2020
MULTI-JURISDICTIONAL NATURAL HAZARDS MITIGATION PLAN

- Braidwood
- Carbon Hill
- Channahon
- Coal City
- Diamond
- Dwight
- Grundy County
- Kinsman
- Mazon
- Morris
- Seneca
- South Wilmington

Grundy County Multi-Jurisdictional Natural Hazards Mitigation Plan
Participating Jurisdictions

- Braidwood
- Carbon Hill
- Channahon
- Coal City
- Diamond
- Dwight
- Grundy County
- Kinsman
- Mazon
- Morris
- Seneca
- South Wilmington

Grundy County Multi-Jurisdictional Natural Hazards Mitigation Plan

Plan Author: University of Illinois Extension

With assistance from: Illinois State Water Survey

Contributing Staff

University of Illinois Extension:

Zachary Kennedy	Community Development Extension Specialist
Carrie McKillip	Community Development Extension Educator
Megan Walsh	County Extension Director

Illinois State Water Survey:

Lisa Graff	HAZUS-MH Projects Lead
Brad McVay	GIS Specialist

The preparation of this report was financed through a Hazard Mitigation Program Planning Grant from the Federal Emergency Management Agency (FEMA), the State of Illinois and Grundy County, Illinois.

Grundy County Multi-Jurisdictional Natural Hazards Mitigation Plan
Steering Committee

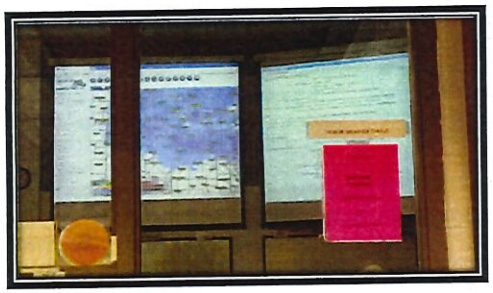
Name	Jurisdiction	Title	Agency
Josh Bolatto	Braidwood	Assistant ESDA Coordinator	Village of Braidwood
Jessica Harvey	Carbon Hill	Municipal Clerk	Village of Carbon Hill
John Grimmenga	Channahon	Emergency Services Coordinator	Village of Channahon
Matt Fritz	Coal City	Village Administrator	Village of Coal City
Terry Kernc	Diamond	Mayor	Village of Diamond
Kevin McNamara	Dwight	Village Administrator	Village of Dwight
Joe Schroeder/George Gray	Grundy County	Emergency Mgt Director/County Administrator	Grundy County
Jim Dunning	Kinsman	Volunteer	Village of Kinsman
Jeff Marques	Mazon	Chief of police	Village of Mazon
Robert Coleman	Morris	Emergency management Director	City of Morris
Grant J Hacker	Seneca	Firefighter/EMT	Village of Seneca
Norman Lardi Jr.	South Wilmington	Board Member	Village of South Wilmington

Grundy County Mitigation Plan

PURPOSE STATEMENT

The Grundy County Natural Hazard Mitigation plan serves to provide guidance for all participating jurisdictions as to specific steps that may be undertaken to reduce the risk to life and property from natural hazards. Hazards considered in the plan include severe storms, tornados, severe winter storms, drought, extreme temperatures, flood, and earthquake. Updated from the 2013 plan, this plan identifies goals as well as specific actions to mitigate losses associated with these Natural Hazards.

The Committee evaluated input from citizens, focus groups, and officials in determining projects to be included in the plan. After careful review of the 2013 Plan Projects, and review of annual meeting information, each participating jurisdiction updated their projects. These projects worked to reduce the impact of natural hazards on citizens, visitors, infrastructure, property and critical facilities. The updated plan will be adopted and implemented by each participating jurisdiction.



Throughout this plan, pictures of preparedness, mitigation actions, disaster events and responses highlight the efforts undertaken by Grundy County Jurisdictions to fulfill this purpose. The table on page 82, Figure 70, shows the progress that has been made on mitigation since the original plan completion in 2013. All photos are courtesy of Grundy County EMA, and depict actual Grundy County Events and locations.

TABLE OF CONTENTS

FIGURE # DIRECTORY

ATTACHMENTS **PAGE #**

INTRODUCTION

Why a Mitigation Plan?

The Disaster Mitigation Act of 2000 (DMA2K) recognized the need for jurisdictions to make and implement a plan to reduce the risk to life and property from natural hazards. In addition, the act requires the Federal Emergency Management Agency (FEMA) to review and approve these plans in order for jurisdictions to receive any FEMA mitigation funding. Once approved, the plan is to be monitored annually and updated every five years. The previous Grundy County Multi-jurisdictional Natural Hazards Mitigation Plan received FEMA approval in 2013. In the intervening years, Grundy County has hosted an annual meeting of participating jurisdictions to monitor progress on the plan.

This plan has allowed Grundy County, Illinois, to develop a plan that looks to protect the health, safety, and welfare of their citizens. Much more than response, mitigation involves assessing the potential for damage from a natural hazard, and developing a project/plan to reduce or eliminate that damage. The preparation of this plan, funded by a grant from FEMA through the State of Illinois, follows the guidelines to make participating Jurisdictions eligible to apply for Mitigation Grant Funding.

Jurisdictional Participation in Plan Development

All jurisdictions within Grundy County, even those with only a portion of their incorporated area within the county, were invited to participate in the development of the multi-jurisdictional Natural Hazards Mitigation planning process. It was determined at the first Steering Committee meeting on September 24, 2019, that a jurisdiction must send a representative to at least one of the steering committee meetings to meet the minimum standard of jurisdictional participation. This standard was set by a consensus vote of the steering committee members present.

While participation in one of steering committee meetings was determined to be the minimum requirement for participation, all jurisdictions were encouraged to participate in all of the meetings, including the public meeting. Twelve of the Jurisdictions within the county participated (See listing on page 4), with no representative participating from Braceville, East Brooklyn, Gardner, or Verona. Several of the participating jurisdictions were border communities, with a portion of the jurisdiction in Grundy County as well as another County. Steering Committee Members from these jurisdictions were asked to focus on the portion of their communities that fell within Grundy County. In addition, neighboring jurisdictions were invited to the public meeting, and agencies were asked for input through both the focus groups and public meeting.

Grundy County has experienced several disasters since the original mitigation plan was adopted. In additional to seasonal flooding, the county was hit by a severe tornado in November of 2013, causing $10.75 million worth of damage in the Diamond and Coal City Area.

GRUNDY COUNTY DEMOGRAPHIC OVERVIEW

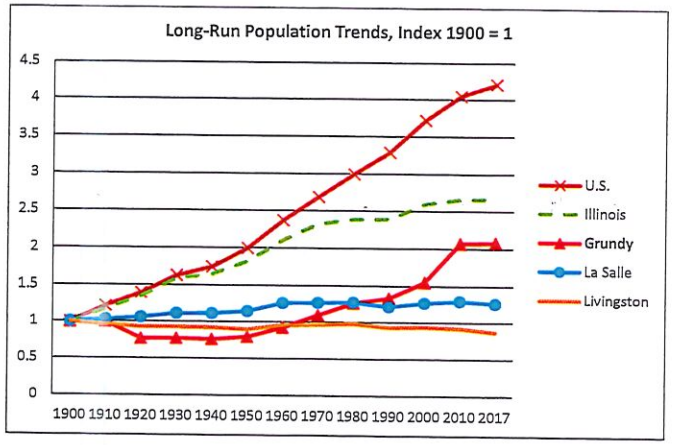
The following data is presented to provide an overview of Grundy County, as well as current trends. All data are benchmarked against two near neighbors, La Salle and Livingston counties, and when appropriate the State of Illinois and the nation.

POPULATION TRENDS

Long-Run Population Trend

The population of Grundy County has increased since 1900. 1910 to 1920 saw a sharp decrease in county population, between 1920 and 1940 the population trend remained flat, after which the population has grown steadily ever since. In 1900 the county had a population of 24,136 and by 2017 the population had grown to an estimated 50,333, an increase of 109 percent. In comparison, over the same time period neighboring La Salle County saw an estimated increase in population of 27 percent, while Livingston County's population shrank by an estimated 14 percent (see figure 1).

Figure 1



Source: U.S. Census Bureau, Decennial Census 1900-2010 & American Community Survey 5-yr Estimates 2013-2017

Short-Run Population Trend

Population in Grundy County has increased from 48,744 in 2010 to an estimated 50,333 in 2017, a gain of about 3.3% percent. Grundy County has outperformed all benchmark areas in population growth over the period of time, with the exception of the U.S. as a whole. In contrast, La Salle County's population from 2010 to 2017 decreased by an estimated 2.3%. Livingston County's population shrank by 5.6 percent over the same period.

Figure 2

	U.S.	Illinois	**Grundy Co.**	La Salle Co.	Livingston Co.
Population 2017	321,004,407	12,854,526	**50,333**	111,151	36,812
Population 2010	303,965,272	12,745,359	**48,744**	113,789	39,010
Population Change 2010-2017	17,039,135	109,167	**1,589**	(2,638)	(2,198)
Population Pct. Change 2010-2017	5.6%	0.9%	**3.3%**	-2.3%	-5.6%

Age of the Population

Grundy County has a younger population than its two near neighbors, the state, and the nation. In 2017 an estimated 27.3 percent of Grundy's population was under the age of 18. This was a higher proportion than all the other benchmark areas. Further, Grundy County has the lowest percentage of persons over 65 years of age among all benchmark areas (see table). The median estimated age in Grundy County in 2017 was 37.5.

Figure 3

2017 Percentage of Population Under 18 and 65 and Over

	U.S.	Illinois	**Grundy Co.**	La Salle Co.	Livingston
Under 18	23.0	23.0	**25.3**	21.6	21.5
Over 65	14.9	14.4	**13.1**	17.7	17.6

Source: U.S. Census Bureau, American Community Survey 5-yr Estimates 2013-2017

Racial Make-up of the Population

Grundy County's population is predominantly white, and non-Hispanic. Whites comprised an estimated 94.1 percent of the population in 2017. Non-Hispanics of any race make up 91.6 percent of the total population. Grundy County has similar racial make-up, but a larger proportion of Hispanic or Latino population and a smaller proportion of black or African American population, than its two neighbors La Salle and Livingston counties (see tables).

Figure 4

2017 Racial Make-up

	U.S.	Illinois	Grundy Co.	La Salle Co.	Livingston Co.
White	73.0%	71.9%	94.1%	93.6%	92.8%
Black	12.7%	14.3%	1.5%	2.5%	4.1%
Other	14.3%	13.8%	4.4%	3.9%	3.1%

Figure 5

2017 Hispanic Population

	U.S.	Illinois	Grundy Co.	La Salle Co.	Livingston Co.
Hispanic or Latino	17.6%	16.8%	9.4%	9.3%	4.4%
Not Hispanic or Latino	82.4%	83.2%	90.6%	90.7%	95.6%

Source: U.S. Census Bureau, American Community Survey 5-yr Estimates 2013-2017

INCOME

Median Household and Per Capita Income

According to the U.S. Census Bureau, American Community Survey, 5-year estimates, the 2017 estimated median household income in Grundy County was $71,598. This was higher than both La Salle and Livingston counties which had median household incomes of $54,693 and $54,339 respectively. The figures for the State of Illinois and the U.S. were $61,229 and $57,652 respectively. In 2017 the estimated per capita income in Grundy County was $31,914. This was higher than both La Salle County at $27,959, and Livingston County at $27,318.

Poverty Rate

According to the U.S. Census Bureau, American Community Survey, 5-year estimates, 9.4 percent of Grundy County residents lived below the poverty line in 2017. The poverty rate among children under 18 was 11.2 percent. Grundy County compared favorably against all benchmark areas in both poverty measures (see table).

Figure 6

2017 Poverty Status

	U.S.	Illinois	Grundy Co.	La Salle Co.	Livingston Co.
Population in Poverty	14.6%	13.5%	9.4%	13.6%	13.3%
Children in Poverty	20.3%	18.8%	11.2%	21.7%	19.4%

Source: U.S. Census Bureau, American Community Survey 5-yr Estimates 2013-2017

HOUSING AND HOUSEHOLDS

Household Types

Married couple families are the largest household type group in Grundy County. While this is also the largest group in all of the benchmark areas, a greater proportion of Grundy County households are married couples (see **Figure 7**).

Figure 7

2017 Estimated Households by Type and Presence of Children

	United States		Illinois		Grundy Co.		LaSalle Co.		Livingston Co.	
Total:	118,825,921		4,818,452		19,006		44,448		14,379	
Households with one or more people under 18 years:	37,676,388	31.7%	1,511,085	31.4%	7,058	37.1%	12,796	28.8%	4,374	30.4%
Family households:	37,326,953	31.4%	1,498,168	31.1%	6,948	36.6%	12,621	28.4%	4,238	29.5%
Married-couple family	24,462,387	20.6%	999,787	20.7%	5,041	26.5%	8,245	18.5%	2,653	18.5%
Other family:	12,864,566	10.8%	498,381	10.3%	1,907	10.0%	4,376	9.8%	1,585	11.0%
Male householder, no wife present	3,212,552	2.7%	120,454	2.5%	540	2.8%	1,260	2.8%	533	3.7%
Female householder, no husband present	9,652,014	8.1%	377,927	7.8%	1,367	7.2%	3,116	7.0%	1,052	7.3%
Nonfamily households:	349,435	0.3%	12,917	0.3%	110	0.6%	175	0.4%	136	0.9%
Male householder	250,197	0.2%	9,307	0.2%	52	0.3%	166	0.4%	74	0.5%
Female householder	99,238	0.1%	3,610	0.1%	58	0.3%	9	0.0%	62	0.4%
Households with no people under 18 years:	81,149,533	68.3%	3,307,367	68.6%	11,948	62.9%	31,652	71.2%	10,005	69.6%
Family households:	40,971,750	34.5%	1,624,323	33.7%	6,874	36.2%	16,984	38.2%	5,277	36.7%
Married-couple family	32,996,965	27.8%	1,303,988	27.1%	5,931	31.2%	13,859	31.2%	4,502	31.3%
Other family:	7,974,785	6.7%	320,335	6.6%	943	5.0%	3,125	7.0%	775	5.4%
Male householder, no wife present	2,534,598	2.1%	100,803	2.1%	229	1.2%	1,139	2.6%	284	2.0%
Female householder, no husband present	5,440,187	4.6%	219,532	4.6%	714	3.8%	1,986	4.5%	491	3.4%
Nonfamily households:	40,177,783	33.8%	1,683,044	34.9%	5,074	26.7%	14,668	33.0%	4,728	32.9%
Male householder	18,671,714	15.7%	776,538	16.1%	2,646	13.9%	7,442	16.7%	2,255	15.7%
Female householder	21,506,069	18.1%	906,506	18.8%	2,428	12.8%	7,226	16.3%	2,473	17.2%

Source: U.S. Census Bureau, American Community Survey 5-yr Estimates 2013-2017

Owner Occupancy Rates

Grundy County has a high rate of owner occupancy. In 2017, an estimated 72.1 percent of occupied housing units were owner occupied. This owner occupancy rate in Grundy was higher than both the U.S. and Illinois, and slightly lower than the two neighboring counties (see **Figure 8**).

Figure 8

2017 Owner vs Renter Occupancy Rates

	U.S.	Illinois	Grundy Co.	La Salle Co.	Livingston Co.
Owner Occupied	63.8%	66.1%	72.1%	72.7%	72.6%
Renter Occupied	36.2%	33.9%	27.9%	27.3%	27.4%

Source: U.S. Census Bureau, American Community Survey 5-yr Estimates 2013-2017

Housing Type

Detached single-family homes are the predominant housing type in Grundy County. In 2017, an estimated 72.0 percent of housing units in Grundy County were detached single family homes. Grundy County had a higher proportion of detached single family homes than the state and the nation, but a lower proportion than neighboring La Salle and Livingston counties (see **Figure 9**).

Figure 9

2017 Estimated Proportion of Housing Units by Units in Structure

	U.S.	Illinois	Grundy Co.	La Salle Co.	Livingston Co.
1 Unit Detached	61.7%	58.9%	72.0%	78.4%	77.7%
1 Unit Attached	5.8%	5.7%	9.4%	2.3%	2.7%
2 Units	3.7%	5.6%	2.5%	4.1%	2.5%
3 to 19 Units	13.7%	16.8%	9.1%	8.5%	9.1%
20 or More Units	8.8%	10.4%	3.0%	2.4%	2.8%
Mobile Home or Trailer	6.3%	2.5%	4.0%	4.3%	5.3%
Boat, RV, Van, etc.	0.1%	0.0%	0.1%	0.0%	0.0%

Source: U.S. Census Bureau, American Community Survey 5-yr Estimates 2013-2017

Grundy County's building stock is much newer than all benchmark areas. Grundy has both a greater proportion of structures built 2000 or later, and the smaller proportion of structures built prior to 1939 than Illinois, and both the neighboring counties (see table). The median year structures were built in Grundy County is 1982.

Figure 10

2017 Proportion of Structures by Age

	United States	Illinois	Grundy Co.	LaSalle Co.	Livingston Co.
Built 2010 or Later	3.2%	1.6%	2.5%	1.2%	1.3%
Built 2000 to 2009	14.5%	11.1%	25.4%	9.5%	6.0%
Built 1990 to 1999	14.0%	11.0%	15.0%	10.9%	10.0%
Built 1980 to 1989	13.6%	8.9%	9.3%	7.0%	6.6%
Built 1970 to 1979	15.5%	14.4%	14.7%	12.1%	13.4%
Built 1940 to 1969	26.4%	31.1%	19.2%	30.4%	28.8%
Built 1939 or Earlier	12.9%	21.8%	13.8%	28.8%	33.7%

Source: U.S. Census Bureau, American Community Survey 5-yr Estimates 2013-2017

GRUNDY COUNTY LAND USE AND DEVELOPMENT TRENDS

Grundy County completed a Comprehensive Plan in April of 2014 that includes a land use and development framework plan. This plan encompasses four guiding principles of preservation, sustainability, completion and coordination. These components recognize the agricultural base of the county, as well as the rich natural environment, while continuing to compete for growth of industry and jobs. A large component of the plan is also to coordinate with the 16 municipalities within the county on all components of land use and growth.

The Plan identifies the following categories of Land Use for the County:

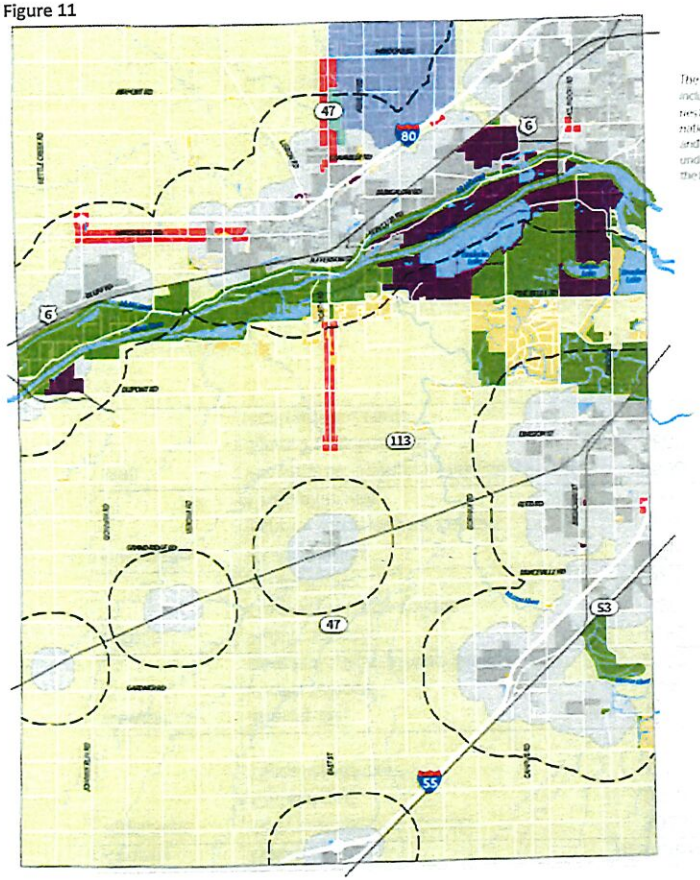
1. Agriculture
2. County Neighborhoods
3. Managed Growth Areas
4. Commercial
5. Office/Industrial
6. Heavy Industrial
7. Parks and Open Space
8. Public and Semi-Public
9. Rail and Utilities.

The illustration from the Grundy County Comprehensive Plan on the following page identifies the land use of the county by a color code. The plan defines each category of land use, and specifies policies associated with each use category.

While population growth has slowed in the county, it still exceeds the state growth rate and the growth rate of the surrounding counties (see population trends, pg. 11). The County has established a Land Use Department that houses Environment and Resource Conservation, Building and Zoning, Planning as well as land use. The department offers online GIS mapping as well as flood plain identification. These tools not only provide information to residents, but also jurisdictional planners and developers to determine individual property status for land use and flooding risk.

Grundy County comprises about 430 square miles and approximately 90% of the land remains unincorporated. By creating a comprehensive land use plan and a department to manage growth, the county has not only recognized the need to think strategically about their development, but has acted upon that need. As part of the coordination effort, the mitigation strategies and projects identified in this document will be considered.

Figure 11



The Land Use & Development Plan includes nine different land use categories for Grundy County. Land use designations describe the primary land use and development intensity of parcels under County jurisdiction, and provide the foundation for zoning.

Land Use Framework Plan

Context
- Grundy County
- 1.5 Mile Planning Jurisdiction (ETJ)
- Incorporated Municipalities

Land Use
- Agricultural
- County Neighborhoods
- Managed Growth Areas
- Commercial
- Office/Industrial Park
- Heavy Industrial
- Parks & Open Space
- Public & Semi-Public
- Rail & Utilities

MAJOR EMPLOYERS IN GRUNDY COUNTY

Information on the major employers in Grundy County, Illinois was retrieved from the Grundy County Economic Development website (https://gedc.com/major-employers/) on February 17, 2020. Due to the changing nature of the workforce, reader's should recheck the website periodically to verify current data for major employers.

Figure 12

Grundy County Large Employers		
Company	Products/Services	Employees
Morris Hospital	Medical	1350
Exelon – Dresden Station	Electricity Generation	900
"D" Construction	Construction	550
Trader Joe's	Distribution Facility	450
Grainger	Distribution Facility	450
Costco	Distribution Center	415
Wal-Mart	Retail	350
LyondellBasell	Polymer Resins	320
Jewel-Osco	Retail	250
Chicago Aerosol	Manufacturing	241
NFI	Distribution Facility	218
Kellogg's	Distribution Facility	200
U.S. Cold Storage	Distribution Facility	190
Aux Sable Liquid Products	Natural Gas Fractionation	179
Menards	Retail	140
Mondelez/Ryder	Distribution Facility	125
Northfield Block	Manufacturing	124
Utility Concrete Products	Manufacturing	110
Nouryon	Specialty Chemicals	100
A & R Distribution	Intermodal Distribution	83
ALDI, Inc.	Distribution Facility	75
Primus Electronics	Distribution Facility	72
Reichhold Chemicals	Manufacturing	71
Sponge Cushion	Manufacturing	70
Ritchie Brothers	Equipment Auction	67
BMW	Distribution Facility	65
Dibble Trucking	Transportation Services	55
Rezin Orthopedics	Medical	50
Metalstamp	Manufacturing	50

In addition to employers within the county, it is important to note that many residents of the county commute to neighboring counties for employment opportunities. Additionally, residents of neighboring counties commute to Grundy County for employment opportunities. These commuting patterns indicate the need for maintaining road access in the event of natural disasters in order to insure economic stability. In reviewing neighboring counties' data, the top three employers for each county are listed in the illustration below. Workforce numbers for employers from Illinois Department of Commerce and Economic Opportunity Community Profiles. These numbers are dated, but updates could not be found in a secondary data search.

Figure 13

Surrounding County Major Employers

County	Employer	Workforce
Kankakee	Riverside Medical Center	3015
	CSL Behring	1600
	Cigna Healthcare	1200
Kendall	Boerne ISD	997
	Public Schools	2443
	Menard's Distribution Center	1100
LaSalle	Public Schools	3150
	Commonwealth Edison	800
	JC Whitney	670
Livingston	RR Donnelley	800
	Pontiac Correctional Center	565
	Caterpillar, Inc	550
Will	Provena St. Joseph's Medical Center	2500
	Silver Cross Hospital	1800
	Hollywood Casino	1756

PLANNING PROCESS

Grundy County received funding through the Illinois Emergency Management Agency (IEMA) to update the 2013 Natural Hazards Mitigation Plan in accordance with the Federal Emergency Management Agency (FEMA) planning requirements. The plan update process included four steering committee meetings, four focus groups, and two public meetings. In addition to the scheduled meetings, steering committee members discussed the planning process with other members of the communities they represented, and solicited input from a wide array of stakeholders.

The chart below illustrates the planning schedule for plan update. As can be noted, the steering committee met four times, in addition to the public meetings and focus groups. Meeting minutes of all of the meetings

Figure 14

Grundy County Planning Calendar

Date	Time	Event	Location	Topic
8/9/2019	10am	Organizing Meeting	EOC	Scheduling
9/24/2019	1pm	Steering Committee 1	EOC	Planning to Plan, Participation, Process Info, Review of 2013 Plan Goals
10/22/2019	1pm	Steering Committee 2	EOC	Risk Assessment, HAZUS info, critical facility info
10/22/19	5:30pm	Public Meeting #1	Council Chambers	Planning Goals
11/12/2020	All Day	Focus Groups	U of I Extension Office	Four Focus Groups on Natural Hazard Impacts – Ag/Business, Human Services and Education, Public Safety and Utilities and Infrastructure
12/10/2019	1 pm	Steering Committee 3	EOC	Project grid updates, ideas from focus groups

are included in the appendix. In addition, the report out from the focus groups are included. These were reviewed with the steering committee during the 3rd meeting on December 10, 2019. While a fourth steering committee and final public meeting were scheduled for April 21, 2020, these activities were cancelled due to COVID-19 restrictions.

COMMUNITY ENGAGEMENT IN THE PLANNING PROCESS

Reaching and engaging the public in the mitigation planning process is getting more challenging as media is becoming more fragmented and diverse. Press releases, social, print and electronic media were all utilized to inform residents of Grundy County of both how and why they should be engaged in the Mitigation Planning Process. A public meeting and an online survey were hosted to give the public opportunities to engage. Additionally, jurisdictional representatives to the Steering Committee were encouraged to talk with community members, friends and neighbors to gather as much information as possible on the community mindset in regards to mitigation.

