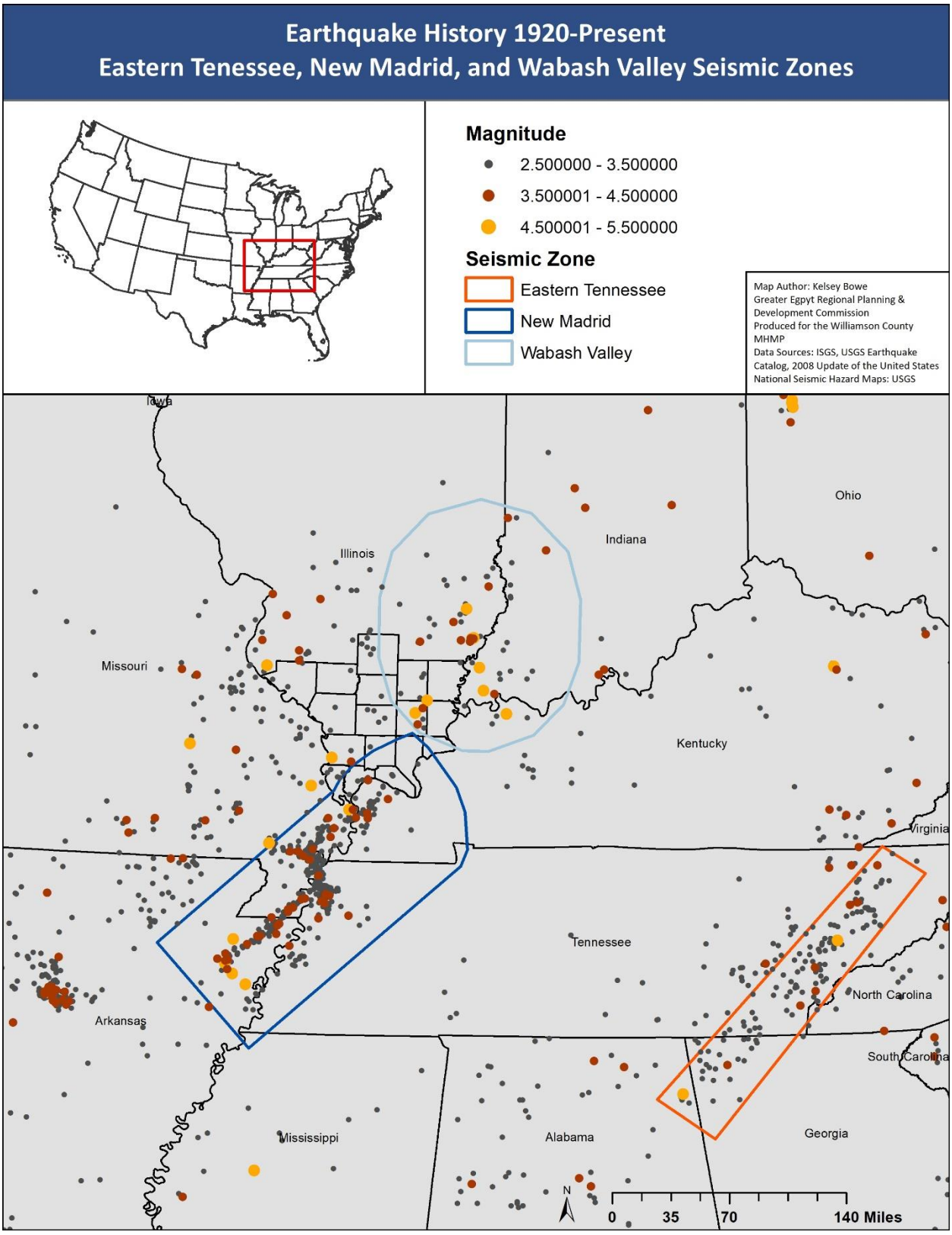
The Wabash Valley Seismic Zone (WVSZ) occurs around the conjunction of Kentucky, Indiana, and Illinois and may impact seismic activity of southern Illinois counties including Franklin. Although a smaller region than New Madrid, it is estimated to be capable of magnitude 7 earthquakes. There is evidence of liquification sites dated at 6,100 years old, and more recently a magnitude 5.2 earthquake occurred in 2008 with an epicenter near Mt. Carmel, IL. Damage was reported from all three states in the seismic zone[25]. Figure 4.7 shows the seismic zones and earthquake history of southern Illinois and surrounding states.

Williamson county has had 3 recorded earthquakes from 1920-2021:

- Mag 3.4 6/9/1981
- Mag 3.0 3/10/1988
- Mag 2.9 6/28/1989
- Mag 2.7 1/11/2013

[25] "Wabash Valley Seismic Zone", Central United States Earthquake Consortium. https://cusec.org/wabash-valley-seismic-zone/

Figure 4.7


Earthquake History 1920-Present
Eastern Tenessee, New Madrid, and Wabash Valley Seismic Zones
Magnitude
2.500000 - 3.500000
3.500001 - 4.500000
4.500001 - 5.500000
Seismic Zone
Eastern Tennessee
New Madrid
Wabash Valley
Map Author: Kelsey Bowe
Greater Egpyt Regional Planning & Development Commission
Produced for the Williamson County MHMP
Data Sources: ISGS, USGS Earthquake Catalog, 2008 Update of the United States National Seismic Hazard Maps: USGS
Iowa
Illinois
Indiana
Ohio
Missouri
Kentucky
Virginia
Tennessee
North Carolina
Arkansas
South Carolina
Mississippi
Alabama
Georgia
N
0
35
70
140 Miles

4.4.3. Risk

Figure 4.8 shows the most current USGS earthquake risk map. The values are expressed as a percentage of the acceleration of gravity (g). These values are a probability of 10% chance of exceeding the displayed ground acceleration within 50 years[26]. Williamson County has a probability of 10-15%, while the center area of the New Madrid Seismic Zone has a probability of 40%.

Areas most at risk for liquefaction and sand blows are floodplains where the water table is within five feet of the surface. Williamson County does not have any high-risk areas for liquefaction, see figure 4.9.

While the county has equal risk of an earthquake occurring, older buildings and infrastructure have a higher risk of damage if one occurred. Construction before international building codes were widely adopted and enforced, and facilities that have not been seismically retrofitted are more likely to be damaged. Unreinforced masonry buildings were one of the most common structures for homes and commercial buildings from settlement through the mid-late 1970s; it is also the most dangerous building types for an earthquake hazard[27]. The Hazus software uses the year 1973 as a threshold for earthquake related building codes. However, in the eastern U.S. they were not widely enforced until much later and it can be difficult to determine the building codes used in old facilities. The Central U.S. Earthquake Consortium (CUSEC) states that most homes in the central U.S. were not built with seismic consideration until 1990.

[26] "USA Earthquake Risk", Layer Description, Map Image Layer by ESRI and USGS, ArcGIS Online.
[27] "Putting down roots in earthquake county- your handbook for earthquakes in the Central United States", U.S. Department of the Interior, U.S. Geological Survey, General Information Product 119.

Figure 4.8

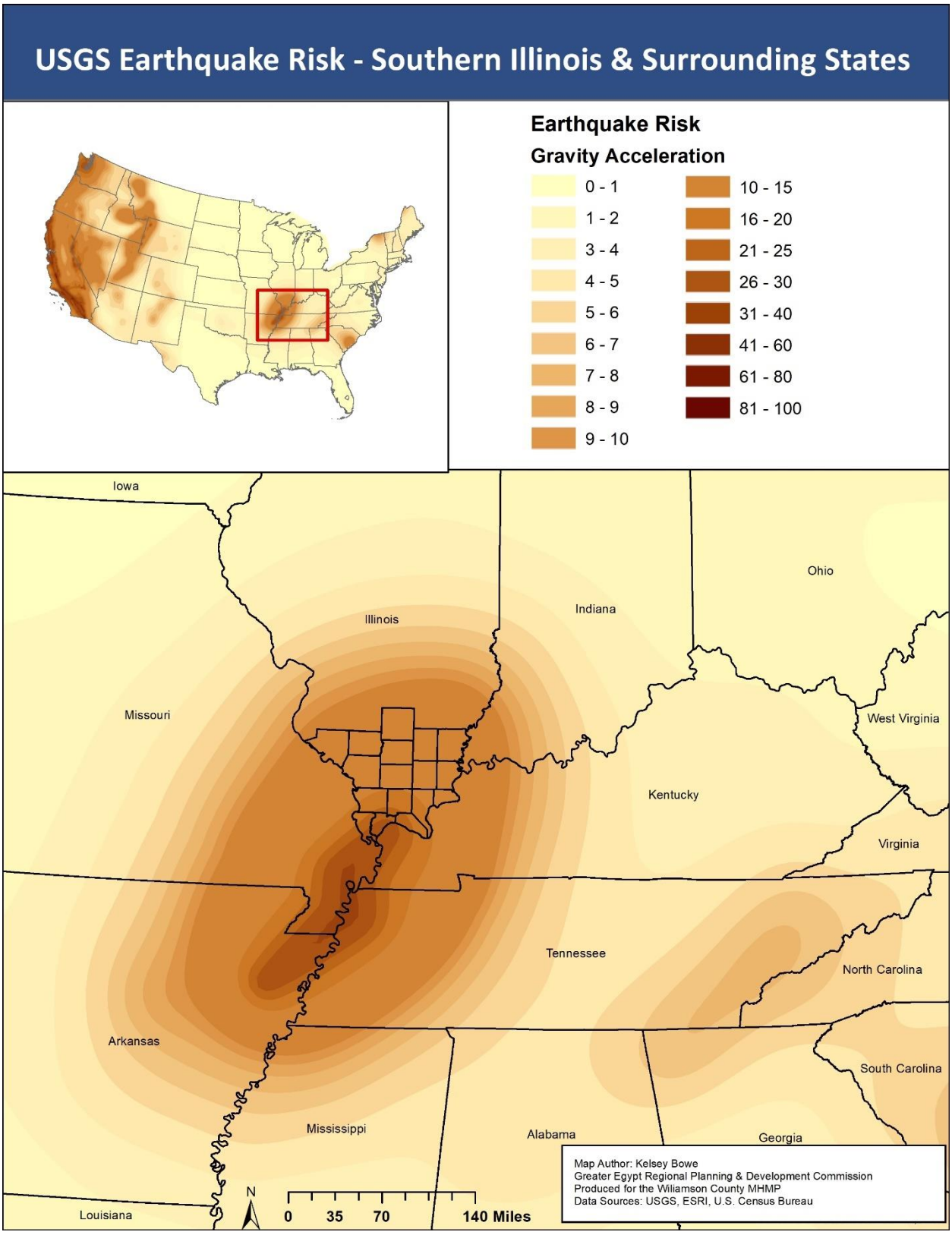
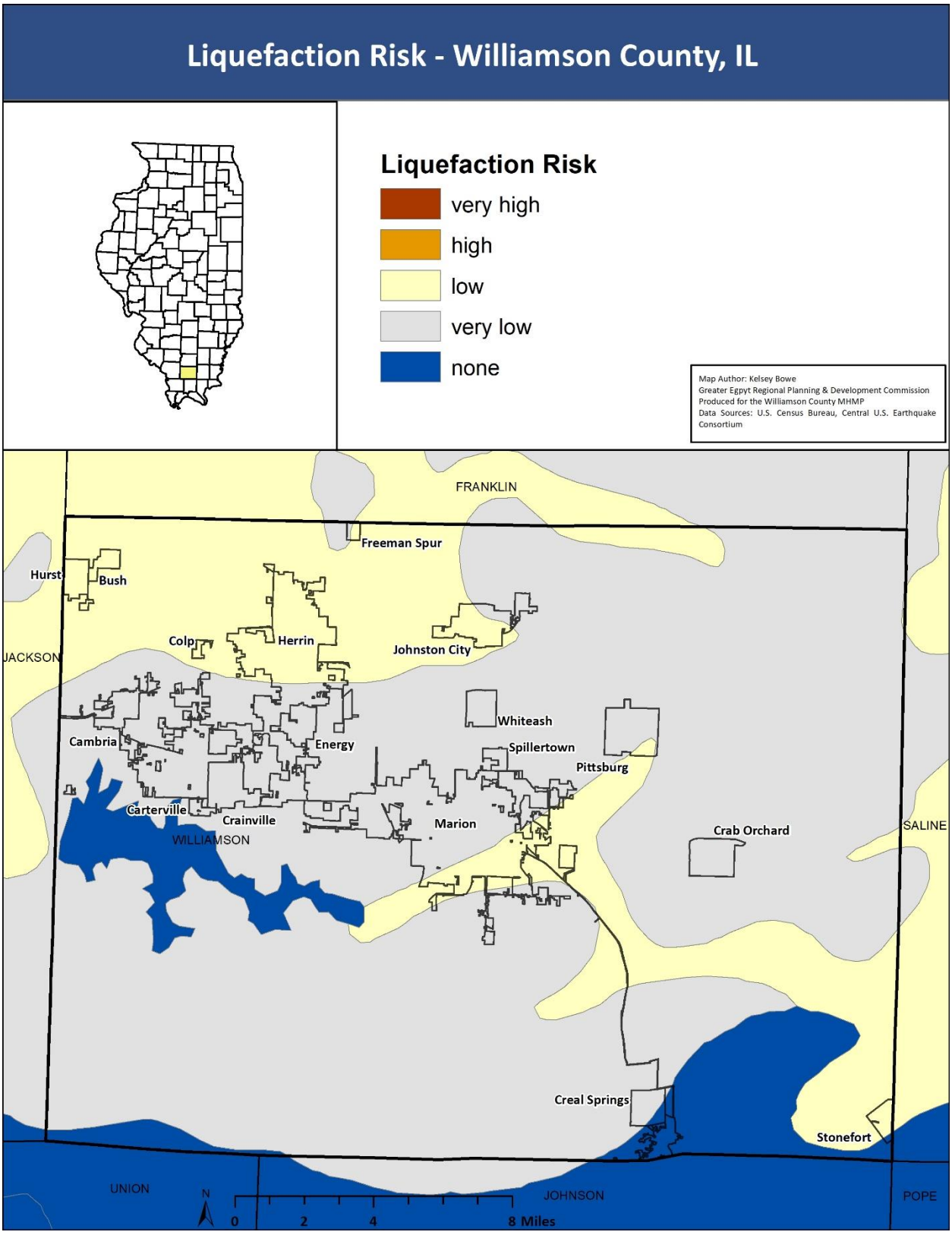

USGS Earthquake Risk - Southern Illinois & Surrounding States
Earthquake Risk
Gravity Acceleration
0 - 1
1 - 2
3 - 4
4 - 5
5 - 6
6 - 7
7 - 8
8 - 9
9 - 10
10 - 15
16 - 20
21 - 25
26 - 30
31 - 40
41 - 60
61 - 80
81 - 100
Iowa
Illinois
Indiana
Ohio
Missouri
West Virginia
Kentucky
Virginia
Tennessee
North Carolina
Arkansas
South Carolina
Mississippi
Alabama
Georgia
Louisiana
N
0 35 70 140 Miles
Map Author: Kelsey Bowe
Greater Egypt Regional Planning & Development Commission
Produced for the Wiliamson County MHMP
Data Sources: USGS, ESRI, U.S. Census Bureau

Figure 4.9


Liquefaction Risk - Williamson County, IL
Liquefaction Risk
very high
high
low
very low
none
Map Author: Kelsey Bowe
Greater Egpyt Regional Planning & Development Commission
Produced for the Williamson County MHMP
Data Sources: U.S. Census Bureau, Central U.S. Earthquake Consortium
FRANKLIN
Freeman Spur
Hurst
Bush
Colp
Herrin
Johnston City
JACKSON
Whiteash
Cambria
Energy
Spillertown
Pittsburg
Carterville
Crainville
Marion
Crab Orchard
SALINE
WILLIAMSON
Creal Springs
Stonefort
UNION
JOHNSON
POPE
N
0
2
4
8 Miles

4.4.4. Hazard Model

Hazus 5.1 was used to model 2 different scenarios for Williamson County. Hazus uses data from the 2010 U.S. Decennial Census and the 2019 Homeland Infrastructure Foundation Level Data. Census tracts, population estimates, replacement values, and other data may not reflect the most current values.

Scenario 1: Magnitude 5.5 event in Williamson County

Model Parameters:
Hazus Arbitrary Scenario - 5.5 magnitude
Depth - 10km
Latitude - 37.7312
Longitude - -88.9755
Total households - 27,421

Results

In this scenario, nearly 8,000 buildings are estimated to be moderately or extensively damaged, and nearly 700 buildings are estimated to be completely damaged. Table 4.16 shows the damage estimates by occupancy type. Essential facilities with at least moderate damage include two hospitals, 10 schools, six police stations, and three fire stations. Transportation systems with at least moderate damage include four highway bridges, three railway facilities, one bus station, and two airports. After seven days, all transportation facilities and segments are expected to be operational (functionality greater than 50%). Utility systems that sustain at least moderate damage are three drinking water facilities, 11 wastewater treatment plants, one electric power facility, and seven communication facilities. After seven days all but one wastewater treatment plants are expected to be functioning. Damage to utility pipelines and the effect on households are displayed in tables 4.17 and 4.18.

Table 4.16 – Damage Estimates by Occupancy Type

	None		Slight		Moderate		Extensive		Complete	
Occupancy Type	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	37.64	0.28	24.96	0.32	36.52	0.66	22.75	1.05	7.12	1.08
Commercial	393.78	2.97	345.15	4.45	475	8.62	264.58	12.21	94.49	14.27
Education	15.68	0.12	10.84	0.14	14.42	0.26	7.37	0.34	2.69	0.41
Government	15.23	0.11	11.17	0.14	15.98	0.29	7.77	0.36	2.85	0.43
Industrial	111.02	0.84	88.18	1.14	123.76	2.25	71.25	3.29	23.79	3.59
Other Residential	1515.73	11.43	1145.84	14.79	1442.6	26.19	761.1	35.13	196.73	29.71
Religion	76.47	0.58	49.77	0.64	51.85	0.94	29.38	1.36	10.53	1.59
Single Family	11095.02	83.67	6071.54	78.37	3347.47	60.78	1002.07	46.26	323.9	48.92
Total	**13,261**		**7,747**		**5,508**		**2,166**		**662**	

Table 4.17

System	Total Pipeline Length (miles)	# of Leaks	# of Breaks
Potable Water	2,345	502	144
Waste Water	1,407	252	72
Natural Gas	39	4	1
Oil	0	0	0

Table 4.18

Total # of Number of Households without Service					
	At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	2,392	626	0	0	0
Electric Power	18,498	12,292	5,228	977	22

Physical damage will result in an estimated 304,000 tons of debris, requiring 12,160 truckloads to remove. Monetary losses as a result of this earthquake scenario are displayed in table 4.19.

In addition to the building related losses, there is an estimated $29.55 million economic loss to the transportation sector and $286.76 million economic loss to utility systems. Total Economic losses are estimated to be $ 1.508 billion.

Table 4.19 - Building Related Economic Loss Estimates (millions of dollars)

Category	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses						
Wage	0	2.5471	39.994	0.9818	3.0761	46.599
Capital-Related	0	1.0848	34.5816	0.5707	0.7619	36.999
Rental	10.8059	8.6297	18.8165	0.3318	1.497	40.0809
Relocation	37.9574	9.2353	30.2433	2.0599	12.2754	91.7713
Subtotal	**48.7633**	**21.4969**	**123.6354**	**3.9442**	**17.6104**	**215.4502**
Capital Stock Losses						
Structural	65.2677	18.4277	45.4661	7.3488	14.6347	151.145
Nonstructural	262.3843	94.9548	137.2934	26.4443	42.0415	563.1183
Content	106.9959	28.4627	78.9835	18.2396	24.7233	257.405
Inventory	0	0	1.7084	3.259	0.2549	5.2223
Subtotal	**434.6479**	**141.8452**	**263.4514**	**55.2917**	**81.6544**	**976.8906**
Total	**483.41**	**163.34**	**387.09**	**59.24**	**99.26**	**1192.34**

Social Impact

The model estimates 780 households will be displaced due to the earthquake, and of those, 474 will need temporary public shelter.

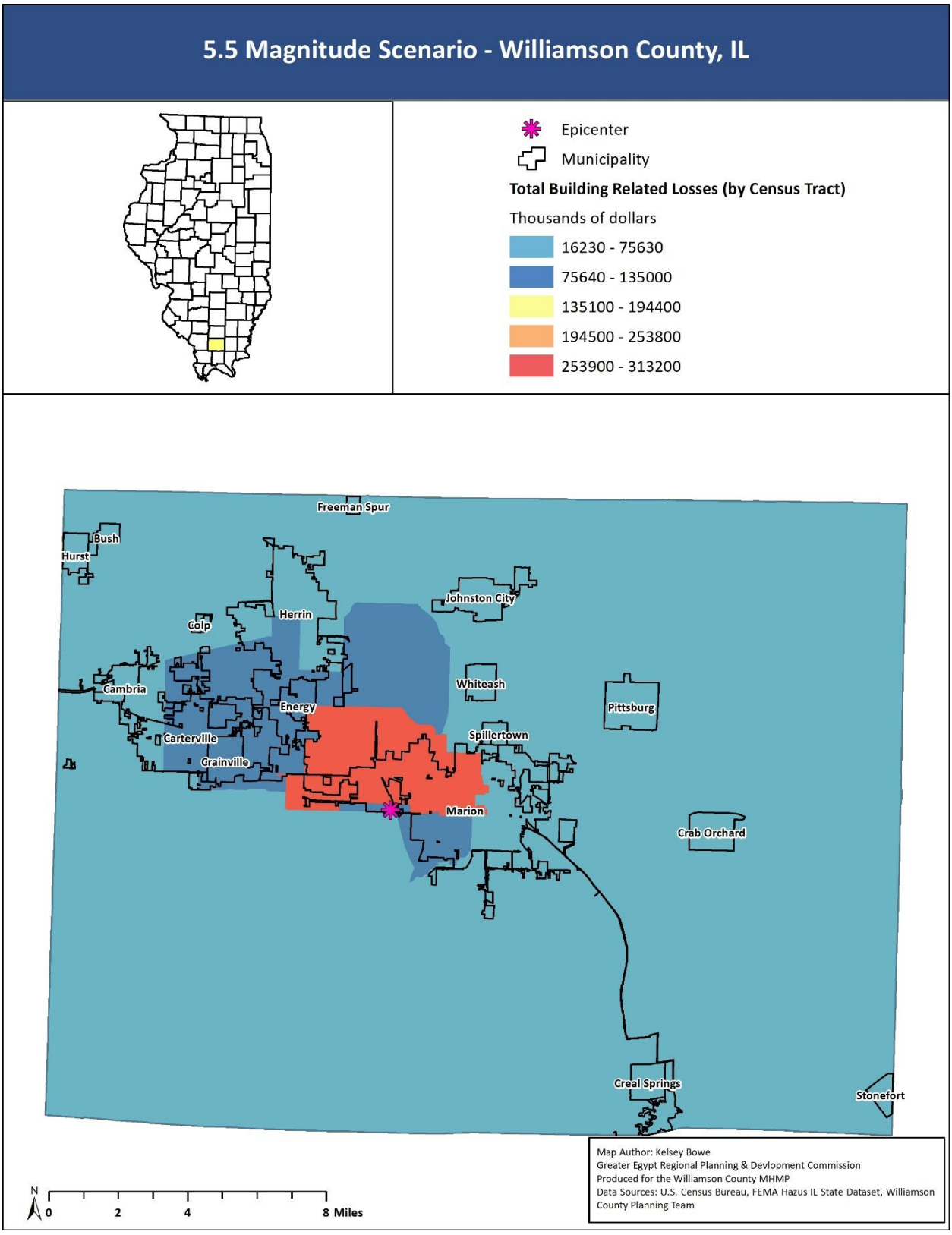
Table ## displays injury and casualty estimates for 3 different occupancy load scenarios. 2:00 AM represents maximum residential occupancy load (most of population home in bed), 2:00 PM represents peak educational, commercial, and industrial occupancy (most of population at work/school), and 5:00 PM represents peak commuter occupancy. Injury severity levels are as follows:

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

Table 4.20 – Injury and Casualty Estimates

Time of Earthquake	Occupancy Type	Level 1	Level 2	Level 3	Level 4
2:00 AM	Commercial	4.27	1.05	0.14	0.28
	Commuting	0.01	0.02	0.03	0.01
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	3.87	0.94	0.12	0.24
	Other-Residential	80.89	17.66	1.95	3.72
	Single Family	160.93	37.61	5.18	10.16
	Total	**250**	**57**	**7**	**14**
2:00 PM	Commercial	258.29	63.36	8.67	16.82
	Commuting	0.12	0.15	0.26	0.05
	Educational	89.83	22.98	3.41	6.61
	Hotels	0	0	0	0
	Industrial	28.55	6.95	0.93	1.8
	Other-Residential	19.3	4.33	0.51	0.94
	Single Family	39.49	9.51	1.37	2.56
	Total	**436**	**107**	**15**	**29**
5:00 PM	Commercial	183.17	45.16	6.24	11.96
	Commuting	2.03	2.53	4.48	0.86
	Educational	9.56	2.45	0.36	0.71
	Hotels	0	0	0	0
	Industrial	17.84	4.34	0.58	1.12
	Other-Residential	30.81	6.9	0.81	1.49
	Single Family	64.57	15.56	2.23	4.19
	Total	**308**	**77**	**15**	**20**

Figure 4.10


5.5 Magnitude Scenario - Williamson County, IL
Epicenter
Municipality
Total Building Related Losses (by Census Tract)
Thousands of dollars
16230 - 75630
75640 - 135000
135100 - 194400
194500 - 253800
253900 - 313200
Freeman Spur
Bush
Hurst
Johnston City
Herrin
Golp
Cambria
Whiteash
Pittsburg
Energy
Carterville
Spillertown
Crainville
Marion
Crab Orchard
Creal Springs
Stonefort
N
0
2
4
8 Miles
Map Author: Kelsey Bowe
Greater Egypt Regional Planning & Devlopment Commission
Produced for the Williamson County MHMP
Data Sources: U.S. Census Bureau, FEMA Hazus IL State Dataset, Williamson County Planning Team

Scenario 2: Magnitude 7.5 event in the New Madrid Seismic Zone

Model Parameters:
USGS ShakeMaps Scenario - M7.5-New Madrid central fault, version 5, bssc2014
Depth - 19.358km
Latitude - 35.83234
Longitude - -90.06303

This model estimates damages and social impacts of a magnitude 7.5 earthquake in the central fault of the NMSZ for Williamson County, Illinois. It is important to note an earthquake of this magnitude would be catastrophic to the population, infrastructure, and economy of southeast Missouri, western Kentucky, southern Illinois, and surrounding areas; even though the effects in Williamson County are expected to be mild. The Mid America Earthquake Center estimated that if a repeat of the 1811-12 earthquakes occurred today, the NMSZ would suffer over 3,000 deaths, hundreds of hospitals could lose functionality, millions of households and businesses would lose water and electricity, and total economic losses would be in the hundreds of billions of dollars.

In this scenario, 1,560 buildings are estimated to be moderately or extensively damaged, and only 20 buildings are estimated to be completely damaged. Table 4.21 shows the damage estimates by occupancy type. No essential facilities are estimated to be damaged. No transportation systems are estimated to be damaged. No utility facilities are estimated to be damaged, but there is some damage to pipelines. Damage to utility pipelines is displayed in table 4.22. No households are expected to lose utility services as a result of the earthquake.

Table 4.21 – Damage Estimates by Occupancy Type

	None		Slight		Moderate		Extensive		Complete	
Occupancy Type	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	99.09	0.4	16.42	0.58	10.8	0.8	2.53	1.18	0.16	0.81
Commercial	1232.08	4.94	200.85	7.13	112.61	8.38	25.65	11.9	1.81	9.13
Education	40.13	0.16	6.43	0.23	3.7	0.28	0.65	0.3	0.08	0.43
Government	41.58	0.17	6.77	0.24	3.98	0.3	0.6	0.28	0.08	0.4
Industrial	324.02	1.3	53.67	1.9	32.3	2.4	7.52	3.49	0.48	2.44
Other Residential	3522.37	14.12	801.78	28.46	647.59	48.18	84.94	39.39	5.32	26.87
Religion	177.81	0.71	23.77	0.84	13.22	0.98	2.92	1.35	0.27	1.38
Single Family	19509.85	78.21	1707.83	60.61	519.92	38.68	90.81	42.11	11.59	58.55
Total	**24,947**		**2,818**		**1,344**		**216**		**20**	

Table 4.22 – Utility Pipeline Damage Estimates

System	Total Pipeline Length (miles)	# of Leaks	# of Breaks
Potable Water	2,345	39	10
Waste Water	1,407	20	5
Natural Gas	39	0	0
Oil	0	0	0

The scenario estimates 33,000 tons of debris will result from building damage, requiring 1,320 truckloads to remove.

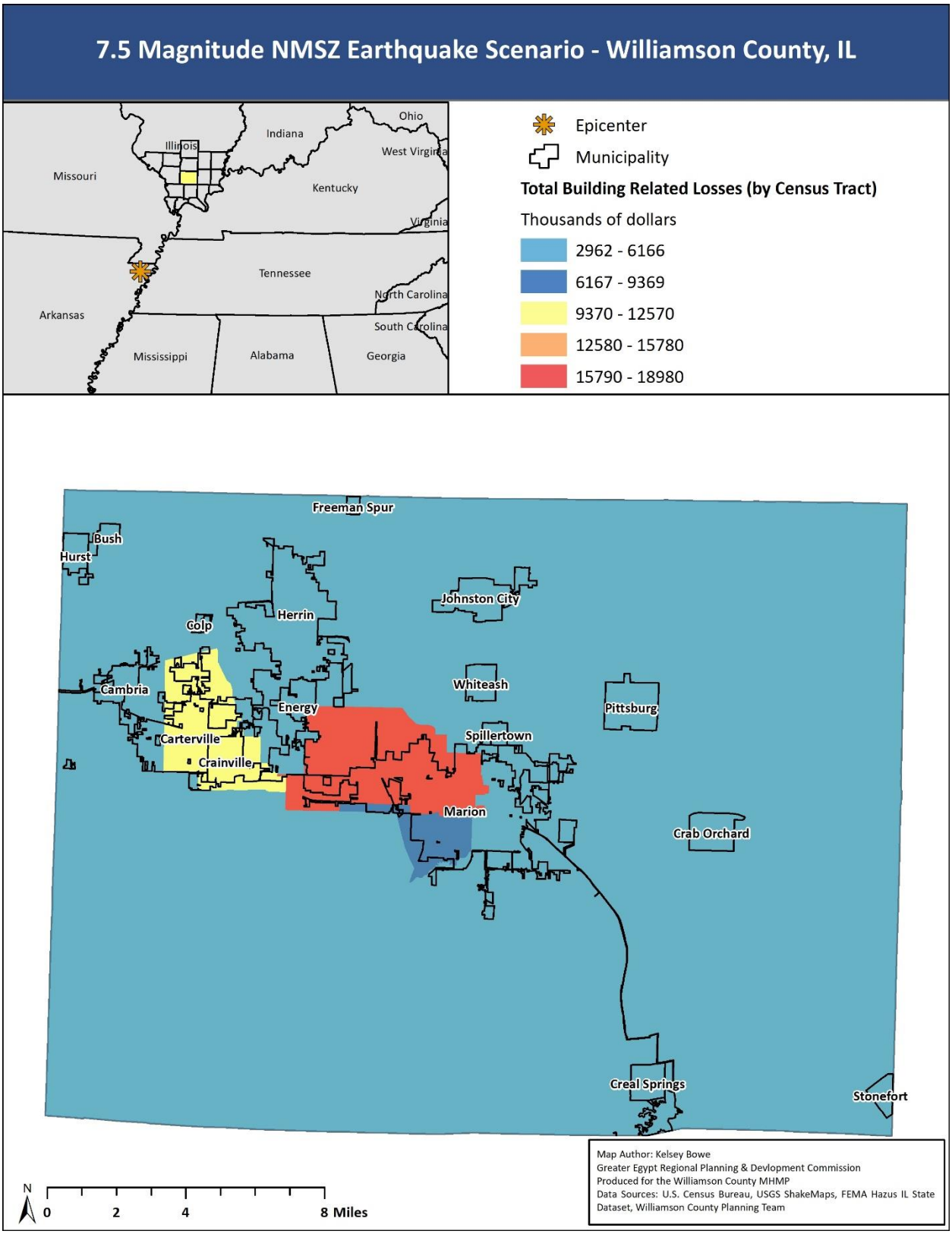
43 households would be displaced as a result of the earthquake, and 26 of the households would be in need of temporary public shelter. This model estimates between 22 and 33 level 1 injuries, 3-5 level 2 injuries, and 0-1 severe injuries or deaths would occur from the earthquake, with the 2pm scenario having the highest estimates.

Table 4.23 – Building-related Economic Loss Estimates

Category	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses						
Wage	0	0.2021	4.3546	0.1282	0.3985	5.0834
Capital-Related	0	0.0861	3.7559	0.0751	0.0966	4.0137
Rental	1.1813	0.8905	2.3019	0.0503	0.1696	4.5936
Relocation	4.1404	1.6158	3.4506	0.3254	1.4313	10.9635
Subtotal	**5.3217**	**2.7945**	**13.863**	**0.579**	**2.096**	**24.6542**
Capital Stock Losses						
Structural	7.3598	2.4522	4.4784	0.9117	1.6584	16.8605
Nonstructural	18.7338	6.5725	7.6966	1.6186	2.9728	37.5943
Content	4.6311	1.1358	3.3742	0.9416	1.2679	11.3506
Inventory	0	0	0.0763	0.1708	0.0149	0.262
Subtotal	**30.7247**	**10.1605**	**15.6255**	**3.6427**	**5.914**	**66.0674**
Total	**36.05**	**12.96**	**29.49**	**4.22**	**8.01**	**90.72**

In addition to the building related losses, there is an estimated $1.74 million economic loss to the transportation sector and $15.97 million economic loss to utility systems. Total Economic losses are estimated to be $108.43 million.

Figure 4.11


7.5 Magnitude NMSZ Earthquake Scenario - Williamson County, IL
Missouri
Illinois
Indiana
Ohio
West Virginia
Kentucky
Virginia
Tennessee
North Carolina
South Carolina
Arkansas
Mississippi
Alabama
Georgia
Epicenter
Municipality
Total Building Related Losses (by Census Tract)
Thousands of dollars
2962 - 6166
6167 - 9369
9370 - 12570
12580 - 15780
15790 - 18980
Freeman Spur
Bush
Hurst
Johnston City
Herrin
Colp
Cambria
Whiteash
Pittsburg
Energy
Carterville
Spillertown
Crainville
Marion
Crab Orchard
Creal Springs
Stonefort
N
0
2
4
8 Miles
Map Author: Kelsey Bowe
Greater Egypt Regional Planning & Devlopment Commission
Produced for the Williamson County MHMP
Data Sources: U.S. Census Bureau, USGS ShakeMaps, FEMA Hazus IL State Dataset, Williamson County Planning Team

4.5. Severe Thunderstorms

4.5.1. Hazard Description

Thunderstorms are rain bearing clouds that produce lightning. The major thunderstorm categories are single cell, multi-cell, squall line, and supercells. Single-cell storms are short lived and can result in heavy rain and lightning. Multi-cell storms occur along a front and can cause hail, strong winds, tornados, and flooding. Squall storms are a composition of smaller cells that are oriented in a thin line. These systems can cause severe winds and heavy rain. A supercell is a highly energetic storm characterized by a strong rotating updraft. Supercells can cause rain, hail, lightning, high winds, and strong tornados. Thunderstorms can also move together as a system. These are known as Mesoscale Convective Systems (MCS) and may last over 12 hours and cover areas as large as a state[28].

Thunderstorm related hazards can be serious. Lightning can cause injury or death to humans, damage to structures, and start fires. The National Weather Service reports that lightning inures roughly 300 people per year and kills 80 people per year in the United States. High wind speeds caused by thunderstorms can result in damage to homes, buildings, trees, and infrastructure. Hail produced by thunderstorms can cause injury to people and damage to automobiles and infrastructure. According to the National Weather Service, for a thunderstorm to be severe it must either produce hail of at least one inch in diameter, winds of at least 58 mph, or produce a tornado. A combination of 40mph winds and 0.5" hail also qualifies as severe.

4.5.2. Climate Change

The largest impacts the Midwest is experiencing from climate change are an increase in spring and summer precipitation and increased flooding. From 2010-2014, the state of Illinois experienced a record number of extreme precipitation events. There are predicted increases in temperature, precipitation, and evaporation in Illinois, leading to frequent and more intense floods and droughts[29]. The Eastern U.S. is also expected to see an increase in days with favorable conditions for severe thunderstorms with the changing climate[30].

