WASHINGTON COUNTY, ILLINOIS

MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

June, 2023

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EXECUTIVE SUMMARY

Goals and Objectives

Communities strive to protect the well-being and safety of their citizens. A hazard mitigation plan (HMP) begins by identifying natural hazard risks and physical and social vulnerabilities in order to understand disaster risk within a community. Mitigation plans are then developed by the community to lessen the impacts of hazards to its citizens and infrastructure.

The *Washington County Multi-Jurisdictional Hazard Mitigation Plan* identifies risks to Washington County, Illinois, and its jurisdictions from natural hazards, and presents hazard mitigation goals and actions that will reduce the risk for loss of life and property damage in the short and long-term future. This is the first hazard mitigation plan developed for Washington County.

Jurisdictions must approve and adopt a hazard mitigation plan to be eligible to receive mitigation grant funding from the Federal Emergency Management Administration (FEMA). With funding from the federal government, communities have the opportunity to implement mitigation projects that may otherwise be financially difficult. This plan enables all participating communities to be eligible for hazard mitigation grant programs administered by FEMA: Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA) Program, and Building Resilient Infrastructure & Communities (BRIC).

Community Participation

Community input is essential for creating a successful mitigation plan. The criteria that would constitute satisfactory jurisdictional participation in the planning process are listed below:

1. Attend a minimum of 1 meeting
2. Submit a list of relevant community documents
3. Confirm hazards that directly affect the community
4. Confirm the list of critical facilities submitted by HAZUS
5. Develop goals for the community
6. Develop and prioritize mitigation actions for the community
7. Host opportunities for public involvement
8. Review and comment on draft plan

Table 1 shows the jurisdictions participating in the 2023 *Washington County Multi-Jurisdictional Hazard Mitigation Plan*.

Table 1. Participation by community in 2023 Washington County Hazard Mitigation Plan.

Jurisdiction	Attend 1 meeting	Risk Assessment	Mitigation Projects	Capability Assessment
Washington County	Y	Y	Y	Y
Addieville	Y	Y	Y	Y
Ashley	Y	Y	Y	N
Du Bois	Y	Y	Y	N
Hoyleton	Y	Y	Y	N
Irvington	Y	Y	Y	N
Nashville	Y	Y	Y	N
New Minden	Y	Y	Y	Y
Oakdale	Y	Y	Y	N
Okawville	Y	Y	Y	Y
Radom	Y	Y	Y	N
Richview	Y	Y	Y	N
Venedy	Y	Y	Y	Y
Wamac	Y	Y	Y	N

Risk Assessment

Risk assessments help jurisdictions identify hazards that could adversely affect their community. Representatives for Washington County's communities were asked to assess the risk of seventeen hazards – dam failure, drought, earthquake, extreme cold, extreme heat, flash flooding, riverine flooding, hazardous materials (HazMat) spill, mine subsidence, pandemic, severe storms, severe winter storms, tornado, and wildfire – affecting their community using hazard profiles – affecting their community using hazard profiles (see Hazard Profiles and Risk Analysis) and their personal experiences.

The overall risk of the hazards was measured by taking into account their probability and severity using the following equation:

Risk (R) = Probability (P) x Severity (S)

The top five hazards identified by Washington County were tornado, severe storms, pandemic, severe winter storms, and extreme heat (*Table 2*). The details of these hazards – how they affect residents and the built community, and historic and projected occurrences – are discussed in Risk Assessment.

Table 2. Risk of natural hazards identified by jurisdictions in Washington County.

Hazard	Average risk	Risk rank
Tornado	13.4	1
Severe storms	12.6	2
Pandemic	11.9	3
Severe winter storms	9.4	4
Extreme heat	8.0	5
Extreme cold	7.3	6
Earthquake	7.1	7
HazMat spill	6.7	8
Drought	6.5	9
Flash floods	4.1	10
Mine subsidence	2.9	11
Wildfire	2.4	12
Riverine flooding	2.0	13
Dam failure	1.4	14

Mitigation Projects

Mitigation projects help jurisdictions reduce the risk of their community being adversely affected by natural hazards. Representatives for Washington County's communities came up with mitigation projects for their communities based on their risk assessment and knowledge of their community's needs. Mitigation projects for the county and each jurisdiction are found in Mitigation Actions.

Capability Assessment

Capability assessments evaluate the capabilities and resources that a community already has at their disposal to reduce hazard risks. Capability assessments for jurisdictions across Washington County can be found in Appendix A: Capability Assessment.

Plan Implementation

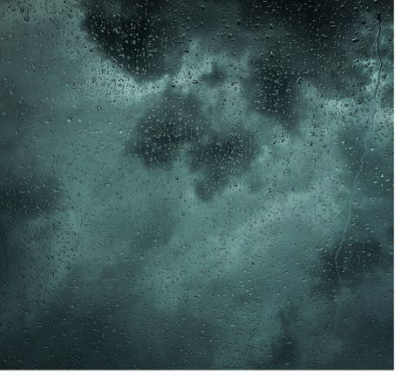
Each participating jurisdiction was required to pass a resolution to adopt the plan.

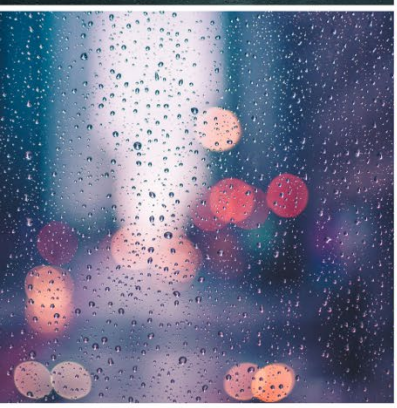
PLAN FINANCING AND PREPARATION

The Washington County Emergency Management Agency (EMA), the Southwestern Illinois Metropolitan and Regional Planning Commission (SIMAPC), and the Prairie Research Institute – Illinois State Water Survey (ISWS), partnered together to prepare this hazard mitigation plan. The EMA assisted in the process by providing meeting space and outreach to local municipalities. SIMAPC provided local planning information, outreach to local municipalities, organizing and facilitating meetings, tracking the grant match, and assisting with other grant administration tasks. ISWS was responsible for managing the planning process, developing the risk assessment, facilitating the mitigation action and strategy development, and preparing the final plan document.

Through participation of these agencies as well as participation, input, and assistance from Washington County Planning Committee members and public, the 2023 Hazard Mitigation Planning process for Washington County was successful.

This plan was prepared using funding from FEMA's Pre-Disaster Mitigation Grant program. The funding consisted of a 75% Federal Share with a 25% cost share. The cost share was provided through participation and time of those on the Steering Committee, the Washington County EMA, as well as in-kind services provided by ISWS.





SECTION 2

PLANNING PROCESS

INTRODUCTION

The Illinois State Water Survey (ISWS) collaborated with the Washington County Emergency Management Agency (EMA) and the Southwestern Illinois Metropolitan and Regional Planning Commission (SIMAPC) to create the 2023 *Washington County Multi-Jurisdictional Hazard Mitigation Plan*. ISWS, SIMAPC, and the EMA encouraged participation by jurisdictional government officials, stakeholders, and the public in the planning process. All thirteen communities participated in the planning process (see *Table 1*).

Community participation is the foundation for an effective HMP. Participation demonstrates a commitment to reduce risks from natural hazards to life and property within a community. HMPs serve as a strategic guide for local officials and other decision-makers as they plan hazard mitigation projects.

HMPs enable the county and jurisdictional governments to:

- Identify actions for risk reduction that are agreed upon by stakeholders and the public.
- Focus resources on the greatest risks and vulnerabilities.
- Build partnerships by involving citizens, organizations, and businesses.
- Increase education and awareness around hazards and their risks.
- Communicate priorities to State and Federal officials.
- Align risk reduction with other state or community objectives.
- Be eligible to apply for FEMA mitigation project grants.

These three guiding principles serve to ensure that the plan is designed to effectively assist Washington County and its jurisdictions in achieving their mitigation goals:

- **Focus on the mitigation strategy.** The mitigation strategy is the plan's main purpose. All other sections contribute to and inform the mitigation strategy and specific hazard mitigation activities.
- **Process is as important as the plan itself.** The plan is only as good as the process and people involved in its development. The plan also serves as the written record of the planning process.
- **This is your community's plan.** To have value, the plan must represent the current needs and values of the community and be useful for local officials and stakeholders. The plan shall be developed in a way that best serves your community's purpose and people.

The following sections detail the process through which the 2023 *Washington County Multi-Jurisdictional Hazard Mitigation Plan* are documented in the plan itself which serves as a written record of the plan-making process. The plan must represent the current needs and values of the community and be useful for local officials and stakeholders. The plan shall be developed in a way that best serves your community's purpose and people.

The planning process involved coordination between ISWS, SIMAPC, and the EMA. ISWS and SIMAPC undertook the organization of resources and the building of the planning team and created the strategy for community outreach. The EMA also provided community outreach and reserved meeting spaces.

PLANNING AND STEERING COMMITTEES

Planning Committee

The Washington County Hazard Mitigation Planning Committee consisted of representatives from ISWS, SIMAPC, and the Washington County EMA (*Table 3*). Members had expertise in urban planning, spatial analysis, hazard mitigation, emergency management, and floodplain management. Planning Committee members attended every planning committee and steering committee meeting.

Table 3. Washington County Planning Committee.

Planning Team	Organization	Title
Matthew Bierman	Washington County Emergency Management Agency (EMA)	Director
Linda Tragesser	Southwestern Illinois Metropolitan and Regional Planning Commission (SIMAPC)	Community and Regional Planner
Camden Arnold	Illinois State Water Survey (ISWS)	Hazard Mitigation Planner
Sutapa Banerjee	ISWS	Hazard Mitigation Planning Intern
Lisa Graff	ISWS	Program Manager
Rebecca Leitschuh	ISWS	Planning and Outreach Specialist
Brad McVay	ISWS	GIS Specialist
Shanay Patel	ISWS	Academic Research Associate
Meirah Williamson	ISWS	Scientific Specialist
Zoe Zaloudek	ISWS	Geospatial Application Developer

Steering Committee

The plan-making process was designed to be inclusive and tailored to the county and individual communities. Local and county officials, fire and police departments, hospital representatives, among others, were invited to be a part of the Steering Committee (*Table 4*). Steering Committee members were invited to attend every Steering Committee meeting (see Appendix B: Meeting Documents for attendance records).

Table 4. Washington County Steering Committee.

Name	Community/Agency	Title
Doug Boecklen	*Addieville, Village of*	Mayor
Ryan Wiedwilt	*Addieville, Village of*	Fire Chief
Ross Schultze	*Ashley, City of*	Retired ISP/Ashley Fire Board
Kevin Woolever	*Ashley, City of*	Alderperson, Ambulance Crew Chief
Christian Bennett	*Du Bois, Village of*	Village President
Chris Klaybor	*Du Bois, Village of*	Village Clerk
Raymond Klaybor	*Du Bois, Village of*	Trustee
Josh Holle	*Hoyleton, Village of*	Village President
Ryan Kees	*Hoyleton, Village of*	Captain, Hoyleton Fire Protection District
Waylon Livesay	*Hoyleton, Village of*	Public Works Supervisor
Tim Renth	*Hoyleton, Village of*	Village President
Marc Heinzmann	*Irvington, Village of*	Chief of Police
Gera Simms	*Irvington, Village of*	Village President
Ray Kolwier	*Nashville, City of*	Mayor
Brian Fletcher	*Nashville, City of*	Chief of Police
Brock Styninger	*Nashville, City of*	Lieutenant, Nashville PD
Candy Cross	*New Minden, Village of*	Village President
Cecil Alfeldt	*Oakdale, Village of*	Village President
Keith Senior	*Okawville, Village of*	Superintendent, West Washington County Unit District Board
Dave Jasper	*Okawville, Village of*	Village President
Steve Milliken	*Okawville, Village of*	Chief of Police
Larry Wachowski	*Radom, Village of*	Village President
Kayla Pedtke	*Radom, Richview, Village of*	Treasurer
Melody Turner	*Richview, Village of*	Village President
Butch Mathus	*Wamac, City of*	Mayor
Philip Leadendecker	*Venedy, Village of*	Village President
Gerald Brockmeier	*Washington County*	Chairman, Washington County Planning Commission
Drew Bauer	*Washington County*	Washington County Sheriff's Office
David Meyer	*Washington County*	Washington County Board Chairman
John Felchlia	*Washington County*	Washington County Ambulance
Stacie Hodge	*Washington County*	Washington County Hospital
Sharon Mewes	*Washington County*	Washington County Assessor
Kiefer Heiman	*Washington County*	County Engineer, Washington County Highway Department
Gene Lamczyk Jr.	*Washington County*	Washington County Board EMA Committee Chair
Kate Muenter	*Washington County*	Washington County Board EMA Committee Chair
Vic Shubert	*Washington County*	Washington County Board EMA Committee Chair
Jamie Beaver	*Other*	Red Cross Disaster Program Coordinator
Jeff Oelze	*Other*	Oil industry
Kevin Brink	*Other*	NOTS Logistics/Industry
Mark Maue	*Other*	Prairie State Energy Campus
Sharon Frederking	*Other*	Washington County Health Department (retired)
Sherri Bassen	*Other*	South Central Transit

TIMELINE AND MEETINGS

Timeline

The internal plan-making process started with team building and organizing resources within ISWS and SIMAPC. Next, ISWS and GWRPC developed a community outreach strategy aimed at identifying community goals, capabilities, and local resources. Risk and capability assessments were given to and filled out by jurisdictions and returned to ISWS. Communities were then contacted for one-on-one meetings to develop hazard mitigation projects. At the final meeting, a HMP maintenance strategy was created to ensure that communities reviewed their mitigation goals annually. The plan was submitted to the Illinois Emergency Management Agency (IEMA) on March 9, 2023 and the Federal Emergency Management Agency (FEMA) on April 14, 2023. The 2023 *Washington County Multi-Jurisdictional Hazard Mitigation Plan* is expected to be adopted by September 2023. See *Table 5* for more details about the project timeline.

Table 5. Timeline of tasks, actions, deliverables, and meetings.

DESCRIPTION OF TASK	START DATE	END DATE	LEAD	ACTIONS	MEETING(S)
Organize resources and build planning team	1/25/2021	3/25/2021	SIMAPC	Identify planning team member agencies, roles, collect community plans and ordinances	March-April 2021
Create outreach strategy	2/15/2021	3/15/2021	SIMAPC	**Meeting 1**	March-April 2021
Assess community capabilities	3/1/2021	4/30/2021	ISWS	Final call for local plans, review of content of local plans	March-August 2021
Conduct risk and capability assessments	5/1/2021	9/30/2021	ISWS	Finalize hazard inventory data collection, historic weather data **Meeting 2**	August 2021-November 2022
Identify mitigation goals and projects	8/1/2021	11/30/2021	ISWS	Create a list of potential mitigation **Meeting 3**	March-November 2022
Develop action plan for implementation	12/1/2021	1/31/2022	ISWS		November-December 2022
Identify plan maintenance strategy	2/1/2022	3/1/2022	SIMAPC		December 2022
Review final draft and open for public comment	3/1/2022	4/30/2022	ISWS	Send plan to SIMAPC, Washington County jurisdictions **Meeting 4**	December 2022
Submit plan to State and FEMA	5/1/2022	8/31/2022	ISWS		November-December 2022
Local adoption of plan; send to IEMA	9/1/2022	12/31/2022	SIMAPC		January-May 2023

Meetings

Planning committee members were identified and invited to planning committee meetings held on January 27, 2021, March 10, 2021, March 29, 2021, June 2, 2021, July 26, 2021, and April 27, 2022. These meetings were

designed to prepare for the four steering committee meetings and to tackle administrative tasks. Brief summaries of the steering committee meetings are provided below. Meeting agendas, minutes, and sign-in sheets can be found in Appendix B: Meeting Documents. A website (https://www.illinoisfloodmaps.org/washingtonHMP.aspx) was created for this project which housed all the relevant documents of the Washington County Hazard Mitigation Project for ease of access and a brief explanation of the process.

Meeting 1: Hazard Mitigation Planning Kick-off – April 21, 2021

ISWS, SIMAPC, and the Washington County EMA went over the purpose of a hazard mitigation plan, what hazard mitigation is, the participation requirements for communities, and the benefits of participating in the plan.

Meeting 2: Hazard Profiles and Risk Assessment – August 25, 2021

ISWS reviewed hazards that may impact Washington County, identified community vulnerabilities that might affect risk, and discussed the history of hazards in the area. The Illinois State Climatologist discussed the importance of integrating climate change into mitigation planning. The Illinois National Flood Insurance Program (NFIP) Coordinator discussed the benefits of joining the NFIP. ISWS concluded the meeting overviewing the risk assessment and asking all jurisdictions to fill out and return a completed one before the next meeting.

Meeting 3: Mitigation Goals and Strategies – January 19, 2022

ISWS and the Illinois Extension provided example mitigation project ideas to reduce hazard risk in Washington County, emphasizing FEMA fundable and low- to no-cost projects. ISWS overviewed the mitigation project grid and announced that they would be reaching out to communities for one-on-one meetings to develop hazard mitigation projects.

Following the third meeting, ISWS scheduled one-on-one meetings with participating jurisdictions in Washington County to discuss active mitigation projects and develop new mitigation projects to enhance disaster preparedness. All 13 communities and the county (see Table 1) met with ISWS over video or phone call.

Meeting 4: Review of Hazard Mitigation Plan – December 8, 2022

ISWS and SIMAPC invited the steering committee and the public to review the 2023 *Washington County Multi-Jurisdictional Hazard Mitigation Plan* and provide comments at a public meeting. ISWS emphasized the importance of plan maintenance and developed a strategy with the Washington County EMA to check-in with communities every year when grant opportunities from IEMA become available. SIMAPC agreed to draft plan adoption documents and send them to communities once the HMP was approved.

PUBLIC INVOLVEMENT

Public participation is an integral part of the hazard mitigation planning process. Unfortunately, due to the COVID-19 pandemic declared by the World Health Organization in March 2020, in-person opportunities to solicit public input for the plan were not as robust as initially intended as in-person meetings were not permitted in 2020 or the majority of 2021.

An internet survey was open from August 18, 2021 through October 31, 2021, to collect the public's opinions on hazards and their community's vulnerability to them. Five residents of Washington County completed this survey. A summary of results can be found in Appendix C: Public Survey Results.

A web map was created to collect comments from community officials and the public. Users were encouraged to mark the locations of critical facilities, roads or areas that frequently flood, places of community or historical significance, mitigation ideas or successes, or any other place that felt important to the mitigation planning process. Between August 25, 2021 and August 25, 2022, the map was viewed 148 times by 15 unique users. Two users left a total of 41 comments regarding critical facility locations, roads or areas that frequently flood, and places of community importance (see *Figure 1*, https://www.illinoisfloodmaps.org/hmp/washington.htm).

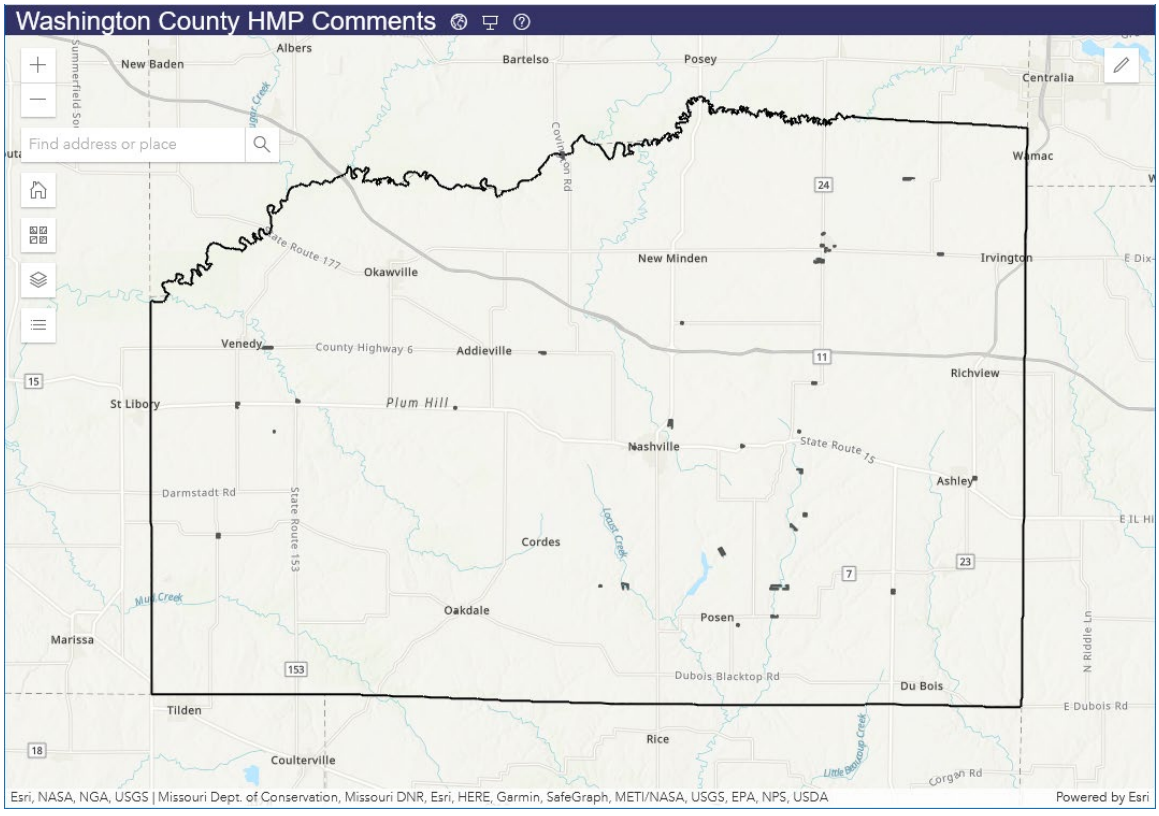


Figure 1. Screenshot of interactive Washington County comment web map. Polygons represent comment locations.

A public meeting was held on December 8, 2022 to review and allow the public to comment on the county's draft HMP. Public notifications were distributed by the Washington County EMA and local community leaders. Appendix B: Meeting Documents contains the minutes from this public meeting.

REVIEW OF TECHNICAL DOCUMENTS

To prepare the *2023 Washington County Multi-Jurisdictional Hazard Mitigation Plan*, a literature review was undertaken of several technical documents written by or for Washington County (*Table 6*). Elements of these documents were incorporated into the HMP in order to align hazard mitigation with the county's current capabilities and development goals.

Table 6. Review of technical documents.

Plan	Year	Element
Washington County Comprehensive Plan	2016	Community vision and profile
Washington County Strategic Plan	2019	Identify goals and partners to improve disaster response
Washington County Disaster Recovery Plan (DRP)	2021	Post-disaster redevelopment strategy
Washington County Emergency Operations Plan (EOP)	2021	Assess vulnerability and actions to protect people and property
*Washington County **I**llinois **C**apability and **A**ssessment **T**HIRA (Threat and Hazards Identification Risk Assessment) **T**ool (**ILCATT**)*	2021	Identify and assess disaster risk and capability

The *2016 Washington County Comprehensive Plan* lays the groundwork for physical development in Washington County in a manner that incorporates the county's vision and promotes economic growth. See Community Vision for more information about this plan.

The *2019 Washington County Strategic Plan* outlines community outreach initiatives which include a system that allows citizens to self-report damage from hazards.

The *2021 Washington County Disaster Recovery Plan (DRP)* is the primary resource for post-disaster recovery. The purpose of the plan is to provide for efficient coordination and policy guidance during the disaster recovery process. The plan discusses short-term recovery strategies and long-term priorities as well. The roles and responsibilities of the Recovery Task Force tasked with assisting the Washington County EMA are also outlined in this document. The *DRP* recommends preparing a post-event redevelopment strategy that protects financial obligations related to existing redevelopment areas, seek new financing for reconstruction and redevelopment, streamlines redevelopment expansion procedures and coordinates with other town, county, state, and federal entities. The *DRP* includes a checklist of tasks to be carried out in preparation for disaster events and recommends a review of existing building codes.

The *2021 Washington County Emergency Operations Plan (EOP)* addresses a broad range of natural hazards, technological hazards, and human-induced hazards accidental and intentional, that could adversely impact Washington County's people, property, environment, or economy. The principal concern is the emergency response phase, from the onset of threat or emergency conditions, through the initial transition to the recovery period.

The *EOP* outlines several goals to be prioritized in emergencies. These include but are not limited to:

- Prevent or respond to damage to significant damage to the department's facilities or equipment or threats to the safety of personnel
- Prevent or restore disruptions to essential operations

- Each year an exercise will be conducted to determine revisions needing to be made to improve response and recovery operations

The *EOP* also considers special needs residents including the developmentally disabled and the elderly. Moreover, the document also describes the organization of command centers during times of crisis. Readily available access to communications via local radio stations and newspapers (e.g., Radio WNSV, Nashville News, Okawville Times) and social media is highlighted in the *EOP* as a way to keep people informed during a disaster.

The *EOP* also delineates strategies to aid emergency operations and relief efforts. These strategies are augmented by a nuanced understanding of local vulnerabilities such as HazMat spills and large-scale infrastructural damage.

PLAN ADOPTION

FEMA outlines adoption mechanisms for both single-jurisdictional plans as well as multi-jurisdictional plans. The plan shall include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council).

Adoption by the local governing body demonstrates the community's commitment to implementing the mitigation strategy and authorizes responsible agencies to execute their actions. For final approval, the community must adopt the plan and send documentation to IEMA, which is responsible for forwarding this documentation to FEMA Region 5. See **Appendix G: FEMA Approval & Adoption Resolutions.**

The Washington County Multi-Jurisdictional Hazard Mitigation Plan for 2023-2028 was adopted by the Washington County Board on May 25, 2023. The plan received approval on June 9, 2023 The plan is active for five years following the approval date. The plan will expire on June 8, 2028. A full update must be completed within five years to maintain Hazard Mitigation Assistance funding eligibility.

PLAN MAINTENANCE

The plan maintenance process is designed to provide:

- A description of the method and schedule for monitoring, evaluating, and updating the mitigation plan within a five-year cycle
    - **Plan monitoring**: A method and schedule for regular monitoring would ideally include reports or other deliverables and expectations for meeting attendance. Monitoring, therefore, becomes part of the regular administrative function of the offices or positions to which it is assigned.
    - **Plan evaluation**: Evaluation of the plan may not occur as frequently as plan monitoring, but it is a critical step to ensure that the plan continues to serve its purpose effectively. At a minimum, communities are required to convene the planning team annually to evaluate the plan's effectiveness and to prepare a report for their governing bodies that demonstrates progress to date.
- A description of how local jurisdictions can incorporate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate
- A discussion on how the community will continue public participation in the plan maintenance process

Monitoring, Evaluating, and Updating the Plan

Throughout the five-year planning cycle, the Washington County EMA will reconvene the HMP Planning Committee to monitor, evaluate, and update the plan on an annual basis. The annual meeting will be initiated by the Washington County EMA and will occur when IEMA sends out the annual solicitation for mitigation grant applications, typically in September.

Members of the planning committee are readily available to engage in email correspondence between annual meetings. If the need for a special meeting, due to new developments or a declared disaster occurs 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.

The committee 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 committee will also review the risk assessment portion of the plan to determine if this information should be updated or modified. 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 HMP 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 county commissioners. An additional meeting will be held in 2027 to address the five-year update of this plan.

The GIS data used to prepare the plan was obtained from existing county GIS data as well as data collected as part of the planning process. The updated Hazus GIS data has been returned to the county for use and maintenance in

the county's system. As newer data becomes available, this updated data will be used for future risk assessments and vulnerability analyses.

Implementation through Existing Programs

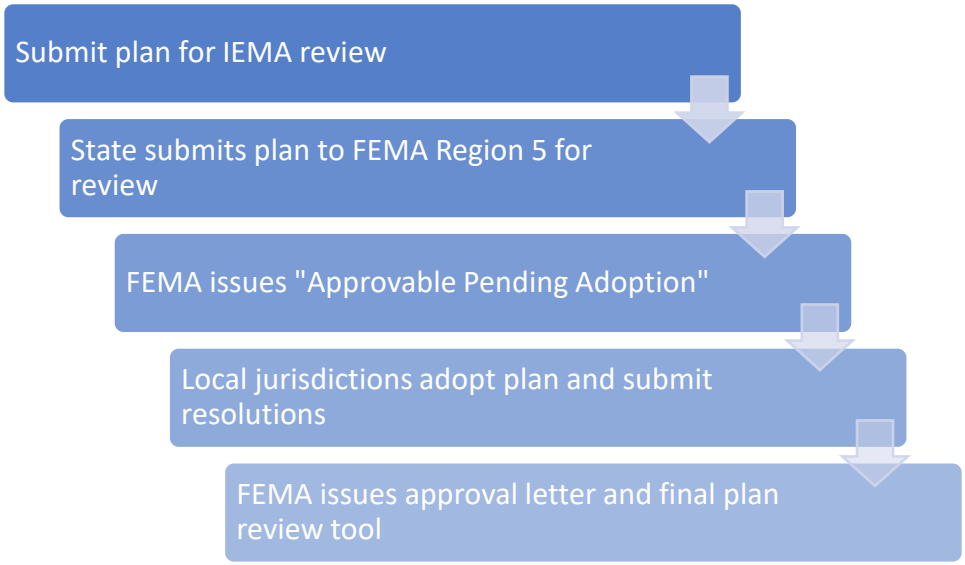
The results of this plan will be incorporated into ongoing planning efforts since many of the mitigation projects identified as part of this planning process are ongoing. Washington County and its incorporated jurisdictions will update the zoning plans and ordinances as necessary and as part of regularly scheduled updates. Each community will be responsible for updating its own plans and ordinances.

Continued Public Involvement

Continued public involvement is critical to the successful implementation of the HMP. Comments from the public on the HMP will be received by the EMA director and forwarded to the HMP planning committee for discussion. Education efforts for hazard mitigation will be ongoing through the EMA. The public will be notified of periodic planning meetings through notices in the local newspaper and on the Washington County EMA Facebook page. Once adopted, a copy of this plan will be maintained in each jurisdiction and in the County EMA Office.

REVIEW PROCESS

Once the state is satisfied that the plan meets the requirements, the State Hazard Mitigation Officer (SHMO) will forward the plan to FEMA Region 5 for review and approval. FEMA will conduct its review within 45 days and provide a completed *Local Mitigation Plan Review Tool* to the state. The process is outlined below:



Approvable Pending Adoption: To fast-track the approval process, FEMA encourages communities to submit the final draft of the HMP to IEMA and FEMA for review before formal adoption by the communities' authorized governing bodies. This will allow for revisions to be made to the plan if required by FEMA.

Plan approval: Upon receiving the record of adoption for each community IEMA, FEMA will issue an official approval letter deeming communities eligible for FEMA Hazard Mitigation Assistance programs. FEMA also sends a final *Local Mitigation Plan Review Tool* that provides feedback on the strengths of the HMP, recommendations for improvements to the HMP during future updates, and suggestions for implementing mitigation strategies.

SECTION 3

COUNTY PROFILE

BACKGROUND

Overview

Washington County is a rural county located in southwestern Illinois. Named after George Washington, Washington County was formed out of St. Clair County in 1818, with its current boundaries being established in 1824. The county is approximately 564 square miles and contains 14 municipalities (*Figure 2*) and 16 townships. The City of Nashville was established as the county seat in 1831 and is the largest community in the county. The City of Centralia and the City of Wamac are partially located in Washington County. Wamac participated in this HMP; Centralia participates in neighboring Marion County's HMP.

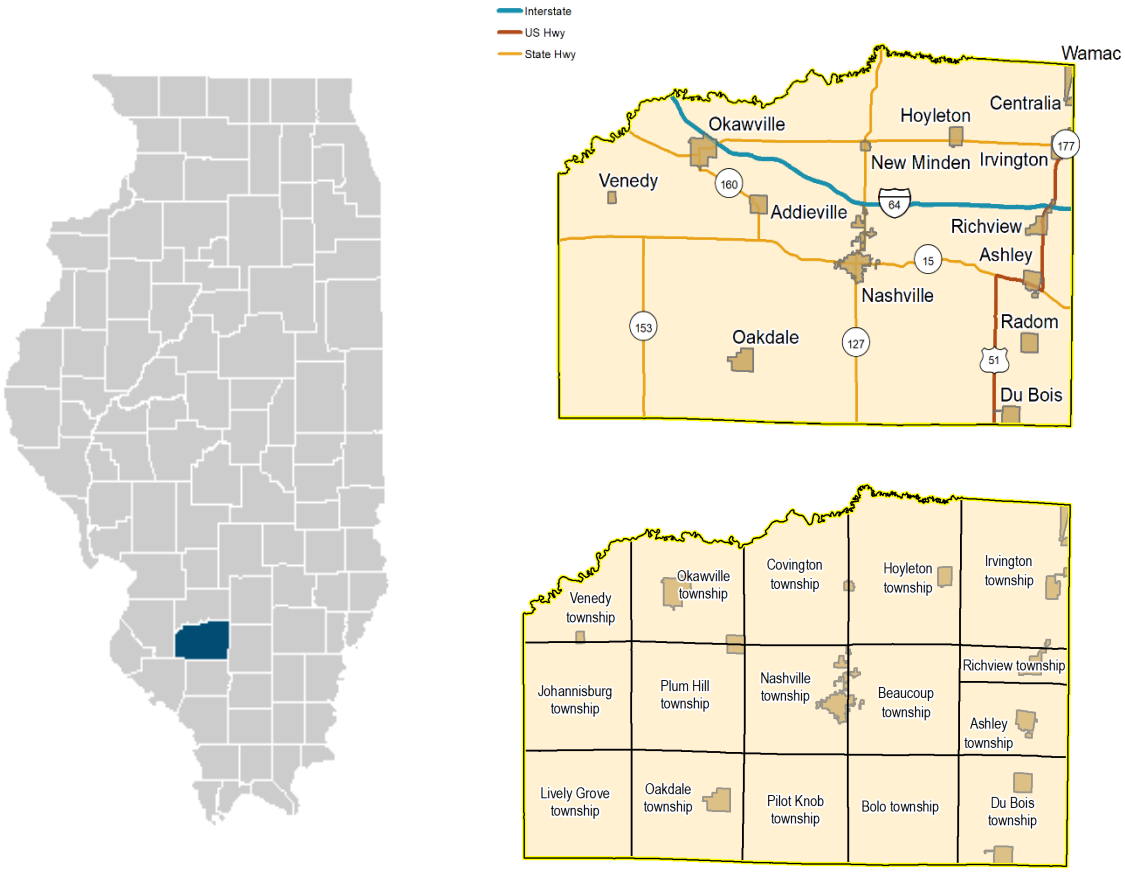


Figure 2. Washington County and jurisdictions.

Neighboring and Special Districts

Washington County is bordered by six Illinois counties:

- **Clinton County:** Situated to the north of Washington County, Clinton County is home to the largest man-made lake in Illinois, Lake Carlyle. The City of Carlyle is the county seat, and the county population is 36,899.[1] Clinton County is part of the St. Louis Metropolitan Statistical Area.
- **Jefferson County:** This county located to the east of Washington County is home to 37,113 people.[2] Jefferson County contains the Mount Vernon, IL Micropolitan Area. It is situated in the southern portion of the region known locally as "Little Egypt."
- **Marion County:** Marion County is an Illinois county sharing the northeastern border of Washington County and has a population of 37,729.[3] Its county seat is the City of Salem and its largest city is the City of Centralia, the latter of which spans Clinton, Jefferson, Marion, and Washington counties.
- **Perry County:** Bordering Washington County and Jefferson County to the south, Perry County has a resident population of 20,945.[4] The county seat is the City of Pinckneyville.
- **Randolph County:** Located southwest of Washington County, Randolph County contains the Village of Kaskaskia, Illinois's first capital. Due to its historical significance in the foundation of Illinois, the county motto is "Where Illinois Began." The county seat is the City of Chester and the county population is 30,163.[5]
- **St. Clair County:** The oldest county in Illinois, St. Clair County is located to the west of Washington County. Its western border is formed naturally by the Mississippi River. St. Clair County is the ninth-most populous county in Illinois with 257,400 residents.[6] Its county seat is the City of Belleville. St Clair County is part of the St Louis Metropolitan Statistical Area.

Washington County is served by six school districts:

- Ashley Community Consolidated School District (CCSD) #15
- Irvington CCSD #11
- Nashville CCSD #49
- Nashville Community High School District (CHSD) #99
- Oakdale CCSD #1
- West Washington County Community Unit District (CUD) #10

Washington County is served by 10 fire protection districts (*Table 7*). With the exception of the Centralia Fire Protection District, all fire protection districts are staffed entirely by volunteers. ISO fire ratings, also referred to as fire scores, rate fire protection districts on a scale of 1 to 10 to indicate how a fire department is able to protect its community. A score of 1 is the best score a fire protection district can receive while a score of 10 is the worst score. *Table 7* shows city and rural ISO fire ratings for districts that serve Washington County. City ISO scores refer to the ability of a fire protection district to serve an area with fire hydrants while rural ISO scores refer to areas without fire hydrants.

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[1] US Census Bureau. “Quick Facts”. Retrieved February 14, 2022, from https://census.gov/quickfacts
[2] Ibid
[3] Ibid
[4] Ibid
[5] Ibid
[6] Ibid

Table 7. Fire protection districts and ISO scores.

Fire Protection District	City ISO	Rural ISO
Addieville	-	6
Ashley	-	6
Centralia	5	8
Coulterville	-	-
Hoyleton	-	7
Irvington	-	5
Marissa	-	3
Nashville	3	6
Okawville	-	5
St. Libory	-	5
Tilden	-	5

Community Vision

The Washington County Comprehensive Plan was prepared in 2016 by a planning committee, made up of community members, and the Southwestern Illinois Metropolitan and Regional Planning Commission (SIMAPC). A product of individual citizen, municipality, taxing body, and other organizational input, the purpose of the plan was to allow county and municipal officials, developers, and the general public to make effective and informed decisions with respect to physical development in the county. The planning committee developed a vision statement for the county:

"Washington County enjoys a diverse, stable economy while embracing and preserving our rich agricultural heritage. Agriculture is our primary industry, but we accommodate growth by conscientiously managing the way new development should occur while preserving our rich farmland, natural resources and woodlands; carefully exploiting our important energy reserves; and maintaining a diverse approach to create a range of employment opportunities and available housing. We value our youth, honor our seniors, and support our families, with a desire for all to thrive in a safe, pristine environment as one of the premier rural counties in Illinois." [7]

To achieve the 2036 vision, the planning committee laid out ten county-wide goals containing specific objectives that could be translated into policy changes. The goals are listed below:

1. Cooperative Planning
   Washington County will work closely with the various local jurisdictions within the County to achieve a shared community vision for the region.
2. Quality of Life
   Preservation of the rural and small-town atmosphere of the County, characterized by an attractive and healthy environment while being open to opportunities to expand the County's economy and tax base.
3. Agricultural Preservation
   Support the conservation, protection, development, and improvement of prime agricultural land to produce foods, fiber, and other agricultural products.
4. Development Patterns
   To encourage development that can be adequately served by transportation facilities, community facilities, public utilities and other urban services and amenities.
5. Employment
   Promote the spirit of growth and the development of the local employment base to diversify the area's economy to provide for personal income growth by using all economic development tools available.

[7] Southwestern Illinois Planning Commission. (2016). *Washington County Comprehensive Plan*.

6. Housing
   Support and promote the availability of a variety of housing types within Washington County that are based on the needs of residents.
7. Transportation
   Continue to provide safe, efficient transportation systems compatible with adjacent land use.
8. Natural Resources
   All development decisions shall consider the conservation and wise use of our air, soil, water resources and the natural environment of Washington County.
9. Historic Preservation
   Continue to protect and maintain local historic and cultural resources that contribute to the character of Washington County.
10. Citizen Participation
    Promote and encourage citizen participation in planning the physical development of the County by assuring that citizen input is invited and welcome in the process.

Geographic Profile

Located in the Southern Till Plain biome, which is characterized by high clay content soils, the majority of Washington County is covered by cropland interspersed with deciduous forests and pasture. Developed urban areas are concentrated in Nashville, Okawville, and the Prairie State Energy Campus southwest of Lively Grove. Nashville and Okawville are located on tributaries of the Kaskaskia River, which marks the northern boundary of the county, with woody wetlands sprouting along its course (*Figure 3*). A major tributary of the Mississippi River, the Kaskaskia River flows southwesterly for 325 miles across Illinois.[8] It is home to an abundance of fish species and wildlife.

