RICHLAND COUNTY, ILLINOIS

MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

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SECTION 1

INTRODUCTION

PARTICIPATING JURSIDICTIONS

Calhoun, Village of

Claremont, Village of

Noble, Village of

Olney, City of

Parkersburg, Village of

Richland County

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 *Richland County Multi-Jurisdictional Hazard Mitigation Plan* identifies risks to Richland 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 an update to the *Richland County Multi-Hazard Mitigation Plan* developed in 2013.

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 *Richland County Multi-Jurisdictional Hazard Mitigation Plan.*

Table 1. Participation by community in Richland County's 2023 Hazard Mitigation Plan.

Jurisdiction	Attend 1 meeting	Risk Assessment	Mitigation Projects	Capability Assessment
Richland County	Y	Y	Y	Y
City of Olney	Y	Y	Y	Y
Village of Calhoun	Y	Y	Y	Y
Village of Claremont	Y	Y	Y	Y
Village of Noble	Y	Y	Y	Y
Village of Parkersburg	Y	Y	Y	Y

Risk Assessment

Risk assessments help jurisdictions identify hazards that could adversely affect their community. Representatives for Richland County's communities were asked to assess the risk of seventeen hazards – dam failure, drought, earthquake, extreme cold, extreme heat, flash flooding, riverine flooding, HazMat spill, pandemic, severe storms, severe winter storms, tornado, and wildfire – 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 jurisdictions in Richland County were pandemic, tornado, wind, severe storms, and earthquake (*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 Richland County.

Hazard	Average risk	Risk rank
Pandemic	16.9	1
Tornado	12.0	2
Wind	10.8	3
Severe storms	10.3	4
Earthquake	9.3	5
Severe winter storms	8.4	6
Ice storms	8.2	7
Hail	7.2	8
Extreme heat	6.7	9
Flash floods	6.7	-
Extreme cold	6.6	11
HazMat spill	6.6	-
Drought	6.1	13
Riverine flooding	4.9	14
Wildfire	2.9	15
Dam Failure	1.9	16

Mitigation Projects

Mitigation projects help jurisdictions reduce the risk of their community being adversely affected by natural hazards. Representatives for Richland 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 Richland 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 Richland County Emergency Management Agency (EMA), the Greater Wabash Regional Planning Commission (GWRPC), and the Prairie Research Institute – Illinois State Water Survey (ISWS) partnered together to prepare this mitigation planning update. The EMA assisted in the process by providing meeting space. The GWRPC assisted in the process by providing local planning information, outreach to local municipalities, 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 the Richland County Planning Committee members and public, the 2023 update to the 2013 Multi-Hazard Mitigation Plan for Richland 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 Planning Committee, the Richland County EMA, as well as in-kind services provided by ISWS.

SECTION 2

PLANNING PROCESS

INTRODUCTION

The Illinois State Water Survey (ISWS) collaborated with Richland County and the Greater Wabash Regional Planning Commission (GWRPC) to update the 2012 *Richland County Multi-Hazard Mitigation Plan* with the 2023 *Richland County Multi-Jurisdictional Hazard Mitigation Plan*. ISWS, GWRPC, and the Richland County Emergency Management Agency (EMA) encouraged participation by jurisdictional government officials, stakeholders, and the public in the planning process. All five 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 Richland 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 primary purpose of the plan is to provide communities with mitigation strategies for hazards affecting their community. and all the other sections of the plan contribute to and inform the mitigation strategy and specific hazard mitigation activities. All procedural details 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, GWRPC, and the EMA. ISWS coordinated with GWRPC to undertake the organization of resources and the building of the planning team and created the strategy for community outreach. GWRPC and the EMA reserved meeting spaces.

PLANNING AND STEERING COMMITTEES

Planning Committee

The Richland County Hazard Mitigation Planning Committee consisted of representatives from ISWS, GWRPC, and the Richland County EMA (*Table 3*). Members were chosen because of their expertise in urban planning, spatial analysis, hazard mitigation, emergency management, and floodplain management, and their ties with communities across Richland County. Planning Committee members attended every planning committee and steering committee meeting.

Table 3. Richland County Planning Committee.

Planning Team	Organization	Title
Kevin Parker	Richland County Emergency Management Agency (EMA)	Director
Lora Smith	Greater Wabash Regional Planning Commission (GWRPC)	Executive Director
Heather Neuman	GWRPC	Community Development Coordinator
Jeff Vaughan	GWRPC	Community Development Coordinator
Sarah Mann	GWRPC	Consultant
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, local business representatives, among others, were invited to be a part of the Steering Committee (*Table 4*). A representative from the Richland County Housing Authority was included in the planning process. The Richland County Housing Authority manages the Housing Choice Voucher Program which assists very low-income families, including the elderly and the disabled, to afford decent, safe and sanitary housing. No other organizations working solely with vulnerable populations was included in the process. Steering Committee members were invited to attend every Steering Committee meeting (see Appendix B: Meeting Documents for attendance records).

Table 4. Richland County Steering Committee.

Name	Community/Agency	Title
Aaron Mefford	Lawrence County	Lawrence County Engineer/County Floodplain Administrator
Juanita Kramer	911 Coordinator	911 Coordinator
Spencer Brock	Calhoun, Village of	Mayor
Sherri Gibson	Calhoun, Village of	Board Trustee
Marcy Oesch	Calhoun, Village of	Board Trustee
John Joyce	Claremont, Village of	Claremont Mayor & Claremont Fire Chief
Darin A. Koelm	Clay County	Clay County Engineer/County Floodplain Administrator
Steve Lewis	Clay County	Clay County EMA
Brad Midgett	Crawford County	Emergency Management Director
Justin Childress	Crawford County	Crawford County Engineer/County Floodplain Administrator
Debbie Judge	Edwards County	Emergency Management Director
Dustin Bunting	Edwards County	Edwards County Engineer/County Floodplain Administrator
Lora Smith	GWRPC	Executive Director
Ben Bland	Jasper County	Jasper County Engineer/County Floodplain Administrator
Ed Francis	Jasper County	
Janelle Adams	Lawrence County	Emergency Management Director
Brad Kessler	Noble, Village of	Mayor
Dave Klingler	Noble, Village of	Noble Fire Chief
Rodney Ranes	Olney Central College	Olney Central College President
Michael Hill, Jr.	Olney Fire District Fire Chief	Olney Fire District Fire Chief
Kevin Paddock	Olney Police Department	Olney Police Chief
Tyler Kocher	Olney Public Works	Street Department Supervisor
Allen Barker	Olney, City of	City Manager
Dallas Colwell	Olney, City of	Olney Code Enforcement/Building Inspector
Frank Bradley	Olney, City of	
Kelsie Sterchi	Olney, City of	City Clerk
Mark Lambird	Olney, City of	Mayor
Raymond Rudolphi	Parkersburg, Village of	Mayor
Alice Mullinax	Richland County, Parkersburg	Richland County Clerk, Parkersburg VC
Andy Hires	Richland County	Richland County Sheriff
Chris Simpson	Richland County	Richland County Community School Superintendent
Danny Colwell	Richland County	Richland County Highway Engineer
Deanna Mitchell	Richland County	Executive Director (Richland County Housing Authority)
Dennis Graves	Richland County	Richland County Board Chairman
Gina Thomas	Richland County	President, Carle Richland Memorial Hospital
Kevin Parker	Richland County	Richland County EMA
Lauren McClain	Richland County	Richland County Development Corporation, Executive Director
Tim Hahn	Richland County	Richland County Assessor
Alice Mullinax	Richland County	County Clerk
Micah Drummond	Richland County	Richland County Health Nurse
Abby Bacon	USDA	Area Specialist Rural Development
Joel Perry	Walmart DC	Asset Protection Manager
Dennis Seidel	Wayne County	Wayne County Engineer/County Floodplain Administrator
Jeff Jake	Wayne County	Emergency Management Director

TIMELINE AND MEETINGS

Timeline

The internal plan-making process started with team building and organizing resources within ISWS and GWRPC. 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) in March 2023 and the Federal Emergency Management Agency (FEMA) in June 2023. The 2023 *Richland 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	6/1/2021	7/31/2021	GWRPC	Identify planning team member agencies, roles, collect community plans and ordinances	August 2021
Create outreach strategy	7/1/2021	8/30/2021	GWRPC	**Meeting 1**	October 2021
Assess community capabilities	10/1/2021	12/22/2021	ISWS	Final call for local plans, review of content of local plans	October-December 2021
Conduct risk and capability assessments	12/22/2021	8/30/2022	ISWS	Finalize hazard inventory data collection, historic weather data **Meeting 2**	December 2021-August 2022
Identify mitigation goals and projects	1/1/2022	2/28/2022	ISWS	Create a list of potential mitigation strategies **Meeting 3**	January-March 2022
Develop action plan for implementation	2/28/2022	7/30/2022	ISWS		February-October 2022
Identify plan maintenance strategy	2/28/2022	7/30/2022	GWRPC		February-October 2022
Review final draft and open for public comment	10/1/2022	10/30/2022	ISWS	ISWS, GWRPC, Richland County jurisdictions and public **Meeting 4**	October 2022
Submit plan to State and FEMA	11/1/2022	12/30/2022	ISWS		November-December 2022
Local adoption of plan; send to IEMA	1/1/2023	5/30/2023	GWRPC		January-May 2023

Meetings

Planning committee members were identified and invited to attend planning committee meetings held on June 2, 2021, June 16, 2021, June 30, 2021, January 6, 2022, and June 16, 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. These stakeholder meetings provided critical information about the vulnerability and the current resiliency of the jurisdiction.

A website (https://www.illinoisfloodmaps.org/hazard-mit-plans-richland.aspx) was created for this project which housed all the relevant documents of the Richland County Hazard Mitigation Project for ease of access and a brief explanation of the process.

Meeting 1: Hazard Mitigation Planning Kick-off – October 15, 2021

ISWS, GWRPC, and the Richland County EMA went over the purpose of a hazard mitigation plan, what hazard mitigation is, the requirements for communities to participate, and the benefits of participating in the plan.

Meeting 2: Hazard Profiles and Risk Assessment – January 12, 2022

ISWS reviewed hazards that may impact the communities, identified community vulnerabilities that might affect risk, discussed the history of hazards in the area, introduced the community web map, and encouraged steering committee members to fill out the risk assessment. All five communities returned risk assessments.

Meeting 3: Mitigation Goals and Strategies – March 23, 2022

The steering committee reviewed hazard mitigation goals from the 2012 *Richland County Multi-Hazard Mitigation Plan* with the help of ISWS and updated goals for the new hazard mitigation plan. ISWS presented ideas for hazard mitigation projects and began scheduling one-on-one meetings with individual jurisdictions to develop hazard mitigation projects.

Following the third meeting, ISWS scheduled one-on-one meetings over video or phone call with representatives from each participating jurisdiction in Richland County to discuss active mitigation projects and develop new mitigation projects in order to enhance disaster preparedness. Each jurisdiction was given the opportunity to rank hazards in order of highest perceive risk to their community. Jurisdictions also shared information about their current mitigation capabilities and proposed projects in the Jurisdictional Project Grid that they felt were central to their community's needs (see Mitigation Actions).

Meeting 4: Review of Hazard Mitigation Plan – October 20, 2022

ISWS and GWRPC invited the steering committee and the public to review the 2023 Richland 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 GWRPC to check-in with communities every year when grant opportunities from IEMA become available. ISWS 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 allowed in 2020 or the majority of 2021. This limited the planning committee's ability to engage with the community, particularly the most vulnerable populations.

An internet survey was open from October 14, 2021 through September 8, 2022, to collect the public's opinions on hazards and their community's vulnerability to them. Forty-five residents of Richland 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 (*Figure 1*). 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 October 15, 2021 and September 15, 2022, the map was viewed 189 times by 47 unique users. Three users left a total of 23 comments regarding critical facility locations, roads or areas that frequently flood, and mitigation successes.

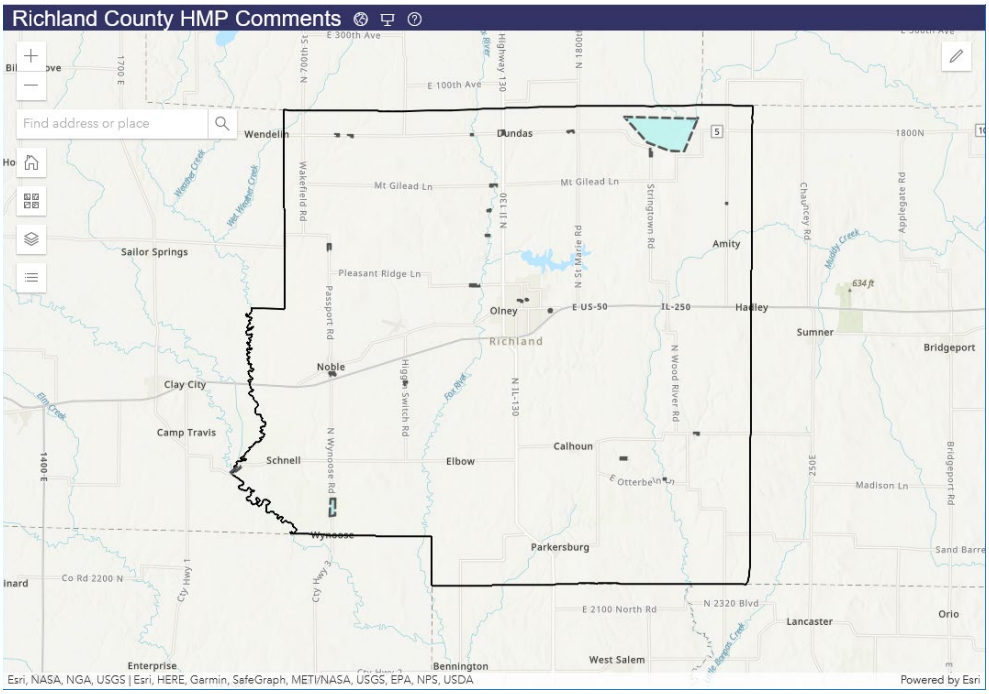


Figure 1. Screenshot of interactive Richland County comment web map. Polygons represent comment locations.

A public meeting was held on October 20, 2022, to review and allow the public to comment on the county's draft HMP. Public notifications were distributed by GWRPC and local community leaders to share with members of their community. Elected officials and representatives from fire and police departments, hospitals, local businesses, and government agencies were invited to represent the communities they serve throughout the process, and act as a voice for their communities when members of the general public were not present. Appendix B: Meeting Documents contains the minutes from this public meeting. Appendix D: Public Notifications contains articles published by the local newspaper throughout the public input process.

REVIEW OF TECHNICAL DOCUMENTS

To prepare this HMP, a literature review was undertaken of several technical documents written by or for Richland 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/Update	Element
Multi-Hazard Mitigation Plan Richland County	2012	Community vision/goal and place profile
Greater Wabash Region Economic Development Plan 2016-2021 (SET)	2016-2021	
Greater Wabash Comprehensive Economic Development Strategy (CEDS)	2017-2022	Outreach/Citizen self-reporting mechanism
Richland County Final Combined Emergency Operations Plan	2021	
Emergency Operations Plan	2021	Goals and vulnerability assessment
Disaster Recovery Plan (Part of EOP)	2021	Post-disaster redevelopment strategy

Multi-Hazard Mitigation Plan Richland County 2012: Addresses a broad range of hazards, that could adversely impact Richland County's people, property, environment, or economy. The major disasters tackled by this plan are tornados, floods, earthquakes, thunderstorms, drought, winter storms and hazardous material storage and transport.

Emergency Operations Plan: Addresses a broad range of naturally occurring hazards, technological and human caused incidents, both accidental and intentional, that could adversely impact Richland 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 Richland County Disaster Recovery Plan (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.

Greater Wabash Region Economic Development Plan 2016-2021 (SET): The purpose of this plan is to strengthen the capacity of communities and counties in rural America to work together. The goal is to develop and implement an

economic development blueprint that strategically builds on the current and emerging economic strengths of a multi-county region.

Greater Wabash Comprehensive Economic Development Strategy 2017-2022 (CEDS): The CEDS is a "regionally developed and owned roadmap for building capacity and guiding the economic prosperity and resiliency of the region." Over 100 community leaders across 7 counties participated. A major challenge identified by the report was attaining full employment across the region.

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 the documentation required for formal adoption to IEMA, which is responsible for forwarding this documentation on to FEMA Region 5. See Appendix F: Adoption Resolutions.

The Richland County Multi-Jurisdictional Hazard Mitigation Plan for 2023-2028 was adopted by the Richland County Board on August 10, 2023. The plan received approval on March 14, 2024. The plan is active for five years following the approval date. The plan will expire on March 14, 2029. 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 Richland County EMA will reconvene the HMP Planning Committee to monitor, evaluate, and update the plan on an annual basis. An additional meeting will be held in 2027 to address the five-year update of this plan. 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.

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. Richland 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.

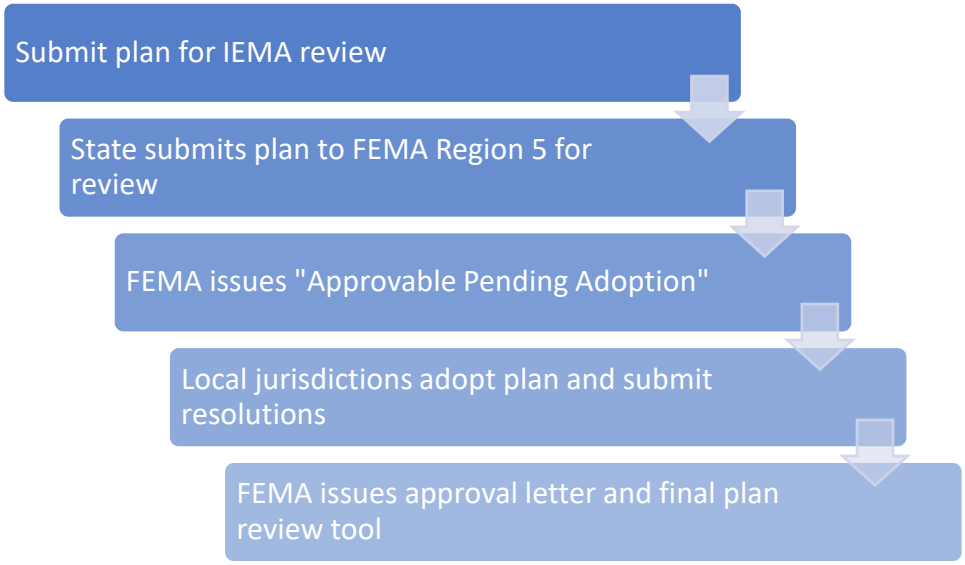
The previous hazard mitigation plan was used in creating the 2021 Richland County Emergency Operations Plan. Ongoing planning efforts will have the updated 2023 Richland County Multi-Jurisdictional Hazard Mitigation Plan available to better align goals and projects with existing programs throughout the communities.

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. 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 SHMO will forward the plan to the 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 from 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

Richland County is a rural county located in southeastern Illinois. Founded in 1841, it derives its name from its namesake in Ohio, from where most of its original settlers migrated. The county is approximately 360 square miles and contains five municipalities and nine townships (*Figure 2*). Richland County is a part of the Greater Wabash region, which encompasses the rural southeast Illinois counties of Crawford, Edwards, Lawrence, Wabash, Wayne, and White. The primary land use in the Greater Wabash region is agriculture with 1,291,675 acres of farmland.[1] The City of Olney is the county seat and largest community in the county.

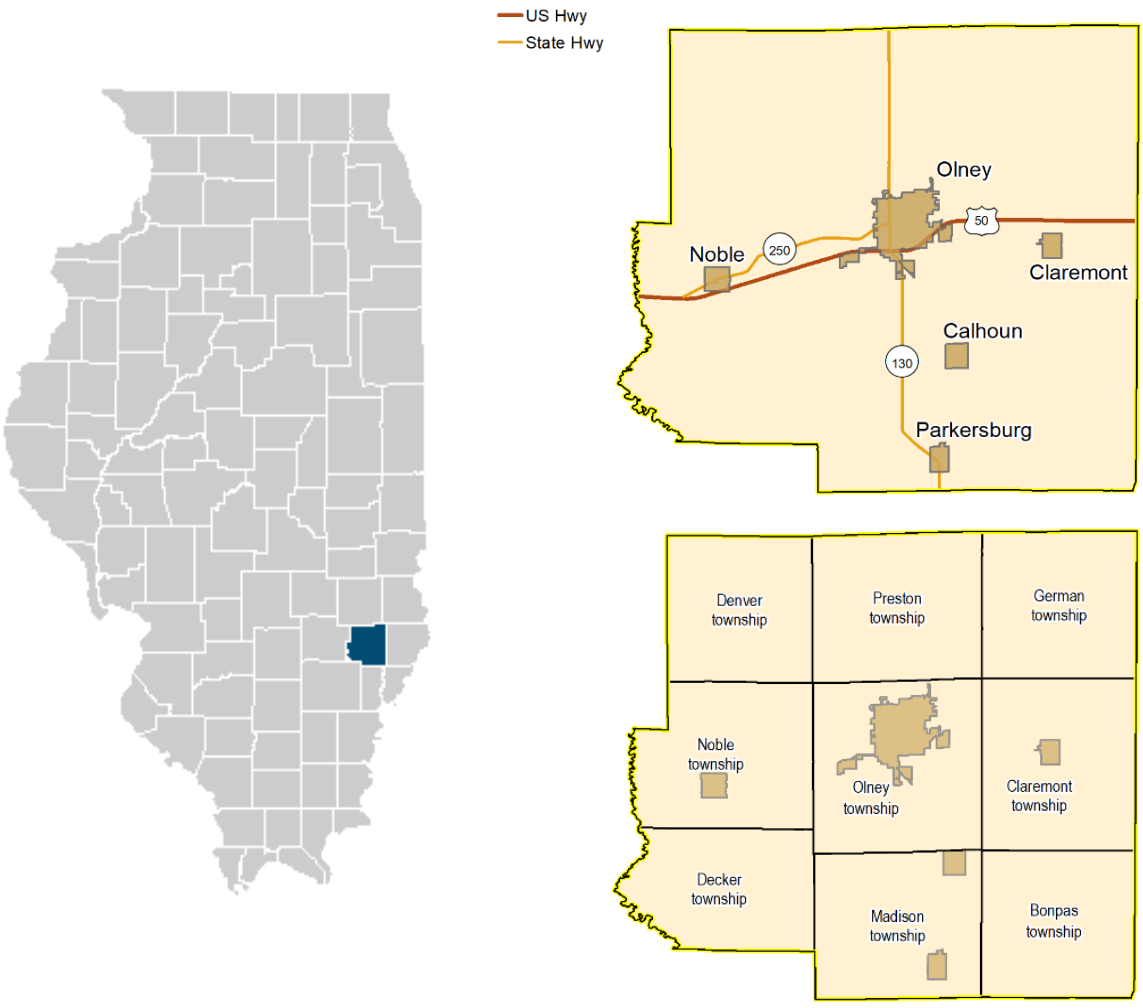


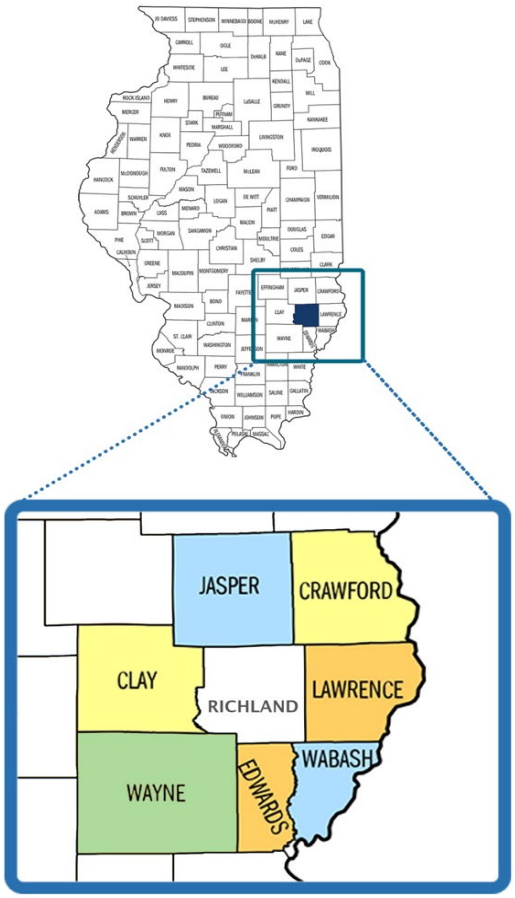
Figure 2. Richland County, jurisdictions, and townships.

[1] Greater Wabash Regional Planning Commission. (2017). *Comprehensive Economic Development Strategy*. http://www.gwrpc.com/images/GWRPC_CEDS.pdf

Olney was selected as the county seat when Richland County was founded in 1841 after much debate. It was decided that Olney would be ideal due to its central location and the amount of land donated. During the Civil War, Union troops were stationed in the city and over 1,700 residents of Richland County served the Union. Besides Cook County, Richland was the only county in Illinois to have provided at least four generals for the Union effort. Olney was named based on a suggestion by Judge Aaron Shaw who wished to honor a friend, Nathan Olney.[2]

Neighboring and Special Districts

Richland County is bordered by seven Illinois counties:



Jasper County: Situated to the north of Richland County, Jasper County was formed in 1831 out of Clay and Crawford Counties. Its county seat is Newton and was named after Sgt. William Jasper- a Revolutionary war hero.

Crawford County: Situated to the northeast direction of Richland County. Its county seat is Robinson. As of 2010 census, it had a population of 19,817.

Lawrence County: Lawrence County is the easternmost county in the state of Illinois and had a population of 15,280 during the 2020 census. Its county seat is Lawrenceville.

Wabash County: Wabash County is located at the southeast of Richland and has a population of 11,947 according to 2010 US Census. The county is named after the Wabash River that abuts its east and south borders. This county is located at the southern portion of Illinois called "Little Egypt".

Edwards County: Edwards County is located in the south of Richland County and is the fourth smallest county in Illinois by area. Edwards county is divided into 'road districts' rather than 'townships' like the rest of the counties in Illinois.

Wayne County: Wayne County is located at the southwest direction of Richland and is also a part of southern Illinois 'Little Egypt' region. Its population is 16,760 as of 2010 census and its county seat is Fairfield.

Clay County: Clay County is located at the west of Richland and has a population of 13,815 according to 2010 US census. Its county seat Louisville.

Richland County is served by one school district:

- Richland County Community Unit School District (CUSD) 1

Richland County is served by five fire protection districts (*Table 7*):

[2] "Olney History". City of Olney. Retrieved September 2022, from https://www.ci.olney.il.us/visitors/olney_history.php

Table 7. Fire protection districts and ISO scores.

Fire Protection District	City ISO	Rural ISO
Christy (Sumner)	6	8b
Claremont	5	5x
Noble	6	6y
Olney	4	4x
West Salem	6	-

With the exception of the Olney and West Salem Fire Protection Districts, 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 Richland 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.

Community Vision

The Greater Wabash Comprehensive Economic Development Strategy (CEDS) for 2017-2022 is a community owned and developed plan designed towards growing a prosperous and resilient region. Over 100 community leaders in the public and private sector across the seven-county region participated in the development of the CEDS. The following vision was created:

"We envision a region in which all sectors (workforce development, education, economic development, and community development) work together toward a growing prosperous region. We strive to attract and strengthen businesses and jobs, improve the quality of life and the standard of living within our communities." [3]

To achieve this vision, the four region-wide goals were laid out. Each goal contained specific strategies with a chart of the party responsible for the strategy, strategy timeline, and the means to measure the achievement of each strategy. The goals are listed below:

1. Create a pipeline of employable workers within the region
2. Create a regional Business Retention & Expansion Program
3. Create an entrepreneurial support system in the region
4. Continuously improve the quality of life and quality of place within the region for future generations

Geographic Profile

Topography

Located primarily in the Southern Till Plain biome, which is characterized by high clay content soils, the majority of Richland County is covered by cropland interspersed with deciduous forests and pasture. [4] The Wabash Border Division surrounds the Fox River and Bonpas Creek in the county, which is characterized by wetlands with a large diversity of trees (*Figure 3*).[5]

[3] Greater Wabash Regional Planning Commission. (2017). *Comprehensive Economic Development Strategy*. http://www.gwrpc.com/images/GWRPC_CEDS.pdf

[4] Illinois Natural History Survey, "Natural Divisions", accessed February 1, 2023. https://publish.illinois.edu/inhseducation/biodiversity/natural-divisions/

[5] Illinois Natural History Survey, "Natural Divisions", accessed February 1, 2023. https://publish.illinois.edu/inhseducation/biodiversity/natural-divisions/

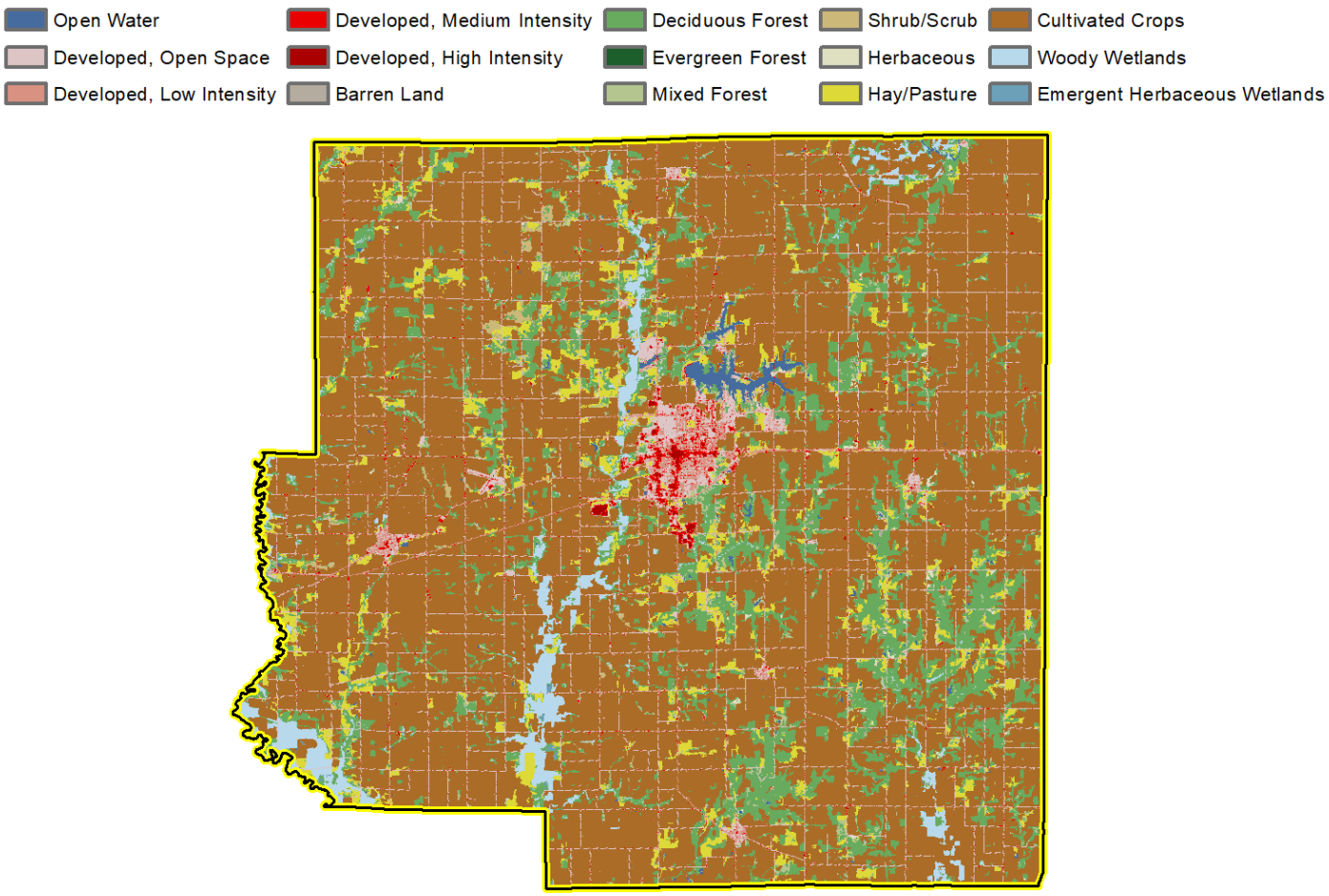


Figure 3. Land cover in Richland County.
Source: Multi-Resolution Land Characteristics (MRLC) Consortium, National Land cover Database (NLCD)

Richland County's lowlands lie along Big Muddy Creek and the Fox River in the southwest, and Bonpas Creek in the southeast portions of the county. Elevations stretch up to 606 feet in the county's highlands, which are located northern and eastern parts of Richland County (*Figure 4*).