Community Surveys were also available in both online and hard copy format, with the online link open from mid-September of 2019 through February of 2020. Steering Committee members and Extension Staff also had hard copy surveys available for the public to complete. These surveys focused upon the community's knowledge of and experience with natural disasters and their impact.

The initial public meeting for the plan update, held in October of 2019, was focused on the process of mitigation planning, as in addition to how disasters affects citizens. Types of mitigation were covered, and attendees were asked to generate ideas on how their risk could be reduced from Natural Hazards. While attendance was low, the discussion was engaging. Surrounding Jurisdictions were invited to the meeting, and at least two counties did attend. Specific letters of invitation went out to Emergency Managers in Kendall, Will, Kankakee, Livingston and LaSalle Counties. The Assistant Chief (Ballun) and Planning Division Chief(Kaller) from Will County were in attendance for the public meeting.

Four focus groups were held in November at the University of Illinois Extension Office in Morris. The notes from these focus groups are included in the attachments. Once the final draft of the plan was completed, it was sent to steering committee members for comment rather than having the final steering committee meeting or the public meeting, which were cancelled due to COVID-19 restrictions. Additionally, it was posted on the Grundy County EMA page, as well as the Grundy County Extension website. Media releases and FaceBook posts with the link were also sent. A seven-day comment period was allowed for those wishing to make comments on the plan.

COMMUNITY SURVEY RESULTS

Over the course of the planning process, an on-line community survey was offered to gather input from the community. The link was promoted through press releases, FaceBook posts and public meetings. While only 185 responded to the survey, the results provided insight as to how the community views their risk, their preparedness and preferred method of notifications. While the full 26 questions are included in the attachments, some items of interest are highlighted in the following bullet points.

- 75% of respondents lived "in town"
- 73% had experienced a disaster
  - 99% citing severe storms
  - 23% citing floods
  - 23% citing winter storms
- 25% of respondents feel they are well or very well prepared for natural hazards, while 38% feel they are somewhat or not at all prepared
- In response to where to receive notification of emergencies, social media had the highest response, with e-mail and television nearly tying for second place
- A great many suggestions for actions to be taken by individuals were received, while several also mentioned infrastructure improvements
- 45% considered the impact of natural hazards before purchasing their homes
- 90% would consider a buyout or relocation if they were designated a high hazard area

The demographics and zip codes of respondents were also collected and can be seen in the full survey report, which is in **ATTACHMENT J** in the attachment section of the report

REVIEW AND INCORPORATION OF EXISTING PLANS, STUDIES, REPORTS, AND TECHNICAL INFORMATION

All known existing plans within Grundy County were gathered by U of I Extension Staff. At one of the Task Force meetings the community representatives were given a Documents Form to be completed in consultation with the leaders in their community, providing them with a list of plans and other documents that should be considered during preparation of the plan. Natural hazards mitigation can be incorporated into existing plans and ordinances during updates. If a community does not have regulations that would promote hazard mitigation, such as building codes, these could be considered for adoption. Other documents could provide helpful information for assessing risks or determining appropriate mitigation projects. A combined listing of community documents is shown in **Figure 15**.

In 2011 Grundy County conducted a threat hazard identification and risk assessment which included not only natural weather-related hazards, but pandemics, and man-made hazards as well. This document was considered in the preparation of this plan and the identification of potential mitigation action items. Additionally, the City of Morris is the site of the Exelon Corporation owned Dresden Generating Station, a nuclear power plant. Per Nuclear Regulatory Commission requirements, this plant has a detailed disaster response plan. The nuclear response plan was also reviewed and considered in the creation of this plan.

Each jurisdiction participating in the planning process and adopting the final plan through the adapted version on the resolution included as ATTACHMENT L, has the authority to engage in mitigation activities related to their jurisdiction. Jurisdictions that encompass flood plains identified in the current floodplain rate maps maintain compliance with the National Flood Insurance Program (NFIP) including all required zoning ordinances. By adopting this plan, each jurisdiction signals their intent to consider mitigation as part of each development and infrastructure decision making process.

Participating jurisdictions that have floodplains are Carbon Hill, Channahon, Morris, Seneca, South Wilmington and unincorporated areas of the county. These jurisdictions are all participating in the National Flood Insurance Program (NFIP), and are in good standing. The remaining jurisdictions do not have existing floodplains, or there is no structure to be damaged by the flooding that may occur.

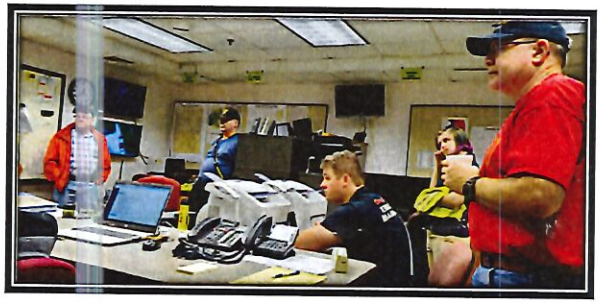


Figure 15

Document	Grundy County	Braceville	Carbon Hill	Channahon	Coal City	Diamond	Dwight	East Brooklyn	Gardner	Kinsman	Mazon	Minooka	Morris	South Wilmington	Verona
Comprehensive Plan	X	X				X	X						X		
Subdivision Ordinance	X					X							X		
Zoning Ordinance	X	X				X							X		
Building Codes	X	X				X							X		
Land Use Plan						X							X		
Existing Land Use Map	X														
Flood Ordinance	X					X	X						X	X	
Flood Insurance Rate Map						X									
Repetitive Flood Loss List															
Elevation Certificates for Bldgs															
Capital Improvement Plan															
Historic Preservation Ordinance															
Storm Water Management Plan	X					X							X		
Hazard Mitigation Plan															
Emergency Management Plan	X						X						X		
Drainage Ordinance													X		
Critical Facilities Map	X														
Hazard Vulnerability Analysis	X														
Infrastructure Map															
Topographic Map															
Other													X		
Community Website													X		
Community Action															
Siren	X					X									
Weather Radio	X														
Storm Spotters															
Local Weather Station	X														
Watershed Repairs															
Road Treatment															

RISK ASSESSMENT

During the second Steering Committee Meeting, on October 22, 2019, the group reviewed a variety of materials when discussing if any of the assigned risk levels should be modified. An updated set of historical weather data was reviewed, as well as the risk assessment data from the 2018 Illinois State Natural Hazard Mitigation Plan. This information is all included in the plan following the updated jurisdictional risk.

Figure 16 - 2019 Summary of Grundy County Risk Assessment

Jurisdiction	Extreme Temperature	Flood	Severe Storm-Tornado	Drought	Earthquake	Severe Winter Storm
Grundy County	MOD	MOD	High	Low/MOD	MOD	MOD
Braceville	MOD	Low	High	Low	MOD	MOD
Carbon Hill	MOD	MOD	High	Low/MOD	MOD	MOD
Channahon	MOD	Low	High	Low/MOD	MOD	MOD
Coal City	MOD	MOD	High	Low/MOD	MOD	MOD
Diamond	MOD	MOD	High	Low/MOD	MOD	High
Dwight	MOD	Low	High	Low/MOD	MOD	MOD
East Brooklyn	MOD	High	High	Low/MOD	MOD	MOD
Gardner	MOD	Low	High	Low/MOD	MOD	MOD
Godley	MOD	Low	High	Low/MOD	MOD	MOD
Kinsman	MOD	MOD	High	Low/MOD	MOD	MOD
Mazon	MOD	MOD	High	Low/MOD	MOD	MOD
Minooka	MOD	Low	High	Low/MOD	MOD	MOD
Morris	MOD	MOD	High	Low/MOD	MOD	MOD
South Wilmington	MOD	MOD	High	Low/MOD	MOD	MOD
Seneca	MOD	Low	High	Low/MOD	MOD	MOD
Verona	MOD	MOD	High	Low/MOD	MOD	MOD

In determining the individual jurisdictional risk, several factors were taken into consideration. These included the historical weather data, the potential risk to life and property, and impact to industry. The committee choose to maintain a basic low/moderate, and high scale, although they choose to place drought in between low and moderate for most of the county. While recent events have not seen significant drought in the county, most committee members feel that due to the agricultural base of the county, drought concerns were slightly higher than low.

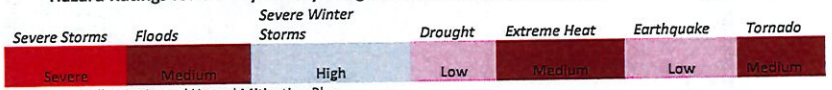
It was determined that extreme temperatures, severe winter storms, tornados and drought are at the same exposure for all jurisdictions. Both extreme temperatures, severe winter storms and drought generally impact the entire region, so there is little to no difference across the county. While severe storms and tornados may only impact a small area of the county, there is no discernable difference in the probability one area would be impacted more so than another.

Due to recent tornados that have impacted the county, it was also determined that the risk for severe storms, which include severe thunder storms, straight line wind events and tornados have been increasing. This increase coupled with the relatively flat terrain of the county led to the nigh risk assessment for these events.

2018 ILLINOIS NATURAL HAZARD MITIGATION PLAN RATINGS FOR GRUNDY COUNTY

The *2018 Illinois Natural Hazards Mitigation Plan* utilizes 1) historical probability, 2) vulnerability, 3) severity of impact and 4) population as the factors considered in determining the risk ratings for 102 counties in Illinois. Based upon historical frequency and probability, vulnerability, severity of impact, and a population criterion, the plan includes a rating for each type of natural hazard for each county. Ratings (from low to high) of very low, low, medium, high and severe were assigned based upon the aforementioned criteria. Grundy County was given the following ratings:

Hazard Ratings for Grundy County Assigned in the 2018 Illinois Natural Hazard Mitigation Plan



Source: 2018 Illinois Natural Hazard Mitigation Plan

The previous version of the Illinois Natural Hazard Mitigation Plan, which was released in 2013, had slightly different ratings for Grundy County. The ratings in the two plans are not directly comparable due to small changes in methodology and ratings scale.

HISTORICAL WEATHER DATA

FEDERAL DISASTER DECLARATION HISTORY SINCE 1981

Most of the federally declared disasters that Grundy County has been a part of since 1981 have been flood events.

FEMA DR#674 – In December of 1982 a federal disaster was declared for several Illinois counties including Grundy. This disaster declaration was the result of a series of severe storm, flooding, and tornado events which hit the area.

FEMA DR#735 – Grundy County was one of several counties that were a part of this 1985 disaster which was the result of flooding, severe storms and ice jams. This disaster also affected counties along the Kankakee, Wabash, and Illinois rivers

FEMA DR#1129 – This July 1996 declaration which included Grundy County was the result of serious flooding.

FEMA DR#1729 – Heavy rains in late August of 2007 led to this September disaster declaration. A total of six counties including Cook, DeKalb, Grundy, Kane, Knox, LaSalle and Warren were included in this disaster. By October of 2007 more than $3.8 million in individual and business assistance had been approved for the affected counties.

FEMA DR#1800 – Severe storms and heavy rain between September 13th and October 5th 2008 caused widespread flooding. Grundy County was part of the larger affected area. Sixty Grundy County households were approved for $213,452 in assistance through FEMA's Individuals and Households Program.

FEMA DR#1960 – Heavy snow fall between January 31st and February 3rd 2011 resulted in Grundy County's inclusion in a federal disaster which included most counties in Illinois.

FEMA DR#4116 – Severe storms, flooding and severe winds contributed to this May 2013 disaster declaration which affected 46 counties including Grundy.

FEMA DR#4157 – Severe storms, severe winds and tornados contributed to impacts that caused this disaster declaration. The affected area included Grundy and 14 other counties.

SEVERE STORMS

The National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center keeps a database of all severe weather events. With regard to severe storms the database keeps records of thunderstorm and high wind events, hail events from 1955 forward. However, the lack of damage inducing thunderstorm and high wind events before 1997 and the lack of any events before 1970 call into question the completeness of this data.

Generally, the Steering Committee felt that there was always a high risk of severe storms throughout the county. As can be seen, these storms strike throughout the county, although the most severe of these have historically been experienced during summer months. Based upon both history and logic, the probability of Grundy County experiencing a severe storm or thunderstorm each year is nearly 100 %. Generally, any structure can sustain damage from a severe storm, but manufactures homes and older homes are particularly vulnerable to wind events. These structures are often inhabited by vulnerable populations that may require shelter during or after an extreme event. Trees were also mentioned as a potential risk from severe storms or wind events. Property owners should be encouraged to do regular trimming and maintenance to mitigate the risk. No other significant risk was noted.

The following table displays all of the damage or injury inducing thunderstorm and high wind events in Grundy County that are listed in the NCDC Storm Events Database.

Figure 17

Thunderstorm and High Wind Events Causing Damage or Injury in Grundy County 1955-Present

Location or County[1]	Date	Time	Recorded Windspeed	Deaths	Injuries	Property Damage	Crop Damage
Morris	7/6/1994	2:52 PM	0 kts.	0	0	50K	0
Minooka	6/6/1995	2:50 PM	0 kts.	0	0	15K	0
GRUNDY	10/24/1995	12:00 PM	0 kts.	2	0	0	0
Morris	6/17/1996	5:30 PM	0 kts.	0	0	30K	0
Countywide	10/29/1996	5:30 PM	62 kts.	0	0	100K	5K
Se Part Of Cnty	4/5/1997	5:00 PM	52 kts.	0	0	70K	0
GRUNDY	4/6/1997	9:30 PM	59 kts.	0	0	10K	0
Morris	7/27/1997	5:42 PM	68 kts.	0	0	20K	0
Morris	6/28/1998	3:10 AM	61 kts.	0	0	60K	40K
GRUNDY	8/24/1998	1:03 PM	44 kts.	0	1	0	0
GRUNDY	11/10/1998	7:30 AM	56 kts.	0	4	0	0
Morris	6/10/1999	11:15 AM	50 kts.	0	0	150K	0
Minooka	7/21/1999	8:30 PM	55 kts.	0	0	50K	0
Mazon	5/31/2000	1:56 PM	65 kts.	0	2	100K	0
Mazon	9/11/2000	9:35 PM	70 kts.	0	0	50K	0
GRUNDY	3/9/2002	11:52 AM	51 kts.	4	4	200K	0
GRUNDY	1/23/2003	1:00 AM	N/A	1	0	0	0
Morris	7/7/2003	8:35 PM	61 kts.	0	0	2.5M	0
GRUNDY	11/13/2003	2:00 PM	51 kts.	0	2	0	0
Mazon	5/30/2004	10:00 AM	55 kts.	0	0	20K	0
Gardner	5/29/2006	3:20 PM	50 kts.	0	0	2K	0
Morris	10/2/2006	10:30 PM	56 kts.	0	0	50K	150K
GRUNDY	2/3/2007	12:00 AM	N/A	1	0	0K	0K
Morris	6/18/2007	4:15 PM	60 kts.	0	0	50K	0K
Morris	8/23/2007	1:45 PM	60 kts.	0	0	100K	50K
Morris	8/23/2007	5:44 PM	54 kts.	0	0	25K	0K
Morris	7/10/2008	3:30 PM	52 kts.	0	0	50K	50K
Coal City	7/10/2008	4:24 PM	55 kts.	0	0	50K	50K
Morris	7/21/2008	7:02 AM	63 kts.	0	0	90K	50K
Paytonville	7/21/2008	7:02 AM	59 kts.	0	0	0K	0K
Morris	7/21/2008	7:05 AM	60 kts.	0	0	50K	0K
Morris	7/21/2008	7:08 AM	52 kts.	0	0	1K	0K
Morris	7/21/2008	7:08 AM	59 kts.	0	0	10K	50K
Minooka	8/4/2008	7:21 PM	61 kts.	0	0	25K	0K
Harrisonville	6/5/2010	8:20 PM	65 kts.	0	0	50K	0K
Paytonville	7/11/2010	7:50 PM	55 kts.	0	0	1K	0K
Morris	7/23/2010	4:45 PM	60 kts.	0	0	10K	0K
Morris	5/11/2011	5:15 PM	55 kts.	0	0	4K	0K
GRUNDY	6/20/2011	5:00 AM	55 kts.	0	0	50K	0K
Coal City	8/2/2011	9:01 PM	56 kts.	0	0	10K	0K
Minooka	7/24/2012	5:19 AM	61 kts.	0	0	10K	0K
Morris	8/4/2012	2:14 PM	60 kts.	0	0	1.5M	0K
Coal City	5/20/2013	9:32 PM	60 kts.	0	0	2K	0K
Minooka	6/24/2013	4:30 PM	65 kts.	0	0	60K	0K
Langham	6/22/2015	8:30 PM	50 kts.	0	0	5K	0K
Central City	8/18/2015	6:30 PM	65 kts.	0	0	10K	0
Morris	6/14/2017	3:45 PM	60 kts.	0	0	10K	0

Source: National Climatic Data Center

Notes: 1 – GRUNDY appearing in all capital letters means the event affected a larger area that included Grundy County. Not all of the damage displayed in the records with (1) occurred in Grundy County.

The following table displays the number of hail events in Grundy County that are listed in the NCDC Storm Events Database.

Figure 18

Number of Hail Events by Jurisdiction 1955-Present

Jurisdiction	Number of Hail Events
Unspecified - Grundy County	9
Coal City	11
Divine	1
Gardner	5
Gorman	1
Kinsman	4
Mazon	7
Minooka	5
Morris	23
Sank Ridge	1
Seneca	1
South Wilmington	1
Verona	1

Source: National Climatic Data Center

TORNADO

(Source: Federal Emergency Management Agency)

Tornadoes are nature's most violent storms. Spawned from powerful thunderstorms, tornadoes can cause fatalities and devastate a neighborhood in seconds. A tornado appears as a rotating, funnel-shaped cloud that extends from a thunderstorm to the ground with whirling winds that can reach 300 miles per hour. Damage paths can be in excess of one mile wide and 50 miles long. Every state is at some risk from this hazard.

Some tornadoes are clearly visible, while rain or nearby low-hanging clouds obscure others. Occasionally, tornadoes develop so rapidly that little, if any, advance warning is possible. Before a tornado hits, the wind may die down and the air may become very still. A cloud of debris can mark the location of a tornado even if a funnel is not visible. Tornadoes generally occur near the trailing edge of a thunderstorm. It is not uncommon to see clear, sunlit skies behind a tornado.

Facts about tornadoes:

- They may strike quickly, with little or no warning.
- They may appear nearly transparent until dust and debris are picked up or a cloud forms in the funnel.
- The average tornado moves southwest to northeast, but tornados have been known to move in any direction.
- The average forward speed of a tornado is 30 MPH, but may vary from stationary to 70 MPH.
- Waterspouts are tornadoes that form over water.
- Tornadoes are most frequently reported east of the Rocky Mountains during spring and summer months.
- Peak tornado season in the southern states is March through May; in the northern states, it is late spring through early summer.
- Tornadoes are most likely to occur between 3 p.m. and 9 p.m., but can occur at any time.

The National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center keeps a database of all severe weather events. With regard to severe storms the database keeps records of thunderstorm and high wind events, hail events, and tornados. According to the NCDC the Storm Events database keeps record of all thunderstorm and wind events, as well as hail events from 1955 forward. However, the lack of damage inducing thunderstorm and high wind events before 1997 and the lack of any recorded events before 1970 call into question the completeness of this data. The tornado events are reportedly tracked back to 1950.

Fujita Tornado Scale

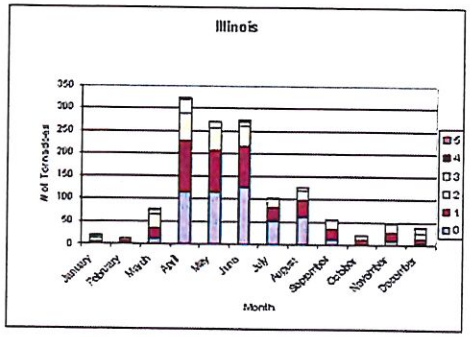
Tornadoes were typically classified using the Fujita or F-scale, the higher the number the worse the damage. In recent years, the F-scale was changed to the EF-scale or "Enhanced Fujita"-scale. This was based on refinements to the original scale and is described in more detail by the NWS on their website (https://www.spc.ncep.noaa.gov/efscale/). Below is the original scale.

Fujita Tornado Scale

F-0	40-72 mph	**Light damage:** some damage to chimneys; tree branches broken; sign boards damaged.
F-1	73-112 mph	**Moderate damage:** peels off some roofing; mobile homes pushed off foundation; moving cars blown off road.
F-2	113-157 mph	**Considerable damage:** roofs torn off houses; mobile home demolished; large trees snapped or uprooted; cars lifted off ground.
F-3	158-205 mph	**Severe damage:** roofs and walls blown down; trains overturned; most trees uprooted; cars lifted and tossed.
F-4	207-260 mph	**Devastating damage:** well-constructed buildings leveled; cars tossed some distance;
F-5	261-318 mph	**Incredible damage:** massive destruction; car-size objects thrown as far as 100 meters; most buildings leveled and swept away; incredible phenomena will occur.

Historically, most tornadoes in Illinois have occurred in April through June in Grundy County. While there is an equally high risk across the county that a tornado might occur, not all structures face the same risk. As with severe wind event thunderstorms, manufactured housing and older, less sturdy homes might face higher likelihood of severe damage. The vulnerable populations residing in these structures may need preparedness education and planning. Further discussion on a county wide wind resistant shelter system is needed, and several participating jurisdictions included a tornado shelter/wind resistant shelter in their project lists. None of the participating jurisdictions noted public facilities or infrastructure they felt particularly vulnerable to tornados.

Figure19: Tornado F-Scale versus Month by F scale in Illinois



The following table displays all of the damage or injury inducing tornado events in Grundy County that are listed in the NCDC Storm Events Database.

Figure 20

Tornados Causing Injuries or Property Damage 1950-Present

Location or County1	Date	Time	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
GRUNDY	6/8/1958	6:30 PM	F1	0	0	3K	0
GRUNDY	11/12/1965	2:35 PM	F2	0	0	25.0M	0
GRUNDY	4/19/1973	5:45 PM	F2	0	0	250K	0
GRUNDY	5/20/1975	3:50 PM	F2	0	1	250K	0
GRUNDY	4/27/1984	5:10 PM	F1	0	0	250K	0
GRUNDY	5/8/1988	5:00 PM	F1	0	0	250K	0
Minooka	4/20/2004	6:10 PM	F0	0	0	76K	0
Gorman	5/28/2013	7:18 PM	F0	0	0	5K	0
Central City-Coal City-Diamond	11/17/2013	12:22 PM	F2	0	5	10.75M	0
Nettle Creek	6/22/2015	8:19 PM	F1	0	0	50K	0
Gorman	6/22/2015	8:43 PM	F0	0	0	50K	0
Paytonville	6/22/2015	8:45 PM	F3	0	7	25.0M	0

Notes: 1 - "GRUNDY" in all capital letters refers to an unspecified location within Grundy County

Source: National Climatic Data Center

SEVERE WINTER STORMS

From 1995 through Spring 2019 there were 29 snow or ice events in Grundy County or just over 1 per year. Since the entire county shares the same risk, it can be assumed that the probability is nearly 100% of a severe winter storm each year. No specific vulnerabilities were noted by jurisdictions other than the cost of road treatment and snow removal. The following table displays the number of winter storms, ice storms, blizzards, and heavy snow events that have occurred in Grundy County since 1995

Figure 21

Snow and Ice Events in Grundy County 1995 - Present

Date	Time	Type	Deaths	Injuries	Property Damage	Crop Damage
12/8/1995	12:00 PM	Winter Storm	0	0	0K	0K
1/15/1997	6:00 AM	Winter Storm	5	0	0K	0K
3/9/1998	4:00 AM	Heavy Snow	0	0	0K	0K
1/1/1999	7:00 PM	Heavy Snow	1	0	0K	0K
3/8/1999	5:00 PM	Heavy Snow	0	0	0K	0K
1/19/2000	12:00 PM	Heavy Snow	0	0	0K	0K
1/30/2002	7:00 PM	Winter Storm	0	0	0K	0K
3/2/2002	9:00 AM	Winter Storm	0	0	0K	0K
2/6/2007	7:00 AM	Winter Storm	0	0	0K	0K
2/13/2007	2:00 AM	Blizzard	0	0	0K	0K
12/1/2007	10:45 AM	Ice Storm	0	0	0K	0K
12/15/2007	1:00 PM	Heavy Snow	0	0	0K	0K
1/31/2008	2:00 PM	Winter Storm	0	0	0K	0K
2/1/2008	12:00 AM	Winter Storm	0	0	0K	0K
12/18/2008	10:00 PM	Ice Storm	0	0	0K	0K
12/18/2008	10:00 PM	Winter Storm	0	0	100K	0K
12/21/2008	1:00 AM	Blizzard	0	0	0K	0K
1/14/2009		Winter Storm	0	0	0K	0K
12/11/2010	2:00 PM	Winter Storm	0	0	0K	0K
2/21/2011	1:00 PM	Blizzard	0	0	0K	0K
1/20/2012	10:00 AM	Winter Storm	0	0	0K	0K
3/5/2013	6:00 AM	Winter Storm	0	0	0K	0K
1/4/2014	1:30 PM	Heavy Snow	0	0	0K	0K
1/26/2014	6:00 PM	Winter Storm	0	0	0K	0K
2/1/2014	4:00 AM	Heavy Snow	0	0	0K	0K
2/17/2014	5:00 AM	Heavy Snow	0	0	0K	0K
2/1/2015	12:00 AM	Heavy Snow	0	0	0K	0K
2/8/2018	6:00 PM	Winter Storm	0	0	0K	0K
2/11/2019	2:15 PM	Ice Storm	0	0	0K	0K

Source: National Climatic Data Center

DROUGHT

As part of the corn belt, Illinois residents typically consider drought a temporary climate feature where precipitation does not reach the "average" amount expected in a period. Depending on the duration of the reduced precipitation and the degree of reduction, a drought can be moderate or severe. The University of Nebraska-Lincoln provides an online United States Drought Monitor (https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx) that maps the intensity of current drought conditions for the United States. These maps are updated weekly and can provide an overview of drought conditions ranging from no drought to exceptional drought. These weekly maps can show the progression of both the onset and ending of drought conditions.

An agricultural drought, defined as a period where the soil moisture is not enough to meet the demands for crops to initiate and sustain growth, is the greatest risk in Grundy County. This is because of the importance of agriculture to the economy of the county. While historical drought records are included in the historical weather data, currently Illinois is showing no abnormally dry areas and the most recent predictions from the Climate Prediction Center do not indicate precipitation shortfalls over the next few months. According to NOAA, precipitation over the next year is predicted to be in the slightly above-normal to normal range.