[8] USACE. "Kaskaskia River Project". Retrieved May 18, 2022, from https://www.mvs.usace.army.mil/Missions/Recreation/Kaskaskia-River-Project/History/

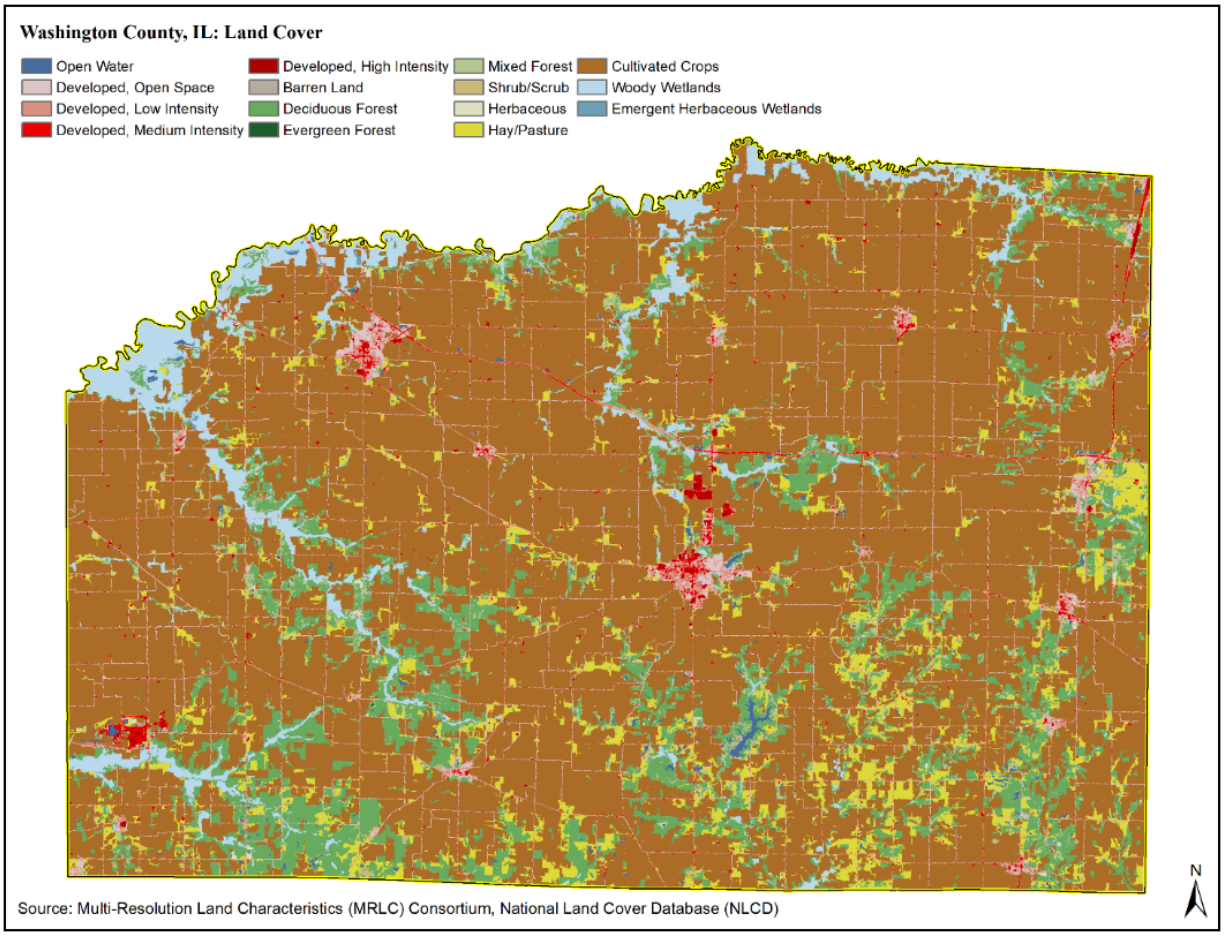

Figure 3. Land cover in Washington County.

Washington County's lowest elevation lies along the Kaskaskia River along the northwest county boundary at 380 feet above sea level. Elevation gently increases moving southeast across the county to over 600 feet (*Figure 4*).

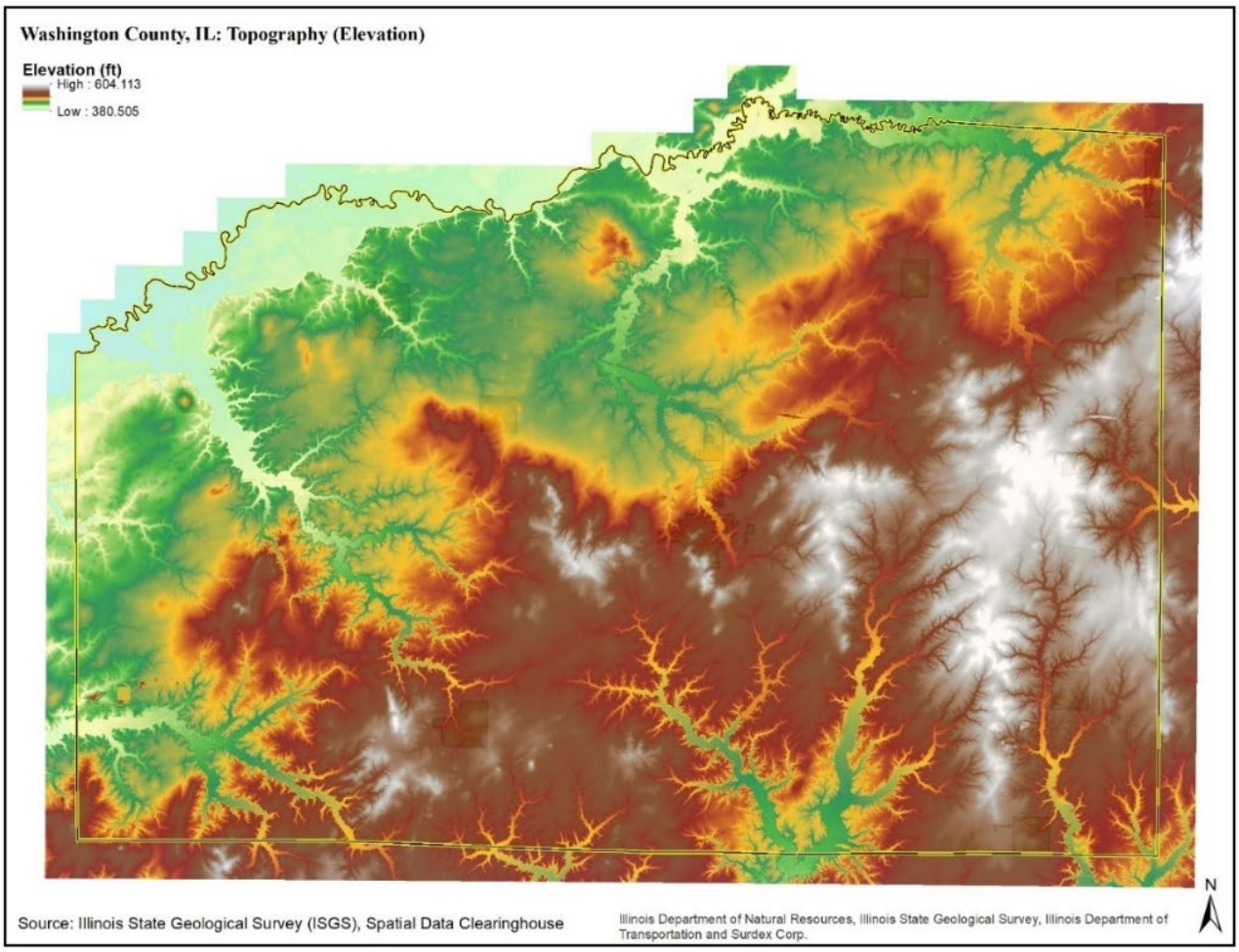

Figure 4. Topography of Washington County.

Washington County contains the Lower and Middle Kaskaskia Watersheds and the Big Muddy Watershed *(Figure 5*). A watershed, or drainage basin, is the land area that drains directly to a common stream, river, or lake. The Kaskaskia Watershed, where agriculture is the primary land use, is part of the Mississippi River basin. With drainage from 22 counties, the Kaskaskia Watershed has a total area of approximately 5,810 square miles and contains two of the largest manmade reservoirs in Illinois – Lake Shelbyville and Carlyle Lake.[9] Lake Carlyle lies directly north of the county on the Kaskaskia River. The Big Muddy Watershed collects drainage from 11 counties and covers an area of 2,390 square miles. The watershed contains Rend Lake and Crab Orchard Lake, two of the largest inland lakes in Illinois, as well as Washington County Lake in the south-eastern part of the county. Besides agricultural land, the Big Muddy Watershed also consists of grasslands, forests, and wetlands.[10]

[9] Illinois Rivers Decision Support System. "Kaskaskia". Retrieved May 18, 2022, from https://ilrdss.isws.illinois.edu/links/watersheds.asp?ws=133

[10] Illinois Rivers Decision Support System. "Big Muddy". Retrieved May 18, 2022, from https://ilrdss.isws.illinois.edu/links/watersheds.asp?ws=134

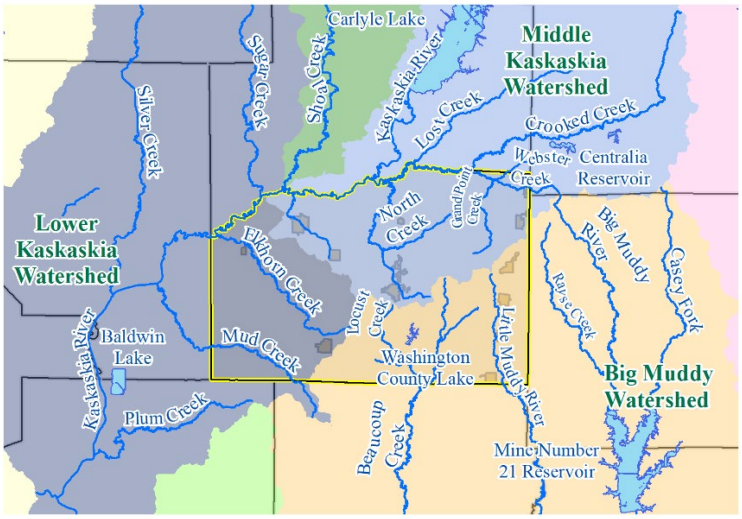

Figure 5. Hydrologic features in Washington County.

Climate

The climate of Illinois is continental with cold winters, warm and humid summers, and moderate spring and fall temperatures. Changes in temperature, humidity, cloudiness, and wind direction occur frequently. Southern Illinois averages nearly 40 days above 90°F and 80 days below 32°F per year. There are nearly 100 days with measurable precipitation and 13 days with more than 1 inch of precipitation in Southern Illinois.[11]

Washington County on average experiences its warmest temperatures in July and coldest temperatures in January. The area receives the most rainfall in late spring and early summer (*Table 8*).

Table 8. Temperature and precipitation, 30-year normals in Washington County (1991-2020). Source: Station NASHVILLE 1 E (USC00116011), NCEI

Month	Temperature Normals			Precipitation Normals	
	Maximum (°F)	*Minimum (°F)*	*Average (°F)*	*Precipitation (in)*	*Snowfall (in)*
Jan	38.7	21.3	30.0	2.68	3.7
Feb	43.9	24.9	34.4	2.15	3.7
Mar	54.2	34.2	44.2	3.47	1.2
Apr	66.0	45.0	55.5	4.58	0.0
May	75.2	55.5	65.3	4.81	0.0
Jun	84.2	64.0	74.1	4.68	0.0
Jul	87.2	67.3	77.2	3.83	0.0
Aug	86.0	65.1	75.6	3.09	0.0
Sep	79.9	57.5	68.7	3.54	0.0
Oct	68.9	46.2	57.6	3.17	0.1
Nov	54.2	34.7	44.4	3.55	0.5
Dec	43.2	26.3	34.7	2.67	2.5
Annual	65.1	45.2	55.1	42.22	11.7

[11] Illinois State Climatologist. "Climate of Illinois". Retrieved May 18, 2022, from https://stateclimatologist.web.illinois.edu/climate-of-illinois/

DEMOGRAPHICS

Population

As of the 2020 US Census, Washington County has a population of 13,761, a decrease of 7% from 14,716 in 2010. Washington County lost more people than the State of Illinois over the same time period, which saw a decrease in population of 0.1%. All communities in the county lost population from 2000 to 2020; Addieville had a modest increase in population between 2010 and 2020 (*Table 9*). Washington County's population is projected to continue declining to 13,060 in 2030.[12]

Table 9. Population of Washington County, 2000-2020. Source: US Census Bureau.

Community	2000	2010	2020	Population change, 2010-2020 (%)
Washington County	**15,148**	**14,716**	**13,761**	**-7%**
Addieville	267	252	259	+3%
Ashley	618	536	462	-14%
Du Bois	210	205	175	-15%
Hoyleton	528	531	520	-2%
Irvington	750	659	581	-12%
Nashville	3,155	3,258	3,105	-5%
New Minden	204	215	175	-19%
Oakdale	201	221	199	-10%
Okawville	1,374	1,434	1,369	-5%
Radom	417	220	183	-17%
Richview	310	253	238	-6%
Venedy	132	138	121	-12%
Wamac	1,356	1,185	985	-17%

The population in Washington County in 2020 was predominantly white, with 5.3% of the population identifying as non-white and 1.6% of the population identifying as Hispanic or Latino (Table 10). Although a small proportion of the overall population, Washington County's non-white population has more than doubled since 2010, rising from 340 to 785. Hispanic and Latino populations have increased by 14%, rising from 197 in 2010 to 224 in 2020.[13]

[12] IDPH. (2019). "Population Projections". https://dph.illinois.gov/content/dam/soi/en/web/idph/files/publications/population-projections-report-2010-2030.pdf

[13] US Census Bureau. 2010 Decennial Census. Retrieved July 22, 2021, from https://data.census.gov

Table 10. Race and ethnicity in Washington County. Source: US Census Bureau, 2020.

Race		
White	13,028	94.7%
Black or African American	85	0.7%
American Indian and Alaska Native	30	0.2%
Asian	69	0.5%
Native Hawaiian and Other Pacific Islander	20	0.1%
Some other race	70	0.5%
Two or more races	447	3.2%
Ethnicity		
Hispanic/Latino	224	1.6%

The median age of Washington County's residents is 44.5 years old which is higher than Illinois' median age of 38.3 years old. Nearly 21% of the population is over 65 years old (*Figure 6*).

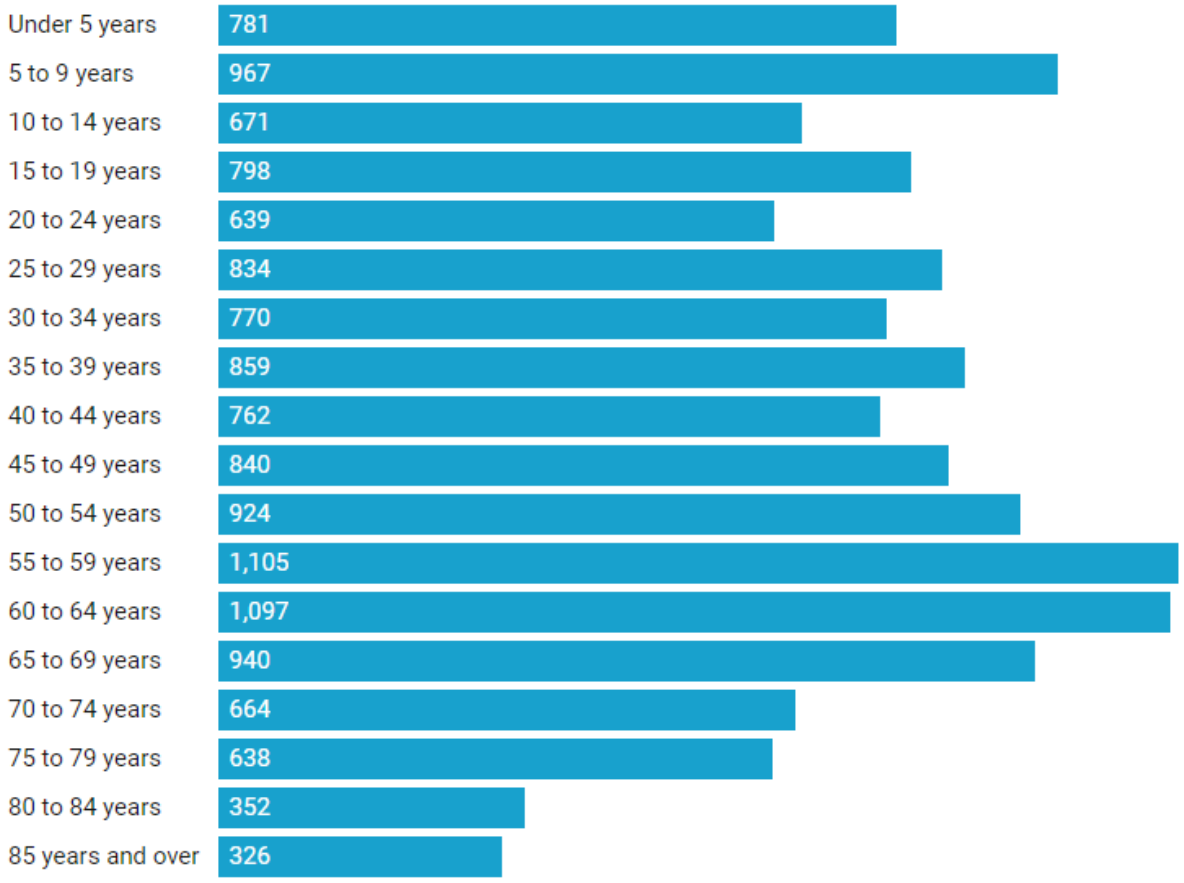

Figure 6. Age in Washington County. Source: American Community Survey, 2020.

The majority of Washington County's residents have a high school diploma. The community of Okawville has the highest number of people with a bachelor's degree or higher. Nearly one-quarter of Wamac's residents do not

have a high school degree. Addieville, Hoyleton, Nashville, and Okawville account for a significant portion of the region's population with a bachelor's degree (*Figure 7*).

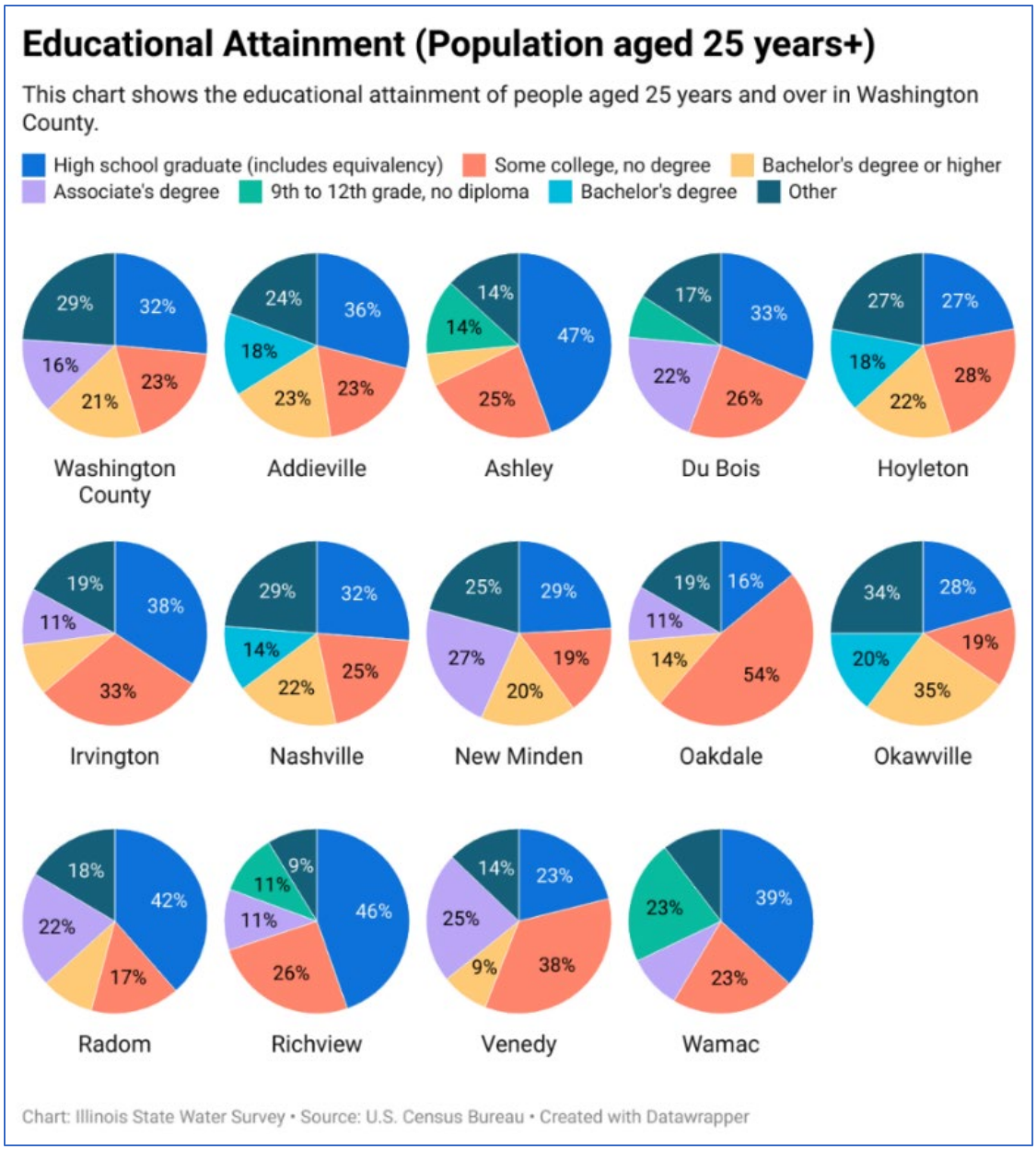

Figure 7. Educational attainement in Washington County (population aged 25+). Source: US Census Bureau, 2020.

Washington County has an unemployment rate of 5%. Addieville and Oakdale have the highest median household income. Wamac has the lowest median household income in the county, which is half of the county average. Over one-quarter of the population in Richview and Wamac live below the poverty line. Nashville accounts for the highest proportion of housing units in the county, followed by Okawville and Wamac. The average rent in Washington County is $716 and the median home value is $117,400.

Table 11. Community unemployment, income, and poverty in Washington County (2020). Source: ACS.

Community	Civilian Labor Force (16+ Years)	Rate of Unemployment (%)	Median Household Income ($)	Population Below Poverty Line (%)
Washington County	**7,459**	**5%**	**$64,390**	**8%**
Addieville	266	9%	$92,841	7%
Ashley	196	9%	$40,125	14%
Du Bois	102	0%	$52,188	9%
Hoyleton	240	4%	$59,028	10%
Irvington	287	8%	$58,438	13%
Nashville	1,517	7%	$56,019	8%
New Minden	119	0%	$61,250	10%
Oakdale	160	17%	$80,893	4%
Okawville	794	7%	$72,330	2%
Radom	82	2%	$50,625	3%
Richview	147	14%	$46,875	26%
Venedy	66	5%	$55,893	8%
Wamac	544	8%	$32,625	28%

Table 12. Community housing occupancy and rental market in Washington County (2020). Source: ACS

Community	Total Housing Units	Homeowner Vacancy Rate (%)	Rental Vacancy Rate (%)	Occupied Units Paying Rent	Median Gross Rent ($)
Washington County	6,653	1.6%	1.3%	1,111	$716
Addieville	111	3.1%	0%	17	$1014
Ashley	271	2.4%	8.7%	64	$703
Du Bois	103	0%	0%	15	$525
Hoyleton	213	1.4%	0%	30	$600
Irvington	305	0%	11.5%	69	$695
Nashville	1,452	3%	0%	348	$729
New Minden	102	0%	0%	5	-
Oakdale	87	1.1%	0%	6	-
Okawville	648	1.8%	0%	151	$790
Radom	100	0%	40%	3	-
Richview	125	0%	0%	19	$725
Venedy	62	0%	0%	6	$483
Wamac	58	1.5%	10.6%	142	$671

ECONOMY AND INDUSTRY

Industry Mix

Washington County has a diverse and stable economy. Educational services, healthcare, manufacturing, and retail services constitute nearly half of employment in Washington County (*Figure 8*). Nascote Industries, a manufacturer of motor vehicles parts, is headquartered in Nashville, IL. They are the largest employer in Washington County, employing over 1,000 people.[14]

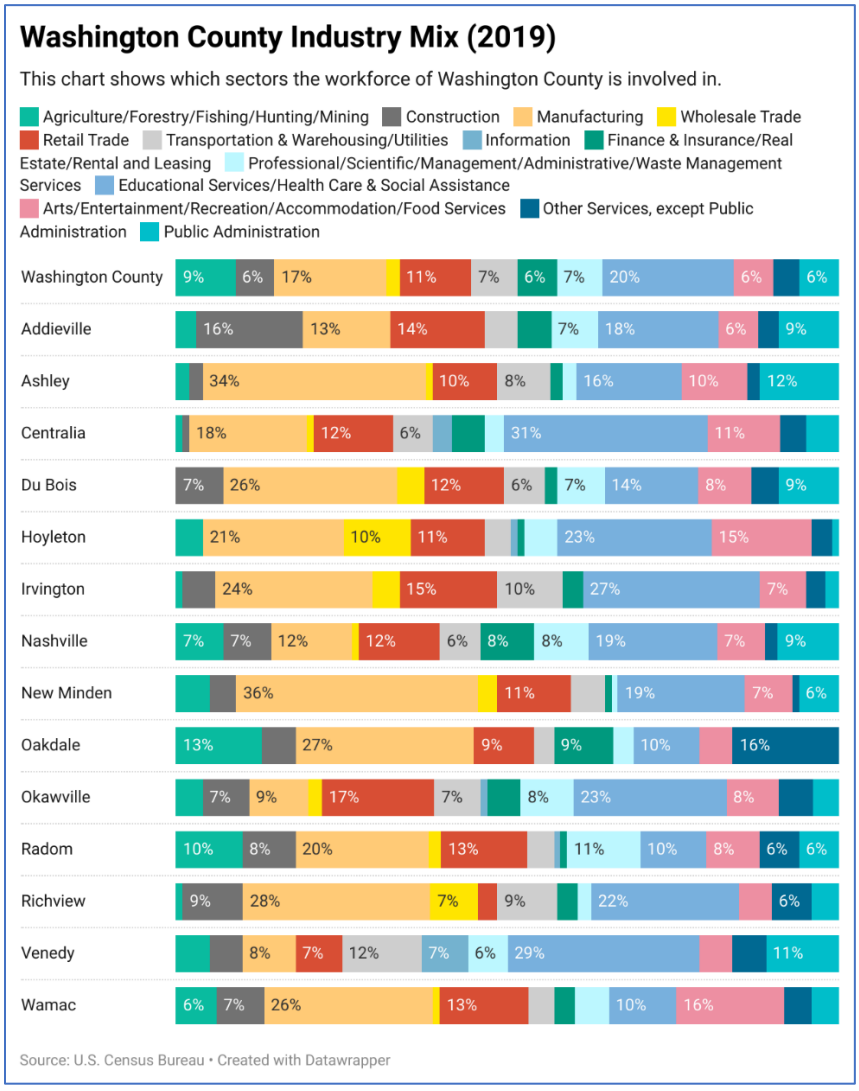

Figure 8. Community occupations by industry. Source: US Census Bureau, 2019.

[14] The Southern. "Here are the companies that employ the most people in Southern Illinois". Retrieved March 8, 2021, from https://thesouthern.com/business/southern-business-journal/here-are-the-companies-that-employ-the-most-people-in-southern-illinois/article_d0e6b7b3-eaa9-514e-a0b3-91c79f887d6b.html

Transportation Network & Commuter Flows

Interstate 64 is the only interstate highway intersecting Washington County. Several state routes go through the county along with US Highway 51. *Figure 9* shows road features and primary and secondary routes that lead evacuating civilians out of communities.

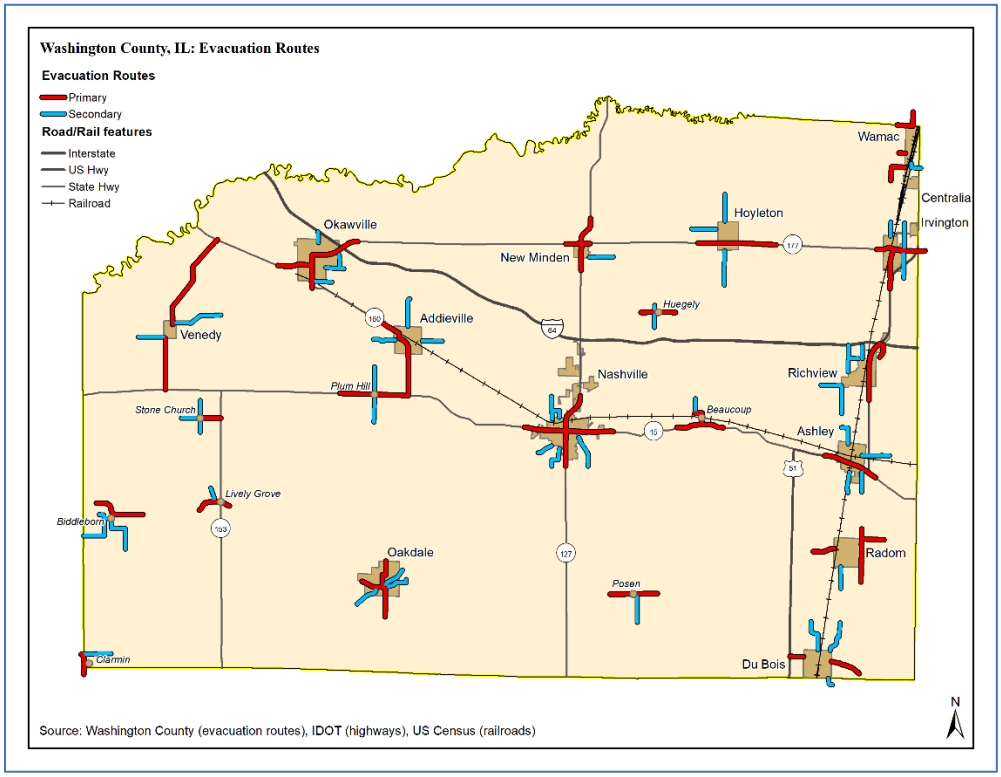

Figure 9. Evacuation routes in Washington County. Source: Washington County, IDOT, US Census Bureau.

Agriculture

Agriculture accounts for less than 10% of employment in the county but constitutes the majority of the county's land cover (*Figure 12*). Corn, soybeans, and wheat are the top crops in acres and farm sales. In addition to cultivated crops, Washington County ranks 3rd in the state for sales from cow milk. Sales from crops, and livestock and poultry total over $200 million, placing Washington County in the top third of sales from agricultural products among counties in Illinois.[15]

[15] USDA. (2017) Census of Agriculture County Profile, Washington County, IL. https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Illinois/cp17189.pdf

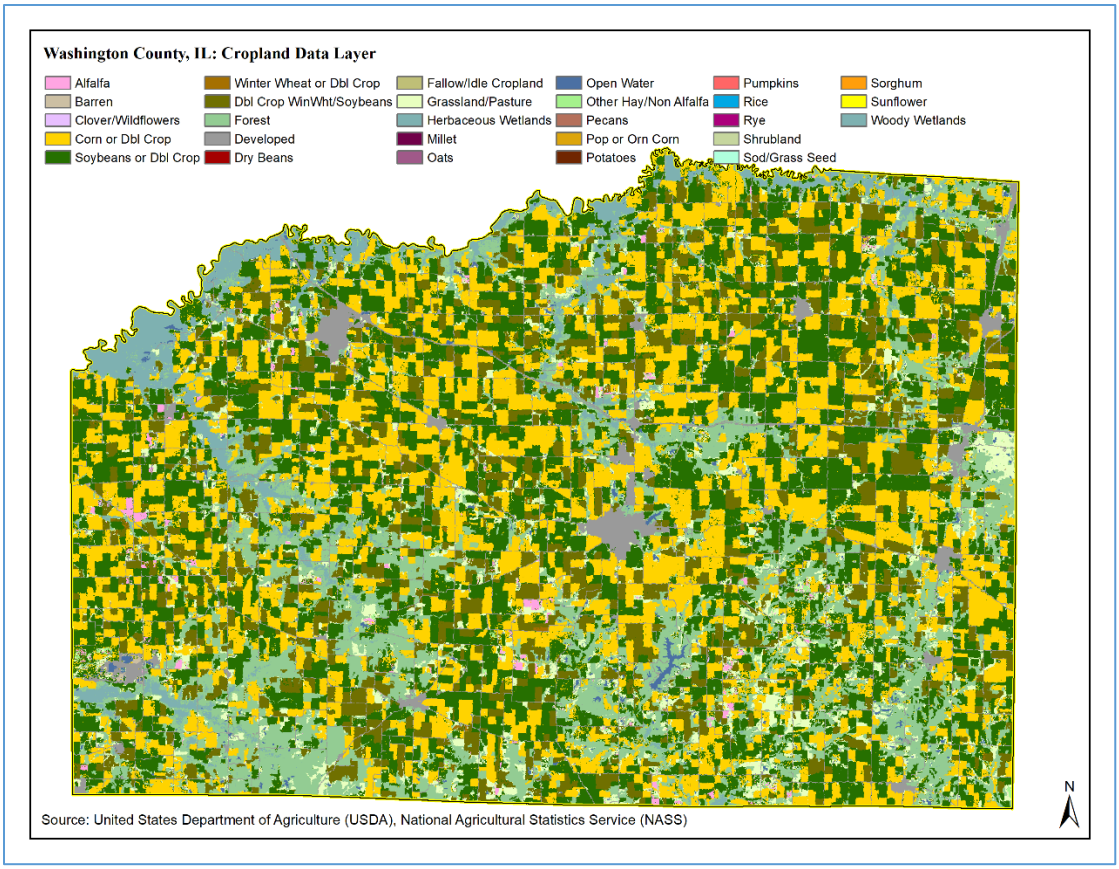

Figure 10. Crop cover in Washington County. Source: USDA, National Agricultural Statistics Service.

Although the number of farms in 2017 had decreased by 8% since 2012, the average size of farms has increased by nearly the same amount (*Table 13*). Overall farmland has decreased slightly from 2012, but still makes up over 90% of Washington County's land cover.

Table 13. Farm and crop overview in Washington County, 2012-2017. Source: USDA Census of Agriculture

Commodity	**2017**	**Change since 2012**
Number of farms	715	-8
Area of farmland (acres)	349,024	-2
Average size of farm (acres)	488	+7
Top crops in Acres	**Rank in county**	**Crop area (acres)**
Soybean	1	163,399
Corn	2	116,899
Wheat	3	46,645

LAND USE AND DEVELOPMENT TRENDS

Urban development and agricultural shifts have occurred over the last two decades in Washington County (Fig. 11). Construction of the Prairie State Energy Campus, a 1,200-acre site that houses two coal-fired power stations and one coal mine, began in 2007 in southwestern Washington County.[16] New and expanding factories have likewise caused urban expansion in northern Nashville. Changes in agricultural land cover have occurred across the county, particularly in the southeastern region.

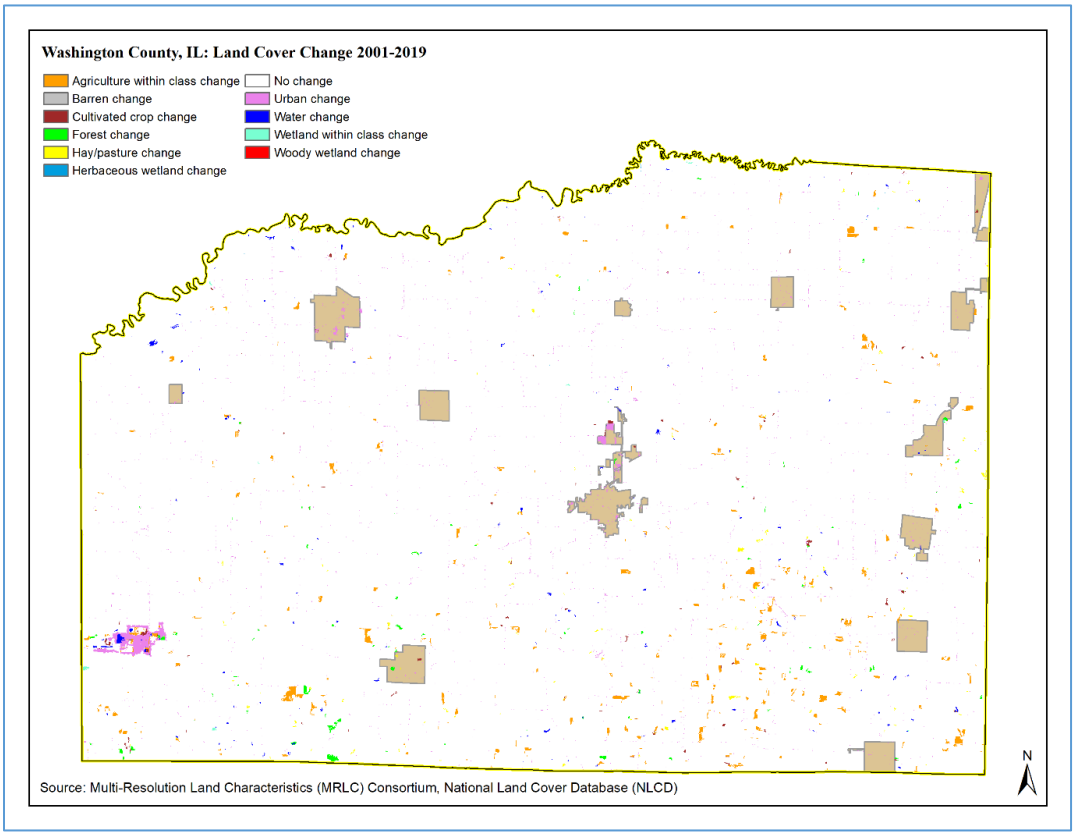

Figure 11. Land cover change in Washington County, 2001-2019.

[16] Brehm, K., Posner, D., Stone, L., and Varadarajan, U. (2021). Transition Opportunities for Prairie State Energy Campus.. https://rmi.org/insight/transition-opportunities-for-prairie-state-energy-campus/

NATIONAL FLOOD INSURANCE PROGRAM

The National Flood Insurance Program (NFIP) is a federal program that enables property owners in participating communities to purchase insurance as a protection against flood losses. Eligibility is premised on the adoption and enforcement of state and community floodplain management regulations intended to prevent unsafe development in the floodplain, reducing future flood damages.[17] If a community adopts and enforces a floodplain management ordinance, the federal government will make flood insurance available within the community as a financial protection against flood losses (*Table 14*). Communities must continue to enforce their local floodplain management ordinances to remain compliant. In Illinois, most communities have adopted the State of Illinois Model Ordinance that goes above and beyond NFIP minimum standards.

Table 14. Community participation in the NFIP

Jurisdiction	Participating	Date joined	Effective FIRM date	SFHA identified
Addieville	N	n/a	n/a	N
Ashley	N	n/a	n/a	N
Du Bois	N	n/a	n/a	N
Hoyleton	N	n/a	n/a	N
Irvington	N	n/a	n/a	N
Nashville	Y	02/06/84	02/06/84	Y
New Minden	N	n/a	n/a	N
Oakdale	N	n/a	n/a	N
Okawville	Y	09/04/87	09/04/87	Y
Radom	N	n/a	n/a	N
Richview	N	n/a	n/a	N
Venedy	N	n/a	n/a	N
Wamac	N	n/a	11/16/11	Y
Washington County (unincorporated)	N	n/a	12/26/80	Y

Flood maps generated by FEMA to support the NFIP are the primary source of information on the location of special flood hazard areas (SFHA). Flood Insurance Rate Maps (FIRM) identify SFHAs (1%-annual-chance floodplains) for streams in the community and delineate flood insurance premiums based on flood risk.

Repetitive loss properties are defined as any insurable building for which the NFIP paid two or more claims of at least $1,000 over a ten-year period. There are no repetitive loss properties in Washington County.

After flooding events, local officials are responsible for inspecting flood damaged structures in the special flood hazard area (SFHA) to determine if they are substantially damaged (50% or more). If so, the property owner is required to bring the structure into compliance with the local floodplain ordinance. The Illinois Department of Natural Resources (IDNR) created a tool for communities to use with steps to take following a flood.[18] Communities can also contact Illinois Association for Floodplain and Stormwater Management (IAFSM) for additional support following a flood.

[17] Federal Emergency Management Agency. "Flood Insurance". https://www.fema.gov/flood-insurance/work-with-nfip/community-status-book

[18] Illinois Department of Natural Resources. (2021). "State of Illinois Flood Damage Packet". https://www2.illinois.gov/dnr/WaterResources/Documents/IL_Damage_Assess_Packet_March_2020.pdf

SECTION 4

RISK ASSESSMENT

DATA AND METHODOLOGY

Hazard Identification

The list of hazards that affect Washington County was created through consultation of resources including the 2018 Illinois Natural Hazard Mitigation Plan, FEMA's National Risk Index (NRI), and various hazard mitigation plans for other jurisdictions in Illinois. Hazards included in this plan are cold wave, dam failure, drought, earthquake, flash flooding, hail, HazMat spill, heat wave, ice storm, lightning, mine subsidence, pandemic, riverine flooding, tornado, wildfire, wind, and winter weather. Hazards excluded from this plan include coastal flooding, cyber-terrorism, and landslide.