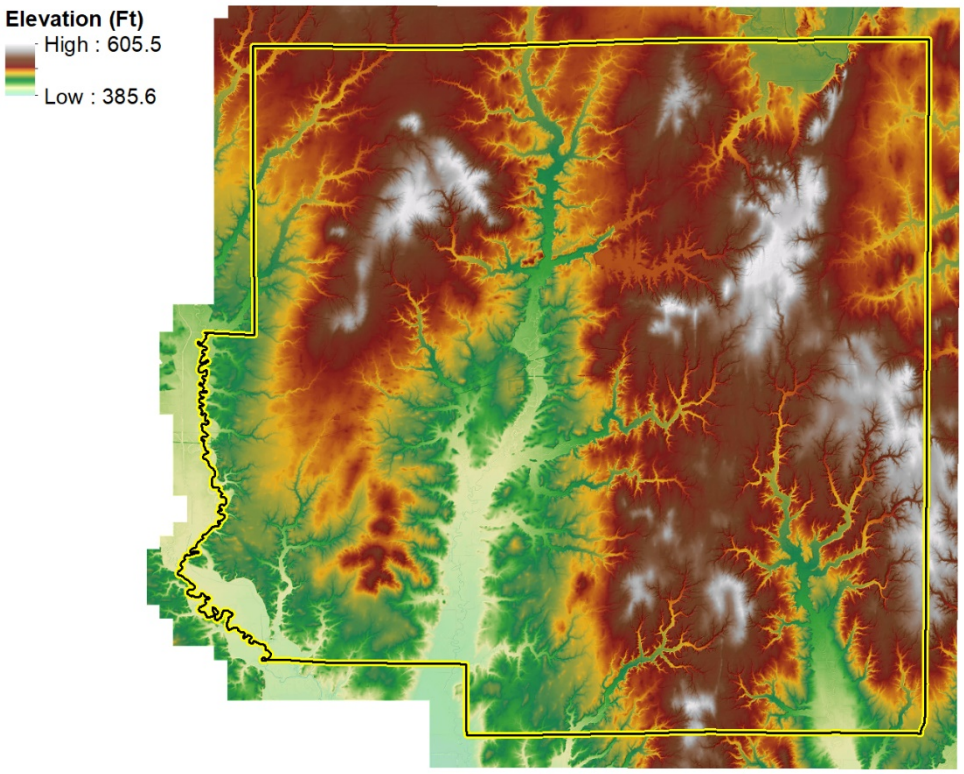


Figure 4.Topography of Richland County. Source: Illinois State Geological Survey (ISGS)

Ecology

The City of Olney is home to the iconic Olney White Squirrels, and the city takes proactive steps to conserve this species. A squirrel count is held in each fall, and the December 2020 count found an average of 69 white squirrels in the community.[6] Visitors to Olney are advised to squirrel watch early in the morning for the best viewing of the local white squirrels. There are many good spots to view the white squirrels in their natural habitat, namely the

Figure 5. White squirrels (L) and white-tail deer (R) of Richland County.

Olney City Park along Route 130, Millers Grove situated on the south side of East Fork Lake and several residential

[6] White Squirrel count in Olney shows good results for the 2nd year in a row | News | wthitv.com

neighbourhoods with mature trees and feeding stations.[7] The white-tail deer is found in Richland County and is its primary game animal.

Hydrology

Richland county contains the A watershed, or drainage basin, is the land area that drains directly to a common stream, river, or lake. Richland County falls in the Little Wabash Watershed, the Lower Wabash Watershed, as well as a part of the Embarras Watershed (*Figure 6*). The Wabash River, the Embarras River, the Little Wabash River, the Skillet Fork River, and the Saline River flow through the Greater Wabash Region. The Wabash River is the longest free-flowing river east of the Mississippi. The Little Wabash watershed in south-eastern Illinois is part of the Wabash River basin. The watershed encompasses 16 counties and has a total drainage area of approximately 3,200 square miles. The primary use of the land within the watershed is agriculture, although many forests and grasslands are also present[8].

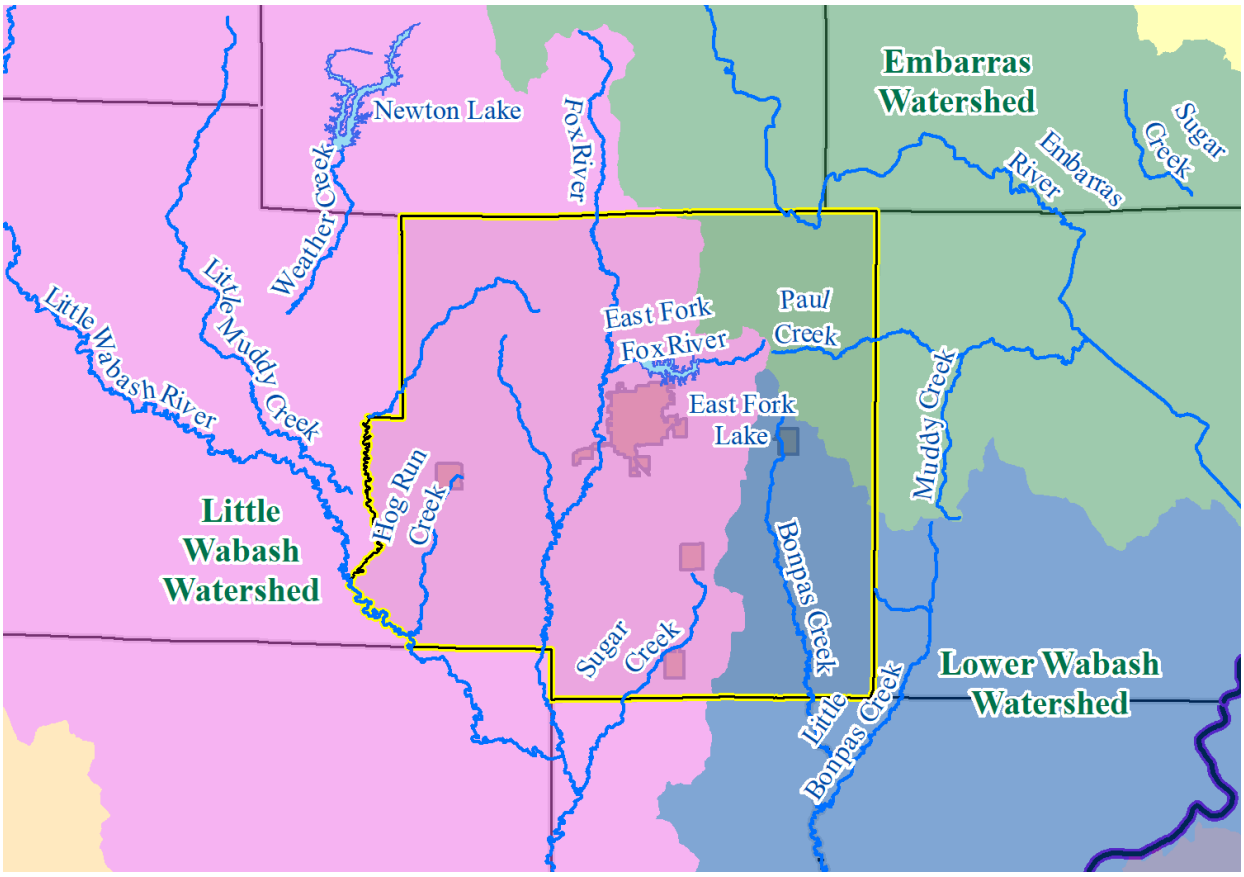


Figure 6. Hydrologic features in Richland County.

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

[7] White Squirrels of Olney

[8] Illinois River Decision Support System (ILRDSS) | ILRDSS - Watershed Information (illinois.edu)

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.[9]

Richland 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 for station OLNEY 2 S (USC00116446). Source: NCEI, 1991-2020

Month	**Temperature Normals**			**Precipitation Normals**	
	Maximum (°F)	*Minimum (°F)*	*Average (°F)*	*Precipitation (in)*	*Snowfall (in)*
Jan	37.8	20.8	29.3	3.52	3.6
Feb	42.7	23.9	33.3	2.57	2.6
Mar	53.4	32.3	42.9	4.21	1.1
Apr	65.6	42.7	54.2	5.02	0.0
May	75.1	53.3	64.2	5.60	0.0
Jun	84.1	62.4	73.2	4.79	0.0
Jul	86.8	65.6	76.2	4.96	0.0
Aug	85.8	63.8	74.8	3.19	0.0
Sep	80.4	55.8	68.1	3.31	0.0
Oct	68.5	44.3	56.4	3.83	0.0
Nov	53.9	33.5	43.7	4.26	0.5
Dec	42.3	25.7	34.0	3.50	2.7
Annual	64.7	43.7	54.2	48.76	10.5

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

DEMOGRAPHICS

Population

Richland County has a current population of 15,766 according to the 2020 U.S. Census and has observed a 3% decrease in its population since the 2010 census (*Table 9*). Around half the residents of the county live in rural areas. Calhoun and Parkersburg have observed the most significant decrease in population while Noble has gained residents over the past ten years after observing a decade of decline. Overall, Richland County has seen about 400 people move out over the last decades. The county has a density of 45 inhabitants per square mile.

Table 9. Richland County and community population trends. Source: U.S. Census

Community	2000	2010	2020	Change since last Census (%)
Richland County	16,149	16,166	15,766	-3%
Calhoun	235	181	149	-18%
Claremont	206	207	218	+5%
Noble	754	608	647	+6%
Olney	8,645	8,758	8,872	+1.3%
Parkersburg	204	278	223	-20%

The historic population estimate shows how population grew exponentially during 1850-1880 with the onset of the Industrial Revolution that brought jobs and consequently people into the county (*Figure 7*). The county's population experienced a small dip between 1920 and 1930 but has remained relatively constant since then.

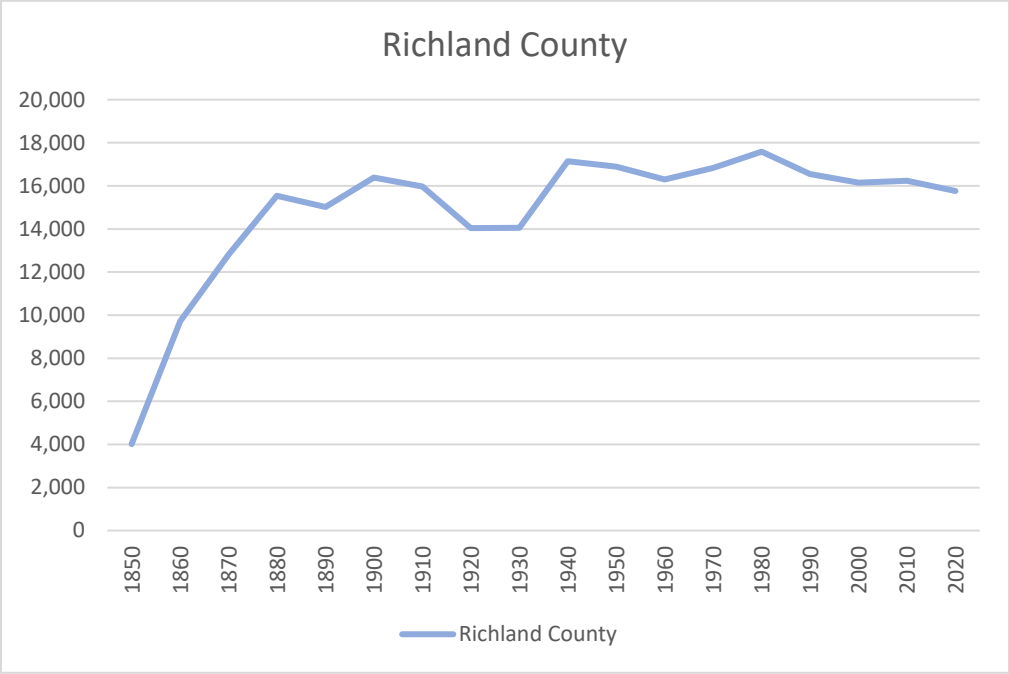


Figure 7. Historic population estimates of Richland County (1850-2020). Source: U.S. Census.

Age & Sex

The age and sex pyramid reveals information about the county's residents (*Figure 8*). The bulge in the pyramid suggests a large portion of the population between the ages of 55-59 years which brings up the average age of the county to 42.5 years. Youth comprise a large portion of the county's populace, with those aged 10 to 14 predominantly being girls. The middle-aged portion of the county's populace tend to be equally distributed across both sexes. However, the county's senior population is largely female.

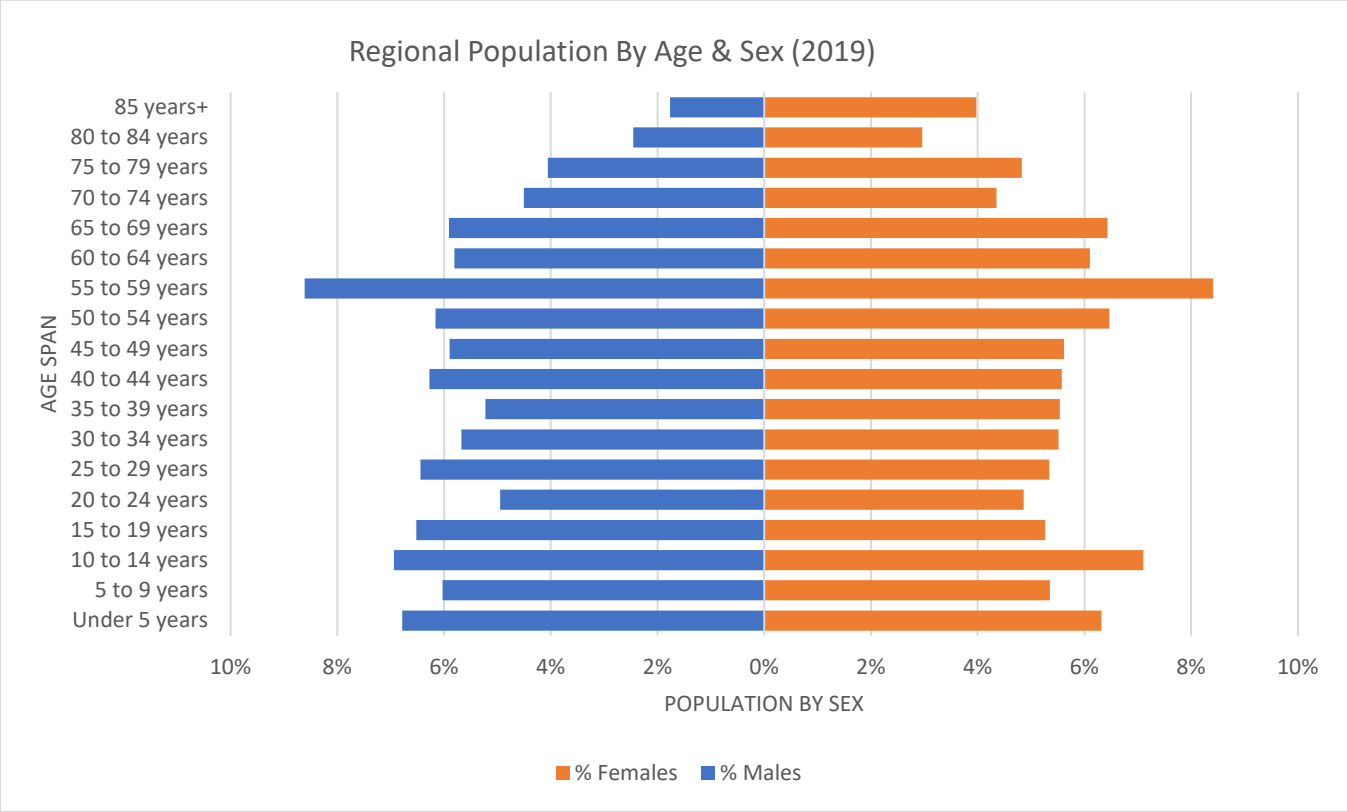


Figure 8. Community population by age and sex (2019); Male (L) | Female (R). Source: U.S. Census.

Race and Ethnicity

Richland County's racial composition is predominantly white while nearly two percent of the county's population identifies as Hispanic/Latino (*Table 10*).

Table 10. Community population by race & ethnicity (2020). Source: U.S. Census.

Race	**Richland County (2020)**	
White	14,896	94.2%
Black or African American	77	0.4%
American Indian and Alaska Native	37	0.2%
Asian	127	0.8%
Native Hawaiian and Other Pacific Islander	7	<0.1%
Some other race	80	0.5%
Two or more races	589	3.7%
Ethnicity		
Hispanic/Latino	273	1.7%

Education Levels

The number of graduates is uniformly distributed across all the communities led by Claremont (*Figure 9*). The county has a relatively low proportion of people without complete schooling. Noble and Olney also account for a significant portion of the region's population with a bachelor's degree. A majority of the regional populace has attained at least a high school graduate level education.

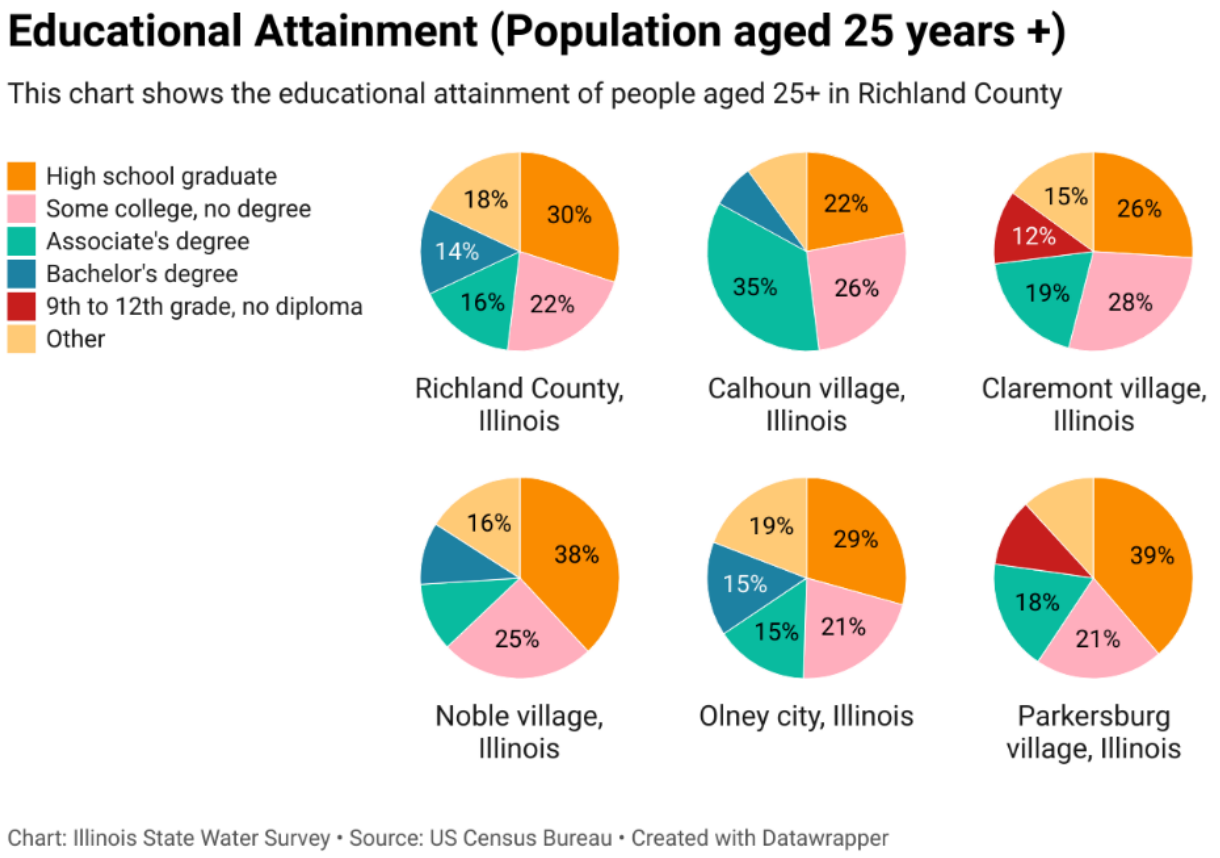


Figure 9. Educational attainment in Richland County (population aged 25+), 2020.

Income & Housing

The median household income in Richland is $55,032, it has increased slightly as compared to the previous years (*Table 11*). It has an unemployment rate of 5.6% as of the 2020 U.S. Census.[10] Calhoun and Claremont have the highest median household income meanwhile Olney has the lowest in the county and the highest unemployment rate owing to the range of income groups it is home to. About 11.9% of the county lives below the poverty line.

[10] Economic Census Bureau

Table 11. Community unemployment, income, and poverty (2020). Sources: U.S. Census, American Community Survey

Community	Civilian Labor Force (16+ Years)	Unemployed Population	Rate of Unemployment (%)	Median Household Income ($)	Population Below Poverty Line (%)
Richland County	7,590	425	5.6%	48,894	13.1%
Calhoun	78	6	7.7%	45,000	28.9%
Claremont	90	1	1.1%	46,458	15.1%
Noble	331	19	5.7%	44,271	14.5%
Olney	3,951	316	8%	39,929	17.4%
Parkersburg	107	3	2.8%	43,333	12.6%

Olney accounts for the highest proportion of housing units in the county, followed by Noble (*Table 12*). Olney also has the highest homeowner and rental vacancy rates in the county. The highest payable median rent is found to be for rental properties in Calhoun. The average rent in Richland County is $566.

Table 12. Community Housing Occupancy & Rental Market.

Community	Total Housing Units	Occupied Units	Vacant Units	Homeowner Vacancy Rate (%)	Rental Vacancy Rate (%)	Occupied Units Paying Rent	Median Gross Rent ($)
Richland County	7,518	6,452	1,066	2.6	8.5	1,647	566
Calhoun	89	62	27	0	0	5	692
Claremont	90	77	13	0	0	9	625
Noble	292	275	17	0	0	62	531
Olney	4,408	3,649	759	4.3	10.8	1,276	539
Parkersburg	78	74	4	0	0	13	525

ECONOMY AND INDUSTRY

Industry Mix

The industry mix in Richland County is dominated by educational services, healthcare, and social assistance followed by the retail trade and manufacturing sectors (*Figure 10*). Calhoun has a specific concentration in the transportation and warehouse sector whereas Olney focuses on wholesale trade. The county is also involved in agriculture, mining, forestry, and construction, among other sectors.

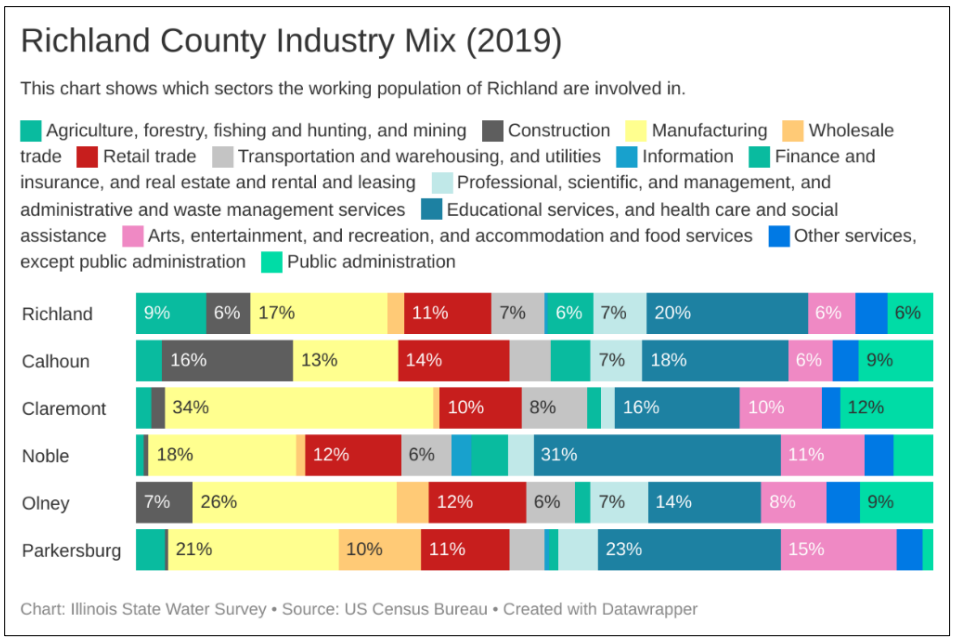


Figure 10. Community Occupational Statistics by Industry (2019). Source: US Census.

The top three largest employers are the Walmart distribution center, Carle Richland Memorial Hospital, and Richland County Community Unit (RCCU) School District #1 (*Table 13*).

Table 13. Largest employers in Richland County (2019). Source: RCDC.

Company/Organization	Employees	Sector
Wal-Mart Distribution Center 6059	947	Warehousing
Carle Richland Memorial Hospital	552	Healthcare
RCCU #1	307	Educational Services
Olney Central College	210	Educational Services
Wal-Mart Super Center	200	Retail
City of Olney	128	Public Administration
Pacific Cycle	126	Retail
Werner Enterprises	103	Transportation
Aperion Care	93	Social Assistance
Prairie Farms	92	Agriculture

Transportation Network & Commuter Flows

State and national highways 250 and 50 connects the communities of Richland County in an east-west direction whereas highway 130 runs north-south (*Figure 11*). All these arterials cross through the City of Olney which is the County's seat. A railway line crosses through Richland along its central east-west axis. A small portion of people from nearby counties travel to Richland for work and vice versa, however, the maximum number of jobs in Richland County are self-contained. A small portion of Richland residents travel to nearby counties of Lawrence, Edwards and Clay for work.[11]

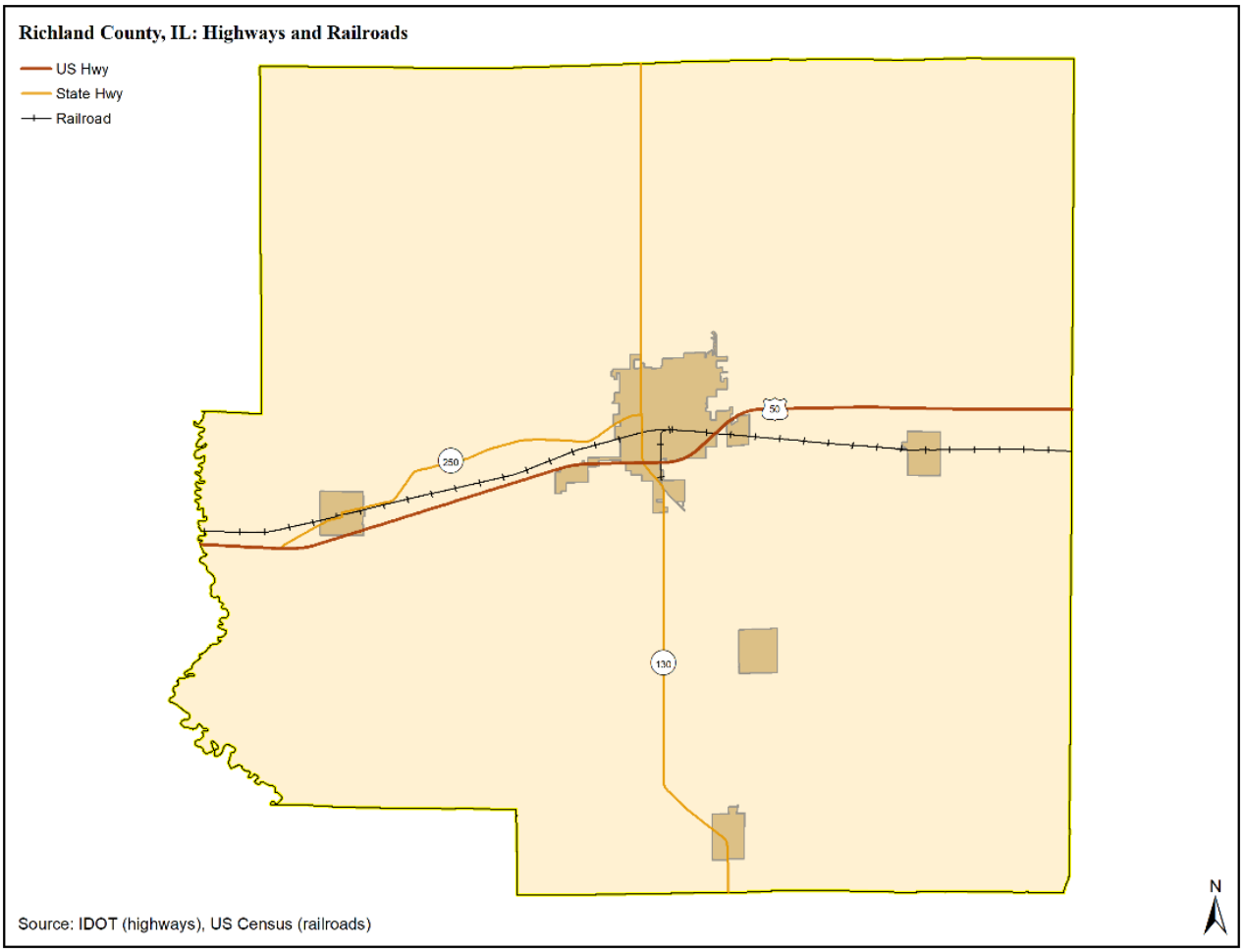


Figure 11. Richland County Highways and Roads. Source: IDOT, US Census.

Agriculture

Richland County lies in the corn belt region and soybean, corn and winter wheat croplands dominate most of its land area (*Figure 12*). Apples, peaches, and grapes are commonly found throughout the region in addition to the occasional sunflower, cotton, wheat, and hay fields.