[28] "Severe Weather 101", NOAA National Severe Storms Laboratory.
[29] "Climate Change in Illinois" Illinois State Water Survey/Prairie Research Institute
[30] NASA - Global Climate Change, "Severe thunderstorms and climate change", April 7, 2013.

4.5.3. Geographic Location and Historical Occurrences

There are 98 total records of hail in Williamson County, with three reports of property damage and no records or death or injury (table 4.24).

There are three total records of lightning in Williamson County (table 4.25)

There are 115 total records of thunderstorm winds in Williamson County from 1966 – present. with 65 of the records causing property damage and/or injuries. See Table 4.26 for a list of damaging wind records with over $15,000 in damages.

Table 4.24 – Hail records that have caused property damage, Williamson County, IL

Location	Date	Hail Diameter (In)	Property Damage
HUDGENS	5/5/1999	2.75	50000
MARION	5/2/2002	2	2000000
HERRIN	5/25/2002	1.75	300000

Source: NOAA Storm Events Database

Table 4.25 – Lightning records, Williamson County, IL

Location	Date	Property Damage
SPILLERTOWN	9/23/2006	10000
CARTERVILLE	6/14/2011	80000
MARION	6/14/2011	50000

Source: NOAA Storm Events Database

Table 4.26 - Selected thunderstorm wind records, Williamson County, IL

Location	Date	Injuries	Property Damage
CORINTH	6/9/1998	0	20000
MARION	6/12/1998	0	25000
MARION	5/17/1999	0	35000
CAMBRIA	1/3/2000	0	100000
MARION	1/3/2000	0	100000
CAMBRIA	5/26/2004	0	75000
JOHNSTON CITY	4/22/2005	0	15000
MARION	10/18/2007	0	25000
CRAB ORCHARD	4/2/2009	0	15000
CARTERVILLE	5/8/2009	1	175000000
CRAB ORCHARD	8/4/2009	0	15000
HERRIN	7/11/2010	0	100000
HAFER	4/19/2011	0	100000
HERRIN	4/19/2011	0	50000
HERRIN	5/25/2011	0	20000
WOLF CREEK	2/29/2012	0	50000
HERRIN	7/2/2012	0	20000
MARION	9/7/2012	0	80000
PULLEYS MILL	1/29/2013	0	50000
HERRIN	6/1/2013	0	25000
COLP	2/20/2014	0	15000
JOHNSTON CITY	4/9/2015	0	20000
MARION	5/8/2015	0	20000
MARION	7/13/2017	0	15000
HERRIN	6/28/2018	0	100000
JOHNSTON CITY	6/21/2019	0	75000
CARTERVILLE	6/21/2019	0	30000

Source: NOAA Storm Events Database

4.6. Severe Winter Weather

4.6.1. Hazard Description

Severe winter weather is any cold weather event that poses risk to human life and property. Severe winter weather may also significantly disrupt transportation and economic sectors. Types of severe winter weather are heavy snowfall, extreme low temperatures, freezing rain, sleet, blizzards, ice storms, and strong winds. Freezing rain refers to precipitation falling as a liquid that enters sub-freezing air or cold surfaces, forming ice while sleet refers to precipitation that freezes while falling. The typical definition of severe winter storm for Illinois is an event that produces six inches of snow or more in 48 hours. Severity of winter weather can also be classified by wind speeds and ice.

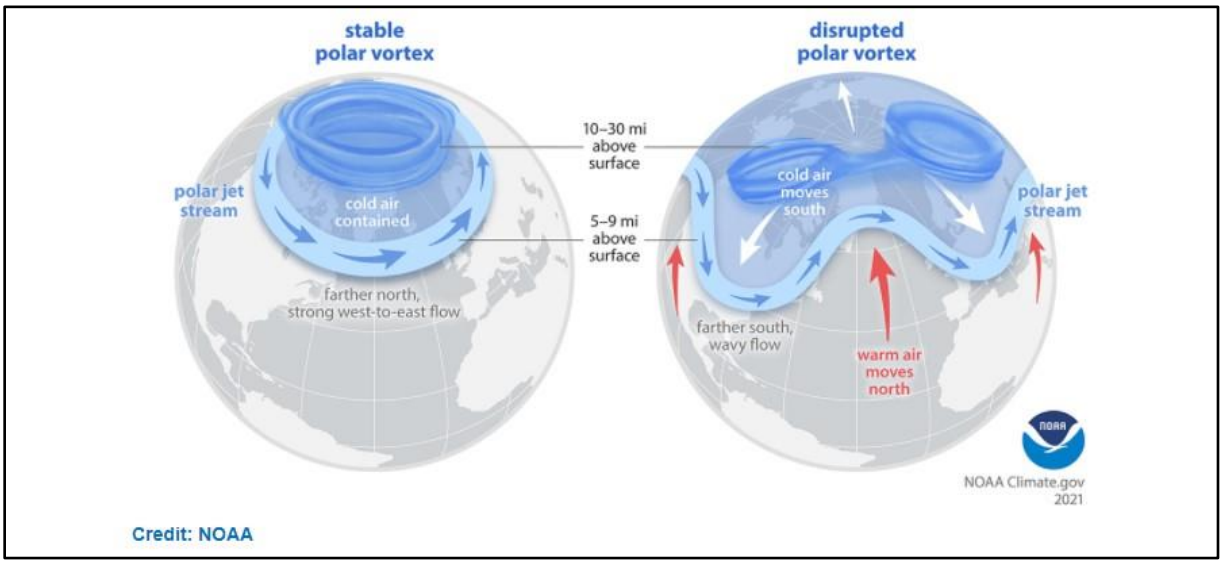
News and weather outlets have been using the term "Polar Vortex" more commonly in recent years. While some outlets are using the term loosely, this report will refer to the NOAA definitions:

- Polar vortex: A band of strong westerly winds that rotate in the stratosphere, 10-30 miles above the surface of the earth, over the north pole. These winds enclose extremely cold air
- Polar Jet Stream: a band of winds in the troposphere, 5-9miles above the earth's surface, over the north pole

Winter weather in the mid to southern United States associated with the polar vortex occurs when it weakens and becomes disrupted or "wobbles". This can in turn interact with the polar jet stream, causing it to move in more wavy forms than its traditional circulation around the north polar regions. These waves of polar jet stream air can dip down far into the U.S., causing severe cold outbreaks, along with ice and snow (figure 4.12)[31]. Some but not all winter storms in southern Illinois are associated with this natural phenomenon.

[31] Lindsey, Rebecca, "Understanding the Arctic polar vortex" NOAA climate.gov, 2021.

Figure 4.12



4.6.2. Specific Impacts

4.6.2.1. Agriculture

Severe winter weather can inflict heavy tolls on the agriculture industry. Planting or harvesting can be delayed. Crops and livestock can die in extreme cases, especially in southern regions where many farmers do not have barns to house their animals in the event of a storm. Unsafe roads can disrupt transportation of harvest and other products on time, and icy conditions can delay barge shipments as well, which is relied on heavily along the Mississippi corridor.

4.6.2.2. Urban

Snow, freezing rain, ice, and sleet can all cause dangerous road conditions, even in small amounts. Disruption of traffic and business closures due to winter weather can negatively impact local and broader economies. Transportation of goods and passengers can be delayed and schools may be shut down when roadways are covered in ice and snow. State, county, and local governments incur large costs for snow removal, salting the roads, and repairing roads that freeze and crack.

Freezing rain can cause immense property damage. When freezing rain comes into contact with surfaces, it forms an ice layer that can quickly become too heavy for power lines, trees, buildings, and roadways. Downed trees and power lines may disrupt power and communication for homes, business, and critical facilities without backup power options. Freezing temperatures can also cause pipes to freeze and burst, which can be very costly to repair.

4.6.2.3. Human Health

Traffic accident frequency increases during winter weather. Negative impacts due to an accident can be exacerbated by delayed medical care - from unsafe roads to health facilities and first responders being stretched thin during winter storm events.

Extreme cold temperature events can lead to frostbite or hypothermia for residents. Windy conditions during a cold weather event lower the wind chill factor, further increasing risk to humans.

4.6.2.4. Natural Landscapes

Effects of the hazard on natural areas are similar to the other sections. Freezing temperatures can cause frostbite and hypothermia in animals. Freezing over of waterbodies can kill some plants and animals. This most often occurs in areas of the south where less species are adapted to winter weather, or when a severe storm occurs later or earlier than normal in a season. Heavy snow and freezing rain can cause limbs to break or whole trees to fall, disrupting forest structure. Economic losses can stem from damaged park facilities, decreased tourism, delays in logging operations, and damaged timber stands.

4.6.3. Climate Change

As mentioned previously, a major effect of climate change in the Midwest is an increase in severe precipitation events, and an increase in heavy snowfalls has been an emerging pattern over the last decade for the eastern two-thirds of the continental US[32].

While some evidence suggests climate change can be causing the polar vortex to wobble and lead to severe winter weather in more southern latitudes, the relationship is not fully understood. One possibility is that global surface temperature increase, especially over Arctic Sea ice, can cause enough changes in surface temperature and pressure to influence the polar vortex. It is also possible these recent winter weather evets are just natural variations in the flows of the polar vortex and polar jet stream. There is limited historical data on patterns of the stratosphere, making it difficult to predict long-term trends for the future[33].

[32] "Climate Change and Extreme Snow in the U.S." NOAA National Centers for Environmental Information.
[33] Lindsey, Rebecca "Understanding the Arctic polar vortex", NOAA climate.gov, 2021.

4.6.4. Geographic Location and Historical Occurrences

Severe winter storms hold the record in Illinois for most total damage produced by any short-term weather event.

Table 4.27 - Severe winter weather and number of records for Williamson County from 1996-2022.

Weather Type	Days
extreme cold	3
heavy snow	10
ice storm	5
winter storm	29

Source: NOAA Storm Events Database

Table 4.28 - Severe winter weather events that caused property damage in Williamson County

Date	Weather Event	Property Damage
01/01/1999	Ice Storm	50,000
01/13/2017	Ice Storm	75,000
02/11/2008	Winter Storm	500,000
03/03/2008	Winter Storm	30,000
01/26/2009	Winter Storm	500,000
02/23/2022	Winter Storm	5,000

Source: NOAA Storm Events Database

4.6.5. Risk

Although the risk for severe winter weather is lower in more southern counties, it does occur, and often causes severe damage to property and infrastructure. Severe winter weather can occur anywhere in Williamson County, the entire county has the same risk.

4.7. Flooding

4.7.1. Hazard Description

Flooding in southern Illinois is a significant and recurring hazard. This is a result of lying between the two largest rivers in the U.S. (when ranked by discharge), the Mississippi and Ohio; as well as climactic and seasonal factors. Characteristics of floods are uniquely influenced by precipitation intensity, infiltration rates, hydrogeologic features of a watershed, and interactions with the built environment.

There are 2 different types of floods that may occur in southern Illinois:

4.7.2. Flash/Upstream Floods

Flash flooding occurs when heavy rainfall leads to rapid flooding in upstream catchments and smaller tributaries. Urban flooding, when water overwhelms an area's drainage capacity is also a type of flash flood. Due to the fast-moving water inherent with flash floods, there can be significant hazards to people and the built environment. These can include loss of human life, destroyed buildings, downed trees, submerged vehicles, downed utilities, and more. Flash floods most often occur in the spring and early summer.

Flash flooding from extreme precipitation (defined as a weather event with more than two inches of precipitation) can have many widespread negative effects. Increased stormwater flow can lead to more pollutants in water bodies including excess nutrients from agriculture and urban fertilizers, pesticides and herbicides, sediments, motor oil and other vehicle pollution, and microbial pathogens.

Urban flooding is defined by the State of Illinois as "The inundation of property in a built environment, particularly in more densely populated areas, caused by rainfall overwhelming the capacity of drainage systems, such as storm sewers. 'Urban flooding' does not include flooding in undeveloped or agricultural areas."[34] A major concern with urban flooding is that it can be difficult to predict which areas have the highest risk, according to the summary report of the Urban Flooding Awareness Act, 90 percent of insurance payouts for urban flooding in Illinois occurred outside of FEMA's mapped 100-year floodplain. The report also states that mapping areas of urban flooding is not feasible on a statewide level and should be addressed by communities. Increased precipitation and urban flooding will also increase stormwater pollution. There are currently no counties in southern Illinois that have stormwater ordinances.

4.7.3. Riverine/Downstream Floods

Riverine floods occur along major rivers and develop more slowly. These floods typically form as a result of widespread, long-lasting rainfalls. Riverine floods in smaller tributaries can occur, but they often runoff and lead to larger downstream flooding. The lag between rainfall and elevated river levels provides more warning of an impending flood event, generally allowing for evacuation, some property protection, and other emergency measures to be made. Riverine

[34] IL General Assembly Public Act 098-0858 "Urban Flooding Awareness Act"

floods can have a wide variety of side effects, from immediate damage due to the force of water and debris moving to secondary and tertiary effects such as disruption of power and services, disease spread, change in hydrology of river channels, and many others[35]. The total damages to human health, property, the economy, and the environment depend on the height, duration, and distribution of flood waters.

4.7.3.1. Flooding and Agriculture

Agriculture is a large component of southern Illinois's economy, especially along the Mississippi, Big Muddy, and Ohio rivers. Both flash and riverine floods can have major impacts on farming and ranching. More intense and frequent spring rains can delay planting, overly saturated soil can harbor harmful fungi and other microbes, and stormwater flow can erode necessary top soils. Long-term riverine floods can destroy a harvest completely, damage buildings and equipment, flood out pasture fields, and drown livestock.

4.7.4. Climate Change

Extreme precipitation is expected to increase with the warming climate, which in turn increases the frequency and intensity of floods. Springtime precipitation is expected to increase in southern Illinois by 10-15% by 2050, with Illinois already experiencing dramatic increases in extreme precipitation events over the past two decades [36]. 2019 was the second wettest year ever documented in the U.S., with extreme flooding events occurring along the Arkansas, Missouri, and Mississippi river basins. These floods affected 15 states, and had an estimated combined cost of $20 billion[37]. The Mississippi River experienced its longest lasting flood in 2019, with river gauges at or above flood stage for record breaking periods in Iowa, Illinois, Mississippi, and Louisiana[38]. Similarly, the Big Muddy River at Murphysboro (USGS Stream Gauge 05599490) was at or above flood stage (22ft) for a total of 143 days during 2019. Peak water height was recorded at 31ft on June 11, 2019[39].

4.7.5. Geographic Location and Historical Occurrences

There have been 24 recorded floods and 36 flash floods in Williamson County in the NOAA Storm events database, see tables below. Flood records for the county begin at 1996 so this is an incomplete list of historical occurrences.

[35] Nelson, S.A., "Flooding Hazards, Prediction, & Human Intervention", Tulane University, 2015.
[36] Frankson, R.K. et al., Illinois State Climate Summary, NOAA Technical Report, 2017.
[37] National Oceanic and Atmospheric Administration, "2019 was the 2nd wettest year on record for the U.S." January 8, 2020.
[38] Donegan, Brian, The Weather Channel, "2019 Mississippi River Flood the Longest-Lasting Since the Great Flood of 1927 in Multiple Locations" May, 22, 2019.
[39] USGS National Water Information System: Web Interface, USGS 05599490 Big Muddy River at RTE 127 at Murphysboro, IL

Table 4.29 - Flood Events in Williamson County

Location	Date	Deaths	Injuries	Property Damage
	4/22/1996	0	0	0
	5/1/1996	0	0	0
HERRIN	6/8/1996	0	0	0
	1/21/1997	0	0	0
MARION	7/19/1997	0	0	0
COUNTYWIDE	1/3/2000	0	0	0
MARION	5/22/2000	0	0	0
	6/17/2000	0	0	0
MARION	8/3/2000	1	0	0
MARION	9/18/2001	0	0	0
	12/17/2001	0	0	0
CAMBRIA	3/18/2008	0	0	375000
ABSHER	4/24/2011	0	0	0
FREEMAN SPUR	5/1/2011	0	0	75000
CARTERVILLE	5/1/2011	0	0	30000
HERRIN	9/1/2012	0	0	0
HERRIN	4/4/2014	0	0	0
HURST	7/6/2016	0	0	10000
JOHNSTON CITY	4/29/2017	0	0	40000
HERRIN	7/13/2017	0	0	0
MARION	11/5/2017	0	0	0
HERRIN	2/21/2018	0	0	0
CARTERVILLE	4/24/2019	0	0	0
HERRIN	3/30/2022	0	0	0

Source: NOAA Storm Events Database

Table 4.30 - Flash flood events in Williamson County that caused property damage

Location	Date	Property Damage
MARION	5/10/1996	1000000
MARION	4/28/1996	500000
COUNTYWIDE	1/21/1999	70000
CRAB ORCHARD	6/29/1998	50000
JOHNSTON CITY	4/29/2017	50000
COUNTYWIDE	4/15/1998	40000
JOHNSTON CITY	4/30/2017	30000
COUNTYWIDE	12/17/2001	10000
COUNTYWIDE	11/15/2005	10000
FREEMAN SPUR	7/15/2018	10000
SCOTSBORO	4/3/2014	5000
MARION	3/11/2021	5000
COUNTYWIDE	11/15/2005	4000
HERRIN	7/4/2006	2000

Source: NOAA Storm Events Database

4.7.6. Risk

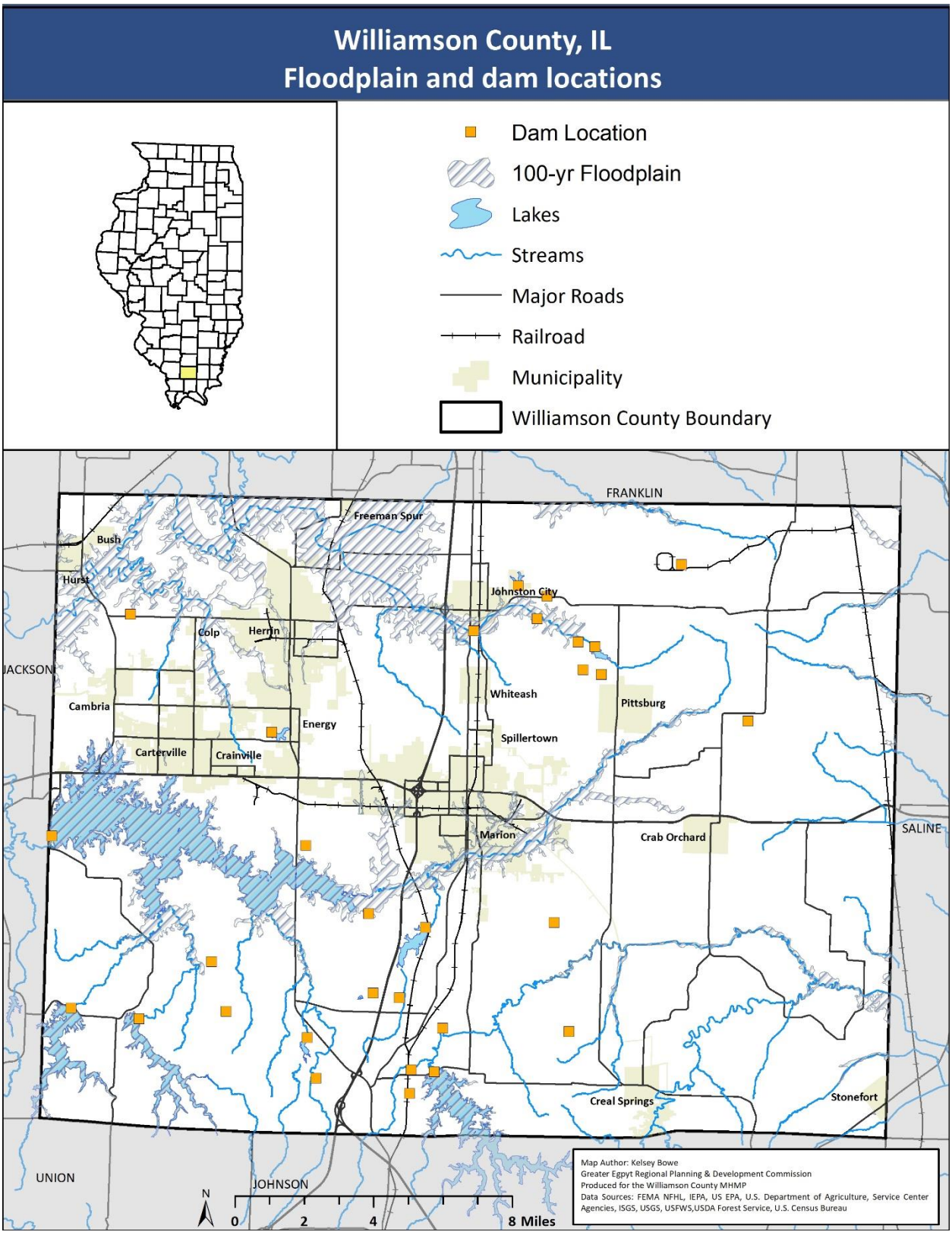
Flooding may occur anywhere during and following heavy precipitation events; In Williamson County, riverine floods are most likely to occur within the floodplains Big Muddy Rivers, as well and its larger tributaries such as Pond Creek, Lake Creek, and Crab Orchard Creek. Flash and urban floods are most likely to occur along low lying roadways and in areas with a high percentage of impervious surfaces- such as Marion and Carterville.

There are six essential and critical facilities in Williamson County that are within the 100-year floodplain:

- Williamson County Fire Protection District Station 5
- United Medical Response Division 4
- Herrin Water Treatment Plant
- Colp Water Treatment Plant
- Hurst Water Treatment Plant
- Cambria Water Treatment Plant

Figure 4.13 shows the 100-year floodplain, dam and levee locations, and major water bodies of Williamson County.

Figure 4.13


Williamson County, IL
Floodplain and dam locations
Dam Location
100-yr Floodplain
Lakes
Streams
Major Roads
Railroad
Municipality
Williamson County Boundary
FRANKLIN
Freeman Spur
Bush
Hurst
Johnston City
Colp
Herrin
JACKSON
Whiteash
Pittsburg
Cambria
Energy
Spillertown
Carterville
Crainville
Marion
Crab Orchard
SALINE
Creal Springs
Stonefort
UNION
JOHNSON
N
0
2
4
8 Miles
Map Author: Kelsey Bowe
Greater Egpyt Regional Planning & Development Commission
Produced for the Williamson County MHMP
Data Sources: FEMA NFHL, IEPA, US EPA, U.S. Department of Agriculture, Service Center Agencies, ISGS, USGS, USFWS,USDA Forest Service, U.S. Census Bureau

4.8. Ground Failure

4.8.1. Hazard Description

Ground failure may refer to any consequence of shaking that affects the stability of the ground[40]. In southern Illinois this is usually caused by subsidence of the land due to sinkholes from karst features or underground mines.

4.8.1.1. Karst

Karst is a type of topography where soluble bedrock (also called carbonate rock) exists. There are different types of soluble bedrock, the most common found in Illinois are limestone and dolomite. Sinkholes form when an area of karst does not have external surface drainage of stormwater. Instead of flowing into waterbodies, rain infiltrates deep into the soil and can dissolve the bedrock over a period of years to decades. As the rock dissolves and forms cracks, soil particles sink into the bedrock and can eventually form visible depressions in the ground. This formation acts as a funnel for stormwater, speeding up formation of the sinkhole. In some cases, the top soil layer will not sag, and instead form a bridge over the void, or shallow cave, that has been forming as the bedrock dissolves. These soil bridges can collapse suddenly and without warning, also leading to sinkholes. Sinkhole collapse usually occurs after intense storm events, but can also occur with severe drought or other causes of water table alteration[41].

While karst sinkholes form naturally, they can be exacerbated by human influence on the landscape. Structures that alter natural drainage and increase stormwater runoff such as paved roads and parking lots, construction sites, and roof downspouts are all examples.

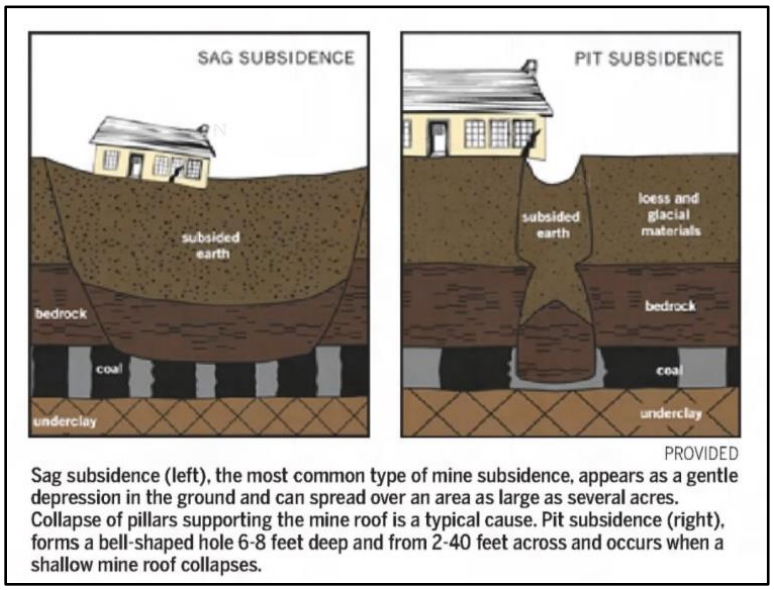
4.8.1.2. Underground Mining

Mining has been a part of Illinois's economy since the state was settled. Mined resources include lead, zinc, fluorites, shale, clay, stone, limestone, dolomite, and coal. Commercial coal mining began around 1810, and since then over 7,400 coal mines have been operated in the state. Much of Illinois contains coal-bearing rock strata.

There are two main types of mine subsidence that may occur. Pit subsidence usually occurs over shallow mines (less than 100ft deep) where bedrock is thin (less than 50ft thick) or composed of weak minerals such as shale. Pits form when the roofs of these shallow mines cave in, and the ground materials above it collapse. This type of subsidence can occur rapidly, the resulting pits are usually 6-8ft deep and less than 16ft across[42]. Sag or trough subsidence occurs when pillars of mine shafts collapse, the size of the subsidence can vary widely depending on how may pillars fall. Sag subsidence may be hundreds of feet long and affect several acres of property. Instead of a single, deep pit forming; sag subsidence produces a low depression in the ground over a large area. Both can cause significant building and property damage.

[40] "ground failure", Earthquake Glossary, USGS.
[41] White, W.B., "Geomorphology and Hydrology of Karst Terrains", Oxford University Press, New York, 1988.
[42] Bauer, R.A., "Mine Subsidence in Illinois: Facts for Homeowners" Illinois State Geological Survey, Prairie Research Institute, 2013.

Figure 4.14 - Diagrams of mine subsidence



Source: Illinois Mine Subsidence Insurance Fund

4.8.2. Geographic Location and Historical Occurrences

Many towns and residences are built on top of or adjacent to underground mines. Therefore, there is always a risk of land subsidence on such properties. Additionally, many abandoned mines do not have historical records or were never adequately mapped. The Illinois State Geological Survey (ISGS) provides a free interactive map online to search for underground mine locations throughout the state[43] (see figures 4.16 and 4.17). This mapping tool is up kept updated with mine records and areas of suspected abandoned mine sites. While a useful tool to search for mine sites in your area, the ISGS states there may be inaccuracies, and landowners concerned about subsidence on their property should contact their insurance company.

Williamson County rests over a geologic area with predominantly shale and coal bearing bedrock. While some areas of limestone exist, karst sinkholes are not a major concern. Figure 4.15 shows karst bedrock types and known sinkhole areas for southern Illinois. Many developed areas of the county sit directly over underground coal mines, figures 4.16 and 4.17 show known and suspected coal mines for southern Illinois and Williamson County.

There is no national or state database with records of ground failure events, however some records have been found from local news sources, these are displayed in table 4.31.

4.8.3. Risk

Areas most at risk for ground failure are highly developed areas over abandoned mines or karst bedrock. The following essential and critical facilities may be on top of underground coal

[43] "Illinois Coal Mines", Illinois State Geological Survey, Prairie Research Institute, https://isgs.illinois.edu/illinois-coal-mines-ilmines.

mines, based on the ISGS mine dataset, but detailed assessments would need to be conducted to confirm the mine locations and assess risk of subsidence.

- Pittsburg Police Department
- Bush Volunteer Fire Department
- Pittsburg Volunteer Fire Department
- Williamson County Fire Protection District Station 3
- Williamson County Fire Protection District Station 4
- Williamson County Fire Protection District Station 5
- Pittsburg Water Treatment Plant
- Colp Water Treatment Plant
- Johnston City Water Treatment Plant
- WJPF 1340 – Herrin
- WVZA CH 224 – Herrin
- WAWJ CH 211 – Marion

Table 4.31 – Ground failure records from southern Illinois

County	Municipality	Year	# of subsidence events	Type	Diameter	Depth	Other notes	Date	Source
Perry	Du Quoin	1954	1	Mine	50ft		Occurred at 202N Line St, abandoned section of Jupiter Coal and Coke Co mine	December 1954	The Southern, Dec 15, 1954
Franklin	Zeigler	1970	1	Mine	no visible hole formed	NA	mine squeeze- ceiling of mine collapses and ground above shifts, Zeigler No 1 mine, closed in 1948, cracks and other damage to several buildings, street, and water mains	September 1970	The southern, Sept 25, 1970
Williamson	Energy	1979	2	Mine			NW part of village	1979	The Southern, Jun 22, 1981, 3
Williamson	Energy	1981	1	Mine	100ft		Sycamore road closed; water line snapped	March 1981	The Southern, March2, 1981 1
Williamson	Energy	1981	1	Mine	25ft	50ft	Energy village park, formed near playground, took several days to fill, Taylor No1 coal mine	June 1981	The Southern, Jun 22, 1981, 3
Williamson	Energy	1981	1	Mine	25ft	15ft	Energy village park, formed near playground, filled with dirt the day it was discovered, Taylor No 1 coal mine	May 1981	The Southern, Jun 22, 1981, 3
Franklin	Sesser	1986	1	Mine	5ft	27ft	suspected to be caused by subsidence of Old Ben 21 mine, blocked city's sewer system	February 1986	The Southern, Feb 07, 1986, E21
Jackson	Dowell	1986	1	Mine			entire block on NW part of village, multiple areas sinking, hole has been visible since 1971	Oct 1986	The Southern, Oct 10, 1986
Williamson	Energy	1992	1	Mine	20ft	12ft	Energy village park	January 1992	The southern, Jan 15, 1992 5W
Union	Dongola	1993	3	Karst	10ft,10ft,	6ft, 6ft, 50ft	Sinkholes were filled with water, holding the land up, construction of a new well drew down the water table, causing the surface to collapse into the holes	March-May 1993	The southern, June 14, 1993, 3A
Williamson	Cambria	1996	1	Mine	22 by 12 ft	81ft	Madison coal co No 12 mine shaft	April 1996	The Southern Apr 27, 1996 A3
Williamson	Johnston City	2007	1	Mine	NA	NA	active mine roof collapsed from moisture, no workers injured, Mach Mine	September 2007	The Southern, Sep 13, 2007
Jackson	Grand tower	2012	2	Levee pipes burst		deepest 19.5 ft		June 2012	the southern June 17, 2013,1
Jackson	Grand Tower	2020	1	Karst	30ft	5ft	sinkhole formation sped up by flooding on Mississippi, caused sewers to back up, road closures	June 2020	The Southern, June 11, 2020 A3
Perry	Du Quoin	2020	1	Mine	8ft	14ft	Smith Ave	February 2020	Benton News, Feb 29, 2020
Williamson	Carterville	2020	1	Mine	25ft	15ft		2020	Benton News, Feb 29, 2020
Franklin	Macedonia	2020	1	Mine	Planned longwall subsidence	NA	road closures on I-14	June 2020	The Southern, Jun 18,2020 A3

Figure 4.15

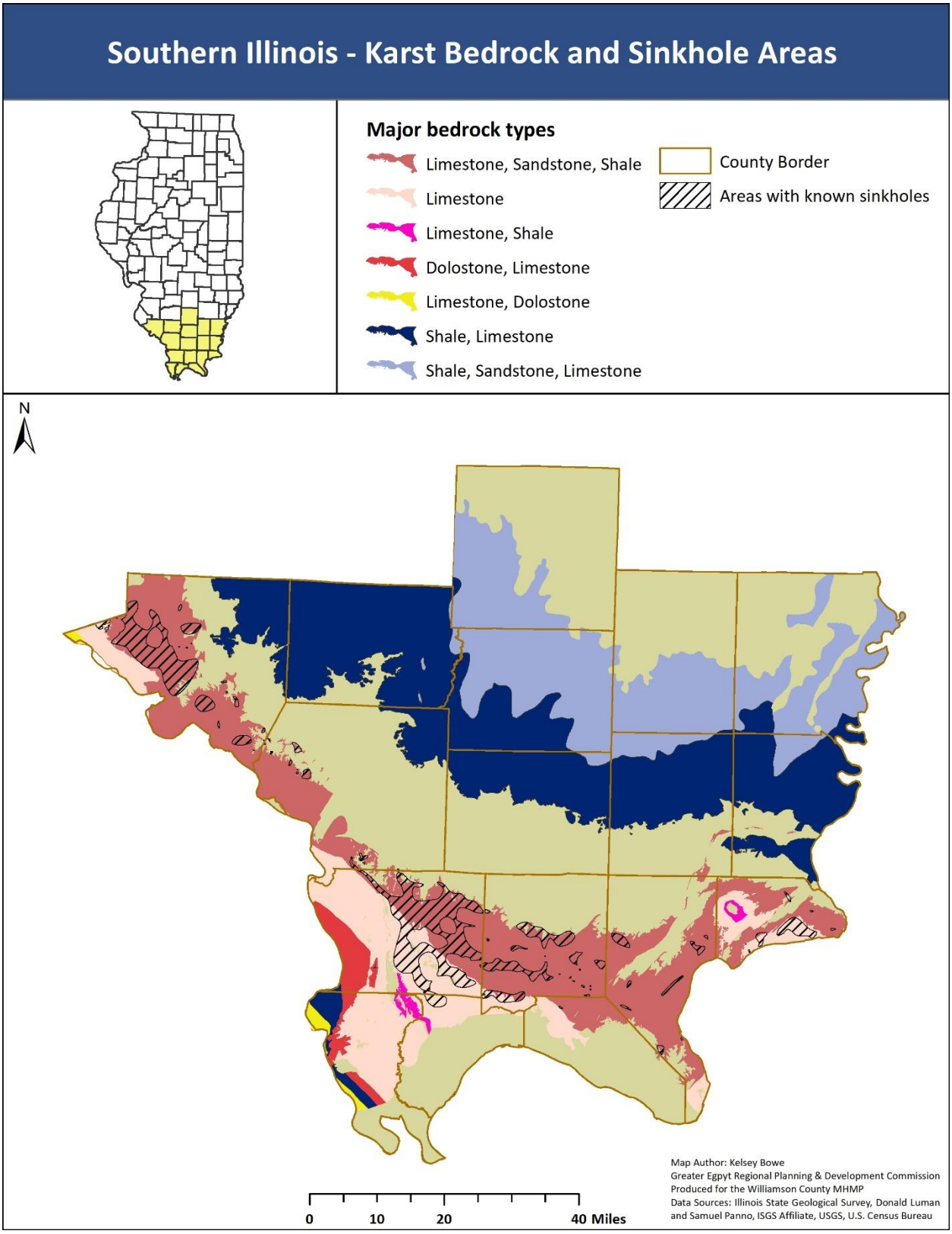

Southern Illinois - Karst Bedrock and Sinkhole Areas
Major bedrock types
Limestone, Sandstone, Shale
Limestone
Limestone, Shale
Dolostone, Limestone
Limestone, Dolostone
Shale, Limestone
Shale, Sandstone, Limestone
County Border
Areas with known sinkholes
N
0
10
20
40 Miles
Map Author: Kelsey Bowe
Greater Egpyt Regional Planning & Development Commission
Produced for the Williamson County MHMP
Data Sources: Illinois State Geological Survey, Donald Luman and Samuel Panno, ISGS Affiliate, USGS, U.S. Census Bureau