Data sources for historic occurrences of hazards include; the National Centers for Environmental Information (NCEI)'s Storm Events Database and Severe Weather Data Inventory (SWDI), the Association of State Dam Safety Officials (ASDSO)'s Dam Incident Database, the United States Geological Survey (USGS)'s Earthquake Catalog, the United States Department of Agriculture (USDA)'s Forest Service's Wildfire Occurrence Database, the United States Coast Guard (USCG)'s National Response Center, the Illinois Mine Subsidence Insurance Fund (IMSIF), and the Illinois Department of Public Health (IDPH). Locations of dams and levees come from the United States Army Corps of Engineers (USACE)'s National Inventory of Dams (NID) and National Levee Database (NLD).

Table 15 gives a summary of reports/cases, damage, and casualties for each hazard found in the data sources listed above. Each data source has its caveats, so while this table is as complete as possible, there may be under- and over-reporting for any variable. Cases and death values from IDPH for the coronavirus pandemic are as of the date of this publication.

Table 15: Summary of Hazard Reports/Occurrences/Claims/Cases in Washington County, IL

Hazard	Reports / Claims / Cases	Start Year	End Year	Yrs	Property and Crop Damage	Injuries	Fatalities	Source
Wind	124	1955	2020	66	$560,500	2	0	NCEI Storm Events Database
Hail	120	1955	2020	66	$200,000	0	0	NCEI Storm Events Database
Lightning reports	2	1996	2020	25	$1,000,000	0	1	NCEI Storm Events Database
Lightning strikes	218,465	1987	2020	34	*	*	*	NCEI SWDI
Tornadoes	29	1950	2020	71	$1,050,000	3	2	NCEI Storm Events Database
Riverine Flooding	3	1996	2020	25	$0	0	0	NCEI Storm Events Database
Flash Flooding	11	1996	2020	25	$0	0	0	NCEI Storm Events Database
Dam/Levee Failure	0	2010	2020	11	*	*	*	ASDSO Dam Incident Database
Winter Weather	37	1996	2020	25	$0	0	0	NCEI Storm Events Database
Ice Storms	2	1996	2020	25	$0	0	0	NCEI Storm Events Database
Drought	4	1996	2020	25	$0	0	0	NCEI Storm Events Database
Heat Wave	50	1996	2020	25	$0	10	0	NCEI Storm Events Database
Cold Wave	3	1996	2020	25	$0	0	0	NCEI Storm Events Database
Earthquake	11	1970	2020	51	*	*	*	USGS Earthquake Catalog
Wildfire	4	1992	2018	27	*	*	*	USDA FS Wildfire DB Database
HazMat Spill	30	1990	2020	31	*	*	*	USCG Natl Response Center
Mine Subsidence	0	2000	2021	21	$14,636	*	*	IMISF
Pandemic	3,498	2020	2022	2	*	*	35	IDPH

** Not Applicable / Not Available from data source*

Hazus

Hazus[19] is a geographic information system (GIS)-based natural hazard risk analysis tool developed and freely distributed by FEMA. It is a loss and risk assessment software package built on GIS technology. The information generated can be used for planning emergency response actions and prioritizing mitigation efforts to reduce risk. Hazus output will provide a baseline for evaluating success in reducing natural hazard risk exposure when conducting future assessments.

The Hazus assessment is highly data-dependent. The accuracy of the analyses depends on several important datasets including essential facilities, building structure information, and general building stock inventories. Washington County's Hazus analyses included the creation of a building inventory using the Washington County assessor's data and an update of the essential facilities database. Risks and losses due to flood hazards were modeled using the Hazus methodology of a Level 2, or advanced, analysis. The earthquake hazard was modeled using Hazus Level 1 methodology. Losses due to a simulated tornado scenario were modeled by a separate methodology using the asset information prepared for Hazus.

[19] FEMA Hazus 5.0 Software. Released May 24, 2021.
https://www.fema.gov/flood-maps/products-tools/hazus

HISTORIC AND FUTURE DISASTERS

Historic Disaster Declarations

Disaster declarations in the State of Illinois can be made at the city, county, state, or federal government level. City or county officials may declare a local disaster to activate emergency operation plans within their jurisdiction. If a disaster overwhelms local response capabilities, local officials may request assistance from the Illinois Emergency Management Agency (IEMA). The Governor of Illinois may request a Presidential Disaster Declaration from the federal government if local and state response capabilities are overwhelmed. Disasters can also be declared by the Farm Service Agency (FSA) and the Small Business Administration (SBA).

Presidential Disaster Declarations

Under the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (Stafford Act), a governor of an affected state or territory, or a tribal government, can request that the President of the United States make a disaster declaration. There are two types of presidential disaster declarations: major disaster declarations and emergency declarations.

A major disaster declaration covers any natural hazard, including hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought, and any fire, flood, or explosion, regardless of the cause. Federal assistance for recovery and future hazard mitigation can be made available to affected counties. An emergency declaration is more broadly defined – one is declared when federal assistance is needed to protect lives, property, public health, and safety, or to lessen the threat of catastrophe – but provides less federal assistance.

Washington County has received seven presidential disaster declarations since 2002. This equates to a disaster declaration slightly more than once every three years.

Table 16. Presidential Disaster Declarations (2002-2022). Source: FEMA

Declaration No.	Declaration Type	Year	Hazard(s) covered by the declaration
1416	Major Disaster	2002	Severe storms, tornadoes, flooding
3230	Emergency	2005	Hurricane
1960	Major Disaster	2011	Severe winter storm
1991	Major Disaster	2011	Severe storm, flooding
4157	Major Disaster	2013	Severe storms, straight-line winds, tornadoes
3435	Emergency	2020	COVID-19 pandemic
4489	Major Disaster	2020	COVID-19 pandemic

State

Between 2010 and 2018, there were 31 gubernatorial disaster proclamations across the State of Illinois. Washington County received three gubernatorial disaster proclamations. In 2013, an EF4 tornado ripped through the county causing property damage across the county and two deaths in Addieville (NCEI 2022, *Table 17*). A Presidential Disaster Declaration was subsequently declared. Washington County has received five gubernatorial disaster declarations since 2010 (*Table 17*). This equates to a disaster declaration once every two and a half years.

Table 17. Gubernatorial disaster proclamations (2010-2022). Source: 2018 Illinois Natural Hazard Mitigation Plan

Year	Hazard(s) covered by the declaration
2011	Severe winter weather
2011	High wind, tornadoes, torrential rain
2013	Severe storms, straight-line winds, tornadoes
2020 (ongoing)	COVID-19 pandemic
2022	Flash flooding, excessive rainfall

Farm Service Agency

The Farm Service Agency (FSA) is an agency in the US Department of Agriculture (USDA) that provides low-interest emergency loans to producers in counties affected by a disaster.

Each county in the State of Illinois has a local FSA office that provides USDA services to producers, including help obtaining federal disaster relief. The Washington County FSA office is in Nashville, IL.

Washington County has received five FSA-administered disaster declarations since 2012 (*Table 18*). This equates to a disaster declaration once every two years.

Table 18. FSA disaster declarations, (2012-2022). Source: FSA

Designation No.	Declaration Type	Year	Hazard(s) covered by the declaration
S3311	Secretarial	2012	Drought, wind, fire, heat, insects
S3865	Secretarial	2015	Excessive rainfall, flooding
S4508	Secretarial	2019	Excessive moisture, flooding, flash flooding
4461	Presidential	2019	Severe storms, flooding
S5097	Secretarial	2021	Excessive moisture, flash flooding
S5334	Secretarial	2022	Excessive moisture, flash flooding

Small Business Administration

The Small Business Administration (SBA) is a government agency that provides low-interest loans to businesses, private nonprofits, homeowners, and renters after a disaster is declared.

SBA disasters are automatically declared when a presidential disaster or agricultural disaster is declared. SBA disasters can also be declared at the request of the Governor of Illinois.

There have been no disaster loans distributed by the SBA to Washington County since 2000, although damages to property were reported to the SBA after the 2013 severe storm and tornado event.

Climate Change

Human-induced climate change is expected to increase the intensity and frequency of natural hazards in Illinois, including extreme heat, drought, and flash and riverine flooding. As a result, human health, ecosystems, infrastructure, and agriculture are expected to be negatively impacted.

Average temperatures are expected to rise by nearly 4°F and there are projected to be over 20 more days above 95°F per year in Southern Illinois by 2050 (Figure 12). Increasing temperatures will negatively impact human health by increasing the risk of heat-related illnesses, such as heat stroke or heat exhaustion. Livestock may similarly suffer heat stress. Warming temperatures may make conditions less suitable for native plants and animals across Illinois and invasive, non-native species could move into Illinois, harming native ecosystems. Projected increases in flooding may also affect habitat availability for native species.

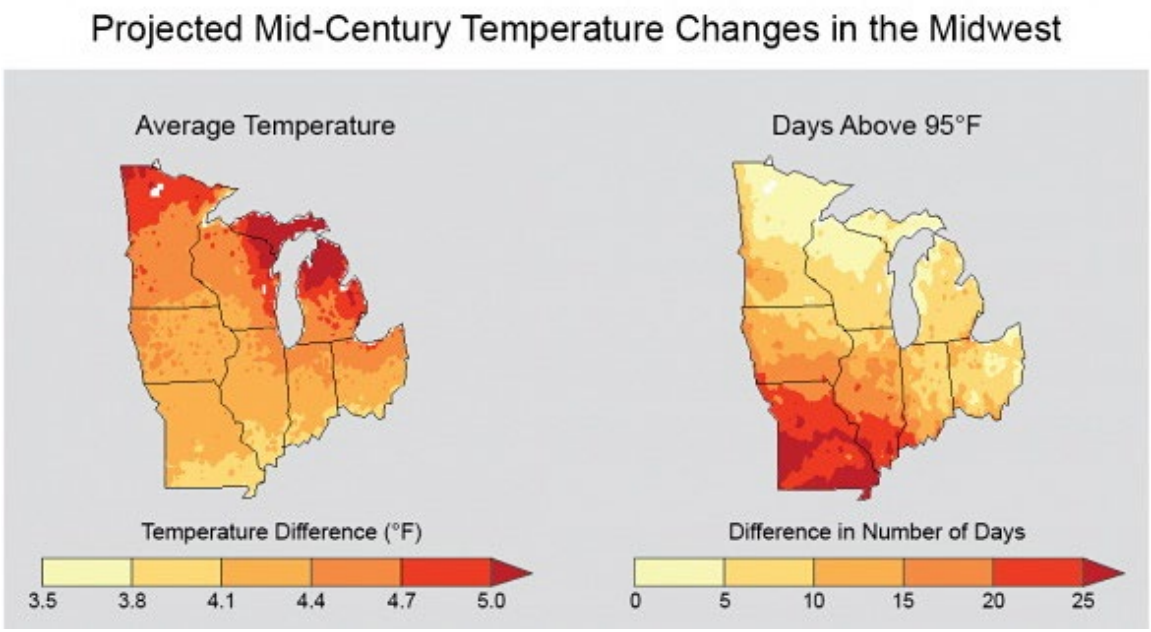

Figure 12. Projected 2050 temperatures changes. Source: US Global Change Research Program (2014).

While climate change is expected to increase precipitation in Illinois, the distribution is expected to become more extreme. Rainfall events of more than 2" are expected to increase, causing more riverine and flash flooding (*Figure 13*). Rivers across Illinois are already flooding more frequently, and this trend is expected to continue. Flash flooding in urban areas is expected to increase, as many stormwater systems are not built to handle the extreme rainfall events and land-use change from urban sprawl reduces water drainage capabilities. Increased flooding can affect human health by increasing the risk of water-borne diseases and flood-related injuries. In rural Illinois, extreme precipitation has caused runoff from agricultural fertilizer to enter groundwater wells, harming the safety of drinking water.

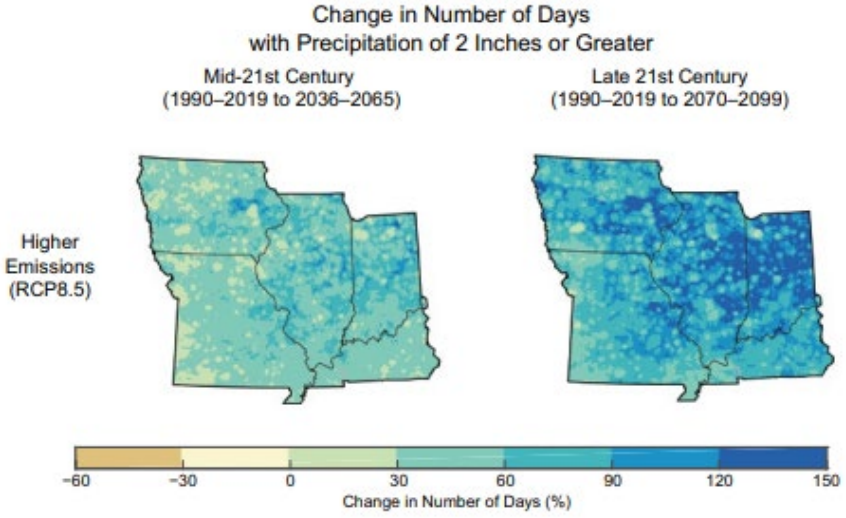

Figure 13. Changes in extreme precipitation by 2100. Source: The Nature Conservancy.

By the end of the 21st century, dry periods between rainfall events are expected to lengthen, and summer precipitation is expected to decrease, increasing the likelihood of severe summer drought (*Figure 14*). Soybean and corn yields are expected to decrease due to a combination of rising temperatures, increasing drought, and more water-borne diseases from increased flooding.

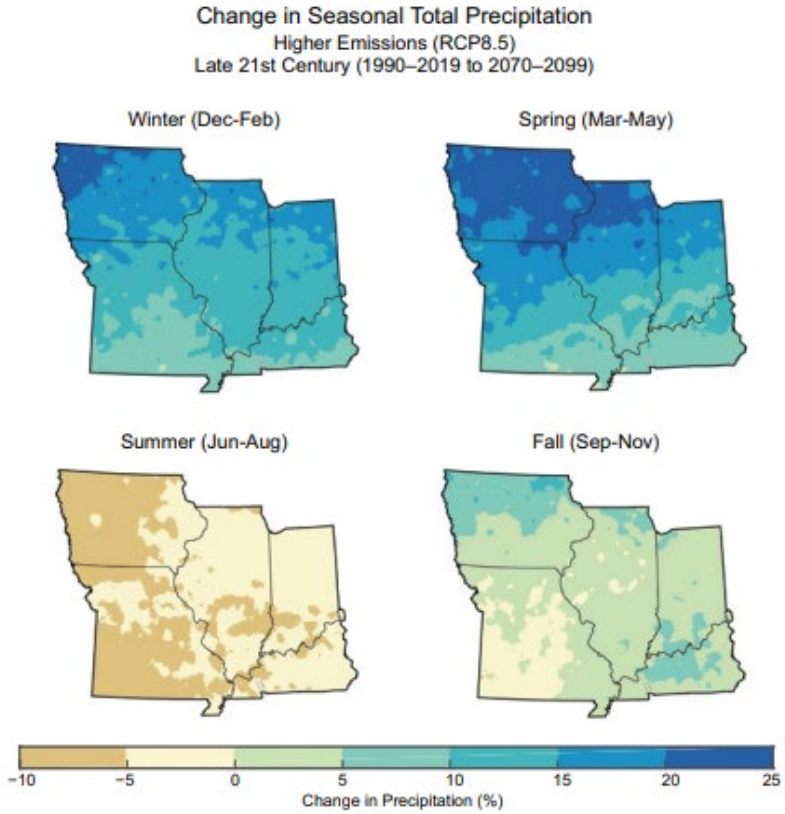

Figure 14. Changes in seasonal total precipitation by 2100. Source: The Nature Conservancy.

Future Losses

As climate changes, climate-related deaths and damages are expected to increase. FEMA's National Risk Index (NRI) calculates the expected annual loss (EAL) – defined as the average economic loss in dollars resulting from natural hazards every year – for 14 hazards (see *Table 19*) in Washington County at the county and census tract level. EAL examines three types of losses: buildings, population, and agriculture, where population loss is quantified by injuries and fatalities caused by a hazard. Exposure, historic losses, and hazard frequency are taken into account when calculating EAL.[20]

Census tracts in the northwest and southern parts of the county, that contain Addieville, Ashley, Du Bois, Oakdale, Okawville, Radom, Venedy, and unincorporated parts of the county have Relatively High EAL, meaning that these areas may expect to see more agricultural and although the overall EAL for Washington County compared to other counties in the US is Relatively Low. Washington County is especially susceptible to losses from earthquakes, drought, and heat waves (*Table 19*).

[20] FEMA. (2021). National Risk Index: Technical Documentation. https://www.fema.gov/sites/default/files/documents/fema_national-risk-index_technical-documentation.pdf

Table 19. Expected annual losses for natural hazards. Source: FEMA

Hazard	Expected Annual Loss
Cold wave	$32,000
Drought	$680,000
Earthquake	$1,200,000
Hail	$47,000
Heat wave	$610,000
Ice storm	$29,000
Landslide	$2,900
Lightning	$46,000
Riverine flooding	$91,000
Wind	$170,000
Tornado	$120,000
Wildfire	$12
Winter weather	$51,000

COMMUNITY ASSETS

Built Environment

Building Exposure

Exposure consists of an estimation of the total replacement cost of all buildings in Washington County represented in 2022 US dollars. Values were taken from the Hazus General Building Stock (GBS) database which is aggregated to the census block level. The total replacement cost values contain both the structure cost of the building as well as its contents. Exposure values are in *Table 20* and *Table 21* below. *Table 20* shows the exposure based on the occupancy class, or use class, of the buildings. *Table 21* contains the building exposure for each incorporated community and unincorporated Washington County.

Table 20. Building Exposure by Occupancy

Occupancy Class	Total Exposure (2022 USD)	Percent of Total
Residential	$3,257,837,000	37.65
Commercial	$2,108,905,000	24.37
Industrial	$952,167,000	11.00
Agriculture	$1,880,572,000	21.73
Religious	$97,860,000	1.13
Government	$102,454,000	1.19
Education	$253,290,000	2.93
Total	**$8,653,085,000**	**100**

Table 21. Building Exposure by Community

Community	Total Exposure (2022 USD)	Percent of Total
Addieville, Village of	$123,281,000	1.42
Ashley, City of	$163,732,000	1.89
Centralia, City of	$961,000	0.01
Du Bois, Village of	$49,196,000	0.57
Hoyleton, Village of	$188,439,000	2.18
Irvington, Village of	$188,808,000	2.18
Nashville, City of	$1,952,092,000	22.56
New Minden, Village of	$42,094,000	0.49
Oakdale, Village of	$88,289,000	1.02
Okawville, Village of	$530,319,000	6.13
Radom, Village of	$45,177,000	0.52
Richview, Village of	$56,267,000	0.65

Venedy, Village of	$45,800,000	0.53
Wamac, City of	$21,741,000	0.25
Unincorporated Areas	$5,156,889,000	59.60
Total	**$8,653,085,000**	**100**

Essential Facilities

Essential facilities are buildings and infrastructure that provide necessary services to the public and would cause harm if they were destroyed or damaged. Examples of essential facilities include hospitals, emergency operation centers (such as police and fire departments), schools, nursing homes, cell towers, and utility centers (such as for electricity or water). There are 96 essential facilities in Washington County. A listing of these facilities can be found in Appendix E: Essential Facilities.

FEMA stipulates those essential facilities should not be located in a floodplain when possible. If an essential facility must be located in a floodplain, it should be designed with higher flood protection standards and have a flood evacuation plan. For Washington County, one essential facility was identified as being located in an approximate Zone A 1% annual chance floodplain represented on the FEMA Flood Insurance Rate Map (FIRM) for the Village of Okawville.[21] This facility is a wastewater lift station located on E. Immanuel Dr in Okawville.

Essential facility data are an example of site-specific information used in Hazus for analysis. This data was first compiled from the Hazus statewide database for Illinois and included schools, medical care facilities, emergency operation centers, police stations, fire stations, and potable/wastewater facilities. This data was used as a starting point with the intent for it to be updated for the *2023 Washington County Multi-Jurisdictional Hazard Mitigation Plan*.

The planning team was asked to help with updating the essential facilities at the April 21, 2021 risk assessment meeting held both virtually and in the Washington County Court House in Nashville, Illinois. Additional categories were added to the essential facilities based on the expertise of local stakeholders. New categories included ambulance services, industrial plants, mines, power plants, and vulnerable populations. These updates and corrections to the Hazus data tables were completed before performing the risk assessment. Locations of essential facilities were confirmed using community feedback and internet mapping services such as Google Maps and Google Street View. The updated Hazus inventory contributed to the Level 2 analysis, which improved the accuracy of the risk assessment.

Table 22 identifies the essential facilities that were used for the analysis. A complete list of the essential facilities and community maps displaying the essential facilities are included in Appendix E: Essential Facilities.

Table 22. Essential facilities.

Facility	Number of Facilities
Ambulance Service	1
Emergency Operation Centers	1
Fire Stations	10
Medical Care Facilities	4

[21] FEMA Flood Map Service Center. (1987). Flood Insurance Rate Map #170679B, Village of Okawville, IL. https://msc.fema.gov/portal/home

Police Stations	5
Schools	14
Industrial Plants	5
Mine	2
Power Plant	1
Vulnerable Populations	3
Facilities of Importance	16
Potable Water Facilities	14
Waste Water Facilities	20

County Building Inventory

A structure-based asset inventory, or building inventory, was compiled for use in the flood and tornado risk assessments. This includes structures located within the 0.2% annual chance (500-year) floodplain for the Hazus flood analysis, and structures within the City of Nashville, the Village of Oakdale, and the Unincorporated Washington County area in-between the two municipalities for the GIS-based tornado analysis.

The building inventory was created using GIS parcel data containing 2020 county assessor's data provided by Washington County[22], and building footprints developed by Microsoft Corporation.[23] The building footprints that intersected the 0.2% annual chance flood depth grid developed in Hazus were converted to points and spatially joined to the parcel polygons to capture the structure attributes. The locations of the points were verified using aerial photography. These features were then classified into several different occupancy classes that are compatible with Hazus. Appendix E: Essential Facilities gives a brief explanation of these classes.

Historic Properties and Cultural Resources

Historic properties and cultural resources contribute to the identity and uniqueness of a community and can cause harm to a community's sense of place if they are damaged or destroyed during a disaster. Damage to historic properties and cultural resources can also cause economic fallout, particularly to the tourism sector. Mitigation actions, such as property improvement and regulatory actions, can be taken to lessen the risk of damage.

There are numerous historic properties and cultural resources across Washington County. The Washington County Historical Society, for example, operates three museums – the John Paul Jones/Kate LeCompte House, the Louisville and Nashville Depot, and the McKelvey One Room School House – that contain items and records with significant cultural impact, and host community events.[24]

[22] Washington County Illinois Tax Assessor Data. Retrieved May 13, 2021, from https://washingtonil.devnetwedge.com/
[23] Microsoft Building Footprints. Retrieved in 2018, from https://www.microsoft.com/en-us/maps/building-footprints
[24] Washington County Historical Society. Retrieved May 20, 2022, from https://www.facebook.com/Washington-County-Historical-Society-1058493847557823/

Figure 15. Original Springs Hotel and Bathhouse, Okawville, IL. Source: Washington County Historical Society

Natural Environment

Washington County has one State Recreation Area – Washington County State Recreation Area. Washington County State Recreation Area contains abundant wildlife and numerous opportunities for outdoor recreation, including hunting, fishing, hiking, picnicking, and camping.[25] In the event of a natural hazard, natural areas can become inaccessible for days to months. Flood waters may need to fall, trees may need to be removed from roads or trails, or buildings may need repairs to make natural areas accessible after a disaster. This can negatively impact tourism and quality of life for local residents.

[25] Illinois Department of Natural Resources (IDNR). "Washington County State Recreation Area". Retrieved May 21, 2022, from https://www2.illinois.gov/dnr/Parks/Pages/WashingtonCounty.aspx

SOCIAL VULNERABILITY

Social vulnerability is defined as the susceptibility of groups of people to impacts by natural hazards. FEMA's National Risk Index (NRI) uses the University of South Carolina's Hazards and Vulnerability Research Institute (HVRI) Social Vulnerability Index (SoVI) to assess social vulnerability, in which 29 socioeconomic variables are identified as impacting community's ability to prepare for, respond to, and recover from natural hazards.[26] Washington County and its municipalities have relatively low social vulnerability to natural hazards compared to other areas across the United States.

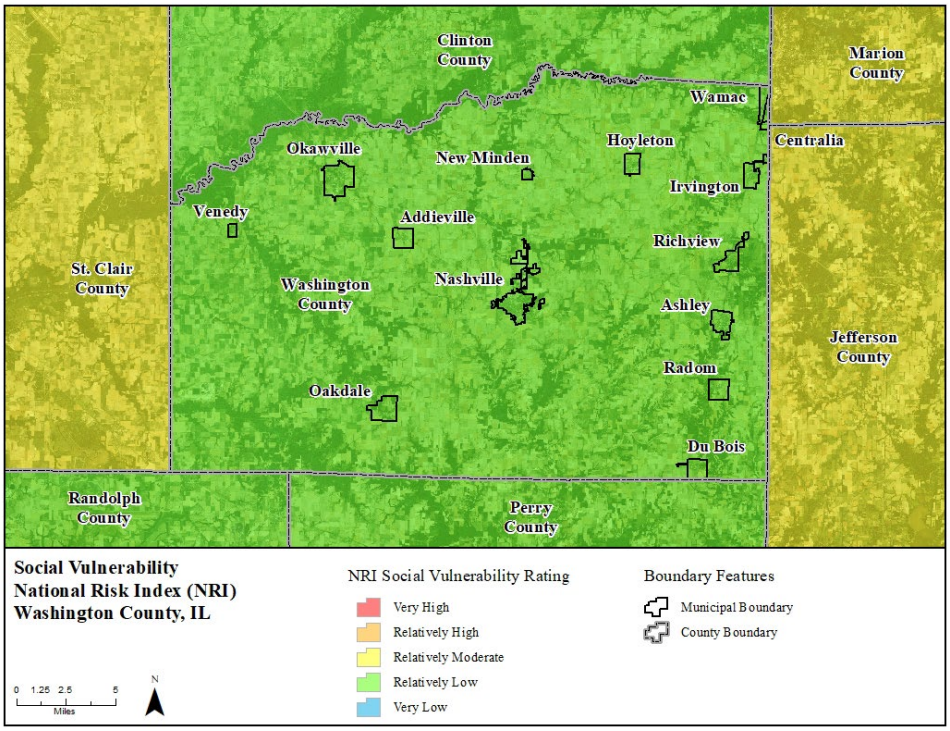

Figure 16. Social vulnerability. Source: FEMA

Although Washington County and its jurisdictions have relatively low social vulnerability, rural counties can have higher disaster vulnerability due to relatively older populations, higher rates of disability, more individuals with lower incomes, higher prevalence of low-cost homes (including mobile and manufactured homes), and individuals who rely on resource-based occupation, such as mining or agriculture. Rural counties also typically have fewer resources available to respond to a disaster due to smaller tax bases. Minimum damage thresholds required to receive federal or state disaster recovery money may not be met. Less access to communication technology may hamper disaster warnings and response. [27]

[26] FEMA. (2021). "National Risk Index: Technical Documentation". https://www.fema.gov/sites/default/files/documents/fema_national-risk-index_technical-documentation.pdf

[27] Natural Hazards Center. "Rural Resilience: Disaster Preparedness for Communities Off the Beaten Path". Retrieved December 15, 2020, from https://hazards.colorado.edu/news/research-counts/rural-resilience-disaster-preparedness-for-communities-off-the-beaten-path

Elderly Populations

Washington County's population has a median age of 44.5 years old, higher than the State of Illinois' median age of 38.3. The number of residents ages 65 and above is expected to increase by 2030.[28] Elderly populations are more vulnerable to natural hazards than younger populations because they may have less physical mobility to respond to sudden-onset hazards, such as moving to higher ground during a flash flood or ducking and covering during an earthquake or tornado. Elderly populations are also more likely to require oxygen or dialysis machines, which can be shut off by power outages caused by severe storms and other natural hazards.

Populations with Disabilities

The American Community Survey (ACS), a survey program conducted by the US Census Bureau, estimates that 1,753 people, or 12.7% of Washington County's population, have a hearing, vision, cognitive, ambulatory, or self-care difficulty. People with hearing, vision, or cognitive disabilities may have heightened difficulty receiving warnings about natural hazards or instructions for what to do while a disaster is unfolding. People with ambulatory or self-care disabilities may not be able to respond to a sudden-onset hazard without assistance.

Low-income Populations

The 2020 US Census estimates that 7.6% of Washington County's population lives below the poverty line. More than one quarter of the population in Richview and Wamac is estimated to live below the poverty line (Table 11). Poverty may impact a person's ability to afford flood or earthquake insurance. Lack of transportation and affordable refuge options, and work requirements may impact a low-income person's ability to evacuate when a natural hazard occurs. During extreme heat or cold events, turning on lifesaving air-conditioning or heat may be unaffordable for low-income populations.

Mobile and Manufactured Home Residents

Although the number of people living in mobile or manufactured homes in Washington County is unknown, 140 mobile home tax bills for mobile homes were delivered by the county in 2021.[29] Mobile and manufactured homes are more vulnerable to natural hazards such as floods, wind, tornadoes, and earthquakes. As of 2009, Washington County requires that mobile homes have tie-down equipment to mitigate hazard risk.[30]

Occupation

Nearly 10% of Washington County's work force is employed by the natural resource sector, which includes agriculture, mining, hunting, forestry, and fishing (*Figure 8*). Natural hazards, including drought, severe storms, tornadoes, and flooding, all of which are prevalent in Washington County, can adversely impact natural resources, harming individual income and the greater economy of the county.

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[28] Illinois Department of Health, "Population Projections", 2019. https://dph.illinois.gov/content/dam/soi/en/web/idph/files/publications/population-projections-report-2010-2030.pdf

[29] News Release. Washington County, IL. Retrieved April 12, 2021, from. https://washingtonco.illinois.gov/treasurer/

[30] Revised Zoning Ordinance. (2009). Washington County, IL. Retrieved April 12, 2021, from https://washingtonco.illinois.gov/wp-content/uploads/2012/01/Washington-County-Illinois-Zoning.pdf

HAZARD PROFILES AND RISK ANALYSIS

Wind

High winds can occur during severe thunderstorms or strong weather systems. Isolated damage is possible when winds are sustained at 40-50 mph, as high winds can blow objects around.[31] Wind speeds over 58 miles per hour are considered severe. Straight-line winds in severe thunderstorms can exceed speeds of 100 mph.[32] Winds this strong can damage, or in extreme cases demolish, trees and structures.

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
1.88	124	66

SOURCE: NCEI STORM EVENTS DATABASE (1955-2020)

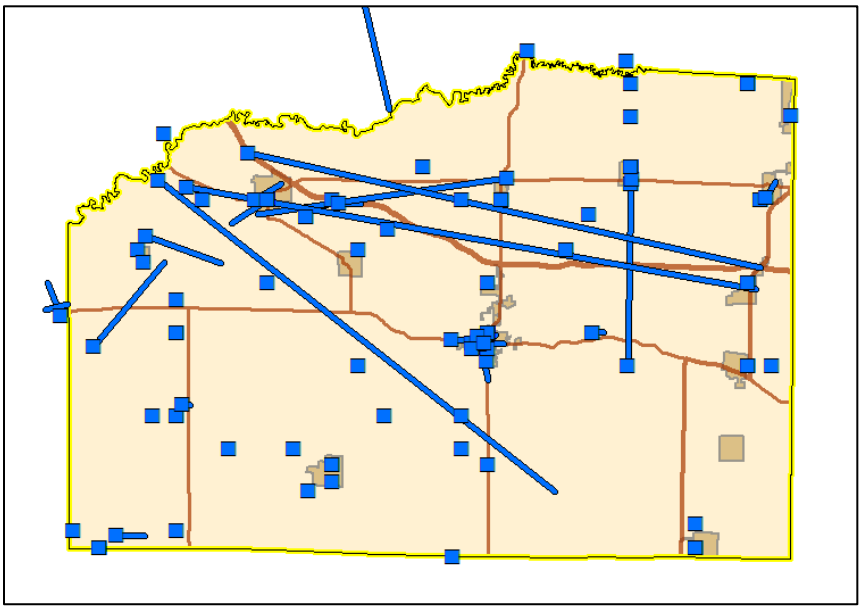

Figure 17. Severe wind reports in Washington County (1955-2019). Source: NCEI

[31] NWS. "Wind Safety". Retrieved April 1, 2021, from https://www.weather.gov/safety/wind
[32] NWS. "Severe Thunderstorm Safety. Retrieved April 1, 2021, from https://www.weather.gov/safety/thunderstorm

A relatively recent example of a storm with damaging winds in Washington County occurred on August 9, 2015. Showers and thunderstorms blew through the area that Sunday evening. Hoyleton Upholstery, located along State Route 177 in Hoyleton, was destroyed (*Figure 18, Figure 19*).[33] Debris was thrown onto nearby homes causing minor to moderate damage. This was later determined to be a microburst by the National Weather Service (NWS).[34]

Figure 18. Volunteers clear salvageable items from Hoyleton Upholstery. Credit: The Nashville News

Figure 19. The building and sign were knocked down by storm winds. Credit: The Nashville News

In the State of Illinois, there have been 18,392 reports of High, Strong, and Thunderstorm Wind between 1955 and 2020, producing an average of 278.67 reports per year.[35] To compare this with Washington County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for the area, the State of Illinois has an average of 2.71 wind reports per year, higher than Washington County's average of 1.88 wind reports per year.

The risk of a severe wind event occurring applies the same to the entire county. There are no known factors that make one area or community more prone to these events than another, although areas with mobile homes may be more susceptible to property damage, injuries, and fatalities caused by wind.

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[33] The Nashville News. "Hoyleton Upholstery Wrecked By Sunday Storms". Retrieved August 11, 2021. https://www.nash-news.com/2015/08/13/hoyleton-upholstery-wrecked-by-sunday-storms

[34] NCEI. "Storm Events Database". Retrieved April 1, 2021, from https://www.ncdc.noaa.gov/stormevents

[35] NCEI. "Storm Events Database". Retrieved April 1, 2021, from https://www.ncdc.noaa.gov/stormevents

Hail

Hail is precipitation in the form of balls of irregular lumps of ice, typically from a thunderstorm.[36] Hail can be the size of a pea or smaller, however, larger hailstones can cause severe damage to buildings, vehicles and plants.[37] Hailstones less than one inch in diameter are not considered severe by the NWS because the likelihood of these causing damage is lower. However, once a hailstone reaches the size of one inch in diameter, it has the potential to cause significant damage.[38]

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
1.82	120	66

SOURCE: NCEI STORM EVENTS DATABASE (1955-2020)

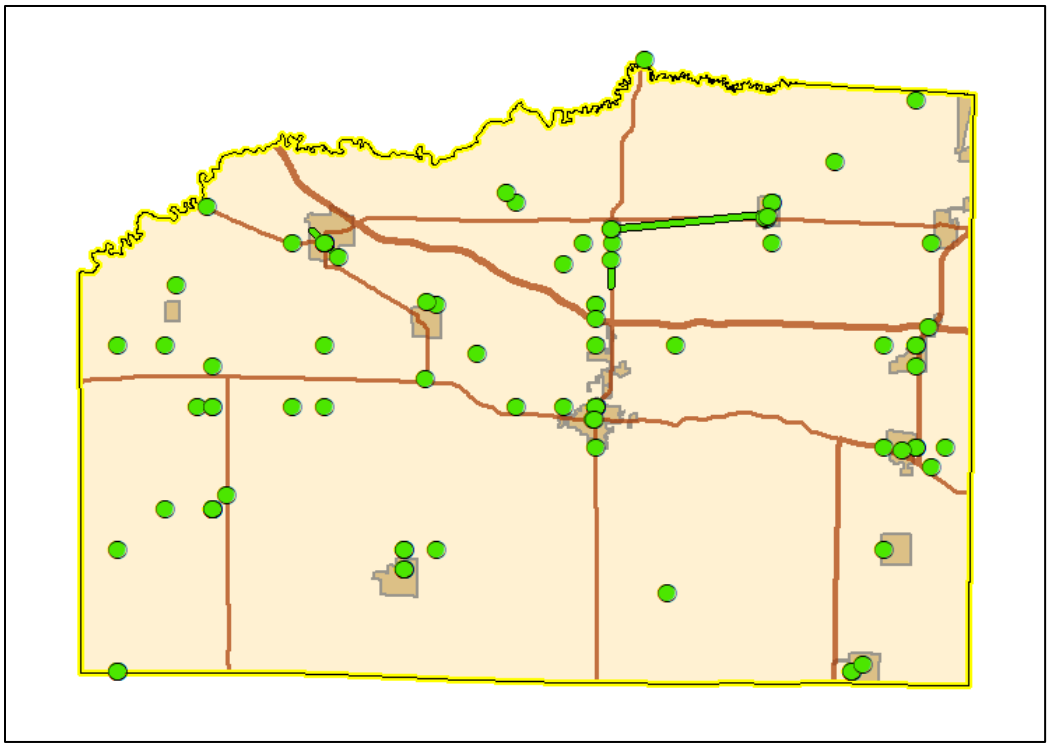

Figure 20. Hail Reports in Washington County (1955-2019). Source: NCEI

[36] American Meteorological Society Glossary. "Hail". Retrieved April 4, 2021, from https://glossary.ametsoc.org/wiki/Hail

[37] NWS. "Severe Thunderstorm Safety". Retrieved April 4, 2021, from https://www.weather.gov/safety/thunderstorm

[38] NWS. "National Implementation of the Use of 1-inch Diameter Hail Criterion for Severe Thunderstorm Warnings in the NWS". Retrieved April 4, 2021, from https://nws.weather.gov/products/PDD/OneInchHail_Oper_PDD.pdf

Washington County saw a swath of hail damage from supercell thunderstorms on April 28, 2012. On this day, storms formed in Missouri and traveled east-southeast, through the St. Louis metro area, and into the county.[39] There were six reports of hail >= 1 inch in diameter within Washington County[40], with one report from Okawville of a hailstone 4.5 inches in diameter (softball size).[41]

In the State of Illinois, there have been 9,445 reports of hail (>= 0.75-inch diameter) between 1955 and 2020, producing an average of 143.11 per year.[42] To compare this with Washington County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for the area, the State of Illinois has an average of 1.39 hail reports per year, lower than Washington County's average of 1.82 hail reports per year.

The risk of a hail event occurring applies the same to the entire county. There are no known factors that make one area or community more prone to these events than another.