(https://www.cpc.ncep.noaa.gov/index.php). The Illinois State Climatologist Office estimates drought on a state wide basis as is indicated in the following table.

Severity of Precipitation Drought Expressed as Percent of the State-wide Average Precipitation

Drought Duration	Moderate Drought	Severe Drought
3 months	45 to 60%	less than 45%
6 months	56 to 70%	less than 56%
12 months	70 to 80%	less than 70%
24 months	78 to 90%	less than 78%

Since 2000, there has never been more than 25% of the land area in Grundy County in D3 drought conditions. With the greatest percentage being 24.14 % during the week of August 7, 2012, according to the United States Drought Monitor. Other than agricultural losses, no specific vulnerabilities we noted due to drought by any jurisdictions.

EXTREME TEMPERATURES

As indicated by the chart (Figure 22), Grundy County experiences extreme temperatures on both ends of the spectrum. Extreme cold and wind chill are a more frequent occurrence in Illinois and Grundy County. The county views extreme temperatures as a medium risk and operates heating and cooling centers in fire stations and village buildings throughout the county. Public announcements are made during both extreme heat and cold temperatures to make sure all residents know where to go should they need either a heating or cooling center. The committee discussed elderly populations as being particularly vulnerable and notifying them of the dangers of extreme temperatures.

Dangers of Extreme Cold

For the purposes of the Steering Committee, extreme cold constitutes any combination of temperature and wind that makes exposure dangerous in less than 30 minutes. Frostbite, according to the Mayo Clinic, is the freezing of the skin and underlying tissues. Most common on the extremities, especially fingers and toes. Frostnip, superficial frostbite, and severe frostbite are the three noted levels of the condition. Severe cases of frostbite can lead to tissue loss or loss of (amputation) of affected tissue.

If continued exposure to extreme cold occurs, hypothermia may also occur; a potentially fatal condition is which the body loses heat faster than it can be produced. Symptoms of hypothermia can include intense shivering, slurred speech and drowsiness.

Dangers of Extreme Heat
(from the Illinois Climatologist Office-Illinois State Water Survey)

Extreme heat is a combination of high temperatures and high humidity. Conditions of extreme heat are dangerous and can cause injury and death. The Heat Index is apparent temperature or a measure of how it feels when temperature and humidity are combined. It is the result of biometeorological studies and takes into account body size, core and body surface temperatures, clothing, the skin's resistance to heat and moisture transfer away from the body. The Heat Index assumes an average-sized adult with clothing in the shade with a 5-mph wind. Being in the full sun or in an area with little air movement can increase the apparent temperature.

What makes extreme heat dangerous? The body cools itself by sweating because the evaporation of moisture has a cooling effect. High humidity reduces this evaporation and hinders the body's effort to cool itself. The dew point temperature is a useful measure of the moisture content of the atmosphere. During summer in Illinois, dew point temperatures in the 50s are generally comfortable. Most people begin to feel the humidity when dew point temperatures are in the 60s. Dew point temperatures in the 70s are rare and cause significant discomfort.

Effects of extreme heat:

Heat cramps: muscular pains and spasms due to heavy exertion. They usually involve the abdominal muscles or legs. It is thought that the loss of water from heavy sweating causes the cramps.

Heat exhaustion: occurs when people exercise heavily or work in a warm, humid place where body fluids are lost through heavy sweating. Blood flow to the skin increases, causing blood flow to decrease to vital organs. This results in mild shock.

Heatstroke/Sunstroke: LIFE THREATENING. The victim's temperature control system stops working as the body quits producing sweat. The body temperature can rise so high that brain damage and death may result if the body is not cooled quickly.

The following table includes the extreme temperature entries for Grundy County in the NCDC database, with the exception of record low temperatures in the early part of 2019. This cold snap shattered records across the Midwest and brought along the resulting infrastructure issues of water pipes, roads and bridges needing repair. It should be noted that these temperature extremes affected an area larger than just Grundy County. The probability of extreme temperatures is expected to be nearly 100%, especially over a five year cycle.

Figure 22

Temperature Extremes in Grundy County 1995-Present

Date	Time	Type	Deaths	Injuries
7/12/1995	11:00 AM	Heat	583	0
2/2/1996	12:00 AM	Extreme Cold	3	0
1/23/2003	1:00 AM	Extreme Cold/Wind Chill	1	0
1/29/2004	6:00 PM	Extreme Cold/Wind Chill	0	0
2/3/2007	12:00 AM	Extreme Cold/Wind Chill	1	0
2/7/2008	12:00 AM	Cold/Wind Chill	1	0
1/15/2009	2:00 AM	Extreme Cold/Wind Chill	0	0
6/22/2009	12:00 PM	Excessive Heat	1	0
1/1/2010	12:00 AM	Cold/wind Chill	1	0
12/13/2010	12:00 AM	Cold/wind Chill	1	0
7/4/2012	12:00 PM	Excessive Heat	0	0
1/6/2014	1:00 AM	Extreme Cold/Wind Chill	0	0
1/28/2014	7:00 AM	Extreme Cold/Wind Chill	0	0
2/19/2015	6:35 AM	Extreme Cold/Wind Chill	0	0
1/1/2018	4:00 AM	Extreme Cold/Wind Chill	0	0
1/29/2019	10:35 PM	Extreme Cold/Wind Chill	0	0

Source: National Climatic Data Center
Note: The deaths shown were not all Grundy County residents. The temperature extremes listed affected areas larger than just Grundy County.

EARTHQUAKES

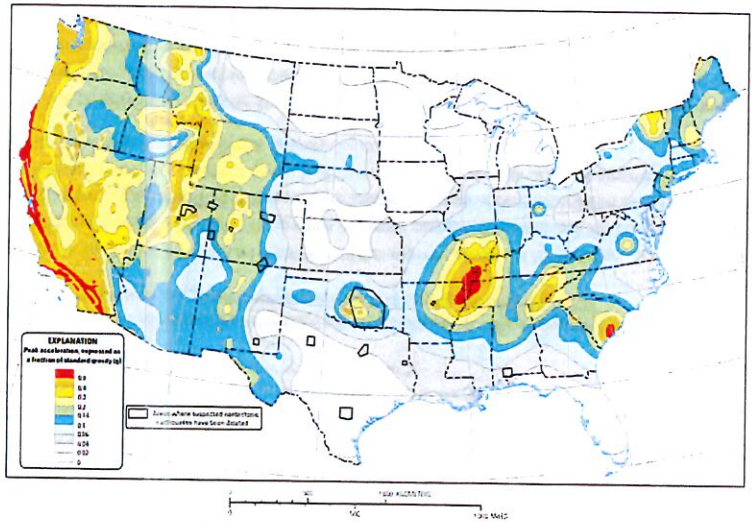
Historical Earthquakes Felt in Grundy County (from Grundy County HAZUS Report, 2020)
According to the United States Geological Survey/ Earthquake Hazards Program Earthquake catalog, which includes databases of earthquakes from 1900–present, there have been 10 recorded earthquakes in a 160 kilometer radius of the approximate center of Grundy County.

Nine of the ten recorded earthquakes have been under magnitude 5. The strongest earthquake within this 160 km radius was a magnitude 5.1 event that occurred in Will County on May 5th, 1909.

In recognition of the above information from the HAZUS report contracted for the plan, Grundy County remains at a low risk for earthquake damage. There were, however conversations around the potential of fuel and consumer good shortages as well as refugees from Southern Illinois areas that may be impacted due to the New Madrid or Wabash Fault lines. Both of these fault lines have the potential to cause significant damage Southern Illinois, which may impact services in the Grundy County Area.

While there is a general understanding that there are no 0% chances of earthquake in any given area, the Grundy County Steering Committee agreed with the most recent Illinois State Hazard Mitigation Plan that the county has a low risk of earthquake. The two maps that follow show both the historical earthquake and their magnitude in Illinois, as well as the projected shaking hazard from an earthquake.

Figure 23: Shaking Map Continental US*

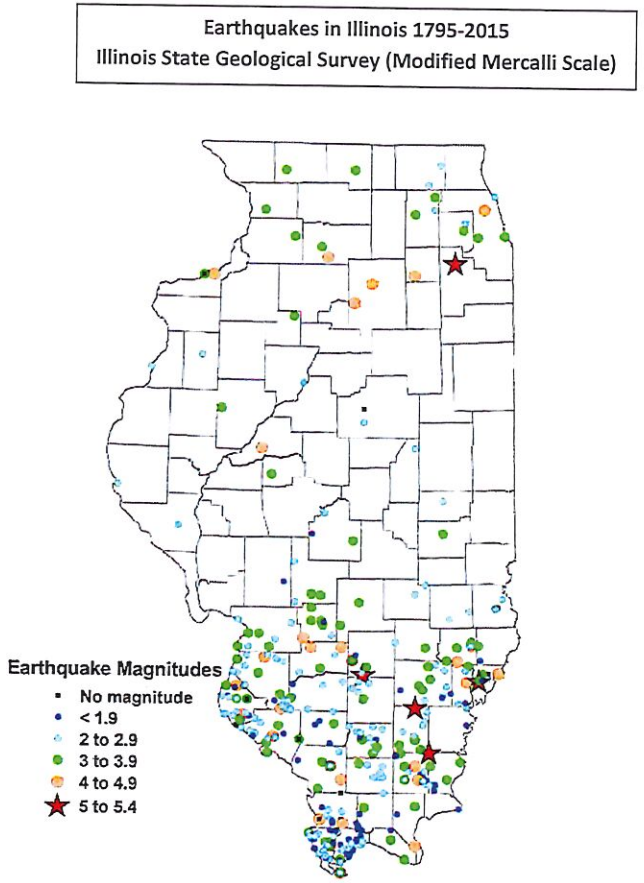


Two-percent probability of exceedance in 50 years map of peak ground acceleration

*https://earthquake.usgs.gov/static/lfs/nshm/conterminous/2014/2014pga2pct.pdf

As can be seen from the United State Geological Survey (USGS) map above, Grundy County shows only a 0.08 shaking risk with expected damage to be minimal. Cracked plaster and items falling off shelves are indicative of this level shaking risk. The following graphic illustrates the earthquakes that have been experienced in Illinois from 1795 to 2015. As can be seen, the risk of seismic activity seems minimal, since the only known activity was a 2 to 2.9 magnitude over the 220 years.

Figure 24 Earthquakes in Illinois Over The Past 200 Years



HISTORICAL FLOOD EVENTS

Figure 25 displays the number of flood events that occurred in Grundy County between 1990 and 2019. The flood risk will be covered extensively in the HAZUS section of the plan.

Grundy County Flood Events Jan 1990 – November 2019				
Location[1]	Date	Property Damage	Crop Damage	Flood Cause
GRUNDY (ZONE)	2/20/1997	$ -	$ -	
Countywide	5/12/2002	$ -	$ -	
GRUNDY (ZONE)	1/13/2005	$ -	$ -	
GRUNDY (ZONE)	2/14/2005	$ -	$ -	
Mazon	5/29/2006	$ -	$ -	
Morris	7/27/2006	$ -	$ -	
Morris	8/23/2007	$ -	$ -	Heavy Rain
Carbon Hill	8/23/2007	$ -	$ -	Heavy Rain
Morris	8/24/2007	$ 2,100,000	$ 500,000	Heavy Rain
Nettlecreek	2/17/2008	$ 50,000	$ -	Heavy Rain/Snow
Nettlecreek	9/14/2008	$ -	$ -	Heavy Rain
Morris	9/15/2008	$ 3,000,000	$ -	Heavy Rain
Nettlecreek	3/10/2009	$ 50,000	$ -	Heavy Rain
Morris Muni Arpt	5/15/2009	$ -	$ -	Heavy Rain
Minooka	5/26/2009	$ -	$ -	Heavy Rain
Carbon Hill	7/24/2009	$ -	$ -	Heavy Rain
Morris	5/28/2011	$ -	$ -	Heavy Rain
Langham	2/19/2018	$ -	$ -	Heavy Rain
Langham	5/1/2019	$ -	$ -	Heavy Rain

Source: National Centers for Environmental Information, Storm Events Database

HAZUS FLOOD HAZARD ANALYSIS

HAZUS OVERVIEW

Hazus is a geographic information system (GIS)-based natural hazard 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 in order 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 a number of important datasets including essential facilities, building structure information, and general building stock inventories. Grundy County's Hazus analyses included creation of a building inventory using Grundy County assessor's data and an update of the essential facilities database. Risks and losses due to flood hazards were modeled using 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.

PROCESSESS AND SOURCES FOR IDENTIFYING ASSETS

Essential Facilities

Essential facility data are an example of site-specific information used in Hazus for analysis. Essential facility data include schools, medical care facilities, emergency operation centers, police stations, and fire stations. This information was first compiled in 2013, and updated for the 2020 Grundy County Multi-jurisdictional Natural Hazards Mitigation Plan.

The planning team was asked to further refine this information at the October 22nd, 2019 risk assessment meeting held in Morris, Illinois. These updates and corrections to the Hazus data tables were completed prior to performing the risk assessment. Locations of facilities were confirmed using community feedback and internet mapping services such as Google Maps. A complete list and a map of all the essential facilities are included in the Project Grid for each participating jurisdiction. The updated Hazus inventory contributed to the Level 2 analysis, which improved the accuracy of the risk assessment.

Figure 26 identifies the essential facilities that were used for the analysis. A complete list of the essential facilities is included as Attachment J.

Figure 26 Essential Facilities List

Facility	Number of Facilities
Ambulance Service	1
Emergency Operation Centers	6
Fire Stations	13
Medical Care Facilities	9
Police Stations	6
Schools	26

Structure Based Asset Inventory - User Defined Facilities (UDF)

In order to create a risk assessment that contains estimated values and losses for each specific structure, a User Defined Facilities (UDF) analysis needs to be completed in Hazus. A structure inventory was compiled for the flood and tornado risk assessments. This includes structures located within the 0.2-percent annual chance (500-year) floodplain for the Hazus flood analysis, and structures within the City of Morris for the GIS based tornado analysis.

A User Defined Facilities table was created using parcel and assessor's data provided by Grundy County. GIS parcel data containing 2018 county assessor's data and building footprints were provided by the Grundy County GIS Department. The building footprints that intersected the FEMA 0.2-percent annual chance floodplain 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. **Figure 27** gives a brief explanation of these classes.

Figure 27 Hazus Building Occupancy Classes

Hazus Occupancy Class Description				
Occupancy Code	Occupancy Description	Sub-Category	SqFt Cost (2018 USD)	Content Cost Factor (CCF)[1]
Residential				
RES1	Single Family Dwelling	1 story, 2 story	N/A[2]	0.5
RES2	Manufactured Housing	Manufactured Housing	$48.86	0.5
RES3A	Multi Family Dwelling – small	Duplex	$124.25	0.5
RES3B	Multi Family Dwelling – small	Triplex/Quads	$109.66	0.5
RES3C	Multi Family Dwelling – medium	5-9 units	$201.33	0.5
RES3D	Multi Family Dwelling – medium	10-19 units	$187.75	0.5
RES3E	Multi Family Dwelling – large	20-49 units	$188.48	0.5
RES3F	Multi Family Dwelling – large	50+ units	$174.53	0.5
RES4	Temp. Lodging	Hotel, medium	$182.28	0.5
RES5	Institutional Dormitory	Dorm, medium	$199.63	0.5
RES6	Nursing Home	Nursing home	$215.91	0.5
Commercial				
COM1	Retail Trade	Dept Store, 1 st	$114.47	1
COM2	Wholesale Trade	Warehouse, medium	$120.00	1
COM3	Personal and Repair Services	Garage, Repair	$139.88	1
COM4	Professional/ Technical/Business Service	Office, Medium	$176.29	1
COM5	Banks	Bank	$261.33	1
COM6	Hospital	Hospital, Medium	$302.35	1.5
COM7	Medical Office/Clinic	Med. Office, medium	$226.54	1.5
COM8	Entertainment & Recreation	Restaurant	$227.53	1
COM9	Theaters	Movie Theatre	$190.95	1
COM10	Parking	Parking garage	$80.59	0.5
Industrial				
IND1	Heavy	Factory, small	$133.03	1.5
IND2	Light	Warehouse, medium	$120.00	1.5
IND3	Food/Drugs/Chemicals	College Laboratory	$180.47	1.5
IND4	Metals/Minerals Processing	College Laboratory	$180.47	1.5
IND5	High Technology	College Laboratory	$180.47	1.5
IND6	Construction	Warehouse, medium	$120.00	1
Religious				
REL1	Church	Church	$190.53	1
Agriculture				
AGR1	Agriculture	Warehouse, medium	$120.00	1
Government				
GOV1	General Services	Town Hall, small	$149.83	1
GOV2	Emergency Response	Police Station	$254.23	1.5
Education				
EDU1	Schools/Libraries	High School	$201.63	1
EDU2	Colleges/Universities	College Classroom	$171.05	1.5

[1]Content Cost Factor is a multiplier applied to Building Cost to estimate the Content Cost of a structure
[2]Costs for residential structures were calculated from the assessed building value

Estimates for fair market value were calculated from the assessed building value of the structure to serve as the building cost, or value, of the structure. Content cost was estimated by multiplying the building cost value by a content cost factor (CCF) based on its occupancy class. Since religious, governmental, and other tax exempt structures have no tax assessed values, replacement cost values were determined using R.S. Means (2018) construction cost estimates taken from the Hazus 4.2 database. CCF and RSMeans values are shown in **Figure 27.** All values were converted to 2019 U.S. dollars using the Consumer Price Index developed by the Bureau of Labor Statistics of the United States Department of Labor.

Flood Risk Assessment

The flood risk assessment conducted for Grundy 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 two separate flood events were analyzed including the 1- percent and 0.2- percent annual chance floods, also known as the 100- and 500- year floods respectively.

To represent the flood hazard, flood depth grids were created for these two flood events in Grundy 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 Illinois River represents the greatest flood hazard for Grundy County. Depth grids for the Illinois River were prepared by the Illinois State Water Survey. The WSE grids were created from cross sections based largely on the 2004 Upper Mississippi River System Flow Frequency Study (USACE, 2004) developed by the U.S. Army Corps of Engineers – Rock Island District (USACE-RI). Ground elevations were determined from a two foot cell size DTM derived from 2018 LiDAR data for Grundy County.

For streams that had detailed studies outside of the Illinois River floodplain, cross sections were taken from FEMA's National Flood Hazard Layer (NFHL). These are the same cross sections that were used to develop the floodplains that are shown on the regulatory Digital Flood Insurance Rate Maps (DFIRMs) for Grundy County.

For the remaining streams that did not have detailed studies, a hydrologic analysis was run in Hazus to create the flood depth grids. The 2018 LiDAR with a ten meter cell size DEM was used for areas inside of Grundy County. For hydraulically important areas outside of Grundy County, the ground elevations were derived using the United States Geological Survey (USGS) 1/3 ArcSecond seamless DEM. The USGS 1/3 ArcSecond DEM is kept up to date with current topographic data through the USGS 3DEP program.

The extents of the different depth grids used are shown in **Figure 28.**

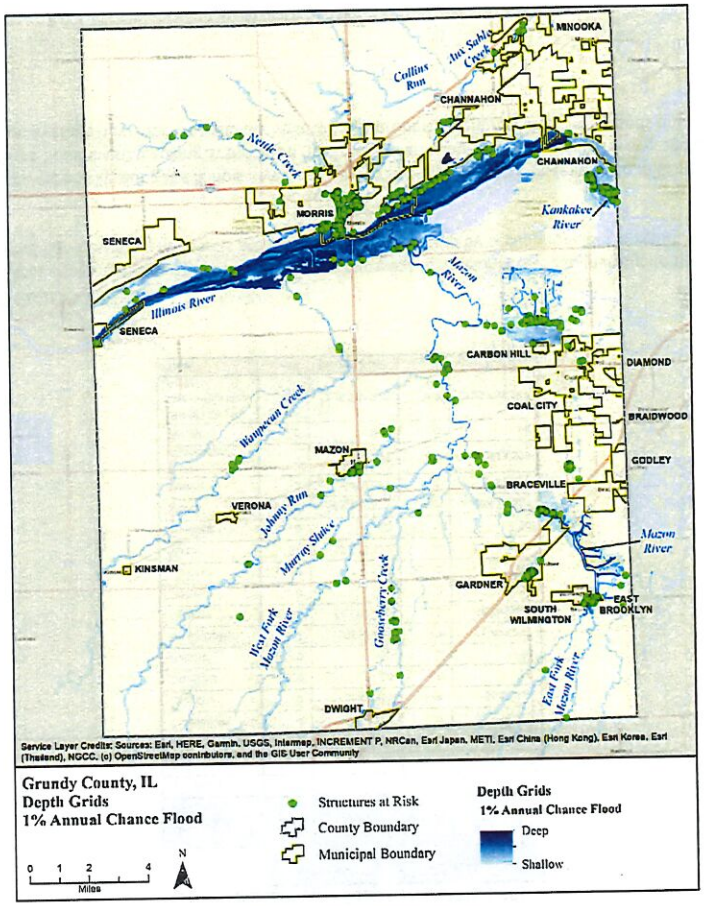


Figure 28 Depth Grid Extents

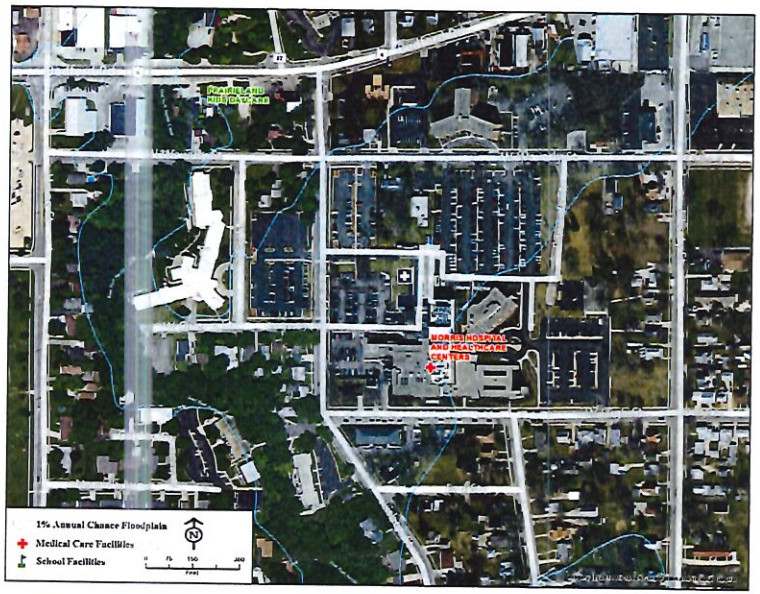
The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software, which is based on current scientific and engineering knowledge. There are uncertainties

inherent in any loss estimation technique. Therefore there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific flood event.

AT RISK ESSENTIAL FACILITIES

The Hazus analysis identified Morris Hospital and Prairieland Kids Daycare, both located in the City of Morris, to be at risk for moderate flooding damages. A map of the essential facilities potentially at risk to flooding is below, **Figure 29.**

Figure 29. 1% Annual Chance Floodplain and Essential Facilities at Risk



Essential facilities located within the flood boundary are at risk for damages similar to those of other buildings located within the flood risk area. These damages include structural failure, water damage, and loss of facility functionality. Not only are the structures vulnerable to damage, the contents and staff are also at risk.

Building Exposure

There are 1,013 structures that were identified to be at a high risk of flooding in Grundy County. For the purpose of this risk assessment, "high risk" structures are those that are located within the 0.2-percent annual chance (500-year) floodplain. Estimates of the structure counts and fair market value of the structures are detailed in **Figure 30** below.

Figure 30 **Structure exposure per flood event (2019 USD)**

	1% Annual Chance Flood (100yr)		0.2% Annual Chance Flood (500yr)	
Community Name	Count	Total Exposure (FMV)	Count	Total Exposure (FMV)
Braceville	0	$0	0	$0
Braidwood	0	$0	0	$0
Carbon Hill	2	$275,180	2	$275,180
Channahon	4	$770,720	7	$1,149,819
Coal City	4	$682,851	4	$682,851
Diamond	0	$0	0	$0
Dwight	0	$0	0	$0
East Brooklyn	7	$532,625	17	$1,473,031
Gardner	53	$4,508,405	53	$4,508,405
Godley	0	$0	0	$0
Kinsman	0	$0	0	$0
Mazon	24	$2,146,322	24	$2,146,322
Minooka	0	$0	0	$0
Morris	326	$64,124,433	408	$100,676,964
Seneca	2	$458,034	2	$458,034
South Wilmington	5	$455,259	16	$1,373,599
Verona	0	$0	0	$0
Grundy County Unincorporated Areas	377	$108,714,826	480	$125,036,267
Total	**804**	**$182,668,655**	**1,013**	**$237,780,472**

ECONOMIC FLOOD LOSSES

A Hazus flood loss analysis was performed using the structure based asset inventory to investigate the impact of the two analyzed flood events. The results are listed by community and by occupancy class in **Figure 31 and Figure 32.**

Flooding events, especially along the Illinois River, 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.

Figure 31 Estimated Losses by Community (2019 USD)

Community Name	1% Annual Chance Flood (100yr)		0.2% Annual Chance Flood (500yr)	
	Count	Total Losses	Count	Total Losses
Braceville	0	$0	0	$0
Braidwood	0	$0	0	$0
Carbon Hill	1	$760	1	$18,500
Channahon	1	$2,570	2	$68,380
Coal City	0	$0	0	$0
Diamond	0	$0	0	$0
Dwight	0	$0	0	$0
East Brooklyn	2	$15,090	9	$101,430
Gardner	22	$150,230	22	$150,230
Godley	0	$0	0	$0
Kinsman	0	$0	0	$0
Mazon	0	$0	0	$0
Minooka	0	$0	0	$0
Morris	90	$8,981,580	231	$33,550,630
Seneca	2	$1,432,250	2	$1,606,830
South Wilmington	0	$0	2	$9,350
Verona	0	$0	0	$0
Grundy County Unincorporated Areas	135	$11,792,520	259	$27,563,080
Total	253	$22,375,000	528	$63,068,430

Figure 32 Estimated Losses by Occupancy (2019 USD)

Occupancy	1% Annual Chance Flood (100yr)		0.2% Annual Chance Flood (500yr)	
	Count	Total Losses	Count	Total Losses
Agricultural	17	$2,148,640	24	$4,347,240
Commercial	54	$10,999,470	75	$31,642,550
Educational	0	$0	1	$71,070
Government	1	$507,360	1	$658,540
Industrial	8	$2,435,320	12	$4,388,520
Religious	1	$89,540	3	$537,850
Educational	172	$6,194,670	412	$21,422,660
Total	253	$22,375,000	528	$63,068,430

SHELTER REQUIREMENTS

Using, Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. The number of displaced people that will require accommodations in temporary public shelters is also estimated.