[11] Journey to work data, US Census 5 Year ACS 2011-2015

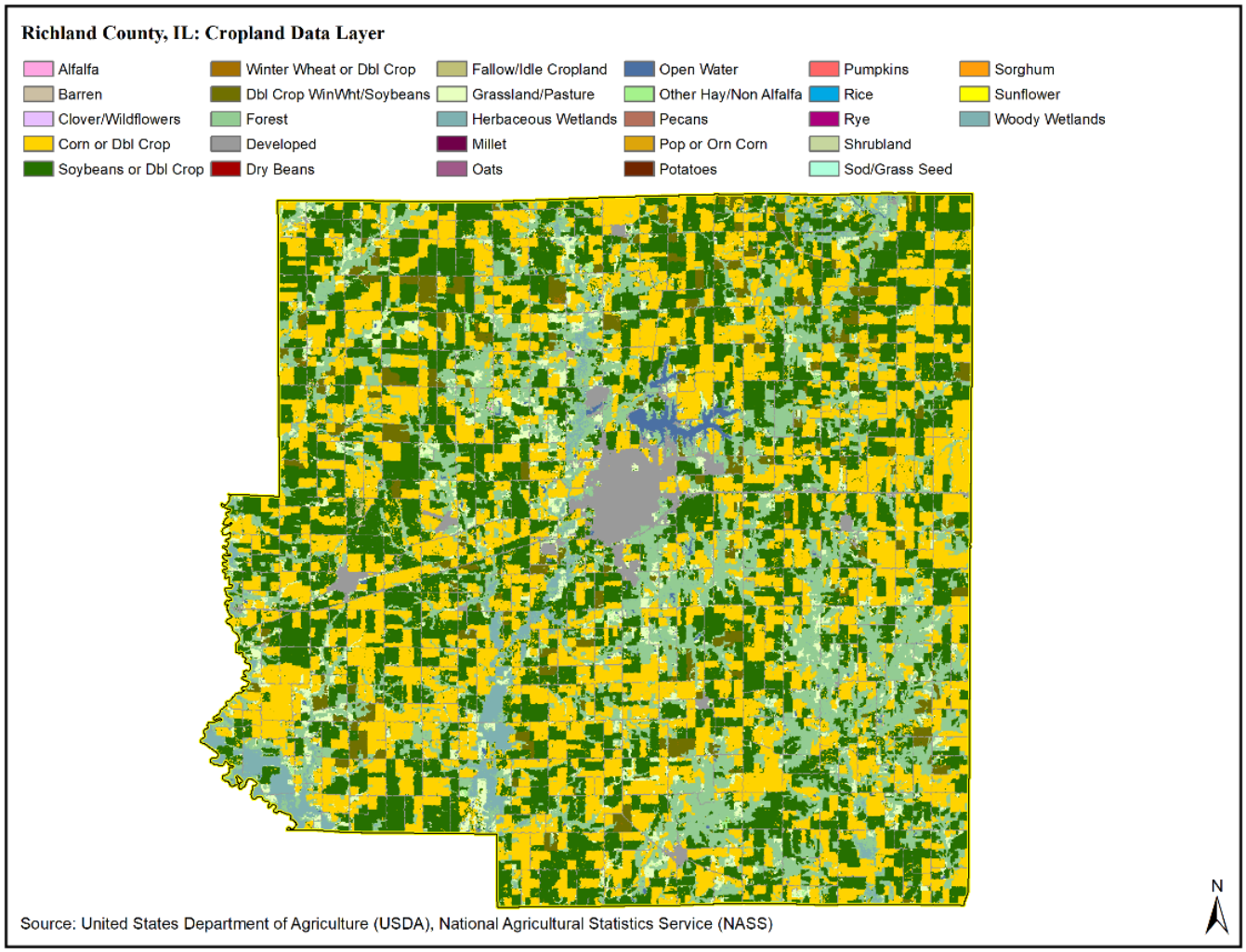


Figure 12. Richland County crop cover.

The average number of farms grew in this region by 8% since 2012 but the average sizes reduced by 12% (*Table 14*). Overall farmlands have decreased slightly, but still make up over 90% of Richland's County's land cover.

Table 14. Farm and crop overview (2012-2017).

Commodity	**2017**	**Change since 2012**
Number of Farms	596	+8%
Area of Farmland (acres)	178,481	-6%
Average Size of Farm (acres)	299	-12%
Top crops in Acres	**Rank in county**	**Crop area (acres)**
Soybean	1	77,274
Corn	2	66,488
Winter wheat	3	7,627

NATIONAL FLOOD INSURANCE PROGRAM

The National Flood Insurance Program (NFIP) is a federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses. A jurisdiction's eligibility to participate is premised on their adoption and enforcement of state and community floodplain management regulations intended to prevent unsafe development in the floodplain, reducing future flood damages.[12] If a community adopts and enforces a floodplain management ordinance to reduce future flood risk to new construction in floodplains, the federal government will make flood insurance available within the community as a financial protection against flood losses (*Table 15*). To ensure compliance with the program, communities must continue to enforce their local floodplain management ordinances. In Illinois, most communities have adopted the State of Illinois Model Ordinance that goes above and beyond NFIP minimum standards and are much more restrictive than NFIP minimums.

Table 15. Community participation in the NFIP

Jurisdiction	Participating	Date Joined	Effective FIRM Date	SFHA Present
Richland County	Y	11/01/1984	11/01/1984	Y
City of Olney	Y	09/04/1985	09/04/1985	Y
Village of Calhoun	N	N/A	N/A	N/A
Village of Claremont	N	N/A	N/A	N/A
Village of Noble	N	N/A	N/A	N/A
Village of Parkersburg	N	N/A	N/A	N/A

Flood maps generated by FEMA to support the NFIP are the primary source of information on the location of special flood hazard areas (SFHA) in the state. Flood Insurance Studies (FIS) and Flood Insurance Rate Maps (FIRM) are issued by FEMA following a detailed engineering analysis of flood hazard areas in participating communities. The FIS and FIRM identify 1%-annual-chance flood elevations and boundaries for selected stream reaches in the community. The FIRM will contain flood elevation information for various flood frequencies and may also delineate floodway boundaries. At the time of this publication, Richland County is currently undergoing the process of completing a FIS and updating their FIRMs. Preliminary maps are anticipated to be available in October 2023.

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 six repetitive loss properties in Richland County. One of which is has a 'Severe Repetitive Loss' designation, which is four or more separate claim payments where each payment is greater than $5,000; or two or more separate claim payments where the total payments exceed the current value of the property. In either case, two of the claim payments must have occurred within 10 years of each other. At the time of publication for this plan, all six properties had been mitigated.

FEMA Guidance specifies that NFIP flood insurance claim information is subject to The Privacy Act of 1974, as amended. The Act prohibits public release of policy holder names, or names of financial assistance recipients and the amount of the claim payment or assistance.

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

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 damaged). If so, the property owner is required to bring a non-conforming 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.[13] Communities can also contact Illinois Association for Floodplain and Stormwater Management (IAFSM) for additional support following a flood.

In Richland County, local floodplain management is the responsibility of the Richland County Floodplain Administrator. At the time of this publication, County Engineer, Dan Colwell, is the Richland County Floodplain Administrator. Richland County will continue to educate these jurisdictions on the benefits of the program.

[13] Illinois Department of Natural Resources, "State of Illinois Flood Damage Packet", 2021. 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 Richland 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, pandemic, riverine flooding, tornado, wildfire, wind, and winter weather. Hazards excluded from this plan include coastal flooding, cyber-terrorism, landslide, and mine subsidence.

Data sources for historic occurrences of hazards include; the National Centers for Environmental Information (NCEI)'s Storm Events Database (SED) 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, 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).

The table below gives a summary of reports/cases, damage, and casualties for each hazard found in the data sources listed above (*Table 16*). 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 16: Summary of Hazard Reports/Occurrences/Claims/Cases in Richland County, IL

Hazard	Reports / Cases	Start Year	End Year	Yrs	Property and/or Crop Damage	Injuries	Fatalities	Source
Wind	101	1955	2020	66	$1,009,000	1	0	NCEI Storm Events DB
Hail	31	1955	2020	66	$200	0	0	NCEI Storm Events DB
Lightning reports	1	1996	2020	25	$62,000	0	0	NCEI Storm Events DB
Lightning strikes	141,109	1987	2020	34	*	*	*	NCEI Svr Wx Data Inv
Tornadoes	14	1950	2020	71	$5,675,000	5	0	NCEI Storm Events DB
Riverine Flooding	6	1996	2020	25	$0	0	0	NCEI Storm Events DB
Flash Flooding	30	1996	2020	25	$46,000	0	0	NCEI Storm Events DB
Dam/Levee Failure	0	2010	2020	11	*	*	*	ASDSO Dam Incident DB
Winter Weather	19	1996	2020	25	$0	0	0	NCEI Storm Events DB
Ice Storms	2	1996	2020	25	$300,000	0	0	NCEI Storm Events DB
Drought	6	1996	2020	25	$24,700,000	0	0	NCEI Storm Events DB
Heat Wave	12	1996	2020	25	$0	0	0	NCEI Storm Events DB
Cold Wave	3	1996	2020	25	$0	0	0	NCEI Storm Events DB
Earthquake	34	1970	2020	51	*	*	*	USGS Earthquake Catalog
Wildfire	7	1992	2018	27	*	*	*	USDA FS Wildfire DB
HAZMAT Spill	40	1990	2020	31	*	*	*	USCG Natl Response Cntr
Pandemic	5,898	2020	2022	2	*	*	77	IL Dept of Public Health

** Not Applicable / Not Available from data source*

Hazus

Hazus[14] is a geographic information system (GIS)-based natural hazard risk analysis tool developed and freely distributed by the Federal Emergency Management Agency (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. Richland County's Hazus analyses included the creation of a building inventory using the Richland 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.

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

HISTORIC AND FUTURE DISASTERS

Historical 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.

Richland County has received eight presidential disaster declarations since 1990 (*Table 17*). This equates to a disaster declaration nearly once every three years.

Table 17. Presidential Disaster Declarations (1990-2022). Source: FEMA

Declaration No.	Declaration Type	Year	Hazard(s) covered by the declaration
871	Major Disaster	1990	Severe storms, tornadoes, flooding
1112	Major Disaster	1996	Severe storms, flooding
1416	Major Disaster	2002	Severe storm, tornadoes, flooding
3199	Emergency	2005	Severe winter storms, snowstorms
3230	Emergency	2005	Hurricane
1960	Major Disaster	2011	Severe winter storms, snowstorms
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 (*Table 18*). Richland County received four gubernatorial disaster proclamations during this time period, equating to nearly one every four years.

Table 18. Gubernatorial disaster proclamations (2010-2018).

Year	Hazard(s) covered by the declaration
2011	Severe winter weather
2011	High wind, tornadoes, torrential rain
2015	Severe storms, tornadoes; flooding, straight-line winds
2016	Severe storms, heavy rainfall, flooding

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 Richland County FSA office is in Olney, IL.

Richland County has received three FSA-administered disaster declarations since 2012 (*Table 19*). This equates to a disaster declaration slightly less than once every three years.

Table 19. FSA disaster declarations, (2012-2022).

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

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 Richland County since 2000.

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 13*). 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.

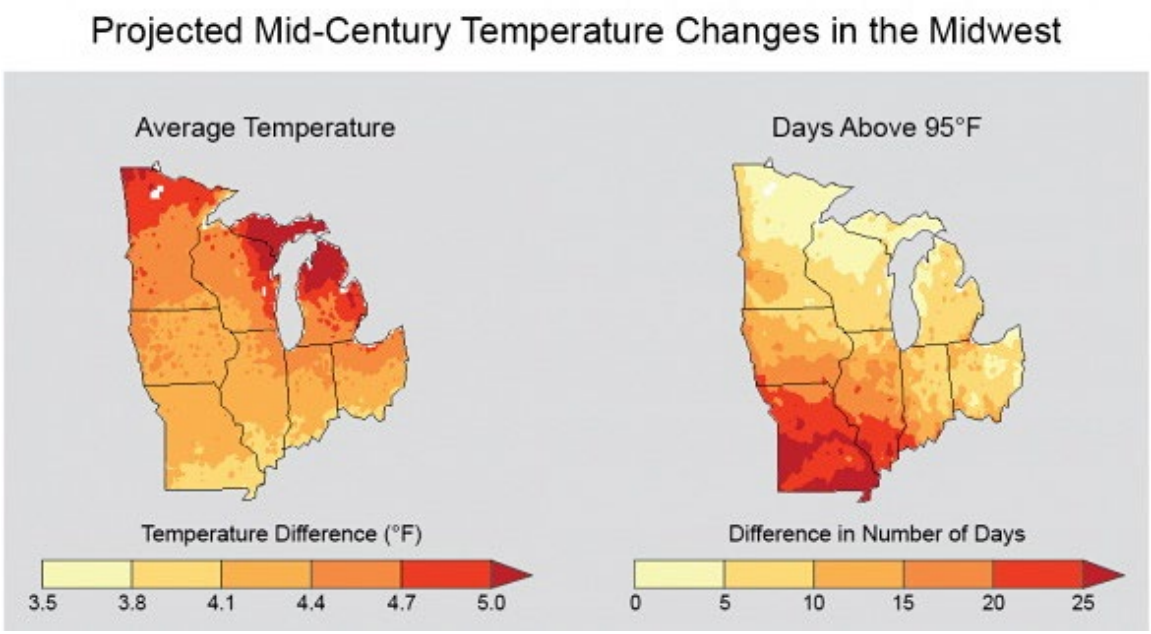


Figure 13. Projected 2050 temperatures changes. Source: US Global Change Research Program (2014).

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 14).* 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. Extreme precipitation has caused runoff from agricultural fertilizer to enter groundwater wells harming the safety of drinking water, particularly for rural communities in Illinois that rely on wells.

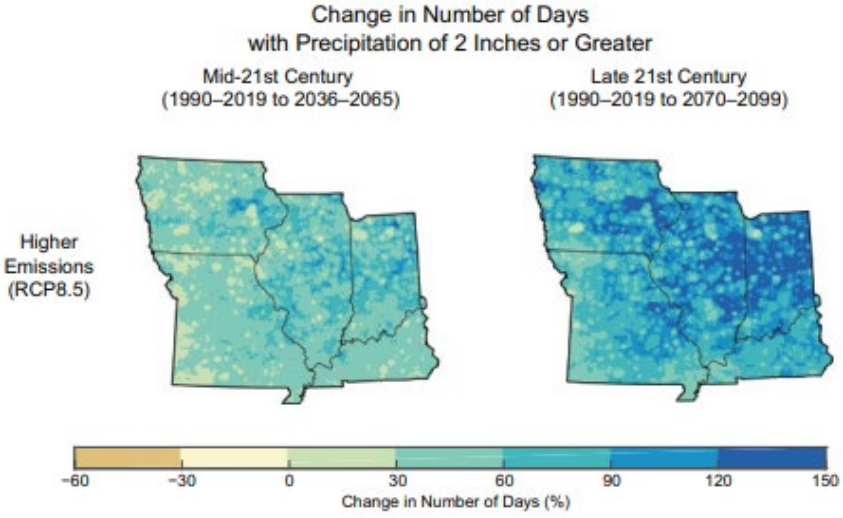


Figure 14. Changes in extreme precipitation by 2100. Source: The Nature Conservancy.

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 15*). 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.

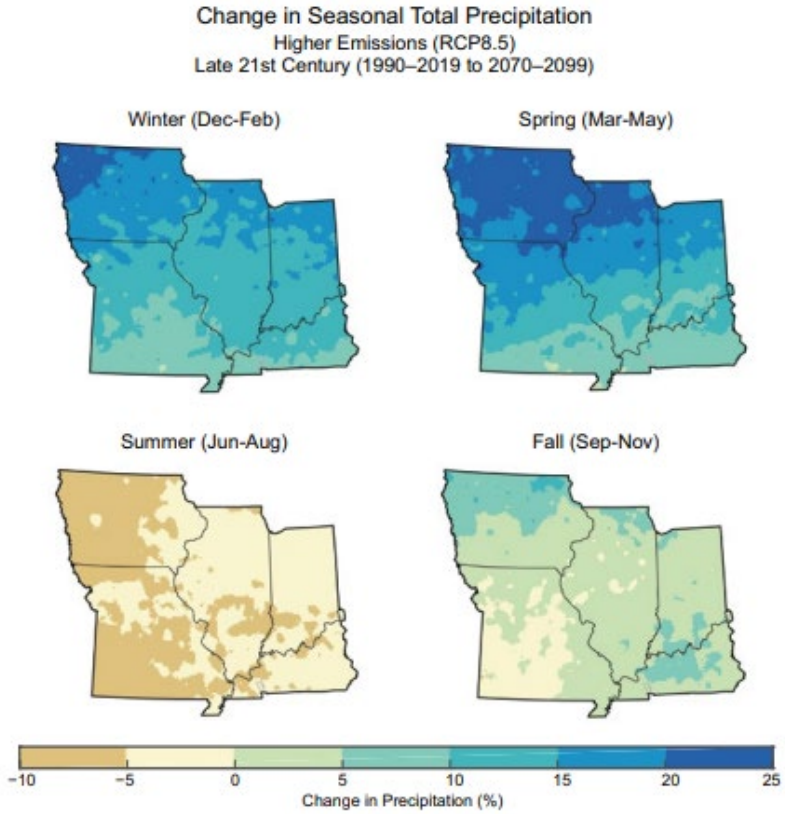


Figure 15. Changes in seasonal total precipitation by 2100. Source: The Nature Conservancy.

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 (*Table 20*) in Richland 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.[15]

Olney has Relatively Low to Relatively Moderate EAL, while census tracts surrounding Olney, which include Calhoun, Claremont, Noble, Parkersburg, and unincorporated Richland County have Relatively High EAL. Overall, the EAL for Richland County compared to other counties in the US is Relatively Low. Richland County is especially susceptible to losses from earthquakes, drought, and heat waves (*Table 20*).

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

Table 20. Expected annual losses for natural hazards. Source: FEMA

Hazard	Expected Annual Loss
Cold wave	$52,000
Drought	$500,000
Earthquake	$870,000
Hail	$76,000
Heat wave	$320,000
Ice storm	$42,000
Landslide	$7,900
Lightning	$33,000
Riverine flooding	$200,000
Wind	$310,000
Tornado	$700,000
Wildfire	$6
Winter weather	$31,000

COMMUNITY ASSETS

Built Environment

Building Exposure

Exposure consists of an estimation of the total replacement cost of all buildings in Richland 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 21 and Table 22 below. Table 21 shows the exposure based on the occupancy class, or use class, of the buildings. Table 22 contains the building exposure for each incorporated community and unincorporated Richland County.

Table 21. Building Exposure by Occupancy

Occupancy Class	Total Exposure (2022 USD)	Percent of Total
Residential	$4,904,842,000	55.00
Commercial	$2,710,103,000	30.39
Industrial	$541,385,000	6.07
Agriculture	$136,918,000	1.54
Religious	$142,686,000	1.60
Government	$105,633,000	1.18
Education	$376,099,000	4.22
Total	**$8,917,666,000**	**100**

Table 22. Building Exposure by Community

Community	Total Exposure (2022 USD)	Percent of Total
Calhoun, Village of	$51,839,000	0.58
Claremont, Village of	$74,642,000	0.84
Noble, Village of	$257,303,000	2.89
Olney, City of	$4,467,950,000	50.10
Parkersburg, Village of	$60,191,000	0.67
Unincorporated Areas	$4,005,741,000	44.92
Total	**$8,917,666,000**	**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 22 identified essential facilities in Richland 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 Richland 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 City of Olney.[16] This facility is City of Olney Sewage Treatment Plant located in the City of Olney.

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 *Richland County Multi-Jurisdictional Hazard Mitigation Pla*n.

The planning team was asked to help with updating the essential facilities at the October 15th, 2021 risk assessment meeting held both virtually and in the Richland County Court House in Olney, Illinois. 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 23 identifies the essential facilities that were used for the analysis. A complete list of the essential facilities is included in Appendix E: Essential Facilities.

Table 23. Essential facilities.

Facility	Number of Facilities
Emergency Operation Centers	1
Fire Stations	5
Medical Care Facilities	2
Police Stations	2
Schools	7
Wastewater Facilities	5

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 Olney for the GIS-based tornado analysis.

The building inventory was created using GIS parcel data containing 2020 county assessor's data provided by Richland County, and building footprints developed by Microsoft Corporation[17]. 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.

[16] FEMA Flood Insurance Rate Map #170581D. City of Olney, IL. Effective Date September 4, 1985. https://msc.fema.gov/portal/home

[17] Microsoft Building Footprints. Downloaded 2018. https://www.microsoft.com/en-us/maps/building-footprints

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 Richland County. The Richland Heritage Museum Foundation, for example, operates four museums – the Heritage House, the Carnegie Museum, the McsBurg Schoolhouse, and the Carriage House – that contain items and records with significant cultural impact, and host community events.[18]

Three structures and one district are listed on the National Register of Historic Places: the Hopkins Ambrose House, the Olney Carnegie Library, the Larchmound House, and the Elliott Street Historic District, located in Olney, IL.

Natural Environment

Richland County has one State Natural Area, Big Creek Woods Memorial, which contains abundant wildlife and vegetation. Richland County is also home to East Fork Lake, located in Olney. The lake provides numerous opportunities for outdoor recreation including fishing, boating, picnicking, and more than 70 acres of wooded area and farm ground with trails for hikers, mountain bikers, and horseback riders. 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.

[18] Richland Heritage Museum Foundation. Accessed October 12, 2022. https://richlandcountymuseums.org/home

SOCIAL VULNERABILITY

Elderly Populations

Richland County's population has a median age of 42.5 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[19] 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 2,709 people, or 17.5% of Richland 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 ACS estimates that 2,022 people, or 13.1% of Richland County's population lives below the poverty line. Nearly 30% of Calhoun's population is estimated to live below the poverty line. Olney has the second highest poverty rate at 17.4% (*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 Richland County is unknown, mobile and manufactured home are more vulnerable to natural hazards such as floods, wind, tornadoes, and earthquakes. Olney requires mobile homes to have tie-down equipment to mitigate hazard risk.[20] Noble requires mobile homes to either be anchored or underpinned to withstand wind pressure of 15 pounds per square inch.[21]

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[19] 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

[20] Municipal Code. Olney, IL. February 14, 2022. https://cms2.revize.com/revize/olneynew/Title%2015%20%20Buildings%20and%20Construction%202.14.2022.pdf

[21] Zoning Code. Noble, IL. Accessed October 2022. https://www.nobleillinois.com/codebook/zoning_code_chapter_40.htm

HAZARD PROFILES AND RISK ANALYSIS

Wind

High winds can occur during severe thunderstorms or during strong weather systems. Isolated damage is possible when winds are sustained at 40-50 mph, as high winds can blow objects around.[22] Wind speeds over 58 miles per hour are considered severe. Straight-line winds in severe thunderstorms can exceed speeds of 100 mph.[23] Winds this strong can damage, or in extreme cases demolish, trees and structures.

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
1.53	100	66

SOURCE: NCEI STORM EVENTS DATABASE (1955-2020)

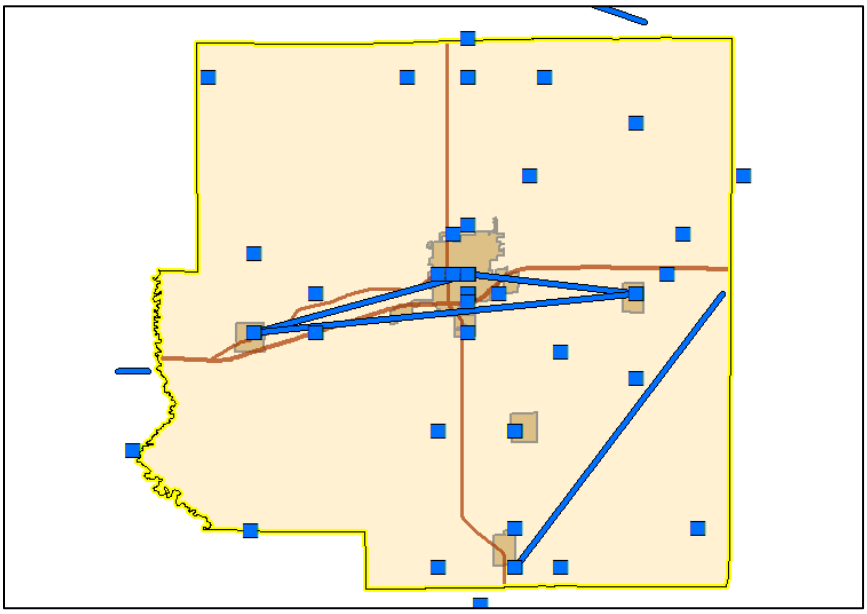

Figure 16: Severe Wind reports in Richland County (1955-2020). Source: NCEI

[22] National Weather Service, "Wind Safety", accessed Apr 2021. https://www.weather.gov/safety/wind
[23] National Weather Service, "Severe Thunderstorm Safety", accessed Apr 2021. https://www.weather.gov/safety/thunderstorm

On April 8th, 2020, supercell thunderstorms, characterized by tall and wide storm clouds and violent weather, broke out in central and southeastern Illinois. Heavy winds with gusts greater than 70mph were observed across the state. Northwest of Olney, IL, a barn was blown over, causing an estimated $50,000 in damages. Other high wind speed events across Richland County have caused toppled power poles and lines, roofs torn off barns and trailer homes, and fallen trees. In one severe wind event in 2004, a tree fell onto a person in a vehicle, causing minor injuries.[24] More recently, in October 2021, winds of 40-60 mph toppled trees and caused serious damage to buildings and vehicles (*Figure 17*). Luckily, no injuries were reported in this event.[25]

Figure 17. In Olney, a tree was uprooted and fell onto a vehicle during a storm in October 2021. Source: The Hometown Register, photo by Tim Dunahee

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.[26] To compare this with Richland County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for area, the State of Illinois has an average of 1.74 reports per year, higher than Richland County's average of 1.53 reports per year.

Overall, the frequency of storm environments conducive to producing severe weather, such as strong winds or tornadoes, has increased across much of the Midwest and mid-south over the past 40-50 years. Potential future impacts from wind could include frequently downed power lines and damage to the natural environment, which could in turn impact the agriculture and tourism sectors. Strong winds can cause damage to buildings, such as roof damage, broken windows, and collapsed walls. Trees can be uprooted by strong winds and their branches can block roads for hours, hampering emergency response.[27] FEMA's National Risk Index (NRI) calculates the expected annual loss for wind to be $310,000 for Richland County.

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[24] National Centers for Environmental Information, Storm Events Database, accessed Apr 2021. https://www.ncdc.noaa.gov/stormevents

[25] The Hometown Register, "Storm destroys trees, homes and cars", accessed Dec 2021. https://www.hometownregister.com/community/storm-destroys-trees-homes-and-cars/article_0b8c99c4-6c28-506c-abbc-a5c23e9d0d2d.html

[26] National Centers for Environmental Information, Storm Events Database, accessed Apr 2021. https://www.ncdc.noaa.gov/stormevents

[27] Illinois Emergency Management Agency. (2021). Wind hazards. Retrieved from https://www2.illinois.gov/iema/Preparedness/hazards/Pages/Wind.aspx

Hail

Hail is precipitation in the form of balls of irregular lumps of ice, typically from a thunderstorm.[28] Hail can be the size of a pea or smaller, however larger hailstones can cause severe damage to buildings, vehicles, and plants.[29] Hailstones less than 1.0 inch in diameter are not considered severe by the National Weather Service because the likelihood of these causing damage is lower. However, once a hailstone is 1.0 inch in diameter it has the potential to cause significant damage.[30]

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
0.47	31	66

SOURCE: NCEI STORM EVENTS DATABASE (1955-2020)

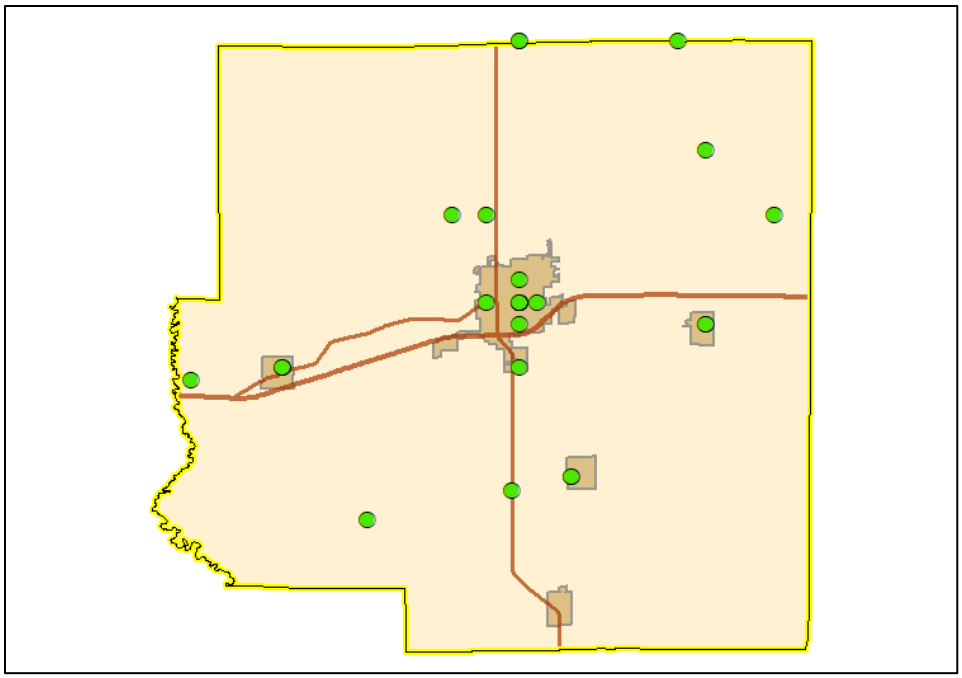

Figure 18. Hail Reports in Richland County (1955-2020). Source: NCEI

[28] American Meteorological Society Glossary, "Hail", accessed Apr 2021. https://glossary.ametsoc.org/wiki/Hail
[29] National Weather Service, "Severe Thunderstorm Safety", accessed Apr 2021. https://www.weather.gov/safety/thunderstorm
[30] National Weather Service, "National Implementation of the Use of 1-inch Diameter Hail Criterion for Severe Thunderstorm Warnings in the NWS", accessed Apr 2021. https://nws.weather.gov/products/PDD/OneInchHail_Oper_PDD.pdf

There have been 16 hailstorms in Richland County in which hail with a diameter of 1" or greater was documented since 1980. Although no major damages caused by hail have been documented in Richland County, nearby areas have experienced severe hail events. In 2001, Mount Carmel, IL replaced their fire department's roof due to hail damage.[31] In 2014, a hail storm caused damage to structures (*Figure 19*), and a farmer in neighboring Wabash County lost over 80 acres of corn and beans. [32]

Figure 19: Hail damage at The Allendale Sand and Gravel Company (in neighboring Wabash County). Source: The Hometown Register

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.[33] To compare this with Richland County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for area, the State of Illinois has an average of 0.89 hail reports per year, lower than Richland County's average of 0.47 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. When a hailstorm strikes, the damage can be catastrophic for homes, businesses, agriculture and infrastructure. FEMA's National Risk Index (NRI) calculates the expected annual loss for hail to be $76,000 for Richland County.

Climate model projections show a potential shift in the seasonality of supercells, which are more common in the central US than any other region. Supercells generate most of the tornadoes in the Midwest and virtually all hail. Model projections show a potential shift toward higher frequency of supercell storms in the late winter and early spring, with fewer in the fall. Climate projections for hail in Illinois are more uncertain than those for severe storms and supercells; however, models project the potential for decreased frequency of hail events but increased severity, meaning more intense and extensive impacts when hailstorms occur in the future.