Figure 4.16

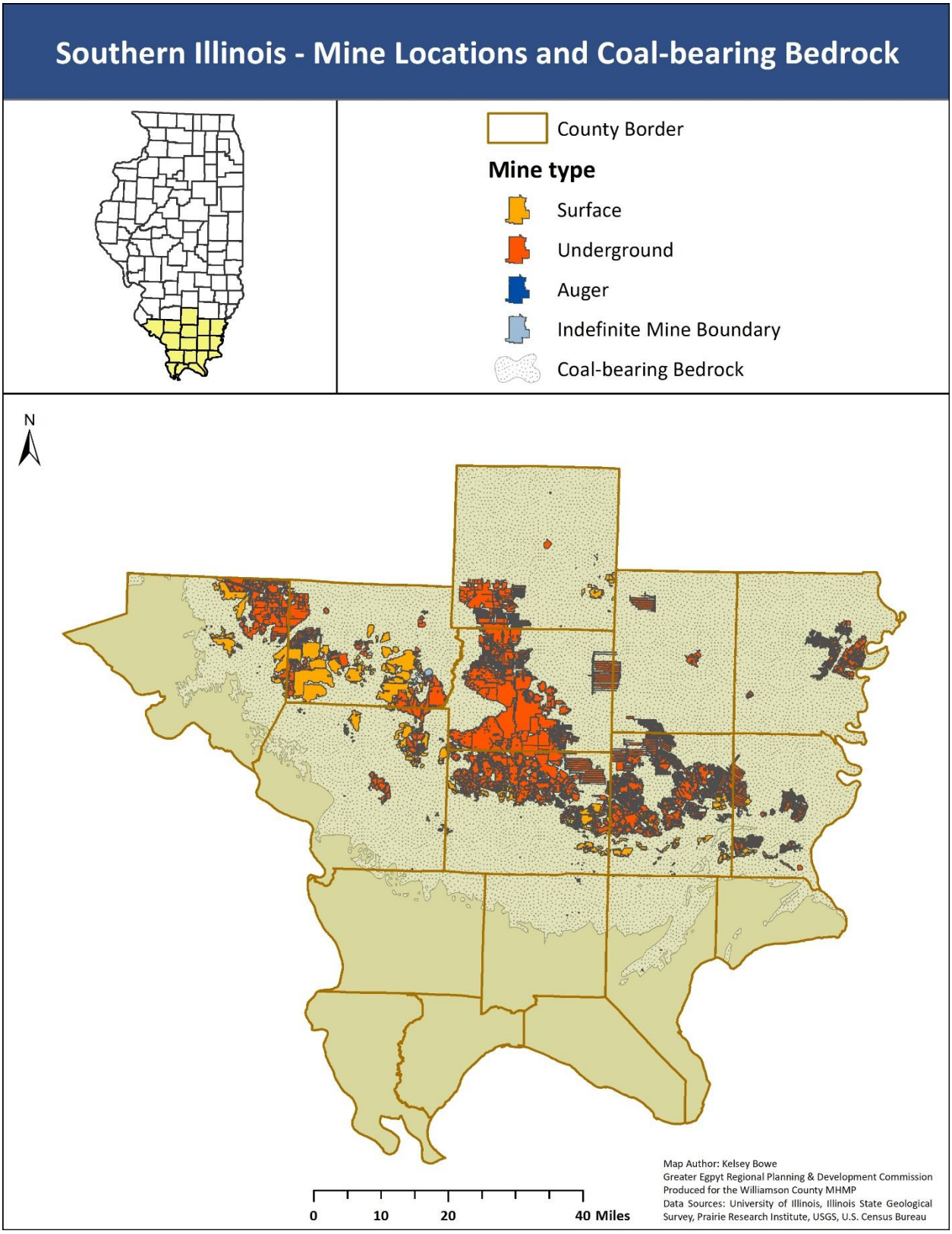
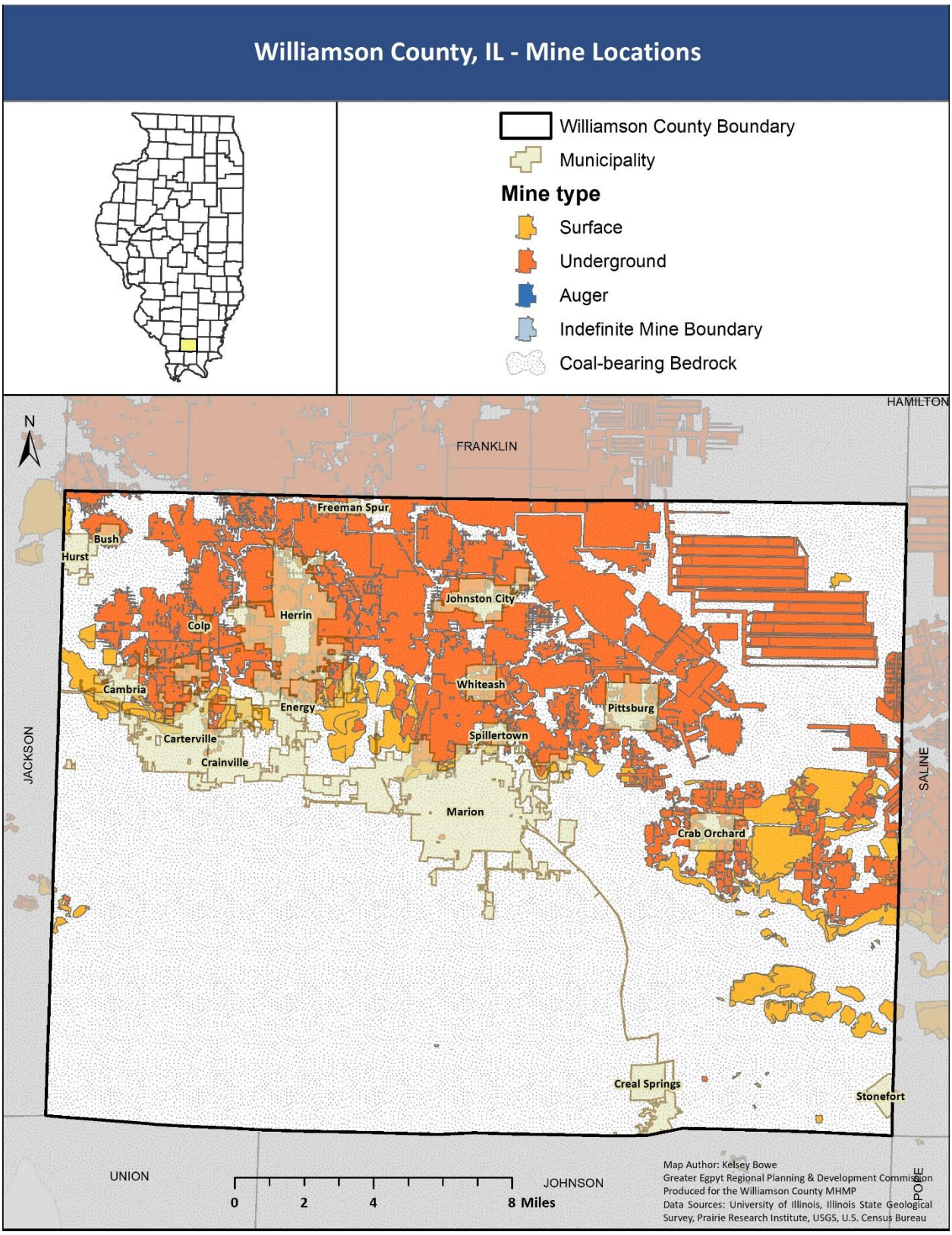

Southern Illinois - Mine Locations and Coal-bearing Bedrock
County Border
Mine type
Surface
Underground
Auger
Indefinite Mine Boundary
Coal-bearing Bedrock
N
0
10
20
40 Miles
Map Author: Kelsey Bowe
Greater Egpyt Regional Planning & Development Commission
Produced for the Williamson County MHMP
Data Sources: University of Illinois, Illinois State Geological Survey, Prairie Research Institute, USGS, U.S. Census Bureau

Figure 4.17


Williamson County, IL - Mine Locations
Williamson County Boundary
Municipality
Mine type
Surface
Underground
Auger
Indefinite Mine Boundary
Coal-bearing Bedrock
N
HAMILTON
FRANKLIN
Freeman Spur
Bush
Hurst
Johnston City
Herrin
Colp
Cambria
Whiteash
Energy
Pittsburg
Carterville
Spillertown
Crainville
JACKSON
SALINE
Marion
Crab Orchard
Creal Springs
Stonefort
UNION
JOHNSON
POPE
0
2
4
8 Miles
Map Author: Kelsey Bowe
Greater Egpyt Regional Planning & Development Commission
Produced for the Williamson County MHMP
Data Sources: University of Illinois, Illinois State Geological Survey, Prairie Research Institute, USGS, U.S. Census Bureau

4.9. Hazardous Materials Release

4.9.1. Hazard Description

Hazardous materials release can take many forms, a general definition is the unintentional release of any material that may cause harm to human health or the environment or cause damage to critical facilities. Areas at highest risk of hazardous materials release are factories and warehouses where chemicals and other dangerous materials are produced or stored, major transportation routes including railways and interstate highways, and mines.

Depending on the type of incident and material released, the extent of such a hazard can range from mild chemical spills to dangerous explosions.

As per the Federal Emergency Planning and Community Right to Know Act (EPCRA) of 1986, IEMA implemented a statewide Hazardous Materials Emergency Planning Program in which any facility that uses or stores threshold amounts of federally mandated substances must report annually to state and local officials, and must immediately report any releases that occur.

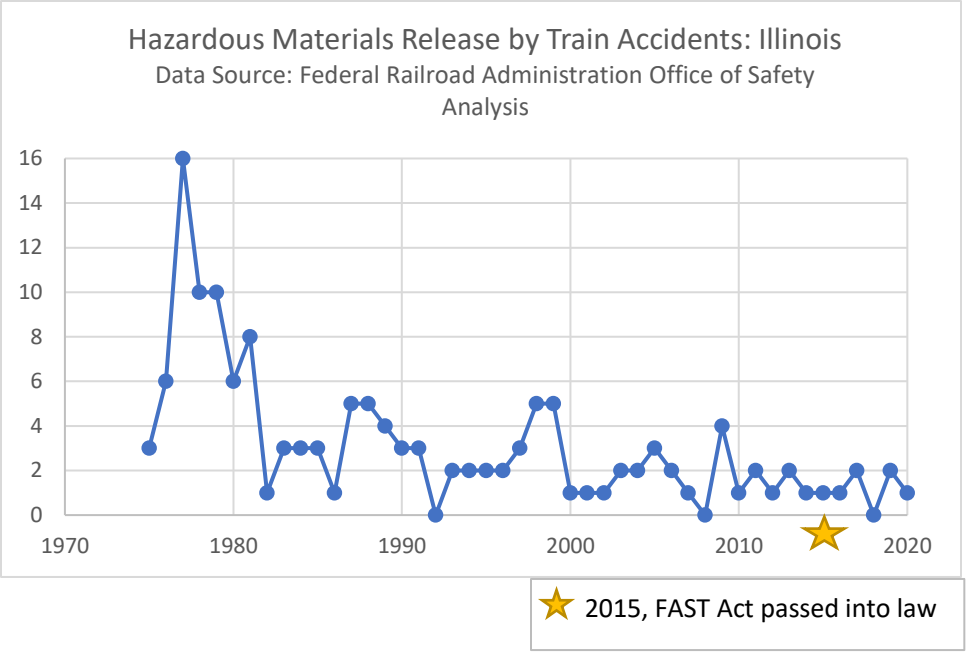
4.9.1.1. Train Derailments

Being in the central of the US, Illinois is a vital part of the transportation industry. The state has over 9,000 miles of railroads; with over 1,300 trains passing through Chicago every day[44]. Illinois leads the nation in number of carloads originating and terminating in the state each year, and has the second highest number of freight rail employees in the country. Additionally, millions of passengers use Amtrack services in the state each year.

Railway safety continues to improve in the United States. The Fixing America's Surface Transportation (FAST) Act of 2015 created new standards for tank cars that carry crude oil, ethanol, and other flammable liquids. These new tank cars, called DOT-117s and replace the older DOT-111 model. They are required to be built with thicker shells and shields, a ceramic thermal protection layer to prevent fire, and a fiberglass insulation layer to keep products at steady temperature and further reduce probability of tank punctures[45]. As of 2018, all DOT-111 crude oil tanks have been replaced. By 2023, all ethanol tanks will be phased out, and by 2025 all other tanks that carry flammable materials will be phased out of service[46]. Figure 4.18 shows number of train accidents that caused HazMat release in Illinois from 1975-2020.

[44] "Rail System" Illinois Department of Transportation
[45] Department of Transportation ""Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains" Final Rulemaking"
[46] Railway Supply Institute "HM-251/FAST Act Timeline"

Figure 4.18



4.9.1.2. Acid Mine Drainage

Acid mine drainage is caused by surface mining, most often for coal. When coal deposits are 100ft or less below the ground, surface mining is the most cost-effective way to extract it. This process involves stripping the surface materials (overburden) away, removing the coal, and refilling the pit back with the overburden. Surface mining is incredibly disruptive to the environment, accelerating the chemical breakdown of minerals and chemicals in the soil. When iron sulfide is exposed to air and water, ferrous sulfate and sulfuric acid are produced and drained into water bodies. Acidic water often dissolves metals present in sediments, including aluminum, iron, manganese, arsenic, cadmium, mercury, and zinc[47]. Sulfate loadings (and secondarily, concentrations of dissolved metals) are directly related to the area of land mined in southern Illinois. It was estimated in 1982 that about 3,500 tons of sulfate per square mile of surface mined land enter streams annually in the Big Muddy and Saline watersheds[11]. Some surface mines in these areas have since closed down, so the numbers may be lower today.

Surface coal mines are found in Gallatin, Jackson, Jefferson, Johnson, Perry, Pope, Randolph, Saline, and Williamson counties (see section 4.8 for more details on coal mining)

[47] L.G. Toler "Some Chemical Characteristics of Mine Drainage in Illinois" GEOLOGICAL SURVEY WATER-SUPPLY PAPER 2078, US Department of the Interior, 1982.

4.9.2. Geographic Location and Historical Occurrences

The most recent IEMA public report on hazardous materials spills includes incidents from 1987-2011. During these years there were 299 reported incidents for Williamson County, with the vast majority being spills of gasoline, diesel fuel, or crude oil[48].

There have been two train derailments in Williamson County since 1972, none of them involved hazardous materials. (Based on articles found in The Southern Illinoisian archives)

Most recently in neighboring Franklin County, a fire at Sugar Camp mine near Benton IL in late August 2021 caused environmental problems. In order to extinguish the fire, the mining company pumped 46,000 gallons of foam containing perfluoroalkyl and polyfluoroalkyl substances (PFAS). These chemicals can be toxic when ingested, do not degrade in the environment, and are under the process of being restricted and phased out of use in many states. There is photo evidence of the foam spreading to above ground ditches and nearby farm fields. The IEPA tested water near the mines three weeks after workers had been evacuated and found PFAS levels up to 16 times higher than state health recommendations[49].

4.9.3. Risk

Transportation routes with the highest risk of hazardous materials release include Interstate 57 and all active railroads.

Other areas of high risk include factories and warehouses that use or store hazardous chemicals, hospitals and colleges that may store large amounts of cleaning supplies and other hazardous chemicals, and farms that store large amounts of fertilizer, herbicides, or pesticides.

There are currently four Hazardous Materials Storage Sites for Williamson County, see table 4.32.

[48] Data.illinois.gov "IEMA Hazardous Materials Spills"
[49] Hawthorne, Michael "Chemical nightmare" The Southern Illinoisian. October 3, 2021.

Table 4.32 – Hazardous Materials Storage Sites, Williamson County, IL.

Facility Name	Address	City	Contact Person	Chemical Name	Chemical Quality (lbs.)
DIAGRAPH CORP.	8233 OGDEN RD.	HERRIN	JOHN WELLS	XYLENE (MIXED ISOMER	3
DIAGRAPH CORP.	8233 OGDEN RD.	HERRIN	JOHN WELLS	METHYL ETHYL KETONE	3
DIAGRAPH CORP.	8233 OGDEN RD.	HERRIN	JOHN WELLS	ETHYLENE GLYCOL	3
DIAGRAPH CORP.	8233 OGDEN RD.	HERRIN	JOHN WELLS	CERTAIN GLYCOL ETHER	3
SOLLAMI CO.	1200 WEAVER RD.	HERRIN	PHILLIP SOLLAMI	NITRIC ACID	3
GENERAL DYNAMICS I AREA	6658 RTE. 148	MARION			
GENERAL DYNAMICS Test Range	11582 Skyline Dr	MARION			
GENERAL DYNAMICS BF-Area	8788 WOLF CREEK RD.	CARTERVILLE			
GENERAL DYNAMICS P-Area	6038 PIGEON CREEK CREEK RD.	MARION			
GENERAL DYNAMICS Area-13	6000 W ODGEN RD	MARION			
GENERAL DYNAMICS Area 6	8545 RTE 148	MARION			
GENERAL DYNAMICS S33	8820 RTE 148	MARION			
GENERAL DYNAMICS I Area S Gate	8000 W ODGEN RD	MARION			
SOUTHERN ILLINOIS POWER COOPERATIVE	11543 LAKE OF EGYPT RD.	MARION	RICHARD G. MYOTT	"HYDROCHLORIC ACID (	1
SOUTHERN ILLINOIS POWER COOPERATIVE	11543 LAKE OF EGYPT RD.	MARION	RICHARD G. MYOTT	HYDROGEN FLUORIDE	1
SOUTHERN ILLINOIS POWER COOPERATIVE	11543 LAKE OF EGYPT RD.	MARION	RICHARD G. MYOTT	"SULFURIC ACID (1994	1
SOUTHERN ILLINOIS POWER COOPERATIVE	11543 LAKE OF EGYPT RD.	MARION	RICHARD G. MYOTT	CHROMIUM COMPOUNDS	0
SOUTHERN ILLINOIS POWER COOPERATIVE	11543 LAKE OF EGYPT RD.	MARION	RICHARD G. MYOTT	LEAD COMPOUNDS	0
SOUTHERN ILLINOIS POWER COOPERATIVE	11543 LAKE OF EGYPT RD.	MARION	RICHARD G. MYOTT	MANGANESE COMPOUNDS	0
SOUTHERN ILLINOIS POWER COOPERATIVE	11543 LAKE OF EGYPT RD.	MARION	RICHARD G. MYOTT	NICKEL COMPOUNDS	0
SOUTHERN ILLINOIS POWER COOPERATIVE	11543 LAKE OF EGYPT RD.	MARION	RICHARD G. MYOTT	ZINC COMPOUNDS	0
SOUTHERN ILLINOIS POWER COOPERATIVE	11543 LAKE OF EGYPT RD.	MARION	RICHARD G. MYOTT	BARIUM COMPOUNDS	0

Source: FEMA Hazus CDMS, Williamson County EMA

4.10. Terrorism

4.10.1. Hazard Description

Terrorist attacks can take many forms, and stem from foreign or national groups or individuals. There are several types of terrorism that are potential threats to the United States[50]:

4.10.1.1. Attacks in public places

This hazard includes active shooters, intentional vehicle crashes, bombs and any other method of mass attack.

4.10.1.2. Bioterrorism

Bioterrorism involves the use of biological agents to harm or kill people, animals, or crops. Agents that may be used as biological weapons include bacteria, viruses, or other toxins.

The CDC maintains a list of potential biological weapons at https://emergency.cdc.gov/agent/agentlist.asp

4.10.1.3. Chemical attack

Similar to bioterrorism, this involves agents designed to harm people, animals, or crops. There are many different chemicals that may be toxic in vapor, liquid, or solid form.

4.10.1.4. Explosions

Explosive devices can come in many sizes and may be carried by individuals (suicide bombers), in vehicles, or hidden and detonated remotely.

4.10.1.5. Nuclear Explosions

These weapons use nuclear reactions to create explosions and may be incredibly destructive. Nuclear devices can be as large as missiles or small enough to be concealed and carried around.

4.10.1.6. Radiological dispersion device

RDDs are designed to scatter sub-lethal amounts of radioactive material with conventional explosive devices.

4.10.1.7. Other

Other acts of terrorism could include assassination, kidnapping, lynching, sabotage, and rioting.

4.10.1.8. Cyberattacks

Any unauthorized attempt to access or damage a computer or network system[51]. The extent and impacts can vary widely depending on the motivations of the attacker. Common results of a cyberattack include:

- Monetary theft
- Identity theft including loss of personal, medical, business, and/or financial records
- Loss of access to computers, phones, and Bluetooth devices

[50] Ready.gov
[51] Ready.gov Cybersecurity

Cyberattacks can be conducted on a large scale and are also a threat to businesses and government agencies. The Cybersecurity & Infrastructure Security Agency (CISA) (A Federal agency within the Department of Homeland Security formed in 2018) states that a growing concern in the United States is the cybersecurity of critical infrastructure. Facilities and infrastructure such as power grids and transportation routes are linked to cyber space in a number of ways, and our growing reliance on such technologies also increases risk of cyberattacks.

One method of cyberattack that is becoming increasingly common is the use of ransomware. This is a type of malware used to encrypt files, or render them unusable. These cyber attackers will then demand a ransom in return for decryption of the files, often with a threat of selling or releasing the files to another party[52]. Cybersecurity continues to be a top priority for the current administration, and bipartisan legislation is being written to require mandatory federal reporting of all ransomware attacks, although there are ongoing debates as to whether or not the U.S. should ban ransom payments[53]

CISA provides guides for business and local government leaders to learn about and begin implementing cybersecurity protocols within their organizations. The CISA Cyber Essentials Starter Kit includes six major actions that organizations should provide to build a culture of cyber readiness[54]:

- Leader: drive cybersecurity strategy and investment
- Staff: develop security awareness and vigilance
- Systems: protect critical assets and applications
- Surroundings: ensure only authorized users have access to digital workplaces
- Data: undergo scheduled backups to avoid data losses
- Crisis Response: develop and test incident response plans to limit damages and restore normal operations quickly

In addition to federal resources, the Illinois Attorney General's office has a data breach reporting system for businesses and governments, as well as an identity theft hotline for all Illinois residents.

[52] CISA "Ransomware Guidance and Resources"

[53] Bajak, Frank "Ransomware gangs get paid off as officials struggle for fix" Associated Press, June 21, 2021.

[54] Cybersecurity & Infrastructure Security Agency "Cyber Essentials Start Kit: The Basics for Building a Culture of Cyber Readiness" 2021.

4.10.2. Geographical Locations and Historical Occurrences

The events on September 11, 2001 was the deadliest single-day terrorist attack in U.S. history. There have been no large-scale attacks in the State of Illinois in recent decades; although gun violence continues to be an issue in many areas. It is difficult to report exact numbers of mass shootings in Illinois or for the whole country as definitions vary by agency. One report from USA Today states 350 "mass killings" occurred in the U.S. from 2006-2017, with 23 of the incidents being from Illinois[55].

Cyberattacks are a continuous national threat. They can occur at any time to individuals, businesses, and government agencies. Cases of identity theft more than doubled from 2019-2020, with a 2,920% increase in cases of victim information being used to apply for government benefit programs[56]. According to the EMSIsoft State of Ransomware in the U.S. report, in 2020 there were ransomware attacks on 113 federal, state, and municipal governments, 560 healthcare facilities, and 1,681 schools, colleges, and universities[57]. The report states that these figures are likely understatements. They also state that the data come from multiple sources, although these sources are not listed.

The most recent cyberattack in the U.S. that gained national attention was the ransomware attack on Colonial Pipeline in May of 2021. The company provides gasoline to 13 states and Washington D.C., with 260 delivery points along the pipeline route. A criminal group locked up the pipeline company's corporate network. The company went offline and shut down their pipeline upon learning of the attack, and later paid a $4.4 million ransom to decrypt their data network. The day following the pipeline shutdown, over 9,500 gas stations ran out of fuel; the company was able to resume operations in a little less than a week[58].

Some recent cyberattacks in the state of Illinois are listed below:

- 2017- Data from Marion County Jail was removed including names, addresses, and social security numbers of former inmates[59]
- 2021- SIU School of Medicine lost patient data in the cyber-attack on Accellion's File Transfer Appliance[60]
- April-May 2021- Ransomware attack on the IL Attorney General's office, loss of case files and court records[61]

[55] USA Today "Behind the Bloodshed" https://www.gannett-cdn.com/GDContent/mass-killings/index.html#title
[56] Skiba, Katherine, "Pandemic Proves to Be Fertile Ground for Identity Thieves" AARP, February 5, 2020; Federal Trade Commission Consumer Sentinel Network Data Book 2020
[57] EMSISOFT Malware Lab "State of Ransomware in the US: Report and Statistics for Q1 and Q2 2020" July 8,2020
[58] Bussewitz, Cathy, "Colonial Pipeline confirms it paid $4.4M to hackers" May 19, 2021 Associated Press.
[59] "MARION COUNTY JAIL ADVISES FORMER INMATES OF DATA BREACH, POSSIBLE IDENTITY THEFT" X95radio news
[60] Davis, Jessica "Trillium, SIU Medicine Added to Tally of Accellion FTA Breach Victims" HealthITSecurity.com
[61] Goudie, Markoff, Tressel, and Weidner, "Cyber attack on Illinois Attorney General's office appears far worse than first thought", May 4,2021, abc7chicago news

4.10.3. Preparedness and survival

While it can be difficult to predict terrorist attacks, there are general steps that can be taken to stay safe. It is recommended to always have exit plans when outside of the home. This includes public places, work, and school. Suspicious packages should be reported instead of being opened. Seeking shelter and contacting law enforcement is the best course of action in the event of any attack. In the case of possible chemical, biological, or nuclear attacks it is imperative to find shelter and stay inside until it is announced safe from potential side effects[62].

Schools and workplaces should have emergency plans in place in the event of any emergency, including terrorist attacks.

The Illinois Terrorism Task Force (ITTF) is an advisory body to the Governor, The Governor's Homeland Security Advisor, and IEMA. They provide guidance for establishing and maintaining long term solutions to the threat of terrorism. The ITTF annual reports and other policies can be found at https://www2.illinois.gov/iema/ITTF/.

4.10.4. Risk

ITTF, IEMA, and County EMA Officials are in charge of monitoring terrorism risk in Illinois. Mass shootings could occur anywhere at any time; and have happened in a variety of places across the United States, including schools, grocery stores, churches, and many other locations.

Cyberattacks can be difficult to predict and may be targeted at individuals, businesses, or government offices. Systems that do implement cybersecurity protocols, or have outdated, weaker protection are more at risk.

[62] Ready.gov "Disasters and Emergencies"

4.11. Dam and Levee Failure

4.11.1. Hazard Description

Dams and levees are both river engineering structures used to control the path and movement of water. Reservoirs created from damming waterways are used for flood control, recreation, storing municipal water supply, and various other purposes. Dam failure can be a significant hazard to surrounding communities depending on the size of the reservoir, age, and structural integrity of the dam in question.

Most dam failures are caused by overtopping (floods that exceed the capability of the dam), internal erosion, and mechanical failure. Because there is so much variation and uncertainty, it is difficult to predict if or when a dam will fail. Detailed risk assessments are not available for all dams in the United States, although the average rate of large dam (greater then 40ft in height) failure in the US is 0.0001 dams/year[63] This rate does not take into account any factors other than dam height and age and should not be used as a replacement for detailed risk assessments performed on individual dams.

The risk of an incident or failure depends of many factors including height of the dam, size of reservoir, age of dam, and frequency of floods and seismic events that can weaken the structural integrity of dams. The amount of damage also depends on the amount or type of infrastructure and number of people living in the potential hazard zone.

Levees are used to contain a river or waterbody to a certain area, protecting the area behind from flooding events. Most large river levees in the U.S. were built by the United States Army Corps of Engineers (USACE) and are maintained by local levee commissions. 97% of levees are earthen embankments, the remaining 3% are concrete and rock levees as well as floodwalls[64].

Issues that can lead to levee breaches include, seepage, undersizing from floods, erosion, damage from tree roots and burrowing animals, and development projects near the levee. In cases of severe floods, levees can also be overtopped. Levee systems also pose a unique issue to riverine flooding. While they are designed to protect communities and property from flood events, the structures themselves can also exacerbate flood events downstream. Levee systems make river channels narrower, when heavy precipitation occurs the water flows faster and higher than it would without the structures in place.

There are many outdated and deteriorating infrastructures in the U.S. including dams and levees. The average age of all dams in Illinois is 53 years. The American Society of Civil Engineers (ASCE) gives the total of Illinois's infrastructure a grade of C-, with dams receiving a C.[65] This grade is mostly due to aging systems, increased usage, and inadequate funding to inspect, maintain, and repair infrastructures.

[63] Ferrante et al. "Uncertainty Analysis for Large Dam Failure Frequencies Based on Historic Data" nrc.gov
[64] "Overview of Levees" 2021 Report Card for America's Infrastructure
[65] Illinois Section of the American Society of Civil Engineers "Report Card for Illinois Infrastructures", 2018.

The extent of dam failure can be defined in terms of percentage of the structure that fails, the area of land that was flooded, or the monetary value that was damaged as a result of the event.

4.11.2. Climate Change

As of the most recent National Climate Assessment, there are no comprehensive climate change related risk assessments for water infrastructure of the U.S.[66]. Increased frequency in severe weather can put extra stress on dams, levees, and other water infrastructure, leading to increased risk of breaches and other damages. 2019 was the wettest year ever recorded in the U.S., which led to the longest lasting flood recorded for the Mississippi River. The longer levees are saturated, the weaker they become. In 2019, over 80 levees systems were overtopped or breached, with 700 miles of damage across 6 states[67].

4.11.3. Geographic Location and Historical Occurrences

There are no levees listed for Williamson County in the USACE National Levees Database, however there are levee systems along the Mississippi River in neighboring counties of southern Illinois. A failure of these may impact emergency services, traffic, and the economy within Williamson County.

The USACE National Dams inventory lists 31 dams for Williamson County (table 4.33), seven of which have a high hazard potential. They have an average age of 59 years. None of the dams in Williamson County are used for hydropower. All of the dams are regulated and inspected by IDNR or U.S. Fish and Wildlife Service (USFWS).

Dam hazard potential is not the probability of failure, rather it is an estimation of the types and cost of damages that would occur in the event of failure. High hazard potential dams would likely cause loss of human life; in addition, large economic loss, environment and utility damages are also expected. Significant hazard potential would lead to heavy economic loss, environmental damage, or disruption of lifeline facilities but no deaths. Low hazard potential dams would have very small economic damage, typically limited to the owner's property[68].

Many dams have an Emergency Action Plan (EAP) although it is not currently required by USACE or any Illinois regulatory agency. EAPs list potential emergency situations and have detailed instructions to be followed to minimize loss of life and damage to facilities and surrounding properties in the event of a dam failure or other emergency[69].

[66] Lall, U.T. et. Al. 2018: Water. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II U.S. Global Change Research Program, Washington, DC, USA, pp. 145–173.
[67] Lieb, D, "AP: States brace for long-term flood fight as damages mount", AP News, 2019.
[68] FEMA, "Federal Guidelines for Dam Safety", April 2004.
[69] Illinois Dam Safety Report 2018

The Association of Dam Safety Officials (ASDSO) and the National Performance of Dams Program (NPDP) both maintain databases that hold records of dam incidents and failures. There are currently two recorded dam incidents for Williamson County:

- 1935: inflow flood at Herrin Reservoir 2 dam
- 1981: piping incident at Johnston City Lake dam

A recent example of a dam failure in the Midwest occurred in May 2020 in Midland County, Michigan. Edenville dam, owned by Boyce Hydro Power company, failed after heavy rains produced a 500-year flood event. The earthen dam was originally constructed in 1925. Old age, the need for a series of repairs, and pressure from the rising reservoir caused the sand embankment to liquefy[70], leading to the failure. 10,000 people had to be evacuated, 2,000 homes, multiple businesses, and several roads and bridges were damaged. The Federal Energy Regulatory Commission (FERC) had issued the owner multiple violations from 2005-2015; and in 2018 revoked their hydroelectric license entirely for lack of compliance with repair requests and failure to meet safety standards. 2019-2020 consisted of a series of permitting arguments and lawsuits between Boyce Hydro and the State, but repairs were never completed[71].

The reservoir size in Midland was 66,200 acre-feet. For comparison, Rend Lake (Franklin/Jefferson Counties) is 607,910 acre-feet. Rend Lake supplies drinking water to parts of Williamson County. Rend Lake Dam is relatively young compared to the average for the U.S., it is owned by the USACE and inspected on a 5-year schedule. The USACE and Rend Lake Conservancy District participated in planning activities for this MHMP.

4.11.4. Risk

Risk area for dam failure depends on the size of the reservoir. The area that could be flooded is known as the dam breach inundation area. Risk area for levee failure includes the floodplain that is protected by the levee system.

In a scenario of a maximum high pool dam breach at Rend Lake, an estimated 1,603 (daytime) to 2,982 (nighttime) people would be at risk, 1,119 buildings are at risk, and total damages could exceed $97 million[72].

[70] House, K, "Report: Shoddy construction, ignored threats led to Edenville Dam collapse", Bridge Michigan, September 2021.
[71] Roth, C, "Timeline: The Edenville Dam saga, before, during and after the break" MLive.com, September 2020.
[72] "Risk Characteristics," Rend Dam, National Inventory of Dams

Table 4.33 – List of dams for Williamson County

Dam Name	River	City	Year Built	Hazard Potential	EAP
CRAB ORCHARD DAM	CRAB ORCHARD CREEK	CARBONDALE, IL	1939	H	Y
LITTLE GRASSY DAM	LITTLE GRASSY CREEK	CARBONDALE, IL	1942	H	Y
DEVIL`S KITCHEN DAM	GRASSY CREEK	CARBONDALE, ILLINOIS	1959	H	Y
LAKE OF EGYPT DAM	SOUTH FORK SALINE RIVER	MARION-OFFSTREAM	1962	H	Y
SPRINGFIELD COAL/ORIENT 4/EAST SLURRY IMP	TRIB LAKE CREEK	PITTSBURG	1985	H	Y
WILLIAMSON ENERGY/POND CREEK MINE/PHASE 2 DAM	TRIB POND CR	WEST FRANKFORT		H	Y
WILLIAMSON ENERGY/POND CREEK MINE/REFUSE DISPOSAL FACILITY	TRIB POND CREEK			H	Y
HERRIN RESERVOIR 1 DAM	TRIB HURRICANE	COLP	1915	S	N
JOHNSTON CITY LAKE DAM	TRIB LAKE CREEK	JOHNSTON CITY	1921	S	N
HERRIN RESERVOIR 2 DAM	MIDDLE WOLF CREEK	CARBONDALE	1926	S	N
ARROWHEAD LAKE DAM	TRIB LAKE CREEK	JOHNSTON CITY	1963	S	N
JOHNSTON CITY SEWAGE LAGOON DAM	LAKE CREEK	JOHNSTON CITY	1963	S	N
ZEIGLER COAL LAKE 5 DAM	TRIB LAKE CREEK	JOHNSTON CITY	1963	S	N
FREEMAN UNITED/ /FRESH WATER LAKE DAM	TRIB LAKE CREEK	JOHNSTON CITY	1964	S	N
MARION RESERVOIR DAM	LIMB BRANCH	MARION	1971	S	N
MARION PRISON LAKE DAM	TRIB LIMB BRANCH	MARION	1991	S	Y
MARION COUNTRY CLUB LAKE DAM	TRIB SOUTH FORK SALINE RIVER	SALINE	1914	L	N
MADISON LAKE DAM	TRIB HURRICANE CREEK	HURST	1919	L	N
KNIGHTS OF PYTHIAS LAKE DAM	TRIB SOUTH FORK SALINE RIVER	SALINE	1928	L	N
DURST LAKE DAM	TRIB CRAB ORCHARD CREEK	PAULTON	1942	L	N
PLEASANT VALLEY LAKE DAM	WOLF CREEK	CARBONDALE	1958	L	N
DAM A-41	UNNAMED TRIBUTARY		1965	L	NR
BELFORD LAKE DAM	TRIB LITTLE CANA CREEK	SALINE	1966	L	N
TEAL LAKE DAM	TRIB LIMB BRANCH	CARBONDALE	1966	L	N
A16 POND DAM	UNNAMED STREAM		1970	L	NR
BLEYAR LAKE DAM	TRIB CANEY BRANCH CREEK	CARBONDALE	1974	L	N
MARTEL LAKE DAM	TRIB LAKE CREEK	JOHNSTON CITY	1974	L	N
SOUTHERN IL POWER FLY ASH DISP POND B-3 DAM	TRIB LITTLE SALINE CREEK	HUGDENS	1986	L	N
SPRINGFIELD COAL/ORIENT 4/AUX SLURRY POND	TRIB LAKE CREEK	PITTSBURG	1986	L	N
SOUTHERN IL POWER SOUTH FLY ASH POND DAM	TRIB LAKE OF EGYPT	GOREVILLE	1989	L	N
VISITOR CENTER DAM	CRAB ORCHARD LAKE-TR		2009	L	NR

Source: USACE National Inventory of Dams

4.12. Wildland fires

4.12.1. Hazard Description

While not as severe or frequent as wildfires in the western United States, Illinois does experience both prescribed and unintentional wildland fire throughout the state. From 2002-2014, Illinois experienced an average of 57 fires per year with an average of 881 acres burned per year[73]. Wildfires are a naturally occurring phenomenon, and can be vital to ecosystem health. Fire is an especially important tool in managing Illinois's remnant tallgrass prairies. The term "wildfire" is used to describe any wildland fire that is unwanted and unplanned. Wildfire usually starts from human caused activities, mostly campfires that spread rapidly. They can also start naturally under the right conditions, or stem from prescribed management fires that get out of control. The extent of a wildfire is generally defined by the number of acres that burned. This is influenced by weather, topography, and amount of fuel available.