For the 1-percent annual chance flood event the model estimates 902 households may be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 60 people (out of a total population of 50,063) may seek temporary shelter in public shelters.

DEBRIS GENERATION

Using its default General Building Stock database, Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) finishes (dry wall, insulation, etc.), 2) structural (wood, brick, etc.) and 3) foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

For the 1-percent annual chance flood the model estimates that a total of 6,030 tons of debris will be generated. Of the total amount, finishes debris compose 39 percent of the total, structural debris compose 36% of the total, and foundation debris compose 26 percent total. If the debris tonnage is converted into a number of truckloads, it will require about 242 truckloads (at 25 tons/truck) to remove the debris generated by the flood.

HAZUS EARTHQUAKE ANALYSIS

Earthquake occurrence is not common within the state of Illinois. However, "a study of earthquakes around the world within stable interior parts of continents shows that earthquakes with magnitudes up to 6.8 can occur anywhere in these settings. A magnitude 6.8 earthquake would produce intensities of VII to IX (refer to Table XI.1)." (IEMA, p. III-141)

PROBABILITIES OF FUTURE EARTHQUAKES

The likelihood of an earthquake of magnitude 6.3 or greater occurring somewhere in the Central U.S. within the next 15 years is 40 to 63 percent and 86 to 97 percent within the next 50 years. An earthquake of this size would damage older structures, especially those of masonry construction. Serious damage could also occur to many schools in the region (ISGS, 1995).

EARTHQUAKE OCCURRENCE IN THE VICINITY

According to the United States Geological Survey/ Earthquake Hazards Program Earthquake catalog, which includes databases of earthquakes from 1900–present, there have been 10 recorded earthquakes in a 160 kilometer radius of the approximate center of Grundy County.

Nine of the ten recorded earthquakes have been under magnitude 5. The strongest earthquake within this 160 km radius was a magnitude 5.1 event that occurred in Will County on May 5th, 1909.

Figure 33 Earthquake Magnitude vs. Modified Mercalli Intensity Scale

Magnitude	Typical Maximum Modified Mercalli Intensity
1.0 – 3.0	I
3.0 – 3.9	II – III
4.0 – 4.9	IV – V
5.0 – 5.9	VI – VII
6.0 – 6.9	VII – IX
7.0 and higher	VIII or higher

http://earthquake.usgs.gov/learn/topics/mag_vs_int.php

Figure 34 **Abbreviated Modified Mercalli Intensity Scale**

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

http://earthquake.usgs.gov/learn/topics/mag_vs_int.php

DESCRIPTION OF EARTHQUAKE SCENARIO

The Hazus assessment is highly data dependent; the accuracy of the analyses depends on a number of important datasets, including essential facilities and general building stock inventories. Use of the national datasets is considered a Level 1 Hazus analysis.

For planning purposes, this scenario involves a Hazus Level 1 analysis of a theoretical moment magnitude 5 earthquake with an epicenter located in Grundy County at latitude 41°17'5.94" N, and longitude 88°25'6.52" W. This locates the epicenter within Section 34, Township 33 North, Range 7 East, approximately 2.5 miles north of the Village of Mazon. Depth of origin used in the analysis was 10 kilometers below the surface.

BUILDING DAMAGE

The Hazus General Building Stock data was used for this analysis. The assessor's data was not used because it was not in the scope of the project to create a UDF inventory for every structure in Grundy County. Hazus estimates that about 3,399 buildings will be at least moderately damaged. This is over 18 percent of the total number of buildings in the region. An estimated 183 buildings will be damaged beyond repair. Table XI.3 below summarizes the expected damage by general occupancy for the buildings in the region. **Figure 36** summarizes the expected damage by general building type.

Figure 35 **Expected Building Damage by Occupancy**

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	79	0.68	40	0.91	50	2.04	26	3.50	6	3.37
Commercial	399	3.45	214	4.84	233	9.46	107	14.23	28	15.01
Education	22	0.19	11	0.24	12	0.48	5	0.66	1	0.78
Government	15	0.13	8	0.17	9	0.35	3	0.44	1	0.51
Industrial	124	1.07	64	1.45	74	3.02	36	4.82	9	4.92
Other Residential	784	6.78	354	7.97	341	13.83	122	16.27	24	13.21
Religion	40	0.35	18	0.40	16	0.64	8	0.99	2	1.08
Single Family	10,103	87.35	3,727	84.02	1729	70.17	445	59.09	112	61.12
Total	**11,566**		**4,436**		**2,464**		**752**		**183**	

Figure 36 **Expected Building Damage by Building Type (All Design Levels)**

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	8,921	77.13	3,091	69.66	1,048	42.52	120	15.92	8	4.46
Steel	167	1.44	81	1.84	143	5.79	89	11.87	23	12.66
Concrete	125	1.08	59	1.33	72	2.91	34	4.54	5	2.97
Precast	56	0.49	21	0.47	33	1.35	22	2.85	3	1.71
Reinforced Masonry	25	0.22	7	0.16	11	0.45	6	0.84	1	0.29
Unreinforced Masonry	1,816	15.7	951	21.43	879	35.67	376	50.03	123	67.05
Manufactured Housing	456	3.94	226	5.11	278	11.31	105	13.95	20	10.86
Total	**11,566**		**4,436**		**2,464**		**752**		**183**	

DEBRIS GENERATION

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel.
This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 117,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 52 percent of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 4,600 truckloads (at 25 tons/truck) to remove the debris generated by the earthquake.

SHELTER REQUIREMENTS

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 237 households to be displaced due to the earthquake. Of these, 127 people (out of a total population of 50,063) will seek temporary shelter in public shelters.

ECONOMIC LOSS

The total economic loss estimated for the earthquake is $623 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 LOSES

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.

Total building-related losses were $608.4 million; 14 percent of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 63 percent of the total loss. **Figure 37** below provides a summary of the losses associated with building damages.

Figure 37 Building-Related Economic Loss Estimates (Millions of Dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	$0.00	$0.79	$14.83	$0.66	$0.84	$17.11
	Capital-Related	$0.00	$0.33	$12.77	$0.43	$0.23	$13.76
	Rental	$5.29	$2.17	$7.00	$0.23	$0.32	$15.01
	Relocation	$18.65	$2.01	$12.08	$1.29	$3.19	$37.22
	Subtotal	**$23.94**	**$5.30**	**$46.68**	**$2.62**	**$4.57**	**$83.11**
Capital Stock Losses							
	Structural	$48.37	$4.67	$19.58	$5.35	$7.10	$85.07
	Non-Structural	$190.82	$27.07	$53.71	$16.50	$14.12	$302.22
	Content	$77.52	$8.39	$30.09	$11.26	$8.41	$135.67
	Inventory	$0.00	$0.00	$0.50	$1.61	$0.22	$2.33
	Subtotal	$316.71	$40.13	$103.89	$34.72	$29.85	$525.29
	Total	$340.65	$45.43	$150.57	$37.34	$34.42	$608.40

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. **Figure 38 & 39** provide a detailed breakdown in the expected lifeline losses.

Figure 38 Transportation System Economic Losses (Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	$750.26	$0.00	0
	Bridges	$151.23	$2.13	1.41
	Tunnels	$0.00	$0.00	0
	Subtotal	**$901.49**	**$2.13**	
Railways	Segments	$132.33	$0.00	0
	Bridges	$0.20	$0.00	0.15
	Tunnels	$0.00	$0.00	0
	Facilities	$0.00	$0.00	0
	Subtotal	**$132.53**	**$0.00**	
Bus	Facilities	$2.42	$0.70	29.12
	Subtotal	**$2.42**	**$0.70**	

Port	Facilities	$25.96	$8.28	31.9
	Subtotal	**$25.96**	**$8.28**	
Airport	Facilities	$21.30	$3.51	16.49
	Runways	$113.89	$0.00	0
	Subtotal	**$135.19**	**$3.51**	
	Total	**$1,197.60**	**$14.64**	

Figure 39

Utility System Economic Losses (Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	$0.00	$0.00	0
	Facilities	$0.00	$0.00	0
	Distribution Lines	$109.67	$2.32	2.11
	Subtotal	**$109.67**	**$2.32**	0
Waste Water	Pipelines	$0.00	$0.00	0
	Facilities	$665.33	$142.20	21.37
	Distribution Lines	$65.80	$1.164	1.77
	Subtotal	**$731.13**	**$143.36**	
Natural Gas	Pipelines	$0.00	$0.00	0
	Facilities	$0.00	$0.00	0
	Distribution Lines	$43.87	$0.40	0.91
	Subtotal	**$43.87**	**$0.40**	
Oil Systems	Pipelines	$0.00	$0.00	0
	Facilities	$0.00	$0.00	0
	Subtotal	**$0.00**	**$0.00**	
Electrical Power	Facilities	$488.40	$86.93	17.80
	Subtotal	**$488.40**	**$86.93**	
Communication	Facilities	$0.56	$0.12	0
	Subtotal	**$0.56**	**$0.12**	
	Total	**$1,373.63**	**$233.13**	

GIS TORNADO ANALYSIS

GIS-overlay modeling was used to estimate the potential impacts of an F3 tornado moving through Grundy County. A hypothetical tornado track was created that begins southwest of the City of Morris and travels two miles on a northeasterly path through Morris and ending to the northeast of the city.

DESCRIPTION OF ANALYSIS

As stated above, the scenario for this analysis is a Fujita Scale F3 tornado moving through the City of Morris. See **Figure 40** below for a map of this scenario. Hazus software was not used for this analysis, however, similar 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. In order to estimate the potential damages, GIS was used to create four different damage zones around the tornado track. Each zone represents a different Fujita Scale wind intensity from F3 to F0 based on their 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 **Figure 40** below. 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 (Hubbard, MacLaughlin, 2006).

Once these zones were created, they were overlaid on top of points derived from the Grundy County Assessor's database. Each point represents an existing structure and is attributed with an estimate of the fair market value of the structure as calculated from its assessed value. The number of structures that fell in each tornado damage zone is listed in **Figure 41.** Depending on which damage zone each of these points were located in, the fair market value of the structure was multiplied by the percentage listed in **Figure 40** to give an estimate of the dollar losses that may result in such an event. These loss estimates are listed in Table **Figure 44.**

Figure 40

Tornado Damage Zones

Zone	Range (Feet)	Damage Percentage
1 (F3)	0-330	80%
2 (F2)	331-660	50%
3 (F1)	661-1320	10%
4 (F0)	1321-2640	0%

Figure 41

F3 Tornado Event

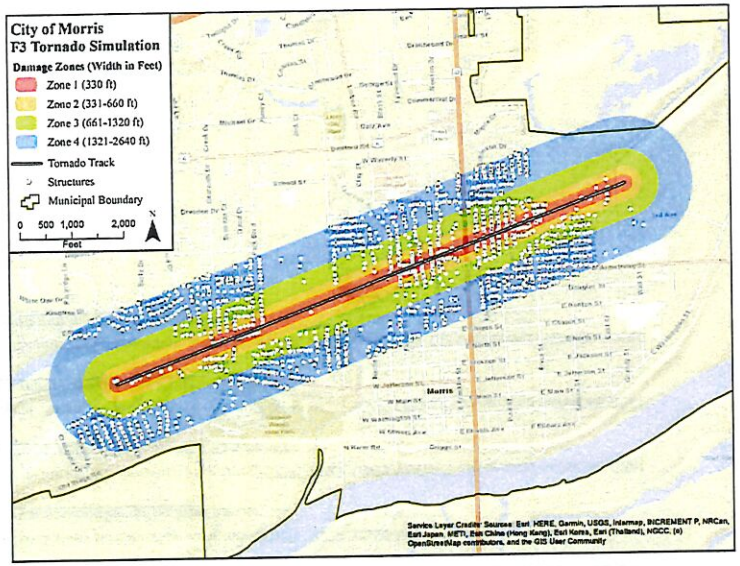


Figure 42

Number of Structures in Each Tornado Damage Zone

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Residential	132	123	222	695
Commercial	9	8	14	38
Industrial	0	0	2	1
Agriculture	0	0	0	1
Government	0	1	0	3
Religion	0	0	0	1
Education	1	0	1	5
Total	**142**	**132**	**239**	**744**

A total of 513 structures located in Zones 1-3 were damaged in this scenario. One of these structures was an essential facility. Two essential facilities were located in Zone 4. These facilities are listed in **Figure 43**.

Figure 43

Essential Facilities Located in Tornado Path

Essential Facilities	Damage Zone	City
Morris Community High School	Zone 3	Morris
Grundy Area Vocational Center	Zone 4	Morris
Morris Municipal Building – Police, EOC	Zone 4	Morris

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 $30,267,500. As detailed in **Figure 44** below, residential losses are the largest contributor to loss estimates. This is unsurprising as 93 percent of the structures reporting losses are residential (Zones 1-3). Zone 1 shows the highest loss totals as the structures in this zone were subject to the highest simulated wind damages.

Figure 44

Total Loss Estimates by Occupancy

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Residential	$12,356,900	$6,688,700	$2,707,500	$0
Commercial	$2,173,400	$861,900	$238,300	$0
Industrial	$0	$0	$140,300	$0
Agriculture	$0	$0	$0	$0
Governmental	$0	$120,900	$0	$0
Religion	$0	$0	$0	$0
Education	$989,100	$0	$3,990,500	$0
Total	**$15,519,400**	**7,671,500**	**7,076,600**	**$0**
Total Losses	**$30,267,500**			

BIBLIOGRAPHY

U.S. Army Corps of Engineers - Rock Island District. 2004. *Upper Mississippi River System Flow Frequency Study Final Report.*

U.S. Army Corps of Engineers - Rock Island District. 2018. *USACE CWMS UMR Model Flood Depth Grids.*

Upper Mississippi River System Flow Frequency Study Final Report. January 2004, U.S. Army Corps of Engineers, Rock Island.

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.

State of Illinois. Office of the Governor. 2018. *Illinois Natural Hazard Mitigation Plan.* Illinois Emergency Management Agency, Springfield, IL.

US Geological Survey Earthquake Hazards Program. 2019. *Earthquake catalog.* https://earthquake.usgs.gov/earthquakes/search/ accessed 27 January, 2020.

R.S. Means Co., Inc., 2018. *Square Foot Costs.* Accessed through FEMA Hazus 4.2 SP3, 2019.

Federal Emergency Management Agency (FEMA), 2019. *Hazus 4.2 SP3.* https://www.fema.gov/hazus

U.S. Geological Survey 3D Elevation Program (3DEP). 2017. *USGS NED 1/3 arc-second n41w088 DEM.* http://nationalmap.gov/elevation.html Reston, VA

U.S. Geological Survey 3D Elevation Program (3DEP). 2019. *USGS NED 1/3 arc-second n41w089 DEM.* http://nationalmap.gov/elevation.html Reston, VA

U.S. Geological Survey 3D Elevation Program (3DEP). 2017. *USGS NED 1/3 arc-second n42w088 DEM.* http://nationalmap.gov/elevation.html Reston, VA

U.S. Geological Survey 3D Elevation Program (3DEP). 2019. *USGS NED 1/3 arc-second n42w089 DEM.* http://nationalmap.gov/elevation.html Reston, VA

NATURAL HAZARDS PROBABILITY AND VULNERABILITY

Grundy County, Illinois is situated approximately 70 miles to the southwest of Chicago. The migration to the suburbs and beyond, while stalled during the recent recession, has made Grundy County one of the fastest growing counties in Illinois. This rapid growth has also increased the counties vulnerability to natural hazards. The county, like most of Illinois, faces risks for multiple natural hazards, including floods, tornados, severe storms, severe winter storms, drought, earthquake, and extreme temperature. While these weather and related phenomenon are unpredictable in the long term, historical data can be used to determine annual probability of each event. The annual probability of flooding is included in the HAZUS – Analysis, while the remaining hazards are assessed for probability in the chart below. The methodology for determining the probability is a simple equation of the sum of the number of events divided by the number of years data has been collected.

Figure 45 **Grundy County Natural Hazard Probability**

Hazard	Extreme Temperature	Severe Storm	D3 Drought	Earthquake	Winter Storm/Ice	Tornados
Number of Events	16	47	0	0	29	12
Years of Data	25	65	20	55	25	70
Annual Probability	64%	72%	0%+	0%+	100%	17%

Please note that the data included in the Figure above is through early 2019 from the sources cited in the historical weather data section of the plan. Notable increases in tornado and winter storm probability reflect the extreme weather patterns recorded over the past decade.

As can be seen from the Figure, most of the natural hazards that affect Grundy County have occurred with some regularity over the recent past, with the exception of earthquakes and more recently, drought. While not on a known major fault line, there does remain a low (but possible) risk for earthquakes in the county. Significant drought, rated as D3 or above, has been notably absent in the last 20 years. The risk to life and property, however, is vastly different. Mitigation efforts to alleviate most risks to life and property are relatively mundane, while the potential for damage to life and property from drought is relatively small. Conversely, mitigation projects for earthquake protection are difficult and costly, while the potential for loss to life and property is extremely high. Balancing these factors would indicate that while preparedness for these events is justified, costly mitigation measures may not be justified.

POTENTIAL LOSS ESTIMATES

HAZUS software was utilized to assess potential damage estimates for flood, earthquake, and tornado events impacting Grundy County. These are the natural hazards that generally cause the greatest damage to property. While other hazards certainly have the potential to paralyze a community, especially severe winter storms, they rarely cause the extreme property loss of floods, earthquakes and tornados.

In the past twenty years, only one winter storm out of 29 in Grundy County met the $100,000 property damage loss threshold. Unfortunately, out of those same 29 winter storm events, six deaths were associated with those hazards, most likely related to poor road conditions, with five of the six deaths occurring during the January 15, 1997 winter storm event.

Economic losses from the ancillary problems related to severe weather events are incredibly difficult to calculate. Such problems as long term power outages, closed roads, and disruption of water and sewer services can be devastating to both residential and business concerns. Both households and businesses should be encouraged to take measures to reduce the risk from these types of disruptions.

GRUNDY COUNTY MITIGATION STRATEGY AND GOALS

Since the Grundy County planning process is updating the existing plan, compiled in 2013, the first steering committee meeting on September 24, 2019 included a review of the goals established by the first plan. It was the consensus of the group that the established goals stand, as well as the previous operational philosophy, stated below.

OPERATIONAL PHILOSOPHY

The Grundy County Natural Hazard Mitigation Steering Committee recognizes that while their mitigation goals specify their specific planning process, Grundy County is part of a much larger region, and as such, their goals will have impacts on more than just Grundy County Citizens. With two major interstates (I-80 and I-55) running through the county, and the county's geographic location just outside one of the largest metropolitan areas in the nation, the steering committee recognizes their responsibility to a larger population, and will develop projects accordingly.

The philosophy recognizes the counties geography in relationship to the largest non-coastal metropolitan area in the nation, and the transportation system that feeds the Chicago metropolitan area. Recent data includes Grundy County as part of the Chicago MSA, which has reach a population estimate of 9.5 million across three states. Despite the inclusion in the MSA, Grundy remains primarily rural, with population estimate of 50,586 as of 2017. Each project included in the plan is tied to one of these goals, as noted in the project grids.

Plan Goals:

Goal 1: Protect the lives, property, and environment of Grundy County from natural disasters.

Goal 2: Protect the infrastructure within the county from damage as a result of natural disasters.

Goal 3: Educate the public on risks associated with natural disasters, and methodology to protect themselves.

Goal 4: Enhance coordination and communication between all levels of response and recovery agencies.

Goal 5: Incorporate natural hazards mitigation into community plans which will guide future development.

MITIGATION ACTIONS – PRIORITIES AND IMPLEMENTATION

Floodplain Management, participation in NFIP, and enforcement of the Floodplain Ordinances are expected of all participating Jurisdictions as a top priority for mitigating flood events. Since participation in NFIP is a required component to access FEMA Grant Funding for mitigation, it is an understood that jurisdictions will comply with NFIP. In the event that new regulatory mapping be adopted during the effective dates of this plan, participation jurisdictions will be expected to comply with the new maps.

Participating NFIP Communities are expected to adopt and enforce floodplain management regulations. These regulations apply to all types of floodplain development activities. The regulations ensure that any proposed floodplain development activities will not cause an increase in future flood damages. New and replacement structures are required to be elevated at or above the base flood elevation. In Illinois, most communities require structures to be protected one foot above the base flood elevation. Grundy County and it's jurisdictions have adopted the State of Illinois Model Floodplain Ordinance. That ordinance goes above-and-beyond NFIP minimum standards. In addition, the State of Illinois' floodway regulations are much more restrictive than NFIP minimums. By adopting the State of Illinois Model Floodplain Ordinance, the county not only complies with all NFIP regulations but exceeds them.

The Steering Committee developed the mitigation projects and priorities listed in the following section in a variety of ways. First, Projects included in the 2013 Plan were reviewed for completion status, and practicality of continued inclusion. Additionally, focus group and public meeting notes were distributed and reviewed for any possible additions to jurisdictional project grids. Jurisdictional representatives to the steering committee were also encouraged to discuss the plan with elected officials, community members and jurisdictional employees to determine additional mitigation project ideas. Finally, costs, potential funding and feasibility were discussed for each project. Projects were dropped when completed or funding seemed unlikely based upon current fiscal constraints.

PROJECT PRIOITIZATION METHOD

The projects were prioritized within the county by using the following method. It is important to recognize that the implementation of all actions is desirable regardless of prioritized order. Actions assigned to Priority A have a permanent or more far-reaching affect than actions under Priority B, although both address the most significant natural hazards in the county. Priority C actions all address the less significant natural hazards. Priority J actions are ready for implementation within the next year and can be accomplished within existing budgets. All actions will aid in the mitigation effort and will be implemented as opportunities arise. The project will be assigned a letter in accordance with the following index:

A. Project permanently eliminate property damages and/or eliminate or reduce injuries and deaths in a specific area OR have a high probability to systematically reduce property damages, injuries and deaths across a wide area. Priority A projects address the most significant natural hazards – extreme heat, flood, severe storm, tornado, and winter storm.
B. Project reduces property damages in a specific area OR have the potential to reduce property damages, injuries and deaths across a wide area OR educate the public on disaster preparedness and mitigation. Priority B projects address the most significant natural hazards – extreme heat, flood, severe storm, tornado, and winter storm.
C. Project eliminates or reduce property damages, injuries and deaths from the less significant natural hazards OR educate the public on disaster preparedness and mitigation related to the less significant natural hazards – dam failure, drought, earthquake and mine subsidence.
D. Project can "just be done" without requiring outside funding and are able to be implemented within one year of Plan adoption. These can be one-time projects or ongoing projects and may address any hazard.

COST/BENEFIT ANALYSIS

A cost/benefit analysis will be needed for any of these projects to be implemented. A cost/benefit analysis will be performed at the time of project application, as costs associated with most planning and construction projects change a great deal over time. 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.

For the purposes of this plan, a ***high*** rating on cost means it is unlikely the jurisdiction could accomplish the project without outside funding, while a ***high*** rating on benefit relates to how well the project would mitigate the situation. A ***low*** cost rating, conversely, means that is likely the jurisdiction can accomplish the project without outside funding. A rating of ***medium*** on cost implies that while the cost may exceed normal maintenance or operating budgets, there is a potential to secure funding. A ***medium*** benefit would potentially protect property, but the scope of that protect may be limited, such as in an educational project.

TYPE OF PROJECT

Each project included on the grid was categorized by the type of project. Below is a key for the project types included on the grid.

C=Construction Project
E=Education Project
P=Policy Project
COM= Communication
PR= Preparedness
R=Response
BO=Buyout

Projects will also be identified as to the type of hazard they address. These will be

A=All hazards
F=Flooding
TSS=Tornado or severe storm
WW=Winter Weather/Ice
E=Earthquake
D=Drought

Table Headings include the following abbreviations:

PT – Project Type
HT= Hazard Type
G = Goal attached
$ = Potential Funding Source
P = Priority
L = Project Lead Agency
C/B = Cost/Benefit
*= Also included in 2013 plan

On the following pages, each participating jurisdiction has a project grid as well as a Jurisdictional map indicating critical facility locations. These projects were included after a review of 2013 jurisdictional projects and their status. Projects marked with an * indicate a project that was included in the 2013, and still needed. **Attachment W** lists the projects completed from the 2013 Plan. Steering committee members and the jurisdictions they represent will utilize both the project grids and maps to inform future planning, infrastructure development and preparedness efforts. Projects included in the plan by the jurisdictions may be eligible for future funding streams by inclusion in planning processes.

PROJECT GRIDS AND MAPS BY JURISDICTION

Grundy County Emergency Management Area consists of all of the county unincorporated areas as well as assistance to incorporated jurisdictions within the County when requested. The Critical Facilities Map on the following page shows both the critical facilities and the regulatory floodplains within the county. Below is a listing of the Mitigation Projects identified for inclusion in the 2020 Mitigation Plan.