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[31] The Hometown Register, "MCFD roof work due to hail damage", accessed Dec 2021. https://www.hometownregister.com/news/local_news/mcfd-roof-work-due-to-hail-damage/article_eb945fed-252d-5442-b268-9ede455ae493.html

[32] The Hometown Register, "A hail of a storm", accessed Dec 2021. https://www.hometownregister.com/news/local_news/a-hail-of-a-storm/article_7c884c43-ff41-5ff7-ba8a-078e758b7c69.html

[33] National Centers for Environmental Information, Storm Events Database, accessed Apr 2021. 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.[34] Lightning occurs most frequently during the summer, although thunderstorms can happen at any time of year.[35]

AVG CG STRIKES/YEAR	TOTAL CG STRIKES	YEARS IN RECORD
4,150	141,109	34

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

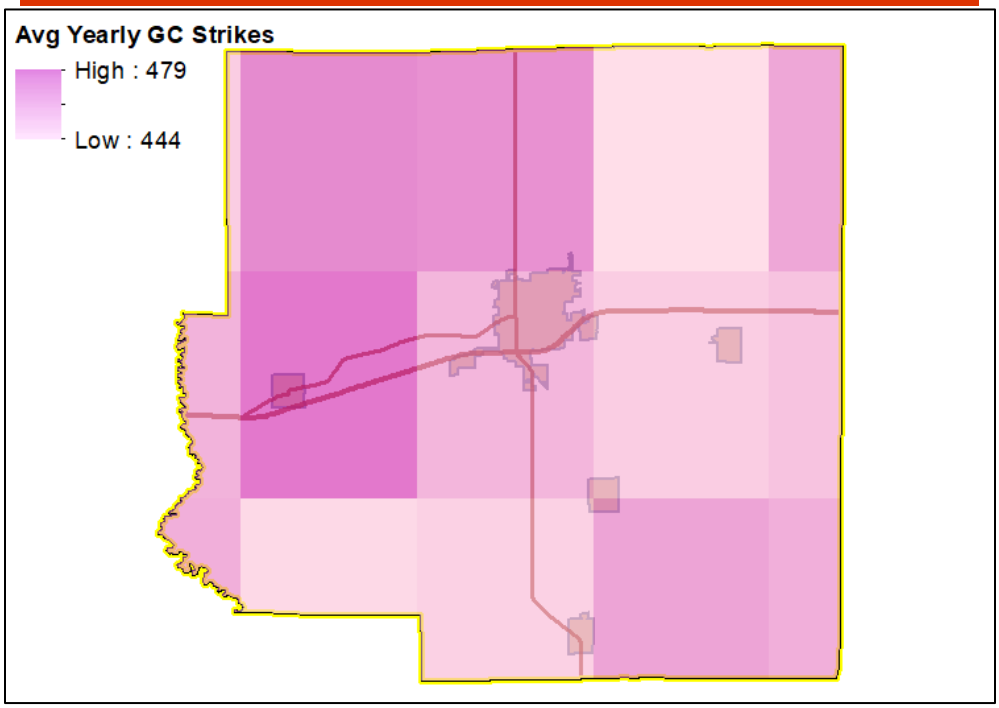

Figure 20. NCEI SWDI Average Yearly Cloud-to-Ground Lightning Strikes (1987-2020).

While the NCEI Storm Events database is a good source of information, it clearly does not record the occurrence of every single lightning strike over Richland 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 are recorded in 0.10-degree tiles. The number of average yearly strikes varies by tile. The number of average yearly strikes for tiles

[34] American Meteorological Society Glossary, "Lightning", accessed Apr 2021. https://glossary.ametsoc.org/wiki/Lightning

[35] National Weather Service, "Lightning Safety Tips and Resources", accessed Apr 2021. https://www.weather.gov/safety/lightning

covering Richland County ranges from 444 to 479. Adding up the average yearly number of strikes for each tile that covers Richland County yields a total of 4,150 average strikes per year. [36]

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 National Weather Service office in Medford developed Hourly Lightning Climatology. According to this climatology, lightning in Richland County is mostly occur during early mornings, afternoons and evenings of the summer months (*Figure 21*).[37]

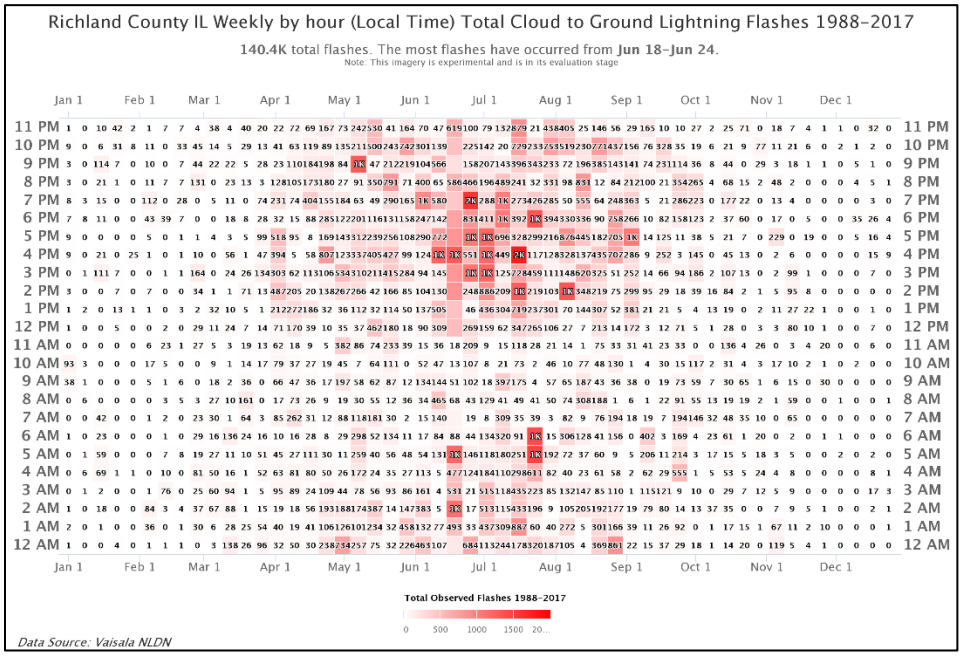

Figure 21. Weekly by Hour Total Cloud-to-Ground Lightning Flashes for Richland County (1988-2017). Source: NWS

On July 5th, 2008, a lightning strike in Olney caused $62,000 worth of property damage and injuries to three people. Lightning struck a 60-foot-tall brick chimney in downtown Olney, causing damage to the building's roof and 16 vehicles. Bricks were flung off the building up to one block away. Flying bricks and other debris caused minor injuries to three people.

[36] National Centers for Environmental Information, "Lightning Products and Services," accessed Dec 2021. https://www.ncei.noaa.gov/products/lightning-products

[37] National Weather Service Medford Office, "Hourly Lightning Climatology for Continental United States", accessed Dec 2021. https://www.weather.gov/mfr/lightning_climatology

Figure 22. Lightning damage to a tree after a storm in October 2014. Source: The Hometown Register

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. [38] To compare this with Richland County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for area, the State of Illinois has an average of 4,559 strikes per year, higher than Richland County's average of 4,150 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. Lightning strikes can damage infrastructure such as buildings, power lines, or cell phone towers. Lightning is a major cause for damage to trees and forests, either by directly killing trees on strike or by igniting fires and burning large numbers of trees when conditions are conducive to the spread of wildfires.[39] FEMA's National Risk Index (NRI) calculates the expected annual loss for lightning to be $33,000 for Richland County.

The impact of climate change on lightning is less well known. Researchers have begun to address the complexity and uncertainty around climate change impacts to severe weather in Illinois. It is thought the warmer and more humid climate in Illinois has had at least some effect on the increasing frequency in severe storm environments, and that lightning activity may increase in a warmer climate.[40]

[38] National Centers for Environmental Information, Storm Events Database, accessed Apr 2021. https://www.ncdc.noaa.gov/stormevents

[39] Latham, D., & Williams, E. (2001). Lightning and forest fires. In *Forest Fires* (pp. 375-418). Academic press. https://doi.org/10.1016/B978-012386660-8/50013-1

[40] Price, C. (2009). Will a drier climate result in more lightning?. *Atmospheric Research*, *91*(2-4), 479-484. https://doi.org/10.1016/j.atmosres.2008.05.016

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.[41] Although in Illinois they are more likely to occur in the Spring during late afternoon hours,[42] 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)

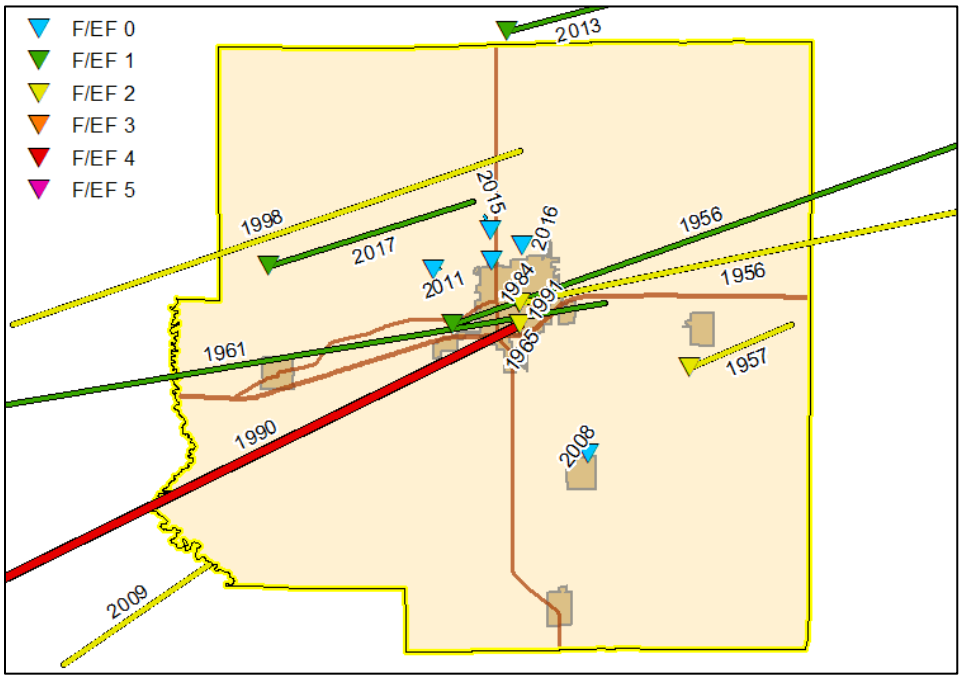

Figure 23. Tornado Reports/Tracks in Richland County (1950-2019). Source: NWS Storm Prediction Center

Richland County faced two devastating tornadoes in 1956 and 1991 that caused estimated damages of $2.5 million each, primarily to property. The strongest tornado in Richland County since 1955 struck on June 2nd, 1990, causing $250,000 worth of property damage. Categorized as an F4 tornado on the Fujita Scale, this storm first touched down west of Richland County, destroying a mobile home and toppling a tree onto two people in a pickup truck,

[41] National Weather Service, "Tornado Safety", accessed Apr 2021. https://www.weather.gov/safety/tornado
[42] Illinois State Climatologist, "Tornadoes in Illinois", accessed Apr 2021. https://stateclimatologist.web.illinois.edu/climate-of-illinois/tornadoes-in-illinois

causing injuries. The tornado went on to destroy a home 1 mile south of Olney, IL. The most recent damaging tornado struck Richland County on November 5th, 2017 (*Figure 24*). Although considered a weak tornado, an estimated $70,000 worth of damage to homes, barns, roofs, garages, and vehicles across the county was reported.[43]

Figure 24. A home damaged by the 11/05/2017 Richland County tornado. Source: National Weather Service

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. [44] To compare this with Richland County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for area, the State of Illinois has an average of 0.24 reports per year, lower than Richland County's 0.20 reports per year.

The risk of a tornado 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.

Tornado GIS Analysis

GIS-overlay modeling was used to estimate the potential impacts of an F3 tornado moving through Richland County. A hypothetical tornado track was created that begins in the southwestern quarter of the City of Olney and travels approximately 3 miles crossing through the city and terminates approximately 500 feet northeast of E Hall St.

[43] National Centers for Environmental Information, Storm Events Database, accessed Apr 2021. https://www.ncdc.noaa.gov/stormevents

[44] Ibid.

Description of Analysis

As stated above, the scenario for this analysis is a Fujita Scale F3 tornado moving through Richland 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.

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 (*Figure 25*). 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 24*. 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[45].

Once these zones were created, they were overlaid on top of points taken from the building inventory derived from the Richland County Assessor's database and building footprints developed by Microsoft Corporation[14]. 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 Section 8.2 Hazus Occupancy Classes . The number of structures that fell in each tornado damage zone is listed in *Table 25*. 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 24* to give an estimate of the dollar losses that may result in such an event. These loss estimates are listed in *Table 27*.

Table 24. 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

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

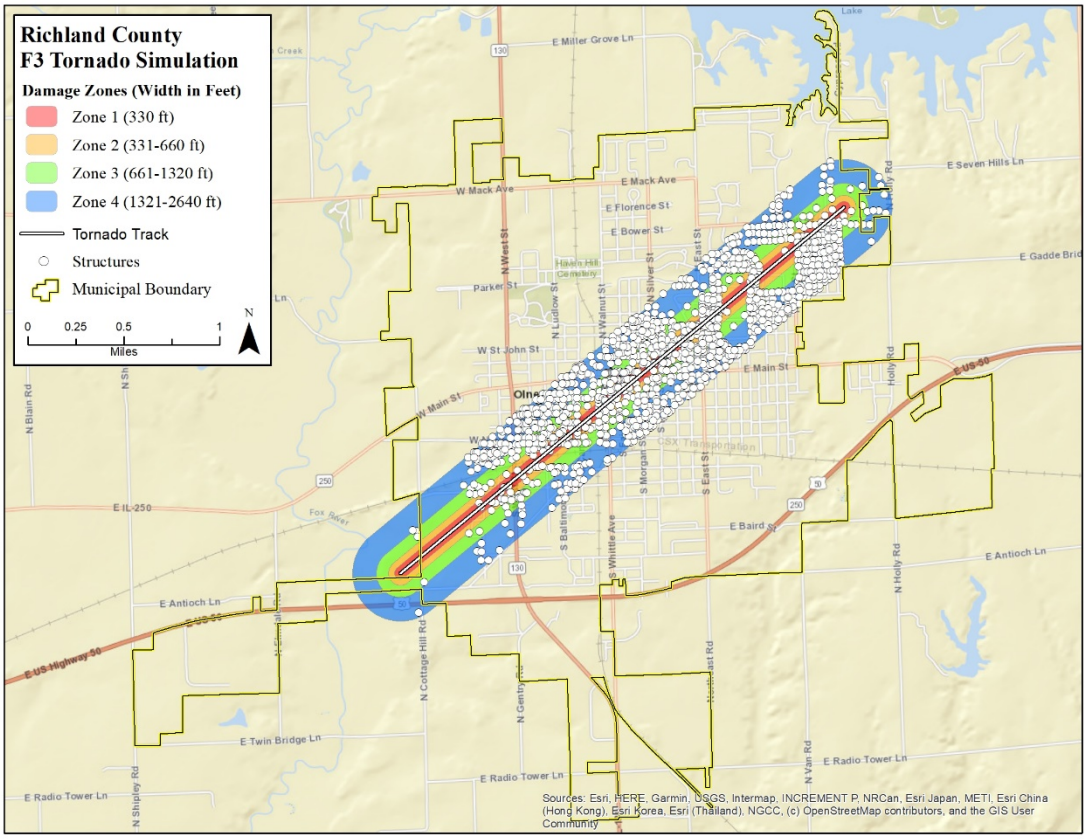

Figure 25. Tornado Damage Zones

Table 25. 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**

A total of 665 structures located in Zones 1-3 were damaged in this scenario. Seven of these structures were essential facilities. Two essential facilities fell within Zone 4. These facilities are listed in *Table 26*.

Table 26. Essential Facilities Located in Tornado Path

Essential Facilities	Damage Zone	City
Olney Police Department	Zone 1	Olney
Richland County Middle School	Zone 1	Olney
Richland Nursing and Rehab	Zone 2	Olney
City of Olney Sewage Treatment Plant	Zone 3	Olney
Richland County Sheriffs Office	Zone 3	Olney
Illinois Eastern Community Colleges	Zone 3	Olney
Richland County EMA	Zone 3	Olney
Carle Richland Memorial Hospital	Zone 3	Olney
Richland County High School	Zone 4	Olney
St. Joseph Elementary School	Zone 4	Olney

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 $299,668,797. As detailed in *Table 27* below, commercial losses are the largest contributor to loss estimates followed closely by industrial. This is due to high-value structures located in Damage Zone 1. Examples include Carle Richland Memorial Hospital and Richland Nursing and Rehab.

Table 27. Total Loss Estimates by Occupancy

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Residential	$42,080,472	$26,901,935	$13,280,064	$0
Commercial	$47,382,320	$84,084,780	$25,195,401	$0
Industrial	$0	$0	$563,405	$0
Agriculture	$0	$0	$63,786	$0
Governmental	$8,222,056	$3,900,240	$1,783,130	$0
Religion	$3,098,544	$5,684,260	$328,688	$0
Education	$29,132,096	$936,120	$7,031,500	$0
Total	**$129,915,488**	**$121,507,335**	**$48,245,974**	**$0**
Total Losses	**$299,668,797**			

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Riverine Flooding

Flooding is a natural part of the hydrologic cycle. It rains, water collects on the ground, it evaporates, 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.[46]

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
0.24	6	25

SOURCE: NCEI STORM EVENTS DATABASE (1950-2020)

In addition to the Unincorporated Areas of Richland County, three incorporated communities have FEMA Flood Insurance Rate Maps (FIRM) showing Special Flood Hazard Areas (SFHA) within Richland County; Claremont, Olney, and Parkersburg (*Figure 26*).[47] Two communities - Unincorporated Richland County and Olney – participate in the National Flood Insurance Program. It is important to note that flooding can occur outside of SFHAs.

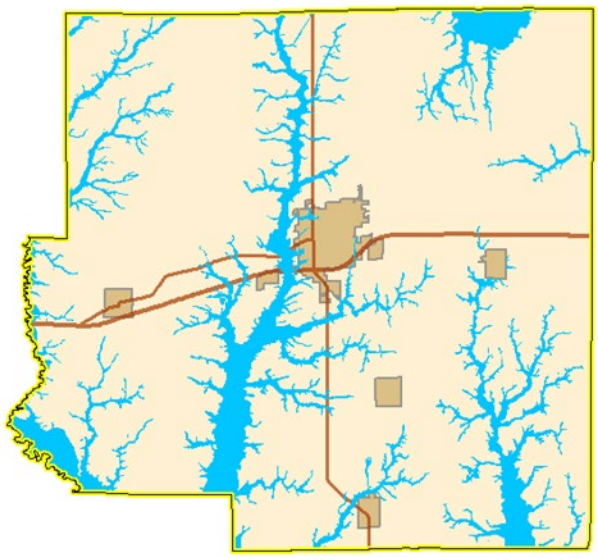

Figure 26. Special Flood Hazard Areas from Flood Insurance Rate Maps in Richland County. Sources: Federal Emergency Management Agency (FEMA), Map Service Center (MSC)

[46] Midwestern Regional Climate Center, "Living with Weather: Floods", accessed Apr 2021. https://mrcc.illinois.edu/living_wx/floods/index.html

[47] Federal Emergency Management Agency, Flood Map Service Center, accessed Apr 2021. https://msc.fema.gov

Three heavy rainfall events occurred between April 29th and May 11th, 2017, that caused widespread riverine and flash flooding in Richland County. Several streets in Olney flooded, numerous creeks overflowed, and many rural roads were impassable for up to 48-hour periods. Despite the widespread flooding, there were no reported injuries, fatalities, or damage to property or crops.[48]

In the State of Illinois, there have been 2,750 reports of flash flooding between 1996 and 2020, producing an average of 110.00 reports per year.[49] To compare this average with Richland County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for spatial area, the State of Illinois has an average of 0.69 riverine flooding reports per year, higher than Richland County's average of 0.24 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.

According to "An Assessment of the Impacts of Climate Change in Illinois", mean precipitation 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. As a result, flooding in most rivers/streams is expected to continue to increase.[50]

Flood Risk Assessment

The flood risk assessment conducted for Richland 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 Richland 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 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 United States Geological Survey (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[51] program. This includes LiDAR data made available in 2011.

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[48] National Centers for Environmental Information, Storm Events Database, accessed Apr 2021. https://www.ncdc.noaa.gov/stormevents

[49] National Centers for Environmental Information, Storm Events Database, accessed Apr 2021. https://www.ncdc.noaa.gov/stormevents

[50] Wuebbles, D; Angel, J; Petersen, K; Lemke, A.M. (2021): An Assessment of the Impacts of Climate Change in Illinois. University of Illinois at Urbana-Champaign. https://doi.org/10.13012/B2IDB-1260194_V1

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

Building Exposure

31 structures were identified to be at a high risk of flooding in Richland 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 fair market value of the structures are detailed in *Table 28* below.

Table 28. 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**
City of Olney	3	$1,296,208	5	$2,756,060
Richland County Unincorporated Areas	15	$3,956,061	26	$8,064,645
Total	**18**	**$5,252,269**	**31**	**$10,820,705**

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 29* and *Table 30*.

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.

Table 29. Total Flood Losses by Community (2021 USD)

		Community Name		
		Olney	Richland County Unincorporated Areas	**Total**
10% Annual Chance Flood (10yr)	Count	1	6	7
	Total Losses	$19,200	$174,960	$194,160
4% Annual Chance Flood (25yr)	Count	1	6	7
	Total Losses	$17,110	$235,050	$252,160
2% Annual Chance Flood (50yr)	Count	2	8	10
	Total Losses	$35,190	$279,570	$314,760
1% Annual Chance Flood (100yr)	Count	2	11	13
	Total Losses	$55,620	$358,820	$414,440
0.2% Annual Chance Flood (500yr)	Count	4	23	27
	Total Losses	$217,240	$1,066,350	$1,283,590
Average Annualized Loss	Count	4	23	27
	Total Losses	$3,600	$28,490	$32,090

Table 30. Total Flood Losses by Occupancy (2021 USD)

		Occupancy Class				
		Agricultural	Commercial	Government	Residential	**Total**
10% Annual Chance Flood (10yr)	Count	2	2	1	2	7
	Total Losses	$20,090	$142,160	$4,250	$27,660	$194,160
4% Annual Chance Flood (25yr)	Count	2	2	1	2	7
	Total Losses	$30,960	$177,720	$8,580	$34,900	$252,160
2% Annual Chance Flood (50yr)	Count	4	2	2	2	10
	Total Losses	$49,540	$193,330	$13,860	$58,030	$314,760
1% Annual Chance Flood (100yr)	Count	5	2	2	4	13
	Total Losses	$68,730	$207,390	$16,760	$121,560	$414,440
0.2% Annual Chance Flood (500yr)	Count	7	3	3	14	27
	Total Losses	$343,220	$243,470	$137,300	$559,600	$1,283,590
Average Annualized Loss	Count	7	3	3	14	27
	Total Losses	$5,280	$17,600	$1,650	$7,560	$32,090

Flash Flooding

Flooding is a natural part of the hydrologic cycle. It rains, water collects on the ground, it evaporates, it rains again. Flooding becomes a problem when water collects on the ground in locations where it normally does not, such as 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.[52] 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.[53] 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
1.20	30	25

SOURCE: NCEI STORM EVENTS DATABASE (1950-2020)

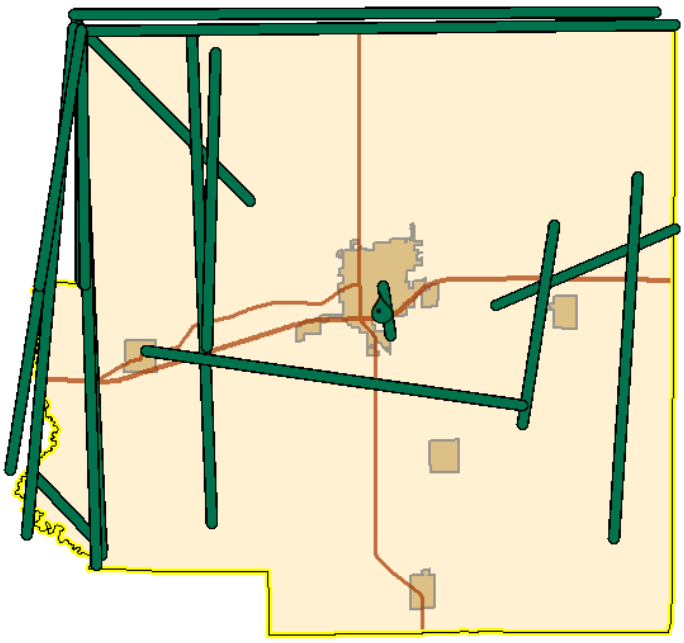

Figure 27. Flash Flood Reports in Richland County (1996-2020). Source: NCEI

Between September 7th and 8th, 2018, Tropical Storm Gordon dropped nearly 7" of rain on Richland County (*Figure 28*). An additional 2" of rain in less than 3 hours was occurred during the afternoon of September 8th, submerging

[52] National Weather Service, "Flood Related Hazards", accessed Jun 2021. https://www.weather.gov/safety/flood-hazards

[53] Midwestern Regional Climate Center, "Living with Weather: Floods", accessed Apr 2021. https://mrcc.illinois.edu/living_wx/floods/index.html

roads and causing flash flooding across the area.[54]In Olney, flooding to a residential property was reported, one city-owned boat dock floated away, and there was moderate flooding to the Gun Range building.[55]

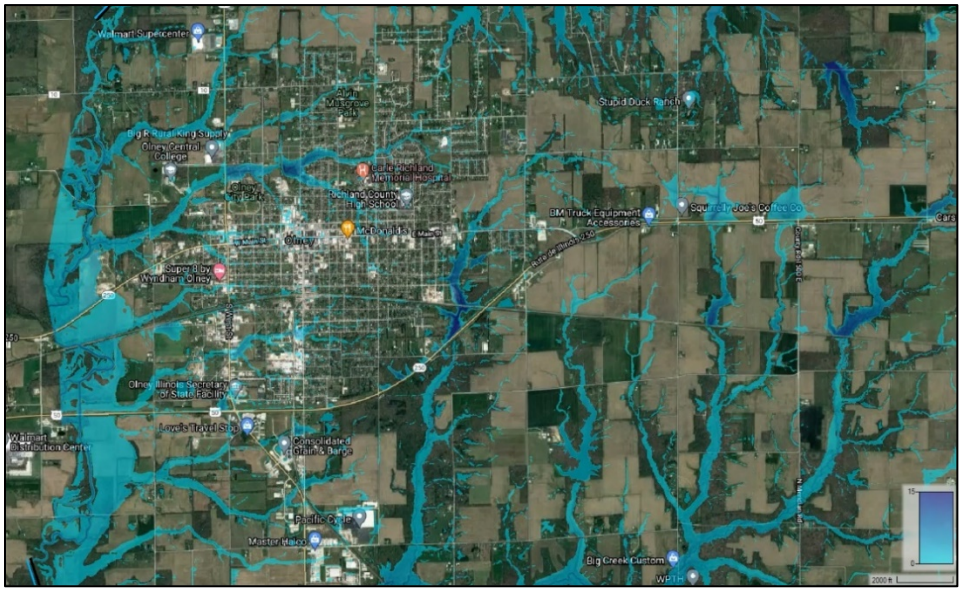

Figure 28. September 8th, 2018, flash flood event in Olney, IL. Precipitation data source: Illinois Climate Network

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. [56] To compare this average with Richland County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for spatial area, the State of Illinois has an average of 0.68 flash flooding reports per year, lower than Richland County's average of 1.20 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. [57] Although rates and amounts of a rain event play the largest factor in whether a location sees a flash flood, the risk for a heavy rainfall is the same across the county.

The Topographic Wetness Index (TWI) uses the effect of local topography on runoff flow direction and accumulation. TWI shows areas with increased accumulated runoff potential, and areas with low slope and large upslope contributing areas. The index can help identify rainfall runoff patterns, areas of potential increased soil moisture, and ponding areas. The Illinois State Water Survey has an interactive map that can be used to identify potential flooding areas across the state of Illinois.[58] Figure 29 shows areas in the county has runoff potential or low slope areas.

[54] National Centers for Environmental Information, Storm Events Database, accessed Apr 2021. https://www.ncdc.noaa.gov/stormevents
[55] City of Olney, City Council Meeting, September 10, 2018. https://www.ci.olney.il.us/departments/city_clerk/minutes.php#revize_document_center_rz1373
[56] National Centers for Environmental Information, Storm Events Database, accessed Apr 2021. https://www.ncdc.noaa.gov/stormevents
[57] Illinois Department of Natural Resources, "Report for the Urban Flooding Awareness Act", June 2015. https://www.dnr.illinois.gov/WaterResources/Documents/Final_UFAA_Report.pdf
[58] ISWS. *Illinois TWI*. (n.d.). Retrieved from https://www.illinoisfloodmaps.org/twi.aspx

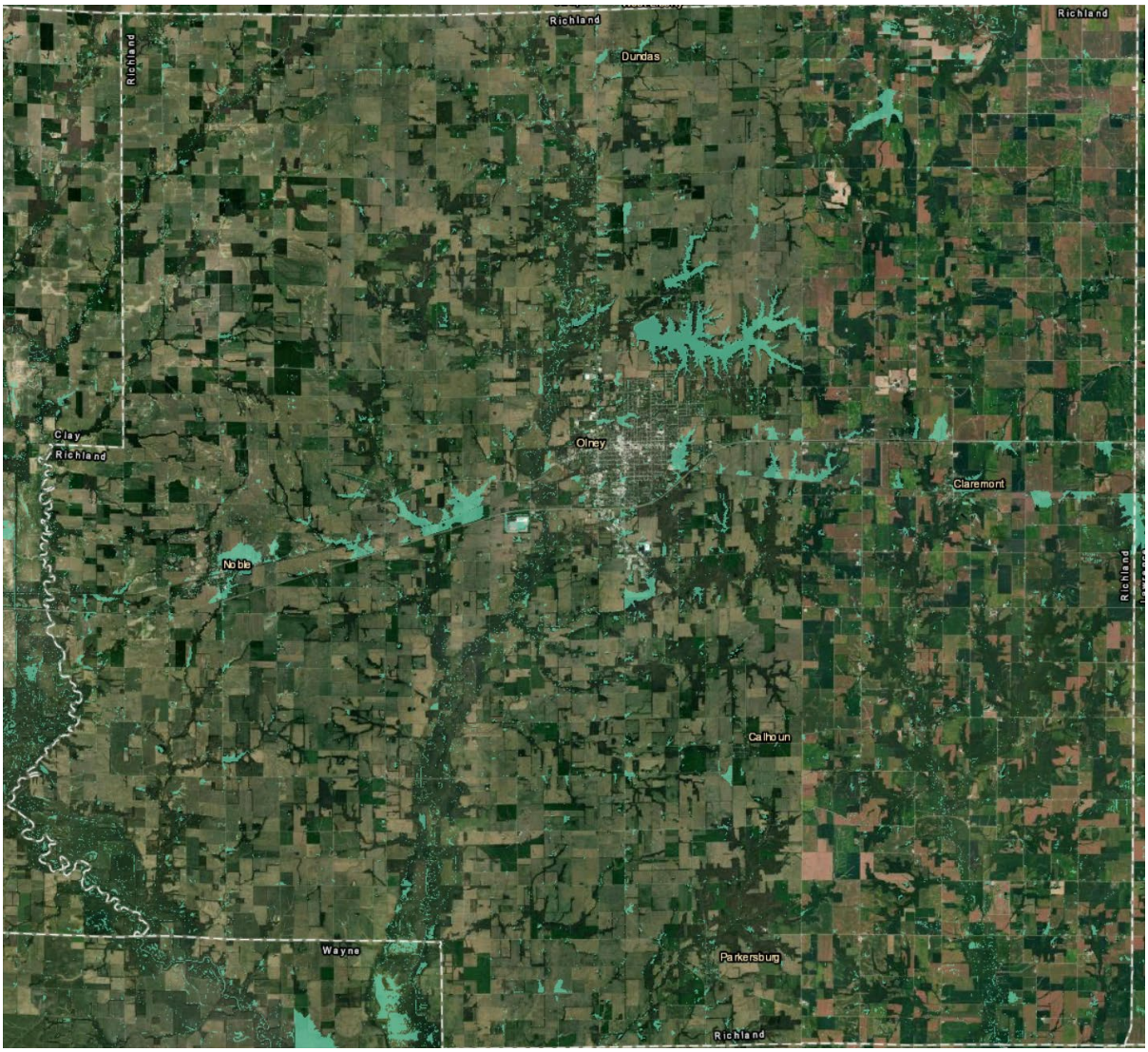

Figure 29. Topographic Wetness Index for Richland County. Source: ISWS

According to "An Assessment of the Impacts of Climate Change in Illinois", mean precipitation 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 is expected to worsen flash flooding in developed areas.[59]

A flash flood risk analysis for socially vulnerable populations was completed at the census tract level (Figure 30). The entire county has a low risk of flash flooding. The City of Olney has a more socially vulnerable population than the surrounding areas.