4.12.2. Geographic Location and Historical Occurrences

The most recent wildfire to occur in southern Illinois occurred in March 2021 in the Shawnee National Forest Fountain Bluff area. The fire burned about 27 acres. Other small wildfires have occurred in the Shawnee throughout the years, and prescribed management burns take place seasonally, with schedules and alerts available from the National Forest webpage.

4.12.3. Risk

Williamson County has an 89% risk of wildfire to homes by the state ranking system, and 27% by the national rank. There is a 92% wildfire hazard potential by state rank and a 20% wildfire hazard potential by national rank[74].

Risk is highest in camping areas and along the Wildland Urban Interface (WUI). Risk is elevated during droughts and high wind. Many state and federal natural areas have fire danger signs posted that are adjusted daily, including on Rte. 148 through Crab Orchard National Wildlife Refuge.

[73] "Wildfires" Living With Weather, mrcc.illiois.edu
[74] "Community Wildfire Defense Grant Risk Dataset" Wildfire Risk to Communities, 2022.

5. Other Minor Hazards

5.1. Drought and Excessive Heat

5.1.1. Hazard Description

There are many different definitions of drought, but in general the term refers to conditions in which below average rainfall occurs and leads to water shortage problems in a given area. There is no official length of time for the conditions listed to be considered a drought, but they are generally measured in terms of weeks or growing seasons and may last over the span of several years[75].

Drought conditions are often accompanied and exacerbated by extreme heat events. Elevated temperatures result in faster rates of evaporation. This results in worsening of drought conditions and decreased soil moisture content. Drought and extreme heat conditions can negatively impact agricultural productivity, urban and natural landscapes, and human health. Severity of drought events depends on duration and geographical extent of the conditions and can also be affected by land use demands, landcover, and water supply.

5.1.2. Specific Impacts

5.1.2.1. Human Health:

Heat Cramps- Muscular pains and spasms due to heavy exertion, is usually the first sign a person is experiencing heat-related illness.

Heat Exhaustion- Typically occurs when people have been exercising or working strenuously in hot, humid environments. Heavy sweating leads to rapid loss of body fluids, blood flow to the skin increases while blood flow to vital organs decreases- resulting in a form of mild shock. If left untreated, the victim may suffer from a heatstroke.

Heat and Sun Stroke- A life-threatening condition. The body's ability to produce sweat and cool itself stops working; body temperature can rise so high that brain damage and death may result if the victim is not treated quickly[76].

5.1.2.2. Urban:

Urban areas can suffer more from high temperatures than surrounding landscapes due to the Heat Island Effect, where built structures including roads and buildings absorb and re-emit the sun's energy more than natural landscapes. Urban areas can be 1-7°F warmer in the day and 2-5°F warmer during the night than outlying areas[77]. Trees and other vegetation provide shade and moisture, which keep areas cooler. In comparison, a parking lot absorbs heat and evaporates less water- leading to elevated temperatures. Side effects of living in urban heat

[75] "Droughts: Things to Know" Water Science School, USGS
[76] 2015 plan
[77] U.S. Environmental Protection Agency. 2008. Reducing urban heat islands: Compendium of strategies. Draft. https://www.epa.gov/heat-islands/heat-island-compendium.

islands can include higher home energy bills, increased exposure to air pollution, and higher risk of heat-related illness. Urban heat islands tend to have higher greenhouse gas emissions and impaired water quality.

5.1.2.3. Agriculture:

Severe drought can stress plants and disrupt normal growing cycles, leading to less productive crops and grazing pasture. This can cause many issues for ranchers, during droughts feed prices go up and cattle prices can plummet[78].

Prolonged drought combined with areas of heavy agriculture can also exacerbate groundwater/aquifer depletion. When groundwater is pumped for crop irrigation (along with other uses) faster than precipitation can recharge the water storage, the water table will lower. If the water table drawdown is significant, wells can run dry in peoples' home, costs associated with pumping water increase, and in severe cases land subsidence may occur. This is an issue in Southwest and Great Plains states[79] and some areas of Chicago suburbs[80], but is less of a concern for southern Illinois.

5.1.2.4. Natural Landscapes:

Forested areas have increased risk of wildfires during droughts and extreme heat. Wildfires are necessary for some natural processes, but when they get out of control wildlife populations can drop to unhealthy levels, habitat loss can be great, and risk of fire spreading to human residences increases. Additionally, uncontrolled fires in natural areas may damage recreational areas such as campgrounds and picnic areas- leading to economic losses in the tourism industry.

Drought and excessive can severely harm freshwater habitats. Prolonged periods of both raise water temperature, increasing the risk of Harmful Algal Blooms (HABs). HABs in freshwater systems are usually a result of cyanobacteria, a type of blue-green algae that can reproduce, or bloom, rapidly in nutrient-rich warm waters such as ponds and reservoirs. Cyanobacteria occur naturally across the US, but HABs only occur under certain conditions. The other major factor that increases risk of HABs are fertilizer runoff from agricultural and urban areas.

Some but not all cyanobacteria produce toxins that cause skin irritation and can be deadly if ingested. Swimming and even playing on beaches are not recommended during HABs. Additionally, the EPA recommends waiting two weeks after a HAB ends before eating fish from the waterbody. Other side effects from HABs include lowered dissolved oxygen and increased turbidity of water, which can lead to die-offs of fish, invertebrates, and submerged freshwater plants. Drought can also dry up water bodies completely, with small streams and shallow wetlands being most at risk. This can result in loss of populations of freshwater organisms and altered community structure. The economic impacts from HABS can be significant, causing

[78] Larson, Debra "Drought Impacts on the Cattle Industry" University of Illinois Animal Sciences
[79] "Groundwater depletion across the nation" USGS factsheet, 2003.
[80] Mannix et al., "Groundwater Depletion in Chicago's Southwestern Suburbs" Illinois State Water Survey

public beach closures and damaging fishery populations. One EPA report from Ohio estimated that a HAB caused an estimated loss of over $37million from decreased tourism.

5.1.3. Climate change

Evidence suggests that the frequency and severity of droughts in the US will increase with climate change; in the Midwest specifically, droughts are expected to occur in late summer months.[81] Increases in temperature, precipitation, and evaporation will continue in Illinois, leading to frequent and more intense floods and droughts[82].

5.1.4. Geographic Location and Historical Occurrences

There are 12 records of excessive heat in Williamson County from 2010-2019 and 24 records of drought from 1998-2012. One drought in southern Illinois lasting through the month of September in 2007 caused $3,450,000 in crop damage across all of the counties affected[83].

Southern Illinois is home to many lakes, often surrounded by agriculture fields; creating ideal conditions for HABs in late summer. Illinois EPA has a statewide HAB testing and monitoring program, but data with locations of specific blooms are not available from their webpage. IEPA recommends ceasing aquatic recreation activities when Microcystin levels are greater than 10ug/L.

5.1.5. Risk

Williamson County has equal risk for heat waves and drought events. Excessive heat may be exacerbated in urban areas due to the heat island effect. HABs are most likely to occur in small ponds and lakes, or in shallow stagnant fingers of larger reservoirs.

[81] Angel, J. et al. 2018: Midwest. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II U.S. Global Change Research Program, Washington, DC, USA, pp. 872–940.
[82] "Climate Change in Illinois" Illinois State Water Survey/Prairie Research Institute
[83] NOAA Storm Events Database

5.2. Utility Disruptions and Power Outages

5.2.1. Hazard Description

This hazard includes short or long-term loss of essential utilities. Essential utilities include electricity, natural gas, potable water supply, wastewater treatment, and communication services (phone and internet). Constellation Energy Company lists the following as the 10 most common causes of power outages[84]:

- Severe weather
- Motor vehicle accidents
- Equipment failure
- Fallen trees
- Wildlife interference
- High energy demand
- Construction work damage
- Public damage (accidental and vandalism)
- Cyberattacks
- Planned outages

Impacts from utility disruptions can range from temporary inconveniences to a widespread public crisis. Loss of power during heat waves or winter storms can lead to weather related deaths. Loss of access to clean water for extended periods can lead to sickness and death. Inoperable communication towers and traffic signals can affect the efficiency of first responders. Local economies may suffer from loss of revenue and inability to pay workers during business closures.

5.2.2. Geographic Location and Historical Occurrences

Utility companies do not make historic records of outages and other issues publicly available. However, residents can search for and report currently active outages from both Ameren Illinois and Egyptian Electric Cooperative. Municipal water companies will publicly post current boil water orders when they occur. Additionally, the IEPA requires water suppliers to inform their customers of water outages and maintenance events that might disturb sediments containing lead.

5.2.3. Risk

Since power outages and other utility disruptions can be caused by a variety of factors, it is difficult to determine risk. In general risk of this hazard is highest during severe weather, and utility lines along highly trafficked roads have a higher risk of being damaged than those in more rural areas. There is also higher risk for older equipment to fail and cause outages.

[84] "10 common causes of power outages" Constellation, 2021.

5.3. Landslides

5.3.1. Hazard Description

Parts of Illinois have a medium to high landslide potential. While these events in Illinois are usually on a smaller scale than landslides in the west, they have been known to cause significant property and infrastructure damage. Most landslides in Illinois are not life threatening. ISGS defines 6 types of landslides that occur in our state[85]:

- **Rock falls-** These occur when blocks of rock fall freely from a steep slope or cliff. Blocks of loess or till that fall from an undercut bluff face are also considered rock falls. Rock falls are most common along bedrock bluffs of the Mississippi river.
- **Slumps -** Slumps occur when a mass of rocks or earth move down along one or more buried failure planes. Almost 60% of recorded landslides in IL were slumps.
- **Rock slump** – usually a permeable bedrock such as limestone sliding on underlying impermeable bedrock, such as shale.
- **Earth slump –** fine textured glacial materials that slide after failure planes form.
- **Earth slumps on bedrock-** Mass of glacial material sliding down bedrock – often shale, usually caused by water percolating the glacial material until reaching the impermeable shale.
- **Earth flows-** Any flow of sand or unconsolidated earth material
- **Rock creeps-** Blocks of rock that slide slowly over a gentle slope, generally very slow and takes place over the course of years.

5.3.2. Geographic Location and Historical Occurrences

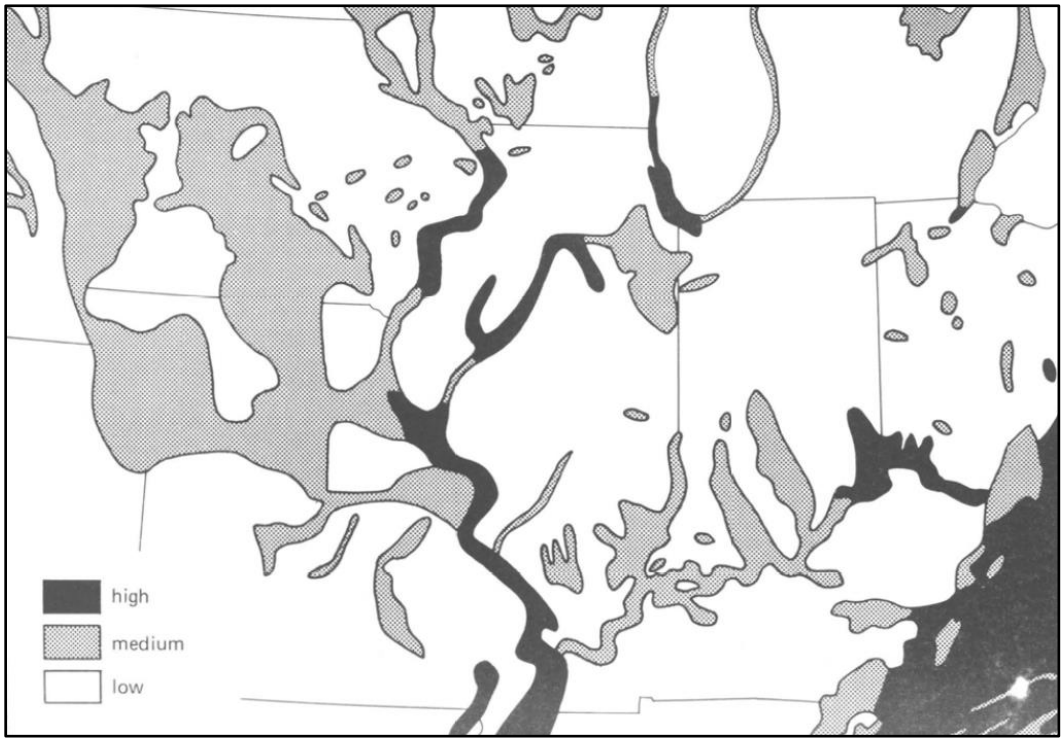
The most recent inventory of landslides in southern Illinois was competed in 1992. During this inventory, ISGS identified 221 landslides that occurred along the Mississippi and Ohio Rivers from Chester to Olmstead[86]. Most of the identified landslides were considered ancient landforms that had occurred during seismic activity of the New Madrid Seismic Zone. Besides earthquakes, heavy rainfall and alteration of risk areas, such as construction projects along bluffs and shorelines can also lead to landslides in southern Illinois.

5.3.3. Risk

Risk of landslide depends on a number of factors including depth and type of bedrock, depth and type of materials overlaying bedrock, slope angle, precipitation, freeze and thaw cycles, and vegetation. Most landslides in Illinois occur near Lake Michigan, and the Mississippi, Illinois, and Ohio Rivers; Williamson County has medium to low risk (figure 4.17).

[85] Killey, Hines, and DuMontelle "Landslide Inventory of Illinois" Illinois Department of Energy and Natural Resources, State Geological Survey Division, 1985.
[86] Wen June S, "Inventory of landslides in southern Illinois near the New Madrid Seismic Zone and the possible failure mechanism at three sites", Journal Volume: 24:7; Conference: 1992 annual meeting of the Geological Society of America (GSA), 1992.

Figure 4.19: Landslide potential in Illinois



Source: ISGS

5.4. Near Earth Object Impact

5.4.1. Hazard Description

Near Earth Objects, or NEOs, are any small Solar System Body that comes into proximity with Earth. This can include comets, asteroids, and meteoroids. NEOs are considered potentially hazardous if they are over 459 feet in diameter and their orbit crosses the orbit of Earth. In general, anything smaller than that is expected to burn up in the atmosphere[87] (although small meteorites do sometimes make contact with the surface).

For clarification a meteoroid is a very small solar system body, usually a piece that broke off of a comet or asteroid. A meteor is a meteoroid that enters Earth's atmosphere, and a meteorite is a meteor that lands on the surface.

The United States and other nations have been undergoing projects to scan for and assess the risk of NEOs since the 1990s under the umbrella term "Spaceguard".[81] The National Aeronautics and Space Administration (NASA) Center for NEO Studies (CNEOS) utilizes Sentry, "a highly automated collision monitoring system that continually scans the most current asteroid catalog for possibilities of future impact with Earth over the next 100 years.[88]" NEOs discovered are ranked on the Palermo and Torino scales. These scales give the NEO a hazard rating based on the probability of impact and the estimated damage. As of January 2019, 19,470 NEOs have been discovered; of these 107 are comets and the rest are asteroids[89].

5.4.2. Geographic Location and Historical Occurrences

There are over 160 known impact craters on the surface of the Earth. Two notable locations are Meteor Crater in Arizona and the Chicxulub Crater in Mexico. Meteor Crater was caused an estimated 50,000 years ago by a meteorite around 150 ft in diameter. The crater is 550 ft deep and nearly a mile wide. The Chicxulub Crater is located in the Gulf of Mexico, just off the coast of the Yucatán Peninsula. The asteroid which caused the crater hit Earth an estimated 66 million years ago, and is widely accepted as the cause of the mass extinction event which led to the demise of the non-avian dinosaurs.

There have been 10 meteorites in Illinois, four from observed falls and the rest were discoveries[90]. The largest of these is known as the Tilden meteorite, which fell on July 13, 1927. It split into three fragments while still in the atmosphere, and landed in three separate counties. The largest of the fragments weighed 110 pounds[91]. The most recent observed meteorite fall occurred in 2003.

5.4.3. Risk

NEO impact could occur anywhere, the county has equal risk

[87] NASA.gov "NASA on the Prowl for Near-Earth Objects" May 25, 2004.
[88] "Sentry: Earth Impact Monitoring", NASA Jet Propulsion Laboratory, Center for Near Earth Object Studies.
[89] NASA CNEOS "Discovery Statistics"
[90] "Meteorites from Illinois" Washington University in St Louis: Earth and Planetary Sciences
[91] Cargile, Clint, "This Week In Illinois History: Stars Fell On Illinois (July 13, 1927)" WNIJ New, Northern Public Radio, July 12, 2021.

5.5. Invasive Species and Infestations

5.5.1. Infestations

An infestation usually refers to a home, business, or farm being overrun or invaded by pests or parasites. This hazard can be caused by native and nonnative species. Home infestations can have a risk of disease spread from the pests. Infestations in agriculture can take many forms and may result in diseased crops or significant loss of crop from pests feeding in large numbers.

The CDC lists the following household pests as potential disease vectors and human health hazards[92]:

- Rodents
- Cockroaches
- Fleas
- Flies
- Fire ants
- Mosquitos
- Termites are also listed as a household threat for the amount of property damage an infestation can cause. In the U.S., termites cause more property damage annually than fires and windstorms combined.

5.5.1.1. Agricultural Infestations

The University of Illinois State Water Survey has a degree day calculator and seasonal maps for estimating peak emergence of common agriculture invertebrate pests, see table 4.34[93]:

Other animals that may cause enough crop damage to be considered an infestation are feral hogs, white-tailed deer, rodents, and birds. Fungal or viral infections and weeds may also be considered agricultural infestations.

[92] Marshall, Carter L MD "Chapter 4: Disease Vectors and Pests" CDC Healthy Housing Reference Manual
[93] "Pest Degree Day Calculators" Illinois State Water Survey: Prairie Research Institute

Table 4.34 – Agricultural Invertebrate Pests of Illinois

Pest	Native Species?
Alfalfa Weevil	no
Armyworm	yes
Bean Leaf Beetle	yes
Black Cutworm	yes
Corn Earworm	yes
Corn Rootworm	yes
European Corn Borer	no
Stalk Borer	yes
Two-spotted Spider Mite	found worldwide, original geographic distribution thought to be Eurasia
Western Bean Cutworm	native to western U.S., has been spreading east
Apple Maggot	yes
Codling Moth	found worldwide, origins unclear
Colorado Potato Beetle	native to Rocky Mtns
Emerald Ash Borer	no
European Red Mite	no
Fruit Tree Leafroller	yes
Grape Berry Moth	no
Oriental Fruit Moth	no
Peachtree Borer	yes
Potato Leafhopper	yes
San Jose Scale	no
Spotted Wing Drosophillia	no
Squash Vine Borer	yes
Brown Marmorated Stink Bug	no
Corn Flea Beetle	yes
Japanese Beetle	no

Source: University of Illinois State Water Survey

5.5.2. Invasive Species

Invasive species are any organism non-native in an ecosystem whose introduction causes or is likely to cause harm to the economy, environment, or human health (Executive Order 13112). Illinois defines exotic weeds as plants not native to North America that when planted, spread vegetatively or naturalize and degrade natural communities, reduce the value of fish and wildlife habitat, or threaten Illinois endangered or threatened species (525 ILCS 10).

Invasive plants and invertebrates can cause significant property damage, decrease crop yields, decrease value of timber stands, as well as disrupt natural communities and impact forest health. Similarly, aquatic invasive species can alter ecosystem structure, decrease water quality, and damage infrastructure. Zebra mussels can be particularly destructive; they breed profusely (a single female may produce 1million eggs/year) and attach to any hard surface in large clusters. Zebra mussels can clog intake pipes of water treatment and power facilities, costing millions of dollars in repair and cleanup[94].

Adopted in 2016, The National Invasive Species Management Plan identifies actions to prevent, eradicate, and control invasive species. It also lists guidelines for restoring ecosystems and other areas affected by invasive species[95].

Illinois has many exotic and invasive species. The Illinois Exotic Weed Act lists 26 species of plant that are illegal to buy, sell, offer to sell, distribute or plant seeds, plants, or parts of plants unless issued a permit by IDNR (Table 4.35). There are many other exotic and invasive plants in Illinois that are not covered by this law, as well as exotic and invasive animals (Tables 4.36, 4.37) Note that these tables may not be complete lists as many species are lacking observation data; additionally, game and agriculture species that are intentionally released (such as honeybees and brown trout) are not included.

[94] "Exotic Aquatic Invertebrates in Illinois" Illinois Department of Natural Resources.
[95] "National Invasive Species Management Plan", USDA National Invasive Species Information Center

Table 4.35 - Plants Listed in the Illinois Exotic Weed Act

Common Name	Scientific Name
Amur honeysuckle	*Lonicera maackii (Rupr.) Herder*
Autumn olive	*Elaeagnus umbellata Thunb.*
Bohemian knotweed	*Reynoutria x bohemica Chrtek & Chrtková*
Buckthorn	*Rhamnus arguta Maxim.*
Chinese buckthorn	*Rhamnus utilis Dcne.*
Common buckthorn, European buckthorn	*Rhamnus cathartica L.*
Dahurian buckthorn	*Rhamnus davurica Pallas*
Giant hogweed	*Heracleum mantegazzianum Sommier & Levier*
Giant knotweed	*Reynoutria sachalinensis F. Schmidt ex Maxim.*
Glossy buckthorn	*Frangula alnus Mill.*
Japanese buckthorn	*Rhamnus japonica Maxim.*
Japanese honeysuckle	*Lonicera japonica Thunb.*
Japanese knotweed	*Reynoutria japonica Sieb. & Zucc.*
Kudzu	*Pueraria montana var. lobata (Willd.) Maesen & S. Almeida*
Lesser celandine, fig buttercup	*Ficaria verna Huds.*
Morrow's honeysuckle	*Lonicera morrowii Gray*
Multiflora rose	*Rosa multiflora Thunb.*
Oriental bittersweet	*Celastrus orbiculatus Thunb.*
Poison hemlock	*Conium maculatum L.*
Purple loosestrife	*Lythrum salicaria L.*
Russian olive	*Elaeagnus angustifolia L.*
Sweet breath of spring	*Lonicera fragrantissima Lindl. & Paxton*
Tamarisk	*Tamarix spp. L.*
Tatarian honeysuckle	*Lonicera tatarica L.*
Teasel	*Dipsacus spp. L.*
Thorny olive	*Elaeagnus pungens Thunb.*

Table 4.36 -Terrestrial Invasive Animal Species

Common Name	Scientific Name
wild boar (feral hog)	*Sus scrofa*
Eurasian collard dove	*Streptopelia decaocto*
European starling	*Sturnus vulgaris*
emerald ash borer	*Agrilus planipennis*
Japanese beetle	*Popillia japonica*
nightcrawler	*Lumbricus terrestris*
southern worm	*Aporrectodea trapezoides*
woodland white worm	*Octolasion tyrtaeum*
soybean aphid	*Agrilus planipennis*
Asian longhorned beetle	*Anoplophora glabripennis*
gypsy moth	*Lymantria dispar*

Sources: IDNR, Invasive.org

Table 4.37 - Aquatic Invasive Animal Species

Common Name	Scientific Name
zebra mussel	*Dreissena polymorpha*
Asian clam	*Corbicula fluminea*
spiny water flea	*Bythotrephes longimanus*
rusty crayfish	*Orconectes rusticus*
bighead carp	*Hypophthalmichthys nobilis*
Silver carp	*Hypophthalmichthys molitrix*
common carp	*Cyprinus carpio*
goldfish	*Carassius auratus*

Sources: IDNR, Invasive.org

5.5.3. Geographic Location and Historical Occurrences

There are not detailed databases that track outbreaks and spread of every pest or invasive species. Agricultural resources and technical assistance can be found from various groups, including the National Resources Conservation Service (NRCS) and University of Illinois Extension offices.

IDNR and National Forest Service provide information about invasive species that harm our native ecosystems, and occasionally provide updates on current projects to manage or remove invasives.

5.5.4. Risk

Risk of infestation or spread of invasive species is variable. Factors include location, time of year, and weather.

6. Mitigation Strategies

"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." Stafford Act Title 44, Chapter 1, Part 201.

This chapter will review current mitigation strategies and ordinances, and list new suggestions for further hazard mitigation. The Williamson County Planning Team worked to develop these strategies specific to each jurisdiction based on the MHMP goals listed below:

Goal 1: Lessen the impacts of hazards to new and existing infrastructure	
Objective:	Retrofit critical facilities and structures with structural design practices and equipment that will withstand natural disasters and offer weather-proofing.
Objective:	Equip public facilities and communities to guard against damage caused by secondary effects of hazards.
Objective:	Minimize the amount of infrastructure exposed to hazards.
Objective:	Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.
Objective:	Improve emergency sheltering in Williamson County.

Goal 2: Create new or revise existing plans/maps for Williamson County	
Objective:	Support compliance with the NFIP for each jurisdiction in Williamson County.
Objective:	Review and update existing, or create new, community plans and ordinances to support hazard mitigation.
Objective:	Conduct new studies/research to profile hazards and follow up with mitigation strategies.

Goal 3: Develop long-term strategies to educate Williamson County residents on the hazards	
Objective:	Raise public awareness on hazard mitigation.
Objective:	Improve education and training of emergency personnel and public officials.

6.1. National Flood Insurance Program Statistics

The National Flood Insurance Program (NFIP) is a federal program managed by FEMA and delivered by a network of multiple insurance agencies. Flood insurance is available to businesses, home & property owners, and renters in communities that participate in the NFIP. Homes and businesses in Special Flood Hazard Areas (SFHA) with government backed mortgages are required to have flood insurance. Flood insurance is also required for some other federal programs, including qualifying for flood-related disaster relief funds and qualifying for grants through the Flood Mitigation Assistance (FMA) Program. Williamson County participates in the NFIP, table 6.1 shows the municipalities that also participate.

Table 6.1 – NFIP participation by municipality

Municipality	Participation	Reason for Non-participation	Current FIRM Effective Date
Bush	no	Suspended by FEMA	8/4/2008
Cambria	no	No structures within SFHA	8/4/2008
Carterville	yes	-	8/4/2008
Colp	no	No structures within SFHA	8/4/2008
Crainville	yes	-	8/4/2008
Creal Springs	no	Municipality not within SFHA	8/4/2008
Energy	no	No structures within SFHA	8/4/2008
Freeman Spur	yes	-	8/4/2008
Herrin	yes	-	8/4/2008
Hurst	yes	-	8/4/2008
Johnston City	yes	-	8/4/2008
Marion	yes	-	8/4/2008
Pittsburg	no	Municipality not within SFHA	8/4/2008
Spillertown	no	Municipality not within SFHA	8/4/2008
Stonefort	no	Municipality not within SFHA	8/4/2008

6.1.1. Community Rating System (CRS)

The Community Rating System (CRS) is a federal incentive program that offers discounts to communities in the NFIP whose floodplain management requirements and practices exceed the minimum standards set forth in the NFIP. The goals of the program are as follows[96]:

[96] "Community Rating System", FEMA.gov

- Reduce and avoid flood damage to insurable property
- Strengthen and support the insurance aspects of the National Flood Insurance Program
- Foster comprehensive floodplain management

Currently, no communities in Williamson County have CRS status.

6.1.2. Repetitive Loss Structures

FEMA defines repetitive loss structures as having at least two paid flood losses over $1,000 each in any 10-year period since 1978. Table 6.2 shows the summary of repetitive loss structures in Williamson County from 1983-2021.

Table 6.2- Repetitive Loss Structure Statistics for Williamson County

Jurisdiction	Occupancy Type	Number of Losses	Total Paid
MARION	OTHR-NONRES	6	$80,887.00
MARION	SINGLE FMLY	2	$4,324.85
MARION	SINGLE FMLY	4	$84,145.36
MARION	SINGLE FMLY	4	$17,589.41
MARION	OTHR-NONRES	7	$158,204.89
MARION	SINGLE FMLY	2	$12,643.31
MARION	OTHR-NONRES	9	$224,788.86
MARION	SINGLE FMLY	3	$36,195.73
MARION	SINGLE FMLY	6	$43,465.41
MARION	SINGLE FMLY	2	$6,605.85
MARION	SINGLE FMLY	2	$9,819.05
MARION	OTHR-NONRES	8	$202,523.11
MARION	SINGLE FMLY	2	$5,443.62
MARION	OTHR-NONRES	3	$39,574.86
MARION	OTHR-NONRES	2	$17,993.17
MARION	SINGLE FMLY	4	$42,683.87
MARION	SINGLE FMLY	4	$9,139.73
MARION	OTHR-NONRES	6	$50,113.70
JOHNSTON CITY	SINGLE FMLY	3	$26,315.12
MARION	SINGLE FMLY	2	$12,261.69
MARION	SINGLE FMLY	2	$11,155.56
MARION	SINGLE FMLY	2	$12,904.78
MARION	BUSI-NONRES	2	$111,003.13
TOTAL		**87**	**$1,219,782.06**

Source: IEMA

6.2. Jurisdiction Ordinances

Hazard Mitigation related ordinances, such as zoning, burning, or building codes, have the potential to reduce the risk from known hazards. These types of regulations provide many effective ways to address resiliency to known hazards. Table 6.3 lists Williamson County's current ordinances that directly pertain, or can pertain, to hazard mitigation. It is important to evaluate the local building codes and ordinances to determine if they have the ability to reduce potential damages caused by future hazards.

Table 6.3 - Jurisdictional Ordinances

Community	Building	Electrical	Stormwater	Flooding	Subdivision	Fire	Land Use	Zoning
Williamson Co.	Building Permit Ordinance - 2020	-	Management Plan (1982)	State Model (Current)	Subdivision Control (2006)	Burning Ordinance (1981)	Comp. Plan (1964)	-
	(Current)							
Bush	-	-	-	-	-	-	-	-
Cambria	-	-	-	-	-	-	-	-
Carterville	ICC IBC	ICC EC (Current)	-	State Model (Current)	State Model (2012)	Burning Ordinance	Comp. Plan (1966)	State Standards (Current)
	(Current)							
Colp	-	-	-	-	-	-	Comp. Plan (1967)	-
Crainville	-	-	State Standards (Current)	State Model (Current)	State Standards (Current)	State Standards (Current)	Comp. Plan (1968)	Municipal Code (Current)
Creal Springs	-	-	-	-	-	-	Comp. Plan (1967)	-
Energy	ICC IBC	-	-	-	State Standards (Current)	NFPA (Current)	-	-
	(Current)							
Freeman Spur	Building Ordinance (2005)	-	-	State Model (Current)	-	Burning Ordinance (2005)	-	-
Herrin	ICC 2000 IBC	ICC 2000 EC	-	State Model (Current)	State Standards (Current)	State Standards (Current)	Comp. Plan (1963)	State Standards (Current)
Hurst	-	-	-	State Model (Current)	-	-	Comp. Plan (1967)	-
Johnston City	-	-	-	State Model (Current)	-	-	Comp. Plan (1964)	-
Marion	ICC 2009 IBC	NFPA 2008 EC	State Standards (2008)	State Model (Current)	City Standards (2013)	NFPA	Comp. Plan (1968)	State Standards (2013)
						-2006		
Pittsburg	NFPA 2000 Life Safety	-	-	-	-	Burning Ordinance (2005)	-	-
Spillertown	-	-	-	-	-	-	-	-
Stonefort	-	-	-	-	-	-	-	-

6.3. New Mitigation Strategies

The following tables display all hazard mitigation strategies proposed by the Williamson County Planning Team. Strategies were created with county goals and FEMA STAPLEE criteria. Strategies from the 2015 Plan are noted in the tables. Planning Team members determined project priority based on the immediate need of the community, overall hazard reduction benefits to the community the strategy would provide, and cost-effectiveness of the project to other alternatives.

The timeline for these projects is based on priority ranking and subject to availability of funding. Jurisdictions are strongly encouraged to apply for grants upon final Plan review and adoption, however it is not a requirement of the Plan that these mitigation strategies are completed.

High priority: 1-3 years, Medium Priority: 4-6 years, Low Priority: 7-10 years

For details on specific grant programs, see appendix 6.

Table 6.4 - FEMA STAPLEE criteria

Social	Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the community's social and cultural values.
Technical	Mitigation actions are technically most effective if they provide a long-term reduction of losses and have minimal secondary adverse impacts.
Administrative	Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.
Political	Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.
Legal	It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.
Economic	Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost benefit review, and possible to fund.
Environmental	Sustainable mitigation actions that do not have an adverse effect on the environment, comply with federal, state, and local environmental regulations, and are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.