[39] NWS. "The Great St. Louis Metropolitan Hail Storms". Retrieved April 12, 2021, from https://www.weather.gov/media/lsx/Events/04_28_2012.pdf
[40] NCEI. "Storm Events Database". Retrieved April 12, 2021, from https://www.ncdc.noaa.gov/stormevents
[41] NWS. "Significant Weather Event Reviews". Retrieved April 12, 2021, from https://www.weather.gov/lsx/events
[42] NCEI. "Storm Events Database". Retrieved April 12, 2021, from https://www.ncdc.noaa.gov/stormevents

Lightning

Lightning is a transient, high-current electric discharge most commonly produced by thunderstorms. Lightning discharges can happen within and between thunderstorm clouds, however, cloud-to-ground lightning strikes are the most studied. This type of lightning can severely injure or kill people, in addition to doing damage to structures, disrupting power/communications infrastructure, and starting fires.[43] Summer is the most common time of year for lightning to occur, however, thunderstorms can happen at any time of year.[44]

AVG CG STRIKES/YEAR	TOTAL CG STRIKES	YEARS IN RECORD
6,425	218,465	34

SOURCE: NCEI SEVERE WEATHER DATA INVENTORY (1987-2020)

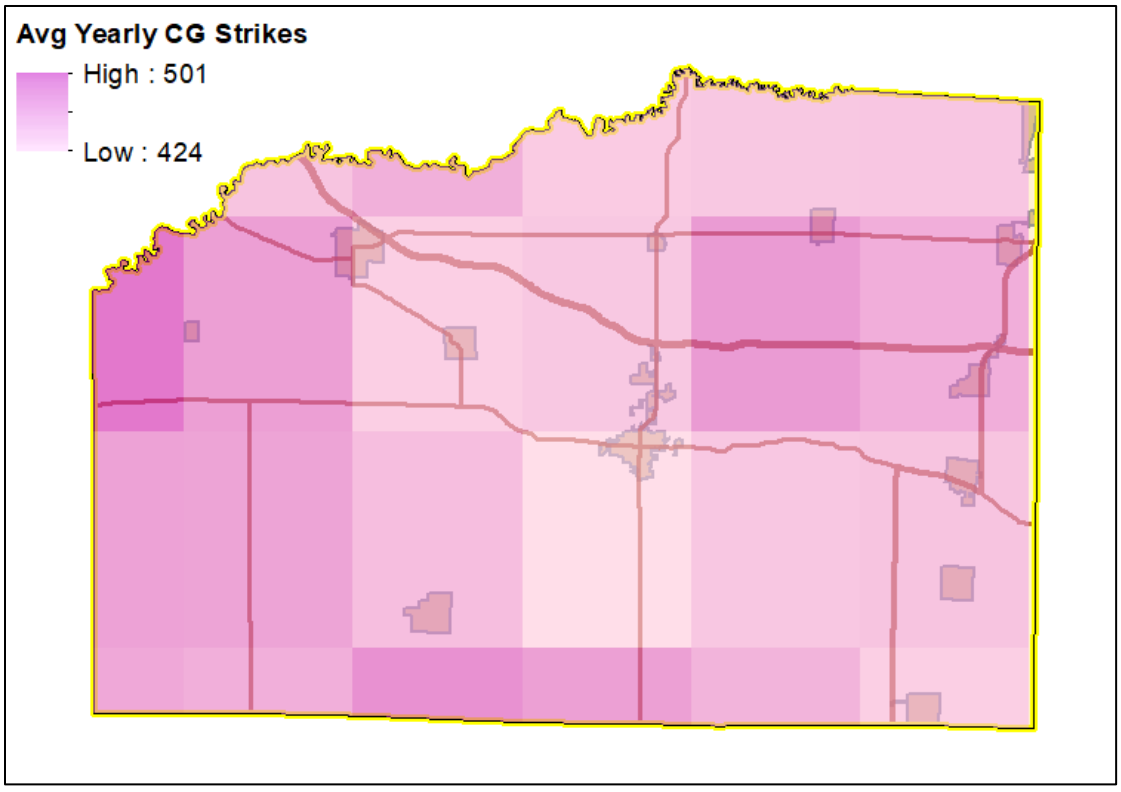

Figure 21. Average Yearly Cloud-to-Ground Lightning Strikes (1987-2020). Source: NCEI SWDI

[43] American Meteorological Society Glossary. "Lightning". Retrieved April 13, 2021, from https://glossary.ametsoc.org/wiki/Lightning

[44] NWS. "Lightning Safety Tips and Resources". Retrieved April 13, 2021, from https://www.weather.gov/safety/lightning

While the NCEI Storm Events database is a good source of information, it does not record the occurrence of every single cloud-to-ground lightning strike over Washington County. NCEI also provides Lightning Tile Summaries as part of the Severe Weather Data Inventory. The number of cloud-to-ground lightning flashes for each day is recorded in 0.1-degree tiles covering the continental US. The number of average yearly strikes varies by tile. The number of average yearly strikes for tiles covering Washington County ranges from 424 to 501. Adding up the average number of strikes for each tile covering the county yields a total of 6,425 average cloud-to-ground lightning strikes per year. [45]

The private sector company Vaisala created the National Lightning Detection Network (NLDN) to record all lightning: cloud-to-ground strokes and cloud pulses. Using data from the NLDN, the NWS office in Medford developed Hourly Lightning Climatology. According to this climatology, lightning in Washington County is most likely to occur during afternoons and evenings of the summer months.[46]

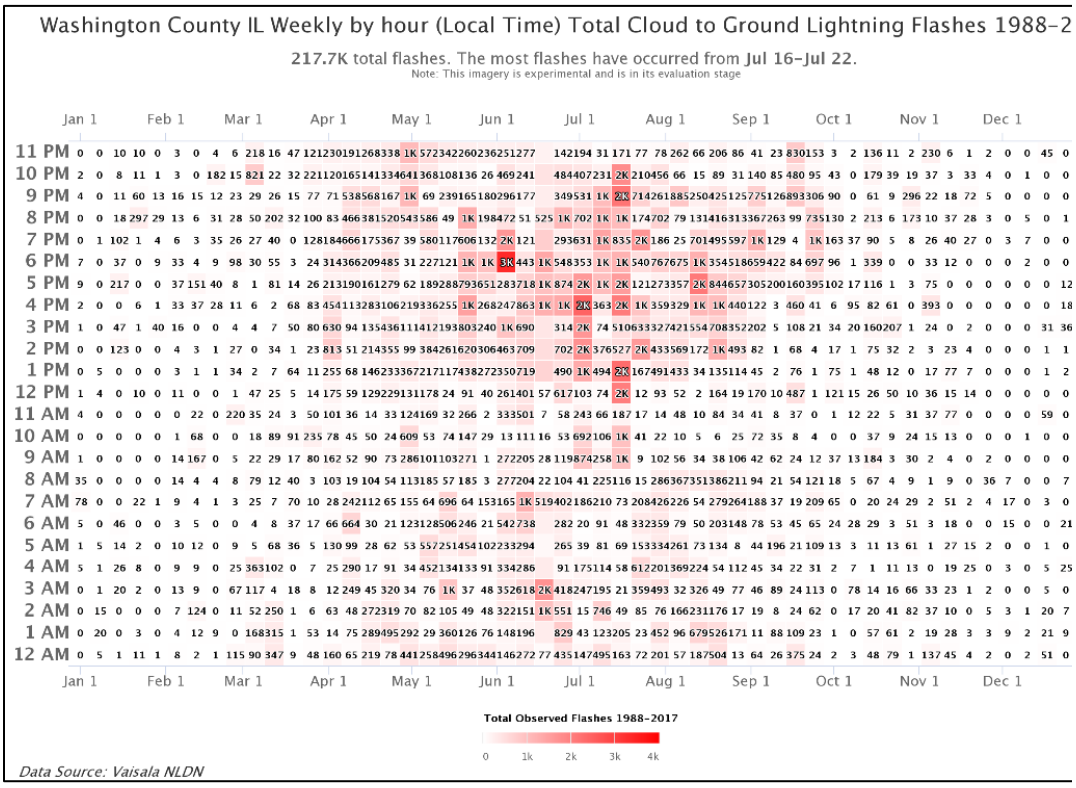

Figure 22. Weekly by Hour Total Cloud-to-Ground Lightning Flashes for Washington County (1988-2017).

Source: NWS

On September 9, 2016, a lightning strike to the communications tower in Nashville's courthouse square caused damage to various electrical systems located nearby. Fortunately, there were no injuries or fatalities, however, sparking and smoke were reported inside the ambulance building. There was also damage to the backup 911 system, digital radio equipment, and the emergency generator, telephone and HVAC systems of the courthouse.

[45] NCEI. "Lightning Products and Services". Retrieved September 11, 2021, from https://www.ncei.noaa.gov/products/lightning-products

[46] NWS. "Hourly Lightning Climatology for Continental United States". Retrieved Apr 13, 2021, from https://www.weather.gov/mfr/lightning_climatology

The Sheriff's department had issues with computers and phones. Nearby businesses lost phone and internet connectivity, and The Nashville News lost some pieces of networking equipment.[47]

There were 24,806,664 recorded cloud-to-ground lightning strikes between 1987 and 2020 in the State of Illinois, producing an average of 677,407 strikes per year. [48] To compare this with Washington County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for the area, the State of Illinois has an average of 7,104 strikes per year, higher than Washington County's average of 6,425 strikes per year.

The risk of a lightning event occurring applies the same to the entire county. There are no known factors that make one area or community more prone to these events than another.

[47] The Nashville News, "Flash From Friday Night Courthouse Lightning Strike Caught On Camera", accessed Aug 2021. https://www.nash-news.com/2016/09/15/flash-from-friday-night-courthouse-lightning-strike-caught-on-camera

[48] NCEI. "Storm Events Database". Retrieved April 12, 2021, from https://www.ncdc.noaa.gov/stormevents

Tornado

A tornado is a violently rotating column of air that extends from the base of a thunderstorm and touches the ground. Tornadoes vary in strength from weak to devastating. Some can be strong enough to uproot large trees and destroy well-made buildings.[49] Although in Illinois they are more likely to occur in the Spring during late afternoon hours,[50] tornadoes can form during any day of the year and during any time of day.

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
0.41	29	71

SOURCE: NCEI STORM EVENTS DATABASE (1950-2020)

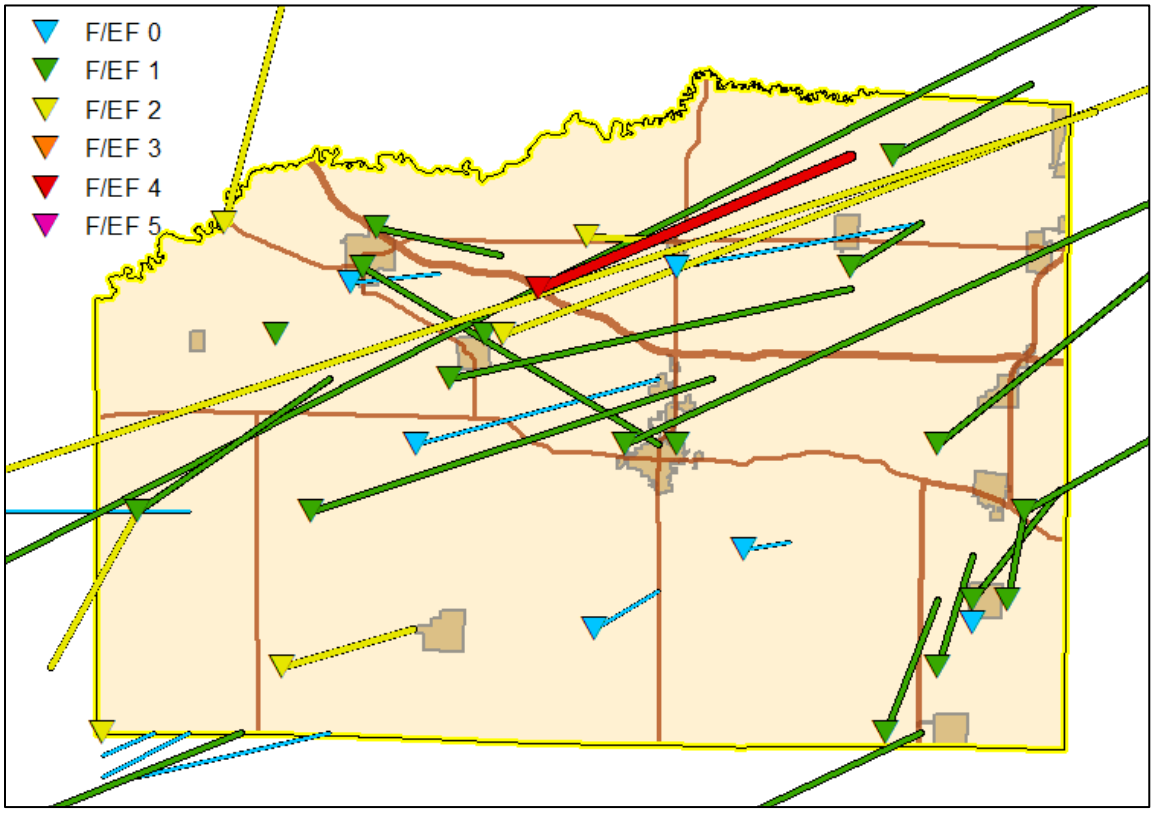

Figure 23. Tornado Reports/Tracks in Washington County (1950-2019). Source: NWS SPC

The strongest and deadliest tornado in Washington County since 1950 struck on November 17, 2013. A fall tornado outbreak occurred on this day. One of these tornadoes was rated EF-4 with maximum winds of at least 166 mph.

[49] NWS. "Tornado Safety". Retrieved April 22, 2021, from https://www.weather.gov/safety/tornado
[50] Illinois State Climatologist. "Tornadoes in Illinois". Retrieved April 22, 2021, from https://stateclimatologist.web.illinois.edu/climate-of-illinois/tornadoes-in-illinois

During its 10.6-mile path, it blew a tractor-trailer off I-64 and completely destroyed a home southeast of New Minden. Two fatalities occurred at this location. The tornado then hit the community of New Minden, producing significant damage to a church and homes nearby. It continued past the community to damage another farm and home before dissipating.[51]

Figure 24. A home damaged by the 11/17/2013 New Minden tornado. Source: NWS

In the State of Illinois, there have been 2,751 reports of tornadoes between 1950 and 2020, producing an average of 38.75 tornadoes per year.[52] To compare this with Washington County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for the area, the State of Illinois has an average of 0.38 tornadoes per year, slightly lower than Washington County's average of 0.41 tornadoes per year.

The risk of a tornado occurring applies the same to the entire county. There are no known factors that make one area more prone to these events than another. Populations living in mobile or manufactured homes are more vulnerable to tornadoes due to the construction quality and lack of wind-resistant shelters nearby.

Tornado GIS Analysis

GIS-overlay modeling was used to estimate the potential impacts of an F3 tornado moving through Washington County. A hypothetical tornado track was created that begins in the Village of Oakdale and travels approximately 12.4 miles crossing through the City of Nashville to terminate 0.64 miles north of Interstate 64.

Description of Analysis

As stated above, the scenario for this analysis is a Fujita Scale F3 tornado moving through Washington County. See *Figure 25* below for a map of this scenario. Hazus software was not used for this analysis. A GIS-based methodology was used to estimate potential damages based on current structure values located in the path of the simulated tornado track.

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[51] NWS. "Tornado Outbreak November 17th 2013". Retrieved April 12, 2021, from https://www.weather.gov/media/lsx/Events/11_17_2013.pdf

[52] NCEI. "Storm Events Database". Retrieved April 12, 2021, from https://www.ncdc.noaa.gov/stormevents

Estimates of dollar losses for structures located in the tornado's path were determined through this analysis. Estimates for injuries/loss of life, shelter needs, and damage to infrastructure are not included. To estimate the potential damages, GIS was used to create four different damage zones around the tornado track. Each zone represents a different Fujita Scale wind intensity from F3 to F0 based on its proximity to the center of the track. A damage percentage is assigned to each zone, with the most intense damage occurring within the center of the tornado path and decreasing amounts of damage away from the center. These percentages are listed in *Table 23*. This methodology of creating buffers was based on the publication titled "A Study of the GIS Tools Available During Tornado Events and Their Effectiveness for Meteorologists, First Responders and Emergency Managers" presented at the American Meteorological Society Cloud Physics Conference in 2006[53].

Once these zones were created, they were overlaid on top of points taken from the building inventory derived from the Washington County Assessor's database. Each point represents an existing structure and is attributed with an estimate of the replacement cost of the structure as calculated from RSMeans square footage values. For more information on this see Appendix F. The number of structures that fell in each tornado damage zone is listed in *Table 24*. Depending on which damage zone each of these points was located in, the fair market value of the structure was multiplied by the percentage listed in *Table 23* to give an estimate of the dollar losses that may result in such an event.

Table 23. Tornado Damage Zones

Zone	Range (Feet)	Damage Percentage
1 (F3)	0-330	0.8
2 (F2)	331-660	0.5
3 (F1)	661-1320	0.1
4 (F0)	1321-2640	0

[53] Hubbard, S.A. and MacLaughlin, K. (2006). A Study of the GIS Tools Available During Tornado Events and Their Effectiveness for Meteorologists, First Responders and Emergency Managers. *American Meteorological Society Cloud Physics Conference.*

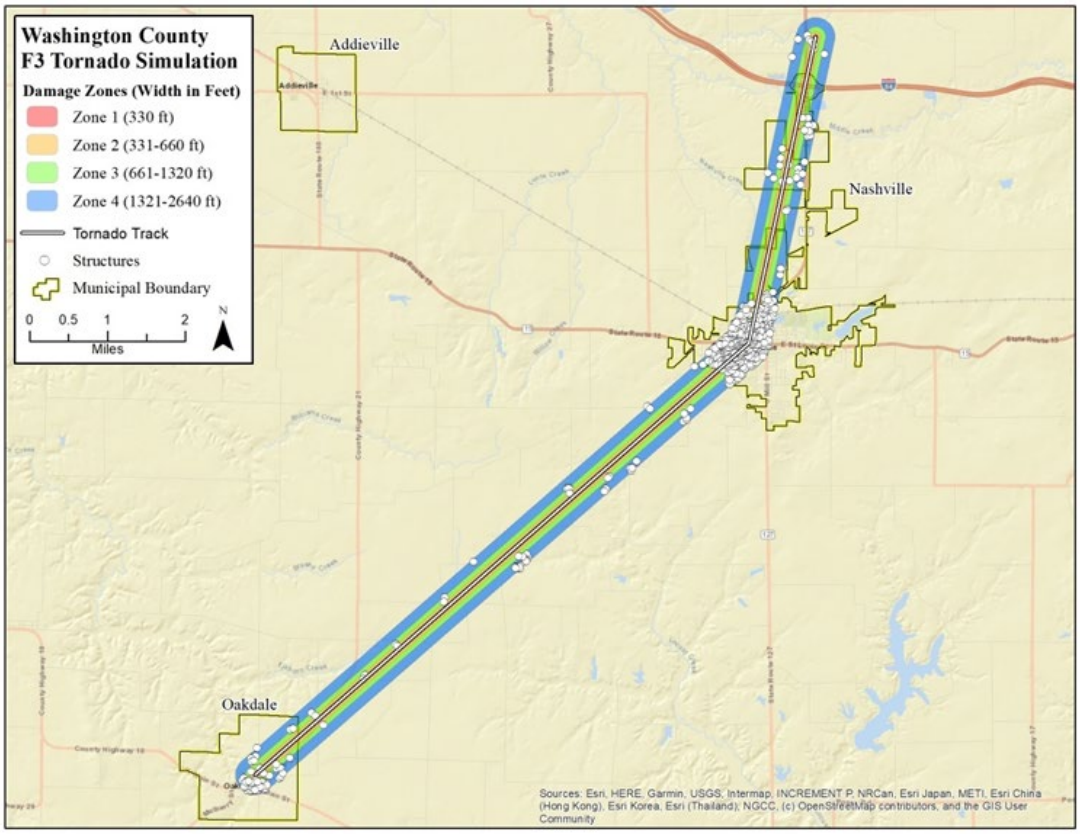

Figure 25. Tornado Damage Zones

A total of 378 structures located in Zones 1-3 were damaged in this scenario. Six of these structures were essential facilities. Four essential facilities fell within Zone 4. These facilities are listed in *Table 25*.

Table 24. Structure Count in Each Tornado Damage Zone

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Residential	115	108	271	630
Commercial	33	50	58	60
Industrial	0	0	3	6
Agriculture	0	0	1	3
Government	5	2	7	2
Religion	1	1	1	7
Education	3	1	5	1
Total	**157**	**162**	**346**	**709**

Table 25. Essential Facilities Located in Tornado Path

Essential Facilities	Damage Zone	City
Nashville Community Fire Protection District	Zone 1	Nashville
Washington County Sheriff	Zone 1	Nashville
Washington County Hospital	Zone 1	Nashville
Industrial Park	Zone 1	Nashville
Washington County Emergency Service District	Zone 3	Nashville
Ambulance Service	Zone 3	Nashville
Coulterville Fire Protection District	Zone 4	Oakdale
Trinity-St John Lutheran School	Zone 4	Nashville
Friendship Manor Nursing Home	Zone 4	Nashville
Nashville Sewage Treatment Plant	Zone 4	Nashville

Damage to, or loss of, these essential facilities can result in a large negative impact on the community during a disaster. The loss of a healthcare center can reduce the capacity to treat those injured during an event. The loss of schools can have impacts such as reduced options for temporary shelter, as schools are often used in this capacity, and can increase the amount of time it takes to restore a level of normalcy to the community.

Economic Losses

The total loss estimate for this event is $112,735,700. Commercial losses are the largest contributor to loss estimates followed closely by industrial due to high-value structures located in Damage Zone 1. This includes commercial structures such as Washington County Hospital and large structures in the Industrial Park located to the north of Nashville. Zone 1 shows the highest loss totals as the structures in this zone were subject to the highest simulated wind damages (*Table 26*).

Table 26. Total Loss Estimates by Occupancy

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Residential	$10,285,282	$6,957,395	$2,581,379	$0
Commercial	$35,439,459	$5,819,582	$2,496,108	$0
Industrial	$25,936,800	$818,733	$15,931,940	$0
Agriculture	$0	$563,283	$754,320	$0
Governmental	$3,860,797	$239,405	$882,833	$0
Religion	$0	$0	$168,384	$0
Education	$0	$0	$0	$0
Total	**$75,522,338**	**$14,398,398**	**$22,814,964**	**$0**
Total Losses	**$112,735,700**			

Riverine Flooding

Flooding is a natural part of the hydrologic cycle. It rains, water collects on the ground, it evaporates, and it rains again. Flooding becomes a problem when water collects on the ground in locations where it normally does not, for example outside of riverbanks, on top of roads, or in homes. Riverine flooding can occur due to an excess of rain, melting snow, or an ice jam. Floods on larger rivers can take days, weeks, or even months to crest and subside.[54]

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
0.12	3	25

SOURCE: NCEI STORM EVENTS DATABASE (1996-2020)

In addition to the Unincorporated Areas of Washington County, three incorporated communities – Nashville, Okawville, and Wamac – have FEMA Flood Insurance Rate Maps (FIRM) showing Special Flood Hazard Areas (SFHA).[55]

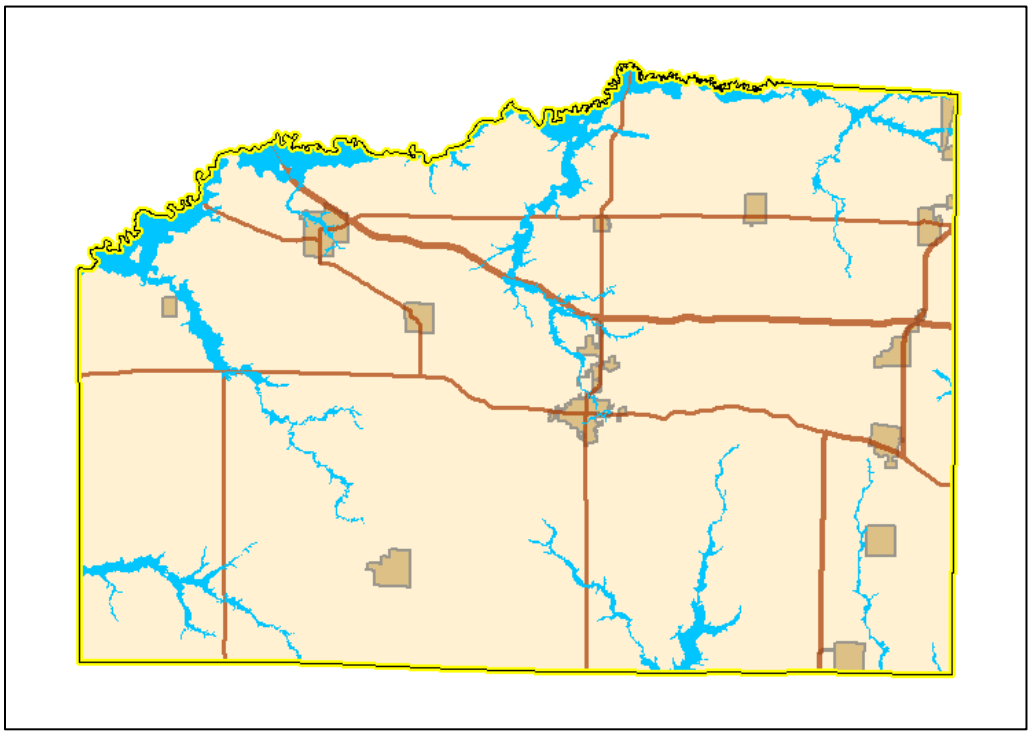

Figure 26. SFHAs on FEMA FIRMs for Washington County. Source: FEMA

[54] Midwestern Regional Climate Center (MRCC). "Living with Weather: Floods". Retrieved Apr 16, 2021, from https://mrcc.illinois.edu/living_wx/floods/index.html

[55] FEMA. "Flood Map Service Center". Retrieved April 16, 2021, from https://msc.fema.gov

Heavy rain at the end of April and during May 2002 caused riverine flooding on the Kaskaskia River. The flooding was relatively minor, however, it lasted through most of May. Parts of Highway 51 had to be closed between Vandalia and Salem.[56]

Figure 27. The bridge between the main playing fields and the golf course at Memorial Park in Nashville, underwater during a flood in May 2017.
Source: The Nashville News

In the State of Illinois, there have been 2,750 reports of flooding between 1996 and 2020, producing an average of 110 reports per year. [57] To compare this with Washington County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for the area, the State of Illinois has an average of 1.07 reports per year, higher than Washington County's average of 0.12 reports per year.

The risk of a riverine flood event occurring at a location varies depending on its proximity to a river, lake, or other surface water feature. The closer a structure is to a water feature, the greater its chances of getting flooded.

Over the last 120 years, mean precipitation has increased by 5-20% across Illinois. The number of days with 2 inches of rain has also increased by about 40%. In the future, Illinois will likely see an overall increase in precipitation over the next few decades, including an increase in the number of days with 2+ inches of rain. As a result, flooding in most rivers/streams is expected to continue to increase.[58]

Hazus Analysis

Flood Risk Assessment

The flood risk assessment conducted for Washington County combines the GIS-based technology of Hazus with the updated structure asset inventory, essential facilities, and flood hazards to provide a solid, consistent framework to quantify the county's risk.

The impact of five separate flood events was analyzed including the 10%, 4%, 2%, 1%, and 0.2% annual chance floods. An average annualized loss (AAL) value is then calculated using the values from the five flood events listed above. AAL represents the estimated long-term value of losses averaged on an annual basis. This value can be useful for estimating the potential flood losses over a defined period of time.

Depth Grids

To represent the flood hazard, flood depth grids were created for each of the five flood events in Washington County. Depth grids consist of a grid of equal-sized cells that cover the spatial extent of a given flood event. Each one of these cells has a flood depth value associated with it for the annual chance event being represented. Depth grids are calculated by subtracting ground elevations from flood elevation grids. Ground elevations take the form

[56] NCEI. "Storm Events Database". Retrieved April 12, 2021, from https://www.ncdc.noaa.gov/stormevents
[57] NCEI. "Storm Events Database". Retrieved April 12, 2021, from https://www.ncdc.noaa.gov/stormevents
[58] Wuebbles, D., Angel, J., Petersen, K., and Lemke, A.M. (2021). An Assessment of the Impacts of Climate Change in Illinois. *The Nature Conservancy, Illinois*. https://doi.org/10.13012/B2IDB-1260194_V1

of a GIS raster Digital Elevation Model (DEM) or Digital Terrain Model (DTM). The Water Surface Elevation (WSE) grids are created by using flood elevations at cross-sections along the studied river or stream. A more detailed description of the source for each of these grids is included in the paragraphs below.

The depth grids were created by running a hydrologic analysis in Hazus. The ground elevations were derived using the USGS 1/3 ArcSecond seamless DEM. The USGS 1/3 ArcSecond, or 10 meters, DEM is kept up to date with current topographic data through the USGS 3DEP program. [59] This includes LiDAR data made available in 2015.

Building Exposure

Fifty structures were identified to be at a high risk of flooding in Washington County. For this risk assessment, "high risk" structures are those that are located within the 1% annual chance (100-year) and the 0.2% annual chance (500-year) floodplain. Estimates of the structure counts and replacement cost value of the structures are detailed in *Table 27* below.

Table 27. High-risk building exposure (building and content cost).

	1% Annual Chance Flood (100yr)		0.2% Annual Chance Flood (500yr)	
Community Name	**Count**	**Total Exposure**	**Count**	**Total Exposure**
Nashville	2	$968,290	9	$4,062,404
Okawville	1	$253,165	1	$253,165
Wamac	3	$617,655	7	$897,092
Washington County Unincorporated Areas	19	$5,765,021	33	$18,489,494
Total	**25**	**$7,604,131**	**50**	**$23,702,155**

Economic Loss Due to Flooding

A Hazus flood loss analysis was performed using the structure-based asset inventory to investigate the impact of the five analyzed flood events. The results are listed by community and by occupancy class in *Table 28* and *Table 29.*

Flooding events can be extreme and devastating, leading to millions of dollars of losses during a flood event. Looking at the flood risk faced on an annual basis by using the average annualized losses shows on average how much it costs per year to keep properties unprotected from floods or in the floodplain.

Structure counts only include buildings that returned flood losses in the analysis. Some structures were not shown to be damaged despite being located within the floodplain such as structures that are elevated above the water of the flood event being analyzed.

[59] U.S. Geological Survey 3D Elevation Program (3DEP). Accessed 2021. USGS NED 1/3 arc-second DEM. https://apps.nationalmap.gov/downloader Reston, VA

Table 28. Total flood losses by community (2021 USD).

		Community Name				Total
		Nashville	Okawville	Wamac	Washington County Unincorporated Areas	
10% Annual Chance Flood (10yr)	Building Count	1	0	3	11	15
	Total Losses	$32,100	$0	$281,500	$1,056,700	$1,370,300
4% Annual Chance Flood (25yr)	Building Count	1	1	3	13	18
	Total Losses	$120,400	$10,700	$325,100	$1,551,900	$2,008,100
2% Annual Chance Flood (50yr)	Building Count	1	1	3	13	18
	Total Losses	$150,000	$53,200	$349,200	$1,786,800	$2,339,200
1% Annual Chance Flood (100yr)	Building Count	2	1	3	19	25
	Total Losses	$188,500	$88,700	$367,200	$2,424,400	$3,068,800
0.2% Annual Chance Flood (500yr)	Building Count	9	1	7	33	50
	Total Losses	$1,552,800	$147,000	$459,200	$6,933,200	$9,092,200
Average Annualized Loss	Building Count	9	1	7	33	50
	Total Losses	$19,040	$2,910	$32,760	$184,020	$238,730

Table 29. Total flood losses by occupancy (2021 USD).

		Occupancy Class				
		Agricultural	Commercial	Government	Residential	**Total**
10% Annual Chance Flood (10yr)	Count	5	1	0	9	15
	Total Losses	$735,200	$32,100	$0	$603,000	$1,370,300
4% Annual Chance Flood (25yr)	Count	7	1	0	10	18
	Total Losses	$1,152,700	$120,400	$0	$735,000	$2,008,100
2% Annual Chance Flood (50yr)	Count	7	1	0	10	18
	Total Losses	$1,340,300	$150,000	$0	$848,900	$2,339,200
1% Annual Chance Flood (100yr)	Count	12	2	0	11	25
	Total Losses	$1,896,400	$188,500	$0	$983,900	$3,068,800
0.2% Annual Chance Flood (500yr)	Count	25	4	1	20	50
	Total Losses	$6,247,400	$887,000	$127,900	$1,829,900	$9,092,200
Average Annualized Loss	Count	25	4	1	20	50
	Total Losses	$142,830	$15,060	$760	$80,080	$238,730

Flash Flooding

Flooding is a natural part of the hydrologic cycle. It rains, water collects on the ground, it evaporates, and it rains again. Flooding becomes a problem when water collects on the ground in locations where it normally does not, for example outside of riverbanks, on top of roads, or in homes. Flash flooding is most commonly caused by heavy rainfall, and it typically begins and subsides quickly.[60] It does not have to occur near an existing stream, and often happens in developed areas, flooding streets and basements, and overwhelming stormwater and combined sewer systems. [61] Due to its fast-developing nature, flash flooding can be extra dangerous because it is difficult to predict.

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
0.44	11	25

SOURCE: NCEI STORM EVENTS DATABASE (1996-2020)

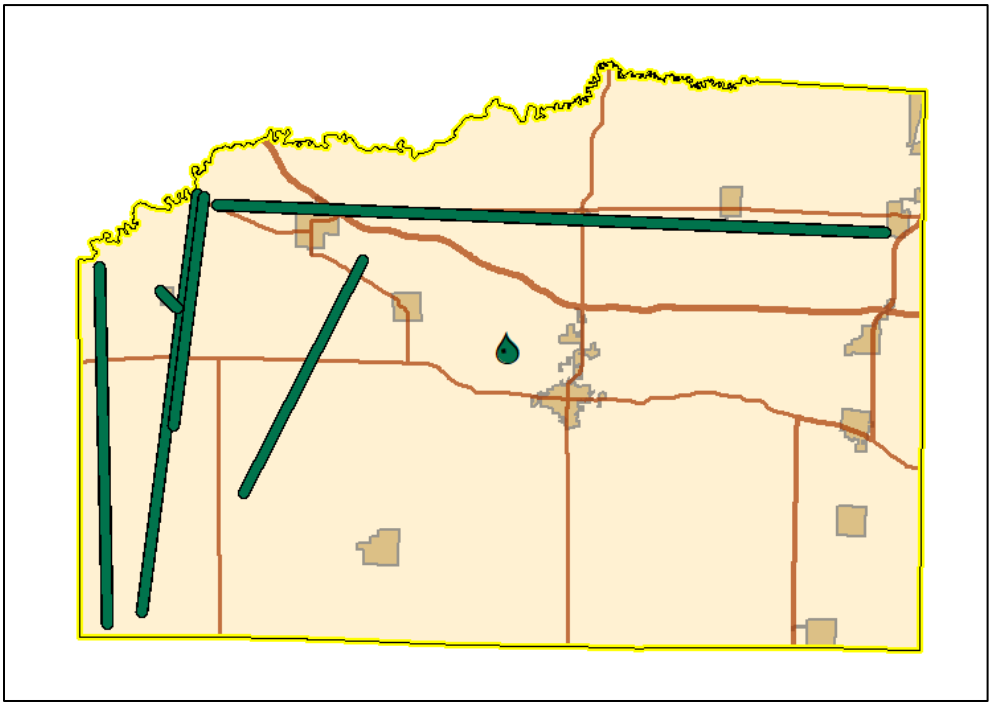

Figure 28. Flash flood reports in Washington County (1996-2020). Source: NCEI

[60] NWS. "Flood Related Hazards". Retrieved June 22, 2021, from https://www.weather.gov/safety/flood-hazards
[61] MRCC. "Living with Weather: Floods". Retrieved April 16, 2021, from https://mrcc.illinois.edu/living_wx/floods/index.html

Starting in the late evening of March 17 and lasting into March 18, 2008, up to 6 inches of rain fell across the area, on the ground that was already saturated. Numerous roads were flooded, including Posen Road and the intersection of Sycamore Road and Peach Tree Road. The City of Nashville Reservoir came dangerously close to overflowing.[62]

In the State of Illinois, there have been 2,724 reports of flash flooding between 1996 and 2020, producing an average of 108.96 reports per year. [63] To compare this with Washington County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for the area, the State of Illinois has an average of 1.06 reports per year, higher than Washington County's average of 0.44 reports per year.

The risk of a flash flood event occurring at a location varies depending on many factors. These include environmental variables such as topography ("hilliness" or "flatness" of an area) and soil type/permeability. Additionally, developed areas with impervious surfaces and aging stormwater systems tend to have higher chances for flash flooding. [64] Although rates and amounts of a rain event play the largest factor in whether a location sees a flash flood, the risk for heavy rainfall is the same across the county.

Mean precipitation in Illinois has increased by 5-20% over the last 120 years. The number of days with 2 inches of rain has also increased by about 40%. In the future, Illinois will likely see an overall increase in precipitation over the next few decades, including an increase in the number of days with 2+ inches of rain. Increases in intense rainfall events are expected to worsen flash flooding in developed areas.[65]

[62] NCEI. "Storm Events Database". Retrieved April 15, 2021, from https://www.ncdc.noaa.gov/stormevents
[63] NCEI. "Storm Events Database". Retrieved April 15, 2021, from https://www.ncdc.noaa.gov/stormevents
[64] IDNR. (2015) "Report for the Urban Flooding Awareness Act". https://www.dnr.illinois.gov/WaterResources/Documents/Final_UFAA_Report.pdf
[65] Wuebbles, D., Angel, J., Petersen, K., and Lemke, A.M. (2021). An Assessment of the Impacts of Climate Change in Illinois. *The Nature Conservancy, Illinois*. https://doi.org/10.13012/B2IDB-1260194_V1

Dam/Levee Failure

The United States Army Corps of Engineers keeps a database of dams called the National Inventory of Dams. Among the many attributes recorded is downstream hazard potential. Ratings of high, significant, or low are given depending on the potential hazard to the downstream area resulting from failure or mis-operation. A probable loss of any human life automatically puts a dam in the high category. Probable economic, environmental, or lifeline losses place a dam in the significant category. If these losses are low and generally limited to the dam owner, a dam will be categorized as low.[66]

HIGH HAZARD POTENTIAL DAMS	SIGNIFICANT HAZARD POTENTIAL DAMS	LOW HAZARD POTENTIAL AND UNDETERMINED DAMS	TOTAL DAMS
2	2	9	13

SOURCE: USACE NATIONAL INVENTORY OF DAMS (2018)

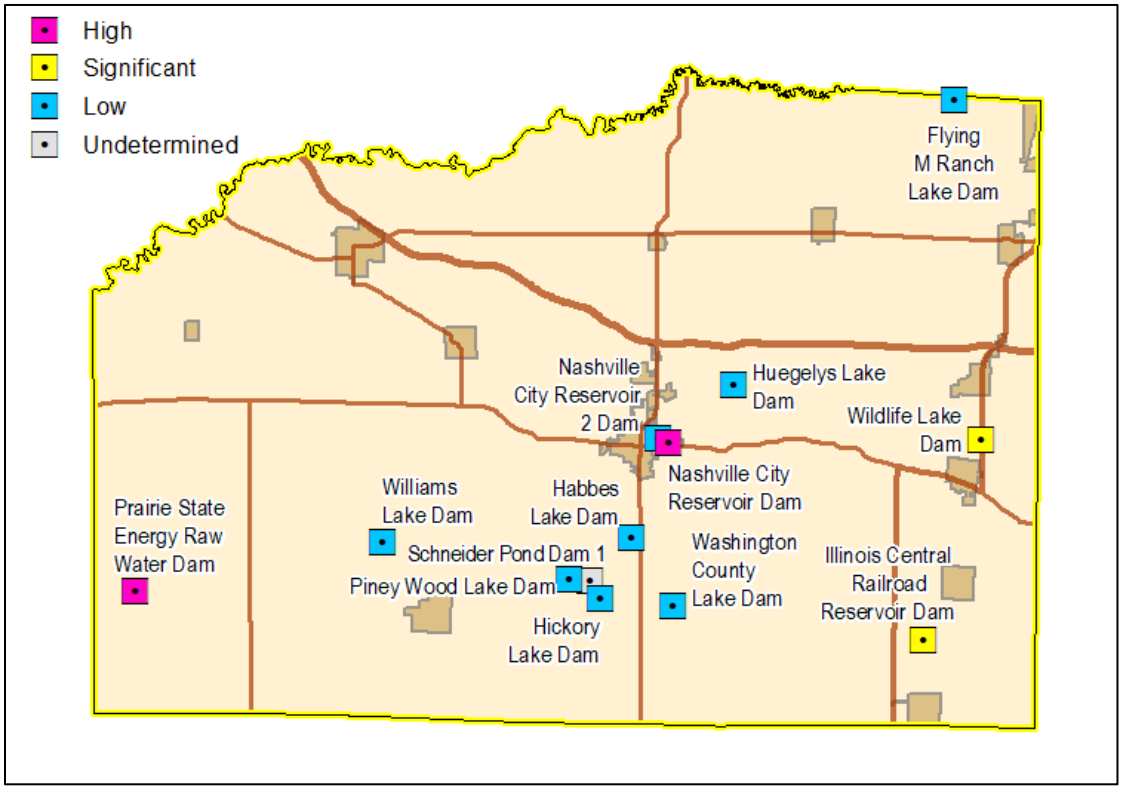

Figure 29. Dams in Washington County. Source: USACE NID

[66] USACE. National Inventory of Dams. Retrieved April 30, 2021, from https://nid.sec.usace.army.mil

According to the National Inventory of Dams, there are 13 dams located within Washington County. Two of these, Prairie State Energy Raw Water Dam and Nashville City Reservoir Dam, are ranked with high downstream hazard potential. Two others, Illinois Central Railroad Reservoir Dam and Wildlife Lake Dam, are listed with significant downstream hazard potential. The other 8 dams have either low or undetermined downstream hazard potential. Although not within Washington County, the Carlyle Lake Dam located upstream on the Kaskaskia River has the potential to cause catastrophic losses if it fails.

On July 26, 2022, a secondary dam on the Nashville City Reservoir was breached after over four inches of rain fell near Nashville in less than 12 hours.[67] The six-foot breach caused nearly 40 acres of land between Ashley, IL and Nashville to flood, including Illinois Route 15. Several residents voluntarily evacuated and there were no reported fatalities. Several more inches of rain fell on July 27 and 28 causing a Hyper Reach alert to be sent to residents who could be impacted if the primary dam was breached.[68] The secondary dam breach relieved pressure on the primary dam, which did not fail.[69]

Figure 30. A six-foot breach on the Nashville Reservoir's secondary dam (L) and resulting flooding on IL Route 15 (R). Source: Charles Guffey, The Nashville News.

A location's proximity to the downstream side of a dam is the most significant factor in determining its risk of being involved in a dam failure event. Other factors certainly play a role, such as a dam's maintenance and materials. Although rates and amounts of a rain event also play a large factor in whether a location is at risk for dam failure, the risk for heavy rainfall is the same across the county.