[59] Wuebbles, D; Angel, J; Petersen, K; Lemke, A.M. (2021): An Assessment of the Impacts of Climate Change in Illinois. University of Illinois at Urbana-Champaign. https://doi.org/10.13012/B2IDB-1260194_V1

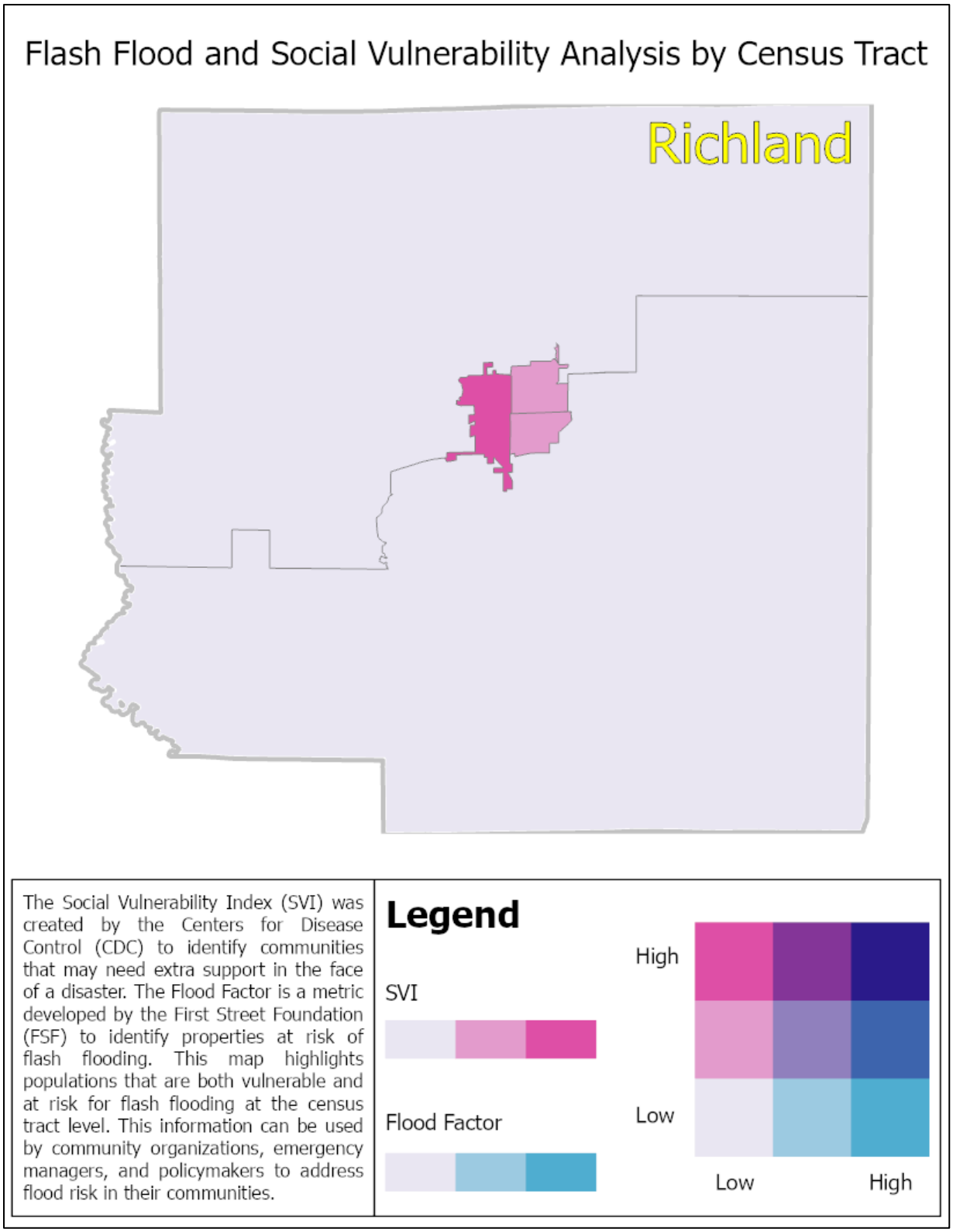

Figure 30: Flash Flood and Social Vulnerability Analysis.

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.[60]

HIGH HAZARD POTENTIAL DAMS	SIGNIFICANT HAZARD POTENTIAL DAMS	LOW HAZARD POTENTIAL AND UNDETERMINED DAMS	TOTAL DAMS
2	2	6	10

SOURCE: USACE NATIONAL INVENTORY OF DAMS (2018)

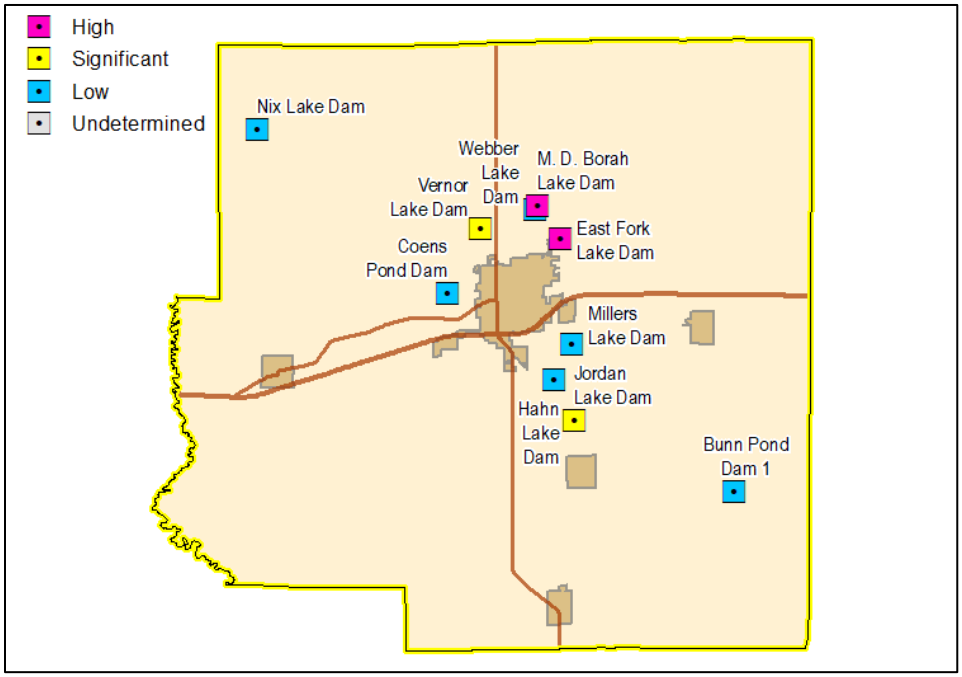

Figure 31: Dams in Richland County (2018). Source: USACE NID

[60] United States Army Corps of Engineers, National Inventory of Dams, accessed Apr 2021. https://nid.sec.usace.army.mil

Figure 32. East Fork Lake. Source: City of Olney website; photo by Xavier Smith

According to the National Inventory of Dams, there are 10 dams located within Richland County (*Figure 31*). Two dams, East Fork Lake Dam and M. D. Borah Lake Dam, are ranked with high downstream hazard potential (*Figure 32*). Two other dams, Hahn Lake Dam and Vernon Lake Dam, are listed with significant downstream hazard potential. The other 6 dams have either low or undetermined downstream hazard potential.

The areas downstream of these dams are most at risk for potential impacts in the event of a dam failure. Possible impacts would be similar to those experienced in riverine or flash flooding events.

While there are no records of dam failure within Richland County, dams have failed within the State of Illinois. The Association of State Dam Safety Officers keeps a database of dam failures. It contains one report in Illinois of an incident in June 2011 of the Waltonville Lake Dam in Jefferson County failing.[61] In another event reported by local media, the Happy Hollow Lake dam in Knox County failed in June 2019, causing a sinkhole in the only road to a residential area.[62]

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 the 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 a heavy rainfall is the same across the county.

According to "An Assessment of the Impacts of Climate Change in Illinois", mean precipitation 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. As a result, flooding in most rivers/streams is expected to continue to increase.[63]

[61] Association of State Dam Safety Officials (ASDSO), Dam Incident Database, accessed Apr 2021. https://damsafety.org/incidents

[62] WMBD News, "Knox County dam failure causes residents to be rerouted", accessed Jun 2021. https://www.centralillinoisproud.com/news/local-news/knox-county-dam-failure-causes-residents-to-be-rerouted

[63] Wuebbles, D; Angel, J; Petersen, K; Lemke, A.M. (2021): An Assessment of the Impacts of Climate Change in Illinois. University of Illinois at Urbana-Champaign. https://doi.org/10.13012/B2IDB-1260194_V1

Winter Weather

As the seasons in the Midwest change from Summer to Fall and Winter, cold Arctic air pushes farther south into the region. Winter storms can form as large low pressure systems and bring sub-freezing temperatures, snow, and wind.[64] 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 (*Figure 33*). 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. [65]

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
0.76	19	25

SOURCE: NCEI STORM EVENTS DATABASE (1996-2020)

Figure 33. Heavy snow slows down traffic at an intersection. Photo by Zoe Zaloudek

The Midwestern Regional Climate Center has calculated snow climatology for selected stations across the US. An observation station in Olney, IL was one of the stations selected. As seen in the *Table 31* below, the area can expect an average of 1.4 events per year with at least 6 inches of snow over a 3-day period.[66]

[64] Midwestern Regional Climate Center, "Living with Weather: Winter Storms", accessed Apr 2021. https://mrcc.illinois.edu/living_wx/winterstorms/index.html

[65] National Weather Service, "Snow Storm Safety", accessed Apr 2021. https://www.weather.gov/safety/winter-snow

[66] Midwestern Regional Climate Center, Snow Climatology Tool, accessed Apr 2021. https://mrcc.illinois.edu/gismaps/snowclimatology.htm

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

OLNEY 2S

	≥ 0.1"	≥ 1.0"	≥ 2.0"	≥ 3.0"	≥ 4.0"	≥ 6.0"	≥ 8.0"	≥ 12.0"	≥ 18.0"	≥ 24.0"
All Months	19.5	12.2	7.5	4.7	3	1.4	0.4	0	0	0
January	6.2	3.7	2.5	1.4	0.8	0.3	0.1	0	0	0
February	5.3	3	1.6	1.3	0.8	0.4	0.2	0	0	0
March	2.5	1.8	0.9	0.6	0.5	0.2	0	0	0	0
April	0.2	0.2	0.1	0.1	0.1	0	0	0	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	0.9	0.6	0.4	0.1	0.1	0	0	0	0	0
December	4.5	2.9	2	1.2	0.8	0.4	0.1	0	0	0

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

Table 31. Average number of 3-day snow totals of selected amounts for Olney, IL (1960/61 – 2017/18). Source: Midwestern Regional Climate Center

Between the evening of February 15th and the afternoon of February 16th 2015, a winter storm blew through the Central Plains eastward into the Tennessee River Valley. Richland County reported between 8 and 9 inches of snow in less than 24 hours. Although there were no reported injuries or fatalities, multiple traffic accidents occurred due to heavy snowfall and hazardous roads.[67]

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. [68] To compare this with Richland County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for area, the State of Illinois has an average of 1.39 reports per year, higher than Richland County's average of 0.76 reports per year.

The extent of the historical winter storms varies in terms of storm location, temperature, and ice or snowfall. Due to the expansive size of winter storms, the area impacted by winter storms is often viewed at a regional level. There are no known factors that make one area or community more prone to these events than another.

Winter storms, particularly those accompanied by heavy snow or strong winds, can cause damage to infrastructure such as power lines, roadways, bridges, and buildings. Roofs can collapse under the weight of snow or ice, and high winds can cause structural damage or topple trees onto buildings. Repairing and restoring infrastructure can be expensive and result in significant economic costs for governments, businesses, and households. Preparation for winter storms, such as opening warming shelters and salting roads, may also be a significant expense for jurisdictions. Areas in the county with important infrastructure, such as the City of Olney which contains the county's only hospital, may be at higher risk for winter storms. FEMA's National Risk Index (NRI) calculates the expected annual loss for winter weather to be $31,000 for Richland County.

[67] National Centers for Environmental Information, Storm Events Database, accessed Nov 2021. https://www.ncdc.noaa.gov/stormevents

[68] National Centers for Environmental Information, Storm Events Database, accessed Apr 2021. https://www.ncdc.noaa.gov/stormevents

The NWS uses the Winter Storm Severity Index (WSSI) to differentiate the possible impacts of winter storms (Figure 34). The WSSI does not depict official warnings and should always be used in context with official NWS forecasts and warnings.

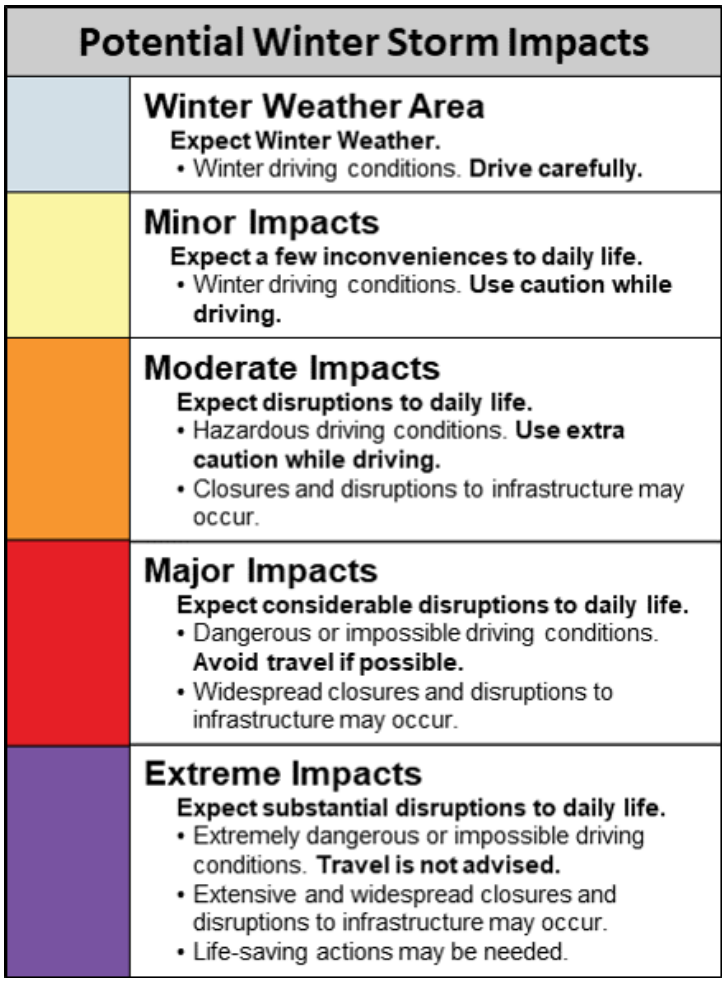

Figure 34: Winter Storm Severity Index (WSSI) Potential Impacts. Source: NOAA, NWS

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.[69]

[69] Wuebbles, D; Angel, J; Petersen, K; Lemke, A.M. (2021): An Assessment of the Impacts of Climate Change in Illinois. University of Illinois at Urbana-Champaign. 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.[70] 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.[71]

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 1948-2000, Richland County can expect an average of 3 to 4 days with freezing rain per year (*Figure 35*).[72]

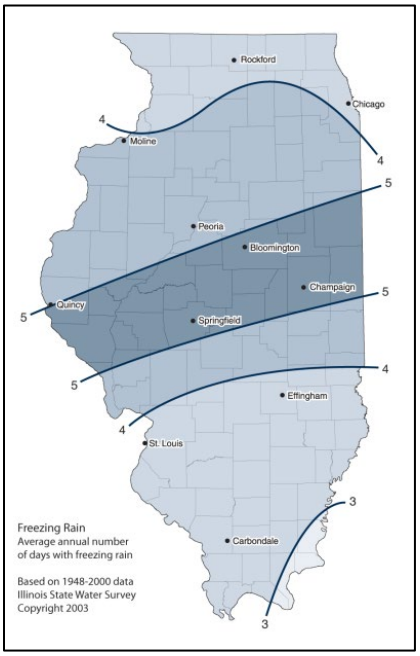

Figure 35: Average Annual number of days with Freezing Rain (1948-2000). Source: Illinois State Climatologist

[70] Midwestern Regional Climate Center, "Living with Weather: Ice Storms", accessed Apr 2021. https://mrcc.illinois.edu/living_wx/icestorms/index.html

[71] National Weather Service, "Ice Storm Safety", accessed Apr 2021. https://www.weather.gov/safety/winter-ice-frost

[72] Illinois State Climatologist, "Ice Storms in Illinois", accessed Apr 2021. https://stateclimatologist.web.illinois.edu/climate-of-illinois/ice-storms-in-illinois

On February 1st and 2nd 2011, an ice storm occurred across parts of central and southeast Illinois. Olney received 0.3 inches of freezing rain, and parts of Richland County measured between 0.25 and 0.5 inches of ice. Although there were no injuries or fatalities, $300,000 of property damage was reported. Downed tree limbs from the heavy glaze of ice caused power outages, and icy roads caused several traffic accidents across Richland County.[73]

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. [74] To compare this with Richland County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for area, the State of Illinois has an average of 0.11 reports per year, higher than Richland County's average of 0.08.

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. The Sperry-Piltz Ice Accumulation (SPIA) Index is commonly used to measure the impact of ice storms.[75] Similar to the enhanced Fujita scale for tornadoes, the SPIA Index uses structure and infrastructure damage as a metric for measuring severity (Figure 36).

ICE DAMAGE INDEX	DAMAGE AND IMPACT DESCRIPTIONS
0	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
2	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
3	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
4	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
5	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.

Figure 36: Sperry-Piltz Ice Accumulation Index. Source: spia-index.com

Future changes in ice storm frequency, severity, and extent remain uncertain because of (1) the challenge of observing and constraining model ice simulations and (2) models' difficulty capturing ice storm processes at necessarily fine scales. Ice accumulation can be particularly damaging to trees, power lines, and infrastructure. The weight of ice can cause branches and power lines to break, leading to power outages and hazardous conditions. The weight of ice can cause building roofs to collapse. Freezing temperatures accompanied by ice storms can lead to pipes bursting, causing damage to water supply and wastewater systems. Ice storms can also cause widespread transportation disruptions, including flight cancellations, road closures, and delays in rail and public transportation services. FEMA's National Risk Index (NRI) calculates the expected annual loss for ice storms to be $42,000 for Richland County.

[73] National Centers for Environmental Information, Storm Events Database, accessed Apr 2021. https://www.ncdc.noaa.gov/stormevents

[74] National Centers for Environmental Information, Storm Events Database, accessed Apr 2021. https://www.ncdc.noaa.gov/stormevents

[75] spia-index.com. (2019). What is the Sperry–Piltz ice accumulation index? https://www.spia-index.com

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.[76]

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
0.24	6	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, (not actually drought), and Moderate (D1), Severe (D2), Extreme (D3) and Exceptional (D4) Drought.[77] 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 37* below shows the USDM Drought Categories for Richland County.

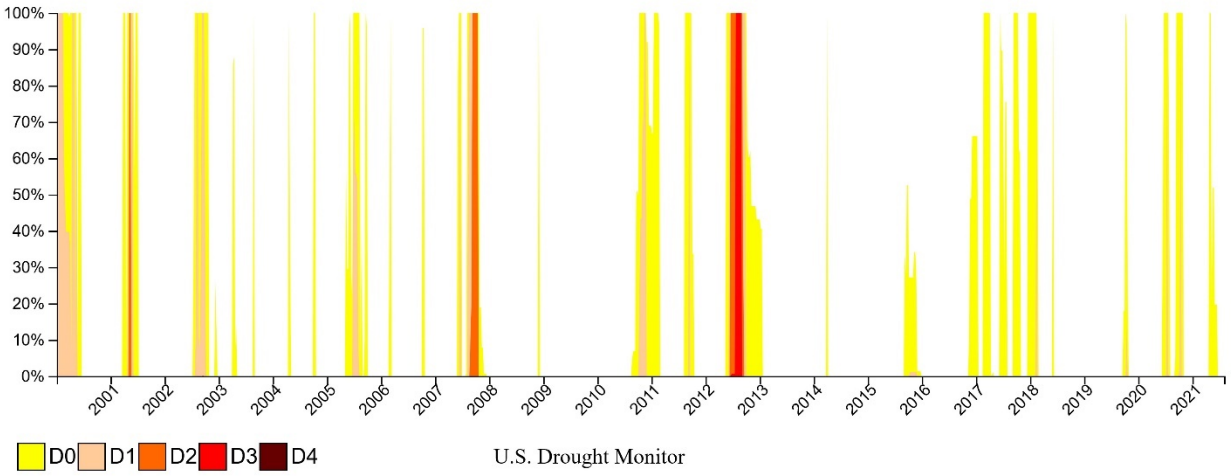

Figure 37: Percent of Richland County area in USDM Drought Categories over time (2000-2020)

Illinois was one of several states stricken by the historic US drought of 2012 (*Figure 38*). After a dry, record warm March and an abnormally dry May, conditions deteriorated rapidly throughout the summer. The average corn

[76] Midwestern Regional Climate Center, "Living with Weather: Drought", accessed Apr 2021. https://mrcc.illinois.edu/living_wx/drought/index.html

[77] National Integrated Drought Information System, "U.S. Drought Monitor (USDM)", accessed Apr 2021. https://www.drought.gov/data-maps-tools/us-drought-monitor

yield in Illinois was about 40% below normal, and average soybean yields were about 10% below normal. Monetary loss from reduced corn crop yield in Richland County was estimated at $24.7 million. In Olney, soil temperatures at 4 inches under sod reached 99.9°F, a record high for the area. East Fork Lake, which supplies raw water for Olney, lost 15% of its full capacity volume. The turning point of the drought occurred in August, due to the remnants of Hurricane Isaac and other August-September precipitation events.[78]

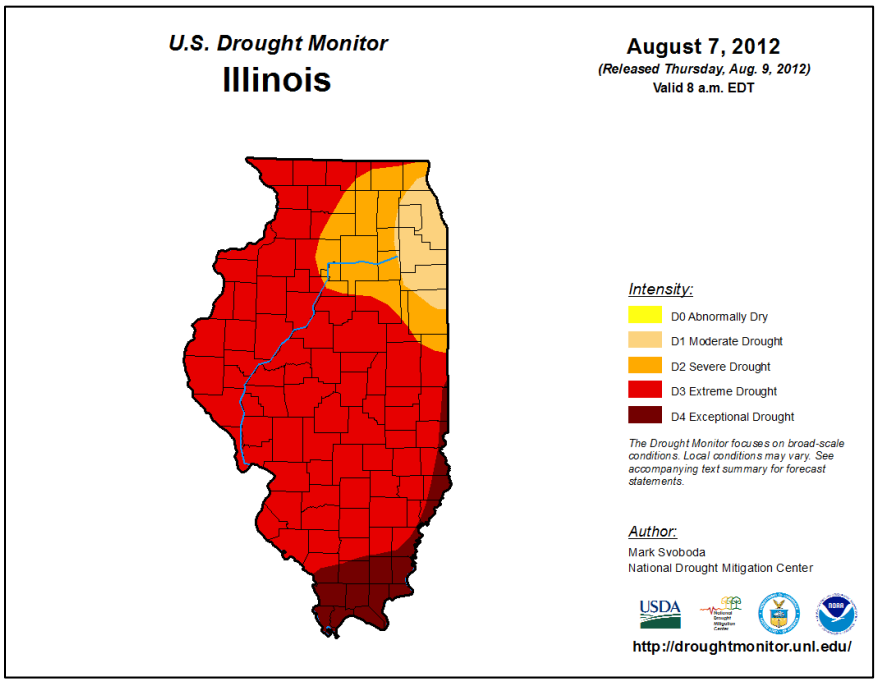

Figure 38: US Drought Monitor map for Illinois on 8/7/2012

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. [79] To compare this with Richland County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for area, the State of Illinois has an average of 0.25 events per year, higher than Richland County's average of 0.24 events 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. Farmland makes up over 90% of Richland's County's land cover, which is extremely susceptible to drought. FEMA's National Risk Index (NRI) calculates the expected annual loss for drought to be $500,000 for Richland County, much of which can be attributed to crop damage and loss.

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.[80]

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[78] Knapp, H. Vernon; Angel, James R.; Atkins, Jennie R.; Bard, Luke; Getahun, Elias; Hlinka, Kenneth J.; Keefer, Laura L.; Kelly, Walton R.; Roadcap, George S., (2017): The 2012 Drought in Illinois. Illinois State Water Survey. http://hdl.handle.net/2142/96286

[79] National Centers for Environmental Information, Storm Events Database, accessed Apr 2021. https://www.ncdc.noaa.gov/stormevents

[80] Wuebbles, D; Angel, J; Petersen, K; Lemke, A.M. (2021): An Assessment of the Impacts of Climate Change in Illinois. University of Illinois at Urbana-Champaign. 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 (sometimes referred to as the "Feels Like" temperature) is commonly used to provide a value taking relative humidity into account (*Figure 39*). [81] 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
0.48	12	25

SOURCE: NCEI STORM EVENTS DATABASE (1996-2020)

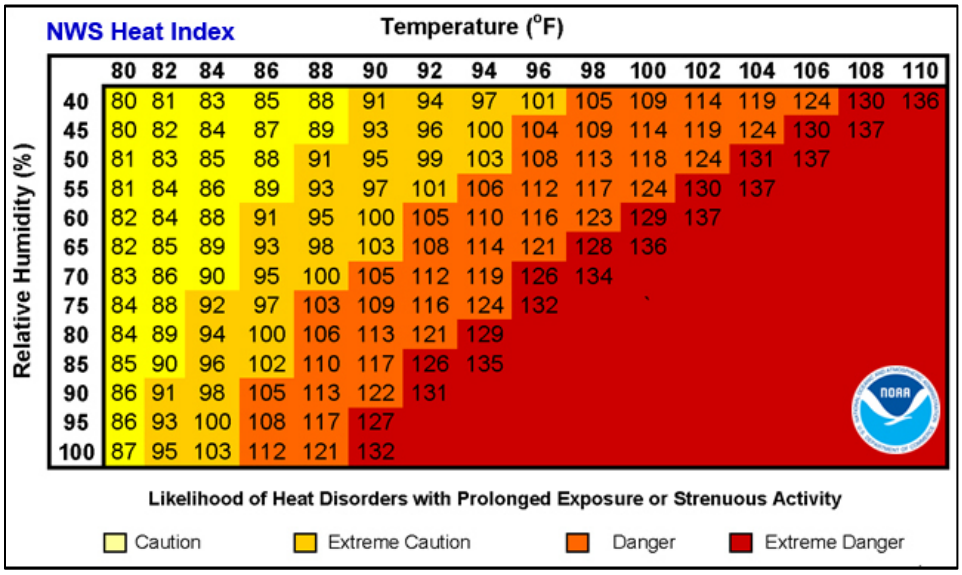

Figure 39: Heat Index Chart. Source: National Weather Service

Because the normal temperatures for an area vary across the country, National Weather Service (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." [82] The NWS office in Lincoln, IL (ILX) has the following criteria for a Heat Advisory: heat index temperatures must forecast for 105°F or higher. A warning "is issued when a hazardous weather or hydrologic event is occurring, is imminent, or has a very high probability of occurring. A warning is

[81] National Weather Service, "Heat Forecast Tools", accessed Apr 2021. https://www.weather.gov/safety/heat-index

[82] National Weather Service Glossary, accessed Apr 2021. https://w1.weather.gov/glossary

used for conditions posing a threat to life or property." [83] For ILX to issue a heat warning, maximum heat index temperatures must be forecast for at least 110°F and minimum heat index temperatures must be forecast for at least 75°F for 48 consecutive hours.

The Midwestern Regional Climate Center has calculated Heat Index climatology for selected stations across the US. Evansville Regional Airport near Evansville, IN is the station closest to Richland County. As seen in *Table 32* below, the area can expect an average of 4.7 days per year with at least one hour of Heat Index temperatures at 105°F. [84]

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

EVANSVILLE REGIONAL AP

Heat Index ≥	80°F	85°F	90°F	95°F	100°F	105°F	110°F	115°F
Calendar Year	118.9	85	55.6	32.3	14.6	4.7	1.1	0.1
January	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0
March	0.6	0	0	0	0	0	0	0
April	3.6	0.5	0	0	0	0	0	0
May	11.9	6.5	2.2	0.4	0	0	0	0
June	24.3	18.5	12	6.2	2.1	0.5	0.1	0
July	29.2	25.1	19.5	13.3	7.2	2.5	0.6	0
August	27.9	22.8	15.6	9.7	4.6	1.6	0.4	0
September	16.9	10.3	6	2.6	0.7	0	0	0
October	4.3	1.4	0.3	0	0	0	0	0
November	0.2	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

Table 32. Average number of days with at least 1 hour of selected Heat Index temperatures for Evansville Regional Airport near Evansville, IL (1973-2018). Source: Midwestern Regional Climate Center

In early June 2011, hot and humid conditions developed over central Illinois. Air temperatures reached the lower to middle 90°F and the heat index reached around 100°F. [85] The Heat Index was not high enough for either a Heat Advisory or a Heat Warning to be issued. Unfortunately, one heat-related death was reported in Richland County. A 19-month-old child was found unresponsive on June 8th 2011 in an unairconditioned room in Noble, IL and died later the same day of hyperthermia. This was the only heat related death reported in Richland County between 1996 and 2020. [86]

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. [87] To compare this with Richland County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for area, the State of Illinois has an average of 0.58 reports per year, lower than Richland County's average of 0.48 reports per year.

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[83] National Weather Service Glossary, accessed Apr 2021. https://w1.weather.gov/glossary

[84] Midwestern Regional Climate Center, "Heat Index Climatology", accessed Apr 2021. https://mrcc.illinois.edu/clim/heatIndex/index.jsp

[85] National Weather Service St. Louis office, "Historic Heat Wave 2012", accessed Apr 2021. https://www.weather.gov/media/lsx/Events/07_07_2012.pdf

[86] National Centers for Environmental Information, Storm Events Database, accessed Apr 2021. https://www.ncdc.noaa.gov/stormevents

[87] National Centers for Environmental Information, Storm Events Database, accessed Apr 2021. https://www.ncdc.noaa.gov/stormevents

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.[88] Due to the nature of heat waves, the area impacted is often viewed at a regional level, and likely affects the entire county.

Intense heat can cause the surface of roads to deform as pavement expands in the heat. The pavement pushes up off the ground at its weak spots when there is no place for it to expand, or where cracks have weakened the pavement, particularly in areas of poor drainage. The risk for roads buckling is greatest when the temperature is over 90 degrees for extended periods. Heat waves can increase demand for electricity, which can lead to power outages and blackouts, particularly in areas with aging or stressed energy infrastructure.[89] The increased demand on water due to a heat wave can have impacts on water sources, which can lead to reduced water quality and availability. FEMA's National Risk Index (NRI) calculates the expected annual loss for heat wave to be $320,000 for Richland County.

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 extreme 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. [90] Many aspects of urban and rural development and economic stability can increase or decrease the risk of heat wave health impacts, including loss of life. For example, sprawl-based urban development increases the intensity of the urban heat island effect, which increases the exposure risk of residents to extreme heat. This type of development also tends to favor car-based transit and car-dependent communities, which increases the risk of social isolation, one of the best predictors of heat health outcomes.