Figure 46 Grundy County

PT	HT	G	$	Project Description	P	L	Time Frame	C/B
C	F	2	FEMA	*Clean and Reshape the channel of the Mazon River in Southeast Grundy County	B	Emergency Management Agency	3-5 YR	H/H
E	A	1,3	LOCAL	*Encourage Public and Businesses to purchase and monitor NOAA All Hazards Radio	D	Emergency Management Agency	ONGOING	L/H
COM	A	1,4	LOCAL	*Establish a county wide public warning system for natural hazards using a variety of means, including IPAWs, to get information to the public	A	Emergency Management Agency	1-3 YR	M/H
C	D	2	HUD/ USDA	Develop and complete a water backups system by connecting to Godley Water Supply.	B	County Public Works	3-5 YR	H/H
E	A	3	LOCAL	Continue public awareness campaigns for all natural hazards. Encourage Participation in COAD and other groups to get public involved.	D	Emergency Management Agency	ONGOING	L/M
COM	A	4,5	LOCAL	Continue to call and host the annual Hazard Mitigation Review Committee Meeting and maintain meeting records	D	Emergency Management Agency	ONGOING	L/M
C	TSS	1	FEMA	Inventory existing wind resistant shelters and develop new shelters in areas where none exist and there is a need (apt and mobile home parks)		Emergency Management Agency	3-10 years	H/H

Figure 47

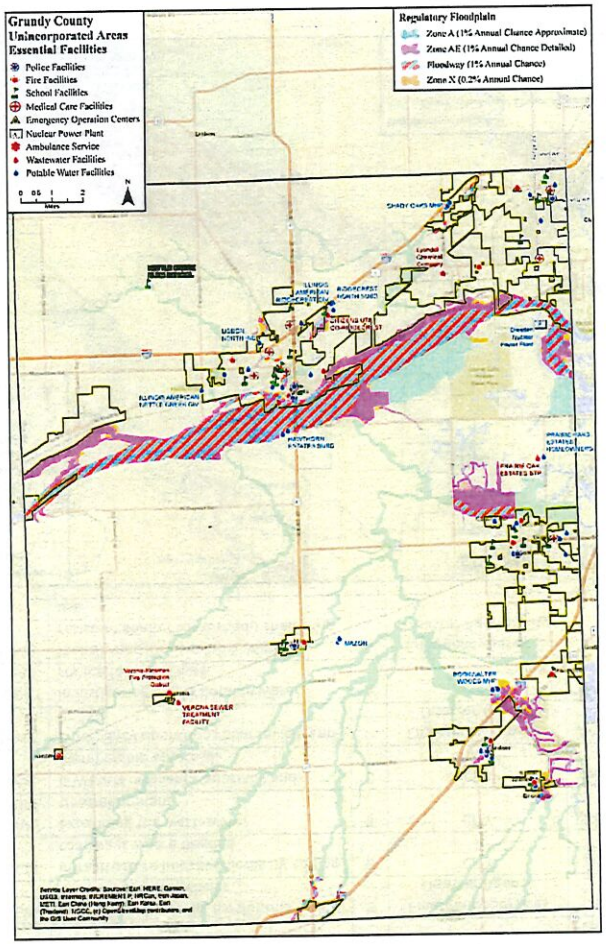


Figure 48 Braidwood

PT	HT	G	$	Project Description	P	L	Time Frame	C/B
PR	ALL	1,3	LOCAL	Encourage all City of Braidwood residents and businesses to purchase and use NOAA all hazard radios	D	Emergency Services Disaster Agency	2020 ONGOING	L/H
PR	ALL	4	NA	Participate in county-wide mutual-aid agreements and multi-jurisdictional hazard mitigation/long term recovery committee	D	City Council	2020 ONGOING	L/H
E	ALL	3	NA	Provide education information on city's website & Facebook pages.	D	ESDA/ City Staff	ONGOING	H/M
P	ALL	4	LOCAL	Apply and maintain membership in IPWMAN for public works mutual aid	B	City Council	2020	L/H
C	TSS	1	FEMA	Develop and maintain a mutual-use shelter for severe weather, heating and cooling.	A	Emergency Services Disaster Agency	1-5YR	H/H

Figure 49

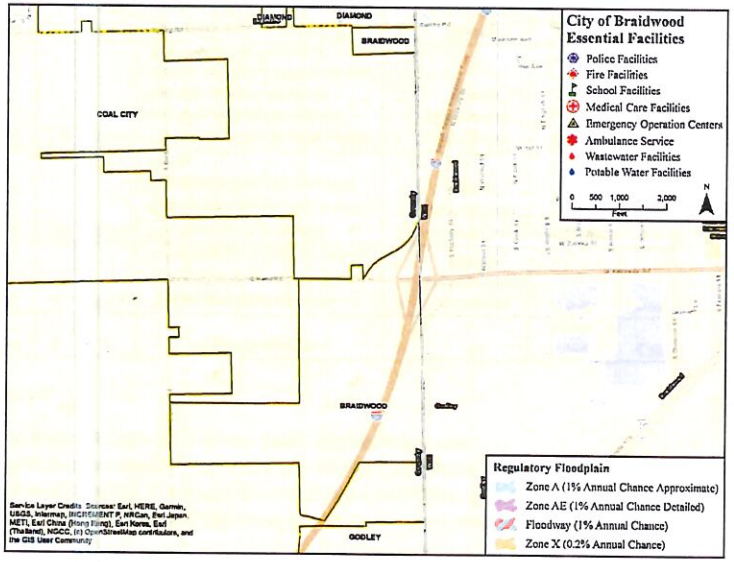


Figure 50 Channahon

PT	HT	G	$	Project Description	P	L	Time Frame	C/B
PR	ALL	4	LOCAL	Forming and training a volunteer corp. to assist in emergencies	D	Emergency Services Disaster Agency	2020	L/H
C	F	2	LOCAL	infrastructure improvements by adding roadways where needed	B	CITY	1-5 YR	H/H
C	F	2	CDAP/ LOCAL	Expanding the wastewater treatment plant	B	CITY	1-5 YR	H/H
P	ALL	2	Local	IPWMAN ordinance approval and membership approval.	D	City	Annual	L/H
P	ALL	1	Local	Emergency operations plan review and update	D	Emergency Services Disaster Agency	Annual	L/H
C	D	2	USDA/ CDAP	Investigating a new potable water source for the village.	A	CITY	3-5 YR	H/H
C	TSS	1	FEMA	Identify and/or develop a wind resistant shelter for tornado sheltering use	A	Emergency Services Disaster Agency/City	1-5 YR	H/H

Figure 51

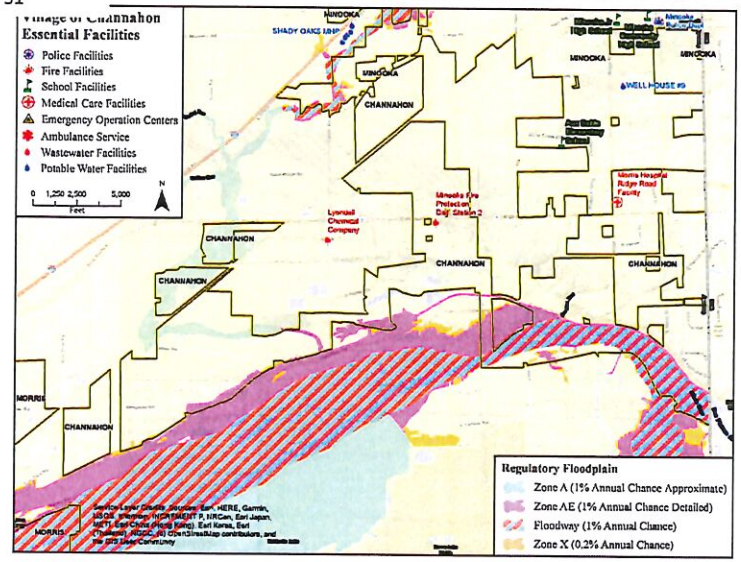


Figure 52 Carbon Hill

PT	HT	G	$	Project Description	P	L	Time Frame	C/B
PR	ALL	4	LOCAL	Apply for and maintain membership in IPWMAN for public works mutual aid.	D	Village Board	2020	L/H
PR	ET	1	LOCAL	Develop a heating and cooling station	B	Village Board	1-3 YR	M/H
C	TSS	1	FEMA	Construct a storm shelter	A	Village Board	1-5 YR	H/H

Figure 53

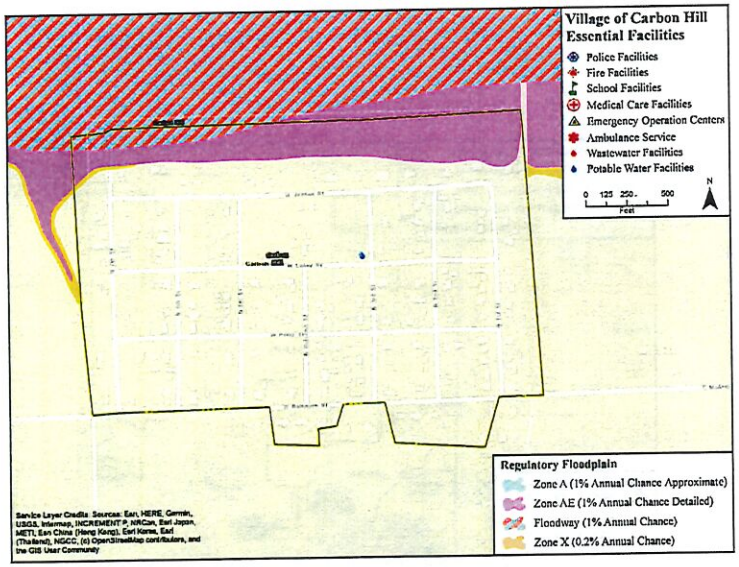


Figure 54 Coal City

PT	HT	G	$	Project Description	P	L	Time Frame	C/B
P	F	1	LOCAL	Schedule regular catch basin clean out and maintenance	D	City Public Works	Each yr	L/M
P	F	1	LOCAL	Schedule regular ditch inspection, cleanout, & maintenance	D	City Public Works	Each yr	L/M
P	A	4	IEMA	Participate in an annual nuclear emergency drill at the CCEOC monitored by IEMA	D	City Emergency Mananagemt n	Each yr	L/H
P	A	4	LOCAL	Maintain membership in IPWMAN for PW mutual aid.	D	City Public Works	Each yr	L/M
COM	A	4	LOCAL	Utilize Multi-band radios for interoperability	B	Village Police Department	Each yr	M/M
C	TSS	2	LOCAL	Lightning Arrest System Installation	C	City Public Works	2020	M/H
P	F	1	LOCAL	Restored Lagoon Storm Water Storage	D	City Public Works	2020	L/M
PR	A	2	IEMA	Water Treatment Plant Backup Generator Installation	B	City Public Works	2023	H/M
PR	A	2	LOCAL	Hunter Lift Station Replacement	B	City Public Works	2025	H/M
C	F	1	STATE	Reed Road Storm Water Conveyance Improvements	B	GC/CC	2021	H/H
C	F	1	LOCAL	Second Avenue Storm Water Collection & Conveyance Improvement	B	City Public Works	2021	M/H
C	F	1	COUNTY	North Broadway Bridge Replacement	B	County and City Road Dept	2024	H/H
C	F	1	LOCAL	Valerio Road Culvert Replacement	B	City Public Works	2020	M/L
P	D	5	USDA	Long-term Potable Water Access Security	D	KRV	2022	H/H
C	F	1	CDBG	Valerio Road Bridge Replacement Project	B	City Public Works	2021	H/L
P	A	5	CMAP	Adopt new Comprehensive Plan to include mitigation planning	C	Village Board	2022	M/M

Figure 55

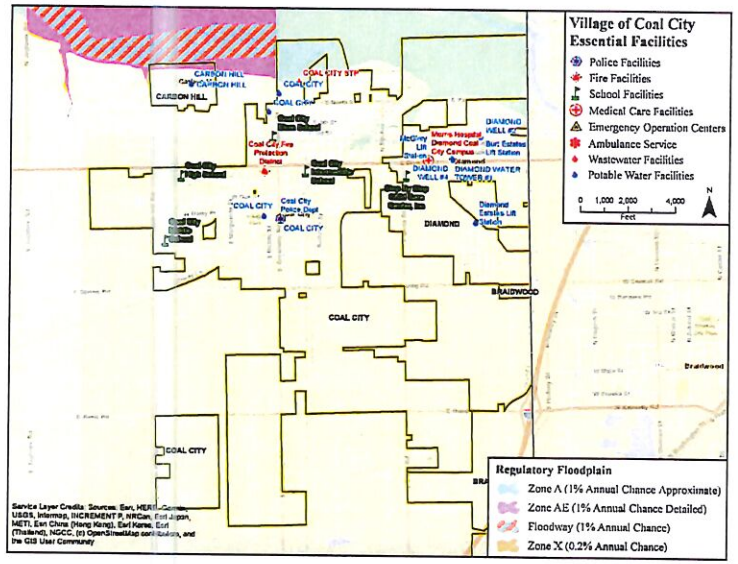


Figure 56 Diamond

PT	HT	G	$	Project Description	P	L	Time Frame	C/B
C	F	1	NA	*Schedule regular catch basin clean out and maintenance	B	Village Maint.	Ongoing	L/M
C	F	2	NA	*Schedule ditch inspection/clean out/ Maintenance	B	Village Maint	Ongoing	L/M
C	TSS	1	FEMA	*Construct underground tornado shelter with generator for trailer court residents and others without basements in their neighborhoods	A	Village Board	3-5 YR	H/H
C	E	2	FEMA	*Retrofit WTP and WWTP to better withstand earthquakes	B	Village Board	4-5YR	M/M
P	TSS/F	3	NA	*Enforcement of Village adopted Storm Water Regulations	D	Village Board	Ongoing	L/M
E	ALL	3	NA	Maintain Educational information on Village Website	D	Village Board	Ongoing	L/M
C	F/TSS	2	FEMA	*Buy out properties to convert to municipal storm water detention & construct phase 1 north end trunk sewer to convey flow	C	Village Board	3-5 YR	H/H
P	ALL	4	LOCAL	*Maintain membership in IPWMAN for public works mutual aid	D	Village Board	Ongoing	L/H
C	F/D	2	LOCAL	Clean out lagoon to create 1M gallon overflow storage for WWTP	C	Village Board	3-5 YR	H/H
C	F	2	LOCAL	Construct Phase 1&2 south end trunk sewer on Border Street to convey flow	C	Village Board	2019 done	h/h

Figure 57

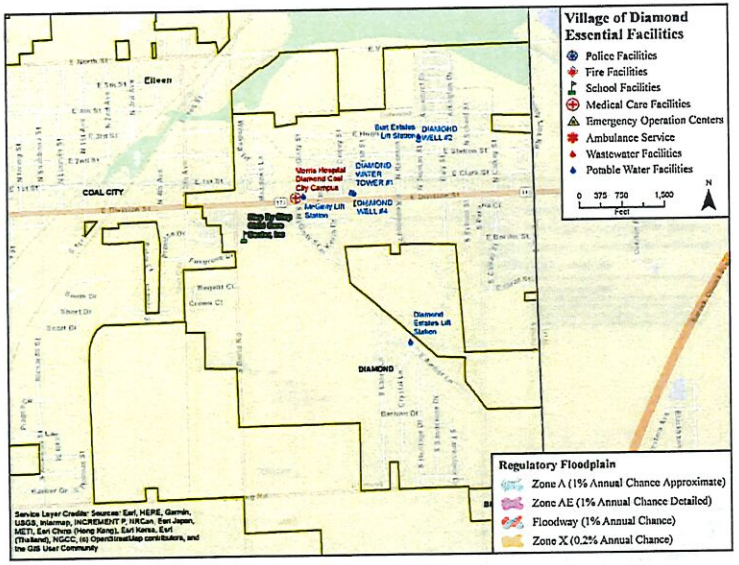


Figure 58 Dwight

PT	HT	G	$	Project Description	P	L	Time Frame	C/B
C	TSS/ ET	1	FEMA	In-Ground Shelter/heating and cooling center	A	Village Board	3-5 YRS	H/H
P	ALL	4	Local	*Participate in County Wide Mutual Aid Agreement	D	Village Board	Ongoing	L/M
C	F	2	Local/ DNR	*Clean Channel of Gooseberry Creek	B	Village Board	1-2 YR	M/M

Figure 59

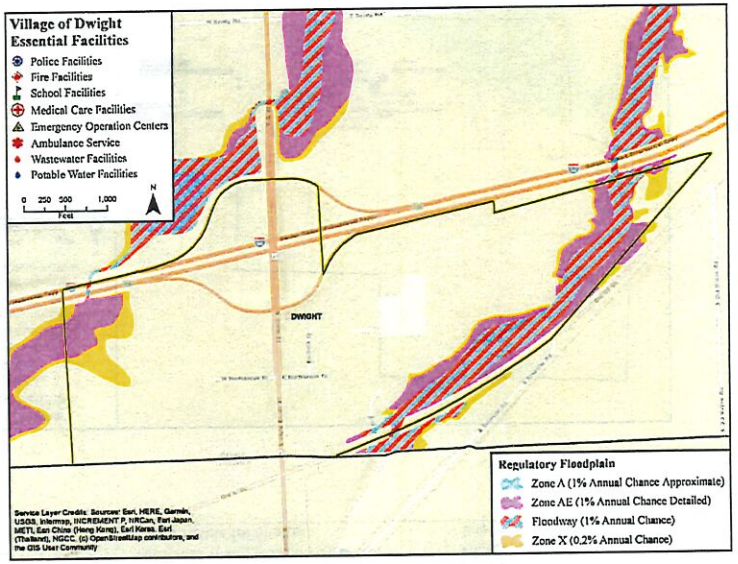


Figure 71 - Kinsman

PT	HT	G	$	Project Description	P	L	Time Frame	C/B
P	All	4	Local	Participate in County Wide Mutual Aid Agreement	D	Village Board	Immediate	L/M
C	TSS	1	FEMA	Construct Wind Resistant Shelter when possible for Shelter.	A	Village Board	3-5 yrs	H/H

Figure 72

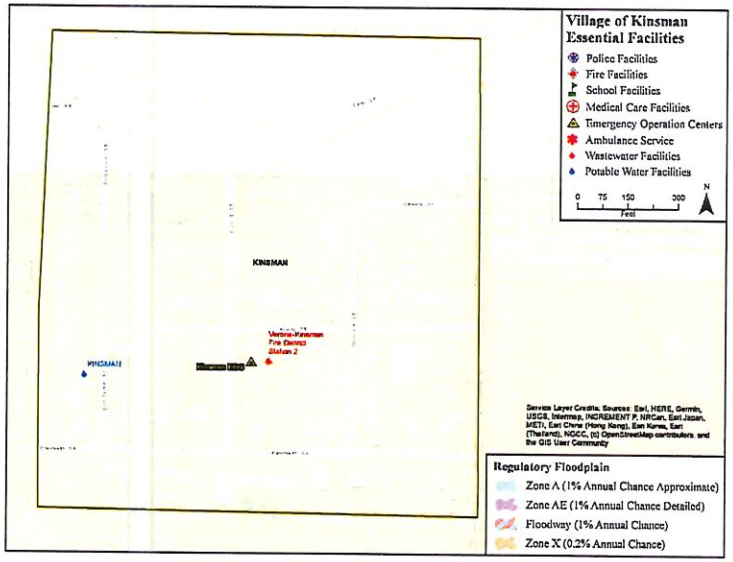


Figure 60 Mazon

PT	HT	G	$	Project Description	P	L	Time Frame	C/B
P	All	4	Local	Participate in County Wide Mutual Aid Agreement	D	Village Board	Immediate	L/M
C	TSS	1	FEMA	*Construct Wind Resistant Shelter when possible for Shelter.	A	Village Board	3-5 yrs	H/H

Figure 61

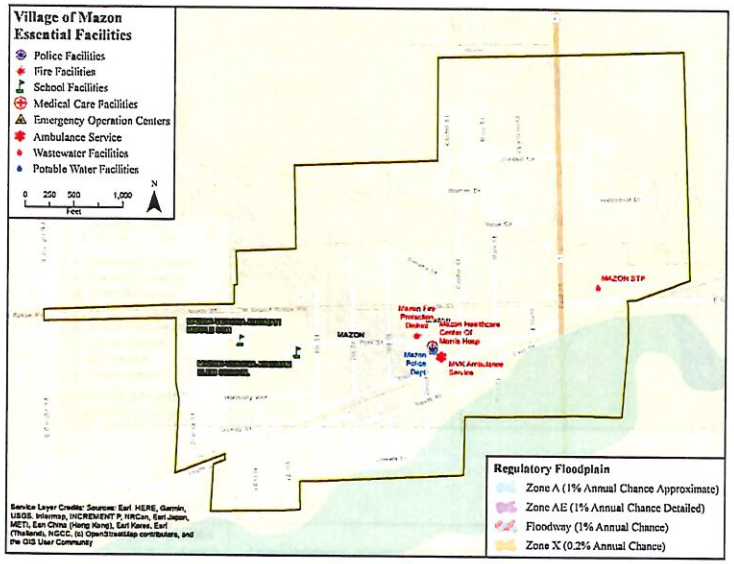


Figure 64 MORRIS

PT	HT	G	S	Project Description	P	L	Time Frame	C/B
P	F TSS	2	FEMA	Sanitary Sewer over flow elimination -Long term control plan and implementation	B	Morris Public Works	5-20 YR	H/H
C	D	2	CDBG	New Water Mains under Nettle Creek at old Park Drive Plant	B	Morris Public Works	2020	H/H
C	D	1	CDBG	Well #5 overhaul	B	Morris Public Works	2020	M/H
P	F	2	LOCAL STATE	Purchase 10 acres of land for new possible water treatment plant at Gun Club and Ashley Roads	B	CITY	5-20 YR	M/H
M	TSS	1	LOCAL	Continue Tree Trimming Plan	D	Morris Public Works	ONGOING	L/M
P	F	4	LOCAL	Develop Long term plan from Rt. 6 north to George Street	B	City Council	2020	M/H
P	F	4	IEMA	Ashley Road Storm Sewer Study from East Rt. 6 south on Ashley Road to Illinois River	A	City Council	1-5 YR	M/H
P	F	4	IEMA	Hatcher Woods Storm Sewer Study in Hatcher Woods Nettle Creek south to Illinois River.	A	City Council	1-5 YR	M/H
P	ALL	4	NA	*Continue to participate in County-Wide mutual aid agreements and multi-jurisdictional hazard mitigation/long term recovery committee	D	Morris Emergency Management	ONGOING	L/H
E	ALL	1,3	NA	*Continue to encourage all City of Morris Residents and businesses to purchase and use NOAA all Hazard Radios	D	Morris Public Works	ONGOING	L/H

Figure 65

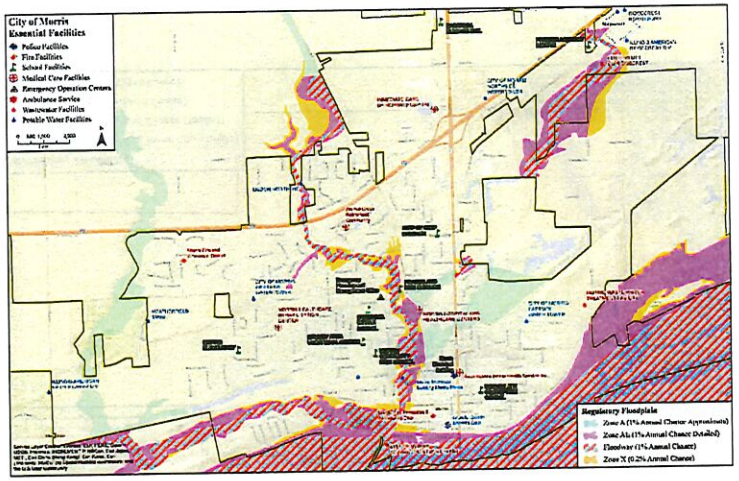


Figure 66 Seneca

PT	HT	G	$	Project Description	P	L	Time Frame	C/B
C	TSS/ ET	1	FEMA	*Develop and maintain a multi use shelter for severe weather, heating and cooling.	A	Village Maint.	3-5 YR	H/H
P	ALL	4	Local	*Apply for and maintain membership in IPWMAN for public works mutual aid	D	Village Maint.	1 yr	L/M
C	F/ TSS	2	Local USDA	*Install and maintain a back-up generator for lift station	B	Water Dept	1-2 YR	M/H
E	ALL	3	Local	*Develop a public awareness campaign for homes and business to purchase NOAA Radios at a discount	D	Emergency Management Agency (EMA)	2020 Ong.	L/M
E	ALL	3	Local	*Provide Educational information on the Village website and Facebook Page	D	Village Clerk/EMA	2020 Ong.	L/M

Figure 67

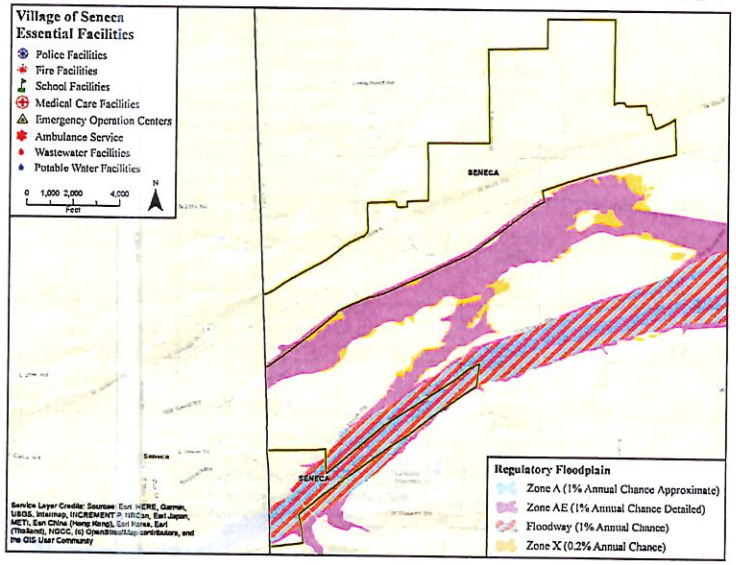
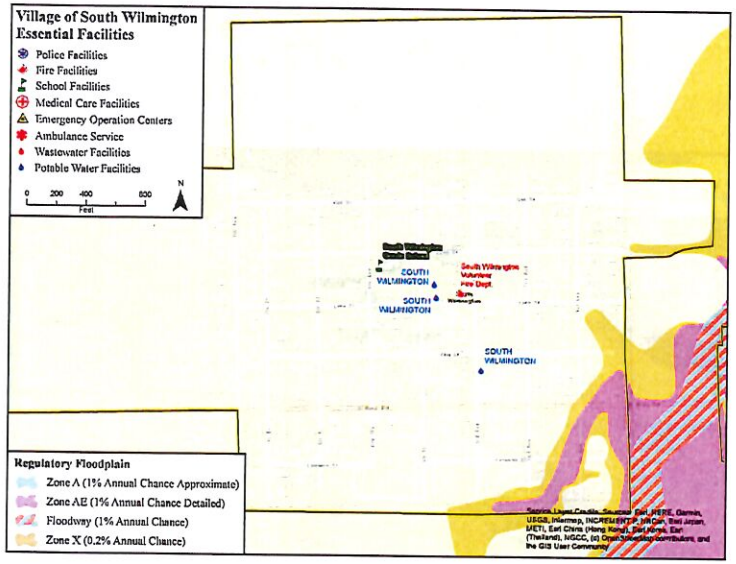


Figure 68 South Wilmington

PT	HT	G	$	Project Description	P	L	Time Frame	C/B
P	All	4	Local	*Participate in County-Wide mutual aid agreements and multi-jurisdictional hazard mitigation/long term recovery committee	D	Village Board	Ongoing	L/H
C	F	2	FEMA	*Clean and Reshape the channel of the Mazon River in South Wilmington	B	County and Village Emergency Management	3-5 YR	H/H

Figure 69



PLAN MAINTENANCE, EVALUATION, AND MONITORING

In Grundy County, maintenance of the plan is assigned primarily to the Emergency Management Department. Upon approval and adoption of the updated plan, an annual mitigation meeting will be held each year. Representation from each jurisdiction will be invited to attend, and the meeting will be open in accordance with the Illinois Open Meetings Act. The press releases will encourage not only the public but neighboring jurisdictions to attend.