[67] NWS. "July 26th, 2022 Historic Flash Flooding in the St. Louis Metro Area". Retrieved July 29, 2022, from https://www.weather.gov/lsx/July262022Flooding

[68] The Nashville News. "Breach found in secondary dam at Nashville Reservoir". Retrieved July 29, 2022, from https://www.nash-news.com/2022/07/26/breach-found-in-secondary-dam-at-reservoir/

[69] KFVS News. "It did what it was supposed to": Secondary dam breaches at Nashville, Ill. Reservoir". Retrieved July 29, 2022, from https://www.kfvs12.com/2022/07/26/it-did-what-it-was-supposed-secondary-dam-breaches-nashville-ill-reservoir/

Winter Weather

Winter storms in the Midwest form as cold Arctic air pushes into the region, forming large low-pressure systems and bringing sub-freezing temperatures, snow, and wind.[70] The term "blizzard" requires sustained winds or frequent gusts of 35 mph or more, with falling or blowing snow frequently reducing visibility to less than a quarter mile for 3 hours or more. These storms can last for several hours to over a day, disrupting transportation of goods and hindering mobility for daily life. Humans and animals caught outside in these conditions can suffer injury or death due to hypothermia. Snow removal and damage repair can be costly for communities and individuals.[71]

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
1.48	37	25

SOURCE: NCEI STORM EVENTS DATABASE (1996-2020)

The Midwestern Regional Climate Center (MRCC) has calculated snow climatology for selected stations across the US. Nashville can expect an average of 1.6 events per year with at least 6 inches of snow over 3 days (*Table 30*).

Table 30. Average number of 3-day snow totals of selected amounts for Nashville, IL (1960-2018). Source: MRCC

Snow Climatology: Average number of 3-Day Snow Totals for

NASHVILLE 1 E

	≥ 0.1"	≥ 1.0"	≥ 2.0"	≥ 3.0"	≥ 4.0"	≥ 6.0"	≥ 8.0"	≥ 12.0"	≥ 18.0"	≥ 24.0"
All Months	21.7	13.3	7.6	5.1	3.3	1.6	0.6	0.1	0	0
January	7	4.1	2.3	1.6	0.9	0.3	0.2	0	0	0
February	6.7	3.8	2.2	1.4	0.9	0.4	0.2	0	0	0
March	2.9	1.8	0.9	0.7	0.5	0.2	0.1	0	0	0
April	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0	0
May	0	0	0	0	0	0	0	0	0	0
June	0	0	0	0	0	0	0	0	0	0
July	0	0	0	0	0	0	0	0	0	0
August	0	0	0	0	0	0	0	0	0	0
September	0	0	0	0	0	0	0	0	0	0
October	0	0	0	0	0	0	0	0	0	0
November	0.7	0.6	0.4	0.2	0.2	0.1	0.1	0	0	0
December	4.2	2.7	1.7	1.1	0.8	0.4	0.1	0	0	0

Period of Record used: Snow Years 1960-61 to 2017-18

[70] MRCC, "Living with Weather: Winter Storms". Retrieved April 29, 2021, from https://mrcc.illinois.edu/living_wx/winterstorms/index.html

[71] NWS, "Snow Storm Safety". Retrieved April 29, 2021, from https://www.weather.gov/safety/winter-snow

Beginning January 26, 2009, a winter storm blew through the Middle Mississippi River Valley. Wintery precipitation occurred in waves through January 28.[72] In Washington County, 7 to 8 inches of mostly snow fell. In Nashville, 8 inches of snowfall was reported.[73]

In the State of Illinois, there have been 5,569 reports of Heavy Snow, Sleet, Winter Storm or Winter Weather between 1996 and 2020, producing an average of 222.76 reports per year. [74] To compare this with Washington County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for the area, the State of Illinois has an average of 2.17 reports per year, higher than Washington County's average of 1.48 reports per year.

The risk of a winter storm occurring applies the same to the entire county. There are no known factors that make one area or community more prone to these events than another.

According to "An Assessment of the Impacts of Climate Change in Illinois", average daily temperatures in Illinois have increased by 1-2°F over the last 120 years. In addition to rising daytime maximum temperatures, overnight minimum temperatures are also increasing, markedly higher than the maximums. In the future, Illinois will likely see fewer snow days leading to decreases in total seasonal snowfall. However, since warmer air can hold more moisture, the frequency and intensity of heavy snow events may still increase.[75]

[72] NWS. "Winter Storm January 26th-28th, 2009". Retrieved April 19, 2021, from https://www.weather.gov/media/lsx/Events/01_31_2008.pdf
[73] NCEI. "Storm Events Database". Retrieved April 16, 2021, from https://www.ncdc.noaa.gov/stormevents
[74] NCEI. "Storm Events Database". Retrieved April 16, 2021, from https://www.ncdc.noaa.gov/stormevents
[75] Wuebbles, D., Angel, J., Petersen, K., and Lemke, A.M. (2021). An Assessment of the Impacts of Climate Change in Illinois. *The Nature Conservancy, Illinois*. https://doi.org/10.13012/B2IDB-1260194_V1

Ice Storms

Winter storms in which freezing rain is the precipitation type are called ice storms. This special precipitation is supercooled liquid water while falling near the surface, however, upon contact with any object, it freezes, forming a layer of solid ice.[76] Even a thin glaze of ice from freezing rain can make any kind of travel hazardous. Heavier accumulations can bring down trees, power lines, and other built structures.[77]

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
0.08	2	25

SOURCE: NCEI STORM EVENTS DATABASE (1996-2020)

According to data collected by the Illinois State Water Survey from 1948 to 2000, Washington County can expect an average of 3 to 4 days of freezing rain per year.[78]

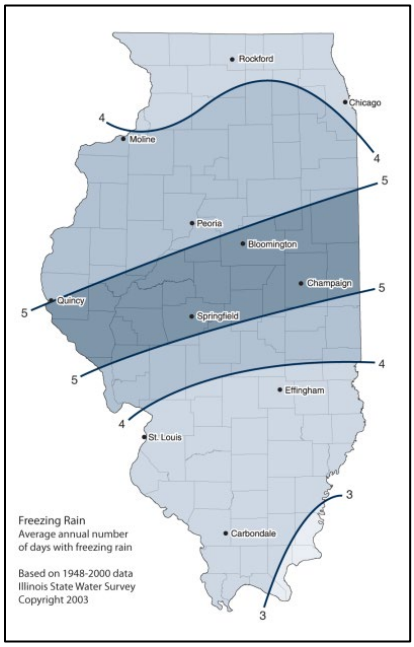

Figure 31. Average Annual number of days with Freezing Rain (1948-2000). Source: Illinois State Climatologist

[76] MRCC. "Living with Weather: Ice Storms". Retrieved April 30, 2021, from https://mrcc.illinois.edu/living_wx/icestorms/index.html

[77] NWS. "Ice Storm Safety". Retrieved April 30, 2021, from . https://www.weather.gov/safety/winter-ice-frost

[78] Illinois State Climatologist. "Ice Storms in Illinois". Retrieved April 30, 2021, from https://stateclimatologist.web.illinois.edu/climate-of-illinois/ice-storms-in-illinois

On January 13, 2017, an ice storm occurred across parts of west-central and southwest Illinois. Schools and businesses closed, and other activities were also cancelled due to the storm.[79] Ice totals were in a range of 0.25 to 0.4 inches. Impacts included a few power outages and slowdowns in transportation.[80]

In the State of Illinois, there have been 432 reports of ice storms between 1996 and 2020, producing an average of 17.28 reports per year. [81] To compare this with Washington County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for the area, the State of Illinois has an average of 0.17 reports per year, higher than Washington County's average of 0.08 reports per year.

The risk of an ice storm occurring applies the same to the entire county. There are no known factors that make one area or community more prone to these events than another.

[79] The Nashville News. "Addieville – January 18, 2017". Retrieved August 3, 2021, from https://www.nash-news.com/2017/01/20/addieville-january-18-2017
[80] NCEI. "Storm Events Database". Retrieved April 16, 2021, from https://www.ncdc.noaa.gov/stormevents
[81] Ibid

Drought

An overly simplified description of drought is an extended period of time with little to no precipitation over an area. It can be difficult to tell exactly when a dry period becomes a drought since the effects of drought tend to appear slowly. Also, the timing of a drought plays a role in who is affected – for example, a drought in the middle of a growing season may affect agriculture more than municipal supplies.[82]

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
0.16	4	25

SOURCE: NCEI STORM EVENTS DATABASE (1996-2020)

The U.S. Drought Monitor (USDM) is the standard for determining drought in the United States. The USDM uses a five-category system, labeled Abnormally Dry or D0 (no drought), Moderate (D1), Severe (D2), Extreme (D3) and Exceptional (D4) Drought.[83] Drought categories show conditions related to dryness and drought using observations of how much water is available in streams, lakes, and soils compared to usual for the same time of year. *Figure 32* shows the USDM Drought Categories for Washington County since 2000.

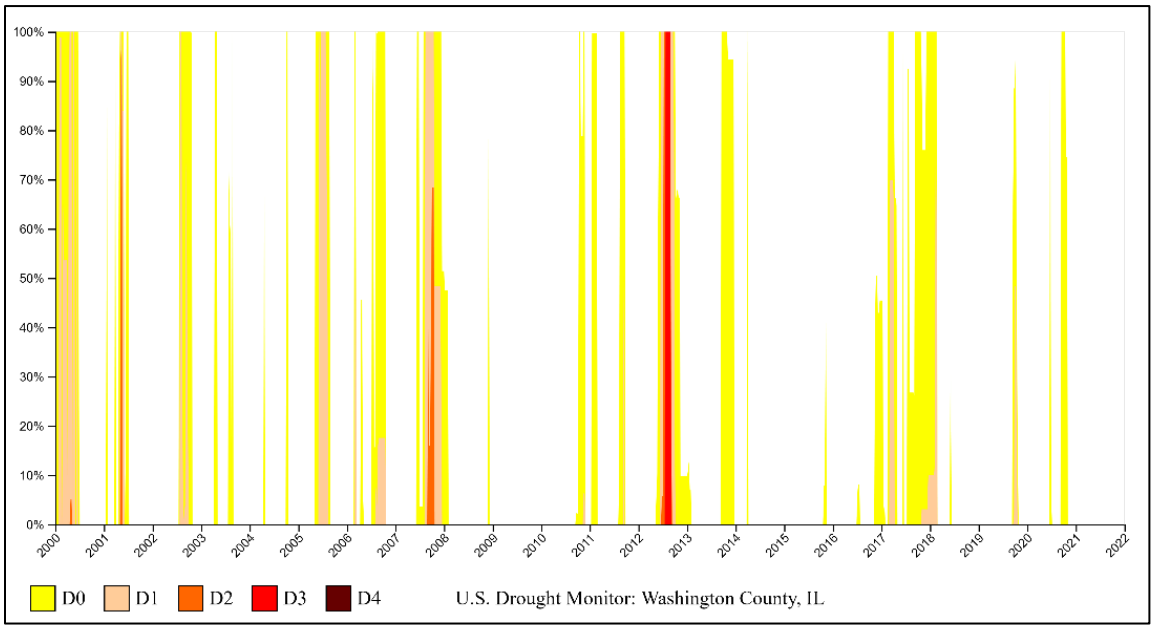

Figure 32. Percentage of Washington County area in USDM Drought Categories (2000-2020). Source: USDM

[82] MRCC. "Living with Weather: Drought". Retrieved April 4, 2021, from https://mrcc.illinois.edu/living_wx/drought/index.html

[83] National Integrated Drought Information System. US Drought Monitor System. Retrieved April 23, 2021, from https://www.drought.gov/data-maps-tools/us-drought-monitor

Illinois was one of several states stricken by the historic US drought of 2012. After a dry, record warm March and an abnormally dry May, conditions deteriorated rapidly throughout the summer. By August, Washington County and much of the state was in an Extreme Drought. The average corn yield in Illinois was about 40% below normal, and average soybean yields were 10% below normal. A coal mine in Washington County requested access to water from state park lakes due to a water shortage. Releases of water from Lake Shelbyville and Carlyle Lake were considered to supplement flows on the Mississippi River for navigation. The turning point of the drought occurred in late August due to the remnants of Hurricane Isaac and other summer precipitation events.[84]

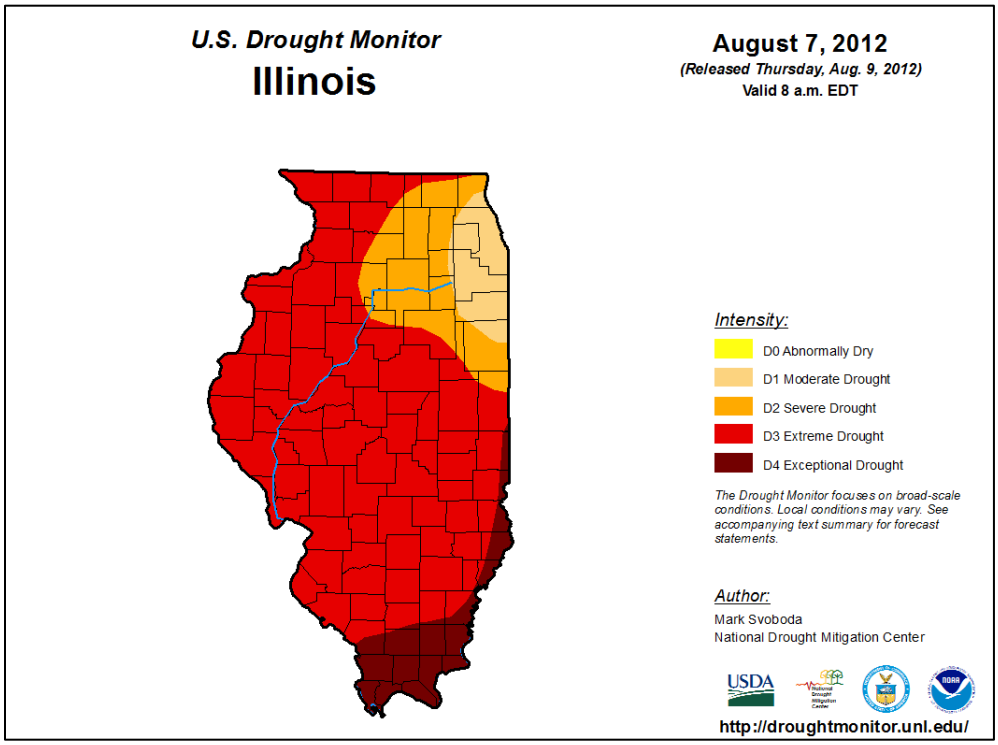

Figure 33. US Drought Monitor map for Illinois on August 7, 2012. Source: USDM

In the State of Illinois, there have been 995 reports of drought between 1996 and 2020, producing an average of 39.8 reports per year. [85] To compare this with Washington County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for the area, the State of Illinois has an average of 0.39 per year, higher than Washington County's average of 0.16 reports per year.

The risk of drought occurring applies the same to the entire county. There are no known factors that make one area or community more prone to these events than another. However, drought can adversely impact individuals employed in agriculture and natural resources more than other industries.

According to "An Assessment of the Impacts of Climate Change in Illinois", mean precipitation has increased by 5-20% over the last 120 years. One result of this is that extreme droughts have become less common. In the future, Illinois will likely see an overall increase in precipitation over the next few decades, including an increase in the number of days with 2+ inches of rain. However, rising temperatures and evapotranspiration also play an important role, and the risk for short-term droughts may increase due to these other factors.[86]

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[84] Knapp, H.V., Angel, James R., Atkins, J.R., Bard, L., Getahun, E., Hlinka, K.J., Keefer, L.L., Kelly, W.R., Roadcap, G.S. (2017). "The 2012 Drought in Illinois." Illinois State Water Survey. http://hdl.handle.net/2142/96286

[85] NCEI. "Storm Events Database". Retrieved April 19, 2021, from https://www.ncdc.noaa.gov/stormevents

[86] Wuebbles, D., Angel, J., Petersen, K., and Lemke, A.M. (2021). An Assessment of the Impacts of Climate Change in Illinois. *The Nature Conservancy, Illinois*. https://doi.org/10.13012/B2IDB-1260194_V1

Heat Wave

Seasonal changes in air temperature are a part of living in the Midwest. In the summer, temperatures are hot – this is expected. However, high temperatures, especially when combined with high amounts of moisture in the air, can become uncomfortable, dangerous, or deadly to humans and animals. The Heat Index takes relative humidity into account in addition to the air temperature, providing a measure of how hot it feels outside (see *Figure 34*). [87] In addition to heat and humidity, the amount of time spent in high temperatures (during the day or at night) also plays a role.

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
2.00	50	25

SOURCE: NCEI STORM EVENTS DATABASE (1996-2020)

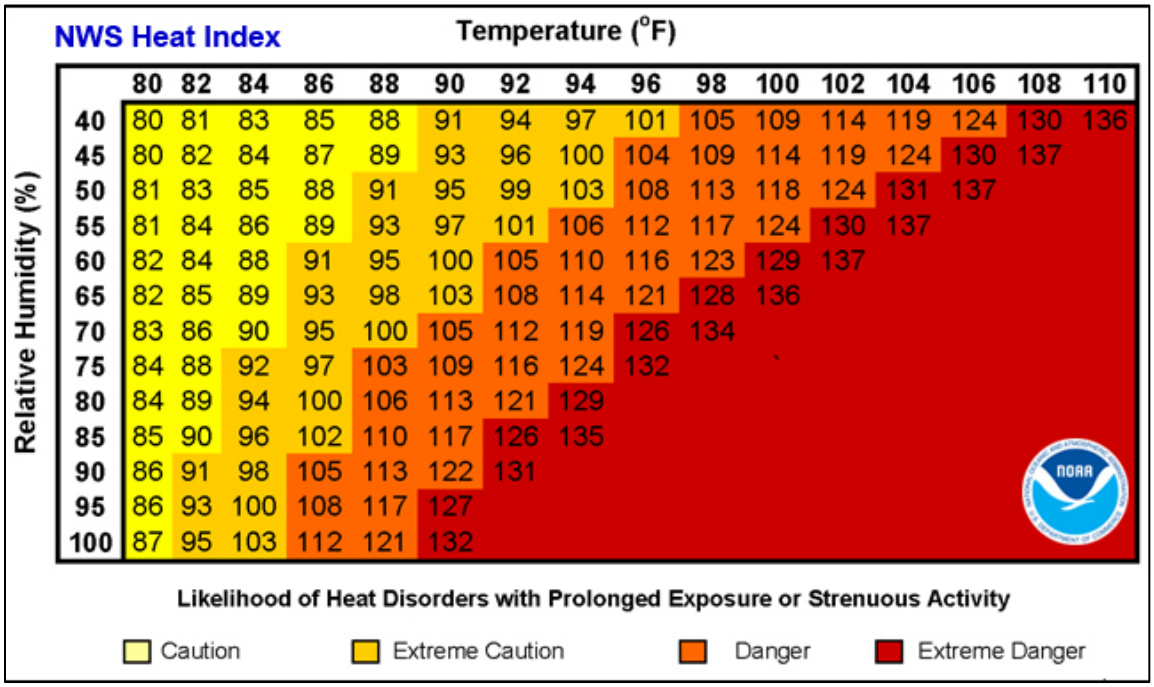

Figure 34. Heat Index chart. Source: NWS

Because the normal temperatures for an area vary across the country, NWS weather forecast offices have different standards for issuing advisories and warnings for heat. According to the NWS Glossary, an Advisory "Highlights special weather conditions that are less serious than a warning. They are for events that may cause significant inconvenience, and if caution is not exercised, it could lead to situations that may threaten life and/or property."[88]

[87] NWS. "Heat Forecast Tools". Retrieved April 4, 2021, from https://www.weather.gov/safety/heat-index
[88] NWS. NWS Glossary. Retrieved April 5, 2021, from https://w1.weather.gov/glossary

The NWS office in St. Louis (LSX) uses the following criteria for a heat advisory: Heat Index temperatures need to be forecast for at least 105°F or forecast Heat Index temps of at least 100-104°F for 4 consecutive days. A warning "is issued when hazardous weather or hydrologic event is occurring, is imminent, or has a very high probability of occurring. A warning is used for conditions posing a threat to life or property." [89] For NWS LSX to issue a heat warning, Heat Index temperatures need to be forecast for at least 110°F for 2 days or forecast Heat Index temps of at least 105°F for 4 consecutive days.

The MRC has calculated Heat Index climatology for selected stations across the US. While not within Washington County, Scott Air Force Base near Belleville, IL was one of the stations selected. The area can expect an average of 9.5 days per year with at least one hour of Heat Index temperatures at 105°F (*Table 31*).

Table 31. Average number of days with at least 1 hour of selected Heat Index temperatures for Scott Air Force Base near Belleville, IL (1973-2018). Source: MRCC

Heat Index Climatology: Average Number of Days with ≥ 1 hr for

BELLEVILLE SCOTT AFB

Heat Index ≥	80°F	85°F	90°F	95°F	100°F	105°F	110°F	115°F
Calendar Year	120.2	87.2	59.9	38.2	21.2	9.5	3	0.7
January	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0
March	0.7	0	0	0	0	0	0	0
April	3.7	1	0.2	0	0	0	0	0
May	11.9	7	2.8	0.8	0.2	0	0	0
June	24.2	18.3	12.6	7.4	3.2	1.1	0.1	0
July	29.3	25.4	20.3	14.9	9.7	4.9	1.7	0.4
August	28.9	23.6	17.5	12	7	3.3	1.1	0.2
September	16.6	10.3	5.9	3.1	1	0.2	0.1	0
October	4.7	1.6	0.5	0	0	0	0	0
November	0.3	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0	0

Note: Annual averages may not match the sum of monthly averages due to rounding.

Data Time Period: 1973 to 2018

In 2012, during the historic drought, a heat wave occurred across the Midwest during the last four days of June and continued into July. A large area of high pressure over this part of the US suppressed rainfall and kept skies cloud-free, allowing abundant solar energy to heat the surface.[90] A high air temperature of 108°F was recorded in Nashville on June 28. Because there was low humidity (i.e., the air was dry), the heat index temperature was not much higher than the air temperature. Although there were no deaths reported in Washington County, heat-related deaths were reported in nearby Madison and St. Clair counties.[91]

In the State of Illinois, there have been 2,328 reports of Heat or Excessive Heat between 1996 and 2020, producing an average of 93.12 reports per year. [92] To compare this with Washington County, the total spatial area of the state

[89] NWS. NWS Glossary. Retrieved April 5, 2021, from https://w1.weather.gov/glossary
[90] NWS St. Louis office, "Historic Heat Wave 2012". Retrieved April 19, 2021, from https://www.weather.gov/media/lsx/Events/07_07_2012.pdf
[91] NCEI. "Storm Events Database". Retrieved April 19, 2021, from https://www.ncdc.noaa.gov/stormevents
[92] Ibid

(57,914 square miles) must be considered. After normalizing for the area, the State of Illinois has an average of 0.91 reports per year, lower than Washington County's average of 2.00 reports per year.

In general, the risk of a heat wave occurring applies the same to the entire county. However, the "urban heat island" effect can occur in developed areas with higher concentrations of buildings and pavement. These materials absorb more heat during the day and radiate it at night, prohibiting temperatures from cooling as much compared to rural areas.[93] Elderly adults are the most vulnerable demographic to heat waves as the body's ability to thermoregulate deteriorates with age.

According to "An Assessment of the Impacts of Climate Change in Illinois", average daily temperatures in Illinois have increased by 1-2°F over the last 120 years. In addition to rising daytime maximum temperatures, overnight minimum temperatures are also increasing, markedly higher than the maximums. In the future, Illinois will likely see increases in extremely high temperatures. Projections to the end of the 21st century predict temperature increases in ranges of 4-9°F to 8-14°F. They are also showing an increase in the number of days with a high temperature of 95°F. [94]

[93] Illinois State Climatologist. "1995 Heat Wave". Retrieved June 3, 2021, from https://stateclimatologist.web.illinois.edu/climate-of-illinois/1995-heat-wave

[94] Wuebbles, D., Angel, J., Petersen, K., and Lemke, A.M. (2021). An Assessment of the Impacts of Climate Change in Illinois. *The Nature Conservancy, Illinois*. https://doi.org/10.13012/B2IDB-1260194_V1

Cold Wave

Seasonal changes in air temperature are a part of living in the Midwest. In the winter, temperatures are cold – this is expected. However, abnormally low temperatures, especially when combined with blowing wind, can become uncomfortable, dangerous, or deadly to humans and animals. The Wind Chill temperature takes wind speed into account in addition to air temperature, providing a measure of how cold it feels outside (see *Figure 35*).[95]

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
0.12	3	25

SOURCE: NCEI STORM EVENTS DATABASE (1996-2020)

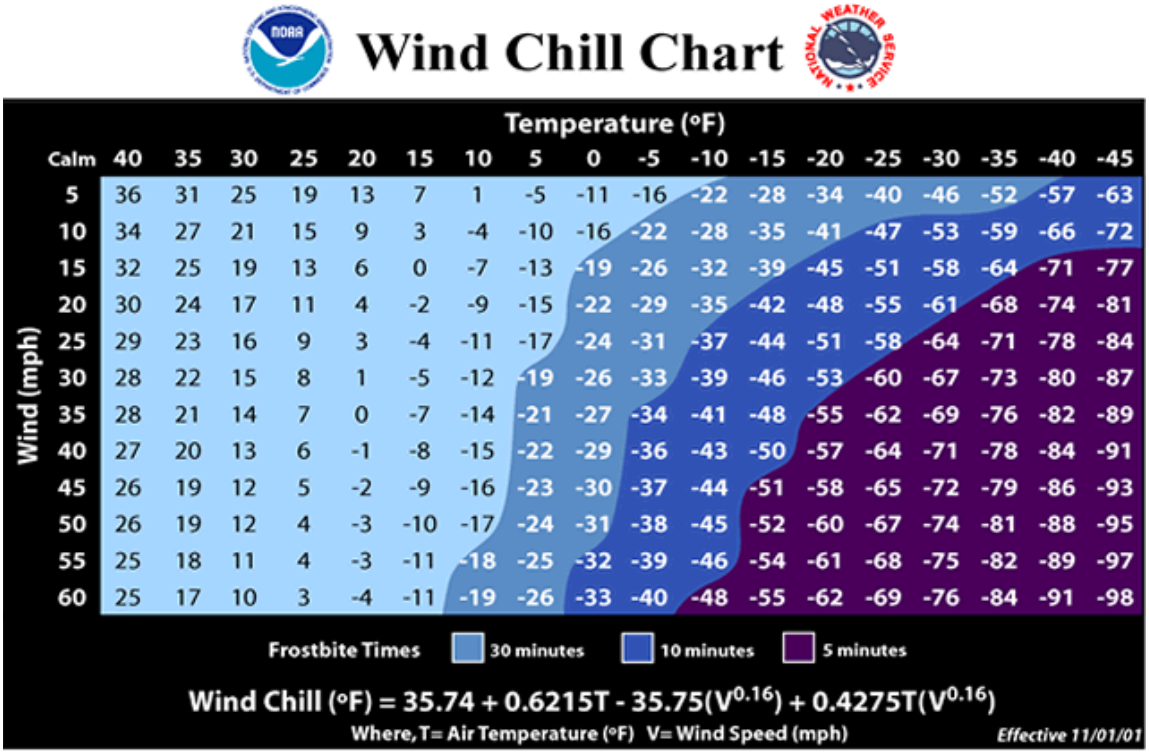

Figure 35. Wind Chill chart. Source: NWS

Because the normal temperatures for an area vary across the country, NWS weather forecast offices have different standards for issuing advisories and warnings for cold. According to the NWS Glossary, an Advisory "Highlights special weather conditions that are less serious than a warning. They are for events that may cause significant inconvenience, and if caution is not exercised, it could lead to situations that may threaten life and/or property."

[95] NWS. "Wind Chill Chart". Retrieved April 20, 2021, from https://www.weather.gov/safety/cold-wind-chill-chart

[96] The NWS office in St. Louis (LSX) issues a Wind Chill Advisory when wind chill temperatures are expected to be between -15°F to -24°F. A warning "is issued when hazardous weather or hydrologic event is occurring, is imminent, or has a very high probability of occurring. A warning is used for conditions posing a threat to life or property." [97] For NWS LSX to issue a Wind Chill Warning, wind chill temperatures need to be forecast at -25°F or below.

The MRCC has calculated Wind Chill climatology for select stations across the US. While not within Washington County, Scott Air Force Base near Belleville, IL was one of the stations selected. The area can expect an average of 1.3 days per year with at least one hour of Wind Chill temperatures at -15°F (*Table 32*).

Table 32. Average number of days with at least 1 hour of selected Wind Chill temperatures for Scott Air Force Base near Belleville, IL (1973/74 - 2018/19). Source: MRCC

Wind Chill Climatology: Average Number of Days with ≥ 1 hr

BELLEVILLE SCOTT AFB

Wind Chill ≤	30°F	25°F	20°F	15°F	10°F	5°F	0°F	-5°F	-10°F	-15	-20°F	-25°F	-30°F	-35°F	-40°F
Snow Year	106.6	80.7	54.8	37.7	26.1	17.2	10.7	6.1	3.2	1.3	0.7	0.4	0.1	0	0
July	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
August	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
September	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
October	1.4	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0
November	12	7.8	3.8	1.7	0.7	0.2	0.1	0	0	0	0	0	0	0	0
December	25.1	19.7	13.6	9.4	6.1	4.1	2.5	1.5	0.8	0.3	0.2	0.1	0	0	0
January	27.8	23.7	18.5	14.7	11.3	7.9	5.1	3.1	1.9	0.8	0.4	0.2	0.1	0	0
February	23.2	18.8	13.6	9.5	6.8	4.4	2.7	1.3	0.5	0.2	0.1	0.1	0	0	0
March	13.8	9	4.8	2.3	1.2	0.6	0.3	0.2	0	0	0	0	0	0	0
April	3.3	1.4	0.5	0.1	0	0	0	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
June	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: Annual averages may not match the sum of monthly averages due to rounding.

Data Time Period: Snow Years 1973/74 to 2018/19

In the State of Illinois, there have been 955 reports of Cold/Extreme Cold/Wind Chill between 1996 and 2020, producing an average of 38.2 reports per year. [98] To compare this with Washington County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for the area, the State of Illinois has an average of 0.37 reports per year, higher than Washington County's average of 0.12 reports per year.

The risk of a cold wave occurring applies the same to the entire county. There are no known factors that make one area more prone to these events than another. Elderly adults are the most vulnerable demographic to cold waves as the body's ability to thermoregulate deteriorates with age.

Average daily temperatures in Illinois have increased by 1-2°F over the last 120 years. In addition to rising daytime maximum temperatures, overnight minimum temperatures are also increasing, markedly higher than the maximums. This means the number of freezing winter nights has decreased. In the future, Illinois will likely see a significant decrease in days with extremely cold temperatures. [99]

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[96] NWS. NWS Glossary. Retrieved April 20, 2021, from https://w1.weather.gov/glossary

[97] Ibid

[98] NCEI. "Storm Events Database". Retrieved April 19, 2021, from https://www.ncdc.noaa.gov/stormevents

[99] Wuebbles, D., Angel, J., Petersen, K., and Lemke, A.M. (2021). An Assessment of the Impacts of Climate Change in Illinois. *The Nature Conservancy, Illinois*. https://doi.org/10.13012/B2IDB-1260194_V1

Earthquake

While Illinois is not known for large, damaging events like those seen in the western US, earthquakes do occur in the state with some regularity. This is due to the state's proximity to the New Madrid Seismic Zone and the Wabash Valley Seismic Zone.[100],[101] There is usually at least one measurable earthquake in Illinois per year, typically in the southern portion of the state. Luckily, damaging earthquakes in Illinois are much less frequent, with minor damage from earthquakes reported about once every 20 years, and serious damage from earthquakes occurring once every 70-90 years.[102]

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
0.22	11	51

SOURCE: USGS EARTHQUAKE CATALOG (1970-2020)

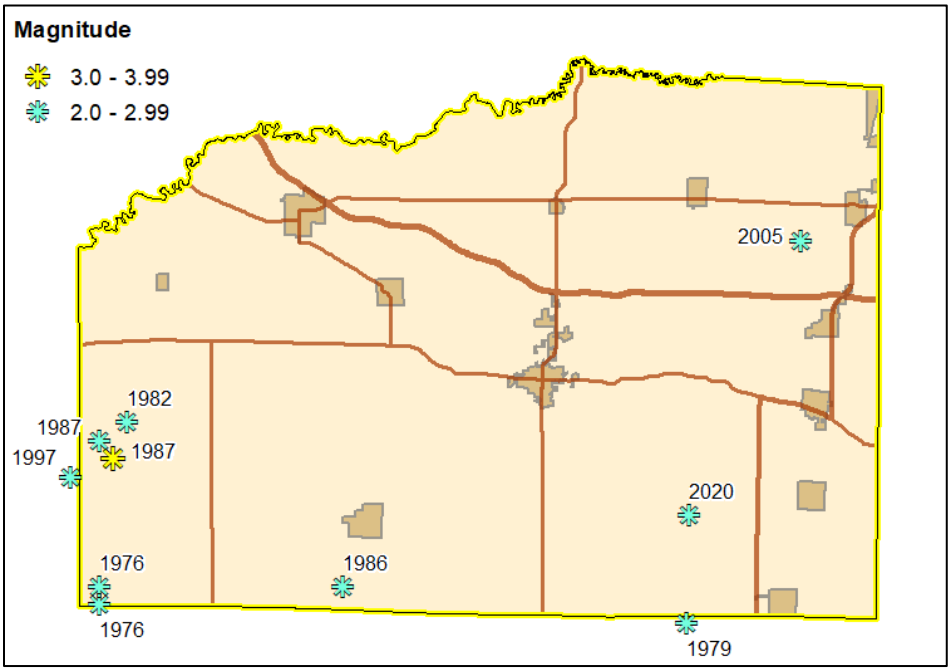

Figure 36. Earthquakes of Magnitude 2.0+ recorded within 1 km of Washington County (1970-2020). Source: USGS

A well-known series of earthquakes known as the New Madrid Earthquakes occurred from December 1811 through February 1812. The three main earthquakes had magnitudes of 7.3 to 7.5 and were said to have caused sand blows,

[100] ISGS. (1995). "Earthquake Occurrence in Illinois". https://isgs.illinois.edu/sites/default/files/files/qk-fct-occur.pdf
[101] ISGS. (1996). "Wabash Valley Earthquakes". https://isgs.illinois.edu/sites/default/files/files/eq-fct-wabash.pdf
[102] ISGS. (1995). "Damaging Earthquakes in Illinois". https://isgs.illinois.edu/sites/default/files/files/qk-fct-damag.pdf

riverbank failures, landslides, seiches on the Mississippi River, and the destruction of the town of New Madrid, MO. While there is no documentation of effects felt in Washington County,[103] many houses were severely damaged in nearby St. Louis from the February 1812 quake and subsequent aftershocks.[104]

Looking to the future, an Illinois State Geological Survey earthquake fact sheet states "The likelihood of a damaging earthquake (magnitude 6.3 or greater) occurring somewhere in the central US within the next 15 years is 40 to 63% and 86 to 97 % within the next 50 years." Also, the United States Geological Survey prepared state-based seismic hazard maps in 2014. This map shows peak ground accelerations having a 2% probability of being exceeded in 50 years. While the highest hazard area in Illinois is the southernmost county, Washington County is shown in bright yellow, an upper-middle hazard category.[105]

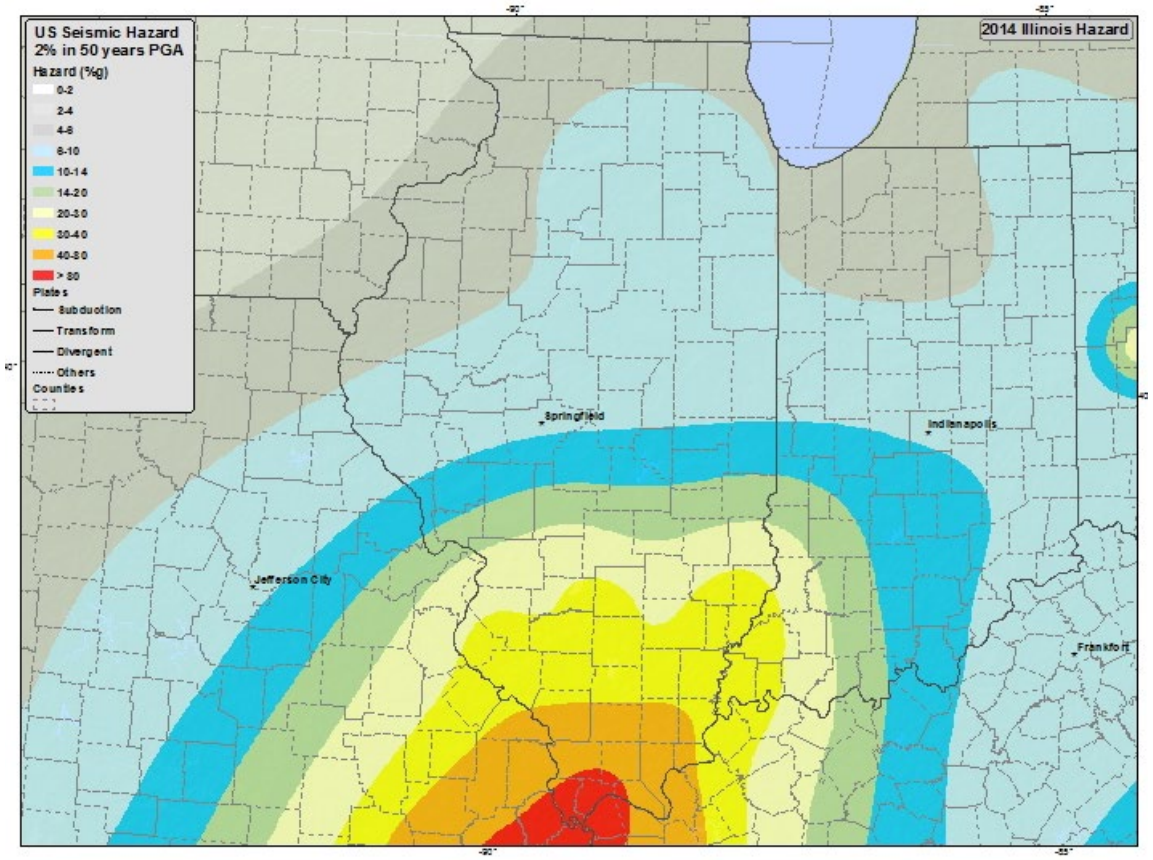

Figure 37. 2014 Illinois Seismic Hazard Map. Source: USGS

In the State of Illinois, there have been 583 catalogued earthquakes (within 10km of the state) between 1970 and 2020, producing an average of 11.43 earthquakes per year.[106] To compare this with Washington County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for the area, the State of Illinois has an average of 0.11 reports per year, lower than Washington County's average of 0.22 reports per year.

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[103] Historical Society of Washington County, Illinois. "This is Washington County; its first 150 years, 1818-1968". Retrieved August 31, 2021, from https://archive.org/details/thisiswashington00hist

[104] USGS. "Summary of 1811-1812 New Madrid Earthquakes Sequence". Retrieved August 31, 2021 https://www.usgs.gov/natural-hazards/earthquake-hazards/science/summary-1811-1812-new-madrid-earthquakes-sequence?qt-science_center_objects=0#qt-science_center_objects

[105] USGS. "2014 Seismic Hazard Map for Illinois". Retrieved April 22, 2021, from https://www.usgs.gov/media/images/2014-seismic-hazard-map-illinois

[106] USGS. "Earthquake Catalog". Retrieved April 22, 2021, from https://earthquake.usgs.gov/earthquakes/search

Hazus Analysis

For planning purposes, a Hazus Level 1 analysis was run on two earthquake scenarios that could impact Washington County. Both scenarios use the Hazus general building stock database to estimate the impact of these events had they occurred in 2021. The magnitude of the earthquakes is measured using the Moment Magnitude (M) scale.

The two scenarios include:

- Scenario #1: New Madrid Historical Event
    - Replication of the 7.4M event that occurred February 7, 1812
- Scenario #2: Wabash Valley Hypothetical Event
    - 7M event occurring in the Wabash Valley Seismic Zone

Building Damage

Scenario #1: New Madrid Historical Event

Hazus estimates that 571 buildings will be at least moderately damaged. This is over 8% of the total number of buildings in the region. An estimated 11 buildings will be damaged beyond repair.

Scenario #2: Wabash Valley Hypothetical Event

An estimated 692 buildings will be at least moderately damaged in this scenario. This is over 10% of the total number of buildings in the region. It's estimated that 16 buildings will be damaged beyond repair.

Economic Loss

Scenario #1: New Madrid Historical Event

The total economic loss estimated for the earthquake is $91.55 million, which includes building and lifeline-related losses based on the region's available inventory.

Scenario #2: Wabash Valley Hypothetical Event

The total economic loss estimated for the earthquake is $139.90 million, which includes building and lifeline-related losses based on the region's available inventory.

The following sections provide more detailed information about these losses.

Building-Related Losses

Building losses are broken into two categories: direct building losses and business interruption losses. Direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. Business interruption losses are those associated with the inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include temporary living expenses for those people displaced from their homes because of the earthquake.