[88] Illinois State Climatologist, "1995 Heat Wave", accessed Jun 2021. https://stateclimatologist.web.illinois.edu/climate-of-illinois/1995-heat-wave

[89] United States. Environmental Protection Agency. Office of Atmospheric Programs. (2006). Excessive heat events guidebook. US Environmental Protection Agency, Office of Atmospheric Programs. https://www.epa.gov/sites/default/files/2016-03/documents/eheguide_final.pdf

[90] Wuebbles, D; Angel, J; Petersen, K; Lemke, A.M. (2021): An Assessment of the Impacts of Climate Change in Illinois. University of Illinois at Urbana-Champaign. 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 (sometimes referred to as the "Feels Like" temperature) is commonly used to provide a value taking wind speeds into account (*Figure 40).*[91]

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

SOURCE: NCEI STORM EVENTS DATABASE (1996-2020)

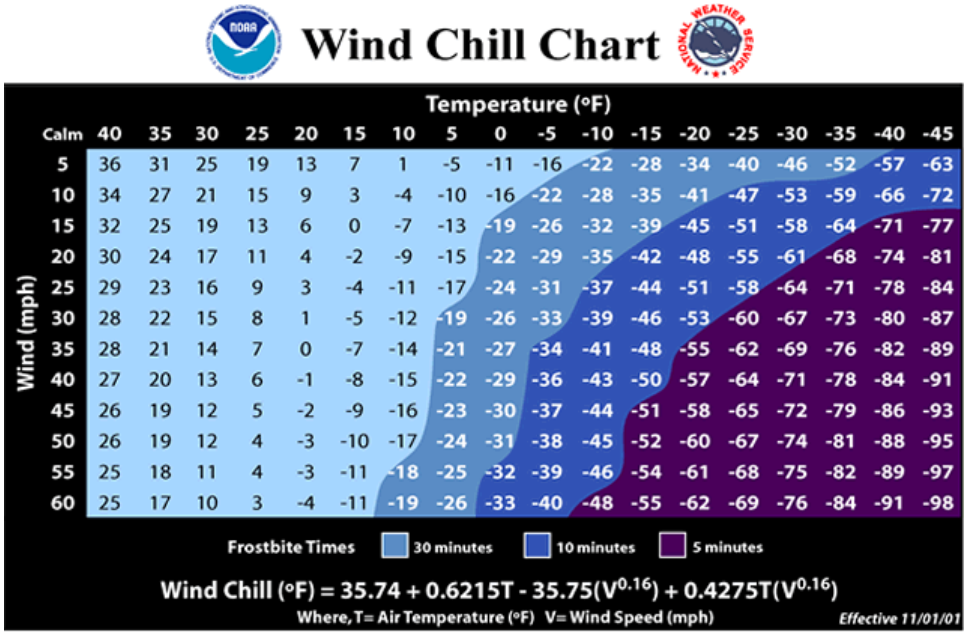

Figure 40: Wind Chill Chart. Source: National Weather Service

Because the normal temperatures for an area vary across the country, National Weather Service (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

[91] National Weather Service, "Wind Chill Chart", accessed Apr 2021. https://www.weather.gov/safety/cold-wind-chill-chart

may threaten life and/or property." [92] The NWS office in Lincoln, IL (ILX) issues a Wind Chill Advisory when temperatures are expected to be between 15°F and -24°F. A Warning "is issued when a 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." [93] For ILX to issue a Wind Chill Warning, wind chill temperatures need to be forecast at -25°F or below.

The Midwestern Regional Climate Center has calculated Wind Chill climatology for selected stations across the US. Evansville Regional Airport near Evansville, IN is the station closest to Richland County. As seen in *Table 33* below, the area can expect an average of 1.3 days per year with at least one hour of Heat Index temperatures at -15°F. [94]

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

EVANSVILLE REGIONAL AP

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	103	73.6	47.5	31	20.4	14	8.5	4.6	2.5	1.1	0.7	0.3	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	2	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0
November	11.8	7	2.6	1.1	0.3	0.1	0.1	0	0	0	0	0	0	0	0
December	23.1	17.2	11.7	7.3	4.6	3.2	1.9	1.2	0.5	0.2	0.1	0.1	0.1	0	0
January	26.9	22.2	16.6	12.4	8.8	6.4	4.1	2.3	1.4	0.6	0.5	0.2	0	0	0
February	21.9	16.8	11.9	8.3	5.8	3.8	2.2	1	0.6	0.3	0.1	0	0	0	0
March	14.1	8.8	4.4	1.9	0.9	0.5	0.2	0.1	0	0	0	0	0	0	0
April	3.2	1.1	0.3	0	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

Table 33. Average number of days with at least 1 hour of selected Wind Chill temperatures for Evansville Regional Airport near Evansville, IN (1973/74 - 2018/19). Source: Midwestern Regional Climate Center

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. [95] To compare this with Richland County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for area, the State of Illinois has an average of 0.24 reports per year, higher than Richland County's average of 0.12 reports per year.

In general, the risk of a cold 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, keeping urban areas warmer than rural areas during cold

[92] National Weather Service Glossary, accessed Apr 2021. https://w1.weather.gov/glossary
[93] National Weather Service Glossary, accessed Apr 2021. https://w1.weather.gov/glossary
[94] Midwestern Regional Climate Center, "Wind Chill Climatology", accessed Apr 2021. https://mrcc.purdue.edu/clim/windChill/index.jsp
[95] National Centers for Environmental Information, Storm Events Database, accessed Apr 2021. https://www.ncdc.noaa.gov/stormevents

waves.[96] Due to the nature of cold waves, the area impacted is often viewed at a regional level and likely affects the entire county. Cold weather can also cause aging critical infrastructure and systems, such as electrical and water/wastewater systems to fracture and fail. Pipes can freeze and burst, leading to disruptions in water supply for homes and businesses. Damage to buildings can occur if they are not designed to withstand extreme cold temperatures. This can include damage to roofs, windows, and other structural components. FEMA's National Risk Index (NRI) calculates the expected annual loss for cold wave to be $52,000 for Richland County.

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 extreme cold temperatures.[97]

[96] Oleson, K.W., Anderson, G.B., McGinnis, S.A., and Sanderson, B. (2018) Avoided climate impacts of urban and rural heat and cold waves over the US using large climate model ensembles for RCP8.5 and RCP4.5. https://doi.org/10.1007/s10584-015-1504-1

[97] Wuebbles, D; Angel, J; Petersen, K; Lemke, A.M. (2021): An Assessment of the Impacts of Climate Change in Illinois. University of Illinois at Urbana-Champaign. 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.[98,99] 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.[100]

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
0.67	34	51

SOURCE: USGS EARTHQUAKE CATALOG (1970-2020)

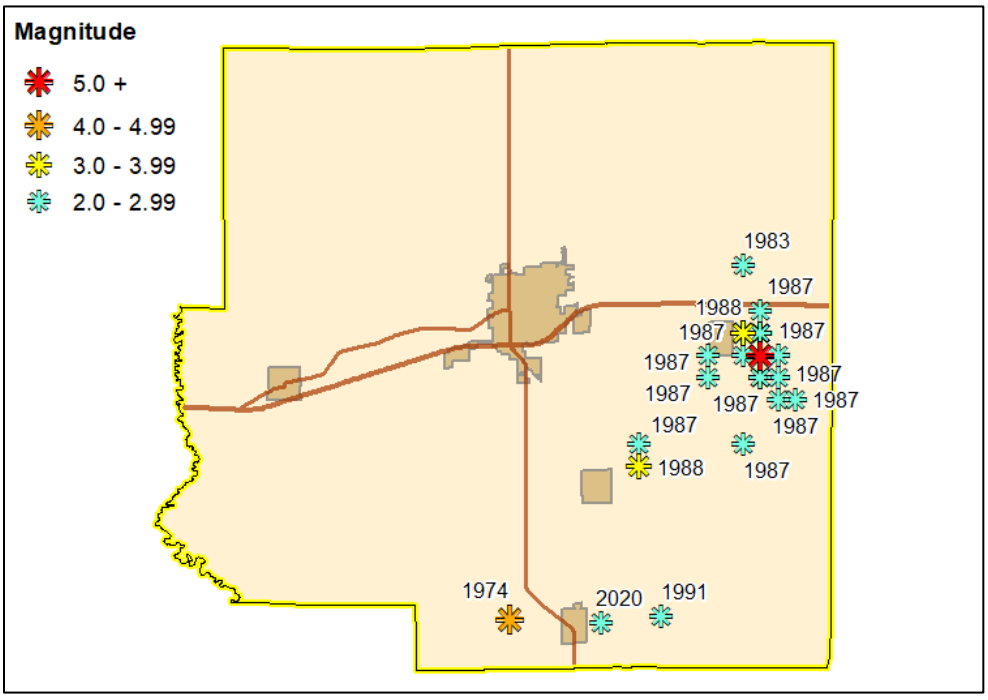

Figure 41. Earthquakes of Magnitude 2.0+ recorded within 1 km of Richland County (1970-2020). Source: United States Geological Survey

[98] Illinois State Geological Survey, "Earthquake Occurrence in Illinois", 1995. https://isgs.illinois.edu/sites/default/files/files/qk-fct-occur.pdf

[99] Illinois State Geological Survey, "Wabash Valley Earthquakes", 1996. https://isgs.illinois.edu/sites/default/files/files/eq-fct-wabash.pdf

[100] Illinois State Geological Survey, "Damaging Earthquakes in Illinois", 1995. https://isgs.illinois.edu/sites/default/files/files/qk-fct-damag.pdf

The 2008 Illinois earthquake was among the largest earthquakes measured in the state of Illinois. The earthquake's epicenter was in the Wabash Valley Seismic Zone near Bellmont, IL, less than 30 miles southeast of Olney, IL. The earthquake had a magnitude of 5.2 and an intensity of VII[101], indicating very strong shaking felt by many people and minor structural damage.[102] While there no reports of damage or injuries in Richland County, 44 residents reported feeling earthquake effects to the USGS's "Did You Feel It?" tool[103], which collects information from people who felt an earthquake to show extent, intensity, and damage.[104] Aftershocks continued for over two weeks after the earthquake. In 1987, 30 years prior to the 2008 Illinois earthquake, an earthquake with similar magnitude and intensity was reported in Illinois. Its epicenter was in Richland County, only 7.5 miles east of Olney, IL. Minor structural damage, such as cracked chimneys, windows, walls, and fences, and muddied well water, were reported.[105]

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 (*Figure 42*). This map shows peak ground accelerations having a 2-percent probability of being exceeded in 50 years. While the highest hazard area in Illinois is the southernmost counties, Richland County is shown in pale and bright yellow, which are upper-middle hazard categories.[106]

[101] United States Geological Survey (USGS), "M 5.2 – 7 km NNE of Bellmont, Illinois", accessed Dec 2021. https://earthquake.usgs.gov/earthquakes/eventpage/nm606657/executive

[102] United States Geological Survey (USGS), "The Modified Mercalli Intensity Scale", accessed Dec 2021. https://www.usgs.gov/programs/earthquake-hazards/modified-mercalli-intensity-scale

[103] United States Geological Survey (USGS), "M 5.2 – 7 km NNE of Bellmont, Illinois | Did You Feel It?", accessed Dec 2021. https://earthquake.usgs.gov/earthquakes/eventpage/nm606657/map?dyfi-responses-10km=true&shakemap-intensity=false

[104] United States Geological Survey (USGS), "Did You Feel It?", accessed Dec 2021. https://earthquake.usgs.gov/data/dyfi/

[105] Langer, C.J., Powers, P.S., Johnston, A.C., and Bollinger, G.A. (1987). The Olney, Illinois, Earthquake of 10 June 1987: A Preliminary Report. https://pubs.usgs.gov/of/1987/0623/report.pdf

[106] United States Geological Survey (USGS), "2014 Seismic Hazard Map for Illinois", accessed Apr 2021. https://www.usgs.gov/media/images/2014-seismic-hazard-map-illinois

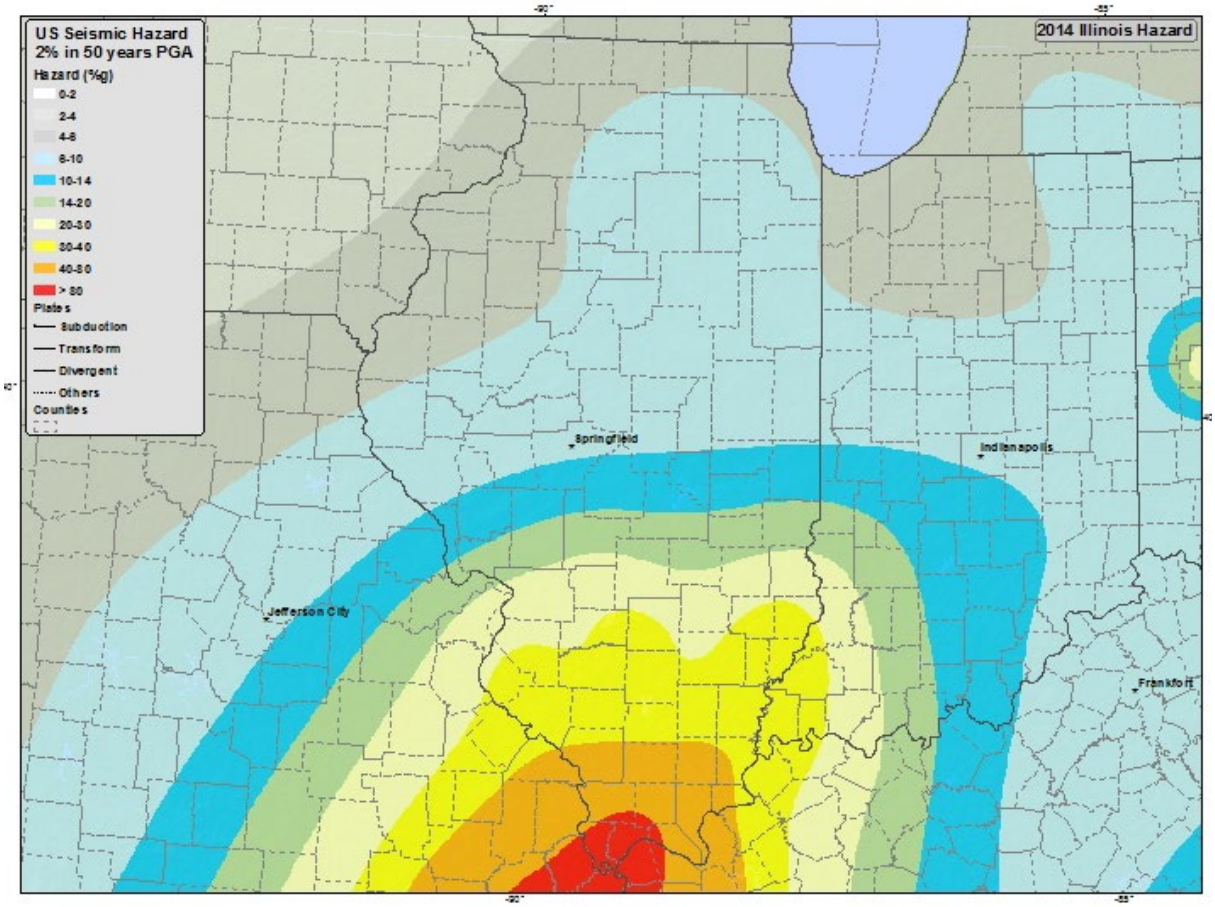

Figure 42. 2014 Illinois Seismic Hazard Map. Source: United States Geological Survey

In the State of Illinois, there have been 583 cataloged earthquakes (within 10km of the state) between 1970 and 2020, producing an average of 11.43 earthquakes per year.[107] To compare this with Richland County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for area, the State of Illinois has an average of 0.07 reports per year, lower than Richland County's average of 0.67 events per year.

Hazus Earthquake Analysis

For planning purposes, a Hazus Level 1 analysis was run on two earthquake scenarios that could impact Richland 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: Richland County Historical Event
    - Replication of the 5.2M event that occurred June 10th, 1987
- Scenario #2: Wabash Valley Hypothetical Event
    - 7M event occurring in the Wabash Valley Seismic Zone

[107] United States Geological Survey (USGS), Earthquake Catalog, accessed Apr 2021. https://earthquake.usgs.gov/earthquakes/search

Building Damage

Scenario #1: Richland County Historical Event

- Hazus estimates that 2,105 buildings will be at least moderately damaged. This is over 27% of the total number of buildings in the region. An estimated 166 buildings will be damaged beyond repair.

Scenario #2: Wabash Valley Hypothetical Event

- An estimated 3,294 buildings will be at least moderately damaged in this scenario. This is over 42% of the total number of buildings in the region. It's estimated that 892 buildings will be damaged beyond repair.

Economic Loss

Scenario #1: Richland County Historical Event

- The total economic loss estimated for the earthquake is $655.02 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 $1,206.44 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: Richland County Historical Event

- Total building-related losses were $315.3 million; 17% 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 45% of the total loss.

Scenario #2: Wabash Valley Hypothetical Event

- Total building-related losses were $781.98 million; 15% 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 32% 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: Richland County Historical Event

- Economic losses to transportation infrastructure was estimated to be $$5.27 million. This represents loss incurred by physical damage to highways and railways.
- Utility System losses were estimated to be $$335.96 million. This includes damages to pipelines, facilities, and distribution lines for utilities including potable water, waste water, natural gas, electrical power, and communication.

Scenario #2: Wabash Valley Hypothetical Event

- Economic losses to transportation infrastructure was estimated to be $22.40 million. This represents loss incurred by physical damage to highways and railways.
- Utility System losses were estimated to be $405.43 million. This includes damages to pipelines, facilities, and distribution lines for utilities including potable water, waste water, natural gas, electrical power, and communication.

Summary of Scenario Losses

Selected results of the two earthquake scenarios are shown in

Table 34 below. Both scenarios would potentially have a significant impact in Richland 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 34. Earthquake Scenario Results (Estimated Losses in Millions of 2021 USD)

	Category	Scenario #1 Richland County 5.2M	Scenario #2 Wabash Valley 7M
Buildings Damaged (Count)	Moderate	1,376	1,490
	Extensive	564	912
	Complete	166	892
	Subtotal	**2,106**	**3,294**
Building Related Economic Loss Estimate	Income Losses	$53.7762	$120.7853
	Capital Stock Losses	$261.5231	$661.1967
	Subtotal	**$315.2993**	**$781.9820**
Transportation System Economic Loss Estimate	Highway	$3.2815	$15.0149
	Airport	$0.8394	$1.4792
	Railway	$1.1442	$5.9068
	Subtotal	**$5.2651**	**$22.4009**
Utility System Economic Loss Estimate	Potable Water	$2.7603	$9.8871
	Waste Water	$332.6060	$393.7394
	Natural Gas	$0.4751	$1.7015
	Electrical Power	$0.0000	$0.0000
	Communication	$0.1173	$0.1010
	Subtotal	**$335.9587**	**$405.4290**
	Loss Totals	**$656.5231**	**$1,209.8119**

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.[108]

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
0.26	7	27

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

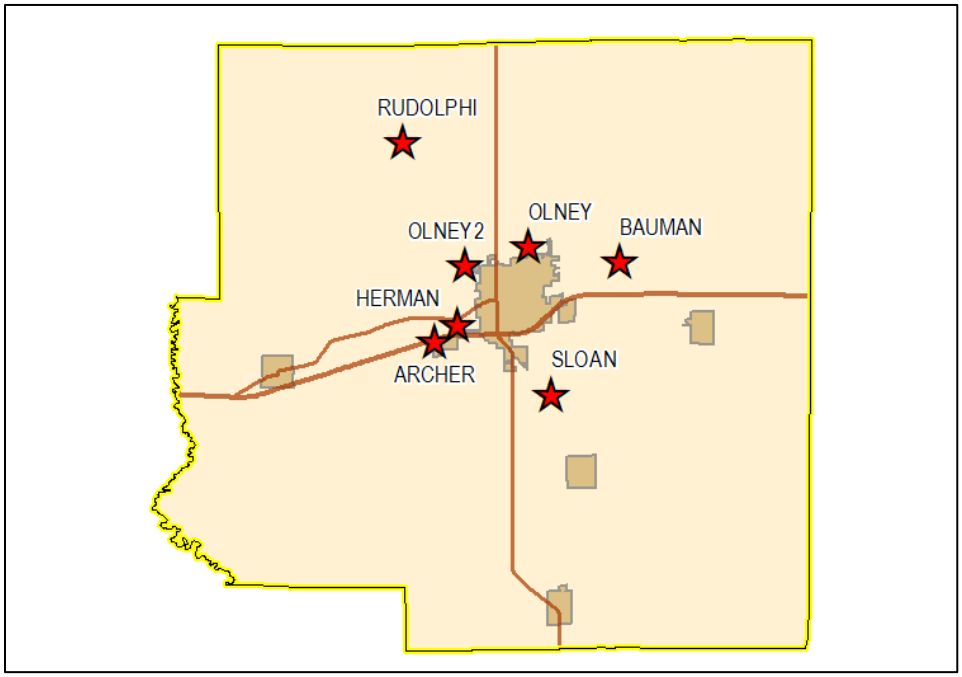

Figure 43: Wildfire reports within 1 km of Richland County (1992-2018). Source: USDA Forest Svc

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.[109] To compare this with Richland County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for area, the State of Illinois has an average of 0.67 reports per year, higher than Richland County's average of 0.26 events per year.

[108] Midwestern Regional Climate Center, "Living with Weather: Wildfires", accessed Apr 2021. https://mrcc.illinois.edu/living_wx/wildfires/index.html

[109] United States Department of Agriculture Forest Service, "Spatial wildfire occurrence data for the United States, 1992-2018", accessed Aug 2021. https://www.fs.usda.gov/rds/archive/Catalog/RDS-2013-0009.5

The Wildland-Urban Interface (WUI) is the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetation fuels.[110] This interface can be found in rural, suburban, and urban areas where homes and businesses are located near or within natural areas such as forests, grasslands, or wetlands. The WUI is often characterized by an abundance of highly flammable vegetation, which can act as fuel for the fire. When a wildfire enters the WUI, it can ignite homes and other structures, putting people's lives at risk and causing significant damage to property. Future development in this area can increase the risk of wildfire.

Although Richland County has forested areas, the majority of the county's land cover is agricultural. Warm temperatures and dry conditions, including drought, can result in tinder-dry crops, which are likely to easily burn. Although agricultural fires tend to be less deadly than other types of fires, they cause monetary crop and property loss each year. Agricultural fires are typically started by open flames, arson, natural causes (e.g., lightning), and equipment (e.g., tractors or other vehicles). Farmer livelihoods and large swaths of farmland are at risk in Richland County.[111]

Following a wildfire, areas are at higher risk of flooding due to loss of vegetation, which in turn may lead to soil erosion. The overall risk for wildfire is low, FEMA's National Risk Index (NRI) calculates the expected annual loss for wildfire to be $6 for Richland County. However, the NRI uses a dataset that focuses on large fires, while agricultural fires tend to be smaller in scale. The NRI may underestimate Richland County's expected annual loss.

While Richland County and the entire state have a relatively low risk for wildfires, warming temperatures and more frequent and lengthy dry periods caused by climate change may lead to a higher agricultural fire frequency and larger areas of burned cropland.[112] Cropland fires could encroach on urban areas, and unhealthy air from these fires may cause health problems in the surrounding communities.

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[110] N*WCG.* Glossary of Wildland Fire, *PMS 205* | *NWCG*. Retrieved from https://www.nwcg.gov/publications/pms205

[111] US Fire Administration. (2002). Topical Fire Research Series: Agricultural Fires. US Fire Administration. https://apps.usfa.fema.gov/downloads/pdf/statistics/v2i10-508.pdf

[112] USGCRP (U.S. Global Change Research Program). (2018). Impacts, risks, and adaptation in the United States: Fourth National Climate Assessment, volume II. Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.). https://nca2018.globalchange.gov/downloads. doi:10.7930/NCA4.2018.

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.[113]

AVG REPORTS/YEAR	TOTAL REPORTS	YEARS IN RECORD
1.29	40	31

SOURCE: US COAST GUARD NATIONAL RESPONSE CENTER (1990-2020)

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 which are downloadable from its website.

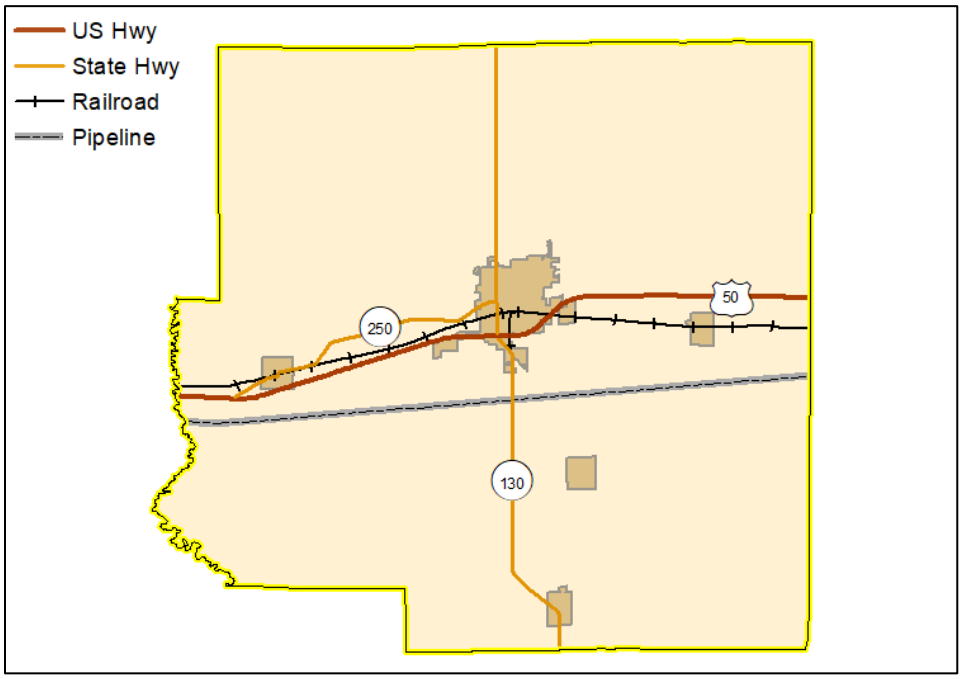

Figure 44: Major transportation features and pipelines in Richland County. Sources: IDOT and Richland County

[113] Federal Emergency Management Agency, "Hazardous Materials Incidents", August 2019. https://www.fema.gov/sites/default/files/2020-07/hazardous-materials-incidents.pdf

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.[114] To compare this with Richland County, the total spatial area of the state (57,914 square miles) must be considered. After normalizing for area, the State of Illinois has an average of 4.08 reports per year, higher than Richland County's average of 1.29 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. *Table 35* below shows how many miles of transportation features are present in Richland County. The most common cause of HazMat incidents in Richland County are related to crude oil pipeline leaks, accounting for 45% of reports.[115]

Table 35: Lengths of major transportation features in Richland County. Source: IDOT, US Census, and Richland County

Transportation Type	Miles
US Highway	26.8
State Highway	37.7
Railroad	28.0
Pipeline (Petroleum)	25.6

[114] United States Coast Guard, "National Response Center", accessed Apr 2021. https://nrc.uscg.mil
[115] United States Coast Guard, "National Response Center", accessed Apr 2021. https://nrc.uscg.mil

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.[116] 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.[117]

Table 36. Pandemics since 1918. Sources: 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 the date of this publication			

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 (*Table 36*). Of these, the influenza pandemic of 1918 by far caused the most deaths in the United States and around the world (*Figure 42*).[118]

Figure 45: Boston Red Cross volunteers assemble gauze face masks during the 1918 pandemic. Source: CDC

[116] Ready.gov, "Pandemics", accessed Jul 2021. https://www.ready.gov/pandemic
[117] State of California, "2018 California State Hazard Mitigation Plan", accessed Jul 2021. https://www.caloes.ca.gov/cal-oes-divisions/hazard-mitigation/hazard-mitigation-planning/state-hazard-mitigation-plan
[118] Centers for Disease Control and Prevention, "Past Pandemics", accessed Jul 2021. https://www.cdc.gov/flu/pandemic-resources/basics/past-pandemics.html

The most recent pandemic, declared by the World Health Organization (WHO) in 2020,[119] was caused by a coronavirus, SARS-CoV-2 (*Figure 46*).[120]

COVID-19 DEATHS	
RICHLAND COUNTY	STATE OF ILLINOIS
77 (0.49%)	35,092 (0.27%)

SOURCE: ILLINOIS DEPARTMENT OF PUBLIC HEALTH

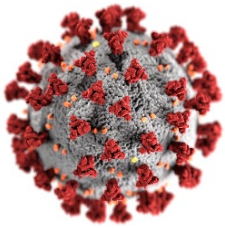

Figure 46: SARS-CoV-2

At the time of this publication, the number of deaths and the percentage of deaths from COVID-19 for Richland County and the State of Illinois are listed above.[121] The State of Illinois has a death rate of 26 per 10,000 people from COVID-19, lower than Richland County's death rate of 47 per 10,000 people.

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 higher risk of exposure to pandemic-causing viruses.

[119] World Health Organization, "WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020", accessed Jul 2021. https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020

[120] World Health Organization, "Coronavirus disease 2019 Q&As", accessed Jul 2021. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/coronavirus-disease-covid-19

[121] Illinois Department of Public Health, "Covid-19 Statistics", accessed Dec 2021. https://dph.illinois.gov/covid19/data.html

SECTION 5

MITIGATION STRATEGIES

INTRODUCTION

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

Risk assessments were sent to all jurisdictions across Richland County on December 22, 2021. A hybrid local hazard mitigation project meeting was held remotely with the jurisdictions of Calhoun, Claremont, Noble, Olney, and Parkersburg on January 12, 2022 via Zoom and at the Olney Public Library.

SUMMARY OF CHANGES

A status update of mitigation actions identified in the 2012 *Richland County Multi-Hazard Mitigation Plan* can be found below.

Table 37. Status of 2012 Mitigation Actions.

Mitigation Strategy	Jurisdiction	Priority	Status	Comments
Distribute weather radios to critical facilities and schools	Richland County	Ongoing	Ongoing	Critical facilities throughout the county have been equipped with weather radios.
Trim trees to minimize the amount/duration of power outages	Richland County	Ongoing	Ongoing	Ongoing practice
Conduct a siren coverage study and purchase additional sirens throughout the county as necessary	Richland County	H	Ongoing	Funding opportunities are limited.
Implement new plans for public education including distribution of literature regarding family safety measures	Richland County	H	Ongoing	Collaborate with Chamber of Commerce and schools for digital distribution.
Improve drainage relating to storm water system in order to protect new and existing structures	Olney	H	Complete	
Institute mass notification system (reverse 911/Nixel) countywide.	Richland County	H	Ongoing	Ongoing practice
Conduct a study to determine shelter capacity; establish new shelters as necessary; equip with generator and necessary supplies	Calhoun, Claremont, Noble, Olney, Parkersburg, Richland County	H	Ongoing	New shelters have been added. Generators and necessary supplied are ongoing.
Increase public awareness of the benefits of the NFIP program	Calhoun, Claremont, Noble, Olney, Parkersburg, Richland County	H	Ongoing	The county will continue to develop public education programs to instruct the public on the benefits of joining the NFIP.
Elevate roads that are underwater when Fox River floods: Mt Gillead Rd, Deer Farm Lane, Tank Farm Lane	Olney, Noble	M	Ongoing	Dependent on available funding.
Install inertial valves	Calhoun, Claremont, Noble, Olney, Parkersburg	M	Ongoing	Keep in plan, update to low priority.