At these meetings, a review of the progress on mitigation projects will be noted, the effectiveness of the completed projects will be evaluated, new project ideas will be documented and disaster preparedness issues will be addressed. The entire attendance will participate in the evaluation, but details of the projects will be presented by the lead agency responsible for the project. Methodology for reviewing completed projects and their effectiveness will be dependent upon the type of project. For example, and educational session might note the # of participants as well as the results of any pre and post test knowledge gain. A more complex project, such as a construction project, might include an evaluation of the project cost vs. actual cost; effectiveness in mitigating the risk (i.e. did the project do what it was supposed to do) or other standards as deemed appropriate by the committee.

While implementation of the plan is the responsibility of each jurisdiction, the Grundy County Emergency Management will maintain contact with each jurisdiction, and serve as a resource to those communities. Participating jurisdictions will utilize the approved plan as reference and guidelines when engaging in other planning processes, including but not limited to comprehensive planning, economic development planning, and capital improvement plans. Additionally, records will be kept of mitigation projects completed.

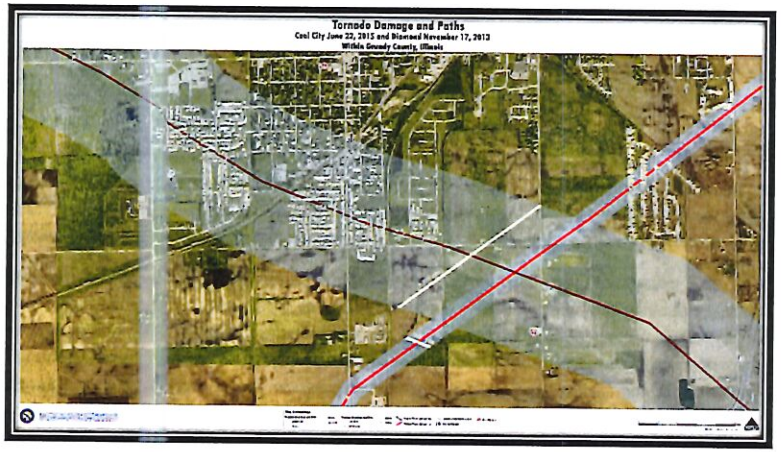
On the following page is a table illustrating the Annual Meeting Reviews from the 2013 Mitigation Plan. As can be seen from this summary, the county has made enormous strides in their mitigation efforts since 2013, with 55% of the projects completed. As the county continues to grow, upgrades to infrastructure, drainage systems and overall preparedness will need to be accomplished to protect lives and properties.

Figure 70

2013 Grundy County Mitigation Projects Completion Status

	# of Projects in Plan	2014	2015	2016	2017	2018	In process	Total projects complete
Grundy County	7	1	5	5	6	6	1	6
Braceville	3	0	0	0		nr	1	
Coal City	0	0	0	0				Non participating
Diamond	11	4	6	6	7	nr		7
Dwight	2	1	1	1	1	nr		1
Mazon	4	1	1	1	1	nr		1
Minooka	6	1	2	2	2	nr		2
Morris	10	4	5	5	10	10		10
Seneca	5	2	2	2	nr	2		2
South Wilmington	3	1	1	1	nr	1		1
Verona	0							Non Participating
All Jurisdictions	1	1	1	1	1	1		1
	52	16	24	24	28			24
Percentage		31.40%	47%	47%	55%			55%

ATTACHMENTS



ATTACHMENT A

August 26, 2019

Dear :

The Grundy County Emergency Management Agency and University of Illinois Extension are once again working on the Multijurisdictional Natural Hazards Mitigation Plan for the County, and are inviting you to be part of the Steering Committee. As you may remember, the plan was created in 2013, and now needs to be updated to continue eligibility for Mitigation Grant dollars from FEMA should project funding be requested. Participating Jurisdictions can identify mitigation projects within the plan, that they can apply for mitigation dollars to fund should dollars become available. Without Jurisdictional Participation Mitigation Dollars **will not** be available to that Jurisdiction

In order for a jurisdiction to participate, they must designate a representative and who participates in at least 1 of the 4 steering committee meetings that are tentatively scheduled below:

- September 24, 2019 1pm Emergency Operations Center, Morris
- October 22, 2019 1pm Emergency Operations Center, Morris
- Dec 10, 2019 1pm Emergency Operations Center, Morris
- February TBD 1pm Emergency Operations Center, Morris

During the plan update process, two public meetings will also be held one on October 22 at 5:30 pm, and one in February or March 2020, once the draft plan is complete, both at the Grundy County Council Chambers. These meetings are crucial to public involvement in the process, so we will be encouraging all jurisdictions to promote the meetings.

As in the original planning process, Extension Staff will be facilitating focus groups for key stakeholders groups, focusing on specific needs of a variety of sectors, including agriculture, education, business and human services. The Illinois State Water Survey will also be update the County wide HAZUS data to determine potential risks from flooding, earthquake, etc.

Please contact Carrie McKillip at University of Illinois Extension, 309.342.5108 or mckillip@illinois.edu, to confirm your participation, or to indicate your jurisdictional designee. If you have questions, feel free to contact me at 815.941.3212.

Joe Schroeder, Director
Grundy County Emergency Management
1320 Union St., Room E-01
Morris, Illinois 60450-2426
(815) 941-3212 Office
(815) 941-3456 Fax

ATTACHMENT B1, B2, B3, B4

B1

Grundy County Hazard Mitigation Committee

September 24, 2019

Grundy County EMA

1pm

Welcome and Introductions	Carrie/Joe
Jurisdictional Participation Requirements and Benefits	
Explanation of the Update process, scope of work and timeline	Carrie
Match Documentation Procedures	Carrie
Community Profiles and Historical Weather Data	Carrie
Review of plan goals from Previous Plan and any potential updates	Carrie
Public Meeting Agenda and information	Carrie
Adjourn	

B2

Grundy County Hazard Mitigation Committee

October 22, 2019

Grundy County EMA

1pm

Welcome and Introductions	Carrie/Joe
Risk Assessment	Carrie
Overview	Carrie
Historical Weather Data	
State Risk Assessment for County	
Hazus Risk Assessment	Lisa Graff
Flooding	
Tornado	
Earthquake	
Critical Facility Location Update	Lisa Graff
Risk Assessment Consensus	Carrie
Time Match Documentation Procedures	Carrie
Public Meeting Agenda	Carrie
Adjourn	

B3

Grundy County Hazard Mitigation Committee

December 10, 2019

Grundy County Emergency Operations Center

1pm

Welcome and Introductions

Project Grids from Previous Plans

New Ideas

Completing the Grids for Update

Final Meeting and Public Meeting tentative dates

Adjourn

B4

Mitigation *is the ongoing effort to lessen the impact on people and property from natural disasters.*

Community Meeting Agenda

Grundy County Mitigation Plan

October 22, 2019

5:30 pm

Welcome/ why are we here?

-Hazard Mitigation Plan Update Process

-What has been completed?

-FEMA Approval

-Jurisdictions Adopt

-Additional Mitigation Projects

Risk Assessment Grid/Natural Disasters to review

Severe Storm
Tornado
Extreme Temperature
Flooding
Earthquake
Severe Winter Storm

Mitigation Ideas

ATTACHMENT C

C-1

September 24, 2019
Grundy County EMA Meeting Room
Meeting Start at 1:04 pm

Attendance: Grant Hacker (Seneca EMA), Blake Pettinelli (Grundy EMA), Joe Schroeder (Grundy EMA), Robert Coleman (Morris EMA), John Grimmbago (EMA Channahon), Terry Kernc (Diamond Mayor), Carrie McKillip, Megan Walsh, Jeremy Attaway (Braceville EMA)

Welcome and Introductions
Joe welcomed participants and charge for the committee. Grundy Mitigation 2013 plan is coming to an end and this is the start for the next plan. Carrie shared some historical information regarding the grant and planning process
Everyone did introductions and shared their role in the project and planning.

Jurisdictional Participation Requirements and Benefits
Each jurisdiction must have a designated representative for the committee in order to be eligible for grant funds. Carrie will reach out to those jurisdictions not here today. If you are not present, you can not receive mitigation dollars from IEMA. Current flood money, 10% of the money will come back to Illinois for projects. They do not necessarily have to be in areas affected by flood but could be anywhere in Illinois that is ready to go.

October 22, 2019 – First Public Meeting
November 12, 2019 – Focus Groups
February or March – Second Public Meeting
June 30 of 2020 - Plan must be submitted

We received a list of recommendations for upcoming planning based on feedback from old plan from FEMA and IEMA. They are asking for pictures from previous disasters. We will try to incorporate as many of the recommendations as possible.

FEMA states one of the goals of plan is to get public engaged in the process. We will engage the community as much as possible through the public survey, public meetings and other methods of communicate. Please share the public survey through Facebook, social media, through public meetings, and any other means possible. Survey is mobile friendly.
https://go.illinois.edu/GrundySurvey

Will plan to invite the Grundy Interagency Council and Grundy COAD to task force.

Explanation of the Update process, scope of work and timeline
We will review the recommendations at each meeting and try to make sure we are including them.
HAZAS– Database modeling system for natural hazards. FEMA database looks at flooding, earthquakes, and hurricane mapping. Illinois Water Survey has developed it to use with tornados. Illinois Water Survey will be at the next meeting to discuss historical weather data. They ask that reps come to the next meeting knowing and ready to map (addresses) for your critical facilities (fire, police, ambulance, hospital).
This plan only includes natural hazards and not man-made disasters. It does not mean you should not be thinking of these issues on your own, but this plan will not cover those accidents.

FEMA wants to know if you have current plans in your jurisdiction. Please review the list compiled from 2013 and bring updates to the next meeting. FEMA would also like that City Councils and Village Boards are thinking of disaster preparedness in building codes, city ordinances, and more so we become more disaster resilient communities. Consider adding a statement regarding "adding/considering city ordinances that are disaster resilient" to each local plan.

Match Documentation Procedures
Document any hours that you are working on towards the plan. FEMA allows us to use your time as match against the grant, if you are not getting specifically paid to do this work. For those volunteering their time we can use the Illinois Dept of Statistics pay rate for the hours you work towards planning. We need 25% of the planning funds to come in from the County, this can come from your time. Joe has a current system he uses will send the form to everyone.

Please include if this is your normal job duty or not. If it is part of normal duties, we will need to have documentation of hourly wage and benefits. This would be anything you do for this plan, and not other (more) local plans. Volunteers should also be included and the hours they spent toward the grant. This includes hours posting online, talking with councils or boards, talking with community members, participating in meetings, etc. (those listening could also complete this documentation). This can include youth groups as well as adults.

Community Profiles and Historical Weather Data
Historical Weather Data will happen next month.
Packet includes demographic overview of American Family Survey with an update for the county. Community data will be at the next meeting. In the old plan each page had a blurb on each city with demographic data. Please look at old plan maps and blurb about community and let Carrie know if anything has changed within your community (annexes, demographics, etc).

Several Grundy communities are in both Grundy and Will. Communities on the border can choose which plan they would like to be part of or they can participate in both. You can include plans in both counties or you can choose which plan to list in. You may have to work with the other county to secure funds even if the plan was listed in the other county.

Can send the water survey maps after Carrie receives them so they can use them. They have created depth grid maps in the past, that can be helpful to explain for those that ask questions regarding how water would affect them in the flood plan.

Review of plan goals from Previous Plan and any potential updates
Review the goals from the last plan (found on page 57). Group reviewed and made the following suggestions.

Goal 2 – Change to say "Public and Private infrastructure"
Goal 4 – Still relevant. Communication is better, but it still has flaws and continues to be needed. Include County COAD into goal.

Task force voted, and changes to the goals were unanimously accepted. No new goals were added.

Public Meeting Agenda and Information
Part of it will be explaining what a mitigation plan is to the public.
What do you think your communities need to be aware of going into this plan?

- The project we have already done and how it impacts and protects them
- History of where we started, where we are and where we are going
- Information on ongoing projects (ie: river project). Create a paper report for each jurisdiction for those members that cannot be in attendance.
- Question and answer session for specific communities/jurisdictions
- Submit ideas for projects for the plan

Carrie will send a draft agenda out in the next couple of weeks for everyone to review and take suggestions from task force members. Carrie will create an agenda, flyers and a press release.

Adjourn
Before the meeting adjourned Carrie asked the task force to complete the public survey.
Meeting adjourned at 2:10 pm

Ideas for Emergency Management Planning

- City Ordinance – All new mobile home parks need to have a tornado shelter on site. Ordinances regarding pole barn churches
- Youth – Make emergency packs for warming centers for those stranded in a storm.
- Volunteers – CERT trainings or have a volunteer committee in a jurisdiction (New Lenox has a great CERT group). Stop the Bleed training (through American Red Cross). Extension programming for disasters (ie: Food safety during a disaster)
- Emergency Management – Low cost reflective signs for things like flooded roadways so the public knows it is upcoming.

C-2

Grundy County Hazard Mitigation Committee
October 22, 2019
Grundy County EMA
1:00 pm

Welcome and Introductions
Blake Pettinelli, Joe Schroeder, Brad McVay, Lisa Graff, Jim Dunnin, George Gray, Terry Kernc, Robert Oalhamn, Jeff Margues, Matt Fritz, Kevin McNamara, Megan Walsh, Carrie McKillip

- Risk Assessment
  - Overview
  - Historical Weather Data
    - Reviewed information on historical weather data. Information regarding hail, tornadoes, drought and extreme temperatures are included in the packet.
  - State Risk Assessment for County
    - County risk - Severe risk for severe storms; Medium risk for flood; High for severe winter storms; Low for drought; Medium for extreme heat; Low for earthquake; High for tornado
- Hazus Risk Assessment – Presentation by Illinois State Water Survey; Lisa Graff and Brad McVay
  - Flooding – Illinois State Water Survey; Lisa Graff
    - Recent update to State Standards for Extreme Rainfall/Storm Events, called bullet 70 (Upper part of Illinois is most affected by updates)
    - Information on recent weather events and update to historical data
    - Possible policy is reviewing storm drain sizes and how they could be improved
  - Tornado – Review of data regarding changes in tornado patterns
    - Possible suggestion; supporting tornado shelters, but we do not typically fund them because we do not traditionally have "strong" tornadoes; Repeat for putting in a better shelter or basement
  - Earthquake – Low risk of earthquake risk in Grundy. Carrie mentioned thinking of earthquake risk related to if a strong event were to hit Chicago and how that would affect Grundy.
- Critical Facility Location Update
  - Illinois Water Survey shared a list of the critical facilities in Grundy County and asked the group to review township lists for missing facilities and update addresses. Share information with Carrie and she will have the list updated.
- Risk Assessment Consensus
  - Reviewed data included in previous application and asked group what should be changed. Carrie suggested going back to communities and ask about specific locations that could use a larger strong sewer and include them in the plan and then they could qualify if listed. These ratings are used for cost benefit analysis for projects in local mitigation plans. This information is also looked at as an opportunity to discuss as a collective group and making decisions based on conversations and group decisions.
    Suggestions:
    - Diamond – Change Severe Storm to High
    - Morris – Change Flood to Moderate; Include language regarding flash flooding
    - Kinsman – Change Flood to Moderate; Flash Flood
    - Mazon – Change Flood to Moderate; Flash Flood
    - Coal City – Change Flood to Moderate; Flash Flood
    - Carbon Hill – Change Flood to Moderate; Flash Flood
- Time Match Documentation Procedures
  - Committee Members were asked to track the time spent on mitigation related activities for documentation of match for the grant.
- Public Meeting Agenda
  - Promote the meeting and the Emergency Management Survey https://go.illinois.edu/grundysurvey. Survey will be open through December for public comments. Encourage everyone to come back for the public meeting. Next meeting is December 10th at the Grundy EMA office. At the next meeting we will go over each jurisdictions project list, those completed, those ongoing and new project ideas.
- Adjourn
  - Meeting adjourned at 2:35 pm

C-3

Hazard Mitigation Meeting Minutes 121019

Meeting Start Time: 13:00
Welcome and Introductions

Project Grids from Previous Plans:
We need specific info for how the jurisdiction will incorporate the goals of the planning processes,
The mitigation plan will be considered in all planning processes (private contractors or/jurisdiction).
Grundy Co. has 55% of buyouts completed.

Notes from the focus groups passed out to Jurisdictions

Jurisdictional Project Grid:
Grundy Co: projects continued.. NIXLE (upgrading), Grundy Co. EMA App, IPAWS,

Braceville didn't show up.

Diamond: Public works now cleans basin, not the county. Generators are completed. Educational info; keep on the website. Continued to be with IPWMAN

Dwight: Dwight will send Carrie his Jurisdictional Project Grid.

Mazon: Didn't' show up.

Minooka: Didn't show up. (Multi-band radios for interoperability) Completed. (Starcom).

Morris: Bob Coleman didn't show up. Storm drains added by the creek (in process – West side sewer overflow project). Backup generators – Completed. Web Portal - completed.
*Improve capabilities will be taken out by Carrie.
Weather Radios ongoing and completed.
Thermal Imaging – Completed
Prune/remove trees – Always on-going.

Seneca: Didn't show up.
Village of Seneca & Seneca EMA are both members of IPWMAN.
Seneca does social media – On-going.

South Wilmington – Mazon River clean & Reshape – On going.
S. Wilmington has a facebook page and also added a backup generator for the water system.
*Will try to become a member of the IPWMAN.

Did a lot of Catch Basin work within the town. Flooding has been much better ever since the storm sewers have been updated.

New Ideas

Carbon Hill first time showing up – Becoming a part of the IPWMAN member. Carbon Hill updated their storm sewers and drains approximately 7 years ago. Carbon Hill just completed a sewer plant and treatment system. They have backup generators for sewer plant. FEMA reduced Carbon Hill's flood plain. Carbon Hill project – Develop a cooling/ heating station for Carbon Hill residents.
Possible idea: Tornado shelter for Carbon Hill.
(Flood mitigation; buyouts, elevation, tornado shelters, culvert size increases, etc.).

COAD – get the jurisdictions involved. Supporting the development of the COAD.

Coal City mentioned to start doing underground fiber optic connection for Telecommunications. Also mentioned was Nuclear Power Plant having disaster cascading issues.

Private companies/properties and mitigation jurisdiction meetings.

Thoughts: livestock training; won't be able to get buy-in for Grundy Co.

Channahon: Improving water treatment plant – Approved. Tornado shelter, culvert resizing, etc.
Public Education. Improving communications; just hired communications manager (Starcom). Shortage of drinking water. Channahon in talk with Joliet; Mitigation to ensure potable water. Industrial expansion, the wells use aquifers but are getting overwhelmed.

Braidwood: public awareness campaign, tornado shelter, mine subsidence,
Hydrology study – get people out of the flood plain that would never flood. Flood plain was amended.

Completing the Grid for Update
Final Meeting and Public Meeting tentative dates -

Adjournment
Meeting End Time: 14:12 (2:11 PM)

ATTACHMENT D- SIGN IN SHEETS

D-1 SEPT STEERING

Appendix C

UNIVERSITY OF ILLINOIS EXTENSION

Program: GC HMP

Date: 9/24/19

Location: Grundy County EOC

Please sign in. Because UI Extension receives government funding, we are required to report race, ethnicity, and gender information for program participants. You are not required to submit this information, but may do so on a voluntary basis.

Name	Address City, State Zip	E-Mail	Phone
Grant J Hacker	Village of Seneca EMA Seneca IL 61360	[illegible]	815-993-5279
Blake Petrinelli	Grundy Co. 1320 Union St. Morris, IL	[illegible]	815-391-[illegible]
Joe Schroeder	1320 Union St. Morris IL	[illegible]	815-94-3212
John M. Grimmer	24555 S [illegible]	[illegible]	815 954 [illegible]
Terry Kernc	Village of Diamond [illegible]	mayor@villageofdiamond	815-634-8149
Megan Walsh	[illegible]	[illegible]	815-[illegible]
Robert H Coleman	City of Morris / Division of [illegible]	[illegible]	815-942-6103
Jeremy [illegible]	[illegible] State Rte 53	[illegible]	(815) 331-3363

Race: White — X marked for most attendees; Ethnicity: Non-Hispanic/Latino — X marked for two attendees.

D-2 OCT STEERING

SIGN-IN SHEET –

UI EXTENSION RECEIVES GOVERNMENT FUNDING. WE ARE REQUIRED TO REPORT RACE, ETHNICITY, AND GENDER INFORMATION FOR PROGRAM PARTICIPANTS. YOU ARE NOT REQUIRED TO SUBMIT THIS INFORMATION, BUT MAY DO SO ON A VOLUNTARY BASIS.

Program: Grundy Mitigation Mtg 2 Date: 10/22/19

Location: Grundy EMA

UNIVERSITY OF ILLINOIS EXTENSION

Name	American Indian or Alaskan Native M	American Indian or Alaskan Native F	Asian M	Asian F	Native Hawaiian & Pacific Islander M	Native Hawaiian & Pacific Islander F	Black M	Black F	White M	White F	Other Race M	Other Race F	2 or More Races M	2 or More Races F	Hispanic/Latino M	Hispanic/Latino F	Non-Hispanic/Latino M	Non-Hispanic/Latino F
Blake Petrinelli									X									
Joe Schroeder																		
Brad McVay									X									
Lisa Graff										X								
Jim Dunning									^									
George [illegible]									X									
Terry Kernc																		
Robert H Coleman									X									
Jeff Marques									X									
Matt Fritz									✓									
Kevin McNamara									✓									
Megan Walsh										X								

D-3 DEC STEERING

SIGN-IN SHEET –
UI EXTENSION RECEIVES GOVERNMENT FUNDING. WE ARE REQUIRED TO REPORT RACE, ETHNICITY, AND GENDER INFORMATION FOR PROGRAM PARTICIPANTS. YOU ARE NOT REQUIRED TO SUBMIT THIS INFORMATION, BUT MAY DO SO ON A VOLUNTARY BASIS.

Program: Kinsley Co Mitigation Date: 12/10/19

Location: Kinsley EMA

ILLINOIS Extension

Name	Race: American Indian or Alaskan Native		Asian		Native Hawaiian & Pacific Islander		Black		White		Other Race		2 or More Races		Ethnicity: Hispanic/Latino		Non-Hispanic / Latino	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Jessica Harvey									X									
Blake Pettinelli									X									
Norm Lardi									X									
Josh Bolatto									X									
Jbolatto@grundycity.us									X									
Joe Schroeder									X									
Kevin Mallaney									X									
MATT FRITZ									✓									
Terry Kern										X								
George Geary									X									
Ken Buck																		
JOAN GRIMENTZ									X									

D-4 PUBLIC MEETING

Public Mtgs

SIGN-IN SHEET –
UI EXTENSION RECEIVES GOVERNMENT FUNDING. WE ARE REQUIRED TO REPORT RACE, ETHNICITY, AND GENDER INFORMATION FOR PROGRAM PARTICIPANTS. YOU ARE NOT REQUIRED TO SUBMIT THIS INFORMATION, BUT MAY DO SO ON A VOLUNTARY BASIS.

Program: Grundy Mitigation Date: 10/22/19

Location: Morris

UNIVERSITY OF ILLINOIS EXTENSION

Name	Race: American Indian or Alaskan Native		Asian		Native Hawaiian & Pacific Islander		Black		White		Other Race		2 or More Races		Ethnicity: Hispanic/Latino		Non-Hispanic / Latino	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Dennis Keith															X			
Blake Pettinelli									X									
Megan Walsh									X									
Dwight Ballen									X									
Ken Buck																		
Joe Schroeder																		
George Geary									X									
Robert H Robinson									X									
Debra Kinsella									X									

ATTACHMENT D-5 AG FOCUS GROUP

SIGN-IN SHEET –
UI EXTENSION RECEIVES GOVERNMENT FUNDING. WE ARE REQUIRED TO REPORT RACE, ETHNICITY, AND GENDER INFORMATION FOR PROGRAM PARTICIPANTS. YOU ARE NOT REQUIRED TO SUBMIT THIS INFORMATION, BUT MAY DO SO ON A VOLUNTARY BASIS.

Program: Ag & Business Focus Group **Date:** 11/21/19

Location: Building in Extension Office

COLLEGE OF AGRICULTURAL, CONSUMER & ENVIRONMENTAL SCIENCES — ILLINOIS Extension

Name	Race										Ethnicity	
	American Indian or Alaskan Native		Asian		Native Hawaiian & Pacific Islander		Black		White		Other Race		2 or More Races		Hispanic/Latino	Non-Hispanic / Latino
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M F	M F
Blake Petrinelli									X							
Megan Walsh									X							
Victoria Wax									X							
Ken Buck																

ATTACHMENT E FOCUS GROUP SCHEDULE

Grundy County Multi-Jurisdictional Hazard Mitigation Plan Update
Focus Groups Schedule
November 12, 2019
Grundy County Illinois Extension Office

9 – 10:30 AM	Agriculture and Business
11- 12:30 PM	Public Safety and Infrastructure
	Break
1:30 – 3 PM	Education and Human Services

ATTACHEMENT F – FOCUS GROUP NOTES

Name: Chris Kindelspire Date: Nov 12th 2019

Natural Hazard	Effects on People/Property	Possible Mitigation Strategies
Severe Storms (thunder, wind, hail)	Lightning damage to sensitive communication equipment Extended power outages / surges Excessive wind loads beyond structure design, especially if the event includes ice buildup.	Use of surge devices and best practices Power system and protective devices designed for load type. Follow TIA standards and use the proper classification for communications structures
Floods	Could limit access to communications facilities	Fuel generators and preform system checks on a routine basis as well as prior to a known upcoming event.
Drought	Could cause an issue with a shift in the soil. Have seen where the ground has severe cracks that cause sever settling.	When backfilling would need to backfill in lifts and compact them vs. a gross backfill of an open hole. Would also want to ensure that the backfill soil had some moisture as well.
Extreme Heat	Could damage outdoor equipment. Potential for power outages and the need for backup power in extreme conditions. Over taxing of HVAC systems cooling sensitive communications equipment. Damage to shelter roofs.	Test the power systems regularly, when specifying the equipment look into options for operations in sever heat and cold. Proper HVAC design and maintenance.
Earthquake	Physical communications tower damage & 911 Center Damage. Interruption in water/sewer/natural gas and broadband to facilities.	Design structures for the seismic zone which it will be utilized in. Design systems to be independent whenever possible.