Scenario #1: New Madrid Historical Event

Total building-related losses were $43.93 million; 22% of the estimated losses were related to the business interruption of the region. The largest loss was sustained by the residential occupancies which made up over 52% of the total loss.

Scenario #2: Wabash Valley Hypothetical Event

Total building-related losses were $57.72 million; 21% of the estimated losses were related to the business interruption of the region. The largest loss was sustained by the residential occupancies which made up over 50% of the total loss.

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages.

Scenario #1: New Madrid Historical Event

Economic losses to transportation infrastructure were estimated to be $5.48 million. This represents loss incurred by physical damage to highways and railways.

Utility System losses were estimated to be $42.15 million. This includes damages to pipelines, facilities, and distribution lines for utilities including potable water, wastewater, natural gas, electrical power, and communication.

Scenario #2: Wabash Valley Hypothetical Event

Economic losses to transportation infrastructure were estimated to be $5.84 million. This represents loss incurred by physical damage to highways and railways.

Utility System losses were estimated to be $76.34 million. This includes damages to pipelines, facilities, and distribution lines for utilities including potable water, wastewater, natural gas, electrical power, and communication.

Summary of Scenario Losses

Selected results of the two earthquake scenarios are shown in *Table 33*. Both scenarios would potentially have a significant impact in Washington County in terms of building damage and damage to the infrastructure of the county. Of the two, Hazus estimates that a 7M event in the Wabash Valley seismic zone would cause greater damage to the county.

Table 33. Earthquake scenario results with estimated losses in millions (2021 USD).

	Category	Scenario #1 New Madrid 7.4M	Scenario #2 Wabash Valley 7M
Buildings Damaged (Count)	Moderate	468	553
	Extensive	92	123
	Complete	11	16
	Subtotal	**571**	**692**
Building Related Economic Loss Estimate	Income Losses	$9.7201	$12.3649
	Capital Stock Losses	$34.2079	$45.3565
	Subtotal	**$43.9280**	**$57.7214**
Transportation System Economic Loss Estimate	Highway	$4.1672	$4.3515
	Railway	$1.3109	$1.4859
	Subtotal	**$5.4781**	**$5.8374**
Utility System Economic Loss Estimate	Potable Water	$2.0863	$2.5418
	Waste Water	$29.5041	$64.5698
	Natural Gas	$0.2530	$0.2464
	Electrical Power	$10.3026	$8.9805
	Communication	$0.0008	$0.0021
	Subtotal	**$42.1468**	**$76.3406**
	Loss Totals	**$91.5529**	**$139.8994**

Wildfire

Even in the Midwest, wildfires (or wildland fires) are a natural component of the earth-atmosphere system. However, it appears that human activity – whether the result of a person's action or the failure of infrastructure – is the cause of the majority of wildfires in the Midwest today.[107]

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
0.15	4	27

SOURCE: USDA FOREST SERVICE WILDFIRE DATABASE (1992-2018)

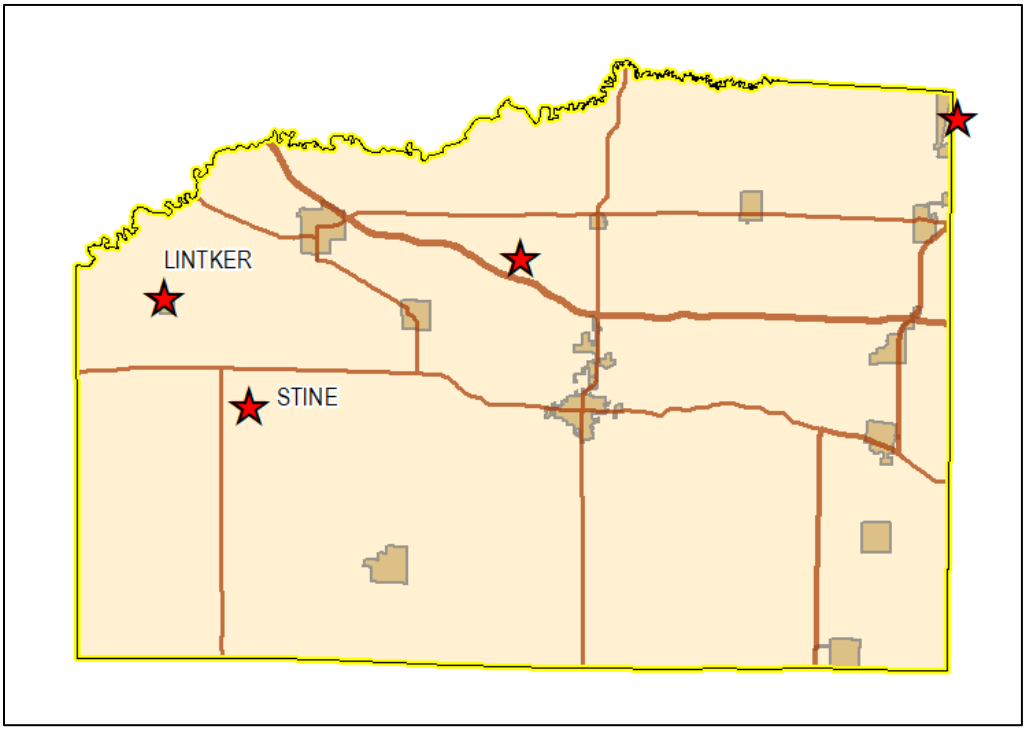


Figure 38. Wildfire reports within 1 km of Washington County (1992-2018). Source: USDA Forest Service

In the State of Illinois, there have been 2,895 reports of wildfire (within 1km of the state) between 1992 and 2018, producing an average of 107.22 reports per year.[108] To compare this with Washington County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for the area, the State of Illinois has an average of 1.04 reports per year, higher than Washington County's average of 0.15 reports per year.

[107] MRCC. "Living with Weather: Wildfires". Retrieved April 2, 2021, from https://mrcc.illinois.edu/living_wx/wildfires/index.html

[108] USDA Forest Service. "Spatial wildfire occurrence data for the United States, 1992-2018". Accessed August 20, 2021, from https://www.fs.usda.gov/rds/archive/Catalog/RDS-2013-0009.5

HazMat Spill

Hazardous materials (abbreviated as HazMat) exist everywhere. Typically, these materials are transported, stored, and used according to guidance. However, regardless of reason or intent, the release of hazardous materials has the potential to cause harm to humans, animals, and the natural and built environment.[109]

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
0.97	30	31

SOURCE: USCG NATIONAL RESPONSE CENTER (1990-2020)

Figure 39 shows the locations of potential HazMat sources in Washington County.

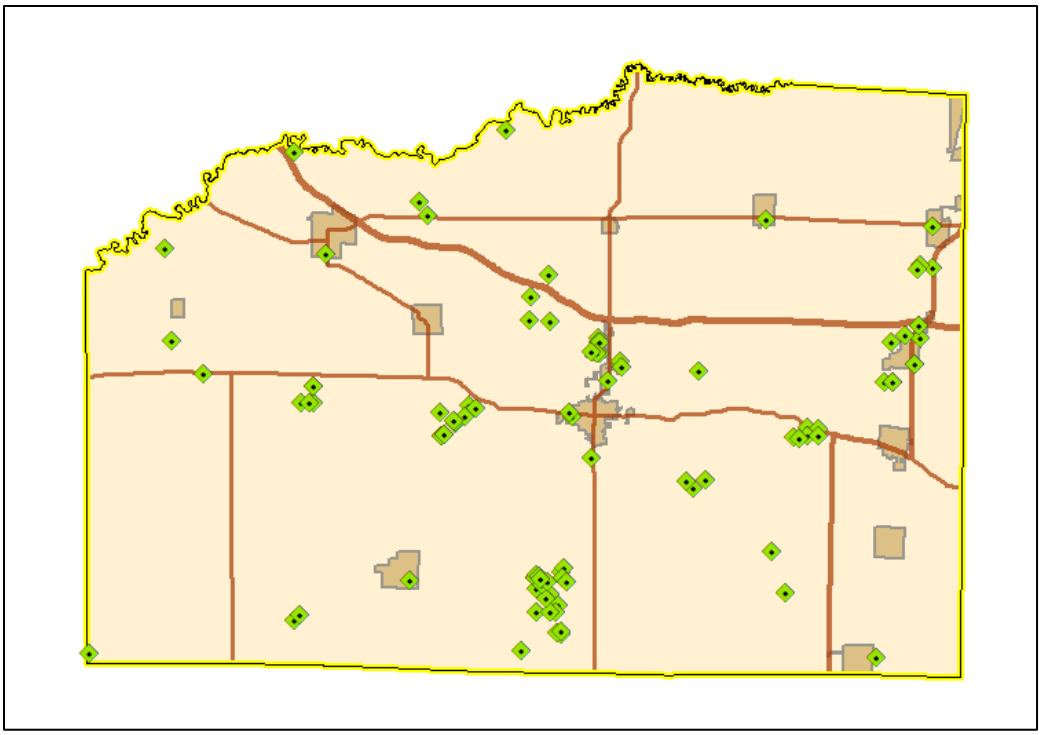


Figure 39. Locations of potential HazMat fixed point sources. Source: Washington County

In addition to fixed point sources, HazMat incidents can occur along corridors where hazardous materials are transported, such as interstates, major highways, railroads, and pipelines. *Figure 40* shows these features in Washington County. *Table 34* shows the length of corridors where hazardous materials are commonly transported.

[109] FEMA. (2019). "Hazardous Materials Incidents". https://www.fema.gov/sites/default/files/2020-07/hazardous-materials-incidents.pdf

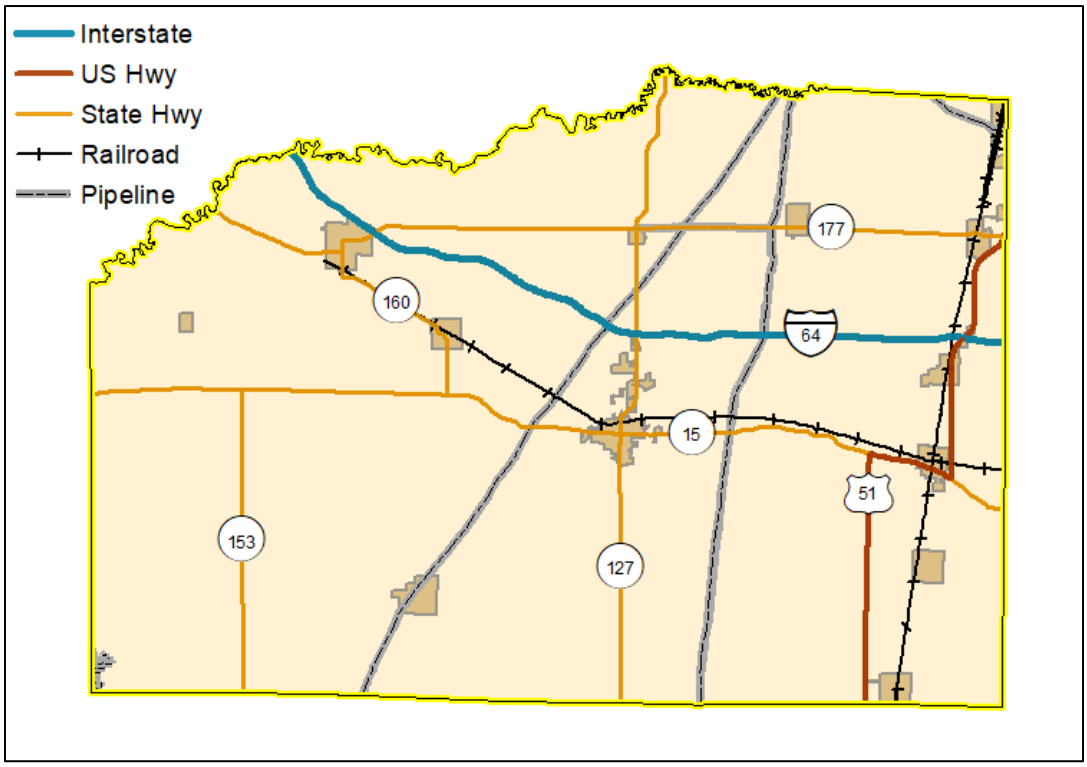


Figure 40. Major transportation features and pipelines. Sources: IDOT, Washington County

Table 34. Lengths of major transportation features. Sources: IDOT, Washington County

Transportation Type	Miles
Interstate	32.9
US Highway	25.5
State Highway	120.3
Railroad	74.7
Pipeline (Crude Oil)	74.3
Pipeline (Natural Gas)	24.3

The U.S. Coast Guard's National Response Center serves as an emergency call center for pollution and railroad incidents. Initial reports are tracked in spreadsheets that are downloadable from its website.

In the State of Illinois, there have been 20,256 pollution incident reports between 1990 and 2020, producing an average of 653.42 reports per year.[110] To compare this with Washington County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for the area, the State of Illinois has an average of 6.36 reports per year, higher than Washington County's average of 0.97 reports per year.

The risk of a HazMat spill occurring at a location is primarily tied to its proximity to either a transportation route (vehicle, rail, pipeline, etc.) or a potential fixed-point source.

[110] USCG. "National Response Center". Retrieved April 30, 2021, from https://nrc.uscg.mil

Mine Subsidence

Mine subsidence occurs when the ground surface sinks downward due to the failure of support in an underground mine. While it is difficult to predict *when* subsidence will occur, a location's proximity to a mine is a good indicator of *whether* it will occur. According to the Illinois Mine Subsidence Insurance Fund (IMSIF), residential and commercial insurance policies must include mine subsidence insurance in 34 of Illinois' 102 counties where underground mining is the most prevalent. Washington County is among the 34 counties on the list.[111]

Figure 41. Illinois Counties where mine subsidence insurance must be included. Source: IMSIF

One of the tasks of the IMSIF is providing reinsurance to insurance companies for damage caused by mine subsidence. IMSIF provided the aggregated data on claims from 2000-2021 shown below. Caveats for these values include the fact that the statistics provided are based on reinsured claims filed with the Fund, and do not reflect uninsured properties, nor properties where reinsurance was waived by the insureds. Subsequently, the possibility exists that there are unaccounted properties with mine subsidence damage. Additionally, the maximum limits for both residential and commercial structures were increased to $750,000 in 2008 and 2011 respectively.

REINSURED CONFIRMED CLAIMS IN WASHINGTON COUNTY	REINSURED CLAIMS REIMBURSED IN WASHINGTON COUNTY
0	$14,636

SOURCE: IMSIF (2000-2021)

[111] IMISF. "How to Obtain Mine Subsidence Insurance". Retrieved April 30, 2021, from https://www.imsif.com/about-mine-subsidence-insurance/how-to-obtain-mine-subsidence-insurance

The Illinois State Geological Survey (ISGS) keeps a spatial database named ILMINES, containing all known information about active and inactive mines in Illinois.[112] It also published a study in 2009 which examined the proximity of underground mines to developed areas.[113]

KNOWN UNDERGROUND MINES IN WASHINGTON COUNTY	ACRES IN CLOSE PROXIMITY TO UNDERGROUND MINING
17	16,697

SOURCE: ISGS COUNTY COAL DATA, ISGS CIRCULAR 575

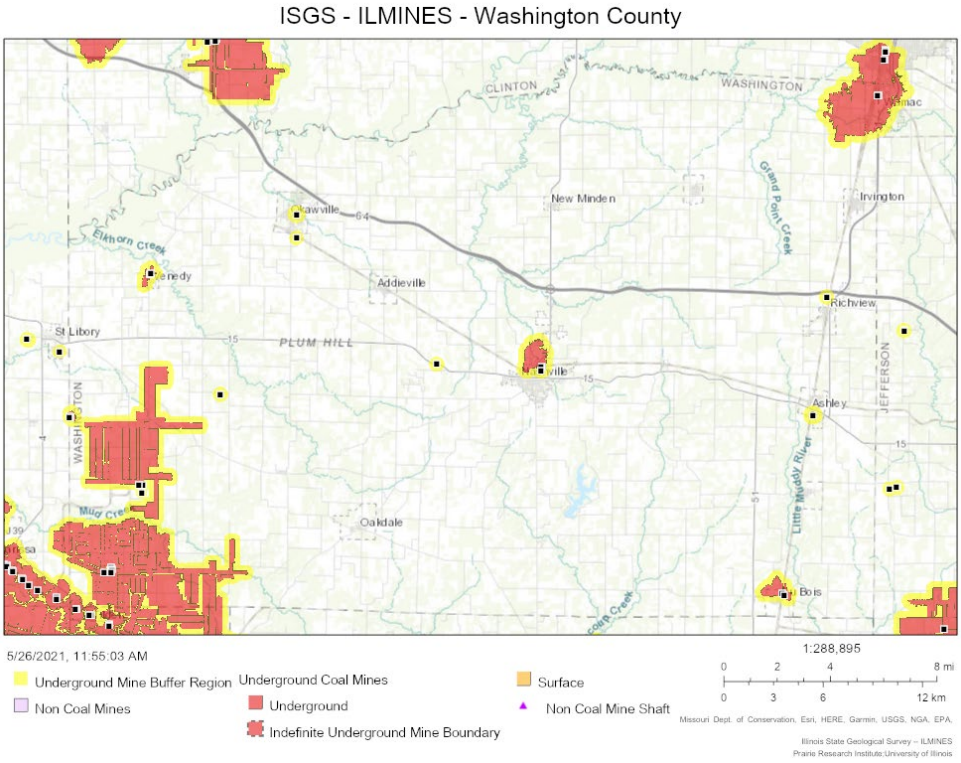


Figure 42. Underground mines in and around Washington County. Source: ISGS

[112] ISGS. "Illinois Coal Mines". Retrieved April 30, 2021, from https://isgs.illinois.edu/ilmines

[113] Korose, C.P., Louchios, A.G., and Elrick, S.D. (2009). "The proximity of underground mines to urban and developed lands in Illinois (Circular 575)". Illinois State Geological Survey. http://hdl.handle.net/2142/43544

Pandemic

According to Ready.gov, "A pandemic is a disease outbreak that spans several countries and affects a large number of people." Pandemics are typically caused by new viruses that are easily transmitted from person to person.[114] Viruses causing pandemics can potentially affect people in all age groups. In addition to illness and death caused by pandemics, societal impacts may include economic disruption.[115]

Table 35: Pandemics since 1918. Source: CDC, WHO

Pandemic Declared	Cause	US Deaths (est.)	Global Deaths (est.)
1918	Influenza A (H1N1) virus	675,000	50,000,000
1957	Influenza A (H2N2) virus	116,000	1,100,000
1968	Influenza A (H3N2) virus	100,000	1,000,000
2009	Novel influenza A (H1N1)pdm09 virus	8,868 – 18,306	151,700 – 575,400
2020	Coronavirus SARS-CoV-2	999,343*	6,301,020*
*As of June 2022			

According to the Centers for Disease Control and Prevention (CDC), there have been five pandemics since 1918. The first four pandemics were caused by influenza viruses, each starting in 1918, 1957, 1968, and 2009. Of these, the influenza pandemic of 1918 by far caused the most deaths in the United States and around the world.[116] The most recent pandemic, declared by the World Health Organization in 2020[117], was caused by a coronavirus, SARS-CoV-2.[118]

[114] Ready.gov. "Pandemics". Retrieved July 30, 2021, from https://www.ready.gov/pandemic
[115] State of California. "2018 California State Hazard Mitigation Plan". Retrieved July 30, 2021, from https://www.caloes.ca.gov/cal-oes-divisions/hazard-mitigation/hazard-mitigation-planning/state-hazard-mitigation-plan
[116] CDC. "Past Pandemics". Retrieved July 30, 2021, from https://www.cdc.gov/flu/pandemic-resources/basics/past-pandemics.html
[117] WHO. "WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020". Retrieved July 30, 2021, from https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020
[118] WHO. "Coronavirus disease 2019 Q&As". Retrieved July 30, 2021, from https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/coronavirus-disease-covid-19

COVID-19 DEATHS	
WASHINGTON COUNTY	STATE OF ILLINOIS
36 (0.26%)	35,494 (0.28%)

SOURCE: IDPH (JUNE 2022)

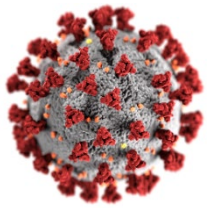


Figure 43. SARS-CoV-2.

At the time of this publication, the number of deaths and the percentage of deaths from COVID-19 for Washington County and the State of Illinois are listed above.[119] The State of Illinois has a death rate of 28 per 10,000 people from COVID-19, slightly higher than Washington County's death rate of 26 per 10,000 people.

Figure 44. Boston Red Cross volunteers assemble gauze face masks during the 1918 pandemic. Source: CDC

By definition, a pandemic is an international event, covering an area much larger than any one county, so in general, the risk of a pandemic occurring applies the same to the entire county. However, populations with certain social determinants of health may have a higher risk of exposure to pandemic-causing viruses. [120]

[119] IDPH. "Covid-19 Statistics". Retrieved January 9, 2022, from https://dph.illinois.gov/covid19/data.html
[120] CDC. "Risk of Exposure to COVID-19". Retrieved July 30, 2021, from https://www.cdc.gov/coronavirus/2019-ncov/community/health-equity/racial-ethnic-disparities/increased-risk-exposure.html

SECTION 5

MITIGATION STRATEGIES

INTRODUCTION

Hazard mitigation planning reduces loss of life and property during disasters and builds stronger communities. In Washington County, the process began with local community representatives identifying natural hazards and vulnerabilities within their communities that could cause disasters using a hazard risk assessment. Community representatives then developed short-term and long-term mitigation strategies for protecting people and property from disasters.

A hybrid local hazard mitigation project meeting was held remotely with Washington County and jurisdictions on January 19, 2022 over Zoom and at the Washington County Courthouse. In the months following the hazard mitigation project meeting (see *Table 5*), one on one meetings were held with representatives of each community to brainstorm potential project ideas. Time was taken to understand the unique characteristics of each community in order to cater projects to their needs while accounting for their capacity.

MITIGATION GOALS

After reviewing the risk assessments for each hazard, engaging in one-on-one hazard mitigation project meetings with communities, reviewing the *2016 Washington County Comprehensive Plan*, identifying critical facilities, and assessing socioeconomic data, the following natural hazard mitigation goals were formulated:

Goal 1: Reduce risk of injury or death from natural hazards.

Goal 2: Reduce risk of property damage from natural hazards.

Goal 3: Educate public on disaster preparedness.

Goal 4: Maintain or increase coordination and response to natural hazards across jurisdictions.

MITIGATION ACTIONS

Natural hazard mitigation project ideas came from members of the community who spent time considering the natural hazards affecting their area and residents. Members of the community ranked priorities and the cost and benefit of each project, discussed funding sources, and developed a proposed schedule with the assistance of the planning committee. Potential projects include construction, education, policy, communication, preparedness, and response. Below are hazard mitigation projects for all 13 jurisdictions and unincorporated Washington County.

The projects were prioritized within each jurisdiction by using the following method. The implementation of all actions is desirable regardless of prioritized order. Actions assigned to Priority H (high) have a permanent or more far-reaching affect than actions under Priority M (medium), although both address the most significant natural hazards in the county. Priority L (low) actions all address the less significant natural hazards.

The committee assigned preliminary cost/benefit assessments to each identified project, using general terms of high, medium, and low related to both the cost and benefit. A high rating on cost means it is unlikely the jurisdiction could accomplish the project without outside funding, a rating of medium on cost implies that while the cost may exceed normal maintenance or operating budgets, and a low-cost rating, conversely, means that is likely the jurisdiction can accomplish the project without outside funding. A high rating on benefit relates to how well the project would mitigate the situation. A medium benefit would potentially protect property, but the scope may be limited, such as in an educational project. A low benefit could potentially protect property, but the scope of project may be limited or applicable to only one hazard.

JURISDICTIONAL PROJECT GRID INSTRUCTIONS

Under the **Goal** column, a goal for the project should be listed. Example of goals could include, but are not limited to, *protect life, protect property, reduce [hazard] risk, educate public, enhance coordination and communication between responding agencies.*

Under the **Community** column, wherever '*Washington County*' is listed alone, the implication is that the project would apply to unincorporated areas. Wherever a specific municipality is listed, the project has been identified by community representatives as needed in their respective municipality. Wherever *'All'* is listed, the project applies to all incorporated municipalities in the county.

Under the **Project Type** column, the following codes can be used to categorize projects: *C = Construction Project; E = Education Project; P = Policy Project; COM = Communication; PR = Preparedness; R = Response;* and *BO = Buyout*.

Under the **Hazard** column, the following codes can be used to identify the hazard being addressed: *A = All hazards; W = Wind; H = Hail; L = Lightning; T = Tornado; RF = Riverine Flooding; FF = Flash Flooding; DF = Dam/Levee Failure; WW = Winter Weather; IS = Ice Storms; D = Drought; HW = Heat Wave; CW = Cold Wave; E = Earthquake; WF = Wildfire; HM = HazMat Spill;* and *P = Pandemic***.** Multiple hazards can be addressed by one project.

Under the **Possible Funding** column, the potential source of funding should be listed. Examples of potential sources include, but are not limited to, public agencies such as *FEMA, HUD, USDA,* or *local* funding; private agencies can be included too if relevant.

- **REQUIRED:** each jurisdiction must have at least one project funded by *FEMA*.

Under the **Project** column, a short description of the project should be provided.

Under the **Priority** column, the following codes can be used to categorize priorities: *H = High; M = Medium;* and *L = Low.*

Under the **Lead or Contact** column, wherever *Emergency Manager/EMA* is listed, the implication is that the *Emergency Manager/EMA* will be assisted by municipal employees and others who meet regularly with the *Emergency Manager/EMA*.

Under the **Proposed Schedule** column, a timeframe for the project should be provided. Examples of timelines could include a start year and end year (e.g., 2022-2024) or the expected duration of a project (e.g., 5-7 years)

Under the **Benefit, Cost** column, the following codes can be used to identify the benefit and cost to the community: *H = High; M = Medium;* and *L = Low.* There should be one code each for benefit and cost.

Table 36. Mitigation strategies for the City of Ashley.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Protect life, reduce exposure to extreme heat and cold	Ashley	C	HW, CW	Local	Identify second location for extreme heat/cold shelter (with generator) – city hall, elementary school – in addition to community center	M	Mayor, City Council	1-3 years	H, L
Protect life, reduce exposure to tornadoes and severe wind	Ashley	C	W, T	FEMA	Create or retrofit tornado shelter/wind resistant room – city hall, community center	H	Mayor, City Council	1-5 years	H, H
Protect life and property from hazards	Ashley	PR, R	All	Local	Develop (or update) an Emergency Action Plan (EAP) for all hazards, with an emphasis on tornadoes, hazmat spill (Ashley has a railroad, major highway US-51), extreme heat/cold – identify first responders, evacuation routes, sheltering locations, etc.	H	Mayor, City Council	1-5 years	H, L
Protect life from natural hazards	Ashley	PR	All	Local	Continue subscription to emergency alert notification system; ensure notifications tell people where to shelter around community	M	Mayor, City Council	Ongoing	H, M
Protect life and property from flooding	Ashley	C	FF, RF	FEMA	Address drainage issues to alleviate standing water during heavy rainfall events; look into FEMA funded projects, contact county highway engineer for ideas	H	Mayor, City Council	1-5 years	H, H
Protect life and property from winter weather, wind, tornadoes	Ashley	PR	W, T, WW	Local	Purchase a backhoe; must have someone who is able to operate it	H	Mayor, City Council	1-5 years	H, H
Enhance communication and coordination between neighboring communities	Ashley, neighboring communities	PR, R	All	Local	Create written mutual aid agreements with neighboring communities	M	Mayor, City Council	1-3 years	H, L
Protect life from severe weather events or other hazards	Ashley	PR	All	Local	Create vulnerable person registry to identify who might need assistance during a severe weather event or hazard	M	Mayor, City Council	1-3 years	H, L

Table 37. Mitigation strategies for Village of Addieville.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Protect life	Addieville	C	W, T	FEMA	Choose location and create/retrofit tornado shelter or wind resistant room	H	Village President, Board	1-5 years	H, H
Protect life	Addieville	PR, R	All	Local	Create list of vulnerable individuals who might need assistance during or after a severe weather event or hazard	M	Village President, Fire Department	1-3 years	H, L
Protect life	Addieville	C	All	Local	Replace/repair sidewalks, curb erosion to improve sidewalk accessibility in Addieville's public park	H	Village President, Board	1-5 years	H, M
Protect life, protect property	Addieville	C	FF	Local, FEMA	Replace/repair culverts under roads that frequently flood	H	Village President, Board	1-5 years	H, H

Table 38. Mitigation strategies for Village of Du Bois.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Protect life, reduce exposure to extreme heat and cold	Du Bois	C	HW, CW	Local	Cooling/warming center with generator (Terry Deering Community Center)	M	Village President	Ongoing	H, L
Protect life and property, reduce exposure to flooding	Du Bois	C	FF	Local	Sidewalk removal and concrete recycling to create rip raps under bridges, railroad tracks, culverts, add to gravel roads to prevent erosion	M	Village President	Ongoing	H, M
Protect life, reduce exposure to tornadoes and severe wind	Du Bois	C	W, T	FEMA	Create or retrofit tornado shelter/wind resistant room – Catholic church or village hall	H	Village President	1-5 years	H, H
Protect life and property from hazardous waste spill	Du Bois	PR, R	HM	Local	Develop an action plan in the event of a hazardous spill (Du Bois has a railroad, major highway US-51)	H	Village President, Village Board	1-3 years	H, L
Protect life from severe weather events or other hazards	Du Bois	PR	All	Local	Create list of vulnerable individuals who might need assistance during a severe weather event or hazard	H	Village President, Village Board	1-3 years	H, L
Enhance communication and coordination between neighboring communities	Du Bois, neighboring communities	PR, R	All	Local	Create written mutual aid agreements with neighboring communities.	H	Village President, Village Board	1-3 years	H, L
Enhance communication and coordination	Du Bois	PR	All	Local	Continue participation in Southern Illinois Mayors Association (SIMA) – potential for collaboration and sharing hazard mitigation ideas	M	Village President	Ongoing	M, L

Table 39. Mitigation strategies for the Village of Hoyleton.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Reduce risk of injury or death from extreme heat and cold	Hoyleton	PR	HW, CW	Local	Identify a location for a heating and cooling center; purchase a generator (30kW, 60kW)	H	Public Works, Mayor	1-5 years	H, H
Educate public on disaster preparedness	Hoyleton	E	All	Local	Disseminate disaster preparedness information, including emergency supply kit information, through church bulletins and door-to-door youth groups	M	Public Works, Mayor	Ongoing	M, L
Reduce severe wind and tornado risk	Hoyleton	PR	W, T	Local	Continue tree surveys and put tree survey plans into writing	L	Public Works, Mayor	Ongoing	M, L
Reduce risk of injury or death from fires	Hoyleton	PR	HW, house fires	Local	Partner with the Red Cross to obtain free smoke detectors; partner with local fire department to distribute smoke detectors door-to-door	H	Public Works, Mayor; Hoyleton fire department	1-3 years	H, L
Reduce risk of injury or death from natural hazards	Hoyleton	PR	All	Local	Develop and implement a plan to check on vulnerable populations during natural hazards	M	Public Works, Mayor; Hoyleton fire department	Ongoing	M, L
Reduce risk of injury or death from severe wind and tornadoes	Hoyleton	C	W, T	FEMA	Identify a room or develop a wind resistant shelter for severe wind/tornado sheltering use	H	Public Works, Mayor	1-5 years	H, M
Increase coordination and response to natural hazards across jurisdictions	Hoyleton, ALL	R	All	Local	Maintain and service mutual aid agreements, such as MABAS (Mutual Aid Box Alarm System)	M	Hoyleton fire department	Ongoing	M, L

Table 40. Mitigation strategies for Village of Irvington.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Protect Irvington residents and vulnerable populations from natural hazards	Irvington	PR	All	Local	Continue evacuation planning and vulnerable population outreach using Google Drive	H	Fire chief, police chief	Ongoing	H, L
Reduce severe wind and tornado risk	Irvington	C	T, W	FEMA	Identify a location for and construct a wind-proof room	H	Village president	1-5 years	H, M
Maintain coordination and response to natural hazards across jurisdictions	Irvington, ALL	R	All	Local	Continue and maintain mutual aid agreements with neighboring fire and police departments	M	Fire chief, police chief	Annually	M, L
Educate public on disaster preparedness	Irvington	PR	All	Local	Educate the public to use QR codes/Google Drive system by disseminating information through PD Facebook page, local newsletters, church bulletins, youth groups going door-to-door	L	Village president, police chief, fire chief	Annually	M, L

Table 41. Mitigation strategies for the Village of Irvington.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Protect Irvington residents and vulnerable populations from natural hazards	Irvington	PR	All	Local	Continue evacuation planning and vulnerable population outreach using Google Drive	H	Fire chief, police chief	Ongoing	H, L
Reduce severe wind and tornado risk	Irvington	C	T, W	FEMA	Identify a location for and construct a wind-proof room	H	Village president	1-5 years	H, M
Maintain coordination and response to natural hazards across jurisdictions	Irvington, ALL	R	All	Local	Continue and maintain mutual aid agreements with neighboring fire and police departments	M	Fire chief, police chief	Annually	M, L
Educate public on disaster preparedness	Irvington	PR	All	Local	Educate the public to use QR codes/Google Drive system by disseminating information through PD Facebook page, local newsletters, church bulletins, youth groups going door-to-door	L	Village president, police chief, fire chief	Annually	M, L

Table 42. Mitigation strategies for the City of Nashville.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Reduce severe wind and tornado risk	Nashville	C	W, T	FEMA	Identify a room or develop a wind resistant shelter for severe wind/tornado sheltering use	H	City council, Mayor	1-5 years	H, H
Reduce impacts of extreme heat and extreme cold weather	Nashville	C	HW, CW, IS	Local	Identify a location for a heating and cooling center with back-up generators	H	City council, Mayor	1-5 years	H, H
Reduce risk of injury or death from natural hazards	Nashville	PR	All	Local	Prepare a written local Emergency Operations Plan for Nashville to increase response capacity and community preparedness.	H	Mayor	Annually	H, L
Reduce the risk of Hazmat spills	Nashville	PR	HM	Local	Develop evacuation and cleaning drills to respond to accidental spills	M	Fire chief, police chief	1-2 years	H, L
Reduce risk during flash flooding and riverine flooding	Nashville	C, PR	RF, FF	Local	Install updated, reflective signage to indicate high-risk flood zones and replace faded signs	M	City council	1-5 years	H, L
Educate public on disaster preparedness	Nashville	E, PR	All	Local	Run preparedness exercises, training, and preparation to the community to build resilience during severe weather months; continue training personnel to use AED devices, perform CPR and to use fire extinguishers etc.	H	City council, fire chief, police chief	Annual; ongoing	H, L
Maintain coordination and response to natural hazards across jurisdictions	Nashville, ALL	R	All	Local	Continue and maintain mutual aid agreements with neighboring fire and police departments	M	Fire chief, police chief	Annually	M, L

Table 43. Mitigation strategies for the Village of New Minden.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Reduce severe wind and tornado risk	Nashville	C	W, T	FEMA	Identify a room or develop a wind resistant shelter for severe wind/tornado sheltering use	H	City council, Mayor	1-5 years	H, H
Reduce impacts of extreme heat and extreme cold weather	Nashville	C	HW, CW, IS	Local	Identify a location for a heating and cooling center with back-up generators	H	City council, Mayor	1-5 years	H, H
Reduce risk of injury or death from natural hazards	Nashville	PR	All	Local	Prepare a written local Emergency Operations Plan for Nashville to increase response capacity and community preparedness.	H	Mayor	Annually	H, L
Reduce the risk of Hazmat spills	Nashville	PR	HM	Local	Develop evacuation and cleaning drills to respond to accidental spills	M	Fire chief, police chief	1-2 years	H, L
Reduce risk during flash flooding and riverine flooding	Nashville	C, PR	RF, FF	Local	Install updated, reflective signage to indicate high-risk flood zones and replace faded signs	M	City council	1-5 years	H, L
Educate public on disaster preparedness	Nashville	E, PR	All	Local	Run preparedness exercises, training, and preparation to the community to build resilience during severe weather months; continue training personnel to use AED devices, perform CPR and to use fire extinguishers etc.	H	City council, fire chief, police chief	Annual; ongoing	H, L
Maintain coordination and response to natural hazards across jurisdictions	Nashville, ALL	R	All	Local	Continue and maintain mutual aid agreements with neighboring fire and police departments	M	Fire chief, police chief	Annually	M, L

Table 44. Mitigation strategies for the Village of Oakdale.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Reduce injury or death from heat and cold waves, ice storms	Oakdale	C	HW, CW, IS	Local	Identify a location for and construct a heating or cooling shelter by purchasing a generator	H	Village President	1-5 years	H, H
Reduce severe wind and tornado risk	Oakdale	C	T, W	FEMA	Identify a location for and construct a wind-proof room	H	Village President	1-5 years	H, M
Reduce injury or death from severe wind and tornado risk	Oakdale	PR, P	T, W	Local	Coordinate with county to create and enforce code for tie down straps for mobile homes	M	Village President, Washington County code enforcement, Washington County board	1-3 years	H, L
Reduce risk of injury or death from severe weather	Oakdale	PR	All	Local	Coordinate NOAA weather radio sales; partner with local youth groups	L	Village President	1-3 years	M, L
Reduce risk of severe storms, tornadoes, wind	Oakdale	PR	T, W	Local	Coordinate with electric company (Ameren) to continue keeping trees trimmed	L	Village President	Ongoing	M, L

Table 45. Mitigation strategies for the Village of Okawville.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Protect resources	Okawville	PR, COM	F	FEMA	Receive updated flood maps to ensure adequate flood insurances for all businesses and residences; communicate information to residents	H	Village President, mapping agencies	1-5 years	H, H
Protect life and resources	Okawville	C	W, T	Local	Upgrade current sirens and provide additional sirens to alert residents of impending wind related weather emergencies	H	Village board, EMA	1-5 years	H, M
Protect life	Okawville, Washington County	COM	F, FF	Local	Provide education regarding water safety during flood events	H	EMA, village board	1-3 years	H, L

Table 46. Mitigation strategies for the Village of Radom.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Protect life, reduce exposure to hazards	Radom	C	HW, CW	Local	Install a generator in existing shelter building to enhance heating and cooling	M	Village President, Board	1-5 years	H, H
Protect life, reduce tornado and wind risk	Radom	C	T, W	FEMA	Retrofitting exterior and interior rooms for wind resistance in existing shelter	H	Village President, Board	1-5 years	H, H
Protect life, reduce risk to hazard that could cause evacuation	Richview	C	F, FF	FEMA, local	Continue culvert repair to protect community and roads from floods	H	Village President, Board	1-5 years	H, H
Enhance communication and coordination between neighboring communities	Radom, neighboring communities	PR, R	All	Local	Formalize mutual aid agreements with Nashville and/or other surrounding communities	M	Village President, Board	1-3 years	H, L
Educate public	Radom	E, COM	All	Local	Education or awareness outreach to educate and inform the community maybe once a year (notices in water bills, church bulletins, etc.)	L	Village President, Board	1-3 years	M, L
Protect life from severe weather events or other hazards	Radom	PR, R, COM	All	Local	Create list of vulnerable individuals who might need assistance during a severe weather event or hazard	H	Village President, Board	1-3 years	H, L
Protect life and property from hazardous waste spill	Radom	PR, R	HM	Local	Develop emergency action plan to combat and respond to hazmat spills	H	Village President, Board	1-3 years	H, L
Protect life and property from hazards	Radom	PR, COM	All	Local	Purchase emergency notification system that conveys hazard and what to do (e.g., where to shelter, where to evacuate)	H	Village President, Board	1-3 years	H, M

Table 47. Mitigation strategies for the Village of Richview.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Protect life, reduce population exposure to hazards	Richview	C	HW, CW, T, W	FEMA	Expand and upgrade small shelter to fit more community members; make shelter wind resistant	M	Village President, Board	1-5 years	H, H
Protect life, reduce risk to hazard that could cause evacuation	Richview	C	T, FF, E, HM	FEMA, local	Repairing a bridge and culvert to make a main road more accessible during an emergency evacuation	H	Village President, Board	1-5 years	H, H
Enhance communication and coordination between neighboring communities	Richview, neighboring communities	PR, R	All	Local	Formalize mutual aid agreements with Irvington and/or other surrounding communities	M	Village President, Board	1-3 years	H, L
Protect life, educate public	Richview	E, COM	All	Local	Education or awareness outreach to educate and inform the community maybe once a year (notices in water bills, church bulletins, etc.)	L	Village President, Board	1-3 years	M, L
Protect life from severe weather events or other hazards	Richview	PR	All	Local	Create list of vulnerable individuals who might need assistance during a severe weather event or hazard	H	Village President, Board	1-3 years	H, L
Protect life and property from hazardous waste spill	Richview	PR, R	HM	Local	Develop emergency action plan to combat and respond to hazmat spills (Richview has a railroad, highway US-51)	H	Village President, Board	1-3 years	H, L
Protect life and property from hazards	Richview	PR, COM	All	Local	Purchase siren that notifies public of a hazard	H	Village President, Board	1-3 years	H, M