Source: FEMA

All Hazards						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Jurisdictions Involved**	**Strategy Proposed by**
AH1	Keeping written/photo/video records of key infrastructure maintenance. These records are vital in the event a disaster damages infrastructure, there are records that the damage was due to the event and not negligence, and can be reported to FEMA accurately in assistance applications	Proposed/Ongoing	Local, EMPG	High	IDOT, Road Commissions, Levee Commissions, Dam Personal, Water Plant managers, etc	IEMA Downstate Disaster workshop 2022
AH2	Forming & training local damage assessment teams and COADs (Community Organizations Active in Disaster)	Proposed	Local, EMPG, other Preparedness Grants	High	IEMA, County EMA, Community Members	IEMA Downstate Disaster workshop 2022
AH3	Saving emergency funds at the county and municipal level to increase resiliency should a disaster occur.	Proposed/Ongoing	local	High	County & Municipal Governments	IEMA Downstate Disaster workshop 2022
AH4	Create/maintain an animal welfare disaster planning committee in order to properly follow requirements of IL PETs Act, and to have protocols in place for rescuing and sheltering pets and livestock during natural disasters. Provide training to staff/volunteers regarding animal rescue procedures and safety.	Proposed	Animal control, non-profits	Low	County Animal Control & Sheriff's Office, Local Animal Rescue Groups	Jenny Richardson, Project Paws of Southern Illinois (PPSI)
AH5	Build a second water plant on a different lake. This would be a very large project with a long timeline.	Proposed	BRIC	Low	Rend Lake Conservancy District (RLCD)	Keith Thomason (General Manager at Rend Lake Conservancy District)
AH6	Improve emergency response training, staff, resources, and equipment. Promote disaster resilience through workshops, education materials, and planning guides.	Ongoing	Local, state, federal	High	County EMA, First Responders, Municipalities	Tamara Caffey-Bey and Arienn Hermann (Regional Emergency Planning Coordinator SPARC)
AH7	Identity the most likely causes of a Mass Casualty Incident and make training exercises for those potential situations. Create a communication plan between coordinating agencies to be involved with mass casualty incidents.	Ongoing	Local, state, federal, private	High	Municipalities, First Responders, Franklin/Williamson County EMA; FEMA; IEMA	Katrina Martin (Director of Emergency Preparedness in Franklin and Williamson County)
AH8	Review and update county & municipality building & zoning codes/ordinances to improve disaster resiliency, community safety, and energy efficiency	Proposed	local	Medium	County Board, Municipalities	2022 National Initiative to Advance Building Codes

Flooding, Dam Failure						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
F1	• Institute a buy-out plan for repetitive loss properties • Regularly perform drainage system maintenance • Culvert replacement • Update urban areas to withstand storm water (rain gardens, bioswales, urban tree planting, permeable pavement) • Outreach/education for homeowners regarding flood insurance options, and home/landscape improvements that can reduce flooding impacts • Raise vulnerable structures on stilts/piles • Conversion of flood prone areas back to wetlands • Review/update EAPs for high potential loss dams and levee districts • Review/update evacuation protocols for high potential loss dams and levee districts. Staying up to date on any severe weather forecast and having evacuation plan in place	Ongoing	Local; State	Medium	Williamson County EMA; City of Marion EMA	Doug Phillips; City of Marion Superintendent
F2	Buy-Out plan for repetitive loss properties. Purchase repetitive loss properties located in frequent flooding or flood plain areas. Flood prevention supplies. Stockpile sandbags and other equipment to mitigate flooding of school buildings.	Proposed	Local; FMA	Medium	Williamson County EMA	Jeff Bink and Chad Milburn (regional office of education #21)
F3	In the case of Dam Failure; Prevent buildings being used or built in flood plains or in the proposed damage path of a failed dam. Prevent school construction in low-lying areas. Develop early warning system for schools in potential damage area of failed dam. Early warning system	Proposed	Local; FMA	Low	Williamson County EMA	Jeff Bink and Chad Milburn (regional office of education #21)

Flooding, Dam Failure						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
F4	• Institute a buy-out plan for repetitive loss properties. Do outreach at schools and teach children how to prepare for flooding. Do community outreach. Sign up people for county alerting program. • Regularly perform drainage system maintenance • Culvert replacement • Update urban areas to withstand storm water (rain gardens, bioswales, urban tree planting, permeable pavement) • Outreach/education for homeowners regarding flood insurance options, and home/landscape improvements that can reduce flooding impacts • Raise vulnerable structures on stilts/piles • Conversion of flood prone areas back to wetlands • Review/update EAPs for high potential loss dams and levee districts • Review/update evacuation protocols for high potential loss dams and levee districts	Ongoing	BRIC, FMA, IEPA, USDA	Medium	Williamson County EMA	Herrin CUSD, Williamson County Government; Kelly Norris, Pat Creek, Amanda Barnes, Ashley Gott, Mike Cerutti, Thom Beebe, Russ Tate, Travis Emery, Robert Owsley, Jim Marlo, Alex Simpson, Jeff Robinson
F5	Reminders needed for flood areas. Make sure senior center has a drainage system in good working order. Encourage insurance for flooding, Ensure senior centers in flood zones have appropriate insurance in case of flooding.	Ongoing	Local, FMA	Medium	Egyptian Area Agency on Aging & senior centers	Becky Salazar (Executive Director)
F6	Be prepared for evacuation-educate seniors on response. Find out which areas would be affected and educate most vulnerable seniors in those areas via flyers on home-delivered meals. Flyers on home-delivered meals is a good way to get info to homebound seniors.	Proposed	Local, Preparedness grant	Medium	Egyptian Area Agency on Aging & senior centers	Becky Salazar (Executive Director)
F7	In the case of a flooding event, attempts will be made to remove people and property from flood zones and away from danger. Attempts will be made to try and enforce flood walls. Flood gates, and evacuation routes will be determined.	Proposed	Local, EMPG	Medium	Williamson County EMA	Noelle Eldridge (Spillertown Village Clerk)
F8	In the event of dam failure; supplies on hand in order to try to make any repairs possible. Have sandbags ready, and volunteers to help lay the sandbags	Proposed	Local, FMA	Low	Williamson County EMA	Noelle Eldridge (Spillertown Village Clerk)

Flooding, Dam Failure						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
F9	Promote awareness and educate students and staff through education materials and planning guides. Regularly perform drainage system maintenance.	Proposed	Local	Low	Herrin CUSD Carterville CUSD / Fire Department	Keith Liddell (Superintendent of Carterville CUSD #5) Nathaniel Wilson (Herrin CUSD)
F10	Promote awareness and educate students and staff through education materials and planning guides. Regularly perform drainage system maintenance. Review/update evacuation protocols for high potential loss dams and levee districts.	Proposed	Local	Low	Johnston city School Staff/ Williamson County EMA	Kathy Clark (Superintendent of Johnston City School CUSD #1)
F11	Culvert Replacement, Regular Drainage Maintenance. Hosting programs at schools to teach children how to prepare for flooding events. Community outreach at City Hall.	Ongoing	State; Federal	Medium	Williamson County EMA/ City of Creal Springs	Shannon Edwards (Chief of Police Creal Springs)
F12	Culvert Replacement; Host a program at the school to teach children how to prepare for dam failures. Program at wonder water reunion.	Ongoing	State; Federal	Low	Williamson County EMA/ City of Creal Springs	Shannon Edwards (Chief of Police Creal Springs)
F13	Buyout plan for repetitive loss properties. Outreach education for flood insurance and landscaping options to reduce flooding problems. Evacuation plan for severe floods. Assist other agencies as needed	Ongoing	l,s,f	Low	Energy Fire Dept	Michael Nelson (Energy Asst Fire Chief)
F14	Turn off pumps and valves to water towers. Check for washed out water lines, fix repairs as needed.	Proposed	Local, FMA, USDA, IEPA	Low	Coal Valley Water Dist.	Bruce Emery (Coal Valley Water District)
F15	Place sandbags around building during severe floods, keep gutters clear	Ongoing	private	High	Lighthouse, County EMA, City of Marion	Shara Robinson (Lighthouse Shelter)
F16	Seek funding to update building so that it is less prone to flood damage	Proposed	Local, FMA	High	Lighthouse, County EMA, City of Marion	Shara Robinson (Lighthouse Shelter)
F17	Purchase emergency pumps and connection equipment to bypass flooded pumps stations. Mobile pumps can be used so that a small fleet of pumps could be used for the entire drinking water system.	Proposed	Local, FMA, BRIC, USDA, IEPA	Medium	RLCD	Keith Thomason (General Manager at Rend Lake Conservancy District)
F18	In the event of a dam failure; Build a second water treatment plants on a separate lake. This would be a very large project with a long timeline.	Proposed	Local, BRIC	Medium	RLCD	Keith Thomason (General Manager at Rend Lake Conservancy District)
F19	Provide training for staff for drinking water bypass operations during flooding.	Ongoing	local	Medium	RLCD	Keith Thomason (General Manager at Rend Lake Conservancy District)

Flooding, Dam Failure						
Code	**Mitigation Strategy**	**Status**	**Funding Source**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
F20	Provide cross connects between the Rend Lake Conservancy District and other water providers so that water can be supplied in the event of failure of the drinking water treatment system. Cross connecting the RLCD system with other water providers would allow water supply until dam repairs could be completed.	Proposed	Local, FMA, BRIC, USDA, IEPA	High	RLCD	Keith Thomason (General Manager at Rend Lake Conservancy District)
F21	Develop and mark emergency evacuation routes for high hazard potential dams	Proposed	Local, EMPG	Medium	Dam owners, County EMA, IDOT	Tamara Caffey-Bey and Arien Hermann (Regional Emergency Planning Coordinator SPARC)
F22	Utilize a plan, where CCHS may be of assistance to other agencies. Due to elevations in the area, flooding is unlikely. A plan would be set in place to open the building up for other agencies to use.	Proposed	Local	Low	Carbondale Community High School Staff//Jackson County EMA	Stephanie Dillow (CCHS School Resource Officer)

Tornados, Severe T-Storms						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
T1	Promote awareness and educate students, staff, and community through education materials and planning guides. Ensure facilities are equipped with emergency survival and first aid supplies, etc.	Ongoing	local	Medium	Herrin CUSD 4	Nathaniel Wilson (Herrin CUSD 4)
T2	Retrofit existing buildings with more structural support. Work with architect to design additional support, apply for federal matching grant to purchase. Implement safe rooms.	Ongoing	Local; State; Federal	High	Williamson County EMA	Doug Phillips; City of Marion Superintendent
T3	Improve early warning systems. Coordinate for early warning systems, improve infrastructure for rural areas. Early warning system notifications on buses. Practice Drills. Prepare students and staff for severe weather, create plans and execute drills.	Proposed	Local	High	Williamson County EMA; Weather Broadcasting Stations	Jeff Bink and Chad Milburn (regional office of education #21)
T4	Construct safe rooms in essential facilities and other community buildings. Retrofit existing buildings to withstand high winds. Do outreach at School Districts and teach children how to take cover. Do outreach with the community. Sign as many up with hypereach. Doing this at all community days, parades, fairs.	Ongoing	Local; State; Federal	High	Williamson County EMA; City of Marion EMA	Williamson County Government; Kelly Norris, Pat Creek, Amanda Barnes, Ashley Gott, Mike Cerutti, Thom Beebe, Russ Tate, Travis Emery, Robert Owsley, Jim Marlo, Alex Simpson, Jeff Robinson; Doug Phillips; City of Marion Superintendent

Tornados, Severe T-Storms						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
T5	Senior centers have current plans, but need to revisit in old buildings. Plan safest place in building for seniors and staff to go during tornado/storm. If funding is available- revamping of old buildings is needed, Senior centers should consider reinforcing old, brittle walls to make buildings sturdier.	Proposed	BRIC, USDA, CDBG	Medium	Egyptian Area Agency on Aging & senior centers	Becky Salazar (Executive Director)
T6	In the case of a tornado, there must be adequate tornado sirens, in order to give the earliest warning signs as possible. Making sure any down powerlines are maintained and people are kept safe from any destruction from the tornado.	Proposed	Local, BRIC, USDA	Medium	Williamson County EMA	Noelle Eldridge (Spillertown Village Clerk)
T7	In the event of a severe thunderstorm; first people must be moved indoors and away from windows. People in lead must stay aware of alerts and warnings. Urgency to stay away from flooded roads; and to have truck and tractors as emergency equipment ready for when its needed.	Proposed	Local	Medium	Williamson County EMA	Noelle Eldridge (Spillertown Village Clerk)
T8	Promote awareness and educate students, staff, and community through education materials and planning guides. Ensure facilities are equipped with emergency survival and first aid supplies, etc.	Ongoing	local	Medium	Carterville CUSD / Fire Department	Keith Liddell (Superintendent of Carterville CUSD #5)
T9	Promote awareness and educate students and staff through education materials and planning guides. Construct safe rooms at schools if funding becomes available.	Ongoing	Local, EMPG, BRIC, USDA	Medium	Johnston city, JC School Staff/ Williamson County EMA	Kathy Clark (Superintendent of Johnston City School CUSD #1), Douglas Dobbins- Johnston City
T10	Promote awareness and educate students, staff, and community through education materials and planning guides. Ensure facilities are equipped with emergency survival and first aid supplies, etc.	Ongoing	Local; State	Medium	Carterville CUSD / Fire Department	Keith Liddell (Superintendent of Carterville CUSD #5)
T11	Construct safe rooms at schools if funding becomes available. Promote awareness and educate students and staff through education materials and planning guides.	Ongoing	State; Federal	Medium	Johnston city School Staff/ Williamson County EMA	Kathy Clark (Superintendent of Johnston City School CUSD #1)
T12	Construct safe rooms in community building. Host an assembly at the school to teach children about how to take cover in a tornado event. Host a program at the Wonder Water reunion. Program will be held at city hall for residents. Sign residents up for county alert program	Ongoing	Local;State; Federal	High	Williamson County EMA/ City of Creal Springs	Shannon Edwards (Chief of Police Creal Springs)
T13	Man the station during risk of severe weather. Keep weather radios in govt buildings. Tornado sirens can be activated by multiple jurisdictions (dispatch, fire, or police radios). Train staff to watch for severe weather. Retrofit buildings to withstand high winds. Construct safe rooms in essential facilities. Assist in damage clean up and assisting injured. Maintain list of bus services that would assist in disasters. Provide list of shelter and food locations during emergencies	Ongoing	L,s,f,	High	Energy Fire Dept	Michael Nelson (Energy Asst. Fire Chief)

Tornados, Severe T-Storms						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
T14	Any new municipal facilities should be constructed having safe rooms. Currently in the plans for building a new fire station that will have a rated safe room area to meet Codes. Include a list of storm shelters available in the city of Herrin and Williamson County in the next update of the City's EOP	Proposed	Local, BRIC, CDBG, USDA	High, Medium	City of Herrin	Shawn Priddy Herrin Fire Chief
T15	Make sure generator is in operating condition. Check tower structure and bridges, check for leaks. Run pumps if needed	Proposed	Local	Medium	Fire Dept, Water District	Bruce Emery (Coal Valley Water District)
T16	Semi-annual tornado drills. Have County EMA or first responders review emergency procedure to ensure safety.	Ongoing/Proposed	Private	Medium	Lighthouse, County EMA	Shara Robinson (Lighthouse Shelter)
T17	Provide training to staff to isolate water supply lines to damaged buildings or water towers to stop leaks and reestablish water supply as quickly as possible. Provide training for employee safety and methods to locally operate drinking water transmission stations without communications for remote operations if radio towers are destroyed. RLCD has already prepared for this event and will implement lessons learned from the recent KY tornado.	Ongoing	local	Medium	RLCD	
T18	It is recommended that all facilities have tornado safe rooms and that persons within the facilities are aware of their location. Tornado drills are encouraged.	Ongoing	Local, state, federal	High	First Responders, FEMA, IEMA	Bi County Health Dept
T19	Older buildings should be hardened to prevent damage. Condemned or structurally unsafe building should be torn down and rubble should be removed and disposed of to prevent excessive flying debris during severe weather.	Proposed	Local, BRIC, USDA, CDBG, Infrastructure Bill	Medium	City Governments/ Private owned businesses	Bi County Health Dept
T20	Develop ordinance to require new development to place all new utility lines underground.	Proposed	Local	High	County/municipal government	Tamara Caffey-Bey and Arien Hermann (Regional Emergency Planning Coordinator SPARC)
T21	Institute a plan for protection and recovery. Will provide a guideline on how to protect and respond to such event. Recovery efforts will be made and the damage would be evaluated.	Proposed	Local	Medium	Carbondale Community High School Staff//Jackson County EMA	Stephanie Dillow (CCHS School Resource Officer)
T22	Provide Jurisdiction-wide Siren Warning Coverage	Proposed/Ongoing	EMPG, Local	Medium	Pittsburg, Crainville, Colp, Williamson County EMA	Keith Violett-Village of Pittsburg, Ron Mitchell-Crainville, Marcella Clark- Colp

Earthquakes						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
EQ1	Install Automatic Shutoff Valves, construct backup water mains, construct new safe rooms	Ongoing	State, federal	M	Williamson County EMA, Franklin-Williamson Bi-County Health Dept., Marion EMA, SIH	
EQ2	Outreach/Education for residents on structural and non-structural retrofitting. Fairs/community days	Ongoing	Local	H	County	
EQ3	Provide information to residents on structural and non-structural retrofitting. Develop earthquake emergency action plans. Construct new safe rooms. Install automatic shutoff valves. Construct backup water mains	Proposed	Local, EMPG, BRIC, FMA, USDA	Low	Williamson County EMA; City of Marion EMA	Doug Phillips; City of Marion Superintendent
EQ4	Develop earthquake emergency action plan. Automatic shutoff valves. Install shutoff valves for all utilities. Work with outside agencies to consult schools on best strategies.	Proposed	Local; State	Medium	Williamson County EMA; City of Marion EMA	Jeff Bink and Chad Milburn (regional office of education #21)
EQ5	Provide information to residents on structural and non-structural retrofitting Develop earthquake emergency action plans. Doing this at all Community Days, Fairs and Parades. Construct new safe rooms Install automatic shutoff valves Construct backup water mains.	Ongoing	State;Federal	Medium	Williamson County EMA; City of Marion EMA	Williamson County Government; Kelly Norris, Pat Creek, Amanda Barnes, Ashley Gott, Mike Cerutti, Thom Beebe, Russ Tate, Travis Emery, Robert Owsley, Jim Marlo, Alex Simpson, Jeff Robinson
EQ6	Current plans in place, but may not be practiced in a while due to recent closure. Revisit earthquake plan and ensure seniors know the plan. Most staff won't know where shutoff valves are located. Ensure staff know where shutoff valves are located. Most staff won't know where shutoff valves are located.	Ongoing	State;Federal	Medium	Egyptian and Senior Centers	Becky Salazar (Executive Director)
EQ7	Continue Hazard Specific activities such as, levee reinforcement, and taking better measures to reenforce the safety and stay aware of the warning systems	Proposed	State;Federal	Low	Williamson County EMA	Noelle Eldridge (Spillertown Village Clerk)
EQ8	Develop earthquake emergency action plans. Promote awareness and educate students, staff, and community through education materials and planning guides.	Ongoing	Local	Low	Herrin CUSD/Carterville CUSD / Fire Department	Keith Liddell (Superintendent of Carterville CUSD #5), Nathaniel Wilson (Herrin CUSD)

Earthquakes						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
EQ9	Develop and review earthquake emergency action plans. Promote awareness and educate students and staff through education materials and planning guides.	Ongoing	Local	High	Johnston city School Staff/ Williamson County EMA	Kathy Clark (Superintendent of Johnston City School CUSD #1)
EQ10	Develop earthquake emergency plans. Provide information to residents about the emergency action plans. Host a program at the Wonder Water Reunion. Construct back up water mains, construct new safe rooms.	Ongoing	Local; State; Federal	Medium	Williamson County EMA/ City of Creal Springs	Shannon Edwards (Chief of Police Creal Springs)
EQ11	Develop earthquake emergency action plans. In the event of an earthquake: Check for and report injured people and building/infrastructure damages. Assist other agencies as needed	ongoing	Local; State; Federal	Low	Energy Fire Dept	Michael Nelson (Energy Asst. Fire Chief)
EQ12	Close valves to keep water in system, asses for leaks and needed repairs as soon as possible	Proposed	Local	Medium	Coal Valley Water	Bruce Emery (Coal Valley Water District)
EQ13	Install at least two water supply lines from the Rend Lake water treatment plant to each community so that there is no single point of failure. A large earthquake will damage many underground water mains and may damage treatment plant structures and piping.	Proposed	Local, BRIC, USDA, CDBG, Infrastructure Bill	High	RLCD	Keith Thomason (General Manager at Rend Lake Conservancy District)
EQ14	Provide cross connects between the Rend Lake Conservancy District and other water providers so that water can be supplied in the event of failure of the water treatment system.	Proposed	Local, BRIC, USDA, CDBG, Infrastructure Bill	High	RLCD	Keith Thomason (General Manager at Rend Lake Conservancy District)
EQ15	Institute a build back and recovery plan for loss of properties. CCHS will apply for FEMA and other funds available for recovery and efforts to rebuild. The building would have to be back to code prior to allowing the building to be functional.	Proposed	Local, FMA, IEMA/FEMA Preparedness Grants	Medium	Carbondale Community High School Staff//Jackson County EMA	Stephanie Dillow (CCHS School Resource Officer)

HazMat Release

Code	Mitigation Strategy	Status	Funding Source/ Potential Grants	Priority	Responsible Organization/ Agency	Strategy Proposed by
HM1	• Acquire protective gear for first responders and locations with high probabilities of occurrence (colleges, factories/warehouses, energy plants) • Develop and update HazMat emergency action plans • Equip facilities with centralized positive-pressure HVAC systems	Proposed	Local, EMPG, DOT safety grants, BRIC	Medium	Williamson County EMA; City of Marion EMA	Doug Phillips; City of Marion Superintendent
HM2	ESSRA money for installation of new HVAC systems. Positive Pressure HVAC. Emergency Action Plan. Develop action plan for hazardous material mitigation with local agencies and ISBE.	Proposed	Local; BRIC, USDA	Medium	Williamson County EMA; City of Marion EMA	Jeff Bink and Chad Milburn (regional office of education #21)
HM3	• Acquire protective gear for first responders and locations with high probabilities of occurrence (colleges, factories/warehouses, energy plants) • Develop and update HazMat emergency action plans • Equip facilities with centralized positive-pressure HVAC systems. Assist jurisdictions and all facilities with plan development and finding funding sources to acquire equipment. Offer Haz Mat Awareness and Haz Mat Refresher training to all jurisdictions and facilities.	Ongoing	Local; State	Medium	Williamson County EMA; City of Marion EMA	Williamson County Government; Kelly Norris, Pat Creek, Amanda Barnes, Ashley Gott, Mike Cerutti, Thom Beebe, Russ Tate, Travis Emery, Robert Owsley, Jim Marlo, Alex Simpson, Jeff Robinson
HM4	Have PPE readily available and chemical data sheets at every site. Chemical data sheets are currently kept. Have emergency plans for Haz Mat incident. Ensure policies are up-to-date and followed.	Ongoing	State;Federal	Medium	Egyptian and Senior Centers	Becky Salazar (Executive Director)
HM5	During a hazardous materials event, efforts will be made to eliminate or reduce risk to harmful or toxic chemical or materials. There will be hazard specific activities improved and training for to service land use and planning decisions.	Proposed	Local, EMPG	Low	Williamson County EMA	Noelle Eldridge (Spillertown Village Clerk)
HM6	Develop and update HazMat emergency action plans. Promote awareness and educate students, staff, and community through education materials and planning guides.	Ongoing	Local	Low	School districts, fire depts, county EMA	Multiple
HM7	Provide protective gear for first responders. Assist facilities with a plan and find grants for equipment. Offer hazmat awareness and hazmat refresher training to all facilities.	Ongoing	State; Federal	Low	Williamson County EMA/ City of Creal Springs	Shannon Edwards (Chief of Police Creal Springs)
HM8	Develop& update HazMat emergency action plans. Acquire protective gear for first responders & locations with high probability of occurrence. Equip facilities with centralized positive pressure HVAC systems. Enhance emergency communication systems. Maintain list of emergency vehicles & equipment. Maintain backup generators. Monitor weather conditions. In the event of a HazMat release, contact MABAS 45 HazMat Team MABAS 65 unit. Assist as needed.	Ongoing	Local, state, federal	Medium	Energy Fire Dept	Michael Nelson (Energy Asst. Fire Chief)
HM9	Repeated water testing in the event of a HazMat release, shutoff pumps & distribute no consumption notices as necessary.	Proposed	Local, IEPA	Low	Coal Valley Water, CDC, Police	Bruce Emery (Coal Valley Water District)

HazMat Release						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
HM10	Test drinking water from the distribution system for chemical parameters if hazardous materials are released near distribution piping. Test the drinking water supply lake on a regular basis for chemical parameters.	Ongoing	Local	High	RLCD	Keith Thomason (General Manager at Rend Lake Conservancy District)
HM11	Obtain PPE for first responders and station near vulnerable areas. (Highways, chemical plants, etc.) Develop an action plan for HazMat releases	Ongoing	Local, state, federal	Medium	Franklin/Williamson County EMA; FEMA; IEMA	Katrina Martin (Director of Emergency Preparedness in Franklin and Williamson County)
HM5	Institute awareness, protection, and procedures to lower risks of exposure. Will provide training and guidelines through Crisis Plan book.	Proposed	Local	Medium	Carbondale Community High School Staff//Jackson County EMA	Stephanie Dillow (CCHS School Resource Officer)

Drought, Extreme Heat						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
D1	• Reduce Urban Heat Island effects with various methods: green infrastructure, urban tree planting, permeable pavement, reflective pavement/roofs, others • Establish wildfire prevention management strategies • Provide cooling centers for vulnerable population. Regular safety meetings for awareness of extreme heat weather and employee and community awareness.	Ongoing	Local; State	Medium	Williamson County EMA; City of Marion EMA	Doug Phillips; City of Marion Superintendent
D2	Allow work from home or half-day schedule when building HVAC systems are inadequate for creating a comfortable atmosphere. Flexible school schedule. Require new buildings meet rigorous eco-friendly standards for saving energy. Green infrastructure	Proposed	Local; IEPA, CDBG, USDA	Medium	Williamson County EMA; City of Marion EMA	Jeff Bink and Chad Milburn (regional office of education #21)
D3	• Reduce Urban Heat Island effects with various methods: green infrastructure, urban tree planting, permeable pavement, reflective pavement/roofs, others • Establish wildfire prevention management strategies • Provide cooling centers for vulnerable population	Proposed	IEPA, USDA CWDG	Medium	Williamson County EMA; City of Marion EMA	Williamson County Government; Kelly Norris, Pat Creek, Amanda Barnes, Ashley Gott, Mike Cerutti, Thom Beebe, Russ Tate, Travis Emery, Robert Owsley, Jim Marlo, Alex Simpson, Jeff Robinson
D4	Provide space for seniors during hot weather. Should be easy to implement if site is open. Provide water and encourage hydration at all senior activities, Hydration helps keep body temperature down.	Ongoing	Local, CDBG, USDA	Medium	Egyptian and senior centers	Becky Salazar (Executive Director)

Drought, Extreme Heat

Code	Mitigation Strategy	Status	Funding Source/ Potential Grants	Priority	Responsible Organization/ Agency	Strategy Proposed by
D5	In the case of a drought, attempts to get water to the most important areas is the first action to take. Then setting up cooling stations and have extra water and fans on standby.	Proposed	Local, USDA, DNR	Low	Williamson County EMA	Noelle Eldridge (Spillertown Village Clerk)
D6	Promote awareness and educate students and staff through education materials and planning guides. Regularly perform drainage system maintenance. Provide cooling centers for vulnerable population.	Proposed	Local	Low	Herrin CUSD, Carterville CUSD / Fire Department	Keith Liddell (Superintendent of Carterville CUSD #5) Nathaniel Wilson (Herrin CUSD)
D7	Promote awareness and educate students and staff through education materials and planning guides. Regularly perform drainage system maintenance. Provide cooling centers for vulnerable population.	Ongoing	Local	Low	Johnston city School Staff/ Williamson County EMA	Kathy Clark (Superintendent of Johnston City School CUSD #1)
D8	Provide cooling center, host a program at the school on how to prepare children for extreme heat and drought. Sign up residents for county alert program.	Proposed	Local; USDA, CDBG	Medium	Williamson County EMA/ City of Creal Springs	Shannon Edwards (Chief of Police Creal Springs)
D9	Establish wildfire prevention management strategies. Have no burn ordinances in the event of a drought. Maintain list of cooling centers. List of transportation for the community. Assist other agencies as needed.	Ongoing	Local, state, federal	Medium	Energy Fire Dept	Michael Nelson (Energy Asst Fire Chief)
D10	Check for overheating on pumps. Have a water conservation plan in place for customers in the event of a drought.	Proposed	Local,	Low	Coal Valley, RLCD	Bruce Emery (Coal Valley Water District)
D11	Develop a water conservation plan and implementation procedures for Rend Lake operations and customers, a severe drought could lower the level in Rend Lake and could require water rationing.	Proposed	Local, Preparedness Grant, IEPA, IDNR	Medium	RLCD	Keith Thomason (General Manager at Rend Lake Conservancy District)

Ground Failure/Mine Subsidence						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
GF1	• Maintain a list of buildings constructed over underground mines. Maintain a list of any underground structures to be affected and map and education of affected mine subsidence areas. • Education programs/brochures regarding mine subsidence insurance for home and landowners	Ongoing	Local; State	Medium	Williamson County EMA; City of Marion EMA	Doug Phillips; City of Marion Superintendent
GF2	List of Buildings over underground mines. Maintain list at county offices of buildings built over mines. Make purchaser/builder aware when property changes hands. Cracks in concrete/structure. Land surveyors watch for structural failures and signs of possible failure.	Proposed	Local; ISGS, IDNR	High	Williamson County EMA; City of Marion EMA	Jeff Bink and Chad Milburn (regional office of education #21)
GF3	• Maintain a list of buildings constructed over underground mines • Education programs/brochures regarding mine subsidence insurance for home and landowners.	Ongoing	Local; State	High	Williamson County EMA; City of Marion EMA	Williamson County Government; Kelly Norris, Pat Creek, Amanda Barnes, Ashley Gott, Mike Cerutti, Thom Beebe, Russ Tate, Travis Emery, Robert Owsley, Jim Marlo, Alex Simpson, Jeff Robinson
GF4	Senior centers should become aware. Know if senior center is over underground mines. Provide education on mine subsidence insurance if applicable. Educate senior centers on insuring in case of mine subsidence.	Proposed	Local, ISGS, IDNR	Low	Egyptian and Senior Centers	Becky Salazar (Executive Director)
GF5	Diffuse the underlying ground rupture, modifying slopes and rerouting water drainage. Install structures such as retaining walls and diverting debris in pathways.	Proposed	BRIC, USDA, IEPA, Infrastructure Bill	Low	Williamson County EMA	Noelle Eldridge (Spillertown Village Clerk)
GF6	Maintain a list of buildings constructed over underground mines. Promote awareness and educate students, staff, and community through education materials and planning guides.	Proposed	Local	Low	Herrin CUSD, Carterville CUSD / Fire Department	Keith Liddell (Superintendent of Carterville CUSD #5), Nathaniel Wilson (Herrin CUSD)
GF7	Maintain a list of buildings constructed over underground mines. Promote awareness and educate students, staff, and community through education materials and planning guides.	Ongoing	Local	Medium	Johnston city School Staff/ Williamson County EMA	Kathy Clark (Superintendent of Johnston City School CUSD #1)
GF8	Make a list of buildings that are constructed over wells and springs. Develop an emergency action plan for sink holes	Ongoing	Local	Low	Williamson County EMA/ City of Creal Springs	Shannon Edwards (Chief of Police Creal Springs)
GF9	Get maps of underground and surface mines. Assist city in checking for damages to structures, sewers, and roads in the event of subsidence. Block dangerous areas. Report to mine company if relevant. For damage to 148, report to IDOT.	Ongoing	Local, state, federal	Medium	Energy Fire Dept	Michael Nelson (Energy Asst Fire Chief)
GF10	Check for excessive meter usage and leaks; shut of valves & pumps and make repairs as needed.	Proposed	Local,	Medium	Police, Coal Valley	Bruce Emery (Coal Valley Water Dist)
GF11	Institute plan to rebuild or revamp damage to structures and property. CCHS would apply for funding to rebuild or demolish structures. The buildings and properties would be monitored and evaluated.	Proposed	Local	Medium	CCHS//Jackson County EMA	Stephanie Dillow (CCHS School Resource Officer)

Winter Storms						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
W1	• Purchase/maintain stockpiles of salt and other de-icing chemicals • Build snow fencing in areas vulnerable to dangerous snow drifts • Collaborate with neighboring counties to keep an updated list of available plow/salt trucks and parts	Ongoing	Local; State	High	Williamson County EMA; City of Marion EMA	Doug Phillips; City of Marion Superintendent
W2	Stockpile resources (salt/de-icing) and equipment. Ensure adequate availability of salt/de-icing items and equipment for ensuring student, staff, and community safety. Maintain list of available equipment (trucks, plows) and companies available with rates. Maintain list of equipment and companies available for disaster abatement.	Proposed	Local	High	Williamson County EMA; City of Marion EMA	Jeff Bink and Chad Milburn (regional office of education #21)
W3	• Purchase/maintain stockpiles of salt and other de-icing chemicals • Build snow fencing in areas vulnerable to dangerous snow drifts • Collaborate with neighboring counties to keep an updated list of available plow/salt trucks and parts. Do outreach at schools and teach children how to prepare for Severe Winter Weather. Do outreach with the community. Sign up people with county alerting program.	Ongoing	Local	High	Williamson County EMA; City of Marion EMA	Williamson County Government; Kelly Norris, Pat Creek, Amanda Barnes, Ashley Gott, Mike Cerutti, Thom Beebe, Russ Tate, Travis Emery, Robert Owsley, Jim Marlo, Alex Simpson, Jeff Robinson
W4	Many sites close when weather is bad. Have someone contracted to salt parking lot before opening and have plenty of salt available to keep sidewalks clear. Ensure clients have emergency meals at home in case of site closure due to weather.	Ongoing	State;Federal	Medium	Egyptian and senior centers.	Becky Salazar (Executive Director)
W5	Making sure that roadways are salted before a winter storm; and ensuring that there are adequate equipment in order to keeps roads plowed. Ensuring that all emergency equipment is adequate and running.	Proposed	Local, IDOT	Medium	Williamson County EMA	Noelle Eldridge (Spillertown Village Clerk)
W6	Promote awareness and educate students, staff, and community through education materials and planning guides. Purchase/Maintain stockpiles of salt and other de-icing chemicals.	Ongoing	Local, State	Low	Herrin CUSD, Carterville CUSD / Fire Department	Keith Liddell (Superintendent of Carterville CUSD #5) Nathaniel Wilson (Herrin CUSD)
W7	Promote awareness and educate students, staff, and community through education materials and planning guides. Purchase/Maintain stockpiles of salt and other de-icing chemicals.	Ongoing	Local	Medium	Johnston city School Staff/ Williamson County EMA	Kathy Clark (Superintendent of Johnston City School CUSD #1)
W8	Have a stock pile of salt and cinders. Make sure the plow trucks are serviced and ready. Programs at the school to educate children on how to prepare for winter weather. Program at city hall for residents. Residents can sign up for an alert system for winter weather advisory.	Ongoing	Local; State	Medium	Williamson County EMA/ City of Creal Springs	Shannon Edwards (Chief of Police Creal Springs)
W9	Pretreat driveways/lots of station. Make sure trucks are ready before storms hit, make sure heat and backup generators are working, make sure list of warming centers is up to date. Assist other agencies as needed.	Ongoing	Local, state, federal	Medium	Energy Fire Dept	Michael Nelson (Energy Asst. Fire Chief)

Winter Storms						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
W10	Make sure pump stations have adequate heating, advise customers to maintain stream of water to avoid freezing pipes during severe winter cold	Proposed	Local	High	Pittsburg/Stonefort Water	Bruce Emery (Coal Valley Water District)
W11	Seek funding for extra de-icing materials & snow/wind protection for walkways	Proposed	Local, private	High	County EMA, City of Marion	Shara Robinson (Lighthouse Shelter)
W12	Provide training and safety materials to staff for water main repairs in severe cold conditions.	Ongoing	Local	Medium	RLCD	Keith Thomason (General Manager at Rend Lake Conservancy District)
W13	Provide alternate raw lake water pumping capabilities for the drinking water treatment plant in case the lake and plant inlet freeze to the point that water cannot be withdrawn from the lake at the existing inlet location.	Proposed	Local, USDA, IEPA, BRIC	High	RLCD	Keith Thomason (General Manager at Rend Lake Conservancy District)
W14	Set plan in place for such event. We would cancel school and close the building in efforts for safety. We would assess damages and apply for funding if need be.	Proposed	Local	Medium	Carbondale Community High School Staff//Jackson County EMA	Stephanie Dillow (CCHS School Resource Officer)

Pandemic/Disease Outbreak						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
P1	• Enhance reporting and contract tracing protocols Williamson County Multi-Hazard Mitigation Plan. List of Potential Mitigation Strategies • Develop/update plans for mass care situations • Develop plan and mutual aid agreement for use of portable morgue	Ongoing	State, Federal	High	Williamson County EMA; City of Marion EMA	Doug Phillips; City of Marion Superintendent
P2	Portable morgue. Develop plan for construction of portable morgue with coroner. Offer parking lot as area for triage. Contact tracing; Schools track tracing through digital and manual means for tracing contact with infected individuals. Possibly develop app or unified platform for greater effectiveness.	Ongoing	Local;State	High	Williamson County EMA; City of Marion EMA	Jeff Bink and Chad Milburn (regional office of education #21)

Pandemic/Disease Outbreak						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
P3	• Enhance reporting and contract tracing protocols Williamson County Multi-Hazard Mitigation Plan List of Potential Mitigation Strategies • Develop/update plans for mass care situations • Develop plan and mutual aid agreement for use of portable morgue. This will be a collaborative effort of the above agencies. Provide preparedness information for all age groups to the public on how to stay safe during a disease outbreak/pandemic. help residents develop disease outbreak/pandemic emergency action plans. Doing this at Community Days, Parades and Fairs	Ongoing	Local;State	High	Williamson County EMA; City of Marion EMA	Williamson County Government; Kelly Norris, Pat Creek, Amanda Barnes, Ashley Gott, Mike Cerutti, Thom Beebe, Russ Tate, Travis Emery, Robert Owsley, Jim Marlo, Alex Simpson, Jeff Robinson
P4	The senior centers have been asked to keep seniors with emergency meals at their home in case of closure due to pandemic or weather. Have a 1–2-week back-up meals for emergency given to seniors in case of meal site closure and inability to get food. Ensure temperatures are taken, masks are worn, and social distancing and potential meal pick-ups instead of on-site during disease outbreaks.	Ongoing	State;Federal	High	Egyptian and Senior Centers.	Becky Salazar (Executive Director)
P5	Urge people to stay home when they are sick; reenforce hand hygiene and face coverings. Travel restrictions will be set in place for those infected and to high-risk individuals.	Proposed	Local, IDPH	Low	Williamson County EMA	Noelle Eldridge (Spillertown Village Clerk)
P6	Enhance reporting and contact tracing protocols. Promote awareness and educate students, staff, and community through education materials and planning guides.	Ongoing	Local; State; Federal	Medium	Herrin CUSD, Carterville CUSD / Williamson County Health Department	Keith Liddell (Superintendent of Carterville CUSD #5) Nathaniel Wilson (Herrin CUSD)
P7	Enhance reporting and contract tracing protocols. Promote awareness and educate students, parents, and staff through education materials and planning guides.	Ongoing	Local; State	Medium	Jonhston city School Staff/ Williamson County Health Department	Kathy Clark (Superintendent of Johnston City School CUSD #1)
P8	Enhance reporting and contact tracing protocols, develop potential mitigation strategies. Provide information about disease outbreak to the public. Help the public develop a strategy plan for disease outbreaks.	Ongoing	Local; State; Federal	Medium	Williamson County EMA/ City of Creal Springs	Shannon Edwards (Chief of Police Creal Springs)