Natural Hazard	Effects on People/Property	Possible Mitigation Strategies
Tornado	Long term power outages, interruption in backhaul complete or partial failure of the structure leading to damage outside of the tornado such as water damage. Significant call volume into 911 center.	Use best practices and engineering data for the area to aid in the design of the structure/facility vs. using typical design practices.
Winter Storms (snow, ice)	Access to sites, staff may not be able to get to and or leave the 911 center for a period of time. Ice can overload communication structures and when coupled with wind could cause complete failure. Significant call volume into 911 center.	Contingency plan for an event such as this. Communication towers using proper TIA revision and class for their design.
Extreme Cold	Backup power sources may have trouble starting due to a number of factors. Metal alloy and plastic items can break if they are struck. Extended power outages are possible.	Include cold weather packages on the generators. Typically you know this is coming and there is time for a quick check on all systems prior to the event.
Flash Floods	These happen quickly, may occur in areas that typically do not flood. Potential for long term power outages. Significant increase of calls into the 911 center. Staff may not be able to access communications sites or 911 center.	Contingency plan for an event such as this.

ATTACHEMNT G PRESS RELEASES/SOCIAL MEDIA/POSTERS

SENT TO MEDIA 9/25/19

Morris, Illinois. The public is invited to provide input on the update to the Grundy County Multi-jurisdictional Natural Hazards Mitigation plan, according the Grundy County Emergency Management Agency. The plan, developed in 2013, outlines projects and activities the participating jurisdictions would like to complete to reduce the impact of natural hazards in the community. According to plan facilitator, Carrie McKillip, mitigation idea can come from anywhere. "This public meeting is just one way the county and jurisdictions are seeking input from citizens." McKillip, from University of Illinois Extension, facilitated the original plan in 2013. "Grundy County has been very successful in completing projects originally outline in the plan, so the meeting will review what has been accomplished already, and what residents think might assist them in reducing the risk to both their lives and their property."

The public meeting will be held October 22, 2019 at 5:30 pm at the Grundy County Board Chambers, 1320 Union Street. Grundy County Emergency Manager, Joe Schroeder encourages any one who is interested to attend the meeting, and also get involved. "In addition to the mitigation planning, there are other ways to provide input. We currently have a survey on-line for residents. The survey can be completed by going to **https://go.illinois.edu/GrundySurvey**."

For more information, contact the Grundy County Emergency Management Agency at 815.941.3212 or Carrie McKillip at mckillip@illinois.edu or 309.342.5108.

SENT TO MEDIA 10/15/2020

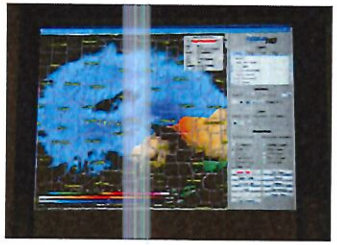
Morris, Illinois. The Grundy County Steering Committee for updating the Grundy County Multi-jurisdictional Natural Hazard Mitigation Plan is inviting all residents to complete a survey on their knowledge of and risk from natural hazards. According to Illinois Extension Educator Carrie McKillip, who is facilitating the plan update, this is a crucial part of the planning process. "We first did this survey in 2012, which gives us a baseline of awareness. By using the same questions, we can compare responses and see where the community is concerning awareness and preparedness," McKillip added.

The survey can be completed by going to **https://go.illinois.edu/GrundySurvey** . The survey will remain open until December 31, 2019 and the results will be summarized in the Hazard Mitigation Plan update.

For more information contact the Grundy County Emergency Management Agency at 815.941.3212 or Carrie McKillip at mckillip@illinois.edu or 309.342.5108.

Sample Facebook Post for Survey

Severe Weather impacts all of Us!



Grundy County is updating the Natural Hazards Mitigation Plan, and needs your input! All residents of Grundy County are invited to take a disaster awareness survey at https://go.illinois.edu/GrundySurvey that will provide input for the mitigation plan. The survey only takes a few minutes, and requires no personal identifying information. Please help us by taking this mobile friendly survey!

Distributed 9/24/19

Grundy County

Hazard Mitigation Community Meeting

PLANNING FOR THE FUTURE IN THE EVENT OF

WE NEED YOUR INPUT AND IDEAS TO UPDATE THE MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

October 22, 2019
5:30 pm
Grundy County Board Chambers
1320 Union Street
Morris, Illinois

ATTACHMENT H- BLANK COMMUNITY SURVEY

Grundy County Multi-Jurisdictional Hazard Mitigation Survey

By completing this survey, you will assist the Hazard Mitigation Steering Committee in their understanding of the preparedness and comfort level of the Communities in the County. All information provided in this survey will be used in aggregate, and no individuals responses will be included for the plan summary. Please indicate your agreement to participate before proceeding on to the survey.

- ○ I agree to participate (1)

What is your zip code?

- ○ 60407 (4)
- ○ 60416 (5)
- ○ 60424 (6)
- ○ 60437 (7)
- ○ 60444 (8)
- ○ 60447 (9)
- ○ 60450 (10)
- ○ 60474 (11)
- ○ 60498 (12)
- ○ Other_____ (13)

Where do you live?

- ○ In town (1)
- ○ In the country (2)

In the past 10 years, have you or someone in your household experienced a natural disaster in this county, such as: Severe storm, drought, floods, winter storms, extreme heat, tornadoes, earthquakes or other natural hazards?

- ○ Yes (Go to Next question) (1)
- ○ No (Skip the next question) (2)

Which of the following types of natural hazard events have you or someone in your household experienced? please check all that apply

- ☐ Severe weather damage in excess of $500 (1)
- ☐ Drought (2)
- ☐ Floods (3)
- ☐ Winter storms (4)
- ☐ Extreme heat (5)
- ☐ Tornadoes (6)
- ☐ Earthquakes (7)
- ☐ Other (please specify): (8) _____

On a scale of 1 to 5, how prepared do you feel you and your household are for the probable impacts of natural hazard events likely to occur within the County?

- ○ Not at all prepared (1)
- ○ Somewhat Prepared (2)
- ○ Adequately Prepared (3)
- ○ Well Prepared (4)
- ○ Very well Prepared (5)

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

	Not Concerned (1)	Somewhat Concerned (2)	Concerned (3)	Very Concerned (4)	Extremely Concerned (5)
Severe Storms (Wind, Lightening) (1)	○	○	○	○	○
Flood (2)	○	○	○	○	○
Winter Storms (3)	○	○	○	○	○
Extreme Heat (4)	○	○	○	○	○
Tornadoes (5)	○	○	○	○	○
Drought (6)	○	○	○	○	○
Earthquakes (7)	○	○	○	○	○
Other (8)	○	○	○	○	○

What is the most effective ways for you to receive information about how to make your household and home safer from natural disasters? (please check all that apply)

- ☐ Newspaper (1)
- ☐ television (2)
- ☐ radio (3)
- ☐ school (4)
- ☐ social media (5)
- ☐ fact sheet/brochure (6)
- ☐ e-mail (7)
- ☐ web sites (8)
- ☐ government (9)
- ☐ mail (10)
- ☐ other (11) _____

To the best of your knowledge, is your property located in a designated floodplain?

- Yes (1)
- No (2)
- I do not know (3)

To the best of your knowledge, if your property located in close proximity (less than 1 mile) to an earthquake fault line?

- Yes (1)
- No (2)
- I do not know (3)

11 Do you have flood insurance?

- Yes (1)
- No (2)
- I do not know (3)

12 Do you have earthquake insurance?

- Yes (1)
- No (2)
- I do not know (3)

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

	Minimally Vulnerable (1)	Moderately Vulnerable (2)	Severely Vulnerable (3)	Don't Know (4)
Severe Storm (wind, lightening (1)				
Flood (2)				
Winter Storms (3)				
Extreme Heat (4)				
Tornadoes (5)				
Drought (6)				
Earthquakes (7)				
Other (8)				

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

	Minimally Vulnerable (1)	Moderately Vulnerable (2)	Severely Vulnerable (3)	Don't Know (4)
Severe storm (wind, lightning) (1)	○	○	○	○
Flood (2)	○	○	○	○
Winter Storm (3)	○	○	○	○
Extreme Heat (4)	○	○	○	○
Tornado (5)	○	○	○	○
Drought (6)	○	○	○	○
Earthquake (7)	○	○	○	○
Other (8)	○	○	○	○

15 What actions do you think could be taken by individuals or the community to reduce damages and hardships caused by natural hazard events?

_____

Did you consider the impact that the possible occurrence of a natural disaster would have on your home before you purchased or moved in?

○ Yes (1)

○ No (2)

○ Do not recall (3)

Did you consider the impact that the possible occurrence of a natural disaster would have on your home before you was the presence of a natural hazard risk zone (flood zone, fault zone, etc.) disclosed to you by a real estate agent, seller, or landlord before you purchased or moved into your home?

○ Yes (1)

○ No (2)

○ Do not recall (3)

Would the disclosure of this type of information influence your decision to purchase or move into a home?

○ Yes (1)

○ No (2)

○ Maybe (3)

Would you be willing to spend money to modify or retrofit your current home from the impacts of future natural disasters? (examples of retrofitting are: elevating a flood prone home; bolting a foundation for seismic impacts; improving home exteriors to withstand higher winds; and so on)?

- Yes (1)
- No (2)
- Maybe (3)

Which of the following incentives would help to encourage you to spend money to retrofit your home for the possible impacts of natural disasters? (please check all that apply)

- Low interest rate loan (1)
- Insurance Premium Discount (2)
- Mortgage Discount (3)
- Property Tax Break (4)
- Grant Funding with Cost Share (5)
- none (6)
- other (7) _____

If your property were located in a designated high hazard area or had received repetitive damages from a natural event, would you consider a buyout or relocation offered by a public agency?

- Yes (1)
- Maybe (2)
- No (3)

How old are you?

- ○ Under 18 (4)
- ○ 18-25yrs (5)
- ○ 26-35yrs (6)
- ○ 36-45yrs (7)
- ○ 46-55yrs (8)
- ○ 56-65yrs (9)
- ○ Over 65years (10)

What is your Gender?

- ○ Male (3)
- ○ Female (4)
- ○ Prefer not to Answer (5)

How long have you lived in Grundy County?

- ○ Less than one year (1)
- ○ 1-4 years (2)
- ○ 5-9 years (3)
- ○ 10-19 years (4)
- ○ More than 20 years (5)

Do you own or rent your home?

- ○ Own (1)
- ○ Rent (2)

What type of structure do you live in?

- Single Family home (1)
- Duplex (2)
- Apartment (3)
- Condo/Townhouse (4)
- Manufactured Home (5)
- Trailer (6)
- Other (7) _____

Grundy County Multi-Jurisdictional Hazard Mitigation Survey

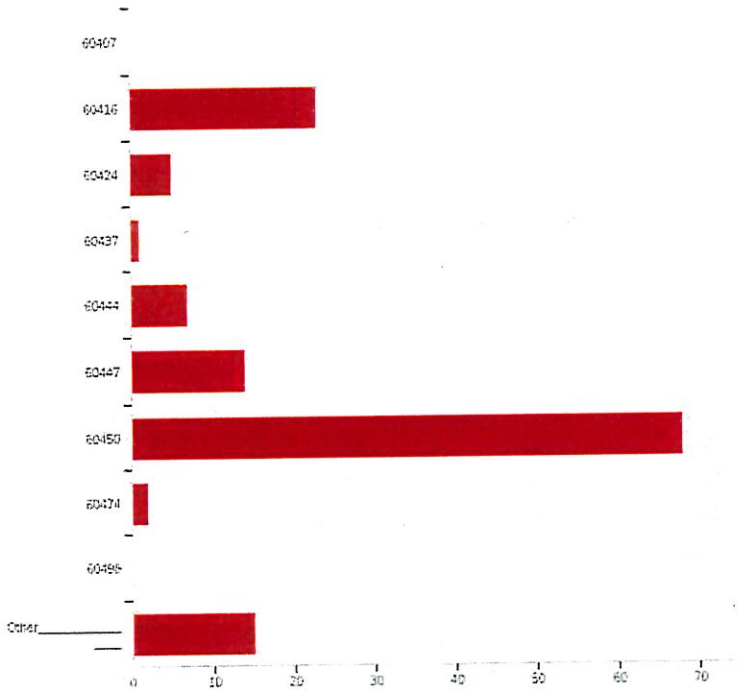
Result as Reported March 24, 2020

Consent to participate

By completing this survey, you will assist the Hazard Mitigation Steering Committee in their understanding of the preparedness and comfort level of the Communities in the County. All information provided in this survey will be used in aggregate, and no individual responses will be included for the plan summary. Please indicate your agreement to participate before proceeding on to the survey.

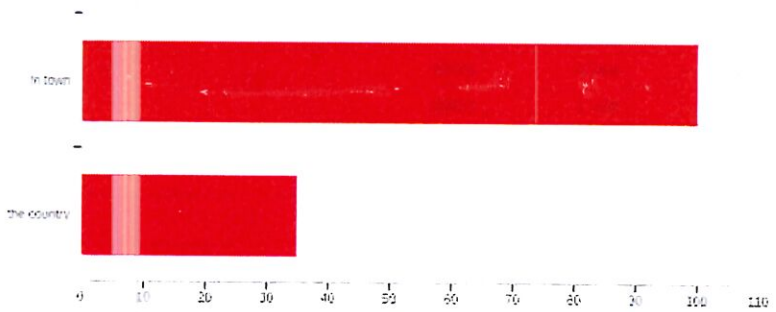
#	Answer	%	Count
1	I agree to participate	99.46%	184
2	I prefer not to participate	0.54%	1
	Total	100%	185

What is your zip code?



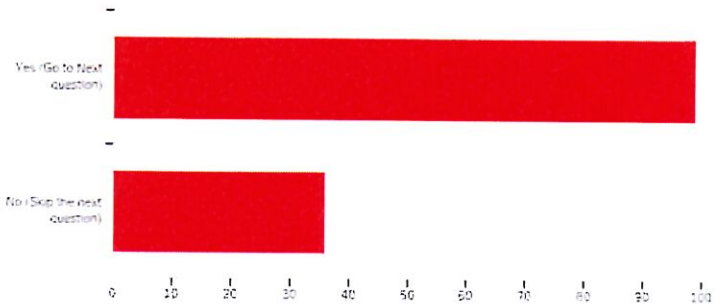
	Answer	%	Count
4	60407	0.00%	0
5	60416	17.04%	23
6	60424	3.70%	5
7	60437	0.74%	1
8	60444	5.19%	7
9	60447	10.37%	14
10	60450	50.37%	68
11	60474	1.48%	2
12	60498	0.00%	0
13	Other_____	11.11%	15
	Total	100%	135

Where do you live?



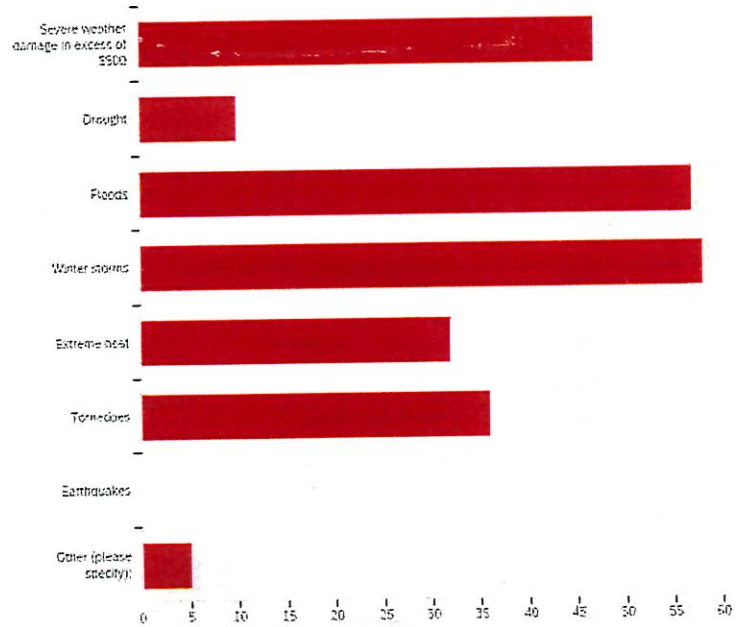
#	Answer	%	Count
1	In town	74.07%	100
2	In the country	25.93%	35
	Total	100%	135

In the past 10 years, have you or someone in your household experienced a natural disaster in this county, such as: Severe storm, drought, floods, winter storms, extreme heat, tornadoes, earthquakes or other natural hazards?



#	Answer	%	Count
1	Yes (Go to Next question)	73.33%	99
2	No (Skip the next question)	26.67%	36
	Total	100%	135

Which of the following types of natural hazard events have you or someone in your household experienced? please check all that apply



#	Answer	%	Count
1	Severe weather damage in excess of $500	19.18%	47
2	Drought	4.08%	10
3	Floods	23.27%	57
4	Winter storms	23.67%	58
5	Extreme heat	13.06%	32
6	Tornadoes	14.69%	36
7	Earthquakes	0.00%	0
8	Other (please specify):	2.04%	5
	Total	100%	245

Other (please specify): - Text

fire

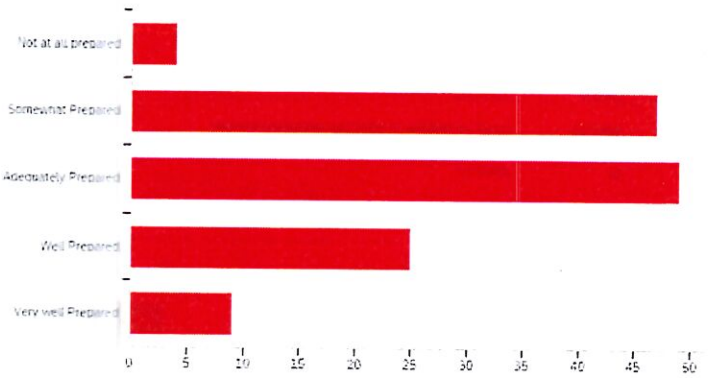
Whole area power outage for days due to storm. Had to relocate disabled son due to medical needs.

two major tornadoes

Extreme cold

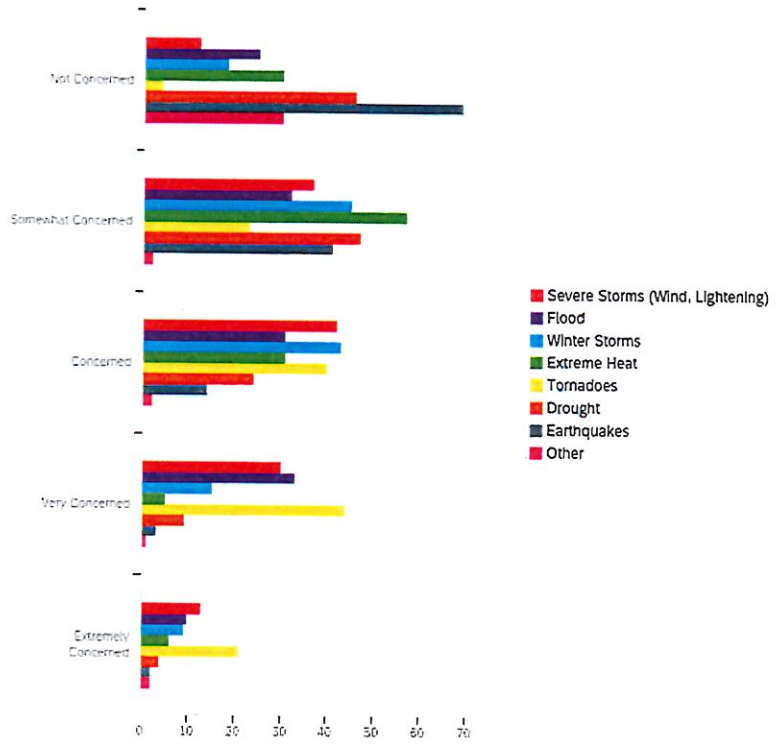
electrical outage for more than 24 hrs

On a scale of 1 to 5, how prepared do you feel you and your household are for the probable impacts of natural hazard events likely to occur within the County?



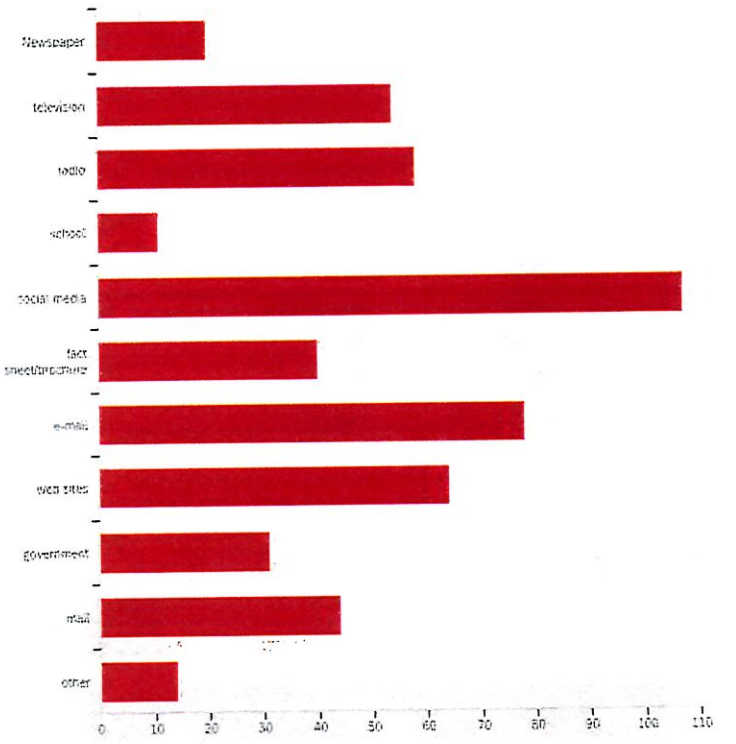
#	Answer	%	Count
1	Not at all prepared	2.99%	4
2	Somewhat Prepared	35.07%	47
3	Adequately Prepared	36.57%	49
4	Well Prepared	18.66%	25
5	Very well Prepared	6.72%	9
	Total	100%	134

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



#	Question	Not Concerned		Somewhat Concerned		Concerned		Very Concerned		Extremely Concerned		Total
1	Severe Storms (Wind, Lightening)	8.96%	12	27.61%	37	31.34%	42	22.39%	30	9.70%	13	134
2	Flood	19.08%	25	24.43%	32	23.66%	31	25.19%	33	7.63%	10	131
3	Winter Storms	13.85%	18	34.62%	45	33.08%	43	11.54%	15	6.92%	9	130
4	Extreme Heat	23.26%	30	44.19%	57	24.03%	31	3.88%	5	4.65%	6	129
5	Tornadoes	3.03%	4	17.42%	23	30.30%	40	33.33%	44	15.91%	21	132
	Drought	35.38%	46	36.15%	47	18.46%	24	6.92%	9	3.08%	4	130
	Earthquakes	53.49%	69	31.78%	41	10.85%	14	2.33%	3	1.55%	2	129
	Other	81.08%	30	5.41%	2	5.41%	2	2.70%	1	5.41%	2	37

What is the most effective ways for you to receive information about how to make your household and home safer from natural disasters? (please check all that apply)



#	Answer	%	Count
1	Newspaper	3.84%	20

2	television	10.36%	54
3	radio	11.13%	58
4	school	2.11%	11
5	social media	20.54%	107
6	fact sheet/brochure	7.68%	40
7	e-mail	14.97%	78
8	web sites	12.28%	64
9	government	5.95%	31
10	mail	8.45%	44
11	other	2.69%	14
	Total	100%	521

Other-

text

Text

Apps

text alert

seminar/informational training similar to what they do for weather spotting

Weather radio and the monitoring of multiple scanner radios

Text

text message

Amateur radio

EMA App

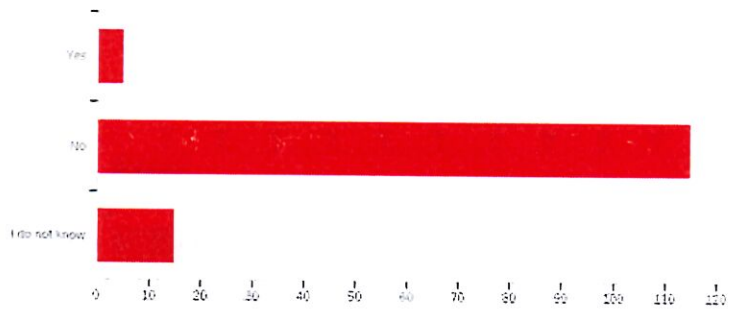
Text

Phone app

Text messages

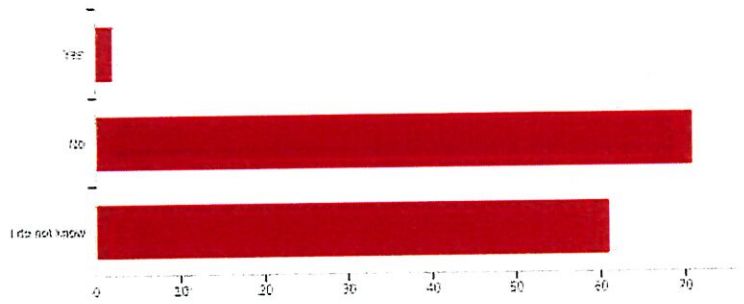
Text

To the best of your knowledge, is your property located in a designated floodplain?



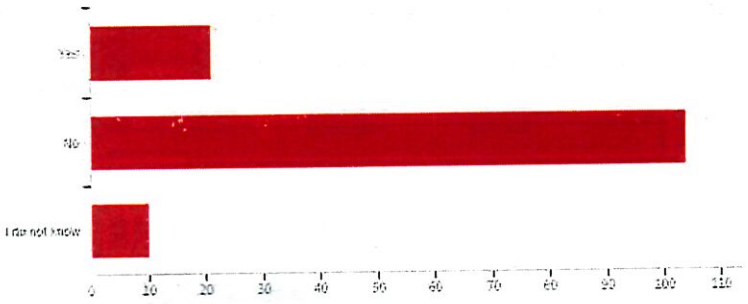
#	Answer	%	Count
1	Yes	3.70%	5
2	No	85.19%	115
3	I do not know	11.11%	15
	Total	100%	135

To the best of your knowledge, if your property located in close proximity (less than 1 mile) to an earthquake fault line?