Table 48. Mitigation strategies for the Village of Venedy.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Protect life	Venedy	C	W, T	FEMA	Choose location and create/retrofit tornado shelter or wind resistant room	H	Village President, Board	1-5 years	H, H
Protect life	Venedy	PR, R	All	Local	Create list of vulnerable individuals who might need assistance during or after a severe weather event or hazard	M	Village President, Fire Department	1-3 years	H, L
Protect life	Venedy	C	HW, CW	Local	Cooling/warming center with generator	H	Village President, Board	1-5 years	H, M
Protect life, protect property	Venedy	C	FF	Local, FEMA	Replace/repair culverts under roads that frequently flood	H	Village President, Board	1-5 years	H, H

Table 49. Mitigation strategies for the City of Wamac.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Reduce severe wind and tornado risk	North Wamac School	C	T	FEMA	Construct a tornado shelter for school children to take shelter in the event of tornado	H	Mayor, School District	1-5 years	H, M
Reduce severe wind and tornado risk	Wamac City Park	C	W, T	FEMA	Turning the restrooms to wind-hardened rooms/tornado shelter	H	Mayor	1-5 years	H, M
Educate public on disaster preparedness	All	PR	All	Local	Run preparedness exercises, training, and preparation to the community to build resilience during severe weather month (Mar) and earthquake month (Oct)	H (Planned)	Mayor	Annual	H, L
Equip the community with the tools that increase alertness levels to natural disasters	All	PR, COM	All	Local	Organize a giveaway or sale event to provide smoke detectors and weather radios to the community	M	Mayor, Wamac Chief of Police Department	1 year	H, M
Reduce risk of injury or death from fires	All	PR	WF, Fire	Local	Partner with the Red Cross to obtain free smoke detectors; partner with local fire department to distribute smoke detectors door-to-door	M	Centralia Fire Protection District, Red Cross	1 year	H, M
Work on an Emergency Operations Plan	All	PR, R	All	Local	Prepare a local Emergency Operations Plan for Wamac to increase response capacity and community preparedness	H	Mayor	1-5 years	H, H
Reduce risk of injury or death from extreme heat and cold	Wamac Sewage Treatment Plant	C	All	Local	Install a backup generator to cater to the sewage treatment plant	M	Mayor	1-5 years	H, H

Table 50. Mitigation strategies for Washington County.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Protect life and property	Washington County	P	All	Local	Review zoning ordinances: amend zoning ordinances to require roof tiedowns for mobile/manufactured homes	M	EMA, county board	1-2 years	M, L
Protect life	Washington County, All	C	T, W	Local, private	Require new subdivisions and trailer courts to build storm shelters, especially for homes without basements	H	EMA, county board	1-5 years	H, H
Protect life	Washington County, All	C	T, W	BRIC	Build wind resistant rooms attached to public buildings	H	EMA, county board, local city councils	1-5 years	H, H
Educate community	Washington County, All	E	All	Local	Hand out informational brochures containing building and occupancy permits	L	EMA, county board	1-3 years	M, L
Protect life and property	Washington County, All	PR	All	Local	Install smoke detectors	H	EMA, fire department	Ongoing; on hold due to supply issues	H, L
Protect life, educate community	Washington County, All	PR, E	All	U of I Extension, local, federal mitigation funds	My Preparedness Initiative (MyPI) program (lead by U of I Extension)	M	EMA, county board	1-3 years	H, M
Protect life and property	Washington County, All	COM, PR	T, severe storms	Local	Update or replace sirens; connect new sirens to central county system	H	EMA, local city councils	1-3 years	H, M
Protect life and property	Washington County, All	COM, PR	All	Local	Continue county alert message system (“Hyper-reach”)	H	EMA	Ongoing	H, L

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Protect life and property	Washington County, All	C	F, FF	FEMA	Identify specific stormwater infrastructure projects to make federal (FEMA) funding possible	H	EMA, county board, local jurisdictions	1-5 years	H, H
Protect property	Washington County	P	F	FEMA	Have unincorporated Washington County join the National Flood Insurance Program (NFIP)	H	EMA	1-5 years	H, L
Protect property	Washington County	P	F	FEMA	Get updated floodplain maps with 2D modeling	H	EMA	1-5 years	H, M

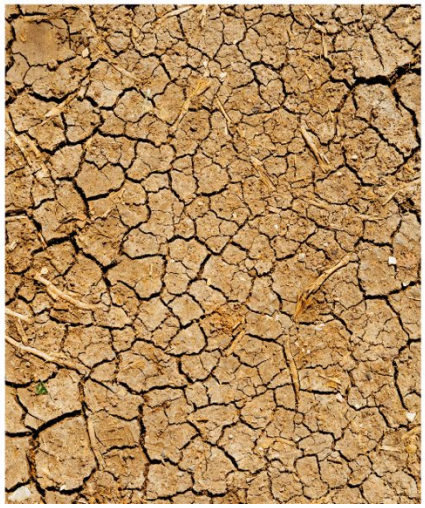
ACRONYMS

Acronym	Definition
ACS	American Community Survey
ASDSO	Association of State Dam Safety Officials
BRIC	Building Resilient Infrastructure and Communities
CDC	Centers for Disease Control
DMA 2000	Disaster Mitigation Act of 2000
EMA	Emergency Management Agency
FEMA	Federal Emergency Management Agency
FMA	Flood Mitigation Assistance
FSA	Farm Service Agency
HMP	Hazard Mitigation Plan
HMGP	Hazard Mitigation Grant Program
IDOT	Illinois Department of Transportation
IDPH	Illinois Department of Public Health
IEMA	Illinois Emergency Management Agency
IMSIF	Illinois Mine Subsidence Insurance Fund
ISGS	Illinois State Geological Survey
ISWS	Illinois State Water Survey
MRCC	Midwestern Regional Climate Center
NCEI	National Centers for Environmental Research
NFIP	National Flood Insurance Program
NID	National Inventory of Dams
NLD	National Levee Database
NOAA	National Oceanic and Atmospheric Administration
NRI	National Risk Index

NWS	National Weather Service
PDM	Pre-Disaster Mitigation
SBA	Small Business Association
SFHA	Special Flood Hazard Area
SHMO	State Hazard Mitigation Officer
SIMAPC	Southern Illinois Metropolitan and Regional Planning Commission
SWDI	Severe Weather Data Inventory
USCG	United States Coast Guard
USDA	United States Department of Agriculture
WHO	World Health Organization





SECTION 8

APPENDIX

APPENDIX A: CAPABILITY ASSESSMENT

A.1 Addieville

A.2 Ashley

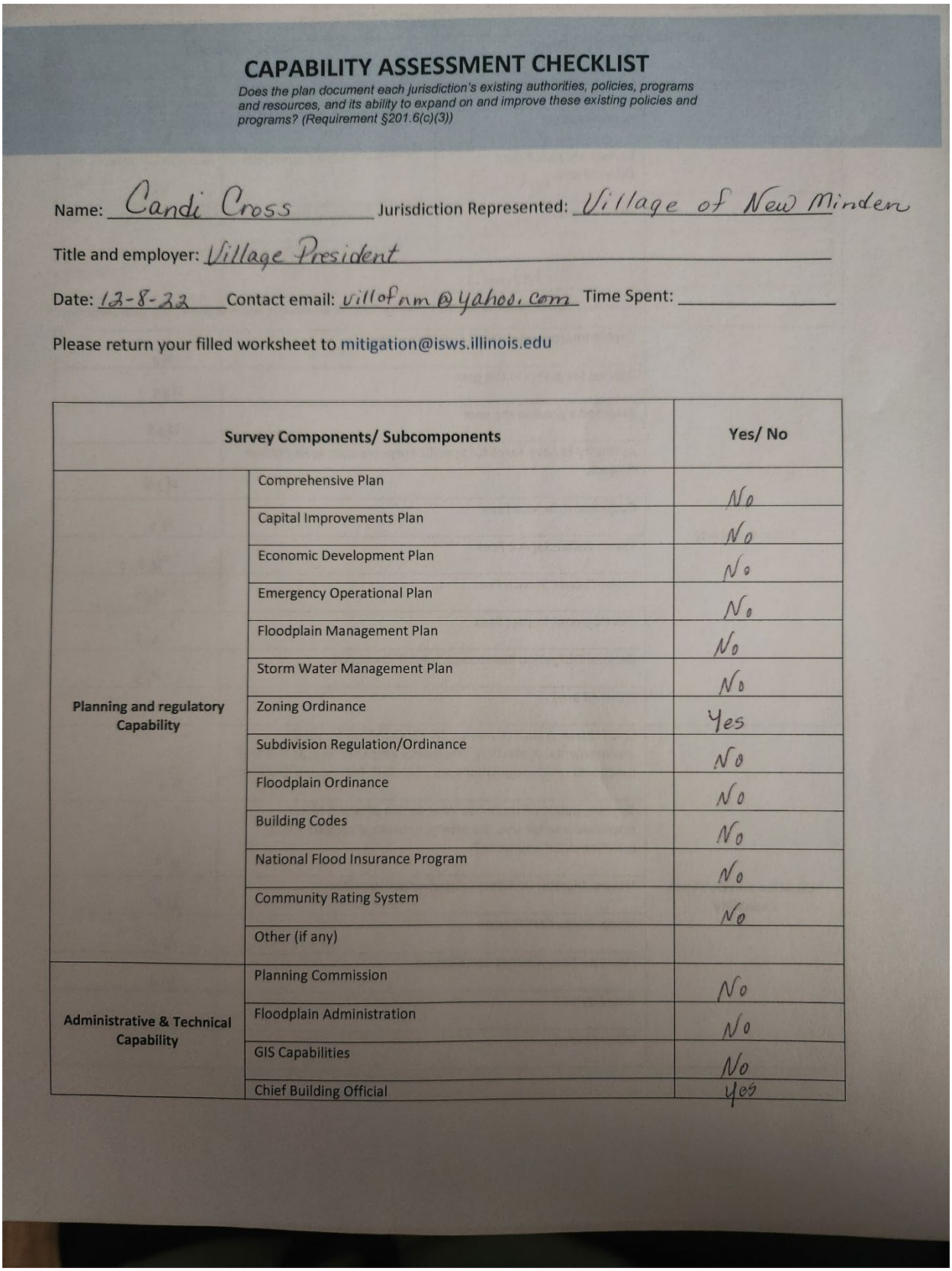
A.3 Du Bois

A.4 Hoyleton

A.5 Irvington

A.6 Nashville

A.7 New Minden



CAPABILITY ASSESSMENT CHECKLIST

Does the plan document each jurisdiction's existing authorities, policies, programs and resources, and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))

Name: Candi Cross Jurisdiction Represented: Village of New Minden

Title and employer: Village President

Date: 12-8-22 Contact email: villofnm@yahoo.com Time Spent: _____

Please return your filled worksheet to mitigation@isws.illinois.edu

Survey Components/ Subcomponents		Yes/ No
Planning and regulatory Capability	Comprehensive Plan	No
	Capital Improvements Plan	No
	Economic Development Plan	No
	Emergency Operational Plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	No
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	No
	Floodplain Administration	No
	GIS Capabilities	No
	Chief Building Official	Yes

WASHINGTON COUNTY

	Civil Engineering	No
	Local Staff Who Can Assess Community's Vulnerability to Hazards	Yes
	Grant Manager	No
	Mutual Aid Agreement Other (if any)	Yes
	Other (if any)	
Fiscal Capability	Capital Improvement Plan/ 1- & 5-Year plan	No
	Applied for grants in the past	Yes
	Awarded a grant in the past	Yes
	Authority to Levy Taxes for Specific Purposes such as Mitigation Projects	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	Yes
	Water/Sewer Service Fees	Yes
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	Yes
	Other (if any)	
Education and Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc. Ex. CERT Teams, Red Cross, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	Storm Ready Certification	No
	Fire wise Communities Certification	No
	Tree City USA	No
	Other (if any)	

WASHINGTON COUNTY

Overall Capability	Limited/Moderate/High
Does the community have the financial resources needed to implement mitigation projects?	Limited
Does the community have the staff/expertise to implement projects?	Limited
Is there community support to implement projects?	Limited
Does the community staff have time to devote to hazard mitigation?	Limited

In case of any queries, please email us at mitigation@isws.illinois.edu

A.8 Oakdale

WASHINGTON COUNTY

CAPABILITY ASSESSMENT CHECKLIST

Does the plan document each jurisdiction's existing authorities, policies, programs and resources, and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))

Name: Charles Bahre Jurisdiction Represented: Oakdale

Title and employer: President of village board

Date: 2/22/2023 Contact email: Pcbahre@Hotmail.com Time Spent: _____

Please return your filled worksheet to mitigation@isws.illinois.edu

Survey Components/ Subcomponents		Yes/ No
Planning and regulatory Capability	Comprehensive Plan	Yes / County Plan
	Capital Improvements Plan	NO
	Economic Development Plan	NO
	Emergency Operational Plan	NO
	Floodplain Management Plan	NO
	Storm Water Management Plan	NO
	Zoning Ordinance	County
	Subdivision Regulation/Ordinance	County
	Floodplain Ordinance	NO
	Building Codes	NO
	National Flood Insurance Program	NO
	Community Rating System	NO
	Other (if any)	
Administrative & Technical Capability	Planning Commission	County
	Floodplain Administration	County
	GIS Capabilities	NO
	Chief Building Official	NO

	Civil Engineering	County
	Local Staff Who Can Assess Community's Vulnerability to Hazards	~~NO~~ Yes
	Grant Manager	NO
	Mutual Aid Agreement Other (if any)	Yes
	Other (if any)	
Fiscal Capability	Capital Improvement Plan/ 1- & 5-Year plan	NO
	Applied for grants in the past	~~NO~~ Yes
	Awarded a grant in the past	~~NO~~ Yes
	Authority to Levy Taxes for Specific Purposes such as Mitigation Projects	Yes
	Gas/Electric Service Fees	NO
	Storm Water Service Fees	NO
	Water/Sewer Service Fees	NO
	Development Impact Fees	NO
	General Obligation Revenue or Special Tax Bonds	NO
	Other (if any)	
Education and Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc. Ex. CERT Teams, Red Cross, etc.	NO
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	County
	Natural Disaster or Safety related school programs	Yes
	Storm Ready Certification	NO
	Fire wise Communities Certification	NO
	Tree City USA	NO
	Other (if any)	

Overall Capability	Limited/Moderate/High
Does the community have the financial resources needed to implement mitigation projects?	NO
Does the community have the staff/expertise to implement projects?	Utilize County
Is there community support to implement projects?	Yes
Does the community staff have time to devote to hazard mitigation?	Yes

In case of any queries, please email us at mitigation@isws.illinois.edu

A.9 Okawville

Name: Dawn Moyer Jurisdiction Represented: Village of Okawville

Title and employer: Clerk - VIllage of Okawville

Date: 09/09/2022 Contact email: villageofokawville@gmail.com Time Spent: 4 hours

Please return your filled worksheet to mitigation@isws.illinois.edu

Survey Components/ Subcomponents		Yes/ No
Planning and regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	No
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Floodplain Management Plan	No
	Storm Water Management Plan	Yes
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	Yes
	Floodplain Ordinance	Yes
	Building Codes	Yes
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	n/a
Administrative & Technical Capability	Planning Commission	No
	Floodplain Administration	No

	GIS Capabilities	No (outsourced for water/sewer mapping)
	Chief Building Official	No
	Civil Engineering	No
	Local Staff Who Can Assess Community's Vulnerability to Hazards	No/Yes
	Grant Manager	No
	Mutual Aid Agreement Other (if any)	Yes - police/county
	Other (if any)	n/a
Fiscal Capability	Capital Improvement Plan/ 1- & 5-Year plan	No
	Applied for grants in the past	Yes
	Awarded a grant in the past	Yes and no
	Authority to Levy Taxes for Specific Purposes such as Mitigation Projects	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	Yes
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	n/a
Education and Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc. Ex. CERT Teams, Red Cross, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	Storm Ready Certification	No

	Fire wise Communities Certification	No
	Tree City USA	No
	Other (if any)	n/a

In case of any queries, please email us at mitigation@isws.illinois.edu

Overall Capability	Limited/Moderate/High
Does the community have the financial resources needed to implement mitigation projects?	limited
Does the community have the staff/expertise to implement projects?	limited
Is there community support to implement projects?	limited
Does the community staff have time to devote to hazard mitigation?	limited

A.10 Radom

A.11 Richview

A.12 Venedy

CAPABILITY ASSESSMENT CHECKLIST

Does the plan document each jurisdiction's existing authorities, policies, programs and resources, and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))

Name: ____ Phillip Leadendecker_____ Jurisdiction Represented: _____Venedy_____

Title and employer: _____Village President, Venedy_____

Date: __1/13/23____Contact email: __aleade@egyptian.net_____ Time Spent: _____20 min_____

Please return your filled worksheet to mitigation@isws.illinois.edu

Survey Components/ Subcomponents		Yes/ No
Planning and regulatory Capability	Comprehensive Plan	No
	Capital Improvements Plan	No
	Economic Development Plan	No
	Emergency Operational Plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	No – Washington County
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	No
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	No
Administrative & Technical Capability	Planning Commission	No
	Floodplain Administration	No
	GIS Capabilities	Map in town
	Chief Building Official	No

	Civil Engineering	No
	Local Staff Who Can Assess Community's Vulnerability to Hazards	Board – nobody employed
	Grant Manager	File for 1-2 grants – town clerk
	Mutual Aid Agreement Other (if any)	Fire department
	Other (if any)	
Fiscal Capability	Capital Improvement Plan/ 1- & 5-Year plan	No
	Applied for grants in the past	Yes
	Awarded a grant in the past	Yes
	Authority to Levy Taxes for Specific Purposes such as Mitigation Projects	Taz levy
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education and Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc. Ex. CERT Teams, Red Cross, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	Storm Ready Certification	No
	Fire wise Communities Certification	Fire Dept
	Tree City USA	
	Other (if any)	

Overall Capability	Limited/Moderate/High
Does the community have the financial resources needed to implement mitigation projects?	Limited
Does the community have the staff/expertise to implement projects?	Just board
Is there community support to implement projects?	No
Does the community staff have time to devote to hazard mitigation?	Follow the county lead

In case of any queries, please email us at mitigation@isws.illinois.edu

A.13 Wamac

A.14 Unincorporated Washington County

CAPABILITY ASSESSMENT CHECKLIST

Does the plan document each jurisdiction's existing authorities, policies, programs and resources, and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))

Name: ___Matthew Bierman_____ Jurisdiction Represented: __Washington County IL_____

Title and employer: ___Emergency Management Agency Director_____

Date: __7/22/2022__Contact email: _matt.bierman@washingtonco.illinois.gov_ Time Spent: __1 Hour_

Please return your filled worksheet to mitigation@isws.illinois.edu

Survey Components/ Subcomponents		Yes/ No
Planning and regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	No
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	Yes
	Floodplain Ordinance	No
	Building Codes	No
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Floodplain Administration	No
	GIS Capabilities	Yes
	Chief Building Official	Yes

	Civil Engineering	Yes
	Local Staff Who Can Assess Community's Vulnerability to Hazards	Yes
	Grant Manager	Yes
	Mutual Aid Agreement Other (if any)	Yes
	Other (if any)	
Fiscal Capability	Capital Improvement Plan/ 1- & 5-Year plan	No
	Applied for grants in the past	Yes
	Awarded a grant in the past	Yes
	Authority to Levy Taxes for Specific Purposes such as Mitigation Projects	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	Yes
	Other (if any)	
Education and Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc. Ex. CERT Teams, Red Cross, etc.	Washington County Ministerial Alliance
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Fire Service and EMA both
	Natural Disaster or Safety related school programs	Coming
	Storm Ready Certification	No
	Fire wise Communities Certification	No
	Tree City USA	No
	Other (if any)	

Overall Capability	Limited/Moderate/High
Does the community have the financial resources needed to implement mitigation projects?	Limited
Does the community have the staff/expertise to implement projects?	Limited
Is there community support to implement projects?	Moderate
Does the community staff have time to devote to hazard mitigation?	Moderate

In case of any queries, please email us at mitigation@isws.illinois.edu

APPENDIX B: MEETING DOCUMENTS

Meeting 1

B.1.1 Agenda

April 21, 2021
Washington County Planning Meeting
Webex and Washington County Court House
Meeting Start at 6:30 pm

Agenda

15 min Welcome and Introductions	Matt/Lisa
15 min Jurisdictional Participation Requirements and Benefits	Linda/Matt
10 min Match Documentation Procedures	Linda
20 min Explanation of the Planning Process, Scope of Work and Timeline	Lisa
10 min Review of Natural Hazards Addressed	Lisa
10 min Existing Local Planning Documents and Critical Facilities	Lisa/Brad
10 min Public Meeting Information & Discussion	Lisa
15 min Next Steps and Adjourn	Lisa/Matt

B.1.2 Sign-in Sheet

NAME	REPRESENTING	PHONE
Matt Bierman	Washington County EMA	
Lisa Graff	Illinois State Water Survey (ISWS)	
Brad McVay	ISWS	
Sally McConkey	ISWS	
Butch Mathus	Mayor of Wamac	
Candy Cross	President of New Minden	(618)478-5742
Cecil Alfeldt	President of Oakdale	(618)329-5381
Chief Brian Fletcher	Nashville PD	
Chief Steve Miliken	Okawville PD	(618)318-5816
Chris Klaybor	Dubois, Village Clerk	618-787-7501
Raymond Klaybor	Dubois	
Dave Jasper	Okawville	(618) 204-0068
David Meyer	Washington County Board Chairman	618-534-5921
Doug Boecklen	Mayor of Addieville	(618)593-0603
Drew Bauer	Washington County Sheriff's Office	
Gene Lamczyk Jr.	County Board EMA Committee Chair	(618)534-1943
Gera Simms	President of Irvington	(618)249-8520
Gerald Brockmeier	Chairman, Wash. Co. Planning Commission	(618) 218-0207
Jamie Beaver	Red Cross Disaster Program Coord.	(309)222-5838
Jeff Oelze	Oil industry	618-559-6811
John Felchlia	Washington County Ambulance	(618)559-3024
Josh Holle	President of Hoyleton	(618)201-9764
Kate Muenter	County Board EMA Committee Chair	(618)406-2070
Keith Senior	Education /Okawville	(217)821-3273
Kevin Brink	NOTS Logistics/Industry	(618)201-6434
Kevin Woolever	Ashley City Board/Ashley FPD	618-314-0665
Kiefer Heiman	Washington Co Hwy Dept, County Engineer	(618)314-0791
Larry Wachowski	President of Radom	(618)485-2241
Mark Maue	Prairie State	618-444-3518 (mobile)
Philip Leadendecker	Venedy	618-824-6357
Ray Kolwier	Mayor of Nashville	(618)599-7359
Ross Schultze	Retired ISP/Ashley Fire Board	(618)218-0389
Ryan Kees	Captain, Hoyleton FPD	(618)314-6370
Ryan Wiedwilt	Fire Chief Addieville	
Sharon Frederking	Health Department (retired)	(618)599-2519
Sharon Mewes	Washington County Assessor	
Sherri Bassen	South Central Transit	(618)532-8076 X135

B.1.3 Meeting Minutes

April 21, 2021
Washington County Planning Meeting
Webex and Washington County Court House
Meeting Start at 6:30 pm

Welcome and Introductions
Lisa Graff welcomed participants. Lisa explained that Matt Bierman started the application process in 2019 it was approved in late 2020. This is the first meeting. The plan is funded by a FEMA grant through IL Emergency Management Agency.

Steering committee introductions: Matt Bierman from Washington Co EMA Director and Linda Tragesser from Southwest Regional Planning Commission.

Review of agenda. Meeting Goals to explain natural hazard mitigation plan, the benefits of developing a plan, the process, and participant's roles.

Everyone did introductions and shared their experience with mitigation planning.

Jurisdictional Participation Requirements and Benefits
Linda Tragesser explained participation is what covers the grant match for the county. Participation is required for your jurisdiction to be covered by this multi-jurisdictional plan. This will allow represented participants to be able to apply for FEMA mitigation grants. Disaster happens, but you can anticipate the impact of a disaster and identify projects or programs that would lessen the impacts, that is what this plan is about. What can we do to mitigate impacts?
Each jurisdiction should participate.

Match Documentation Procedures
Linda's responsibility to bring representatives of all jurisdictions to the meetings, document the participation, and calculate the match. In the end, the plan needs to be adopted by each jurisdiction. Email Linda with questions. She will share with the group.

Explanation of the Planning Process, Scope of Work, and Timeline
Lisa Graff provided an overview of the process as two main parts, identify the risk, then identify mitigation actions. She reviewed the Stafford Act, DMA2000, this act requires communities to have a mitigation plan to be eligible for mitigation grants, plans must be updated every 5-years.
Risk is the intersection of hazard and vulnerability. Act Before Disaster Strikes – reduce risk. The goal is to save lives, reduce costs, get the community back and running quickly and preserve the community landmarks and all aspects of daily life.

The Mitigation Planning Schedule was reviewed. Public participation important and looking to the representatives to help publicize and encourage participation.

Lisa provided an overview of the planning process, community profile, natural hazard profile, perform the risk assessment. A next step is the policy crosswalk which consists of reviewing other plans that are in place. Mitigation strategizing is next, identifying action items. For example, a community that needs a new gym incorporates a tornado shelter use out of the new gym project. Incorporate mitigation in ongoing projects. The last step is the adoption of the plan and determining how to maintain the plan. The FEMA crosswalk to score the plan was introduced to illustrate how all requirements must be met for FEMA approval.

Review of Natural Hazards Addressed

Lisa introduced hazards listed in the IL State Hazard Mitigation plan and then the ones identified for Washington County. Pause for input. Linda T. pointed out the real possibility of dam failures, e. g. Lake Carlyle.

Lisa presented mitigation statistics showing mitigation saves, reduces the impact on local business and displaced families.

Federal Mitigation Grants such as Building Resilient Infrastructure and Communities, Flood Mitigation Assistance Program, and Hazard Mitigation Grant Program. Project examples were noted including property acquisition, retrofit, protection of utilities, stormwater management improvement. Matt noted that since Washington County did not have a plan in place in 2018, they could not access HMGP funds.

Existing Local Planning Documents and Critical Facilities

Brad McVay reviewed the list of essential/critical facilities that need to be identified. In the event of a disaster the community and responders need to know where these facilities are. He explained a community map will be prepared as well as a spreadsheet. Participants need to review and provide corrections and additions.

Public Meeting Information & Discussion

Lisa Graff emphasized the importance of public involvement. There is hope that by summer an in-person meeting will be a possibility. ISWS will prepare flyers and materials to post. A survey will be conducted.

Next Steps and Adjourn

Sign and return the letter of intent to participate.
Send community plans for review.
Promote public involvement.
Natural Hazards profile will be available for review and discussion at the May meeting. Representatives should share with others and get input.
July – tentative public meeting.

Communication will continue via email. Goal is to have a plan that reflects all the communities and get funding for actions to reduce risk.

Closing

Matt Bierman – looking forward to working with communities to build the plan which is much needed. This will allow them to do projects like having a storm shelter in every community. Butch Mathis, mayor of Wamac, noted they are working with Illinois Rural Development for a tornado siren for Clinton Co would also help in Washington County. Illinois Rural Development can provide funding. Wamac in three counties. Several bridges with flooding, need remediation.
Linda T. again emphasized the importance of participation.

Meeting Adjourned at 7:50 pm

Meeting 2

B.2.1 Agenda

AGENDA

Washington County Hazard Mitigation Committee

Meeting #2 – Hazard Profiles and Risk Assessment

Virtual Zoom* & Washington County Courthouse
August 25, 2021
3-5 pm

1. Welcome and Introductions (10 min)
2. Overview (5 min)
3. State Climatologist (20 min)
4. Hazard Profiles and Risk Assessments (25 min)
5. Critical Facility Location (5 min)
6. Break (5 min)
7. Illinois NFIP Coordinator (15 min)
8. Risk Assessment Activity by Jurisdiction (20 min)
9. Time Match Documentation Procedures (5 min)
10. To Do – Community profile, survey, community webmap, risk assessment (10 min)
11. Adjourn

B.2.2 Sign-in Sheet

NAME	REPRESENTING
Matt Bierman*	Washington County EMA
Rebecca Leitschuh*	Illinois State Water Survey (ISWS)
Trent Ford	ISWS*
Marilyn Sucoe	State of Illinois, NFIP
Sharon Frederking*	Public Health Administrator for Washington County (retired)
Jamie Beaver*	Washington County EMA
Linda Tragesser	SIMAPC
Keifer Heiman	Washington Co Highway Dept
Jeff Oelze	Oelze Oil Company
Waylon Livesay	Hoyleton
Brock Styninger	Nashville PD
Kevin Brink*	NOTS Transportation
Dawn Moyer	Okawville
Sherri Bassen*	South Central Transit
Darrah Sabo	Wash Co EMA
Vic Schubert	County Board Member
Kiefer Heiman	County Highway

*joined via Zoom

B.2.3 Meeting Minutes

See here for meeting notes: https://uofi.box.com/s/4rhhob03jskywwpg6qg1n5bpt7s04rkt

Meeting 3

B.3.1 Agenda

Washington County Hazard Mitigation Committee

Meeting #3 – Mitigation Strategies

Virtual Zoom* & Washington County Courthouse
January 19, 2022
1-2:30 pm

1. Welcome and Introductions (10 min)
2. Overview (5 min)
3. Review Community Risk Assessments (15 min)
4. Mitigation Strategies and Project Ideas (25 min)
5. Review Project Grid and Process for 1-1 Community Calls (10 min)
6. To Do – Risk Assessment, Mitigation Strategy Project Grid (5 min)
7. Adjourn

B.3.2 Sign-in Sheet

NAME	REPRESENTING
Matt Bierman*	Washington County EMA
Lisa Graff*	Illinois State Water Survey (ISWS)
Zoe Zaloudek*	ISWS
Brad McVay*	ISWS
Meirah Williamson*	ISWS
Carrie McKillip*	Illinois Extension
Sharon Frederking*	Public Health Administrator for Washington County (retired)
Matt Bierman	Washington County EMA
Linda Tragesser	SIMAPC
Keifer Heiman	Washington Co Highway Dept

*joined via Zoom

B.3.3 Meeting Minutes

Welcome, Intro, and Overview (Lisa, Matt)

- Lisa Graff and Matt Bierman welcomed participants and introduced the meeting. Lisa overviewed the previous two meetings which involved going over natural hazards and identifying hazards that cause the most risk.
- Lisa gave an overview of the meeting and introduced Carrie McKillip with the University of Illinois Extension.
- In-person and online participants introduced themselves.

Review Community Risk Assessments (Lisa)

- Lisa went over the communities that still have outstanding Risk Assessments, including: Okawville, Wamac, Addieville, Dubois, Irvington, New Minden, Oakdale, Radom, Richview, and Venedy
    - Matt noted that there should be a Risk Assessment for Okawville; Lisa responded that she would check for Okawville's
- Lisa emphasized the importance for filling out these risk assessments in order to receive hazard mitigation grant funds from FEMA and the State of Illinois.

Mitigation Strategies and Project Ideas (Carrie)

- Carrie overviewed the nine categories of mitigation projects, and the importance of identifying which hazards pose the greatest threat, or have the highest risk, to your community to create mitigation plans
    - Example: building codes are important for mitigating multiple natural hazards such as earthquakes, severe wind (tornado/derecho), storm water
    - Example: promoting sound land use
        - Take into account ag land, industrial land, residential, wetlands/nature preserves if flood risk, especially flash flooding, is a high-risk natural hazard; hurricane Katrina is an example of poor land use planning
    - Example: structural retrofits for vulnerable places (e.g. hospitals, nursing homes)
        - Seismic protection and retrofits for existing structures for earthquake risk; University of California Santa Barbara retrofitted one building one year before an earthquake; this building was the only one that did not incur damage
    - Example: flood retrofits for vulnerable places
        - Retrofits include elevation (raising home), wet floodproofing (allow one room of house to flood), relocation, dry floodproofing (seal home), levees/floodwalls, demolition for flood risk, particularly riverine
    - Example: flood insurance
        - Reach out to community members in floodplain to ensure that homeowners are still paying for flood insurance; home owners outside the floodplain can buy flood insurance too → homes outside floodplain can flood!
    - Example: acquisition and buyouts
        - IEMA has done buyouts
        - Once a buyout is completed, the area can no longer be developed
        - Areas bought out can be turned into natural areas such as nature preserves or

wetlands, reducing flood risk

- Example: informing the public
  - Public awareness campaigns
    - These can occur on social media, particularly community websites: can include announcements about sirens, what to do when there's a power outage, where to go during a disaster, encouraging people to have portable chargers; often during a disaster, community members may turn to their phones for assistance
  - Educational programs
    - Can partner with community groups, Illinois extension, Red Cross to help communities know what to do and where to go during a disaster
  - Community exercises
    - CERT teams: engage communities in practicing what to do in case of emergency
- Example: stormwater infrastructure
  - Can help reduce flood risk
  - Detention/retention ponds are typically for new developments, filtration strips, rain gardens in neighborhoods – good for smaller mitigation projects, but need to be managed, potentially by county park system
- Most important: plan implementation!
  - The plan is only as good as the implementation
  - Low to no cost items can help keep community working towards goal, and can keep mitigation plans at the forefront of the public's mind
  - Good to have every 6 months (rather than every 12) – important to keep everyone in the loop and active in the plan
  - Plans need to be updated every 5 years
  - Identify community partnerships – e.g. could partner city parks with gardening group to build rain garden

- Carrie emphasized the importance of including a variety of mitigation plans to receive money from FEMA, US Dept of Agriculture (USDA), Housing and Urban Development (HUD), and other sources
- Carrie emphasized thinking outside the box and creativity for developing mitigation programs
- Lisa added that a FEMA handbook on mitigation strategies and programs will be sent out to provide ideas for mitigation programs; emphasized the importance of having mitigation actions so communities aren't scrambling after a disaster

Review Project Grid and Process for 1-1 Community Calls (Carrie, Lisa)

- Carrie emphasized that each community needs to complete a project grid, with at least one FEMA fundable projects – higher cost projects such as buyouts, retrofitting are typically FEMA fundable, but lower cost mitigation projects are important to show that the community is thinking about mitigation
- Carrie overviewed the different columns in the project grids, noting that although the focus is FEMA funding, there is plenty of funding from other public sources (e.g. HUD) and private sources

- Carrie asked if the grid looks the same as ISWS; Lisa responded in the affirmative and noted that ISWS will send out the grid with abbreviations, and the FEMA document with hazard mitigation plan examples
- Lisa emphasized the importance of checking in and having frequent meetings to build on actions and projects
- Lisa noted that she found Okawville's assessment, and Matt added that we should have others too; Lisa noted the naming conventions may have caused these discrepancies and that ISWS will review assessments
- Lisa overviewed the web map and encouraged more comments to be added; noted Keifer Heiman's comments about roads that overtop during rain, and these are important to know for evacuation routes, improving highway signs
- Lisa noted that ISWS will be reaching out for 1-1 community meetings soon
- Linda noted that everyone who is in attendance has submitted a risk assessment

To Do: Risk Assessment, Mitigation Strategy Project Grid

Closing Comments

Lisa thanked everyone for attending and adjourned the meeting.

Meeting Adjourned at 2:15 pm

Meeting 4

B.4.1 Agenda

Washington County Meeting #4 – Hazard Mitigation Plan Public Meeting
December 8th, 2022 | 6:30pm – 7:30pm
Washington County Courthouse

1. Introduction
2. Mitigation Goals
3. Current progress report
4. Top 3 hazards in Washington County and individual communities
5. Moving forward – draft timeline for next steps
6. Grant information
7. Discussion and questions

B.4.2 Sign-in Sheet

ATTENDEES

Attendee	Representation
Candi Cross	New Minden
Doug Boecklon	Addieville
Melissa Boecklon	Addieville
Sharon Frederking	Washington County Health Department
Jerry Brockmell	Planning Committee
Darrah Sabo	Washington County EMA
Matt Bierman	Washington County EMA
Linda Tragesser	Southern Illinois Regional Planning Commission
Lisa Graff	Illinois State Water Survey (ISWS)
Meirah Williamson	ISWS
Camden Arnold	ISWS

B.4.3 Meeting Minutes

Washington County Meeting #4 – Hazard Mitigation Plan Public Meeting
December 8th, 2022 | 6:30pm – 7:30pm
Washington County Courthouse

KEY INFORMATION

1) **Every jurisdiction must provide comments on the hazard mitigation plan**. You can view the plan at illinoisfloodmaps.org/hmp/washington.htm and send comments to mitigation@isws.illinois.edu.
2) **Every jurisdiction must develop a plan maintenance strategy.** This includes monitoring mitigation projects, evaluating the plan's usefulness, and preparing to update the plan in 2028. These actions should be undertaken at least once a year. See below for more information.
3) **Every jurisdiction must adopt the plan.** This can be done by formal resolution, council minutes, or other adoptions allowed under local law.
4) Every participating jurisdiction will be eligible for federal mitigation funds.

INTRODUCTION

To goal of this meeting is to overview the goals and objectives of the plan and the final steps for getting the plan approved by FEMA so Washington County will be eligible for grants. The final steps include reviewing the plan, getting public comments on the plan, and creating a timeline for plan maintenance and jurisdiction adoption.

WASHINGTON COUNTY HAZARD MITIGATION GOALS AND OBJECTIVES

Goal 1: Reduce risk of injury or death from natural hazards.

Goal 2: Reduce risk of property damage from natural hazards.

Goal 3: Educate public on disaster preparedness.

Goal 4: Maintain or increase coordination and response to natural hazards across jurisdictions.

All attendees moved to approve the goals presented.

COMMUNITY PARTICIPATION REQUIREMENTS

In addition to the documents that all jurisdictions have completed, FEMA requires that a representative from every jurisdiction in the county comments on the hazard mitigation plan. Comments are also welcome from anyone who wants to review the plan.

RISK ASSESSMENT RESULTS AND HAZARD MITIGATION PROJECTS

Top hazards ranked by the county are: Pandemic, Tornadoes, and Severe Storms. Communities in the county have projects included in the plan that align with these hazards.

PLAN MAINTENANCE

Washington County's Hazard Mitigation Plan must be updated every five years (next update will be in 2028). Plan maintenance includes:

- Monitoring: develop a process to track progress and status of mitigation projects
- Evaluating: develop criteria to determine if the plan is effective
- Updating: decide where, when, and who will participate in monitoring, evaluating, and the 2028 update process; check-ins should happen yearly
    - For example, the mayor, county clerk, or EMA could check in on mitigation project status every year
    - Or, jurisdictions can send one representative to a yearly group meeting called by the EMA and/or Greater Wabash to discuss mitigation projects and progress

Attendees agreed that Emergency Manager, Matt Bierman, will initiate check ins with each community during their yearly reports. At this time, information about upcoming grant opportunities can also be shared with the communities.

PLAN ADOPTION

After plan is final, local jurisdictions will adopt the plan by formal resolutions, council minutes, or other forms of adoption allowed by local law. The five-year timeline of the plan begins once the first community adopts the plan.

Linda Tragesser agreed to draft all adoption documents for each community and send them out at the same time once plan is approved.

MITIGATION BENEFITS

There are financial and societal benefits to mitigation projects. Frequently, mitigation projects save communities money – there could be less damage or harm to structures or individuals, improving culverts or drainage can reduce the time and money spent closing roads or helping people evacuate, etc.

Jurisdictions can also apply for federal mitigation grants awarded by FEMA, such as Building Resilient Infrastructure and Communities (BRIC), Flood Mitigation Assistance (FMA) Program, and Hazard Mitigation Grant Program (HMGP).

CONCLUDING REMARKS

The plan is on the website (https://www.illinoisfloodmaps.org/washingtonHMP.aspx). Please download the plan and provide comments to mitigation@isws.illinois.edu.