Mitigation Strategy	Jurisdiction	Priority	Status	Comments
Purchase transfer switches to provide back-up power to medical care facilities	Olney	M	Ongoing	Keep in plan. Dependent on available funding.
Establish mutual aid agreements with neighboring jurisdictions	Richland County	M	Ongoing	Finalize remaining mutual aid agreements.
Harden essential facilities, including fire stations	Calhoun, Claremont, Noble, Olney, Parkersburg	M	Ongoing	Keep in plan. Dependent on available funding.
Improve and enforce floodplain ordinances to ensure that new construction does not occur in floodplains	Richland County	M	Ongoing	Coordination by County Floodplain Administrator
Conduct a commodity flow study	Richland County	M	Ongoing	Dependent on available funding. Add to future plans if funding becomes available.
Conduct an engineering study to improve safety at the Elmdale Road railroad crossing	Olney	M	Ongoing	Dependent on available funding. Add to future plans if funding becomes available.
Improve rural water supply for fire response	Richland County	L	Ongoing	Dependent on available funding. Add to future plans if funding becomes available.
Provide cooling\warming shelters	Calhoun, Claremont, Noble, Olney, Parkersburg	L	Ongoing	Continue to support existing shelters and add new shelters.
Establish a database to identify and educate special needs population	Richland County	L	Ongoing	Continue to identify groups or individuals that can assist with endeavors in each community.
Develop redundant public water systems	Richland County	L	Ongoing	Dependent on available funding. Add to future plans if funding becomes available.
Bury new power lines	Calhoun, Claremont, Noble, Olney, Parkersburg, Richland County	L	Ongoing	Dependent on available funding. Add to future plans if funding becomes available.

GOALS

The COVID-19 pandemic made it difficult to formulate hazard mitigation goals with the entire Richland County community. After reviewing the risk assessments for each hazard, engaging in local hazard mitigation project meetings with community members, reviewing the 2012 *Richland County Multi-Hazard Mitigation Plan*, identifying critical facilities, and assessing socioeconomic data, the following natural hazard mitigation goals were formulated.

- Goal 1: Lessen the impacts of hazards to new and existing infrastructure.
- Goal 2: Create new or revise existing plans/maps for the community.
- Goal 3: Develop long-term strategies to educate community residents on the hazards affecting their county.

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. Separate meetings were held with representatives from Calhoun, Parkersburg, Olney and Noble during July and August 2022. 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. Projects were ranked high, medium, or low based on the urgency of the project, availability of funding, and capacity of the jurisdiction. Potential projects include construction, education, policy, communication, preparedness, and response. Funding for projects can come from local operating budgets, in-kind donations, donations from local businesses, regional funding opportunities, state and federal grants and low-interest loan programs. 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 '*Richland 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 38. Mitigation strategies for Village of Calhoun.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Protect life by reducing severe wind and tornado risk.	Calhoun	C	T, W, HW, CW, E, IS	FEMA	Calhoun community center and 2 churches in Calhoun can function as a tornado shelter when needed. Calhoun community center has a backup generator too. A possible project would be to retrofit the Village Hall to be wind and earthquake resistant and to have heating + cooling capabilities.	H	Mayor	1-3 years	H,H
Equip facilities and communities to notify against damage caused by hazards.	Calhoun	R	T	Local	Install tornado sirens in the community to alert residents during severe weather events. Continue to pursue installation of tornado siren at Village Hall with the EMA's help.	H	Mayor	< 1 year	H, L
Protect life by reducing risk to flash floods.	Calhoun	C	FF	FEMA	Continue to identify locations in the community that get affected during flash floods and construct culverts to direct the flow of storm water in those areas. Monitor current culverts for any damage/repair needs.	M	Mayor	1-3 years	H,H
Evaluate and strengthen the communication and transportation abilities of emergency services throughout the community. Protect life by improving response time to severe events.	Calhoun, Richland County	R, PR	All	Local	Calhoun does not have a fire dept. or in-house emergency response services. Richland County aids Calhoun on a need-by-need basis which often means delayed response due to distance. Formalizing a mutual aid agreement would be beneficial.	M	Mayor	1 year	H, L
Raise public awareness on hazard mitigation.	Calhoun	E, PR, COM	All	Local	Conduct disaster preparedness programs for the community. Distribute flyers/ spread awareness or host educational events for residents to learn what to do in case of severe weather emergencies.	M	Mayor	Every year	H, M

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Develop long-term strategies to educate community residents on the hazards affecting their county. Raise public awareness on hazard mitigation.	Calhoun	COM	ALL	Local	Develop severe hazard notification and evacuation plan and communicate it to the residents. Create a registry of vulnerable citizens who might need assistance- people with disabilities and elder citizens of the community. Continue to inform community of status of projects identified in the HMP.	L	Mayor	Update Every year	H, M

Table 39. Mitigation strategies for Village of Claremont.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Protect life by reducing severe wind and tornado risk	Claremont	C	W, T	FEMA	Identify a room or develop a wind resistant shelter for severe wind/tornado sheltering use. Claremont's fire dept. is one of the most prominent buildings in the community and can be retrofitted to be used as a shelter. It has a capacity of around 200-300 and is solar powered.	H	Mayor	1-5 years	H, H
Protect life by reducing extreme heat and cold risk	Claremont	C, COM	HW, CW	Local	Identify a location for a heating and cooling center to use with generator support during severe weather seasons like Extreme heat and Extreme cold. It can be Claremont's fire dept. itself of some other prominent building. This location needs to be communicated to the residents of Claremont	H	Mayor	1-5 years	H, L
Protect life and educate public about severe weather	Claremont	COM	ALL	Local	Identify group in community that could develop severe hazard notification and evacuation plan – telephone tree, knocking on doors may be more effective than Facebook/radio	H	Mayor	1 year	H, L
Protect life and educate public about severe weather	Claremont	E, PR	All	Local	Develop an education and awareness program to spread disaster preparedness amongst community members. Information on how to tackle potential hazards could be distributed through flyers and	H	Mayor	1 year	H, L

Table 40. Mitigation strategies for Village of Noble.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Improve emergency sheltering in the community. Protect life by reducing severe wind and tornado risk.	Noble	C	T, W, HW, CW, E, IS	FEMA	Retrofitting existing shelters to withstand severe weather. Noble has identified 3 locations to act as possible shelters- The High school, Eastern Community college and Lion's club. These locations can be retrofitted to be wind and earthquake resistant shelters with heating + cooling capabilities along with a generator.	H	Mayor	1-3 years	H,H
Equip facilities and communities to guard against damage caused by hazards.	Noble	C	T	Local	Installing tornado sirens in the community (Fire siren is currently used for all events)	H	Mayor	1-3 years	H, M
Evaluate and strengthen the communication and transportation abilities of emergency services throughout the community. Maintain connection between communities.	Noble, Richland County	P	All	Local	Formalizing mutual aid-agreements with Olney for support during an emergency response to possible disasters.	H	Mayor	< 1 year	H, L
Equip facilities and communities to guard against damage caused by hazards.	Noble	C	F	Local	Installing smoke detectors in homes for safety and quick response to fire	M	Fire chief	1 year	H, M
Retrofit critical facilities and structures with structural design practices and equipment that will withstand natural disasters.	Noble	C	FF	FEMA	Clearing out of the Grand creek that runs from the north all the way to the southern end of the town. Unclogging it would help in channeling storm water faster and more efficiently.	M	Mayor	1-3 years	H,H
Review and update existing, or create new documents support hazard mitigation	Noble	COM	All	Local	Create a registry of vulnerable citizens who might need assistance- for e.g., people with disabilities and elder citizens of the community.	L	Mayor	Every year	H, L

Table 41. Mitigation strategies for City of Olney.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Improve emergency sheltering in the community. Protect life by reducing severe wind and tornado risk.	Olney	C	T, W, HW, CW, E, IS	FEMA	Identify possible shelter locations in Olney that can house most of its residents. The shelters can be churches, basements, community centers etc. This shelter needs to be retrofitted in order to be resistant to severe winds and seismic activity. Heating and cooling capabilities along with a generator is crucial for community needs.	H	Mayor	1-3 years	H,H
Evaluate and strengthen the communication and transportation abilities of emergency services throughout the community. Maintain connection between communities.	Olney, Richland County	P, R	All	Local	Formalizing mutual aid-agreements with smaller communities that depend on Olney for emergency response.	H	Mayor	< 1 year	H, L
Retrofit critical facilities and structures with structural design practices and equipment that will withstand disasters.	Olney	C	FF	FEMA	An aftermath of severe thunderstorms / ice storms in Olney are power outages that last several days. An emergency power generator that is capable of running the sewer plant is an immediate need of the community.	M	Mayor	1-3 years	H,H
Develop long-term strategies to educate community residents on the hazards affecting their county. Raise public awareness on hazard mitigation.	Olney	E, PR, COM	All	Local	Conduct disaster preparedness programs for the community. Distribute flyers/ spread awareness or host educational events for residents to learn what to do in case of severe weather emergencies.	M	Mayor	Every year	H, M

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Equip communities to guard against damage caused by hazards	Olney	C	FF	Local	Installing stop signs along roads that are frequently affected by flash floods. Richland HMP web map has several locations marked and identified.	M	Mayor	1-3 years	L, H
Review and update existing, or create new documents support hazard mitigation	Olney	P	All	Local	Create a registry of vulnerable citizens who might need assistance- for e.g., people with disabilities and elder citizens of the community.	L	Mayor	Every year	H, M

Table 42. Mitigation strategies for Village of Parkersburg.

Goals	Jurisdiction	Action	Hazard	Funding	Description	Priority	Contact	Timeline	Benefit, Cost
Protect life by reducing severe wind and tornado risk	Parkersburg, ALL	C	W, T	FEMA	Identify a room or develop a wind resistant shelter for severe wind/tornado sheltering use	H	Mayor	1-5 years	H, H
Protect life by reducing extreme heat and cold risk	Parkersburg	C, COM	HW, CW	Local	Identify a location for a heating and cooling center to use with Parkersburg's generator and communicate to citizens where it is	H	Mayor	1-5 years	H, L
Protect life and educate public about severe weather	Parkersburg	COM	ALL	Local	Identify group in community that could develop severe hazard notification and evacuation plan – telephone tree, knocking on doors may be more effective than Facebook/radio	H	Mayor	1-5 years	H, L
Evaluate and strengthen the communication and transportation abilities of emergency services throughout the community. Maintain connection between communities.	Parkersburg	P	All	Local	Formalizing mutual aid-agreements with Olney for support during an emergency response to possible disasters.	H	Mayor	< 1 year	H, L
Equip public facilities and communities to guard against damage caused by effects of hazards.	Parkersburg	R	HM	Local	Develop a plan to tackle hazmat spills along the major highway that runs through the community	M	Mayor	1 year	H, L

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
GWRPC	Greater Wabash Regional Planning Commission
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
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
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 Calhoun Capability Assessment

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: Marcy Oesch Jurisdiction Represented: Calhoun, IL

Title and employer: Village of Calhoun board trustee

Date: 7/25/22 Contact email: village of calhoun board@yahoo.com Time Spent: 10 min

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

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

	Chief Building Official	2
	Civil Engineering	2
	Local Staff Who Can Assess Community's Vulnerability to Hazards	2
	Grant Manager	2
	Mutual Aid Agreement Other (if any)	2
	Other (if any)	2
Fiscal Capability	Capital Improvement Plan/ 1- & 5-Year plan	2
	Applied for grants in the past	2
	Awarded a grant in the past	2
	Authority to Levy Taxes for Specific Purposes such as Mitigation Projects	2
	Gas/Electric Service Fees	2
	Storm Water Service Fees	2
	Water/Sewer Service Fees	2
	Development Impact Fees	2
	General Obligation Revenue or Special Tax Bonds	2
	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.	2
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	2
	Natural Disaster or Safety related school programs	2
	Storm Ready Certification	2
	Fire wise Communities Certification	2

Overall Capability	Limited/Moderate/High
Does the community have the financial resources needed to implement mitigation projects?	None
Does the community have the staff/expertise to implement projects?	None
Is there community support to implement projects?	None
Does the community staff have time to devote to hazard mitigation?	None

	Tree City USA	
	Other (if any)	

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

A.2 Claremont Capability Assessment

Name: _JOHN JOYCE_____ Jurisdiction Represented: VILLAGE OF CLAREMONT

Title and employer: MAYOR

Date: _7-20-22_Contact email: CLAREMONTCHIEF@GMAIL.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	YES
	Economic Development Plan	NO
	Emergency Operational Plan	YES
	Floodplain Management Plan	NO
	Storm Water Management Plan	YES
	Zoning Ordinance	NO
	Subdivision Regulation/Ordinance	NO
	Floodplain Ordinance	NO
	Building Codes	YES
	National Flood Insurance Program	NO
	Community Rating System	NO
	Other (if any)	
Administrative & Technical Capability	Planning Commission	NO
	Floodplain Administration	NO

	GIS Capabilities	YES
	Chief Building Official	NO
	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	YES
	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	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.	YES
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	YES
	Natural Disaster or Safety related school programs	NO
	Storm Ready Certification	NO

	Fire wise Communities Certification	YES
	Tree City USA	NO
	Other (if any)	

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?	NO
Does the community have the staff/expertise to implement projects?	NO
Is there community support to implement projects?	NO
Does the community staff have time to devote to hazard mitigation?	NO

A.3 Noble Capability Assessment

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: Brad Kessler Jurisdiction Represented: _____

Title and employer: Village of Noble (Mayor)

Date: 7/20/2022 Contact email: nobleil@bspeedy.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	Yes
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	Yes
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	No
Administrative & Technical Capability	Planning Commission	No
	Floodplain Administration	No
	GIS Capabilities	No

	Chief Building ~~Offeial~~ Inspector	Yes
	Civil Engineering	No
	Local Staff Who Can Assess Community's Vulnerability to Hazards	No
	Grant Manager	No
	Mutual Aid Agreement Other (if any)	Yes
	Other (if any)	No
Fiscal Capability	Capital Improvement Plan/ 1- & 5-Year plan	
	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	No
	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	Yes
	Other (if any)	No
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.	Yes
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes
	Natural Disaster or Safety related school programs	No
	Storm Ready Certification	No
	Fire wise Communities Certification	No

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?	No
Is there community support to implement projects?	No
Does the community staff have time to devote to hazard mitigation?	No

	Tree City USA	
	Other (if any)	

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

A.4 Olney Capability Assessment

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: MARK Lambird And DANAS Colwell Jurisdiction Represented: city of Olney

Title and employer: Mayor city of Olney

Code officer city of olney

Date: 8-23 Contact email: codeenf@cityofOlney.com Time Spent: 2 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	Yes
	Economic Development Plan	Yes
	Emergency Operational Plan County	Yes
	Floodplain Management Plan	Yes -
	Storm Water Management Plan	No -

	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	Yes
	Floodplain Ordinance	Yes
	Building Codes	Yes
	National Flood Insurance Program	Yes -
	Community Rating System	ISO RATING
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Floodplain Administration	Yes -
	GIS Capabilities	Yes
	Chief Building Official	Yes
	Civil Engineering	Yes
	Local Staff Who Can Assess Community's Vulnerability to Hazards	Yes
	Grant Manager	GREATER WABASH
	Mutual Aid Agreement Other (if any)	Member of IPWMAN
	Other (if any)	
Fiscal Capability	Capital Improvement Plan/ 1- & 5-Year plan	Yes
	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	No
	Gas/Electric Service Fees	AMERAN Franchise Fee
	Storm Water Service Fees	NO
	Water/Sewer Service Fees	Debt service fee on Sewer

Overall Capability		Limited/Moderate/High
Does the community have the financial resources needed to implement mitigation projects?		Moderate
Does the community have the staff/expertise to implement projects?		Moderate
Is there community support to implement projects?		Moderate
Does the community staff have time to devote to hazard mitigation?		Moderate
	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.	Red Cross
	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	Yes -
	Other (if any)	

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

A.5 Parkersburg Capability Assessment

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: Raymond Rudolph Jurisdiction Represented: Village of Parkersburg

Title and employer: Mayor - village of Parkersburg

Date: 10/20/22 Contact email: pbvgvillagemayor@gmail.com Time Spent: Since May 2021

Please return your filled worksheet to

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
	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	No
	Floodplain Administration	No
	GIS Capabilities	No

	Chief Building Official	No
	Civil Engineering	Yes
	Local Staff Who Can Assess Community's Vulnerability to Hazards	yes
	Grant Manager	yes
	Mutual Aid Agreement Other (if any)	No
	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	yes
	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	No

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

	Tree City USA	No
	Other (if any)	

In case of any queries, please email us at

A.6 Richland Capability Assessment

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: Danny J. Colwell, P.E. Jurisdiction Represented: Richland County

Title and employer: Richland County Engineer, Richland County

Date: 7/25/22 Contact email: dcolwell@richlandcounty.illinois.gov Time Spent: 1 hour

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

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

	Chief Building Official	N
	Civil Engineering	Y
	Local Staff Who Can Assess Community's Vulnerability to Hazards	Y, but
	Grant Manager	Y, but not in house
	Mutual Aid Agreement Other (if any)	Y
	Other (if any)	
Fiscal Capability	Capital Improvement Plan/ 1- & 5-Year plan	N
	Applied for grants in the past	Y
	Awarded a grant in the past What kind of grant?	Y
	Authority to Levy Taxes for Specific Purposes such as Mitigation Projects	N
	Gas/Electric Service Fees	N
	Storm Water Service Fees	N
	Water/Sewer Service Fees	N
	Development Impact Fees	N
	General Obligation Revenue or Special Tax Bonds	N
	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.	Y
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	?
	Natural Disaster or Safety related school programs	?
	Storm Ready Certification	?
	Fire wise Communities Certification	?

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?	moderate
Is there community support to implement projects?	it depends on how much it will cost tax payers
Does the community staff have time to devote to hazard mitigation?	limited

	Tree City USA	
	Other (if any)	

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

APPENDIX B: MEETING DOCUMENTS

B.1 Meeting 1 Documents

Meeting 1 Agenda

October 15, 2021
Richand County Planning Meeting
Webex and Washington County Court House
Meeting Start at 6:30 pm

Agenda	
Welcome and Introductions (15 min)	Kevin/Rebecca
Jurisdictional Participation Requirements and Benefits (10 min)	Kevin/Rebecca
Match Documentation Procedures	
Explanation of the Planning Process, Scope of Work & Timeline (20 min)	Rebecca
-----BREAK (10 min)-----	
Review of Natural Hazards (10 min)	Rebecca
Local Plans, Critical Facilities, & WebMap (10 min)	Rebecca/Brad/Zoe
Public Participation (10 min)	Rebecca
Next Steps and Adjourn (15 min)	Rebecca/Kevin

Meeting 1 Meeting Minutes

October 15, 2021

Richand County Planning Meeting

Webex and Washington County Court House

Meeting Start at 6:30 pm

Welcome and Introductions

Rebecca Leitschuh and Kevin welcomed participants. This is the first meeting. The plan is funded by a FEMA grant through IL Emergency Management Agency.

Steering committee introductions: Kevin from Richland Co EMA Coordinator and Laura from Wabash Valley Regional Planning Commission, standing in for Heather.

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

Everyone did introductions and shared their experience with storms or with the October 11, 2021 storm in Richland County. Juanita shared a map she prepared of 911 reports from that day.

Jurisdictional Participation Requirements and Benefits

Rebecca 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. 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, it is about the process.

Match Documentation Procedures

Rebecca explained that Heather 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.

Explanation of the Planning Process, Scope of Work, and Timeline

Rebecca Leitschuh provided an overview of the process as two main parts, identify the risk, then identify mitigation actions. Natural Hazard Mitigation Plan needs to be updated 5 years, typically apply for a grant 2 years before to pay for the update. Having an adopted and approved HMP will allow represented communities to be able to apply for FEMA mitigation grants.

Disaster Cycle – Recovery, Mitigation, Preparation, Response. Mitigation should be considered at all phases of the disaster cycle.

Rebecca reviewed the Stafford Act, and the DMA2k amendment, 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. Mitigation is any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event.

Rebecca asked attendees who they would like to see attend or participate in the planning process. Kevin summarized the power and utility companies, Illinois Gas, Ameren, Norris, the City has its own system, EJ water for rural areas. Police Officer (NAME) cellular and fiber optic service providers, satellite internet. 5 power companies are all co-ops except for Ameren, Rebecca inquired about a map. Ameren covers 99-95% of the population. Norris covers most of the rural population. Wayne, White, Lawrence, Clay electric are the other rural co-ops. Lauren suggested adding Norris Power to the group since they are very proactive in reducing hazards to outages.

Parkersburg – confusion about the meeting. EPA meeting about waterlines – confused with HMP invite – disasters and the waterlines.

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

Rebecca 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. Rebecca asked about the top 3 action items from the 2012 HMP.

Replacement bridge over Fox River. US Route 50 does not flood. County split by river and only one road does not flood – looking to increase number of crossings that do not flood and to elevate out of 100-year floodplain.

Juanita is not aware of a siren coverage study; currently only Olney is covered by sirens. Juanita expresses a need for an additional method to communicate imminent risks to citizens.

The FEMA crosswalk to score the plan was introduced to illustrate how all requirements must be met for FEMA approval. The last step is the adoption of the plan and determining how to maintain the plan.

Review of Natural Hazards Addressed

Rebecca introduced hazards listed in the IL State Hazard Mitigation plan and then the ones identified for Richland County. Pause for input. A lot of large animal confinement facilities - potentially a hazard with rupture of sewer ponds. Zoe suggested the hazard could be potentially be addressed under the HazMat category. There will be an effort to map these facilities.

Rebecca 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.

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 web map and a spreadsheet. Participants need to review and provide corrections and additions. Zoe Zaloudek gave a demo of a web map application that participants can enter shapes and comments into to collect information. Juanita shared that the Assessor has mitigation points/areas, Brad will follow up with Assessor (Tim Hahn) and WTH GIS to obtain the mitigation points.

Next Steps and Adjourn

Sign and return the letter of intent to participate.

Send community plans for review.

Natural Hazards profile will be available for review and discussion at the May meeting. Representatives should share with others and get input.

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.

Meeting Adjourned at 7:50 pm

Meeting 1 Sign In Sheet

October 15, 2021
Richand County Planning Meeting
Webex and Washington County Court House
Meeting Start at 6:30 pm

Attendance

Name	Community/Agency	Title
Juanita Kramer	911 Coordinator	911 Coordinator
Debbie Judge	Edwards County	Emergency Management Director
Lora Smith	GWRPC	Executive Director
Dallas Colwell	Olney, City of	Olney Code Enforcement/Building Inspector
Phil White	Parkersburg, Village of	
Brad Ameter	Richland County	Deputy
Danny Colwell	Richland County	Richland County Highway Engineer
Deanna Mitchell	Richland County	Executive Director (Richland County Housing Authority)
Kevin Parker	Richland County	Richland County EMA
Lauren McClain	Richland County	Richland County Development Corporation, Executive Director
Lisa Graff	ISWS	Program Manager
Rebecca Leitschuh	ISWS	Planning and Outreach Specialist
Brad McVay	ISWS	GIS Specialist
Zoe Zaloudek	ISWS	Geospatial Application Developer

B.2 Meeting 2 Documents

Meeting 2 Agenda

AGENDA

Richland County Hazard Mitigation Committee

Meeting #2 – Hazard Profiles and Risk Assessment

Virtual Zoom* & Olney Public Library

January 12, 2022

1-3 pm

1. Welcome and Overview (10 min)
2. State Climatologist (20 min)
3. Community Web Map (10 min)
4. Identifying Community Vulnerabilities (15 min)

--- Break (10 min)

5. Hazard Profiles and Risk Assessments (20 min)
6. Risk Assessment Activity by Jurisdiction (30 min)
7. To Do – Community profile, survey, community web map, risk assessment (5 min)
8. Adjourn

*The meeting will have both virtual and in-person options to participate. Zoom meeting details follow below.

Zoom Meeting Information

https://illinois.zoom.us/j/81687596212?pwd=OElsQnZjZGJ6UzRtZXhpeHVqQlA1UT09
Meeting ID: 816 8759 6212
Password: 804558
Zoom call-in: 1-312-626-6799

Meeting 2 Meeting Minutes

January 12th, 2022

Richland County Risk Assessment Meeting #2

Olney Public Library, Zoom

Meeting Start: 1pm

Welcome and Intro

- Lisa Graff and Kevin Parker welcomed participants. In-person and zoom participants introduced themselves and shared natural hazard experiences.
- Lisa briefly recapped Richland County Hazard Mitigation Planning meeting #1
- Lisa gave an overview of the meeting: Review natural hazards that may impact county + community, identify community vulnerabilities that might affect risk, state climatologist, community web map, community vulnerability, history of hazards, work on community survey/activity

State Climatologist

- Trent overviewed his presentation: Hazard Mitigation Planning and Climate Change
- Focus of the presentation will be on hazards that will change with climate change
- Changes to community assets are analogous to climate change → as they change, both can affect risk
- Overview of climate change assessments
    - There are global, national, and regional assessments → regional is what we use to make hazard mitigation plans and mitigate risk for people
- Hazard profiles
    - Flooding
        - **Increasing** frequency, particularly urban and riverine
        - More **heavy** rainfall days but fewer overall rainfall days → heavy runoff and potential for subsequent dry spells and negative effects on soil moisture + microbes
        - Ex. June 2013: 6.67" of rain in 4 days in Olney
            - 7.5% chance of occurrence in 1989 → 15% chance in 2019
            - Heavy rainfall is becoming more likely to occur in any given year
    - Drought
        - Multi-year drought is more concerning than multi-month drought
        - Olney has drought resilience compared to other regions in state
        - Long droughts may become less common in IL, but flash droughts may increase
            - Flash droughts: short droughts that come on quickly
            - Don't affect water supply, but affect ag and ecosystems
    - Extreme heat

        - Increasing temperatures and humidity result in higher risk of exposure and heat-related illness
        - Not just an urban issue!
        - Heat hospitalization 20% greater in Richland County than St Clair County
        - Agriculture economies like Richland may experience greater exposure because agriculture is an outdoor job → more exposure to heat and other elements
    - Severe storms and tornadoes
        - Impacts of climate change are unclear
        - How we develop commercial and residential areas (e.g. urban sprawl – putting more people/structures in harms way) may be more impactful than climate change's impact on severe storms and tornadoes
        - Severe wind may be more impactful than tornadoes, and is likely to become more frequent
    - What does climate change mean for planning?
        - Hazards are made worse by climate change
        - Vulnerability can be made worse by climate change
        - Low-income communities will experience disproportionate impacts
        - Amplifies the need for mitigation and adaptation measures
            - More exposure to more severe hazards → need to make society less vulnerable to changing hazards, and account for changing hazards
- Trent provided resources and contact info
- Question asked by an in-person participant: is there a map or timeline for when Richland County's flood maps will be finished?
    - Lisa responded in the affirmative, and added that there will be a map/timeline discussed in the presentation after the break

Community Web Map

- Zoe Zaloudek provides an overview of how to use the comment web map (https://www.illinoisfloodmaps.org/hmp/richland.htm). This overview includes how to use the website, what different buttons on the website indicate, and how to add a comment to the map.
- Lisa explained why the web map is important: in part, it's a requirement, but it also helps us and you understand where and what your community's hazards are.

Identifying Community Vulnerabilities

- Lisa overviewed vulnerability: vulnerability to natural hazards is the potential to be harmed by these hazard events
- Social vulnerability, physical vulnerability, economic vulnerability, and environmental vulnerability affect a community's overall vulnerability

- Social vulnerability: people in poverty, people with disabilities, children under 5, and adults over 65 can impact vulnerability to natural hazards
- Physical vulnerability: mobile homes can be vulnerable to severe wind/tornadoes, housing authority, shelter locations, populations needing special assistance for evacuation
- ISWS wants Richland to develop a list of vulnerable properties – more details to come

10-minute break (1:58-2:08pm)

Lisa welcomed everyone back from break and introduced the next presentation (hazard profiles and risk assessments) and its importance

Hazard Profiles and Risk Assessments

- Zoe introduced the presentation and discussed why there are more hazard profiles (16) and how they differ from the previous risk assessment
    - Broadly, hazards have been broken down into smaller categories (e.g. the previous flood hazard has been broken down into riverine and flash flooding for the new hazard profile)
- Zoe overviewed the hazards
    - Important to note that averages are what happened in the past and do not predict the future; as Trent mentioned, multiple hazards will likely increase due to community development and climate change
    - Hazards include: severe wind, hail, lightning, tornado, dam failure, severe weather winter, ice storms, drought, heat waves, cold waves, earthquakes, wildfires, hazmat spills, pandemic, and…
        - Riverine flooding
            - 0.24 reports per year, or one riverine flood every 4 years
            - Usually near a river – water enters a normally dry area
            - Question/comment from Richland County Highway Engineer Dan Colwell – Little Wabash floods dozens of times a year, interrupting transportation, indicating the Storm Events Database is underreporting events
                - Zoe made a note and Lisa mentioned possible impacts (transportation interruptions, economic impacts, etc) and encouraged that a comment be left on the comment web map
        - Flash flooding
            - 1.2 reports per year – Zoe mentioned this may possibly be an underestimate based on the riverine flooding discussion, and encouraged that flash flood prone areas be noted on the comment web map
- Zoe overviewed the risk severity of the old hazard categories, noting that flood, hazmat, severe thunderstorms, and winter weather were all severe
- Brad McVay overviewed HAZUS and methods for riverine flooding and earthquake
- HAZUS riverine flooding results were analyzed at 1% and 0.2% annual flood chance: more affected buildings and higher damages for 0.2% than 1% chance annual flood

- HAZUS earthquake results were created using the 1987 earthquake at MM 5.2 and MM 7.7 if it occurred today: more affected buildings and higher damages for MM 7.7 than 5.2; important to note that damages include buildings, roads, wage loss from people out of work, etc.
- Tornado analysis done outside of HAZUS
    - Simulated F3 tornado event shows severe damage to critical facilities
    - Brad discussed how loss beyond economic loss should be considered: for example, damages to buildings (e.g. hospitals, schools (which can be used as post-tornado recovery shelters), sheriff's office) can affect resiliency and recovery
    - Brad discussed the NRI → NRI shows that Richland County is generally resilient to natural hazards

Risk Assessment Activity by Jurisdiction

- Lisa discussed risk assessment activity and emphasized what should be focused on when doing the risk assessment – hazard size/path, important structures
    - Very important to complete for all jurisdictions in Richland County because it is federal requirement for grant
    - Note how much time you spent on Risk Assessment, web map, reviewing hazard profiles
    - Heather is keeping track of time for grant
    - Lisa again emphasized potential vulnerabilities (population age, location of critical facilities, etc.)
    - How do we quantify risk?
        - Probability: how likely is it for this event to occur
        - Severity: how severe will this event be
        - Risk = probability x severity
    - Lisa overviewed how to fill out Risk Assessment Activity using probability scores and severity scores
- Lisa emphasized how important it is to use the comment web map and to fill out the risk assessment

Closing Comments

Kevin Parker emphasized that Richland County is an earthquake county. Kevin also discussed hazmat, noting that there are two hazardous facilities that have the potential to cause hazardous impacts to the county if they were to fail or be damaged

Meeting Adjourned at 2:58 pm

Meeting 2 Sign In Sheet

January 12th, 2022

Richland County Risk Assessment Meeting #2

Olney Public Library, Zoom

Meeting Start: 1pm

Name	Community/Agency
Rodney Ranes*	Olney Central College (president)
Phil White*	Village of Parkersburg/West Salem
Lora Smith*	GWRPC
Carrie McKillip*	U of I Extension
Kevin Parker	Richland County (EMA)
Dan Colwell	Richland County (highway engineer)
Brad Kessler	Village of Noble (mayor)
Chris Simpson	Richland County School District (superintendent)
Lauren McClain	Richland County Development Corporation (executive director)
Dallas Colwell	City of Olney (building inspector)
Rusty Holmes	City of Olney (fire chief)
Gina Thomas	Carle Richmond Memorial Hospital (president)
Alice Mullinax	Richland County/Parkersburg (county clerk)
Heather Newman	GWRPC
Mark Lambird*	City of Olney (mayor)
Lisa Graff	ISWS
Rebecca Leitschuh	ISWS
Brad McVay	ISWS
Zoe Zaloudek	ISWS

B.3 Meeting 3 Documents

Meeting 3 Agenda

AGENDA

Richland County Hazard Mitigation Committee

Meeting #3 – Mitigation Strategies

Virtual Zoom* & Olney Public Library

March 23, 2022

1:00-3:00 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 Discussion (20 min)
6. To Do – Risk Assessment, Mitigation Strategy Project Grid (10 min)
7. Adjourn

*The meeting will have both virtual and in-person options to participate. Zoom meeting details follow below.