Pandemic/Disease Outbreak						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
P9	Enhance reporting and contract tracing protocols. Develop/update plan for mass care situations. Develop mutual aid agreement for use of portable morgue. Follow CDC, state & local health dept protocols. Agreements with ambulance service.	Ongoing	Local; State; Federal	Medium	Energy Fire Dept	Michael Nelson (Energy Asst. Fire Chief)
P10	Maintain water availability to customers while making sure workers maintain safe distances	Ongoing	local	Medium	Coal Valley Water Dist testing lab	Bruce Emery (Coal Valley Water District)
P11	Seek funding to relocate COVID positive residents in hotels or other locations to maintain health of facility. Other procedures already in place	Ongoing	Local, state, federal, private	Medium	Lighthouse Shelter, Bi-County Health Dept, Heartland Hospital	Shara Robinson (Lighthouse Shelter)
P12	Implement procedures and purchase a large supply of masks for personnel protection and continued operations of the Rend Lake Intercity Drinking Water Treatment Plant and Transmission System.	Ongoing	local	High	RLCD	Keith Thomason (General Manager at Rend Lake Conservancy District)
P13	Develop alternative work stations, equipment/computer technology for alternative work stations, and alternative living arrangements for water treatment plant operators that must still work when exposed to a virus to keep drinking water flowing.	Proposed	Local, IDPH	Medium	RLCD	Keith Thomason (General Manager at Rend Lake Conservancy District)
P14	Update plans for mass vaccination and contact tracing.	Ongoing	Local, state	Low	LHDs/Hospitals/1st responders/ Congregate care facilities/ local Gov	Bi County Health Dept
P15	Update plan for contagious mass casualty outbreak.	Proposed	Local, IDPH, CDC,	Low	1st responders/hospitals/lhds/IEMA/FEMA/ Gov. Health Dept	Bi County Health Dept
P16	Institute awareness and procedures to help prevent and protect against the outbreak. CCHS would work with programs to educate and prevent spread of the epidemic. Procedures and guidelines will be set and followed by guidance of the local health department and federal laws.	Proposed	Local; IDPH, CDC	Medium	Carbondale Community High School Staff//Jackson County EMA	Stephanie Dillow (CCHS School Resource Officer)

Terrorism						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
TR1	Follow protocol from local and state services. Making public aware of any situation endangering community	Ongoing	Local; State	Medium	Williamson County EMA; City of Marion EMA	Doug Phillips; City of Marion Superintendent
TR2	Develop, maintain, and test drills for active shooters and other terrorism risks. Lockdown drills, ensure school staff member(s) have adequate training to deal with fallout from terrorist event. Student Resource Officer training.	Proposed	Local; IEMA	High	Williamson County EMA; City of Marion EMA	Doug Phillips; City of Marion Superintendent
TR3	Enhance security and safety around vulnerable facilities, such as schools, hospitals, government facilities, critical infrastructure, etc. Install surveillance equipment around facilities. Develop Emergency Action Plans and enhance existing plans.	Ongoing	State;Federal	Medium	Williamson County EMA; City of Marion EMA	Williamson County Government; Kelly Norris, Pat Creek, Amanda Barnes, Ashley Gott, Mike Cerutti, Thom Beebe, Russ Tate, Travis Emery, Robert Owsley, Jim Marlo, Alex Simpson, Jeff Robinson
TR4	Encourage seniors remain at home. Provide safety information to seniors on what to do in a terrorist attack.	Ongoing	State;Federal	Low	Egyptian Area Agency on Aging & senior centers	Becky Salazar (Executive Director)
TR5	In the event of a terrorist attack, the Police department and Fire department will be expected to take action to keep citizens safe. Having extra coverage when we feel like there could be a higher threat.	Proposed	Local, IEMA	Low	Williamson County EMA	Noelle Eldridge (Spillertown Village Clerk)
TR6	Promote awareness and educate students, staff, and community through education materials and planning guides. Ensure facilities are equipped with emergency survival and first aid supplies, etc.	Proposed	Local	Low	Herrin CUSD/Carterville CUSD / Fire Department	Keith Liddell (Superintendent of Carterville CUSD #5) Nathaniel Wilson (Herrin CUSD)
TR7	Promote awareness and educate students, staff, and community through education materials and planning guides. Ensure facilities are equipped with emergency survival and first aid supplies, etc.	Proposed	Local	Low	Johnston city School Staff/ Williamson County EMA	Kathy Clark (Superintendent of Johnston City School CUSD #1)
TR8	Have security around high-risk facilities. Install surveillance equipment around facilities. Programs at schools to teach children and public how to prepare for terrorist attacks. Sign up residents for county alert system.	Ongoing	State	Low	Williamson County EMA/ City of Creal Springs	Shannon Edwards (Chief of Police Creal Springs)
TR9	Shut down pumps & valves, perform excessive testing to ensure water quality is safe.	Proposed	Local, IEPA, IEMA	Low	Water Districts, National Guard	Bruce Emery (Coal Valley Water District)

Terrorism						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
TR10	Implement the items identified in the Rend Lake Risk and Resiliency Plan. Eliminate single points of failure in the water treatment and transmission system so that a single terrorist event will have less impact on the public. RLCD is working to identify areas that need duplicate components to avoid the single points of failure.	Proposed	Local, IEMA, IEPA	High	RLCD	Keith Thomason (General Manager at Rend Lake Conservancy District)
TR11	Institute training, and procedures to protect the school and persons. Would utilize hands on training and instructions to equip persons within the building how to response and react to such an occurrence.	Proposed	Local	Medium	Carbondale Community High School Staff//Jackson County EMA	Stephanie Dillow (CCHS School Resource Officer)

Cyberattack						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
C1	• Encourage businesses and government offices to review and utilize the steps in the Cybersecurity & Infrastructure Security Agency (CISA) Cyber Essentials Starter Kit- this is free educational material provided by the Federal Government • Make local businesses and government offices aware of the Illinois Attorney General's office data breach reporting system • Provide resources for the public on cyber security for home computers and smartphones; make residents aware of the IL identity theft hotline	Proposed	Local; Infrastructure Bill	Low	Williamson County EMA; City of Marion EMA	Doug Phillips; City of Marion Superintendent
C2	Train all staff and students in proper use of technology and safe internet usage. Awareness training. Distribute free federal and state resources for further awareness. Obtain and distribute free resources for additional training and awareness of potential risks.	Proposed	Local; Infrastructure Bill	High	Williamson County EMA; City of Marion EMA	Jeff Bink and Chad Milburn (regional office of education #21)

Cyberattack						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
C3	• Encourage businesses and government offices to review and utilize the steps in the Cybersecurity & Infrastructure Security Agency (CISA) Cyber Essentials Starter Kit- this is free educational material provided by the Federal Government • Make local businesses and government offices aware of the Illinois Attorney General's office data breach reporting system • Provide resources for the public on cyber security for home computers and smartphones; make residents aware of the IL identity theft hotline. Help facilities within the county to get Cybersecurity training for their facility. Do community outreach and educate students how to prevent Cyber Attacks.	Ongoing	Local; State	High	Williamson County EMA; City of Marion EMA	Williamson County Government; Kelly Norris, Pat Creek, Amanda Barnes, Ashley Gott, Mike Cerutti, Thom Beebe, Russ Tate, Travis Emery, Robert Owsley, Jim Marlo, Alex Simpson, Jeff Robinson
C4	Have senior centers review CISA's starter kit. Have Attorney General's office speak at local senior centers on local and recent cyber threats. Centers were doing this regularly pre-pandemic	Ongoing	State;Federal	Medium	Egyptian Area Agency on Aging & senior centers	Becky Salazar (Executive Director)
C5	During a cyberattack case, make sure that the systems are always updated with the newer software. Make sure we do every update and have every password protected.	Proposed	Local	Low	Williamson County EMA	Noelle Eldridge (Spillertown Village Clerk)
C6	Promote awareness and educate students and staff through education materials and planning guides. Coordinate with Williamson County EMA to provide resources for the public on cybersecurity for computers and smartphones; promote awareness of the IL identity theft hotline.	Proposed	Local	Low	Herrin CUSD, Carterville CUSD / Fire Department	Keith Liddell (Superintendent of Carterville CUSD #5) Nathaniel Wilson (Herrin CUSD)
C7	Promote awareness and educate students, staff, and community through education materials and planning guides. Provide resources for the public on cyber security for home computers and smartphones; make residents aware of the IL identity theft hotline.	Proposed	Local	Low	Johnston city School Staff/ Williamson County EMA	Kathy Clark (Superintendent of Johnston City School CUSD #1)
C8	Make local businesses aware of local attorney general office data branch reporting system. Provide resources for the public cyber security for home computers and smart phones. Make residents aware of the IL ID theft hotline. Help businesses within the community to set up cyber security training for their businesses. Program at school to educate students on how to prevent cyberattacks.	Ongoing	Local	Low	Williamson County EMA/ City of Creal Springs	Shannon Edwards (Chief of Police Creal Springs)
C9	City of Marion provides IT expertise, seek extra funding to upgrade cybersecurity.	Proposed	Local, private	Low	Lighthouse Shelter, City of Marion, County EMA	Shara Robinson (Lighthouse Shelter)

Cyberattack						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
C10	Perform a study to identify cyberattack weakness at the drinking water treatment plant and pumping stations. Although RLCD keeps most of the systems off-line to minimize the potential and impact of a cyberattack, additional protection is needed for the Rend Lake water supply.	Proposed	Local, Infrastructure Bill	High	RLCD	Keith Thomason (General Manager at Rend Lake Conservancy District)
C11	Install low tech manual operation components for the drinking water treatment plant and pump stations to allow continued operation if the entire computerized system is disabled. All critical operational components need to be operable without automated computer control.	Proposed	Local, Infrastructure Bill	High	RLCD	Keith Thomason (General Manager at Rend Lake Conservancy District)
C12	Plan and procedures set in place. Set up procedures on how to respond and repair issues.	Proposed	Local	Low	Carbondale Community High School Staff//Jackson County EMA	Stephanie Dillow (CCHS School Resource Officer)

Power outage/ utility disruption						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
PO1	Stay in contact with local utility company on areas of utility outage. Communicate with local utility company for power updates.	Ongoing	Local; State	Medium	Williamson County EMA; City of Marion EMA; Ameren	Doug Phillips; City of Marion Superintendent
PO2	Install generators for school buildings. Ensure proper working condition of installed generators for continuity of business. Install generators. Perform monthly tests on existing emergency lighting. Emergency lights testing.	Proposed	Local; BRIC, USDA, CDBG, Infrastructure Bill	High	Williamson County EMA; City of Marion EMA; Ameren	Jeff Bink and Chad Milburn (regional office of education #21)
PO3	Install backup power supplies at all critical facilities and critical infrastructure. Do Community and school outreach and teach students and citizens how to prepare for power outages/utility disruptions. Sign up people for county alert program.	Ongoing	State;Federal	Medium	Williamson County EMA; City of Marion EMA; Ameren	Williamson County Government; Kelly Norris, Pat Creek, Amanda Barnes, Ashley Gott, Mike Cerutti, Thom Beebe, Russ Tate, Travis Emery, Robert Owsley, Jim Marlo, Alex Simpson, Jeff Robinson
PO4	Provide seniors a list of items to have nearby in case of power outage, like blanket, flashlight, etc. Have senior center staff check with seniors after power outage to ensure they throw out refrigerated items that may have gone bad.	Proposed	Local, IDPH	Medium	Egyptian Area Agency on Aging & senior centers	Becky Salazar (Executive Director)
PO5	In the case of a power outage, stay in contact with the utility department at all times, and have generators, gathering places, and heaters or fans for warm air circulation.	Proposed	Local; BRIC, USDA, CDBG, Infrastructure Bill	Medium	Williamson County EMA	Noelle Eldridge (Spillertown Village Clerk)
PO6	Promote awareness and educate students and staff through education materials and planning guides. Install backup power supplies and improve aging infrastructure.	Ongoing	Local	Medium	Herrin CUSD, Carterville CUSD / Fire Department	Keith Liddell (Superintendent of Carterville CUSD #5) Nathaniel Wilson (Herrin CUSD)
PO7	Promote awareness and educate students, staff, and community through education materials and planning guides. Improve aging infrastructure.	Ongoing	Local	Low	Johnston city School Staff/ Williamson County EMA	Kathy Clark (Superintendent of Johnston City School CUSD #1)
PO8	Install generators at facilities. Host a program at the school to teach students and civilians how to prepare for power outages. Sign up residents for county alert system.	Ongoing	State; Federal	Medium	Williamson County EMA/ City of Creal Springs	Shannon Edwards (Chief of Police Creal Springs)
PO9	Assist other agencies or care facilities as needed. Keep station manned. Make sure generators are in working condition. Check for damages and degree of outage	Ongoing	Local, state, federal	Medium	Energy Fire Dept	Michael Nelson (Energy Asst. Fire Chief)
PO10	Use backup generators, use alternate water source if possible	Proposed	Local; BRIC, USDA, CDBG, Infrastructure Bill	Medium	Water Districts	Bruce Emery (Coal Valley Water District)

Power outage/ utility disruption						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
PO11	Facility has backup generator, seek financial assistance for maintenance and repairs	Ongoing	Local, state, private	Medium	Lighthouse Shelter	Shara Robinson (Lighthouse Shelter)
PO12	Refurbish or replace the 50-year-old emergency engines that are located at pump stations	Proposed	Local, BRIC, USDA, IEPA, Infrastructure Bill	High	RLCD	Keith Thomason (General Manager at Rend Lake Conservancy District)
PO13	Install emergency diesel generator hookups/or installed generators at each pump station and lift station so that the stations can be operated if no engine exists at that location or if the emergency engines fail for any reason. No emergency engines or generators currently exist at any RLCD wastewater treatment lift station or treatment site. Water transmission sites that have engines also need switchgear hook-up panels in case the engines fail during operation or are down for repairs when an outage occurs.	Proposed	Local, BRIC, USDA, IEPA, Infrastructure Bill	High	RLCD	Keith Thomason (General Manager at Rend Lake Conservancy District)
PO14	Perform procedures and instructions on how to respond. Work with local agencies, and building coordinators to respond quickly.	Proposed	Local	Low	Carbondale Community High School Staff//Jackson County EMA	Stephanie Dillow (CCHS School Resource Officer)

Wildfires						
Code	**Mitigation Strategy**	**Status**	**Funding Source**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
WF1	Ensure adequate distance is maintained to minimize losses in the event of catastrophic fire. When distance is not available, construct fireproof firebreaks. Build firebreaks between buildings. Invest in, maintain, and test functionality of firefighting planes. Invest in firefighting planes	Proposed	Local, USDA CWDG	Low	Williamson County EMA	Jeff Bink and Chad Milburn (regional office of education #21)
WF2	Practice fire safety at every office with fire drills and information on how to respond at home. Keep alert to any wildfires in the area to alert vulnerable seniors.	Proposed	Local, EMPG	Medium	Egyptian Area Agency on Aging & senior centers	Becky Salazar (Executive Director)
WF3	Making sure that fire trucks are equipped with a appropriate amount of water; and ensure that all service vehicles are ready to go	Proposed	Local, IEMA	Low	Williamson County EMA	Noelle Eldridge (Spillertown Village Clerk)
WF4	Promote awareness and educate students, staff, and community through education materials and planning guides. Establish wildfire prevention management strategies.	Proposed	Local	Medium	Herrin CUSD, Carterville CUSD / Fire Department	Keith Liddell (Superintendent of Carterville CUSD #5) Nathaniel Wilson (Herrin CUSD)
WF5	Promote awareness and educate students and staff through education materials and planning guides.	Proposed	Local	Low	Johnston city School Staff/ Williamson County EMA	Kathy Clark (Superintendent of Johnston City School CUSD #1)
WF6	Work with local fire agencies. Assess damages and apply for funding to rebuild and restore.	Proposed	Local	Low	Carbondale Community High School Staff//Jackson County EMA	Stephanie Dillow (CCHS School Resource Officer)
WF7	Write a Community Wildfire Protection Plan for Williamson County	Proposed	Local, USDA CWDG	High	WCFPD, County EMA, All other Fire Depts, Greater Egypt	Eric Miller, Battalion Chief, WCFPD

Near Earth Object Impact (Meteorite/asteroid)						
Code	**Mitigation Strategy**	**Status**	**Funding Source**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
NEO1	Develop action plan for minimizing loss of life in the event of a meteor attack. Emergency Action Plan. Repurpose mining tunnels for evacuation. Work with local mining agencies to secure escape routes into underground systems in the event of a meteor attack.	Proposed	Local; IEMA	Low	Williamson County EMA	Jeff Bink and Chad Milburn (regional office of education #21)
NEO2	Educate staff and seniors on what to do in a meteor incident. Review other agencies' plans on meteor response.	Proposed	Local	Low	Egyptian Area Agency on Aging & senior centers	Becky Salazar (Executive Director)
NEO3	In the event that there is a meteor strike, people in lead must pay attention to alerts through the weather channel or radio station. Keeping residents up to date on the tactics used during these events.	Proposed	IEMA	Low	Williamson County EMA	Noelle Eldridge (Spillertown Village Clerk)
NEO4	Promote awareness and educate students, staff, and community through education materials and planning guides. Prepare facilities with emergency survival and first aid supplies, etc.	Proposed	Local	Low	Herrin & Carterville CUSD / Fire Department	Keith Liddell (Superintendent of Carterville CUSD #5) Nathaniel Wilson (Herrin CUSD)
NEO5	Assess damage and utilize recovery plan. Work with other agencies to assess damage and make recovery efforts	Proposed	Local	Low	Carbondale Community High School// Jackson County EMA	Stephanie Dillow (CCHS School Resource Officer)

Other Potential Hazards						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Responsible Organization/ Agency**	**Strategy Proposed by**
OH1	Toxic Chemicals: communicate with local and state hazmat teams to mitigate strategy for cleanup.	Ongoing	Local;State	Low	Williamson County EMA//Local HazMat team	Doug Phillips; City of Marion Superintendent
OH2	To prevent landslides, install strong root systems in the surrounding area. Plant deep-rooting trees and other grasses. Install netting along major highways to prevent debris from entering the roadway and damaging vehicles. Rock-catching netting along major highways.	Proposed	Local; IDOT, IDNR, ISGS	Low	Williamson County EMA	Jeff Bink and Chad Milburn (regional office of education #21)
OH3	Install fencing and rhizome barriers to prevent invasive species from entering/leaving property. Install barriers to prevent invasive species from entering or leaving the area. Pest prevention solution: Ensure frequent application of insecticides and monitoring of possible infestations.	Ongoing	Local	High	Williamson County EMA	Jeff Bink and Chad Milburn (regional office of education #21)
OH4	Determine areas at risk to a landslide. Educate centers and seniors where this is a risk factor.	Proposed	State; Federal	Low	Egyptian Area Agency on Aging & senior centers	Becky Salazar (Executive Director)
OH5	Educate seniors on signs of infestation of bed bugs, roaches, etc. Senior centers will close until infestation is taken care of.	Proposed	State; Federal	Medium	Egyptian Area Agency on Aging & senior centers	Becky Salazar (Executive Director)
OH6	Diligent awareness for infestations, and scheduling a spray inf needed. Contact Bi-County Health Department for hard to control pests	Proposed	Local, IDPH	Low	Williamson County EMA	Noelle Eldridge (Spillertown Village Clerk)
OH7	In the event of a land slide, sandbags, wood, or some kind of barrier to slow, or stop the landslide. Machinery must be accessible and running	Proposed	IDOT, DNR, ISGS	Low	Williamson County EMA	Noelle Eldridge (Spillertown Village Clerk)
OH8	Landslides- Promote awareness and educate students, staff, and community through education materials and planning guides. Prepare facilities with emergency survival and first aid supplies, etc.	Proposed	Local	Low	Herrin &Carterville CUSD / Fire Department	Keith Liddell (Superintendent of Carterville CUSD #5) Nathaniel Wilson (Herrin CUSD)
OH9	Invasive Species- Promote awareness and educate students, staff, and community through education materials and planning guides. Enhance emergency communication system infrastructure, warning system enhancements.	Proposed	Local	Low	Herrin &Carterville CUSD / Fire Department	Keith Liddell (Superintendent of Carterville CUSD #5) Nathaniel Wilson (Herrin CUSD)

6.4. 2015 Mitigation Strategies

The following tables contain mitigation strategies from the previous version of the Williamson County MHMP; these strategies were reviewed and reapproved by the Planning Team.

All Hazards						
Code	Mitigation Strategy	Status	Funding Source	Priority	Jurisdictions Involved	Responsible Organization/ Agency
AH1	**Promote Disaster Resilience Through Workshops, Education Materials, and Planning Guides:** Various agencies have implemented forms of this strategy. Local resources have been used to target and inform the resident population. Pandemic education and outreach was conducted the year prior to the 2009 H1N1 pandemic and continued heavily throughout the response by Franklin-Williamson Bi-County Health Dept. (FWBCHD). Education and outreach continues by FWBCHD and various community partners. Local, state and federal sources have been used in past and current pandemic and other disaster education. Additional funding will be sought from local, state and federal sources.	Ongoing	L, S, F	H	All	Williamson County EMA, Franklin-Williamson Bi-County Health Dept., SIH, Schools
AH2	**Develop Social Media Techniques to Provide Critical Weather Updates and Disseminate Critical Information:** The Williamson County EMA and municipalities use their public access channels, websites, Twitter and Facebook pages to notify the public about hazard mitigation and critical weather updates. SIH and the Shawnee Preparedness and Response Coalition would like to develop communication tools and capacities, including social and digital media, to provide critical updates and information to community. All Williamson County School Districts continue to work with local weather stations to provide up-to-date information for students and families.	Ongoing	L	H	Williamson County, Cambria, Carterville, Creal Springs, Herrin, Marion, School Districts, SIH, Our Lady of Mt. Carmel School	Williamson County EMA, SIH
AH3	**Establish Liaison/Groups that Meets Regularly to Discuss Hazard Mitigation and Disaster Risk Reduction:** Several groups meet on a regular basis to discuss hazard mitigation including: Williamson County LEPC, Disaster Risk Reduction Group, Franklin-Williamson Public Health and Medical Committee, Shawnee Preparedness and Response Coalition, Healthy Southern Illinois Delta Network, Shawnee Alliance for Seniors.	Ongoing	L	H	All	Various Agencies

All Hazards						
Code	**Mitigation Strategy**	**Status**	**Funding Source/ Potential Grants**	**Priority**	**Jurisdictions Involved**	**Responsible Organization/ Agency**
AH4	**Enhance Emergency Communication System Infrastructure:** The Williamson County EMA will oversee the implementation of this project. As of 2015, the County utilizes Next Generation 911, First net and 211. The City of Marion utilized GIS to enhance its emergency communication. SIH and Shawnee Preparedness and Response Coalition would like to develop and implement a region-wide back-up emergency communication system. Funding for the future has not been secured, but additional funding will be sought from Department of Homeland Security, State, and local resources. Implementation is forecasted to be complete within approximately three years.	Ongoing / Proposed	L, BRIC, DHS	H	Williamson County, Marion, SIH, Our Lady of Mt Carmel School	Williamson County EMA, Marion EMA, SIH
AH5	**Improve Communication Between Utility Companies:** County and Local Agencies continue to maintain contact with utility companies before during and after hazardous events.	Ongoing	L	H	All	Various Agencies
AH6	**Distribute/Program NOAA Weather Radios:** The Franklin-Williamson Bi-County Health Department distributed weather radios to Faith Based Organizations (FBO). The Health Dept. has plans to continue FBO outreach within the next five years. Crainville, Creal Springs and Marion would like to distribute weather radios to village residents. Future funding has not been secured. Implementation, if funding is available, is forecasted to be initiated within approximately 3-5 years.	Ongoing / Proposed	L, EMPG	M	Williamson County, Crainville, Creal Springs, Marion	Franklin-Williamson Bi-County Health Dept., Creal Springs, Marion
AH7	**Improve EMA Training, Staff, Resources, And Equipment:** The County EMA and Marion EMA oversees the implementation of this project. Funding has not been secured for future training, but additional funding will be sought from Department of Homeland Security, State and Local resources.	Ongoing	L, S, F	H	Williamson County, Marion	Williamson County EMA
AH8	**Maintain Centralized Geographical Database Including Natural Hazard/Risk Assessment:** The County EMA and City of Marion IT Specialists/GIS Dept. oversees this project. After each mitigation plan update, the geographical database is updated to include new information about hazard events and the number of structures within the 100-year floodplain.	Ongoing	L	H	Williamson County, Marion	Williamson County Supervisor of Assessments / GIS Dept., Marion IT Specialist / GIS Dept.

All Hazards						
Code	Mitigation Strategy	Status	Funding Source/ Potential Grants	Priority	Jurisdictions Involved	Responsible Organization/ Agency
AH9	**Develop/Maintain Comprehensive Plan to Incorporate Natural Hazards:** Williamson County and its incorporated jurisdiction participate in the 5 year renewal of the Multi-Hazard Mitigation Plan. The next update process will take place in 2020 and the county will seek federal funds to update the plan.	Ongoing / Proposed	L, HMGP	M	All	Williamson County EMA
AH10	**Develop a Vulnerable Population List:** Williamson County does not have a comprehensive vulnerable population list, which was deemed too labor-intensive to compile and to keep updated. Williamson County does have a vulnerable population registry that is housed with WC EMA and managed by a local civic organization. The Franklin-Williamson Bi-County Health Dept. (FWBCHD) has a list of resources identified within the community that may be helpful in addressing functional/access needs. FWBCHD shall explore the vulnerable population list project underway with the Disaster Risk Reduction Steering Committee in Jackson County with assistance from Southern Illinois University.	Ongoing	L	H	Williamson County, SIH, Villas of Holly Brook, Lighthouse Shelter, Family Crisis Center, Egyptian Area Agency on Aging	Franklin-Williamson Bi-County Health Dept., SIH
AH11	**Develop Mutual Aid Agreements:** The County works with local emergency agencies to maintain mutual aid agreements. Several fire agencies in Williamson County are members of the MABAS-IL. MABAS (Mutual Aid Box Alarm System) - a statewide, non-discriminatory mutual aid response system for fire, EMS and specialized incident operational teams. The MABAS system defines a resource response plan to any location within the state when the Governor orders a Declaration of Disaster. Several law enforcement agencies in Williamson County are members of ILEAS (Illinois Law Enforcement Alarm System) - a statewide law enforcement mutual aid system. The City of Carterville is a member of IPWMAN (Illinois Public Works Mutual Aid Network) – a statewide network of public works related agencies whose principal purpose is to provide mutual aid response and recovery assistance to each other when confronted with natural or man-made emergencies and disasters.	Ongoing	L	H	All	Williamson County EMA
AH12	**Create an Alternative Emergency Operations Center:** Funding has not been secured, but additional funding will be sought from Federal, State, and Local resources	Proposed	L, BRIC	H	Williamson County, Marion	Williamson County EMA, Marion EMA

All Hazards						
Code	Mitigation Strategy	Status	Funding Source/ Potential Grants	Priority	Jurisdictions Involved	Responsible Organization/ Agency
AH13	**Retrofit/Harden Critical Facilities and Utilities:** The County EMA and Marion EMA will oversee the implementation of this project. The Franklin-Williamson Bi-County Health Dept. (FWBCHD) will seek federal funding to harden the FWBCHD building. The Village of Herrin would like to harden the Public Works Facility. SIH would like to retrofit existing facilities to serve surge healthcare needs in the event of mass casualties. Funding has not been secured as of 2015. Implementation, if funding is available from PDM or HMGP, is forecasted to be initiated within approximately one year.	Proposed	L, BRIC, USDA, CDBG, Infrastructure Bill	H	All	Williamson County EMA, Franklin-Williamson Bi-County Health Dept., Marion EMA, SIH
AH14	**Identify and Procure Backup Potable Water Supplies**: Williamson County will partner with Greater Egypt Regional Planning and Development Commission to seek out potential funding sources to procure a back-up potable water supply.	Proposed	S, BRIC, USDA, IEPA, Infrastructure Bill	H	Williamson County, Cambria, Carbondale, Carterville, Crainville, Creal Springs, Energy, Freeman Spur, Herrin, Hurst, Johnston City, Marion, Pittsburg , Spillertown, Rend Lake Conservancy District	Williamson County EMA, Greater Egypt Regional Planning Commission, Rend Lake Conservancy District
AH15	**Construct Additional Community Safe Rooms:** The County EMA will oversee the implementation of this project. The Franklin-Williamson Bi-County Health Dept. (FWBCHD) will seek federal funding to install a tornado safe room in the FWBCHD building. The Village of Cambria would like to utilize the community center as an additional safe room/heating/cooling shelter. SIH would like to retrofit existing clinics, physician offices, and other SIH facilities to serve as storm safe rooms. Local resources will be used to evaluate the cost benefit of the shelters and define specific locations. Funding has not been secured as of 2015. Implementation, if HMA funding is available, is forecasted to be initiated within approximately 3-5 years.	Proposed	L, BRIC, USDA, CDBG, Infrastructure Bill	H	All	Williamson County EMA, Franklin-Williamson Bi-County Health Dept., Marion EMA, SIH
AH16	**Create Additional Heating / Cooling Shelters:** Additional shelters are opened on an as need basis at various locations within the county. The Villages of Cambria, Creal Springs, and Herrin would like to utilize the community centers as an additional safe room/heating/cooling shelter.	Ongoing	L, S	M	Williamson County, Cambria, Creal Springs, Herrin, Marion	Williamson County EMA, Marion EMA, Cambria Fire Dept./Water Dept.
AH17	**Equip Critical Facilities with Back-Up Generators:** The County EMA will oversee the implementation of projects for County facilities. The Village of Cambria would like to equip the community center with a back-up generator. Funding has not been secured as of 2015. Implementation, if HMA funding is available, is forecasted to be initiated within approximately 3-5 years.	Proposed	L, BRIC, USDA	H	All	Williamson County EMA, Marion EMA, Cambria Water Dept. Superintendent

All Hazards						
Code	Mitigation Strategy	Status	Funding Source/ Potential Grants	Priority	Jurisdictions Involved	Responsible Organization/ Agency
AH18	**Acquire Portable Lighting for Mass Casualty Preparation:** The County EMA will oversee the implementation of this project. SIH and the Shawnee Preparedness and Response Coalition would like to purchase an adequate number of light towers to use for mass casualty care. Funding has not been secured as of 2015. Implementation, if funding is available, is forecasted to be initiated within approximately 3-5 years.	Proposed	S, IDPH	M	Williamson County, SIH	Williamson County EMA, SIH
AH19	**Acquire Hazard Event Training Trailer:** The County EMA will oversee the implementation of this project. Funding has not been secured as of 2015. Implementation, if funding is available, is forecasted to be initiated within approximately 5 years.	Proposed	L	L	Williamson County	Williamson County EMA
AH21	Retrofit/Harden Critical Facilities and Enhance constriction to withstand high winds and earthquake	Proposed	L, BRIC, USDA, CDBG, Infrastructure Bill	H	Our Lady of Mt. Carmel School	Our Lady of Mt. Carmel School…
AH23	Construct Community Safe Room	Proposed	L, BRIC, USDA, CDBG, Infrastructure Bill	H	Our Lady of Mt. Carmel School	Our Lady of Mt. Carmel School
AH25	Equip Facility with back-up generators	Proposed	L, BRIC, USDA, CDBG, Infrastructure Bill	H	Our Lady of Mt. Carmel School	Our Lady of Mt. Carmel School
AH27	Relocate existing utility lines underground	Proposed	L, BRIC, USDA, CDBG, Infrastructure Bill	H	Our Lady of Mt. Carmel School	Our Lady of Mt. Carmel School

Flooding, Dam Failure						
Code	Mitigation Strategy	Status	Funding Source/ Potential Grants	Priority	Jurisdictions Involved	Responsible Organization/ Agency
F1	**Maintain Participating Status in the NFIP by Enforcing a Flood Damage Prevention Ordinance:** The Williamson County EMA is responsible for the general administration of the Williamson County Flood Damage Prevention Ordinance. Each participating jurisdiction has a representative responsible for the administration of the individual Flood Damage Prevention Ordinances.	Ongoing	L	H	Williamson County, Carbondale, Carterville, Crainville, Freeman Spur, Herrin, Hurst, Johnston City, Marion	Williamson County EMA and City/Village Building Services
F2	**Improve Public Awareness on the NFIP, Buyout Programs, and Flood Mitigation:** The Williamson County EMA website, Twitter and Facebook pages are used to notify the public about flood mitigation. Williamson County will also continue to educate communities that do not participate in the NFIP on the benefits of joining.	Ongoing	L	L	Williamson County	Williamson County EMA
F3	**Institute a Buyout Plan for Repetitive Loss Properties or Flood Prone Properties:** The Williamson County EMA will oversee the implementation of buyout and relocation projects in the county. Future funding has not been secured, but additional funding will be sought from federal, state and local resources. Implementation is forecasted to begin within approximately 3-5 years.	Proposed	L, FMA	H	Williamson County, Carbondale, Carterville, Crainville, Freeman Spur, Herrin, Johnston City, Marion	Williamson County EMA
F4	**Flood Proof or Elevate Critical Facilities and Utilities:** The Williamson County EMA will oversee the implementation of this project in the county. Funding has not been secured, but additional funding will be sought from state and local resources. Implementation is forecasted to begin within approximately 3-5 years.	Proposed	L, FMA	H	Williamson County, Carbondale, Carterville, Freeman Spur, Herrin, Hurst, Marion	Williamson County EMA
F5	**Culvert Replacement**: The Williamson County Highway Dept. will oversee the implementation of projects on County roads and bridges. Village/Townships will be responsible for their respective projects. Funding has not been secured, but additional funding will be sought from state and local resources. Implementation is forecasted to begin within approximately 1-3 years.	Proposed	L, FMA, IDOT	H	Williamson County, Cambria, Carbondale, Carterville, Crainville, Creal Springs, Energy, Freeman Spur, Herrin, Hurst, Johnston City, Marion, Pittsburg , Spillertown	Williamson County Highway Dept. or City/Village/Townships Street Depts.
F6	**Elevate Low-Lying Roads:** The Williamson County Highway Dept. will oversee the implementation of projects on County roads. Village/Townships will be responsible for their respective projects. Funding has not been secured, but additional funding will be sought from state and local resources. Implementation is forecasted to begin within approximately 1-3 years.	Proposed	L,FMA, IDOT	H	Williamson County, Cambria, Carbondale, Carterville, Crainville, Creal Springs, Energy, Freeman Spur, Herrin, Hurst, Johnston City, Marion, Pittsburg , Spillertown	Williamson County Highway Dept. or City/Village/Townships Street Depts.