APPENDIX C: PUBLIC SURVEY RESULTS

Washington County Multi-Jurisdictional Hazard Mitigation Plan Survey

Online survey was open 8/18/2021 - 10/31/2021

Total submissions: 5

ID: 1246161303

Reporting provided by Web Services at Public Affairs | University of Illinois at Urbana-Champaign

1. By completing this survey, you will assist the Hazard Mitigation Steering Committee in their understanding of the preparedness and natural hazard knowledge of residents in the county. All information provided in this survey will be included as a summary, and none of the information will be attributed to you directly. Please indicate your agreement to voluntarily participate before proceeding on to the survey.	*Percent*	*Count*
I agree to participate	**100%**	**5**

2. What is your zip code?	*Percent*	*Count*
62263	**0%**	**0**
62271	**20%**	**1**
62214	**20%**	**1**
62803	**60%**	**3**
62268	**0%**	**0**
62808	**0%**	**0**
62831	**0%**	**0**
62848	**0%**	**0**
62876	**0%**	**0**
62877	**0%**	**0**
Other	**0%**	**0**

3. Where do you live?	*Percent*	*Count*
In town	**80%**	**4**
In the unincorporated county	**20%**	**1**

4. In the past 10 years, have you or someone in your household experienced a disaster in this county, such as: severe storm, tornado, flood, sever winter storm, drought, extreme temperature, earthquake, wildfire, HAZMAT spill, mine subsidence, levee break, pandemic or other natural hazards?	*Percent*	*Count*
Yes (go to next question)	**80%**	**4**
No (skip the next question)	**20%**	**1**

5. Which of the following types of hazard events have you or someone in your household experienced? Please check all that apply.	*Percent*	*Count*
Severe storm damage in excess of $500	**60%**	**3**
Tornado	**60%**	**3**
Flood	**40%**	**2**
Winter storm	**80%**	**4**
Drought	**60%**	**3**
Extreme temperature	**80%**	**4**
Earthquake	**0%**	**0**
Wildfire	**0%**	**0**
HAZMAT spill	**0%**	**0**
Mine subsidence	**0%**	**0**
Levee break	**0%**	**0**
Pandemic	**100%**	**5**
Other	**0%**	**0**

6. On a scale of 1 to 5, how prepared do you feel you and your household are for the probable impacts of hazard events likely to occur within the county?	*Percent*	*Count*
1 - Not at all prepared	**0%**	**0**
2 - Somewhat prepared	**40%**	**2**
3 - Adequately prepared	**60%**	**3**
4 - Well prepared	**0%**	**0**
5 - Very well prepared	**0%**	**0**

How concerned are you about the following hazards impacting your community and/or county? (please check the corresponding ranking for each hazard)

7. Severe storm (Wind, Hail, Lightning)	*Percent*	*Count*
1 - Not concerned	**0%**	**0**
2 - Somewhat concerned	**0%**	**0**
3 - Concerned	**0%**	**0**
4 - Very concerned	**60%**	**3**
5 - Extremely concerned	**40%**	**2**

8. Tornado	*Percent*	*Count*
1 - Not concerned	**0%**	**0**
2 - Somewhat concerned	**0%**	**0**
3 - Concerned	**0%**	**0**
4 - Very concerned	**60%**	**3**
5 - Extremely concerned	**40%**	**2**

9. Floods (Riverine, Flash/Urban)	*Percent*	*Count*
1 - Not concerned	**0%**	**0**
2 - Somewhat concerned	**60%**	**3**
3 - Concerned	**40%**	**2**
4 - Very concerned	**0%**	**0**
5 - Extremely concerned	**0%**	**0**

10. Severe winter storm (Winter weather, Ice storm)	*Percent*	*Count*
1 - Not concerned	**0%**	**0**
2 - Somewhat concerned	**0%**	**0**
3 - Concerned	**20%**	**1**
4 - Very concerned	**40%**	**2**
5 - Extremely concerned	**40%**	**2**

11. Drought	*Percent*	*Count*
1 - Not concerned	**0%**	**0**

2 - Somewhat concerned	**20%**	**1**
3 - Concerned	**40%**	**2**
4 - Very concerned	**40%**	**2**
5 - Extremely concerned	**0%**	**0**

12. Extreme temperatures (Heat wave, Cold wave)	*Percent*	*Count*
1 - Not concerned	**0%**	**0**
2 - Somewhat concerned	**20%**	**1**
3 - Concerned	**40%**	**2**
4 - Very concerned	**40%**	**2**
5 - Extremely concerned	**0%**	**0**

13. Earthquake	*Percent*	*Count*
1 - Not concerned	**40%**	**2**
2 - Somewhat concerned	**0%**	**0**
3 - Concerned	**0%**	**0**
4 - Very concerned	**20%**	**1**
5 - Extremely concerned	**40%**	**2**

14. Wildfire	*Percent*	*Count*
1 - Not concerned	**40%**	**2**
2 - Somewhat concerned	**0%**	**0**
3 - Concerned	**60%**	**3**
4 - Very concerned	**0%**	**0**
5 - Extremely concerned	**0%**	**0**

15. HAZMAT spill	*Percent*	*Count*
1 - Not concerned	**20%**	**1**
2 - Somewhat concerned	**40%**	**2**
3 - Concerned	**40%**	**2**
4 - Very concerned	**0%**	**0**
5 - Extremely concerned	**0%**	**0**

16. Mine subsidence	*Percent*	*Count*
1 - Not concerned	**20%**	**1**
2 - Somewhat concerned	**20%**	**1**
3 - Concerned	**60%**	**3**
4 - Very concerned	**0%**	**0**
5 - Extremely concerned	**0%**	**0**

17. Dam failure	*Percent*	*Count*
1 - Not concerned	**40%**	**2**
2 - Somewhat concerned	**40%**	**2**
3 - Concerned	**20%**	**1**
4 - Very concerned	**0%**	**0**
5 - Extremely concerned	**0%**	**0**

18. Pandemic	*Percent*	*Count*
1 - Not concerned	**0%**	**0**
2 - Somewhat concerned	**40%**	**2**
3 - Concerned	**0%**	**0**
4 - Very concerned	**40%**	**2**
5 - Extremely concerned	**20%**	**1**

19. Other	*Percent*	*Count*
1 - Not concerned	**20%**	**1**
2 - Somewhat concerned	**0%**	**0**
3 - Concerned	**0%**	**0**
4 - Very concerned	**0%**	**0**
5 - Extremely concerned	**0%**	**0**

20. What are the most effective ways for you to receive information about how to make your household and home safer from disasters? (please check all that apply)	*Percent*	*Count*
Newspaper	**20%**	**1**
Television	**40%**	**2**

Radio	**80%**	**4**
School	**60%**	**3**
Social media	**60%**	**3**
Brochure	**40%**	**2**
E-mail	**80%**	**4**
Websites	**40%**	**2**
Government	**60%**	**3**
USPS mail	**0%**	**0**
Other	**0%**	**0**

21. To the best of your knowledge, is your property located in a designated floodplain?	*Percent*	*Count*
Yes	**0%**	**0**
No	**100%**	**5**
I do not know	**0%**	**0**

22. Do you have flood insurance?	*Percent*	*Count*
Yes	**40%**	**2**
No	**60%**	**3**
I do not know	**0%**	**0**

23. Do you have earthquake insurance?	*Percent*	*Count*
Yes	**60%**	**3**
No	**20%**	**1**
I do not know	**20%**	**1**

How vulnerable is your infrastructure (streets, water, sewer, electricity, etc) to:

24. Severe storm (Wind, Hail, Lightning)	*Percent*	*Count*
1 - Minimally vulnerable	**20%**	**1**
2 - Moderately vulnerable	**0%**	**0**
3 - Very vulnerable	**80%**	**4**
4 - I do not know	**0%**	**0**

25. Tornado	*Percent*	*Count*
1 - Minimally vulnerable	**20%**	**1**
2 - Moderately vulnerable	**0%**	**0**
3 - Very vulnerable	**80%**	**4**
4 - I do not know	**0%**	**0**

26. Floods (Riverine, Flash/Urban)	*Percent*	*Count*
1 - Minimally vulnerable	**60%**	**3**
2 - Moderately vulnerable	**40%**	**2**
3 - Very vulnerable	**0%**	**0**
4 - I do not know	**0%**	**0**

27. Severe winter storm (Winter weather, Ice storm)	*Percent*	*Count*
1 - Minimally vulnerable	**0%**	**0**
2 - Moderately vulnerable	**40%**	**2**
3 - Very vulnerable	**60%**	**3**
4 - I do not know	**0%**	**0**

28. Drought	*Percent*	*Count*
1 - Minimally vulnerable	**20%**	**1**
2 - Moderately vulnerable	**60%**	**3**
3 - Very vulnerable	**20%**	**1**
4 - I do not know	**0%**	**0**

29. Extreme temperatures (Heat wave, Cold wave)	*Percent*	*Count*
1 - Minimally vulnerable	**20%**	**1**
2 - Moderately vulnerable	**60%**	**3**
3 - Very vulnerable	**20%**	**1**
4 - I do not know	**0%**	**0**

30. Earthquake	*Percent*	*Count*
1 - Minimally vulnerable	**40%**	**2**
2 - Moderately vulnerable	**20%**	**1**
3 - Very vulnerable	**40%**	**2**

4 - I do not know	**0%**	**0**

31. Wildfire	*Percent*	*Count*
1 - Minimally vulnerable	**100%**	**5**
2 - Moderately vulnerable	**0%**	**0**
3 - Very vulnerable	**0%**	**0**
4 - I do not know	**0%**	**0**

32. HAZMAT spill	*Percent*	*Count*
1 - Minimally vulnerable	**40%**	**2**
2 - Moderately vulnerable	**60%**	**3**
3 - Very vulnerable	**0%**	**0**
4 - I do not know	**0%**	**0**

33. Mine subsidence	*Percent*	*Count*
1 - Minimally vulnerable	**40%**	**2**
2 - Moderately vulnerable	**20%**	**1**
3 - Very vulnerable	**40%**	**2**
4 - I do not know	**0%**	**0**

34. Dam failure	*Percent*	*Count*
1 - Minimally vulnerable	**100%**	**5**
2 - Moderately vulnerable	**0%**	**0**
3 - Very vulnerable	**0%**	**0**
4 - I do not know	**0%**	**0**

35. Pandemic	*Percent*	*Count*
1 - Minimally vulnerable	**60%**	**3**
2 - Moderately vulnerable	**0%**	**0**
3 - Very vulnerable	**40%**	**2**
4 - I do not know	**0%**	**0**

36. Other	*Percent*	*Count*
1 - Minimally vulnerable	**20%**	**1**
2 - Moderately vulnerable	**0%**	**0**
3 - Very vulnerable	**0%**	**0**
4 - I do not know	**0%**	**0**

How vulnerable to damage are the critical facilities (police station, fire station, emergency operation centers, etc) within your community/county to:

37. Severe storm (Wind, Hail, Lightning)	*Percent*	*Count*
1 - Minimally vulnerable	**0%**	**0**
2 - Moderately vulnerable	**40%**	**2**
3 - Very vulnerable	**60%**	**3**
4 - I do not know	**0%**	**0**

38. Tornado	*Percent*	*Count*
1 - Minimally vulnerable	**0%**	**0**
2 - Moderately vulnerable	**20%**	**1**
3 - Very vulnerable	**80%**	**4**
4 - I do not know	**0%**	**0**

39. Floods (Riverine, Flash/Urban)	*Percent*	*Count*
1 - Minimally vulnerable	**80%**	**4**
2 - Moderately vulnerable	**0%**	**0**
3 - Very vulnerable	**0%**	**0**
4 - I do not know	**0%**	**0**

40. Severe winter storm (Winter weather, Ice storm)	*Percent*	*Count*
1 - Minimally vulnerable	**20%**	**1**
2 - Moderately vulnerable	**80%**	**4**
3 - Very vulnerable	**0%**	**0**
4 - I do not know	**0%**	**0**

41. Drought	*Percent*	*Count*
1 - Minimally vulnerable	**80%**	**4**
2 - Moderately vulnerable	**20%**	**1**
3 - Very vulnerable	**0%**	**0**
4 - I do not know	**0%**	**0**

42. Extreme temperatures (Heat wave, Cold wave)	*Percent*	*Count*
1 - Minimally vulnerable	**40%**	**2**
2 - Moderately vulnerable	**60%**	**3**

3 - Very vulnerable	**0%**	**0**
4 - I do not know	**0%**	**0**

43. Earthquake	*Percent*	*Count*
1 - Minimally vulnerable	**40%**	**2**
2 - Moderately vulnerable	**20%**	**1**
3 - Very vulnerable	**40%**	**2**
4 - I do not know	**0%**	**0**

44. Wildfire	*Percent*	*Count*
1 - Minimally vulnerable	**100%**	**5**
2 - Moderately vulnerable	**0%**	**0**
3 - Very vulnerable	**0%**	**0**
4 - I do not know	**0%**	**0**

45. HAZMAT spill	*Percent*	*Count*
1 - Minimally vulnerable	**60%**	**3**
2 - Moderately vulnerable	**40%**	**2**
3 - Very vulnerable	**0%**	**0**
4 - I do not know	**0%**	**0**

46. Mine subsidence	*Percent*	*Count*
1 - Minimally vulnerable	**40%**	**2**
2 - Moderately vulnerable	**20%**	**1**
3 - Very vulnerable	**40%**	**2**
4 - I do not know	**0%**	**0**

47. Dam failure	*Percent*	*Count*
1 - Minimally vulnerable	**100%**	**5**
2 - Moderately vulnerable	**0%**	**0**
3 - Very vulnerable	**0%**	**0**
4 - I do not know	**0%**	**0**

48. Pandemic	*Percent*	*Count*
1 - Minimally vulnerable	**40%**	**2**
2 - Moderately vulnerable	**20%**	**1**
3 - Very vulnerable	**40%**	**2**

4 - I do not know	**0%**	**0**

49. Other	*Percent*	*Count*
1 - Minimally vulnerable	**0%**	**0**
2 - Moderately vulnerable	**0%**	**0**
3 - Very vulnerable	**0%**	**0**
4 - I do not know	**0%**	**0**

50. What actions do you think could be taken by individuals or the community to reduce damages and hardships caused by hazard events?		*Count*
	Answered	***3***
	Skipped	**2**
1. Continued meetings with community agencies to work toward preparedness. Communication with the public.		
2. I think the community needs a storm and cold/heat shelter with a large basement, standby generator, and food/water. We currently don't have one.		
4. Not Sure		

51. Was the presence of a floodplain disclosed to you by a real estate agent, seller, or landlord before you purchased or moved into your home?	*Percent*	*Count*
Yes	**40%**	**2**
No	**60%**	**3**
Do not recall	**0%**	**0**

52. Would the disclosure of flood risk influence your decision to purchase or move into a home?	*Percent*	*Count*
Yes	**60%**	**3**
No	**40%**	**2**
I do not know	**0%**	**0**

53. Would you be willing to spend money to modify your home to reduce the impacts of future disasters? (examples include elevating a flood prone home, improving home exterior to withstand higher winds, install tie-clips to secure roof, and so on)	*Percent*	*Count*
Yes	**60%**	**3**
No	**40%**	**2**
Maybe	**0%**	**0**

54. Which of the following incentives would help to encourage you to spend money to modify your home to reduce the possible impacts of disasters? (please check all that apply)	*Percent*	*Count*
Low interest rate loan	**60%**	**3**
Insurance premium discount	**100%**	**5**
Mortgage discount	**60%**	**3**
Property tax break	**100%**	**5**
Grant funding with cost share	**80%**	**4**
None	**0%**	**0**
Other	**0%**	**0**

55. If your property were located in a designated high hazard area or had received repetitive damages from an event, would you consider a buyout or relocation offered by a public agency?	*Percent*	*Count*
Yes	**20%**	**1**
No	**20%**	**1**
Maybe	**60%**	**3**

56. How old are you?	*Percent*	*Count*
Under 18	**0%**	**0**
18-25	**0%**	**0**
26-35	**20%**	**1**
36-45	**60%**	**3**
46-55	**0%**	**0**
56-65	**0%**	**0**
Over 65	**20%**	**1**

57. How long have you lived in Washington County?	*Percent*	*Count*
Less than one year	**0%**	**0**
1-5 years	**0%**	**0**
6-10 years	**0%**	**0**
11-20 years	**0%**	**0**
More than 20 years	**100%**	**5**

58. Do you own or rent your home?	*Percent*	*Count*
Rent	**0%**	**0**
Own	**100%**	**5**

59. The National Flood Insurance Program (NFIP), managed by the Federal Emergency Management Agency, enables homeowners, business owners and renters in participating communities to purchase federally backed flood insurance. Would you be interested in learning more about the NFIP?	*Percent*	*Count*
Yes	**0%**	**0**
No	**60%**	**3**
Maybe	**40%**	**2**
Other	**0%**	**0**

60. Would you be interested in learning more about and joining a local Community Emergency Response Team (CERT)?	*Percent*	*Count*
Yes	**40%**	**2**
No	**0%**	**0**
Maybe	**20%**	**1**
Other	**40%**	**2**

APPENDIX D: PUBLIC NOTIFICATIONS

Press Release

Final Public Meeting to Discuss Washington County Local Hazard Mitigation Plan Set for December 8

Washington County, along with the participating jurisdictions of Ashley, Du Bois, Hoyleton, Irvington, Nashville, New Minden, Oakdale, Okawville, Radom, Richview, and Wamac, will be having their final public meeting December 8, 2022 from 6:30-8:30 pm at the Washington County Courthouse (125 E. Elm St. Nashville, IL. 62263). The purpose of this meeting is to review their draft Hazard Mitigation Plan (HMP). If you are unable to go to the final meeting and want to make a comment, please email the Illinois State Water Survey at mitigation@isws.illinois.edu

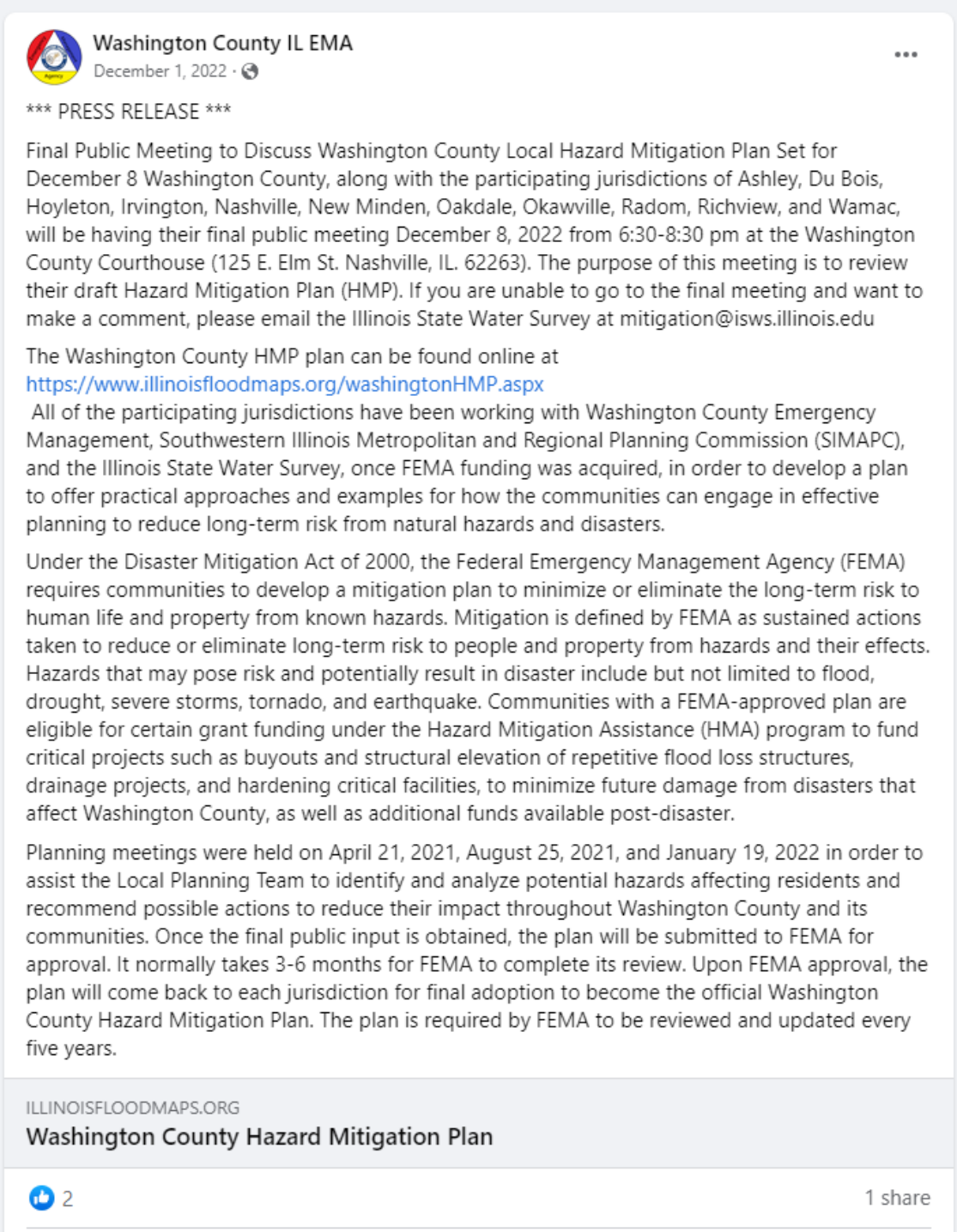
The Washington County HMP plan can be found online at https://www.illinoisfloodmaps.org/washingtonHMP.aspx

All of the participating jurisdictions have been working with Washington County Emergency Management, Southwestern Illinois Metropolitan and Regional Planning Commission (SIMAPC), and the Illinois State Water Survey, once FEMA funding was acquired, in order to develop a plan to offer practical approaches and examples for how the communities can engage in effective planning to reduce long-term risk from natural hazards and disasters.

Under the Disaster Mitigation Act of 2000, the Federal Emergency Management Agency (FEMA) requires communities to develop a mitigation plan to minimize or eliminate the long-term risk to human life and property from known hazards. Mitigation is defined by FEMA as sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects. Hazards that may pose risk and potentially result in disaster include but not limited to flood, drought, severe storms, tornado, and earthquake. Communities with a FEMA-approved plan are eligible for certain grant funding under the Hazard Mitigation Assistance (HMA) program to fund critical projects such as buyouts and structural elevation of repetitive flood loss structures, drainage projects, and hardening critical facilities, to minimize future damage from disasters that affect Washington County, as well as additional funds available post-disaster.

Planning meetings were held on April 21, 2021, August 25, 2021, and January 19, 2022 in order to assist the Local Planning Team to identify and analyze potential hazards affecting residents and recommend

possible actions to reduce their impact throughout Washington County and its communities. Once the final public input is obtained, the plan will be submitted to FEMA for approval. It normally takes 3-6 months for FEMA to complete its review. Upon FEMA approval, the plan will come back to each jurisdiction for final adoption to become the official Washington County Hazard Mitigation Plan. The plan is required by FEMA to be reviewed and updated every five years.



Washington County IL EMA
December 1, 2022 ·

*** PRESS RELEASE ***

Final Public Meeting to Discuss Washington County Local Hazard Mitigation Plan Set for December 8 Washington County, along with the participating jurisdictions of Ashley, Du Bois, Hoyleton, Irvington, Nashville, New Minden, Oakdale, Okawville, Radom, Richview, and Wamac, will be having their final public meeting December 8, 2022 from 6:30-8:30 pm at the Washington County Courthouse (125 E. Elm St. Nashville, IL. 62263). The purpose of this meeting is to review their draft Hazard Mitigation Plan (HMP). If you are unable to go to the final meeting and want to make a comment, please email the Illinois State Water Survey at mitigation@isws.illinois.edu

The Washington County HMP plan can be found online at
https://www.illinoisfloodmaps.org/washingtonHMP.aspx
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ILLINOISFLOODMAPS.ORG
Washington County Hazard Mitigation Plan

2 1 share

APPENDIX E: ESSENTIAL FACILITIES

Police Facilities

Name of Facility	Location
Ashley Police Department	Ashley
Irvington Police Department	Irvington
Nashville Police Department	Nashville
Washington County Sheriff	Nashville
Okawville Police Department	Okawville

Fire Facilities

Name of Facility	Location
Addieville Community FPD	Addieville
Ashley FPD Station #1	Ashley
Ashley FPD Station #2	DuBois
Hoyleton Fire Protection District	Hoyleton
Irvington Fire Protection District	Irvington
Nashville Community FPD	Nashville
Hoyleton Community FPD	New Minden
Coulterville FPD	Coulterville
Okawville Community FPD	Okawville
Okawville FPD – Venedy Station	Venedy

Medical Facilities

Name of Facility	Location
Irvington Township Rural Health	Hoyleton
Medical Clinic (Under Construction)	Hoyleton
Washington County Hospital	Nashville
Nashville Health Care Center and Dentist Office	Nashville

School Facilities

Name of Facility	Location
Ashley Com Consolidated School	Ashley
Hoyleton Education Center	Hoyleton
Trinity Lutheran School	Hoyleton
Irvington Elem School	Irvington
Nashville Middle School	Nashville
Nashville Com High School	Nashville
St Ann School	Nashville
Trinity-St John Lutheran School	Nashville
Oakdale Grade School	Oakdale
Okawville Grade School	Okawville
Okawville Jr/Sr High School	Okawville

Immanuel Lutheran School	Okawville
St Peter Ucc Educational Building	Okawville
St Michael School	Radom

Emergency Operations Center

Name of Facility	Location
Washington County Emergency Service	Nashville

Ambulance Services

Name of Facility	Location
Washington County Emergency Service	Nashville

Vulnerable Populations

Name of Facility	Location
Joshua Manor	Hoyleton
Friendship Manor Nursing Home	Nashville
Washington County Senior Services	Okawville

Power Plants

Name of Facility	Location
Prairie State Energy Campus	Washington County Unincorporated Areas

Industrial

Name of Facility	Location
Industrial Park	Nashville

Mines

Name of Facility	Location
Prairie State Energy Campus Coal Mine	Washington County Unincorporated Areas
Coal Mine	Washington County Unincorporated Areas

Potable Water Facilities

Name of Facility	Location
Water Tower	Ashley
Pumping Station	Clinton County
Water Tower	Hoyleton
Water Tower	Irvington
Water Tower	Nashville
Nashville WTP	Nashville
Water Tower	Nashville
Pump Station - Underground Storage Tank	Okawville
Water Tower	Okawville
Water Tower	Okawville

Okawville WTP	Okawville
Water Pumping Station	Washington County Unincorporated Areas
Water Tower	Washington County Unincorporated Areas
Water Tower	Washington County Unincorporated Areas

Waste Water Facilities

Name of Facility	Location
Addieville STP	Addieville
Ashley STP	Ashley
Dubois STP	Dubois
Sewer Pumping Station	Hoyleton
Sewer Lift Station	Hoyleton
Hoyleton STP	Hoyleton
Irvington Sd WWTF	Irvington
Nashville STP	Nashville
Waste Water Facility	Nashville
Waste Water Facility	Nashville
New Minden STP	New Minden
Wastewater Lift Station	Nashville
Wastewater Lift Station	Nashville
Wastewater Lift Station	Nashville
Wastewater Lift Station	Nashville
Wastewater Lift Station	Nashville
Okawville WWTP	Okawville
Radom STP	Radom
Richview STP	Richview
Wamac STP	Wamac

Facilities of Importance

Name of Facility	Location
Frontiernet Main Communications Hub	Hoyleton
Kretzer's Grill and Bar	Hoyleton
IDOT Equipment Storage	Nashville
Highway Department Storage	Nashville
Washington County Material Yard	Oakdale
Bolo Township Shed	Washington County Unincorporated Areas
Pilot Knob Township	Washington County Unincorporated Areas
Dubois Township Shed	Washington County Unincorporated Areas
Ashley Township Shed	Washington County Unincorporated Areas
Beaucoup Material Yard	Washington County Unincorporated Areas
Irvington Township Material Yard	Washington County Unincorporated Areas

Hoyleton Township Shed	Washington County Unincorporated Areas
Lively Grove Township Shed	Washington County Unincorporated Areas
Johannisburg Township Yard	Washington County Unincorporated Areas
Beaucoup Township Shed	Washington County Unincorporated Areas
Plum Hill Township Garage	Washington County Unincorporated Areas

APPENDIX F: HAZUS OCCUPANCY CLASSES

Replacement cost values were determined using R.S. Means (2018) construction cost estimates taken from the Hazus 5.0 database. This value serves as the building cost, or value, of the structure. Content cost, or the value of the contents of the structure, was estimated by multiplying the building cost value by a content cost factor (CCF) based on its occupancy class. CCF and RSMeans values are shown in the tables below. All values were converted to 2021 U.S. dollars using the Consumer Price Index developed by the Bureau of Labor Statistics of the United States Department of Labor.

Hazus Occupancy Class Description				
Occupancy Code	**Occupancy Description**	**Sub-Category**	**SqFt Cost (2018 USD)**	**Content Cost Factor (CCF)[1]**
Residential				
RES1	Single Family Dwelling	Refer to RES1 Cost		0.5
RES2	Manufactured Housing	Manufactured Housing	$48.86	0.5
RES3A	Multi-Family Dwelling – small	Duplex	$124.25	0.5
RES3B	Multi Family Dwelling – small	Triplex/Quads	$109.66	0.5
RES3C	Multi-Family Dwelling – medium	5-9 units	$201.33	0.5
RES3D	Multi Family Dwelling – medium	10-19 units	$187.75	0.5
RES3E	Multi-Family Dwelling – large	20-49 units	$188.48	0.5
RES3F	Multi Family Dwelling – large	50+ units	$174.53	0.5
RES4	Temp. Lodging	Hotel, medium	$182.28	0.5
RES5	Institutional Dormitory	Dorm, medium	$199.63	0.5
RES6	Nursing Home	Nursing home	$215.91	0.5
Commercial				
COM1	Retail Trade	Dept Store, 1 st	$114.47	1
COM2	Wholesale Trade	Warehouse, medium	$120	1
COM3	Personal and Repair Services	Garage, Repair	$139.88	1
COM4	Professional/ Technical/Business Service	Office, Medium	$176.29	1
COM5	Banks	Bank	$261.33	1
COM6	Hospital	Hospital, Medium	$302.35	1.5
COM7	Medical Office/Clinic	Med. Office, medium	$226.54	1.5
COM8	Entertainment & Recreation	Restaurant	$227.53	1
COM9	Theaters	Movie Theatre	$190.95	1
COM10	Parking	Parking garage	$80.59	0.5

Industrial				
IND1	Heavy	Factory, small	$133.03	1.5
IND2	Light	Warehouse, medium	$120	1.5
IND3	Food/Drugs/Chemicals	College Laboratory	$180.47	1.5
IND4	Metals/Minerals Processing	College Laboratory	$180.47	1.5
IND5	High Technology	College Laboratory	$180.47	1.5
IND6	Construction	Warehouse, medium	$120	1
Religious				
REL1	Church	Church	$190.53	1
Agriculture				
AGR1	Agriculture	Warehouse, medium	$120	1
Government				
GOV1	General Services	Town Hall, small	$149.83	1
GOV2	Emergency Response	Police Station	$254.23	1.5
Education				
EDU1	Schools/Libraries	High School	$201.63	1
EDU2	Colleges/Universities	College Classroom	$171.05	1.5

[1]Content Cost Factor is a multiplier applied to Building Cost to estimate the Content Cost of a structure

Single Family Residential RS Means Square Foot Cost				
Description	**Height Class**	**Average Base Cost (2018 USD)**	**Finished Basement Cost (2018 USD)**	**Unfinished Basement Cost (2018 USD)**
Economy	1 story	$97.61	$26.45	$9.55
Economy	2 story	$104.04	$15.20	$6.30
Economy	3 story	$104.04	$15.20	$6.30
Economy	Split level	$96.69	$15.20	$6.30
Average	1 story	$116.66	$32.80	$11.25
Average	2 story	$122.75	$21.05	$7.40
Average	3 story	$127.94	$16.65	$5.80
Average	Split level	$113.66	$21.05	$7.40
Custom	1 story	$159.51	$53.65	$21.65
Custom	2 story	$163.95	$30.90	$12.90
Custom	3 story	$168.69	$22.55	$9.60
Custom	Split level	$153.15	$30.90	$12.90
Luxury	1 story	$188.84	$59.00	$22.65
Luxury	2 story	$194.94	$34.55	$13.85
Luxury	3 story	$201.09	$25.50	$10.40
Luxury	Split level	$181.61	$34.55	$13.85

APPENDIX G: FEMA APPROVAL & ADOPTION RESOLUTIONS

FEMA Approval Pending Adoption

U.S. Department of Homeland Security
FEMA Region 5
536 S. Clark St., 6th Floor
Chicago, IL 60605

FEMA

May 5, 2023

Mr. Sam Al-Basha
State Hazard Mitigation Officer
Illinois Emergency Management Agency
1035 Outer Park Drive
Springfield, IL 62704

Dear Mr. Al-Basha:

Thank you for submitting the 2023 Washington County Multi-Jurisdictional Hazard Mitigation Plan for our review. The plan was reviewed based on the local plan criteria contained in 44 CFR Part 201, as authorized by the Disaster Mitigation Act of 2000. The plan met the required criteria for a multi-jurisdiction hazard mitigation plan. Formal approval of this plan is contingent upon the adoption by the participating jurisdictions of this plan. Once FEMA Region 5 receives documentation of adoption from the participating jurisdictions, we will send a letter of official approval to your office.

We look forward to receiving the adoption documentation and completing the approval process for the 2023 Washington County Multi-Jurisdictional Hazard Mitigation Plan Update.

If there are any questions from either you or the communities, please contact Meghan Cuneo, at (202) 615-5294 or email at Meghan.Cuneo@fema.dhs.gov.

Sincerely,

JOHN A WETHINGTON

Digitally signed by JOHN A WETHINGTON
Date: 2023.05.05 11:53:36 -05'00'

John Wethington
Chief (acting), Risk Analysis Branch
Mitigation Division

www.fema.gov

FEMA Approval Letter

U.S. Department of Homeland Security
FEMA Region 5
536 S. Clark St. 6th Floor
Chicago, IL 60605

FEMA

June 9, 2023

Mr. Sam AL-Basha
State Hazard Mitigation Officer
Illinois Emergency Management Agency
1035 Outer Park Drive
Springfield, IL 62704

Dear Mr. AL-Basha:

Thank you for submitting adoption documentation for the 2023 Washington County Multi-Jurisdictional Hazard Mitigation Plan. The plan was reviewed based on the local plan criteria contained in 44 CFR Part 201, as authorized by the Disaster Mitigation Act of 2000. The plan met the required criteria for a multi-jurisdictional hazard mitigation plan, and the plan is now approved for Washington County.

The approval of this plan ensures continued availability of the full complement of Hazard Mitigation Assistance (HMA) Grants. All requests for funding, however, will be evaluated individually according to the specific eligibility and other requirements of the particular program under which the application is submitted.

We encourage the communities to follow the plan's schedule for monitoring and updating the plan and continue their efforts to implement the mitigation measures. The expiration date of the 2023 Washington County Multi-Jurisdictional Hazard Mitigation Plan is June 8th, 2028. The plan must be reviewed, revised as appropriate, resubmitted, and approved no later than the plan expiration date.

Please pass on our congratulations to the now approved communities for completing this significant action. If you or the communities have any questions, please contact Meghan Cuneo at (202) 615-5294 or Meghan.Cuneo@fema.dhs.gov.

Sincerely,

JOHN A WETHINGTON
Digitally signed by JOHN A WETHINGTON
Date: 2023.06.09 13:32:15 -05'00'

John Wethington
Chief (acting), Risk Analysis Branch
Mitigation Division

www.fema.gov

FEMA Approval Letter 2

U.S. Department of Homeland Security
FEMA Region 5
536 S. Clark St. 6th Floor
Chicago, IL 60605

FEMA

August 4, 2023

Mr. Sam AL-Basha
State Hazard Mitigation Officer
Illinois Emergency Management Agency
1035 Outer Park Drive
Springfield, IL 62704

Dear Mr. AL-Basha:

Thank you for submitting adoption documentation for the 2023 Washington County Multi-Jurisdictional Hazard Mitigation Plan. The plan was reviewed based on the local plan criteria contained in 44 CFR Part 201, as authorized by the Disaster Mitigation Act of 2000. The plan met the required criteria for a multi-jurisdictional hazard mitigation plan, and the plan is now approved for Irvington Village, Radom Village, West Washington County Unit School District, and St. Libory Fire Protection District.

The approval of this plan ensures continued availability of the full complement of Hazard Mitigation Assistance (HMA) Grants. All requests for funding, however, will be evaluated individually according to the specific eligibility and other requirements of the particular program under which the application is submitted.

We encourage the communities to follow the plan's schedule for monitoring and updating the plan and continue their efforts to implement the mitigation measures. The expiration date of the 2023 Washington County Multi-Jurisdictional Hazard Mitigation Plan is June 8th, 2028. The plan must be reviewed, revised as appropriate, resubmitted, and approved no later than the plan expiration date.

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Sincerely,

JOHN A WETHINGTON
Digitally signed by JOHN A WETHINGTON
Date: 2023.08.04 11:42:40 -05'00'

John Wethington
Chief, Risk Analysis Branch
Mitigation Division

www.fema.gov

FEMA Approval Letter 3

U.S. Department of Homeland Security
FEMA Region 5
536 S. Clark St. 6th Floor
Chicago, IL 60605

FEMA

August 22, 2024

Zachary Krug
Hazard Mitigation Section Manager
Illinois Emergency Management Agency
1035 Outer Park Drive
Springfield, IL 62704

Dear Mr. Krug:

The 2023 Washington County Multi-Jurisdictional Hazard Mitigation Plan was reviewed based on the local plan criteria contained in 44 CFR Part 201, as authorized by the Disaster Mitigation Act of 2000. The 2023 Washington County Multi-Jurisdictional Hazard Mitigation Plan met the required criteria for a multi-jurisdictional hazard mitigation plan and the plan is now approved for New Minden Village, Nashville City, Oakdale Village, Okawville Village, Richview Village, Venedy Village, and Wamac City.

To ensure that all participating jurisdictions are eligible to apply for future funding opportunities, please submit adoption resolutions for the remaining jurisdictions who participated in the planning process:

- Addieville Village
- Ashley City
- Du Bois Village
- Hoyleton Village

The expiration date of the 2023 Washington County Multi-Jurisdictional Hazard Mitigation Plan is June 8, 2028.

An approved local mitigation plan, including adoption by the local government, is one of the conditions for applying for and/or receiving FEMA mitigation grants from the following programs:

- Hazard Mitigation Grant Program (HMGP)
- HMGP Post-Fire
- Building Resilient Infrastructure and Communities
- Flood Mitigation Assistance

Having an approved mitigation plan does not mean that mitigation grant funding will be awarded. Specific application and eligibility requirements for the programs listed above can be found in each FEMA grant program's respective policies and annual Notice of Funding Opportunities, as applicable.

To avoid a lapsed plan, the next plan update must be approved before the end of the approval period, including adoption by the participating jurisdiction(s). Before the end of the approval period, please allow sufficient time to secure funding for the update, including the review and approval process. Please include time for any revisions, if needed, and for your jurisdiction to formally adopt the plan after the review, if not adopted prior to submission. This will enable you to remain eligible to apply for and receive funding from FEMA's mitigation grant programs with a mitigation plan requirement. Local governments,

including special districts, with a plan status of "Approvable Pending Adoption" are not eligible for FEMA's mitigation grant programs with a mitigation plan requirement.

We look forward to discussing options for implementing this mitigation plan. If there are any questions from either you or the communities, please contact Meg Burrows at (312) 408-5320 or email at meghan.burrows@fema.dhs.gov.

Sincerely,

John Wethington
Chief, Risk Analysis Branch
Mitigation Division

Washington County Resolution

Resolution # 2023-30

ADOPTING THE WASHINGTON COUNTY, ILLINOIS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, Washington County 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-Jurisdictional Hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, Washington County participated jointly in the planning process with the other local units of government within Washington County to prepare a Multi-Jurisdictional Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Washington County Board hereby adopts the Washington County, Illinios Multi-Jurisdictional Hazard Mitigation Plan as an official plan; and

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

ADOPTED THIS 25 Day of May, 2023.

David A. Meyer
Washington County Board Chairman

13 Aye

0 Nay

Shari Hemper
Attested by: Washington County Clerk

COUNTY CLERK
WASHINGTON COUNTY, ILLINOIS

Village of Irvington Resolution

Resolution # 6-12-23

ADOPTING THE WASHINGTON COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Village of Irvington 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 Village of Irvington participated jointly in the planning process with Washington County and the other local units of government within Washington County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Irvington Board of Trustees hereby adopts the Washington County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Southwestern Illinois Metropolitan and Regional Planning Commission will submit on behalf of the County and the Village of Irvington 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

Attest: Kathy McKinney
Village Clerk

Village of Radom County Resolution

Resolution # 2023-1

ADOPTING THE WASHINGTON COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Village of Radom 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 Village of Radom participated jointly in the planning process with Washington County and the other local units of government within Washington County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Radom Board of Trustees hereby adopts the Washington County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Southwestern Illinois Metropolitan and Regional Planning Commission will submit on behalf of the County and the Village of Radom 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 5th Day of July, 2023.

Village President

Attest: Village Clerk

St. Libory Fire Protection District Resolution

Resolution # 23-127

ADOPTING THE WASHINGTON COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the St. Libory Fire Protection District 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 St. Libory Fire Protection District participated jointly in the planning process with Washington County and the other local units of government within Washington County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the St. Libory Fire Protection District Board of Trustees hereby adopts the Washington County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Southwestern Illinois Metropolitan and Regional Planning Commission will submit on behalf of the County and the St. Libory Fire Protection District 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 July, 2023.

Joseph Leuchtefeld
Board President

West Washington County Unit School District Resolution

Resolution # 62223

ADOPTING THE WASHINGTON COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the West Washington County Unit School District 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 West Washington County Unit School District participated jointly in the planning process with Washington County and the other local units of government within Washington County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the West Washington County Unit School District Board of Trustees hereby adopts the Washington County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Southwestern Illinois Metropolitan and Regional Planning Commission will submit on behalf of the County and the West Washington County Unit School District 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 June, 2023.

Neal Hackstack
Board President

Attest: _____
Superintendent