Join Zoom Meeting
https://illinois.zoom.us/j/82222833852?pwd=MjA4V3ZtQ2k5ay8vMmpkaFhxZXo1Zz09

Meeting ID: 822 2283 3852
Password: 623064

Dial by your location
+1 312 626 6799 US (Chicago)
+1 646 518 9805 US (New York)

Meeting 3 Meeting Minutes

Richland County

Community Meeting Notes

Mitigation Strategies – 3/23/2022

Carrie McKillip's presentation on mitigation strategies

Development of an action plan needed for funding for projects

FEMA describes several categories to lessen the impact of disasters

1. Building Codes designed to account for:
    - Earthquake (New Madrid/Wabash fault)
    - Severe winds (also Tornado/Derecho)
    - Stormwater
2. Promoting sound land use
    - Allows recharging of the water table
    - Large lake in Richland County (are they subject to any regulations)
    - Recommend not building in floodplains
3. Structural retrofitting
    - Shelter spot retrofitting
    - Floodproofing (elevating/wet floodproofing); e.g. Iowa Floodproofing (2008)
    - Relocation (can be expensive)
    - Levees and floodwalls
    - Buyouts and demolition undertakings for Repetitive Loss Properties (RLP)
4. Flood insurance
    - Participation in the National Flood Insurance Program (NFIP)
    - Participation in the Community Rating System (CRS) through specified activities
5. Acquisition (Buyouts)
    - Accounting for varied degree of damages across different areas
6. Informing the public
    - March is "Severe Weather Awareness Month"
    - Consider routine medical needs to be important especially in times of emergency overload
    - Create Citizen Emergency Response Teams (CERT)
7. Stormwater infrastructure
    - Detention/retention ponds
    - Filtration strips
    - Rain gardens
    - Heavier veins expected for next 5-10 years
8. Plan implementation
    - Regular meetings
    - FEMA requires one FEMA fundable project
    - Grant applications
    - Form community partnerships
    - Annual inventory of trees

Goals Discussion

All 3 goals approved by all present at the meeting

Mitigation strategy recommendations:

1. Resources to pass along during building permit approval process (recommendation by Richland County Development Corporation); *Aligned with Goal 1 of Richland County HMP (2013)*
2. Address the health department issue; no health department established for Richland County (neighboring counties such as Jasper County are paid a substantial amount for health and human services)
3. Address the issue of the Walmart Distribution Center in case of fire; if the fire escapes the Walmart DC containment zone, then it poses a significant risk to the community.

Ongoing/Completed Processes & Requests

1. Public app for crisis alerts (*ongoing*)
2. Include Olney's successful undertaking of the stormwater system overhaul in the Webmap (*completed*)
3. Revise mass notification system and include 911 (*revised priority from High to Medium*)
4. Establishment of mutual aid agreements with neighboring jurisdictions (*ongoing*)
5. The City of Noble opts for a storm shelter (requested by the Mayor of Noble)

Meeting 3 Sign In Sheet

Richland County HMP Meeting #3, March 23, 2022, 1:00-3:00 P.M. Olney City Library, 400 West Main Street, Olney, IL 62450				
Name/Company	Address	Phone #	Email Address	
1 Heather Neuman, Greater Wabash RPC	10 West Main, Albion, IL 62806	618-445-3612	heather@gwrpc.com	
2 Kevin Parker, Richland County EMA		618-843-8034	ka9tch@yahoo.com	
3 Lisa Graff, IL State Water Survey	2204 Griffith Dr | M/C 674, Champaign, IL 61820	217.265.9430	lgraff@illinois.edu	
4 Brad Kessler Mayor Village of Noble	113 E. North Ave Noble 62868	618-388-0194	brad kessler 88@yahoo.com.	
5 Lauren McClain RCDC, Exec. Dir.	315 W. Main St. Olney IL 62450	618-392-2305	lauren.mcclain@rcdc.com	
6 DALLAS Colwell	300 S. Whittle. Olney, IL	618.395-7302	code enf@ city of Olney.com	
7 Shanay Patel	2204 Griffith Dr. Champaign	2174195707	shanayp2@illinois.edu	
8 MARK LAMPERD	303 S Elliott St	618-837-8001	Mayor@cityofolney.com	
9 Chris Simpson	1100 E. Laurel St.	(618) 395-2324	Csimpson@rccu1.net	
10 Rusty Holmes	300 S. Whittle	618-395-7302	RholmesAcity of Olney	
11 Rodney Ranes - online				
12 Zoe Zaloudek ISWS online				
13 Brad McVay ISWS online				
14				
15				

B.4 Meeting 4 Documents

Meeting 4 Agenda

Richland County Meeting #4 – Hazard Mitigation Plan

October 20th, 2022 | 6pm – 8pm

1. **INTRODUCTION**
2. **RICHLAND COUNTY HAZARD MITIGATION GOALS AND OBJECTIVES**
3. **COMMUNITY PARTICIPATION REQUIREMENTS**
4. **RISK ASSESSMENT RESULTS AND HAZARD MITIGATION PROJECTS**
5. **PLAN MAINTENANCE**
6. **PLAN ADOPTION**
7. **MITIGATION BENEFITS**
8. **CONCLUDING REMARKS**

Meeting 4 Meeting Minutes

Richland County Meeting #4 – Hazard Mitigation Plan

October 20th, 2022 | 6pm – 8pm

KEY INFORMATION

1) **Every jurisdiction must provide comments on the hazard mitigation plan**. You can view the plan at https://arcg.is/CCG4q1 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 **PLAN MAINTENANCE** 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 Richland 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.

RICHLAND COUNTY HAZARD MITIGATION GOALS AND OBJECTIVES

Goal 1: Lessen the impacts of hazards to new and existing infrastructure, **life, and property.** Bolded words are additions to the 2013 plan goals and objectives.

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 five hazards ranked by the county are: Pandemic, Tornadoes, Severe Wind, Severe Storms, and Earthquakes. Communities in the county have expressed interest in retrofitting buildings to withstand tornado damage and improving or adding tornado sirens.

PLAN MAINTENANCE

Richland 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

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.

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://arcg.is/CCG4q1). Please download the plan and provide comments to mitigation@isws.illinois.edu.

Meeting 4 Sign In Sheet

Richland County Meeting #4 – Hazard Mitigation Plan

October 20th, 2022 | 6pm – 8pm

ATTENDEES

Attendee	Representation
Kevin Parker	Richland County
Lisa Graff	Illinois State Water Survey (ISWS)
Meirah Williamson	ISWS
Jeff Vaughn	Greater Wabash Regional Planning Commission (GWRPC)
Darrell Hampsten	GWRPC
Mike Conn	Illinois Eastern Community College
Jamia Joyce	Village of Claremont
Rusty Homes	City of Olney Fire Department
Andrew Hines	Richland County Sheriff's Office
Jessica Clark	Carle Memorial Hospital
Alice Mullinax	Richland County, Village of Parkersburg
Danny Collwell	Richland County

APPENDIX C: PUBLIC SURVEY RESULTS

Richland County Multi-Jurisdictional Hazard Mitigation Plan Survey

Total submissions: 45

Status: terminated

Type: PDF Summary with Answers

ID: 974289469

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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%**	**45**

2. What is your zip code?	*Percent*	*Count*
62450	**82%**	**37**
62425	**2%**	**1**
62452	**7%**	**3**
62803	**9%**	**4**

3. Where do you live?	*Percent*	*Count*
In town	**78%**	**35**
In the unincorporated county	**22%**	**10**

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)	**58%**	**26**
No (skip the next question)	**42%**	**19**

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	**40%**	**18**
Tornado	**7%**	**3**
Flood	**13%**	**6**
Winter storm	**18%**	**8**
Drought	**9%**	**4**
Extreme temperature	**13%**	**6**
Earthquake	**7%**	**3**
Wildfire	**2%**	**1**
HAZMAT spill	**2%**	**1**
Mine subsidence	**2%**	**1**
Levee break	**2%**	**1**
Pandemic	**33%**	**15**
Other	**2%**	**1**

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	**7%**	**3**
2 - Somewhat prepared	**58%**	**26**
3 - Adequately prepared	**27%**	**12**
4 - Well prepared	**4%**	**2**
5 - Very well prepared	**4%**	**2**

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	**4%**	**2**
2 - Somewhat concerned	**18%**	**8**
3 - Concerned	**40%**	**18**
4 - Very concerned	**27%**	**12**
5 - Extremely concerned	**11%**	**5**

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	**31%**	**14**
2 - Somewhat concerned	**31%**	**14**
3 - Concerned	**24%**	**11**
4 - Very concerned	**9%**	**4**
5 - Extremely concerned	**4%**	**2**

10. Severe winter storm (Winter weather, Ice storm)	*Percent*	*Count*
1 - Not concerned	**4%**	**2**
2 - Somewhat concerned	**27%**	**12**
3 - Concerned	**29%**	**13**
4 - Very concerned	**29%**	**13**
5 - Extremely concerned	**11%**	**5**

11. Drought	*Percent*	*Count*
1 - Not concerned	**27%**	**12**
2 - Somewhat concerned	**40%**	**18**
3 - Concerned	**24%**	**11**
4 - Very concerned	**4%**	**2**
5 - Extremely concerned	**4%**	**2**

12. Extreme temperatures (Heat wave, Cold wave)	*Percent*	*Count*
1 - Not concerned	**20%**	**7**
2 - Somewhat concerned	**38%**	**17**
3 - Concerned	**22%**	**10**
4 - Very concerned	**13%**	**6**
5 - Extremely concerned	**7%**	**3**

13. Earthquake	*Percent*	*Count*
1 - Not concerned	**18%**	**8**
2 - Somewhat concerned	**24%**	**11**
3 - Concerned	**36%**	**16**
4 - Very concerned	**9%**	**4**
5 - Extremely concerned	**13%**	**6**

14. Wildfire	*Percent*	*Count*
1 - Not concerned	**69%**	**31**
2 - Somewhat concerned	**22%**	**10**
3 - Concerned	**4%**	**2**
4 - Very concerned	**0%**	**0**
5 - Extremely concerned	**4%**	**2**

15. HAZMAT spill	*Percent*	*Count*
1 - Not concerned	**33%**	**15**
2 - Somewhat concerned	**42%**	**19**
3 - Concerned	**13%**	**6**
4 - Very concerned	**4%**	**2**
5 - Extremely concerned	**4%**	**2**

16. Mine subsidence	*Percent*	*Count*
1 - Not concerned	**71%**	**32**
2 - Somewhat concerned	**22%**	**10**
3 - Concerned	**2%**	**1**
4 - Very concerned	**0%**	**0**
5 - Extremely concerned	**4%**	**2**

17. Dam failure	*Percent*	*Count*
1 - Not concerned	**58%**	**26**
2 - Somewhat concerned	**24%**	**11**
3 - Concerned	**11%**	**5**
4 - Very concerned	**0%**	**0**
5 - Extremely concerned	**7%**	**3**

18. Pandemic	*Percent*	*Count*
1 - Not concerned	**16%**	**7**
2 - Somewhat concerned	**20%**	**9**
3 - Concerned	**24%**	**11**
4 - Very concerned	**18%**	**8**
5 - Extremely concerned	**20%**	**9**

19. Other	*Percent*	*Count*
1 - Not concerned	**58%**	**26**
2 - Somewhat concerned	**13%**	**6**
3 - Concerned	**9%**	**4**
4 - Very concerned	**0%**	**0**
5 - Extremely concerned	**7%**	**3**

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	**27%**	**12**
Television	**42%**	**19**
Radio	**49%**	**22**
School	**9%**	**4**
Social media	**87%**	**39**
Brochure	**11%**	**5**
E-mail	**49%**	**22**
Websites	**42%**	**19**
Government	**22%**	**10**
USPS mail	**44%**	**20**
Other	**9%**	**4**

21. To the best of your knowledge, is your property located in a designated floodplain?	*Percent*	*Count*
Yes	**0%**	**0**
No	**80%**	**36**
I do not know	**20%**	**9**

22. Do you have flood insurance?	*Percent*	*Count*
Yes	**11%**	**5**
No	**78%**	**35**
I do not know	**11%**	**5**

23. Do you have earthquake insurance?	*Percent*	*Count*
Yes	**49%**	**22**
No	**40%**	**18**
I do not know	**11%**	**5**

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

24. Severe storm (Wind, Hail, Lightning)	*Percent*	*Count*
1 - Minimally vulnerable	**16%**	**7**
2 - Moderately vulnerable	**40%**	**18**
3 - Very vulnerable	**29%**	**13**
4 - I do not know	**16%**	**7**

25. Tornado	*Percent*	*Count*
1 - Minimally vulnerable	**11%**	**5**
2 - Moderately vulnerable	**42%**	**19**
3 - Very vulnerable	**38%**	**17**
4 - I do not know	**9%**	**4**

26. Floods (Riverine, Flash/Urban)	*Percent*	*Count*
1 - Minimally vulnerable	**47%**	**21**
2 - Moderately vulnerable	**24%**	**11**
3 - Very vulnerable	**13%**	**6**
4 - I do not know	**16%**	**7**

27. Severe winter storm (Winter weather, Ice storm)	*Percent*	*Count*
1 - Minimally vulnerable	**9%**	**4**
2 - Moderately vulnerable	**40%**	**18**
3 - Very vulnerable	**42%**	**19**
4 - I do not know	**7%**	**3**

28. Drought	*Percent*	*Count*
1 - Minimally vulnerable	**31%**	**14**
2 - Moderately vulnerable	**40%**	**18**
3 - Very vulnerable	**4%**	**2**
4 - I do not know	**24%**	**11**

29. Extreme temperatures (Heat wave, Cold wave)	*Percent*	*Count*
1 - Minimally vulnerable	**20%**	**9**
2 - Moderately vulnerable	**42%**	**19**
3 - Very vulnerable	**22%**	**10**
4 - I do not know	**16%**	**7**

30. Earthquake	*Percent*	*Count*
1 - Minimally vulnerable	**20%**	**9**
2 - Moderately vulnerable	**27%**	**12**
3 - Very vulnerable	**40%**	**18**
4 - I do not know	**13%**	**6**

31. Wildfire	*Percent*	*Count*
1 - Minimally vulnerable	**73%**	**33**
2 - Moderately vulnerable	**7%**	**3**
3 - Very vulnerable	**4%**	**2**
4 - I do not know	**16%**	**7**

32. HAZMAT spill	*Percent*	*Count*
1 - Minimally vulnerable	**44%**	**20**
2 - Moderately vulnerable	**27%**	**12**
3 - Very vulnerable	**9%**	**4**
4 - I do not know	**20%**	**9**

33. Mine subsidence	*Percent*	*Count*
1 - Minimally vulnerable	**69%**	**31**
2 - Moderately vulnerable	**7%**	**3**
3 - Very vulnerable	**0%**	**0**
4 - I do not know	**24%**	**11**

34. Dam failure	*Percent*	*Count*
1 - Minimally vulnerable	**64%**	**29**
2 - Moderately vulnerable	**18%**	**8**
3 - Very vulnerable	**4%**	**2**
4 - I do not know	**0%**	**6**

35. Pandemic	*Percent*	*Count*
1 - Minimally vulnerable	**27%**	**12**
2 - Moderately vulnerable	**22%**	**10**
3 - Very vulnerable	**38%**	**17**
4 - I do not know	**13%**	**6**

36. Other	*Percent*	*Count*
1 - Minimally vulnerable	**44%**	**20**
2 - Moderately vulnerable	**9%**	**4**
3 - Very vulnerable	**2%**	**1**
4 - I do not know	**29%**	**13**

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	**13%**	**6**
2 - Moderately vulnerable	**36%**	**16**
3 - Very vulnerable	**27%**	**12**
4 - I do not know	**24%**	**11**

38. Tornado	*Percent*	*Count*
1 - Minimally vulnerable	**13%**	**6**
2 - Moderately vulnerable	**31%**	**14**
3 - Very vulnerable	**36%**	**16**
4 - I do not know	**20%**	**9**

39. Floods (Riverine, Flash/Urban)	*Percent*	*Count*
1 - Minimally vulnerable	**53%**	**24**
2 - Moderately vulnerable	**18%**	**8**
3 - Very vulnerable	**4%**	**2**
4 - I do not know	**24%**	**11**

40. Severe winter storm (Winter weather, Ice storm)	*Percent*	*Count*
1 - Minimally vulnerable	**16%**	**7**
2 - Moderately vulnerable	**31%**	**14**
3 - Very vulnerable	**33%**	**15**
4 - I do not know	**20%**	**9**

41. Drought	*Percent*	*Count*
1 - Minimally vulnerable	**42%**	**19**
2 - Moderately vulnerable	**22%**	**10**
3 - Very vulnerable	**7%**	**3**
4 - I do not know	**27%**	**12**

42. Extreme temperatures (Heat wave, Cold wave)	*Percent*	*Count*
1 - Minimally vulnerable	**33%**	**15**
2 - Moderately vulnerable	**29%**	**13**
3 - Very vulnerable	**16%**	**7**
4 - I do not know	**22%**	**10**

43. Earthquake	*Percent*	*Count*
1 - Minimally vulnerable	**16%**	**7**
2 - Moderately vulnerable	**29%**	**13**
3 - Very vulnerable	**33%**	**15**
4 - I do not know	**22%**	**10**

44. Wildfire	*Percent*	*Count*
1 - Minimally vulnerable	**51%**	**23**
2 - Moderately vulnerable	**16%**	**7**
3 - Very vulnerable	**4%**	**2**
4 - I do not know	**29%**	**13**

45. HAZMAT spill	*Percent*	*Count*
1 - Minimally vulnerable	**31%**	**14**
2 - Moderately vulnerable	**33%**	**15**
3 - Very vulnerable	**7%**	**3**
4 - I do not know	**29%**	**13**

46. Mine subsidence	*Percent*	*Count*
1 - Minimally vulnerable	**58%**	**26**
2 - Moderately vulnerable	**4%**	**2**
3 - Very vulnerable	**2%**	**1**
4 - I do not know	**36%**	**16**

47. Dam failure	*Percent*	*Count*
1 - Minimally vulnerable	**49%**	**22**
2 - Moderately vulnerable	**20%**	**9**
3 - Very vulnerable	**4%**	**2**
4 - I do not know	**27%**	**12**

48. Pandemic	*Percent*	*Count*
1 - Minimally vulnerable	**18%**	**8**
2 - Moderately vulnerable	**22%**	**10**
3 - Very vulnerable	**31%**	**14**
4 - I do not know	**24%**	**11**

49. Other	*Percent*	*Count*
1 - Minimally vulnerable	**33%**	**15**
2 - Moderately vulnerable	**4%**	**2**
3 - Very vulnerable	**2%**	**1**
4 - I do not know	**42%**	**19**

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	**16**
	Skipped	**29**

2. Prior planning with some resources on hand to handle or mitigate emergencies.

5. Preparing ahead

8. Don't know

11. Educate the Public

15. Accurate, do-able education/information. Access to the community's disaster plan(s).

16. Have preparedness kits in their home or on premises? Keep yards and around buildings free from trash and junk?

22. Local information on what to have ready in your home. Designated shelters ready to go & public knowledge increased on that

24. Education on preparing for the most likely hazard potentials.

26. Not much can be done as one never knows how or when a catastrophic event will occur. However, communication is key for the community.

27. Preparedness

29. Have places people know to go to in case of tornado ect. Meeting safe places if put out of their homes from storms . Is our community ready today in case of event or would it take 24 to 48 hours for help?

34. Personal preparedness, infrastructure improvements

35. Require certification classes often

37. City clearing out old trees that can fall over during storms, hitting houses or downing power lines. Better storm drainage.

42. Public education

43. Stop the crap with Covid they are making it worse than it has to be it's a control tactic

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	**18%**	**8**
No	**38%**	**17**
Do not recall	**44%**	**20**

52. Would the disclosure of flood risk influence your decision to purchase or move into a home?	*Percent*	*Count*
Yes	**60%**	**27**
No	**11%**	**5**
I do not know	**29%**	**13**

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	**31%**	**14**
No	**20%**	**9**
Maybe	**49%**	**22**

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	**40%**	**18**
Insurance premium discount	**73%**	**33**
Mortgage discount	**47%**	**21**
Property tax break	**71%**	**32**
Grant funding with cost share	**62%**	**28**
None	**7%**	**3**
Other	**9%**	**4**

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	**53%**	**24**
No	**7%**	**3**
Maybe	**40%**	**18**

56. How old are you?	*Percent*	*Count*
Under 18	**0%**	**0**
18-25	**2%**	**1**
26-35	**7%**	**3**
36-45	**29%**	**13**
46-55	**29%**	**13**
56-65	**22%**	**10**
Over 65	**11%**	**5**

57. How long have you lived in Richland County?	*Percent*	*Count*
Less than one year	**0%**	**0**
1-5 years	**13%**	**6**
6-10 years	**7%**	**3**
11-20 years	**16%**	**7**
More than 20 years	**64%**	**29**

58. Do you own or rent your home?	*Percent*	*Count*
Rent	**7%**	**3**
Own	**93%**	**42**

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	**11%**	**5**
No	**49%**	**22**
Maybe	**36%**	**16**
Other	**2%**	**1**

60. Would you be interested in learning more about and joining a local Community Emergency Response Team (CERT)?	*Percent*	*Count*
Yes	**29%**	**13**
No	**36%**	**16**
Maybe	**36%**	**16**
Other	**0%**	**0**

APPENDIX D: PUBLIC NOTIFICATIONS

Immediate Press Release

Final Public Meeting To Discuss Richland County Local Hazard Mitigation Plan Set For October 6

Richland County along with the participating jurisdictions of Olney, Noble, Calhoun, and Parkersburg will be having their final public meetings October 6, 2022 from 6-8 pm at the Olney Central College Banquet Room (305 N. West Street, Olney, Illinois 62450). The purpose of this meeting is to review their draft FEMA 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 Richland County HMP plan can be found online at https://storymaps.arcgis.com/stories/141a3ce3f03a495cae9d39e7c50af45e

All of the participating jurisdictions have been working with Richland County Emergency Management, Greater Wabash Regional Planning Commission, 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 Richland County, as well as additional funds available post-disaster.

Planning meetings were held October 15, 2021, January 12, 2022, and March 23, 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 Richland County and its communities. Once the final public input is obtained, the plan will be submitted to FEMA for approval. It normally takes from 3-6 months for FEMA review. Upon FEMA approval, the plan will come back to each jurisdiction for final adoption to become the official Richland County Hazard Mitigation Plan. The plan is required by FEMA to be reviewed and updated every five years.

APPENDIX E: ESSENTIAL FACILITIES

Police Facilities

Name of Facility	Location
Olney Police Department	Olney
Richland County Sheriff's Office	Olney

Fire Facilities

Name of Facility	Location
Claremont-Bonpas Fire Department	Calhoun
Claremont-Bonpas Fire Protection Dist.	Claremont
Noble Wakefield Fire Protection District	Noble
Olney Fire Department	Olney
Noble-Wakefield Fire Protection District	Wakefield

Medical Facilities

Name of Facility	Location
Carle Richland Memorial Hospital	Olney
Richland Nursing and Rehab	Olney

School Facilities

Name of Facility	Location
Illinois Eastern Community College	Olney
Olney Central College	Olney
St Joseph Elementary School	Olney
Richland County High School	Olney
Richland County Middle School	Olney
Richland County Elementary School	Olney

Emergency Operations Center

Name of Facility	Location
Richland County EMA	Olney

Waste Water Facilities

Name of Facility	Location
Calhoun STP, Village of	Calhoun
Claremont STP, Village of	Claremont
Noble STP, Village of	Noble
Olney STP, City of	Olney
Parkersburg STP, Village of	Parkersburg

APPENDIX F: ADOPTION RESOLUTIONS

FEMA Approval Pending Adoption Letter

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 the 2023 Richland County Multi-Jurisdictional Hazard Mitigation Plan Update 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 Richland 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: 2023.08.04 11:43:42 -05'00'

John Wethington
Chief, 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

March 14, 2024

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

Dear Mr. Krug,

The 2023 Richland County Multi-Jurisdictional Hazard Mitigation Plan Update 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 Richland County Multi-Jurisdictional Hazard Mitigation Plan Update met the required criteria for a multi-jurisdictional hazard mitigation plan and the plan is now approved for: the villages of Parkersburg, Noble, Claremont, and Calhoun, the City of Olney, and Richland County.

The expiration date of the 2023 Richland County Multi-Jurisdictional Hazard Mitigation Plan Update is five years from the date of this letter.

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 jurisdictions. 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 Maria Freeman at (202) 793-0810 or email at maria.freeman@fema.dhs.gov.

Sincerely,

JOHN A WETHINGTON
Digitally signed by JOHN A WETHINGTON
Date: 2024.03.14 15:31:01 -05'00'

John Wethington
Chief, Risk Analysis Branch
Mitigation Division

Richland County Adoption Resolution

Richland County Adoption Resolution

Richland County, Illinois

RESOLUTION NO. 2023-8-10

A RESOLUTION OF THE Richland County ADOPTING THE

RICHLAND COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN – AUGUST 2023

WHEREAS the Richland County recognizes the threat that natural hazards pose to people and property within Richland County; and

WHEREAS the Richland County has prepared a multi-hazard mitigation plan, hereby known as RICHLAND COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN – AUGUST 2023 in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS (Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023) identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in (local community) from the impacts of future hazards and disasters; and

WHEREAS adoption by the Richland County demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the (title and date of mitigation plan).

NOW THEREFORE, BE IT RESOLVED BY THE RICHLAND COUNTY, ILLINOIS, THAT:

Section 1. In accordance with (local rule for adopting resolutions), the Richland County adopts the RICHLAND COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN – AUGUST 2023.

ADOPTED by a vote of 6 in favor and 0 against, and 0 abstaining, this 10 day of August, 2023.

By: Dean RCa
(print name)

ATTEST:

By: [signature]
(print name)

OFFICIAL SEAL
AMANDA TROYER
NOTARY PUBLIC STATE OF ILLINOIS
My Commission Expires 01-18-2027
ID # 90[illegible]19

APPROVED AS TO FORM:

By: _____
(print name

Village of Calhoun Adoption Resolution

Village Of Calhoun
PO Box 88
Calhoun, IL 62419

RESOLUTION NO. 23-1

A RESOLUTION OF THE VILLAGE OF CALHOUN ADOPTING THE RICHLAND COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN – AUGUST 2023

WHEREAS the Calhoun Village Board recognizes the threat that natural hazards pose to people and property within the Village of Calhoun; and

WHEREAS the Village of Calhoun has prepared a multi-hazard mitigation plan, hereby known as "Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023" in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Village of Calhoun from the impacts of future hazards and disasters; and

WHEREAS adoption by the Calhoun Village Board demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023.

NOW THEREFORE, BE IT RESOLVED BY THE VILLAGE OF CALHOUN, ILLINOIS, THAT:

Section 1. In accordance with (local rule for adopting resolutions), the Calhoun Village Board adopts the Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023.

ADOPTED by a vote of 4 in favor and 0 against, and 2 abstaining, this 14 day of September, 2023.

By: Spencer Brock
(print name)

ATTEST:

By: Brandi Lutz
(print name)

Village of Claremont Adoption Resolution

Village of Claremont, Illinois

RESOLUTION NO. 2023-1

A RESOLUTION OF THE VILLAGE OF CLAREMONT ADOPTING THE RICHLAND COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN – AUGUST 2023

WHEREAS the Claremont Village Board recognizes the threat that natural hazards pose to people and property within the Village of Claremont; and

WHEREAS the Village of Claremont has prepared a multi-hazard mitigation plan, hereby known as "Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023" in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Village of Claremont from the impacts of future hazards and disasters; and

WHEREAS adoption by the Claremont Village Board demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023.

NOW THEREFORE, BE IT RESOLVED BY THE VILLAGE OF CLAREMONT, ILLINOIS, THAT:

Section 1. In accordance with (local rule for adopting resolutions), the Claremont Village Board adopts the Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023.

ADOPTED by a vote of 4 in favor and 0 against, and 2 abstaining, this 12 day of September, 2023.

By: Loretta Steber
(print name)

ATTEST:

By: John Sayre
(print name)

APPROVED AS TO FORM:

By: Sharon Jones
(print name)

Village of Noble Adoption Resolution

A RESOLUTION OF THE VILLAGE OF NOBLE ADOPTING THE RICHLAND COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN – AUGUST 2023

WHEREAS the Noble Village Board recognizes the threat that natural hazards pose to people and property within the Village of Noble; and

WHEREAS the Village of Noble has prepared a multi-hazard mitigation plan, hereby known as "Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023" in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Village of Noble from the impacts of future hazards and disasters; and

WHEREAS adoption by the Noble Village Board demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023.

NOW THEREFORE, BE IT RESOLVED BY THE VILLAGE OF NOBLE, ILLINOIS, THAT:

Section 1. In accordance with (local rule for adopting resolutions), the Noble Village Board adopts the Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023.

ADOPTED by a vote of 6 in favor and 0 against, and 0 abstaining, this 28th day of August 2023.

Brad Kissler Mayor
VILLAGE PRESIDENT

ATTEST:
Teresa Hundley
VILLAGE CLERK

City of Olney Adoption Resolution

RESOLUTION NO. 2023-R-57

RESOLUTION ADOPTING THE RICHLAND COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN OF AUGUST 2023

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

WHEREAS, the City of Olney has prepared a multi-hazard mitigation plan, hereby known as "Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023" in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Olney from the impacts of future hazards and disasters;

WHEREAS, adoption by the Olney City Council demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023.

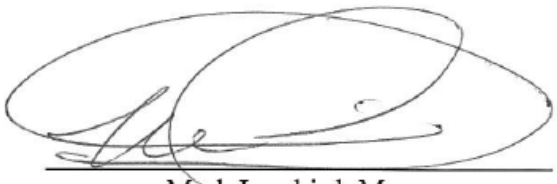
NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF OLNEY, ILLINOIS, that the Olney City Council adopts the Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023.

PASSED by the City Council of the City of Olney, Richland County, Illinois, this 14th day of August, 2023.

AYES 5

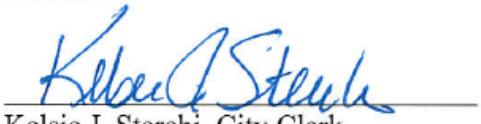
NAYS 0

ABSENT 0



Mark Lambird, Mayor

ATTEST:



Kelsie J. Sterchi, City Clerk

Village of Parkersburg Adoption Resolution

Village of Parkersburg, Illinois
RESOLUTION NO. 2023-08-14
A RESOLUTION OF THE VILLAGE OF PARKERSBURG ADOPTING THE RICHLAND COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN – AUGUST 2023
WHEREAS the Parkersburg Village Board recognizes the threat that natural hazards pose to people and property within the Village of Parkersburg; and

WHEREAS the Village of Parkersburg has prepared a multi-hazard mitigation plan, hereby known as "Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023" in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Village of Parkersburg from the impacts of future hazards and disasters; and
WHEREAS adoption by the Parkersburg Village Board demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023.
NOW THEREFORE, BE IT RESOLVED BY THE VILLAGE OF PARKERSBURG, ILLINOIS, THAT:
Section 1. In accordance with (local rule for adopting resolutions), the Parkersburg Village Board adopts the Richland County Multi-Jurisdictional Hazard Mitigation Plan – August 2023.
ADOPTED by a vote of 5 in favor and 0 against, and 1 abstaining, this 14 day of August, 2023

By: Raymond L. Rudolph. Raymond Rudolphi, Mayor
(print name)
ATTEST:
By: Alice Mullinax Alice Mullinax, Clerk
(print name)
APPROVED AS TO FORM:
By: _____
(print name)