Flooding, Dam Failure						
Code	Mitigation Strategy	Status	Funding Source/ Potential Grants	Priority	Jurisdictions Involved	Responsible Organization/ Agency
F7	**Retrofit Water Supply Systems**: Williamson County EMA and Rend Lake Conservancy District would oversee this project. Implementation, If HMA funding is available, is forecasted to be initiated within approximately one- three years.	Proposed	L, BRIC, USDA, IEPA	H	Williamson County, Cambria, Carbondale, Carterville, Crainville, Creal Springs, Energy, Freeman Spur, Herrin, Hurst, Johnston City, Marion, Pittsburg , Spillertown, Rend Lake Conservancy District	Williamson County EMA, Rend Lake Conservancy District
F8	**Maintain a List of Floodprone Structures:** The County EMA and Marion IT Specialists / GIS Dept. oversee this project. After each mitigation plan update, the geographical database is updated to include new information about flood hazards and number of structures in the floodplain.	Ongoing	L	H	Williamson County, Marion	Williamson County EMA and Supervisor of Assessments / GIS Dept., Marion IT Specialists / GIS Dept.
F9	**Conduct a Watershed Analysis of Runoff and Drainage Systems to Predict Insufficient Capacity in Storm Drains/Natural Creek Systems:** The Greater Egypt Regional Planning and Development Commission is current conducting a watershed study for Hurricane Creek in Williamson County.	Ongoing	L, S	M	Williamson County	Greater Egypt Regional Planning Commission
F10	**Develop Dam / Levee Failure Emergency Action Plans:** The County EMA and Marion EMA will oversee the implementation of this project. Currently eight out of thirty-one dams in Williamson County have emergency action plans.	Proposed	L	L	Williamson County, Marion	Williamson County EMA, Marion EMA

Tornados, Severe T-Storms						
Code	Mitigation Strategy	Status	Funding Source/ Potential Grants	Priority	Jurisdictions Involved	Responsible Organization/ Agency
ST1	**Construct Additional Community Safe Rooms:** The County EMA will oversee the implementation of this project. Local resources will be used to evaluate the cost benefit of the shelters and define specific locations. Funding has not been secured as of 2015. Implementation, if HMA funding is available, is forecasted to be initiated within approximately 3-5 years. The Franklin-Williamson Bi-County Health Dept. aims to add a safe room to their facility within the next 3-5 years with the help of federal funding, if available.	Proposed	L, BRIC, CDBG, USDA, Infrastructure Bill	H	All	Williamson County EMA, Franklin-Williamson Bi-County Health Dept.
ST2	**Install Lightening Detection System:** As of 2015, the county installed two lightening detection systems at the Herrin and Marion School sport complex. The County EMA will oversee the implementation of future project for county facilities and schools. Funding has not been secured as of 2015. Implementation, if funding is available, is forecasted to be initiated within approximately 3 years.	Proposed	L, BRIC, CDBG, USDA, Infrastructure Bill	M	Williamson County, All School Districts	Williamson County EMA
ST3	**Provide Jurisdiction-wide Siren Warning Coverage**: The Village of Cambria has jurisdiction-wide coverage with manual activation. The City of Carterville has three sirens that are strategically placed to cover Carterville, Crainville, and Colp. The Villages of Crainville, Creal Springs, Pittsburg, Johnston City, and John A. Logan College would like to seek funding to provide jurisdiction-wide siren coverage.	Ongoing / Proposed	L, BRIC, CDBG, USDA, Infrastructure Bill	H	Williamson County, Cambria, Carterville, Crainville, Creal Springs, Johnston City, Marion, Pittsburg, John A. Logan College	Williamson County EMA, Marion EMA
ST4	**Retrofit Structures to Withstand High Winds:** The County EMA will oversee the implementation of this project for county-owned facilities. SIH would like to install wind resistant (storm rated) glass and / or shutters in hospitals, clinics, and physician offices owned by SIH. Funding has not been secured as of 2015. Implementation, if HMA funding is available, is forecasted to be initiated within approximately 3-5 years.	Proposed	L, BRIC, CDBG, USDA, Infrastructure Bill	M	All	Williamson County EMA, SIH

Earthquakes						
Code	Mitigation Strategy	Status	Funding Source/ Potential Grants	Priority	Jurisdictions Involved	Responsible Organization/ Agency
EQ1	**Map And Assess Community Vulnerability to Seismic Hazards:** The County EMA and Marion IT Specialists / GIS Dept. oversee this project with assistance from SIU. After each mitigation plan update, the geographical database is updated to include new information about earthquake hazard events.	Ongoing	L, F	L	Williamson County	Williamson County EMA, Marion IT Specialists / GIS Dept.
EQ2	**Install Automatic Shutoff Valves:** Williamson County will seek federal funding, if HMA funding is available, to install automatic shutoff values in the Williamson County facilities. The Franklin-Williamson Bi-County Health Dept. (FWBCHD) will seek federal funding to install automatic shutoff valves in the FWBCHD buildings. SIH would like to continue to retrofit all SIH hospitals and clinic with stabilization and back up equipment in the event of an earthquake.	Proposed	L, BRIC, USDA, CDBG, Infrastructure Bill	L	Williamson County, Crainville, Creal Springs, Marion, Pittsburg, SIH	Williamson County EMA, Franklin-Williamson Bi-County Health Dept., Marion EMA, SIH
EQ3	**Develop/Update Earthquake Emergency Action Plan:** The Williamson County EMA will oversee the implementation of this project. Funding has not been secured as of 2015. Giant City CCSD #130 has an earthquake emergency action plan in place. In addition, Giant City CCSD #130 has a long term care plan for students in the event of a large scale earthquake. Additional planning could be done to produce a more robust plan.	Proposed	L	L	Williamson County, Marion, Giant City CCSD #1130	Williamson County EMA, Marion EMA, Giant City CCSD #130
EQ4	**Adopt the 2009 International Building Code for the Design of Building Retrofits for Seismically Vulnerable Buildings:** The County and City of Marion currently enforces the IBC but would like to investigate adopting stricter standards in the event of an earthquake.	Proposed	L	L	Williamson County, Marion	Williamson County EMA, Marion EMA, Board of Commissioners
EQ5	**Retrofit Water Supply Systems:** Williamson County EMA would oversee this project. Implementation, If HMA funding is available, is forecasted to be initiated within approximately one- three years.	Proposed	L, BRIC, USDA, IEPA, Infrastructure Bill	H	Williamson County, Cambria, Carbondale, Carterville, Crainville, Creal Springs, Energy, Freeman Spur, Herrin, Hurst, Johnson City, Marion, Pittsburg, Spillertown, Rend Lake Conservancy District	Williamson County EMA
EQ6	**Retrofit/Harden Critical Facilities to Protect Against Damages from Earthquakes:** The County EMA will oversee the implementation of this project. Funding has not been secured as of 2015. SIH and The Franklin-Williamson Bi-County Health Dept. would like to continue to retrofit all hospitals and clinics with stabilization and back up equipment in the event of an earthquake.	Proposed	L, BRIC, USDA, CDBG, Infrastructure Bill	H	All	Williamson County EMA, Franklin-Williamson Bi-County Health Dept., SIH

HazMat Release						
Code	Mitigation Strategy	Status	Funding Source/ Potential Grants	Priority	Jurisdictions Involved	Responsible Organization/ Agency
HAZ1	**Develop/Update HAZMAT Emergency Response Plan:** The Williamson County LEPC reviews and updates the emergency action plan on an annual basis. SIH has an HAZMAT emergency response plan and updates it on an as need basis. Giant City CCSD #130 has an emergency evacuation plan in place (including shut down of all air/heat units).	Ongoing	L	H	Williamson County, SIH, Giant City CCSD #130	Williamson County LEPC, SIH, Giant City CCSD #130
HAZ2	**Conduct a Hazardous Materials Commodity Flow Study:** The Williamson County EMA will utilize neighboring county commodity flow studies (if available).	Proposed	L	M	Williamson County	Williamson County EMA
HAZ3	**Equip Critical Facilities with Centralized Positive-Pressure HVAC Systems:** The County EMA and Marion EMA will oversee the implementation of this project. Funding has not been secured as of 2015. Implementation, if funding is available, is forecasted to be initiated within approximately 5 years.	Proposed	BRIC, Infrastructure Bill	L	Williamson County, Marion, All School Districts	Williamson County EMA, Marion EMA
HAZ4	**Acquire HAZMAT Protective Gear:** The Carterville Police Dept. has 5 Hazardous Materials Technicians trained for HAZMAT incidents and is a member of ILEAS which supplies HAZMAT equipment and gear. John A. Logan College has a significant amount of hazardous materials on campus and will seek funding to purchase appropriate gear for its first responders in the event of hazardous materials release. As SIH updates their hazmat response plan they will seek to purchase additional response equipment as necessary.	Ongoing / Proposed	L, EMPG, DOT safety grants	H	Carterville, Herrin, John A. Logan College, SIH	Carterville Police and Fire Depts., John A. Logan College, SIH

Drought, Extreme Heat						
Code	Mitigation Strategy	Status	Funding Source/ Potential Grants	Priority	Jurisdictions Involved	Responsible Organization/ Agency
H1	**Develop/Enforce Water Use Restrictions During Periods of Drought or Burn Ordinances:** The County and several jurisdictions currently have burn ordinances in place or enforce water restrictions during periods of drought to conserve water supplies.	Ongoing	L	M	Williamson County, Carbondale, Carterville, Crainville, Creal Springs Energy, Freeman Spur, Herrin, Johnston City, Marion, Pittsburg	County/ Village/City Board of Commissioners
H2	**Retrofit Water Supply Systems:** The County EMA will oversee the implementation of this project. Funding has not been secured as of 2015. Implementation, if funding is available, is forecasted to be initiated within approximately 5 years.	Proposed	L, BRIC, USDA, IEPA, Infrastructure Bill	H	Williamson County, Cambria, Carbondale, Carterville, Crainville, Creal Springs, Energy, Freeman Spur, Herrin, Hurst, Johnston City, Spillertown, Rend Lake Conservancy District	Williamson County EMA, Marion EMA
H3	**Educate Farmers on Soil and Water Conservation Practices:** The Williamson County Farm Bureau continues to educate farmers on soil and water conservations practices.	Proposed	Farm Bureau	M	Williamson County	Williamson County Farm Bureau

Ground Failure						
Code	Mitigation Strategy	Status	Funding Source/ Potential Grants	Priority	Jurisdictions Involved	Responsible Organization/ Agency
GF1	**Map and Assess Community Vulnerability to Ground Failure Hazards:** The County EMA and Marion IT Specialists / GIS Dept. oversee this project with assistance from SIU. After each mitigation plan update, the geographical database is updated to include new information about ground failure hazard events.	Ongoing	L, ISGS	L	Williamson County, Marion	Williamson County EMA, Marion IT Specialist / GIS Dept.
GF2	**Maintain a List of Buildings Constructed Over Underground Mines:** The County EMA and Marion IT Specialists / GIS Dept. oversee this project with assistance from SIU. After each mitigation plan update, the geographical database is updated to include new information about ground failure hazard events.	Ongoing	L	L	Williamson County, Marion	Williamson County EMA, Marion IT Specialist / GIS Dept.
GF3	**Stabilize Areas Vulnerable to Ground Failure:** The Villages of Crainville and Creal Springs would like to seek federal funding to stabilize areas vulnerable to ground failure.	Proposed	L, BRIC, IDNR	H	Crainville, Creal Springs	Crainville, Creal Springs

Winter Storms						
Code	Mitigation Strategy	Status	Funding Source/ Potential Grants	Priority	Jurisdictions Involved	Responsible Organization/ Agency
WS1	**Install Signs that Direct Traffic Towards Shelters and Safe Travel Routes:** The Williamson County EMA and Marion EMA install signs on an as-need basis at various locations within the county during critical times.	Ongoing	L	M	Williamson County, Marion	Williamson County EMA, Marion EMA
WS2	**Establish a Network of 4WD/Off-road Vehicles to Access Stranded People:** The County EMA oversees this project. Additional funding will be sought to increase the network of 4WD/Off-road vehicles in the County.	Ongoing / Proposed	L, EMPG, Mutual Aid Agreements	H	Williamson County, Crainville, Creal Springs, Marion	Williamson County EMA
WS3	**Purchase Deicing Chemicals:** The Village of Cambria purchases deicing chemicals on an annual basis. The Villages of Crainville, Creal Springs, Herrin and Johnston City would like to seek funding to purchase deicing chemicals.	Ongoing	L, S,H	H	Cambria, Crainville, Creal Springs, Herrin, Johnston City, Our Lady of Mt. Carmel School	City/Village Utility and Street Depts.,Schools

Disease Outbreak						
Code	Mitigation Strategy	Status	Funding Source	Priority	Jurisdictions Involved	Responsible Organization/ Agency
EP1	**Educate Community on Pandemics and How to Mitigation their Impacts:** Potential funding sources includes: Illinois Department of Public Health, U.S. Dept. of Health and Human Services, and various Private foundations	Ongoing	S, F	H	Williamson County	Franklin-Williamson Bi-County Health Dept.
EP2	**Purchase Software/Develop Website which Allows the Public to Pre-Register to Receive Mass Prophylaxis Medications:** Potential funding sources includes: Illinois Department of Public Health, U.S. Dept. of Health and Human Services, and various Private foundations	Proposed	Local, IDPH, CDC, private	M	Williamson County	Franklin-Williamson Bi-County Health Dept.
EP3	**Develop Technological Solutions for Schools to Report Large Numbers of School Absences:** This strategy will limit the spread of disease, facilitate situational awareness and rapid cycle decision making for school closures, parenting messaging, etc. Potential funding sources includes: Illinois Department of Public Health, U.S. Dept. of Health and Human Services, and various Private foundations.	Proposed	Private, IDPH, CDC	H	Williamson County	Franklin-Williamson Bi-County Health Dept.

7. Plan Implementation

7.1. Implementation through Existing Programs

Throughout the planning process, the Williamson County Planning Team worked to identify existing hazard mitigation policies, develop mitigation goals, and a create a comprehensive range of mitigation strategies specific to each jurisdiction. This work provides a blueprint for reducing the potential loses identified in the Risk Assessment (Section 4). The ultimate goal of this plan is to incorporate the mitigation strategies proposed into ongoing planning efforts within the County. The Williamson County Emergency Management Agency will be the local champion for the mitigation actions. The Williamson County Board and the city and village councils will be an integral part of the implementation process. Federal and state assistance will be necessary for a number of the identified actions.

Greater Egypt will use the MHMPs from all 5 counties in the region as guidance in other planning initiates including the Comprehensive Economic Development Strategy (CEDs), Transportation Planning, and Environmental Planning. It is recommended that the County and municipalities also incorporate this document into their local planning efforts.

Continued public involvement is also critical to the successful implementation of the MHMP. Comments from the public on the MHMP will be received by the Williamson County Emergency Management Agency and forwarded to the Planning Team for discussion. Education efforts for hazard mitigation will be an ongoing effort of Williamson County. The public will be notified of periodic planning meetings through notices in the local newspaper. Once adopted, a copy of the MHMP will be maintained in each jurisdiction and in the Williamson County Emergency Management Agency.

7.2. Monitoring, Evaluation, and Updating the MHMP

Throughout the five-year planning cycle, the Williamson County Emergency Management Agency will reconvene the Planning Team to monitor, evaluate, and update the plan on an annual basis. Members of the planning committee are readily available to engage in email correspondence between annual meetings. If there is a need for a special meeting, due to new developments or the occurrence of a declared disaster in the county, the team will meet to update mitigation strategies. Depending on grant opportunities and fiscal resources, mitigation projects may be implemented independently by individual communities or through local partnerships.

As part of the update process, the Planning Team will review the county goals and objectives to determine their relevance to changing situations in the county. In addition, state and federal policies will be reviewed to ensure they are addressing current and expected conditions. The team will also review the risk assessment portion of the plan to determine if this information should be updated or modified. The plan revision will also reflect changes in local development and its relation to each hazard. The parties responsible for the various implementation actions will report on the status of their projects, and will include which implementation processes

worked well, any difficulties encountered, how coordination efforts are proceeding, and which strategies should be revised.

Updates or modifications to the MHMP during the five-year planning process will require a public notice and a meeting prior to submitting revisions to the individual jurisdictions for approval. The plan will be updated via written changes, submissions as the committee deems appropriate and necessary, and as approved by the Williamson County Board.

Appendix 1: Planning Team List

County		
Jurisdiction	**Name(Last,First)**	**Title**
County EMA	Creek, Patrick	Deputy Director
	Burgess, Brian	EMA Director (new)
	Norris, Kelly	EMA Director (past)
	Beebe, Thom	EMA Volunteer
	Tate, Cody	Volunteer
	Tate, Russell	Volunteer
	Bemesderfer, Alison	Volunteer
	Bemesderfer, Larry	Volunteer
	Barnes, Amanda	Clerk - Recorder
County Building Commission	Cerutti, Mike	Operations Manager
County Housing Authority	Crompton, Randy	Property Manager
	Emery, J Travis	County Engineer
REDCO	Fenton, Kelly	Executive Director
Unincorporated Areas	Gentry, Brent	Commissioner
	Gott, Ashley	Treasurer
Williamson County Schools	Hodge, Jami	Executive Director of student Services
	Marlo, Jim	Chairman- county commission
County Fire Protection	Norris, Jeremy	Fire Chief
Assessor's Office	Robinson, Jeffrey	Supervisor of Assessments
	Simpson, Alex	Assistant Supervisor of Assessments
Animal Control	Harris, Kevin	Animal Control Supervisor
County Soil & Water CD	Etheridge, Joleena	Resource Conservationist
County Sheriff's Office	Owsley, Robert	Lieutenant
	McCabe, Scott	Chief deputy

Cities/villages		
Jurisdiction	**Name(Last,First)**	**Title**
Bush	Hall, Les	Fire Chief
Carterville	Flaningam, Mike	Chief of Police
	Rains, Ron	Fire Chief
	Stoner, Mary	Library Director
Cambria	Gottschalk, Steven	President
Colp	Clark, Marcella	President
	Duncan, Mary Ann	Clerk
Crainville	Mitchell, Ron	Mayor
Creal Springs	Edwards, Shannon	Chief of Police
	Amy	?
Energy	Barclay, Andrew	Superintendent of Public Works
	Nelson, Michael	Asst fire chief
	Terry, Robert	Operations Sergeant
Freeman Spur	Baldi, Shawn	Village President
	Baldi, Carol	Village Clerk
Herrin	Mullen, Susan	Library Director
	Priddy, Shawn	Fire Chief
Hurst	Gottschalk, Tom	Fire Chief
	Simpkins, James	Mayor
Johnston City	Barter, JD	Chief of Police
	Burton, Thomas	Fire Chief
	Dobbins, Doug	Mayor
Marion	Barnett, Tim	Fire Chief
	Barrett, William	EMA/911
	Broomfield, Loretta	Library Director
	Ziegler, Brian	Engineer
	Olsen, Jennifer	Director of Business Development
Pittsburg	Cutsinger, Scott	Fire Chief (Volunteer)
	Davis, Hillary	EMT
	Terry, Robert	Chief of Police
	Violett, Keith	Village President
	Violett, Kyle	Administrator
Spillertown	Berry, Tom	Board Member
	Eldridge, Dustin	Mayor
	Eldridge, Noelle	Clerk
	James, Paul	Board Member
	Nickelson, Jason	Board member
	Owsley, Robert	Board member
Stonefort	Milburn, James	Mayor

Schools		
Jurisdiction	**Name(Last,First)**	**Title**
Regional office of education #21	Milburn, Chad	Network Specialist
	Bink, Jeffrey	Health Life Safety
Herrin CUSD 4	Wilson, Nathaniel	Superintendent
New Simpson Hill District 32	Nighswander, Joe	Superintendent
OLMC school	Swann, Jason	principal
Carterville CUSD #5	Liddell, Keith	Superintendent
Marion CUSD #2	Moake, Jeff	Director of Grounds and Buildings
	Watson, Kim	chief financial officer
Crab Orchard CUSD	Stone, Sy	Superintendent
Galatia School District	Crank, Shain	Superintendent
Johnston City CUSD #1	Clark, Kathy	Superintendent
Agape Christian High School	Knox, Seth	Prinicpal
	Sanderson, Carleen	Administrative Assistant
CCHS 165	Dillow, Stephanie	School Resource Officer
	Booth, Daniel	Superintendent
John A Logan College	Willmore, Marion Allan	Chief of Police
Health & Emergency groups		
Jurisdiction	**Name(Last,First)**	**Title**
Marion/Herrin 911 EMS	Dunn, Richard	CEO
Regional Hospital Coordinating Center	Herrmann, Arien	Region V manager
	Hagan, Marty	Region 5 RHCC Resource Section Chief
	Caffrey-Bey, Tamara	Regional Emergency Planning Coordinator
Herrin Hospital	Graul, Bradley	RN / EMS Coord. / Emer. Mgt. Chair
Heartland Regional Medical Center	Fort, Nikolas	Emergency Manager
Shawnee Health Services	DeMello, Tresa	Director of Health and Safety
Lake of Egypt Fire Protection	Odum, Jerry	Fire Chief
Franklin-Williamson Bi-County Health	Martin, Katrina	Director of Emergency Preparedness
	Alexander, Shelley	Director of Emergency Preparedness

Water Districts		
Jurisdiction	**Name(Last,First)**	**Title**
Coal Valley Water District	Emery, Bruce	Superintendent
Ferges Water District	Taylor, Susan	Office Manager
Blairsville Public Water District	Coulter, Candy	District Manager
Corinth Water District	Baker, Christie	Office Manager
Other		
Jurisdiction	**Name(Last,First)**	**Title**
The Lighthouse Shelter	Robinson, Shara	Executive Director
Marion Senior Citizens Center	Graskewicz, Jill	Executive Director
Rend Lake Conservancy District	Thomason, Keith	General Manager
	Sanders, Larry	Treasurer
Egyptian Area Agency on Aging	Salazar, Becky	Executive Director
	Wallis, Kandi	volunteer program project director
Shawnee Senior Living	Curry, Carol	Administrator
Centerstone	Newman, Deb	Facilities Consultant
Lake of Egypt Property Owners Association	Pfaltzgraff, Darwin Leroy	volunteer
Crab Orchard Public Library District	Steinsultz, Erin	Library Director
Perry County EMA	Genesio, Charles	Director
Franklin County EMA	Buckingham, Ryan	Director
Jackson County EMA	Burns, Robert	Sheriff, EMA Coordinator
	Rowe, Orval	Deputy EMA Coordinator
Jefferson County EMA	Lueker, Steve	Coordinator
	Hertenstein, Keith	Assistant Coordinator

Appendix 2: Williamson County Essential Facilities

Emergency Operations Centers

Name	Address	City	Zip	Yr Built	Backup Power	Sq Ft	Replacement Value (x1000)	Census Tract
Williamson County Emergency Operations Center - Primary	407 N Monroe St, 3rd Floor Board Room	Marion	62959		No	660	$2,797	17199021001
Williamson County Emergency Operations Center - Secondary	404 N. Van Buren, Second Floor Training Room (Sheriff's Office)	Marion	62959		Yes	11000	$2,797	17199021001

Ambulance Stations

Name	Address	City	Zip	Yr Built	Backup Power	Kitchen	Shelter Capacity	Equipment	Sq Ft	Replacement Value	Census Tract
Williamson County Ambulance Service	201 S Park Ave	Herrin	62948						2337	594,135	17199020400
United Medical Response Division 4	1001 W Central St	Marion	62959						3654	928,956	17199021001
MedicOne Medical Response	1104 N Pentecost Rd	Marion	62959						3380	859,297	17199021002
Air Evac - Marion Base	9842 Old Bainbridge Trail	Marion	62959						3000	762,690	17199021002

Fire Protection

County	Name	Address	City	Zip	Yr Built	Backup Power	Kitchen	Shelter Capacity	Equipment	Sq Ft	Replacement Value (x1000)	Census Tract
Williamson	Bush Volunteer Fire Department	406 Poplar Ave	De Soto	62924	1972					11000	2796	17199020100
Williamson	Cambria Fire Department	103 S Maple St	Cambria	62915	1972					11000	2796	17199020100
Williamson	Carterville Fire Department	300 N Division St	Carterville	62918	1976	Y	Y		2 Engines, 1 Ladder Truck, 1 Brush Truck	11000	2796	17199020201
Williamson	Crab Orchard National Wildlife Refuge Fire Department	8848 Route 148	Marion	62959	1982					11000	2796	17199021400
Williamson	Energy Fire Department	210 N Pershing St	Energy	62933	1984					11000	2796	17199020300
Williamson	Herrin Fire Department	401 S Park Ave	Herrin	62948	1973	Y	small	5-20	2 Engines, 1 Squad, 1 Ladder Truck (75'), 1 Brush Truck, 1 Polaris UTV Brush unit, 2 Command Vehicles, 1 MABAS Western Shelter trailer.	5000	4000	17199020400
Williamson	Hurst Fire & Rescue	120 N King St	Hurst	62949	1972					11000	2796	17199020100
Williamson	Johnston City Fire Department	500 Washington Ave	Johnston City	62951	1959	Y	Y		2 Engines (1 with medical equipment), 1 Ladder truck, 1 Squad, 1 Brush truck w trailer, 1 ATV, 1 MVU Mabas Division 45 Fan Truck, 1 van with medical equipment, 1 car (chief's vehicle)	11000	2796	17199020700
Williamson	Lake of Egypt Fire Protection District Headquarters/Station 1	12228 Lake of Egypt Rd	Marion	62959	2009	Y	Y		#2- Fire Engine, #2- Tankers, #2- Ambulance, #2- Brush trucks and #1- Heavy rescue truck	11000	2796	17199021400
Johnson	Lake of Egypt Fire Protection District Station 2	1605 Eagle Point Bay	Goreville	62939	1973	N	N		#2-Tankers	11000	2796	17087977700

County	Name	Address	City	Zip	Yr Built	Backup Power	Kitchen	Shelter Capacity	Equipment	Sq Ft	Replacement Value (x1000)	Census Tract
Williamson	Lake of Egypt Fire Protection District Station 4/ Live-In & Maintenance	11708 Lake of Egypt Rd	Marion	62959	1982	N	N		#1- decon Truck, #1- Brush Truck, #1- Rescue Boat and #1- Fire Engine	11000	2796	17199021400
Williamson	Lake of Egypt Fire Protection District Station 5	7913 Grassy Rd	Carbondale	62902	1982	N	N			11000	2796	17199021400
Williamson	Marion Fire Department	204 N Court St	Marion	62959	2020	Y	Y		4 engines, 1 ladder truck	11000	2796	17199021001
Williamson	Pittsburg Volunteer Fire Department	110 Lodge St	Pittsburg	62974	1977				2 engines, 1 first responder vehicle	11000	2796	17199020801
Williamson	Williamson County Fire Protection District Station 1	1505 East Main St.	Marion	62959	2018	Y, 175KW phase3	Commercial		engine 2150, tender 2160, Brush Truck 2170/UTV, Ladder 2180, Reserve Tender 2161	11000	2796	17199020900
Williamson	Williamson County Fire Protection District Station 3	9366 Paulton Rd.	Marion	62959	1977	N	Small		engine 2350, tender 2360, Brush Truck 2370/UTV	11000	2796	17199020802
Williamson	Williamson County Fire Protection District Station 4	20938 Corinth Rd.	Thompsonville	62890	1977	N	Small		engine 2450, tender 2460, Brush Truck 2470/UTV.	11000	2796	17199020801
Williamson	Williamson County Fire Protection District Station 5	1600 West Broadway	Johnston City	62951	1959	N	Small		engine 2550, tender 2560, Brush Truck 2570/UTV	11000	2796	17199020700
Williamson	Williamson County Fire Protection District Station 6	3232 S. Park Ave.	Herrin	62948	1984	N	Small		engine 2650, tender 2660, Squad 1 2680/UTV	11000	2796	17199021002
Williamson	Williamson County Fire Protection District Station 7	410 W Blue Ave	Creal Springs	62922	1977	N	Small		engine 2750, tender 2760, Brush Truck 2770	11000	2796	17199020802

Police

Name	Address	City	Zip	Yr Built	Backup Power	Kitchen	Shelter Capacity	Equipment	Sq Ft	Replacement Value (X1000)	census tract
Cambria Police Department	105 S Maple St	Cambria	62915	1972					11000	2796.53003	17199020100
Carterville Police Department	126 Illinois Ave	Carterville	62918						11000	2796.53003	17199020201
Crainville Police Department	1200 Marilyn St	Carterville	62918						11000	2796.53003	17199020201
Creal Springs Police Department	507 E Walnut	Creal Springs	62922	1977					11000	2796.53003	17199020802
Energy Police Department	210 N Pershing St	Energy	62933	1984					11000	2796.53003	17199020300
Herrin Police Department	321 N 14th St	Herrin	62948	1946					11000	2796.53003	17199020400
Hurst Police Department	111 Bush Ave	Hurst	62949	1972					11000	2796.53003	17199020100
John A Logan College Campus Police	700 Logan College Dr, E120	Carterville	62918	1976					11000	2796.53003	17199020201
Johnston City Police Department	100 W Broadway Blvd	Johnston City	62951						11000	2796.53003	17199020700
Marion Police Department	1001 W Deyoung St	Marion	62959						11000	2796.53003	17199021001
Pittsburg Police Department	302 W Avery Ave	Pittsburg	62974	1977					11000	2796.53003	17199020801
Spillertown Police Department	102 Community Dr	Marion	62959	1986					11000	2796.53003	17199020900
Williamson County Sheriff's Department	404 North Van Buren St.	Marion	62959						11000	2796.53003	17199021001

Hospitals

Name	Address	City	Zip	Yr Built	# beds	Backup Power	Kitchen	Shelter Capacity	Sq Ft	Replacement Value (x1000)	Census Tract
Herrin Hospital	201 S 14th St	Herrin	62948	1946	114					15,510.55	17199020400
Heartland Regional Medical Center	3333 W Deyoung St	Marion	62959	2000	106					12,517.29	17199021002
Marion VA Medical Center	2401 W Main St	Marion	62959	1969	225					30,612.94	17199021200

Schools

District/Type	Name	Address	City	Zip	Yr Built	#students	Shelter Capacity	Backup Power	Kitchen	Sq Ft	Replacement Value (x1000)
Carterville CUSD #5	Carterville High School	1415 West Grand Avenue	Carterville	62918	1976					43,143	8698.89
Carterville CUSD #5	Carterville Intermediate School	300 School Street	Carterville	62918	1976					38,071	7676.34
Carterville CUSD #5	Carterville Junior High School	816 S. Division	Carterville	62918	1976					25,000	5040.75
Carterville CUSD #5	Tri-C Elementary School	1405 W. Grand Ave.	Carterville	62918	1985					51,714	10427.15
College	John A Logan College	700 Logan College Drive	Carterville	62918	1976					367583.3	62875.13
Crab Orchard CUSD #3	Crab Orchard Elementary School	19189 Bailey St	Marion	62959	1977	326					
Crab Orchard CUSD #3	Crab Orchard High School	19189 Bailey St	Marion	62959	1977	160	1500			91113	7700
Herrin CUSD #4	Herrin Elementary School	5200 West Herrin Road	Herrin	62948	1969					54,714	11,032
Herrin CUSD #4	Herrin High School	700 N 10th	Herrin	62948	1957					57,714	11636.93
Herrin CUSD #4	Herrin Junior High School	700 S 14th St	Herrin	62948	1946					40,143	8,094
Herrin CUSD #4	North Side Primary Center	601 N 17th St	Herrin	62948	1946					37,571	7,576
Johnston City CUSD #1	Jefferson Elementary School	1108 Grand Avenue	Johnston City	62951	1959	285	20			26000	5400
Johnston City CUSD #1	Johnston City High School	1500 Jefferson Avenue	Johnston City	62951	1959	320	50			57000	13200
Johnston City CUSD #1	Lincoln Elementary School	20163 Corinth Rd.	Pittsburg	62974	1977	135	20			18000	4400
Johnston City CUSD #1	Washington Middle School	100 E. 12th St.	Johnston City	62951	1959	325	50			53000	900

District/Type	Name	Address	City	Zip	Yr Built	#students	Shelter Capacity	Backup Power	Kitchen	Sq Ft	Replacement Value (x1000)
Marion CUSD #2	Adams School	15740 Lake of Egypt Rd	Creal Springs	62922	1977	243	575			66450	1395
Marion CUSD #2	Jefferson Elementary School	700 E. Boulevard St.	Marion	62959	1947	360	317			25412	14582
Marion CUSD #2	Lincoln Elementary School	400 Morningside Dr.	Marion	62959	1986	489	720			62325	17260
Marion CUSD #2	Longfellow Elementary School	1400 W. Hendrickson	Marion	62959	1969	249	545			33665	11682
Marion CUSD #2	Marion High School	1700 Wildcat Dr.	Marion	62959	2016	1151	2223			338487	74340
Marion CUSD #2	Marion Junior High School	1609 W Main St	Marion	62959	1984	752	1490			128910	24834
Marion CUSD #2	Washington Elementary School	420 E Main St.	Marion	62959	1947	489	1202			69025	15358
Private School	Marion Adventist Christian School	9314 Old Route 13	Marion	62959	1984					785.7143	158.42
Private School	Our Lady of Mt Carmel School	400 West Monroe St.	Herrin	62948	2017						7000
Private School	Unity Christian School	100 E College St	Energy	62933	1984					13500	2722
Regional Office of Education #21	Project Echo Alternative School	17428 IL-37	Johnston City	62951	1959					3571.429	720.12
Serves Multiple Districts	Williamson County Education Services	411 S Court St	Marion	62959	1947					285.7143	57.61

Appendix 3: Risk Indices

County Summary

hazard	avg risk index	# of lists included	total # lists	% importance	Weighted rank
tornado	14.60	50	52	0.96	14.04
epidemic	14.42	38	52	0.73	10.54
earthquake	11.44	47	52	0.90	10.34
thunderstorm	7.23	48	52	0.92	6.67
Severe winter weather	6.68	48	52	0.92	6.17
flooding	6.76	42	52	0.81	5.46
Drought/extreme heat	5.98	41	52	0.79	4.72
ground failure	6.32	37	52	0.71	4.50
hazmat release	5.21	41	52	0.79	4.11
terrorism	6.04	25	52	0.48	2.90
dam failure	5.78	18	52	0.35	2.00
wildfire	4.75	13	52	0.25	1.19
infestation	3.29	14	52	0.27	0.88
levee failure	6.29	7	52	0.13	0.85
meteor	4.10	10	52	0.19	0.79
cyber attack	6.80	5	52	0.10	0.65
utility disruption	10.00	3	52	0.06	0.58
invasive spp	2.15	13	52	0.25	0.54
microburst	7.00	2	52	0.04	0.27
landslide	2.00	2	52	0.04	0.08
drinking water pollution	4.00	1	52	0.02	0.08

Cities & Villages

Bush	
Hazard	Risk Index
drought/heat	4
tstorm	4
flooding	3
tornado	3
winter weather	3
hazmat	2

Cambria	
Hazard	Risk Index
earthquake	16
drought/heat	16
epidemic	16
ground failure	16
tornado	16
tstorm	8
winter weather	6
infestation	4
invasives	4
wildfire	4

Carterville	
Hazard	Risk Index
earthquake	8
epidemic	8
tornado	6
drought/heat	4
ground failure	4
Tstorm	4
flooding	3
hazmat	3
winter weather	3
meteor	1
terrorism	1

Colp	
Hazard	Risk Index
epidemic	32
earthquake	16
ground failure	16
Tstorm	16
winter weather	16
tornado	12
drought/heat	8
hazmat	4
infestation	2
invasives	2
terrorism	2
wildfire	2

Crainville	
Hazard	Risk Index
epidemic	16
ground failure	16
tornado	16
earthquake	12
winter weather	12
tstorm	8
drought/heat	6
flooding	4
microburst	2

Creal Springs	
Hazard	Risk Index
tornado	16
earthquake	8
tstorm	4
winter weather	3
flooding	2

Energy	
Hazard	Risk Index
tornado	9
earthquake	8
epidemic	6
flooding	6
wildfire	6
tstorm	5.5
winter weather	5.5
ground failure	5
hazmat	4.5
drought/heat	3
terrorism	2

Freeman Spur	
Hazard	Risk Index
epidemic	32
tornado	32
ground failure	24
hazmat	24
earthquake	16
winter weather	16
tstorm	8
wildfire	8
flooding	6
drought/heat	4
terrorism	4
meteor	1

Herrin	
Hazard	Risk Index
tornado	12
earthquake	8
winter weather	8
hazmat	6
Tstorm	4
extreme heat	3
flooding	3
ground failure	3
dam failure	2
epidemic	2
terrorism	2
meteor	1
infestation	1
invasives	1

Hurst	
Hazard	Risk Index
tornado	16
earthquake	8
hazmat	4
tstorm	4
flooding	3
winter weather	3
drought/heat	2

Johnston City	
Hazard	Risk Index
tornado	22
drought/heat	6
flooding	6
ground failure	5
tstorm	5
winter weather	5
cyberattack	4
earthquake	4
hazmat	2.5
epidemic	2

Marion	
Hazard	Risk Index
tornado	10
hazmat	9
earthquake	8
winter weather	6
flooding	4

Pittsburg	
Hazard	Risk Index
tornado	9
earthquake	8
epidemic	8
tstorm	6
wildfire	6
winter weather	6
flooding	5
drought/heat	2.5
ground failure	2.5
hazmat	2.5
terrorism	1.5
infestation	1
invasives	1
meteor	1

Spillertown	
Hazard	Risk Index
epidemic	32
drought/heat	32
flooding	32
earthquake	16
tstorm	16
tornado	16
utility disruption	16
winter weather	16
meteor	8
ground failure	6
wildfire	6
trail derailment	4
cyberattack	2
hazmat	2
infestation	1
invasives	1
terrorism	1

Stonefort	
Hazard	Risk Index
hazmat	16
tornado	16
earthquake	8
winter weather	8
drought/heat	4
drinking water pollution	4
tstorm	3
epidemic	2
meteor	1

School Districts

CCHS	
hazard	risk index
tornado	8
winter weather	8
earthquake	6
epidemic	6
hazmat	6
drought/heat	4
flooding	4
tstorm	4
terrorism	1

Crab Orchard CUSD	
hazard	risk index
tornado	8
earthquake	4
tstorm	4
winter weather	4
epidemic	2

Marion CUSD	
hazard	risk index
tornado	32
epidemic	16
terrorism	12
earthquake	8
drought/heat	8
ground failure	8
meteor	8
winter weather	8
flooding	6
tstorm	4
wildfire	4
infestation	3
hazmat	2
invasives	1

ROE #21	
hazard	risk index
flooding	24
tornado	24
epidemic	16
ground failure	16
hazmat	12
microburst	12
earthquake	8
drought/heat	8
levee failure	8
tstorm	8
winter weather	6
dam failure	4
wildfire	4
infestation	2
invasives	2
terrorism	2

Galatia SD	
hazard	risk index
epidemic	16
tornado	12
meteor	8
tstorm	8
winter weather	8
earthquake	4
drought/heat	4
flooding	4
ground failure	4
dam failure	2
hazmat	2
levee failure	2
terrorism	2
wildfire	2
infestation	1
invasives	1
landslide	1

Williamson County Student Services	
hazard	risk index
earthquake	32
epidemic	16
terrorism	16
tornado	16
winter weather	8
flooding	6
drought/heat	4
meteor	4
tstorm	4
ground failure	1
hazmat	1
infestation	1
invasives	1

Carterville SD	
hazard	risk index
earthquake	16
epidemic	16
tornado	16
dam failure	8
tstorm	8
flooding	4
hazmat	4
drought/heat	3
winter weather	3
ground failure	2

Johnston City SD	
hazard	risk index
earthquake	16
epidemic	16
tornado	16
tstorm	8
dam failure	4
drought/heat	4
flooding	4
hazmat	4
winter weather	4
ground failure	2

Herrin CUSD	
hazard	risk index
tornado	9
earthquake	6
epidemic	6
winter weather	6
tstorm	4
drought/heat	3
flooding	3

New Simpson Hill SD	
hazard	risk index
earthquake	24
tornado	24
terrorism	16
tstorm	12
winter weather	12
epidemic	8
drought/heat	8
hazmat	8
wildfire	8

JALC	
hazard	risk index
tornado	12
tstorm	8
hazmat	6
winter weather	4

Other Jurisdictions

County Officials Avg	
hazard	risk index
earthquake	18
epidemic	17
tornado	14
cyberattack	8
tstorm	8
flooding	6.5
dam failure	6
levee failure	4
wildfire	4
drought/heat	3.25
terrorism	3
ground failure	2.25
invasives	2
mass casualty	2
power outage	2
landslide	1

Coal Valley Water District	
hazard	risk index
tstorm	8
earthquake	6
tornado	6
ground failure	2
winter weather	2

public building commission	
hazard	risk index
earthquake	16
epidemic	16
tornado	16
dam failure	8
tstorm	8
flooding	4
hazmat	4
drought/heat	3
winter weather	3

lighthouse center	
hazard	risk index
tornado	32
earthquake	24
flooding	16
tstorm	16
winter weather	8
drought/heat	4
terrorism	4
ground failure	2

Ferges Water District	
hazard	risk index
tstorm	16
tornado	12
earthquake	8
winter weather	6
flooding	4
ground failure	4
hazmat	4
terrorism	4

Marion 911	
hazard	risk index
tornado	12
hazmat	9
earthquake	8
tstorm	4

WC Soil & Water CD	
hazard	risk index
epidemic	32
terrorism	32
tornado	16
infestation	8
tstorm	8
flooding	6
ground failure	6
invasives	6
earthquake	4
drought/heat	3

WC Sheriff's office	
hazard	risk index
earthquake	16
epidemic	16
tornado	16
tstorm	8
dam failure	4
flooding	4
ground failure	4
hazmat	4
drought/heat	3
terrorism	3
winter weather	3

Shawnee Senior Living	
hazard	risk index
epidemic	32
drought/heat	24
tornado	16
winter weather	16
flooding	8
infestation	8
tstorm	4

Marion Senior Center	
hazard	risk index
epidemic	16
terrorism	16
earthquake	12
cyberattack	8
flooding	8
ground failure	8
meteor	8
tstorm	8
tornado	8
utility disruption	8
winter weather	8
dam failure	4
drought/heat	4
hazmat	4
landslide	4

REDCO	
hazard	risk index
tornado	12
earthquake	4
flooding	2
hazmat	2

Centerstone	
hazard	risk index
earthquake	16
tornado	16
levee failure	8
tstorm	8
winter weather	4.5
flooding	4
hazmat	4
drought/heat	3
ground failure	2

Villas of Hollybrook	
hazard	risk index
epidemic	32
tornado	32
earthquake	16
drought/heat	16
tstorm	16
winter weather	16
ground failure	8
hazmat	8
flooding	6
infestation	4
invasives	4

Lake of Egypt Fire Protection	
hazard	risk index
flooding	16
hazmat	16
winter weather	12
wildfire	9
dam failure	8
tstorm	8
tornado	8

Egyptian Area Agency on Aging	
hazard	risk index
ground failure	32
earthquake	13.5
flooding	12
tornado	11
epidemic	10
levee failure	9
dam failure	8
infestation	6
winter weather	6
hazmat	5
terrorism	5
drought/heat	4
tstorm	4

LoE Property Owners	
hazard	risk index
earthquake	16
epidemic	16
tornado	16
tstorm	8
dam failure	8
flooding	4
hazmat	4
drought/heat	3
winter weather	3
ground failure	2

Rend Lake Conservancy Dist	
hazard	risk index
dam failure	8
earthquake	4
epidemic	4
drought/heat	4
ground failure	4
terrorism	4
winter weather	4
flooding	3
hazmat	2

RHCC	
hazard	risk index
cyberattack	12
epidemic	12
hazmat	12
earthquake	8
drought/heat	8
terrorism	8
tornado	8
civil disruption	8
flooding	6
utility disruption	6
dam failure	4
ground failure	4
infestation	4
meteor	4
CBRN	4
transportation incident	4
tstorm	3
wildfire	2
winter weather	2

Appendix 4: Meeting Announcements

*Due to a typo in the meeting 2 announcement, both meeting 2 and meeting 3 for Williamson County were open to the public.

PUBLIC MEETING NOTICE
Williamson County EMA and Greater Egypt will host a public meeting Tuesday, October 19 at 10:00 AM to provide information and receive public input on the update to the Jefferson County Multi-hazard Mitigation Plan. The meeting will be held through Zoom. You can find the meeting information by visiting greateregypt.org/hazard-mitigation-planning.
23085 10/16

***** Proof of Publication *****

THE SOUTHERN ILLINOISAN
710 N Illinois Avenue
Carbondale, IL 62901
Ph: 618-529-5454

PUBLIC NOTICE
Greater Egypt is hosting a public meeting for the Williamson County Multi-Hazard Mitigation Plan. This meeting will take place via Zoom on Thursday, March 17th at 10am. The Zoom link plus details regarding the MHMP process, and other meeting materials can be found at https://greateregypt.org/hazard-mitigation-planning/
24919 3/9

GREATER EGYPT REGIONAL PLAN -Legals

3117 CIVIC CIRCLE BLVD., SUITE A
MARION IL 62959

ORDER NUMBER 24919

CERTIFICATE OF THE PUBLISHER

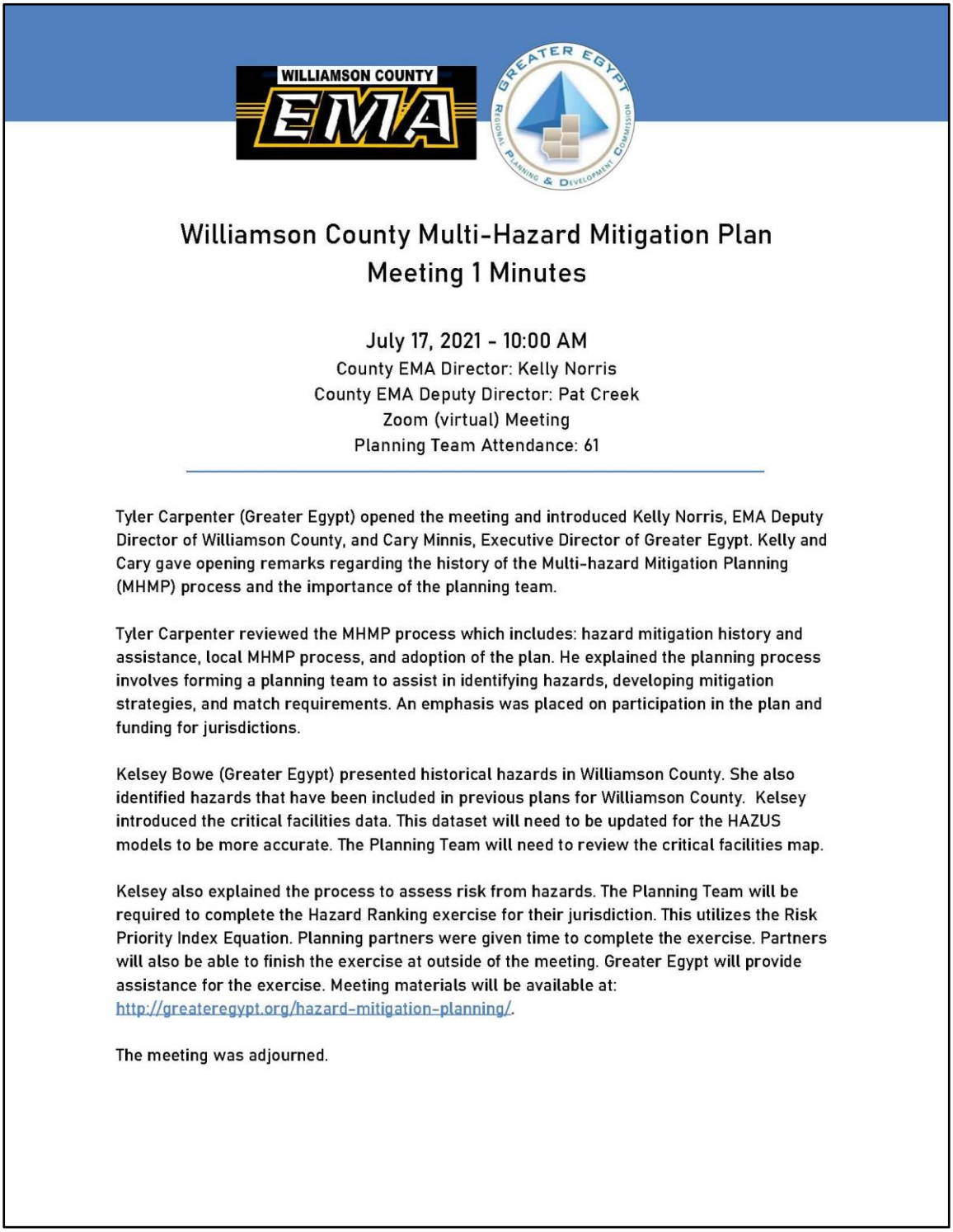
LEE ENTERPRISES hereby certifies that it is now and has been for more than one year continuously, d/b/a The Southern Illinoisan, a daily secular newspaper of general circulation, published in the City of Carbondale, the County of Jackson and the State of Illinois, and further certifies that said newspaper has been continuously published at regular intervals of more than once each week with more than a minimum of fifty issues per year for more than one year prior to the first publication of the notice, and further certifies that The Southern Illinoisan is a newspaper as defined by the Statutes of the State of Illinois in such cases made and provided, and further hereby certifies that a notice of which the annexed notice is a true copy, has been regularly published in said paper.

Section: Legals
Category: 0900 Legals
PUBLISHED ON: 03/09/2022

TOTAL AD COST: 19.76
FILED ON: 10/11/2022

By

Appendix 5: Meeting Minutes



Williamson County Multi-Hazard Mitigation Plan
Meeting 1 Minutes

July 17, 2021 - 10:00 AM
County EMA Director: Kelly Norris
County EMA Deputy Director: Pat Creek
Zoom (virtual) Meeting
Planning Team Attendance: 61

Tyler Carpenter (Greater Egypt) opened the meeting and introduced Kelly Norris, EMA Deputy Director of Williamson County, and Cary Minnis, Executive Director of Greater Egypt. Kelly and Cary gave opening remarks regarding the history of the Multi-hazard Mitigation Planning (MHMP) process and the importance of the planning team.

Tyler Carpenter reviewed the MHMP process which includes: hazard mitigation history and assistance, local MHMP process, and adoption of the plan. He explained the planning process involves forming a planning team to assist in identifying hazards, developing mitigation strategies, and match requirements. An emphasis was placed on participation in the plan and funding for jurisdictions.

Kelsey Bowe (Greater Egypt) presented historical hazards in Williamson County. She also identified hazards that have been included in previous plans for Williamson County. Kelsey introduced the critical facilities data. This dataset will need to be updated for the HAZUS models to be more accurate. The Planning Team will need to review the critical facilities map.

Kelsey also explained the process to assess risk from hazards. The Planning Team will be required to complete the Hazard Ranking exercise for their jurisdiction. This utilizes the Risk Priority Index Equation. Planning partners were given time to complete the exercise. Partners will also be able to finish the exercise at outside of the meeting. Greater Egypt will provide assistance for the exercise. Meeting materials will be available at: http://greateregypt.org/hazard-mitigation-planning/.

The meeting was adjourned.

Meeting Attendance
Meeting 1: July 15, 2021 10:00 AM
Name
Barnes, Amanda
Barnett, Tim
Barrett, William
Beebe, Thom
Bink, Jeffrey
Burton, Thomas
Cerutti, Mike
Chief Odum
Clark, Marcella
Coulter, Candy
Creek, Patrick
Crompton, Randy
cstre
Cutsinger, Scott
DeMello, Tresa
Duncan, Mary Ann
Dunn, Richard
Edwards, Shannon
Emery, Bruce
Emery, Travis
Etheridge, Joleena
Fenton, Kelly
Flaningam, Mike
Fort, Nikolas
Gott, Ashley
Gottschalk, Steven
Graskewicz, Jill
Graul, Bradley

Grimes, Renee
Hagan, Marty
Liddell, Keith
Marlo, Jim
Martin, Katrina
McCuan, John
Milburn, Chad
Mitchell, Ron
Moake, Jeff
Mullen, Susan
Norris, Jeremy
Norris, Kelly
Owsley, Robert
Priddy, Shawn
Rains, Ron
Robinson, Jeffrey
Robinson, Shara
Rowe, Orval
Simpson, Alex
Steinsultz, Erin
Susan
Tate, Russell
Taylor, Susan
Terry, Robert
Terry, Robert
Williams, Joyce
Willmore, Alan
Ziegler, Brian
Bowe, Kelsey
Carpenter, Tyler
Minnis, Cary

Williamson County Multi-Hazard Mitigation Plan
Meeting 2 Minutes

October 19, 2021 - 2:00 PM
County EMA Director: Kelly Norris
County EMA Deputy Director: Pat Creek
Zoom (virtual) Meeting
Planning Team Attendance: 49

Tyler Carpenter (Greater Egypt) opened the meeting. He gave remarks about the planning updates and what to expect in the upcoming months. Mr. Carpenter reviewed Meeting 1, and the timeline of the MHMP planning committee. It was emphasized that the planning partners meet the match requirements of FEMA and stay conscious of the responsibilities of the planning partners.

Kelsey Bowe (Greater Egypt) reviewed the MHMP key elements such as historical data, statistical data base on 100 and 500-year occurrences of floods, tornadoes, and earthquakes. Ms. Bowe explained the planning process that involves the planning team to assist in identifying hazards, developing mitigation strategies, and planner partner participation. The overall destruction and cost of a natural hazard event are outlined; showing that there would be an estimated 48,000 truckloads of waste from a worse case possible event. Ms. Bowe covered the hazard ranking review, which must be filled out and submitted before the upcoming deadlines. Ms. Bowe reviewed the different modeling software and how they help to understand the consequences of a natural hazard event, including the Hazus 5 model, Aloha modeling, and ArcGIS software.

Ms. Bowe presented historical hazards in Williamson County. She also identified hazards that have been included in previous plans for Williamson County. She introduced the critical facilities data, and talked about the facilities that are essential which may not be included. This dataset will need to be updated for the HAZUS models to be more accurate. Ms. Bowe informed the planning partners about the possible funding sources available through BRIC and the EPA. Ms. Bowe's last remarks covered the importance of the mitigation strategies worksheet to be filled out with two different strategies, and submitted by the planning partners

Planning partners were given time to complete the exercise. Partners will also be able to finish the exercise outside of the meeting. Greater Egypt will provide assistance for the exercise. Meeting materials will be available at: http://greateregypt.org/hazard-mitigation-planning/

The meeting was adjourned.

Meeting Attendance
Meeting 2: October 19, 2021 2:00 PM
Name
Tyler Carpenter
Kelsey Bowe
Gabrielle Reed
19112- Administrator
ACHS
Alison Bemesderfer
Larry Bemesderfer
Brad Graul
Bruce Talley
Bskiba
Chad Milburn
Allan Willmore
Bruce Emery
Ryan Buckingham
Doug Kimmel
Brandon Hendrix
Herrin park District
Howard Saver
Travis Emery
Jami Hodge
Joe Nighswander
Jody Chaney
John McCuan
Joleena Etheridge
Jeff Robinson
Kathy Clark
Kelly Norris
Kim Watson
K Taylor
Katrina Martin
Kevin Reichert
Larry Sanders

Mandy Horn
Marty Hagan
Mary Stoner
Nathaniel Wilson
Pat Creek
Mike Cerutti
Rick George
Robert Terry
Russell Tate
Scott Lee
Shawn Priddy
Susan Mullen
Caffey-Bey, Tamara
Tim Atkinson
Alex Simpson
Tom Berry
6189982100

Williamson County Multi-Hazard Mitigation Plan

Meeting 3 Minutes

March 17th, 2022 10:00 AM
County EMA Director: Kelly Norris
County EMA Deputy Director: Pat Creek
Zoom (virtual) Meeting
Planning Team Attendance: _13_

Kelsey Bowe (Greater Egypt) opened the meeting and gave introductory remarks. Meeting attendees were encouraged to introduce themselves through the chat feature. Kelsey covers what to expect in the following months for MHMP planning and the expectations of the planning committee. Ms. Bowe reviewed the Planning Updates and the timeline of the MHMP. She explained the planning process involves collaboration within the jurisdictions in order to assist in identifying hazards, developing mitigation strategies, and match requirements Williamson County has met their match requirements. Ms. Bowe discussed the Planning Partner responsibilities moving forward.

Kelsey Bowe (Greater Egypt) reviewed the hazard ranking for Williamson County; based on the responses of the planning partners. She also discussed the updates for any essential facility within the county; giving planning partners a moment to review and make changes. Ms. Bowe presented the mitigation strategies that each jurisdiction has completed. The importance and appreciation of submitting adequate mitigation strategies, and essential facilities data was expressed further by Ms. Bowe.

Ms. Bowe explained what to expect in the future for Williamson County MHMP plans, and offered an opportunity to reach out to her about any last-minute changes being made for the strategies. The goals of hazard mitigation strategies were reviewed. The team was given time during the meeting to make any comments or changes based on the essential facilities list information, and the mitigation strategies information.

The meeting was adjourned.

This document has been requested per jurisdiction, in order to meet the responsibilities of the planning team. Greater Egypt will provide assistance for the exercise. Meeting materials will be available at: http://greateregypt.org/hazard-mitigation-planning/.

Meeting Attendance
Meeting 3: March 17, 2022 10AM
Name
Kelsey Bowe
Gabrielle Reed
Kelly Norris
Pat Creek
Bruce Talley
Katrina Martin
Bruce Emery
Russell Tate
Erin Steinsultz
Kathy Clark
Tom Berry
Jeff Bink
Shawn Priddy

Appendix 6: Mitigation Related Grant Opportunities

Below is a list of current federal and state grant programs related to various hazard mitigation topics. This list may not be exhaustive and planning partners are encouraged to conduct their own searches for grants to match a project idea. Please note these programs may not be active at all times of the year, and some programs may be cancelled during the 5-year cycle that this Plan is active. A detailed excel spreadsheet can be downloaded for free at https://greateregypt.org/hazard-mitigation-planning/

FEMA Grants

Program Name	Grants Available (if multiple)	Projects Covered	Who Can Apply
Hazard Mitigation Grant Program (HMGP)		Available after federally declared disasters, provides funding to rebuild structures in a way to mitigate future problems	state, local, tribal and territorial governments
Flood Mitigation Assistance (FMA) Grant		Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage, competitive grant, projects are chosen for cost effectiveness and eligibility	state, local, tribal and territorial governments that have FEMA approved hazard mitigation plans in place and are part of the NFIP
Building Resilient Infrastructure and Communities (BRIC)		variety of hazard mitigation projects can be approved under this program	state, local, tribal and territorial governments
Emergency Food and Shelter Program (EFSP)		funds projects to provide shelter, food, and supportive services to individuals and families who are experiencing, or at risk of experiencing, hunger and/or homelessness	funds dispersed to local nonprofit and governmental social service organizations through EFSP National Board allocations
Resilience Grants	National Dam Safety Program (NDSP) State Assistance		
	Rehabilitation Of High Hazard Potential Dam (HHPD) Grant Program		
	National Earthquake Technical Assistance Program (NETAP)		
	Multi-State and National Earthquake Assistance (MSNEA)		nonprofit organizations and institutions of higher education that possess the critical skills necessary to develop and implement regional (multi-state) and/or national earthquake risk mitigation activities.

FEMA Preparedness Grants

*In Illinois, IEMA must apply for these funds on behalf of state and local organizations

- Emergency Management Performance Grant
    - Enhancing and sustaining all-hazards emergency management capabilities.

- Tribal Homeland Security Grant
    - Preventing, preparing for, protecting against and responding to acts of terrorism.

- Transit Security Grant
    - Protecting critical public transportation systems (intra-city bus, ferries and all forms of passenger rail) from acts of terrorism.

- Intercity Passenger Rail Grant – Amtrak
    - Protecting Amtrak rail system from acts of terrorism.

- Homeland Security Grant
    - Preventing, preparing for, protecting against and responding to acts of terrorism.

- Nonprofit Security Grant
    - Fund physical security enhancements and activities for nonprofit organizations that are at high risk of a terrorist attack.

- Intercity Bus Security Grant
    - Protecting private operators of intercity over-the-road bus transportation systems from acts of terrorism.

- Port Security Grant
    - Protecting ports from acts of terrorism.

- Assistance to Firefighters Grants
    - Three grant programs focused on enhancing the safety of the public and firefighters in fire-related hazards.

- Presidential Residence Protection Assistance Grant
    - Reimbursements to state and local law enforcement agencies for costs incurred while protecting any non-governmental residence of the president being secured by the United States Secret Service.

- Regional Catastrophic Grant Program
    - Funding for local governments to encourage innovative regional solutions to catastrophic incidents.

- National Earthquake Hazards Reduction Program Grant
    - Funding to support the establishment of earthquake hazards reduction programming and implementation of earthquake safety, mitigation and resilience activities at the local level.

Other Federal Grants

Agency	Program Name	Grants Available (if multiple)	Projects Covered	Who Can Apply
U.S. Dept of Housing and Urban Development	Community Development Block Grant (CDBG) Program	Public Infrastructure, Housing Rehabilitation Program, Economic Development, Disaster Response	Community Based projects in communities that do not receive HUD allocations	Communities/Local government
U.S. Dept of Agriculture	USDA Direct Community Facility Loan & Grant Program	Loan and Grant programs offered for various projects	provides affordable funding to develop essential community facilities in rural areas	Public organizations, community-based non-profits, or federally recognized Tribes in rural areas (less than 20,000 residents
U.S. Dept of Agriculture	Rural Utilities Service Water and Environmental Programs (WEP)		construction of water and waste facilities in rural communities	rural communities with populations of 10,000 or less
U.S. Environmental Protection Agency	Brownfields Program	Brownfields Assessment Grants, Brownfields Revolving Loan Fund (RLF) Grants, Brownfields Cleanup Grants, Multipurpose (MP) Grants, Job Training (JT) Grants, Technical Assistance, Training, and Research Grants, State and Tribal Response Program Grants	Various projects related to assessment, outreach, cleanup and research of Brownfield sites impacted by hazardous materials	Varies by grant, check NOFOs, states, tribes, communities and stakeholders may be eligible
Delta Regional Authority	States' Economic Development Assistance Program (SEDAP)	provides direct investment into community-based and regional projects that address the DRA's congressionally mandated four funding categories	FUNDING PRIORITIES: basic public infrastructure, transportation infrastructure, business development & entrepreneurship, workforce development	Greater Egypt handles DRA applications for Franklin, Jackson, Williamson, and Perry counties *Jefferson County does not qualify for DRA funding
Delta Regional Authority	Community Infrastructure Fund (CIF)	This funding is set aside for physical infrastructure projects, may be used on construction projects for flood control, basic public infrastructure, and transportation infrastructure		Greater Egypt handles DRA applications for Franklin, Jackson, Williamson, and Perry counties *Jefferson County does not qualify for DRA funding
Delta Regional Authority	Public Works and Economic Adjustment Assistance (PWEAA) program.			Greater Egypt handles DRA applications for Franklin, Jackson, Williamson, and Perry counties *Jefferson County does not qualify for DRA funding

Agency	Program Name	Grants Available (if multiple)	Projects Covered	Who Can Apply
U.S. Dept of Transportation	Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grants		Projects for RAISE funding will be evaluated based on merit criteria that include safety, environmental sustainability, quality of life, economic competitiveness, state of good repair, innovation, and partnership. Within these criteria, the Department will prioritize projects that can demonstrate improvements to racial equity, reduce impacts of climate change and create good-paying jobs.	regional and local governments
U.S. Dept of Transportation-pipeline and hazardous materials safety administration	Assistance for Local Emergency Response Training (ALERT)		hazmat response training for volunteer or remote emergency responders.	The ALERT grant is competitively awarded to non-profit organizations capable of delivering an established curriculum to emergency responders.
U.S. Dept of Transportation-pipeline and hazardous materials safety administration	Hazardous Materials Instructor Training (HMIT) Grant		train-the-trainer program that facilitates the training of hazmat instructors who then conduct training in Hazardous Materials Regulations (HMR) for hazmat employees.	competitively awarded to non-profit organizations that satisfy both of the following eligibility requirements: 1) expertise in conducting hazmat employee training programs and 2) capable of reaching a target population of hazmat employees and including them in the training program.
U.S. Dept of Transportation-pipeline and hazardous materials safety administration	Supplemental Public Sector Training (SPST) Grant		a train-the trainer program that facilitates the training of instructors who then conduct training in hazmat response for individuals with a statutory responsibility to respond to hazmat accidents and incidents.	competitively awarded to national non-profit fire service organizations
U.S. Dept of Transportation-pipeline and hazardous materials safety administration	Community Safety (CS) Grant		enhances the capability of communities to prepare for and respond to hazmat accidents and incidents and supports the training of state and local enforcement personnel who are responsible for enforcing the safe transportation of hazmat	competitively awarded to non-profit organizations
U.S. Dept of Transportation-pipeline and hazardous materials safety administration	State Damage Prevention Grants		establish comprehensive state programs designed to prevent damage to underground pipelines	state authority (or municipality with respect to intrastate gas transportation) that is or will be responsible for preventing damage to underground pipeline facilities is eligible as long as 1) the state participates in the oversight of pipeline transportation pursuant to an annual 49 U.S.C. §60105 certification or 49 U.S.C. §60106 agreement in effect with the Pipeline and Hazardous Materials Safety Administration, and 2) is designated by the state's governor, in writing, as the eligible recipient of the grant funding.

Illinois Specific Grants

Agency	Program Name	Grants Available (if multiple)	Projects Covered	Who Can Apply
Illinois Clean Energy Community Foundation	Energy Program	K-12 Solar and Wind Schools Grant, First Responders Resilience Pilot Program, PV for Nature/welcome centers, Solar Thermal, Biomass, Advancing Renewable Energy and Emerging Technology Grants, Net Zero Energy Wastewater Treatment Plant Grants	various, see website	various, see website
IEMA and Illinois Terrorism Task Force	Preparedness and Response (PAR) Grant Program		helps enhance statewide emergency preparedness and response	state agencies, public universities, units of local government, and statewide mutual aid organizations
IEMA	Hazardous Materials Emergency Preparedness (HMEP) - IEMA		funds projects designed to increase effectiveness in safely and efficiently handling hazardous materials incidents	state, territorial, tribal, and local governments that have IEMA approved LEPCs in place
Rebuild Illinois capital infrastructure plan of 2019, IDOT	Rebuild Illinois	Rebuild Illinois Transit Capital Grant Program, Rebuild Illinois for Distressed Communities Grant, Fast-Track Public Infrastructure (FTPI) component	$45 billion worth of investments in roads, bridges, railroads, universities, early childhood centers and state facilities over the next six years	Funding allocated to various groups as laid out in the bill, 3 Grant cycles will open to accept proposals for IDOT projects **cannot find a webpage that lays out all contents of bill with grant application info, some have expired and the new fiscal year openings are not online
IL American Water	ENVIRONMENTAL GRANT PROGRAM	funding for innovative, community-based environmental projects that improve, restore or protect the watersheds, surface water and groundwater supplies in our local communities.	Located within an American Water service area Completed between May and November of the grant funding year Be a new or innovative community initiative, or serve as significant expansion to an existing program.	Local, State, Federal government bodies. 501c certified non profit organizations

IEPA Grants

Agency	Program Name	Grants Available (if multiple)	Projects Covered	Who Can Apply
IEPA	Unsewered Communities	Planning Grant Program, Construction Grant Program	Project planning and construction for unsewered communities to develop and/or update wastewater treatment programs	Local government units
IEPA	Wastewater/Stormwater and Drinking Water Loans	Water Pollution Control Loan Program (WPCLP),Public Water Supply Loan Program (PWSLP)	Our programs provide financial assistance to eligible public or private applicants for the design and construction of a wide variety of projects that protect or improve the quality of Illinois' water resources. We assist applicants with projects that address human health and failing water infrastructure. Eligible projects include new drinking water or wastewater infrastructure construction; upgrading or rehabilitating existing infrastructure; storm water-related projects that benefit water quality; and a variety of other projects that protect or improve the quality of Illinois's rivers, streams, and lakes.	local government and private entities
IEPA	Energy Efficiency at Waste Water Treatment Plants	Public Water Infrastructure Energy Assessments, Waste Water Treatment Plant (WWTP) Energy Efficiency Grant	no-cost energy usage assessments to publicly owned water facilities. The final assessment reports break down recommendations for energy efficiency improvements at each facility and include upfront costs for equipment upgrades or retrofits, estimated time for return of investment, and savings resulting from upgrades and retrofits.	local governments, grant funds available only if municipality has completed an energy assessment within last 5 years
IEPA	Water Quality	Water Quality Management (604b), Nonpoint source Pollution (319), and green infrastructure grants	development of watershed-based plans, outreach/education related to water quality, develop preliminary management practices, implementation of BMPs; (stormwater management, flood control, pollution control, and other projects may be covered)	Greater Egypt applies for water quality grants on behalf of municipalities or other groups in our counties
IEPA	Low Income Residential Energy Efficiency Program	Energy Efficiency Trust Fund (EE Trust Fund)	Building Envelope insulation Window replacement Space heating and cooling equipment retrofit Heating and cooling distribution system retrofit Installation of efficient domestic hot water equipment Lighting upgrades (indoor and/or outdoor) High-efficiency appliance installation/replacement Programmable thermostats installation Energy metering changes	local governments, public housing authorities, other non-profits

Appendix 7: Adopting Resolutions

Resolution # 23-05-02-71

ADOPTING THE WILLIAMSON COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, Williamson County, Illinois recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, Williamson County participated jointly in the planning process with the other local units of government within the County to update the 2015 Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that Williamson County, Illinois hereby adopts the updated Williamson County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Williamson County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS 2nd Day of May, 2023.

Tim Atkisson, Chairman

Jim Marlo, Commissioner

Jim Rasor, Commissioner

Attested by: County Clerk & Recorder

Resolution # 6|23

ADOPTING THE WILLIAMSON COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Village of Bush, Illinois recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the Village of Bush participated jointly in the planning process with the other local units of government within the County to update the 2015 Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Bush, Illinois hereby adopts the updated Williamson County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Williamson County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS 11th Day of June, 2023.

Village President

Village Trustee

Village Trustee

Village Trustee

Village Trustee

Village Trustee

Village Trustee

Village Trustee

Attested by: Village Clerk

Resolution #66-23-574

ADOPTING THE WILLIAMSON COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Village of Cambria, Illinois recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the Village of Cambria participated jointly in the planning process with the other local units of government within the County to update the 2015 Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Cambria, Illinois hereby adopts the updated Williamson County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Williamson County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS 20th Day of June, 2023.

Village President

Village Trustee

Village Trustee

Village Trustee

Village Trustee

Village Trustee

Village Trustee

Attested by: Village Clerk

Resolution # 2023-06-02

ADOPTING THE WILLIAMSON COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Village of Crainville, Illinois recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the Village of Crainville participated jointly in the planning process with the other local units of government within the County to update the 2015 Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Crainville, Illinois hereby adopts the updated Williamson County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Williamson County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS 13th Day of June, 2023.

Ron Mitchell
Village President

Julie Aue
Village Trustee

Sam Jones
Village Trustee

John Oetjen
Village Trustee

Michael Harbin
Village Trustee

Martin Brueyns Jr.
Village Trustee

Kim Rains
Village Trustee

Jaquelyn A. Chapman
Attested by: Village Clerk

VILLAGE OF CRAINVILLE
SEAL
WILLIAMSON COUNTY, IL

Resolution #2023-2

ADOPTING THE WILLIAMSON COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Village of Energy, Illinois recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the Village of Energy participated jointly in the planning process with the other local units of government within the County to update the 2015 Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Energy, Illinois hereby adopts the updated Williamson County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Williamson County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS 23rd Day of May, 2023.

Village President

Village Trustee

Village Trustee

Village Trustee

Village Trustee

Village Trustee

Village Trustee

Village Trustee

Attested by: Village Clerk

Seal of the Village of Energy Est. 1907 The Heart of Southern Illinois

Resolution 11-2023

ADOPTING THE WILLIAMSON COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the City of Herrin, Illinois recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the City of Herrin participated jointly in the planning process with the other local units of government within the County to update the 2015 Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the City of Herrin, Illinois hereby adopts the updated Williamson County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Williamson County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED BY THE City Council of the City of Herrin this 12th day of June, 2023.

Shelly Huggins, Municipal Clerk

NAME	AYE	NAY	ABSTAIN	ABSENT
Alderman Sheila Ahlgren	x			
Alderman David Shoemake	x			
Alderman Randy Crompton	x			
Alderman Paul York	x			
Alderman Steve Miller	x			
Alderman Scott Kinley	x			
Alderman Bill Sizemore	x			
Alderman Marilyn Ruppel	x			

APPROVED by the City Council of the City of Herrin this 12th day of June, 2023.

Steve Frattini, Mayor

ATTEST:

Shelly Huggins, Municipal Clerk

JOHNSTON CITY
WILLIAMSON COUNTY, ILLINOIS

RESOLUTION NO. _05-23_ ___

A RESOLUTION ADOPTING THE WILLIAMSON COUNTY MULTI-HAZARD MITIGATION PLAN

ADOPTED BY
THE CITY COUNCIL AND MAYOR
OF THE
CITY OF JOHNSTON CITY ILLINOIS

THIS _23RD__DAY OF __MAY____, 2023

:

Published in pamphlet form by
Authority of the City Council and
Mayor of the City of Johnston City,
Williamson County, ILLINOIS

THIS 24TH____ DAY OF _MAY___, 2023

RESOLUTION NO. R05-23 _____

A RESOLUTION ADOPTING THE WILLIAMSON COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the City of Johnston City, Illinois recognizes the threat that natural hazards pose to people and property; AND

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; AND

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; AND

WHEREAS, the City of Johnston City participated jointly in the planning process with the other local units of government within the County to update the 2015 Multi-Hazard Mitigation Plan;

NOW THEREFORE, BE IT RESOLVED, that the City of Johnston City, Illinois hereby adopts the updated Williamson County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Williamson County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

APPROVED: Douglas A Dobbins
Douglas Dobbins, Mayor

CITY OF JOHNSTON CITY, ILLINOIS SEAL

Attest: Jade West
Jade West, City Clerk

PASSED THIS 23rd DAY OF MAY, 2023 BY THE CITY COUNCIL OF THE CITY OF JOHNSTON CITY, ILLINOIS.

	Ayes	Nays	Absent	Abstain	Not voting
Alderman Hatfield	X				
Alderwoman Willis	X				
Aldernan Emery	X				
Alderman Peebels			X		
Alderman Hoffard	X				
Alderman Carmickle	X				
Alderwoman Davis	X				
Alderman Kee	X				
Mayor Dobbins					X

Approved this 23rd day of MAY, 2023

SEAL

Douglas Dobbins, Mayor

ATTEST

Jade West, City Clerk

Resolution 2023-11

ADOPTING THE WILLIAMSON COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the City of Marion, Illinois recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the City of Marion participated jointly in the planning process with the other local units of government within the County to update the 2015 Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the City of Marion, Illinois hereby adopts the updated Williamson County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Williamson County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS 22nd Day of May, 2023.

Mayor

City Council Member

City Council Member

City Council Member

City Council Member

Attested by: City Clerk

Resolution # 2023-15

ADOPTING THE WILLIAMSON COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Village of Pittsburg, Illinois recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the Village of Pittsburg participated jointly in the planning process with the other local units of government within the County to update the 2015 Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Pittsburg, Illinois hereby adopts the updated Williamson County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Williamson County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS 12th Day of June, 2023.

Village President

Village Trustee

Village Trustee

Village Trustee

Village Trustee

Village Trustee

Village Trustee

Attested by: Village Clerk

Resolution # 683

ADOPTING THE WILLIAMSON COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Village of Stonefort, Illinois recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the Village of Stonefort participated jointly in the planning process with the other local units of government within the County to update the 2015 Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Stonefort, Illinois hereby adopts the updated Williamson County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Williamson County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Emergency Management Agency and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS 15th Day of May, 2023.

Village President

Village Trustee

Village Trustee

Village Trustee

Village Trustee

Village Trustee

Village Trustee

Attested by: Village Clerk