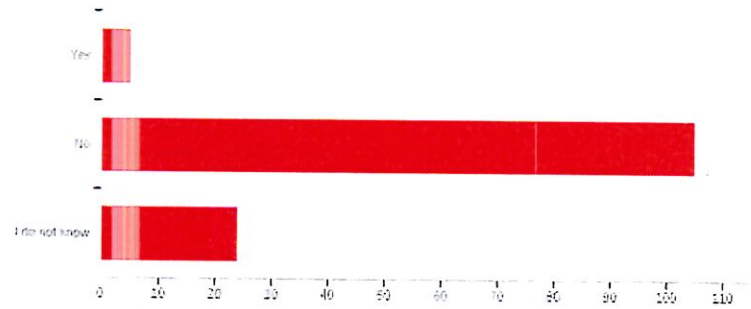
#	Answer	%	Count
1	Yes	1.49%	2
2	No	52.99%	71
3	I do not know	45.52%	61
	Total	100%	134

11 - Do you have flood insurance?



#	Answer	%	Count
1	Yes	15.56%	21
2	No	77.04%	104
3	I do not know	7.41%	10
	Total	100%	135

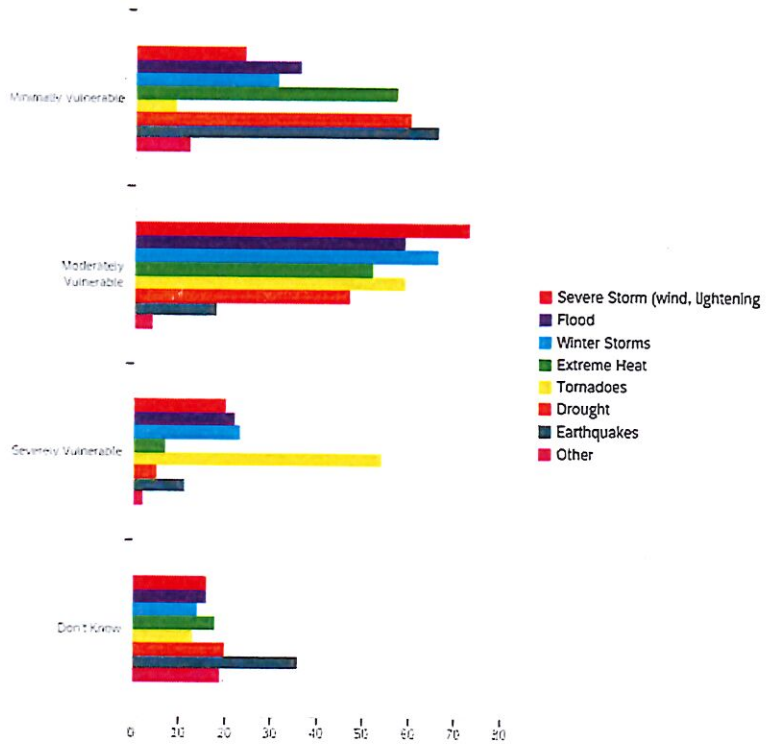
12 - Do you have earthquake insurance?



#	Answer	%	Count
1	Yes	3.73%	5
2	No	78.36%	105
3	I do not know	17.91%	24
	Total	100%	134

139

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

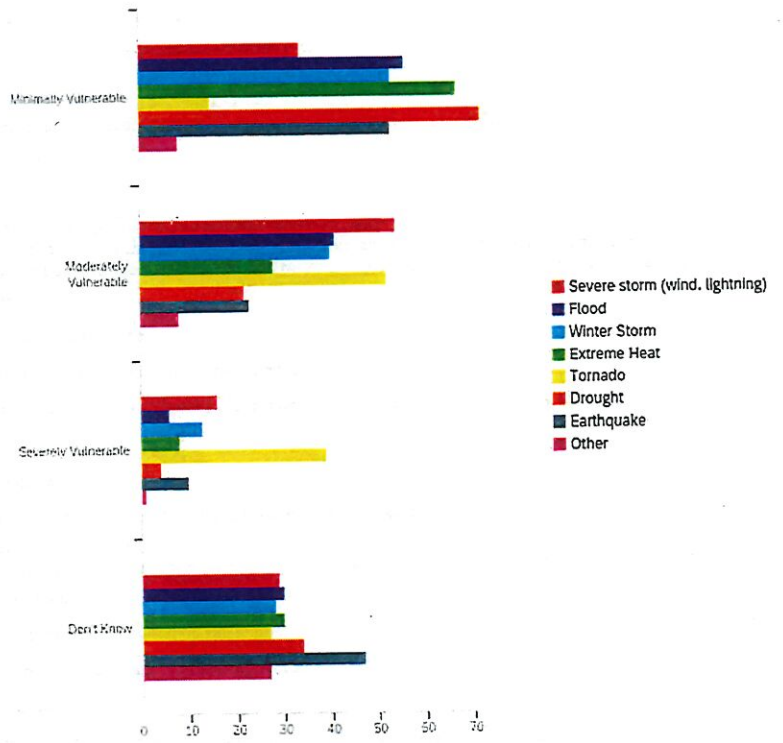


#	Question	Minimally Vulnerable		Moderately Vulnerable		Severely Vulnerable		Don't Know		Total
1	Severe Storm (wind, lightening	18.05%	24	54.89%	73	15.04%	20	12.03%	16	133
2	Flood	27.07%	36	44.36%	59	16.54%	22	12.03%	16	133

140

3	Winter Storms	23.13%	31	49.25%	66	17.16%	23	10.45%	14	134
4	Extreme Heat	42.54%	57	38.81%	52	5.22%	7	13.43%	18	134
	Tornadoes	6.67%	9	43.70%	59	40.00%	54	9.63%	13	135
	Drought	45.45%	60	35.61%	47	3.79%	5	15.15%	20	132
	Earthquakes	50.38%	66	13.74%	18	8.40%	11	27.48%	36	131
	Other	32.43%	12	10.81%	4	5.41%	2	51.35%	19	37

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



#	Question	Minimally Vulnerable		Moderately Vulnerable		Severely Vulnerable		Don't Know		Total
1	Severe storm (wind, lightning)	25.56%	34	40.60%	54	12.03%	16	21.80%	29	133
2	Flood	42.11%	56	30.83%	41	4.51%	6	22.56%	30	133
3	Winter Storm	39.55%	53	29.85%	40	9.70%	13	20.90%	28	134
4	Extreme Heat	50.38%	67	21.05%	28	6.02%	8	22.56%	30	133
	Tornado	11.28%	15	39.10%	52	29.32%	39	20.30%	27	133
	Drought	54.55%	72	16.67%	22	3.03%	4	25.76%	34	132
	Earthquake	39.85%	53	17.29%	23	7.52%	10	35.34%	47	133
	Other	18.18%	8	18.18%	8	2.27%	1	61.36%	27	44

What actions do you think could be taken by individuals or the community to reduce damages and hardships caused by natural hazard events?

What actions do you think could be taken by individuals or the community to reduce damages and hardships caused by natural hazard events?

Require area farmers and water districts to properly tile the land to ensure proper water runoff that protects neighborhoods around them.

Build proper infrastructure, where I live the developer is flooding everyone out

I am not sure

Prepare ahead of time, and stay off the roads

Continued hazard education and outreach

preparedness

Information, salting roads when it snows, having plans in place and making sure all residents are aware of the plans

Pay attention to alerts and don't take unnecessary chances.

unknown

None

have a generator,emergency kit in safe place like the basement, have a plan of evacuation

Plenty of prior notice of impending disaster

Steps to be prepared

none

Public transportation, well being checks on known disabled and seniors. Dresden has a mobility list. More community events to raise funds to support Emergency Management and other first responders. Our hospital is a critical need for this area

Don't know

Prepare

sewer system updates, placing electrical wires underground through the community

Don't know!

Better drainage in some areas.

Have a safe place for people to go

proper maintenance of trees and structures, as well as keeping storm drains clear and performing leaf removal in the fall to prevent storm drains from becoming clogged

during the last tornadoes, churches set up shelters along with governmental agencies. People helped people locally. Several insurance companies were very slow in sending relief. Emergency funds that were established by a non profits foundation is a help. because they can send money or supplies faster.

Be prepared

Insurance

Expedited response times to the restoration of vital services like electricity.

Unsure

Be prepared, know your home vulnerabilities.

Preparedness classes to help families and pets act appropppriately during a natural disaster. More community outreach when natural disasters do occur.

continued infrastructure investment, need functining EEOC in Coal City area (south of river)

preplanning

Be more community oriented

Be alert to changing conditions

Education

Don't know

Idk

Training for Tornados to be prepared in case

Have home generators. Put power lines underground

Education about howeowners insurance

Better placement of alert sirens. I can't hear inside my house. 2600 Winterbottom rd

Continued genral maintenance in and around the home, stock supplies and have a plan

preparedness plans

Culverts in Wauponsee twp are blocked further down or not adequate to handle flooding from Southmor Rd, running to the South

Education

Preparation discussions

Planning and preparedness information

Being prepared for any emergencies

Be knowledgeable

Try to select a home that is out of known danger areas (flood zones, etc)and stay aware of impending dangers (weather, etc).

Having a preparedness plan and training for individuals like CERT

I feel there is a lot of information out there, but it isn't always easy to understand how you can get help after a disaster. There is so much coming at you and you don't know what to trust.

insurance and saving money for all hazards - individuals, businesses and governments

Be prepared. Pay attention to the warnings issued.

Get Preparred

Being educated and prepared

Training, Drills

Those with a well should, if they can afford it, invest in a generator that will at least run the well pump. Should also have a couple of weeks worth of nonperishable food on hand.

Continued contingency planning and engineering

Be aware of current and future weather reports.

WATER RUN OFF MITIGATION FROM FIELDS

Electric outages-have utility perform much better foresty/tree clearing.

Better building codes, prepare.

Be informed on what to do if they happen

Proper and timely maintenance and upkeep of structures and landscape maintenance including tree trimming as well as regularly scheduled infrastructure maintenance and upgrading

Awareness,

Talk with people that have experienced these hardships and see what they've changed.

Better preparedness efforts, resiliency

building structures away from flood areas and strong enough to withstand high winds

Listen to the radio stations. Get prepared days in advance if they are taking about of some sort of bad weather.

unknown

Have a good recovery plan.

Mitigate any hardships/ public preparedness

improve drainage in flood prone areas of the county

education

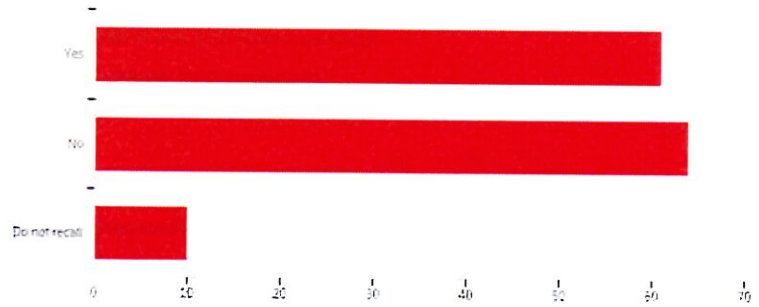
removing dead trees, cleaning street drains, checking power lines for stability

Keep sewers free of debris

follow building codes closely, take shelter during events, be prepared

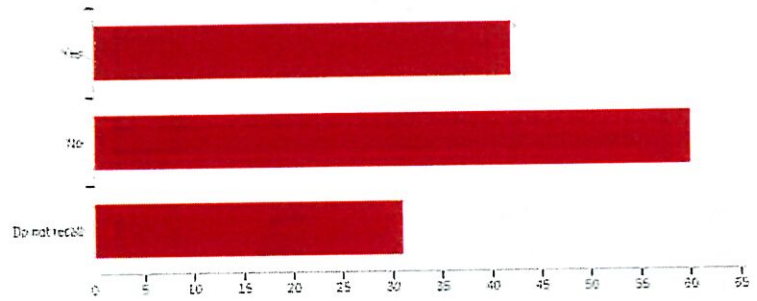
Education and planning

Did you consider the impact that the possible occurrence of a natural disaster would have on your home before you purchased or moved in?



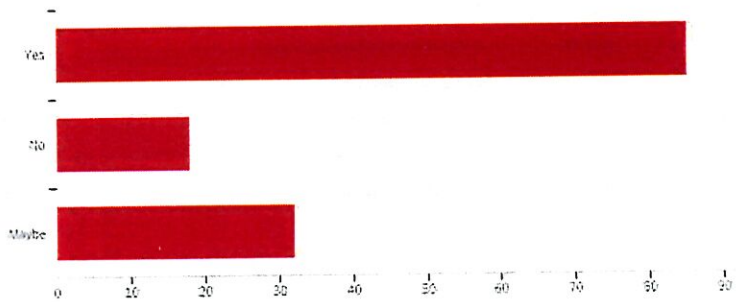
#	Answer	%	Count
1	Yes	45.19%	61
2	No	47.41%	64
3	Do not recall	7.41%	10
	Total	100%	135

Did you consider the impact that the possible occurrence of a natural disaster would have on your home before you was the presence of a natural hazard risk zone (flood zone, fault zone, etc.) disclosed to you by a real estate agent, seller, or landlord before you purchased or moved into your home?



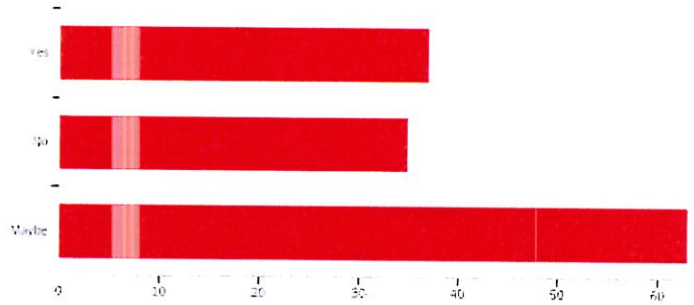
#	Answer	%	Count
1	Yes	31.58%	42
2	No	45.11%	60
3	Do not recall	23.31%	31
	Total	100%	133

Would the disclosure of this type of information influence your decision to purchase or move into a home?



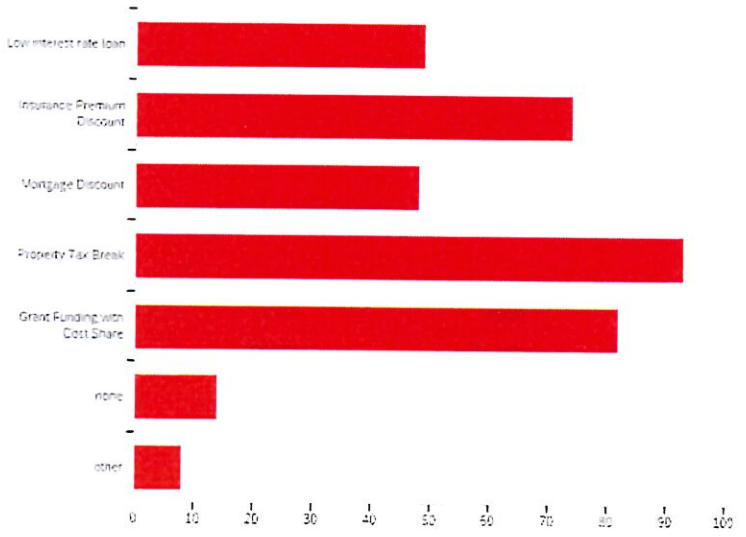
#	Answer	%	Count
1	Yes	62.96%	85
2	No	13.33%	18
3	Maybe	23.70%	32
	Total	100%	135

Would you be willing to spend money to modify or retrofit your current home from the impacts of future natural disasters? (examples of retrofitting are: elevating a flood prone home; bolting a foundation for seismic impacts; improving home exteriors to withstand higher winds; and so on)?



#	Answer	%	Count
1	Yes	27.41%	37
2	No	25.93%	35
3	Maybe	46.67%	63
	Total	100%	135

Which of the following incentives would help to encourage you to spend money to retrofit your home for the possible impacts of natural disasters? (please check all that apply)

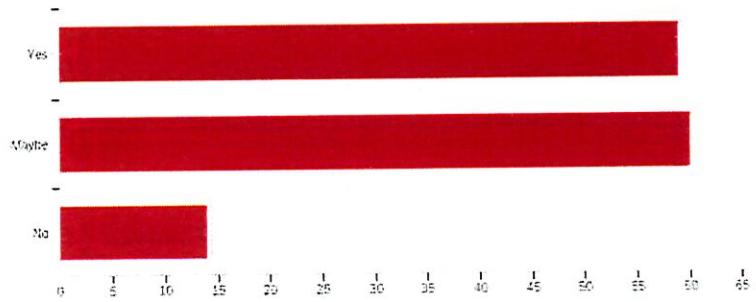


#	Answer	%	Count
1	Low interest rate loan	13.32%	49
2	Insurance Premium Discount	20.11%	74
3	Mortgage Discount	13.04%	48
4	Property Tax Break	25.27%	93
5	Grant Funding with Cost Share	22.28%	82
6	none	3.80%	14
7	other	2.17%	8

	Total	100%	368

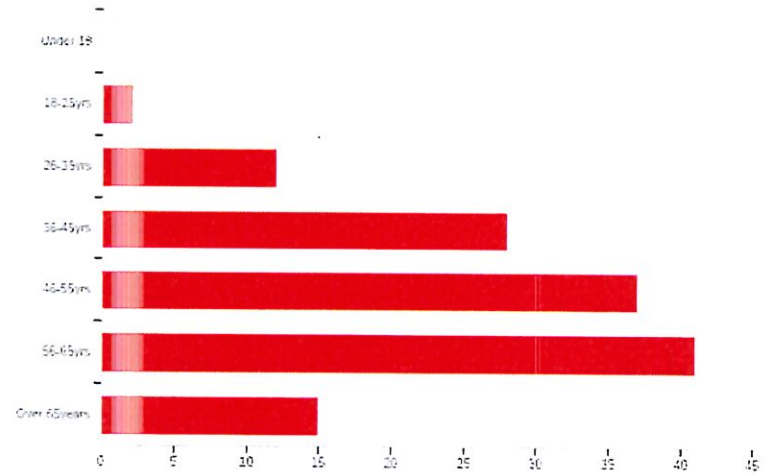
other - Text
I'm in a safe apartment building
I have no money and very limited income
not sure about grant funding with cost share. need more info.
The others don't apply to me as I live on a not for profit piece of property
Shown need
I am a renter, so I can't see any incentive program justifying my own expenses to retrofit a home I don't actually own.
I rent, I couldn't fix my home if I wanted to.

If your property were located in a designated high hazard area or had received repetitive damages from a natural event, would you consider a buyout or relocation offered by a public agency?



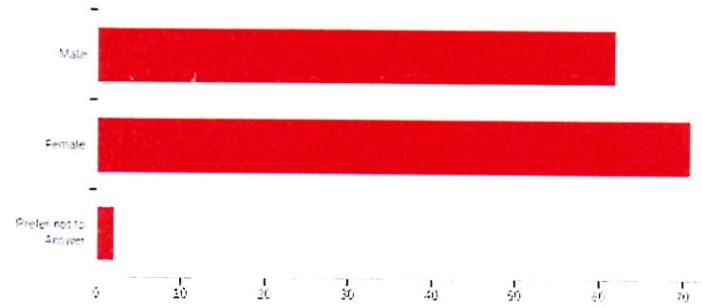
#	Answer	%	Count
1	Yes	44.36%	59
2	Maybe	45.11%	60
3	No	10.53%	14
	Total	100%	133

How old are you?



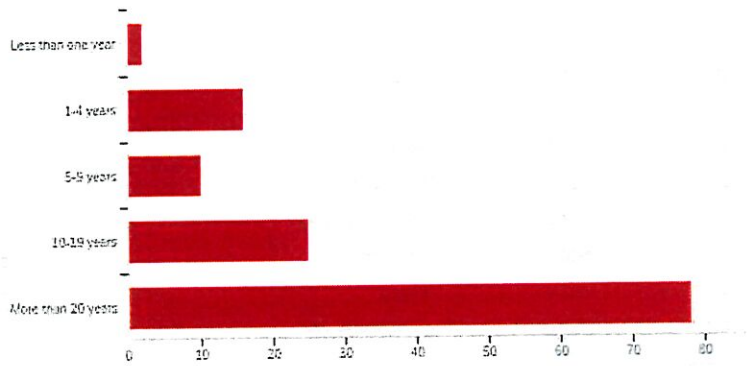
#	Answer	%	Count
4	Under 18	0.00%	0
5	18-25yrs	1.48%	2
6	26-35yrs	8.89%	12
7	36-45yrs	20.74%	28
8	46-55yrs	27.41%	37
9	56-65yrs	30.37%	41
10	Over 65years	11.11%	15
	Total	100%	135

What is your Gender?



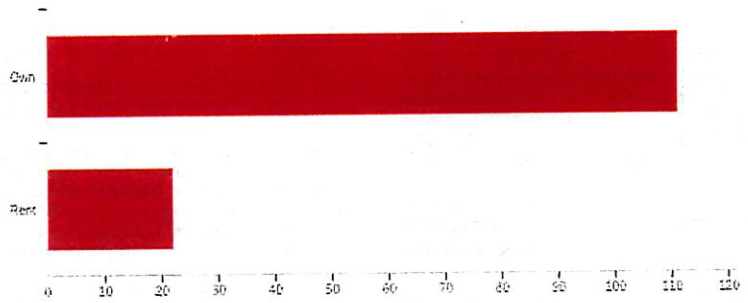
#	Answer	%	Count
3	Male	45.93%	62
4	Female	52.59%	71
5	Prefer not to Answer	1.48%	2
	Total	100%	135

How long have you lived in Grundy County?



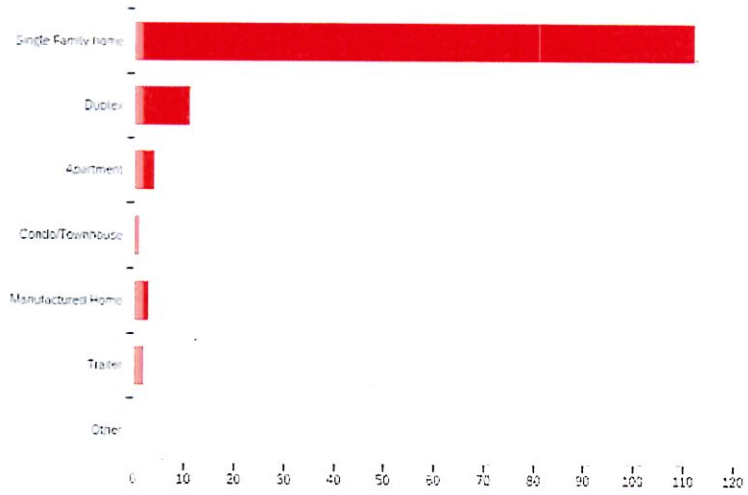
#	Answer	%	Count
1	Less than one year	1.53%	2
2	1-4 years	12.21%	16
3	5-9 years	7.63%	10
4	10-19 years	19.08%	25
5	More than 20 years	59.54%	78
	Total	100%	131

Do you own or rent your home?



#	Answer	%	Count
1	Own	83.46%	111
2	Rent	16.54%	22
	Total	100%	133

What type of structure do you live in?



#	Answer	%	Count
1	Single Family home	84.21%	112
2	Duplex	8.27%	11
3	Apartment	3.01%	4
4	Condo/Townhouse	0.75%	1
5	Manufactured Home	2.26%	3
6	Trailer	1.50%	2
7	Other	0.00%	0
	Total	100%	133

ATTACHMENT J -Listing of Essential Facilities and Facilities of Local Importance

Essential Facilities

Police Facilities

Name of Facility	Community
Coal City Police Dept	Coal City
Gardner Police Dept	Gardner
Mazon Police Dept	Mazon
Minooka Police Dept	Minooka
Grundy County Sheriff's Dept	Morris
Morris Police Dept	Morris

Fire Facilities

Name of Facility	Community
Braceville Fire Protection District	Braceville
Minooka Fire Protection Dist. Station 2	Channahon
Coal City Fire Protection District	Coal City
Gardner Volunteer Fire Department	Gardner
Verona-Kinsman Fire District Station 2	Kinsman
Mazon Fire Protection District	Mazon
Minooka Fire Protection Dist. Station 1	Minooka
Lyondell Chemical Company	Morris
Morris Fire and Ambulance District	Morris
Morris Fire Prot. & Ambulance District	Morris
South Wilmington Volunteer Fire Dept.	South Wilmington
Verona-Kinsman Fire Protection Dist.	Verona

Medical Facilities

Name of Facility	Community
Morris Hospital Ridge Road Facility	Channahon
Morris Hospital Diamond Coal City Campus	Diamond
Mazon Healthcare Center of Morris Hospital	Mazon
Minooka Health Care Center	Minooka
Morris Hospital and Healthcare Centers	Morris
Morris Healthcare Rehabilitation Center	Morris
Immediate Care of Morris Hospital	Morris
Walnut Grove Retirement Community	Morris
Renaissance Home Health Service Inc.	Morris

Nuclear Power Plant

Name of Facility	
Dresden Nuclear Power Plant	Grundy County Unincorp.

School Facilities

Name of Facility	Community
Braceville Elem School	Braceville
Coal City Elem School	Coal City
Coal City Middle School	Coal City
Coal City High School	Coal City
Coal City Intermediate School	Coal City
Step By Step Child Care Center, Inc	Diamond
Gardner Elem School	Gardner
Gardner-South Wilmington Twp H S	Gardner
Mazon-Verona-Kinsman Elem School	Mazon
Mazon-Verona-Kinsman Middle School	Mazon
Aux Sable Elementary School	Minooka
Minooka Primary Center	Minooka
Minooka Elementary School	Minooka
Minooka Jr High School	Minooka
Minooka Community High School	Minooka
Grundy Area Vocational Center	Morris
Immaculate Conception School	Morris
Morris Elementary	Morris
Morris Community High School	Morris
Nettle Creek Elem School	Morris
Premier Academy Morris	Morris
Saratoga Elem School	Morris
Shabbona Middle School	Morris
Prairieland Kids Daycare	Morris
Step By Step Daycare	Morris
South Wilmington Grade School	South Wilmington

Ambulance Services

Name of Facility	Community
MVK Ambulance Service	Mazon

Emergency Operations Center

Name of Facility	Community
Braceville Emergency Svc	Braceville
Kinsman EOC	Kinsman
Minooka Emergency Operations Center	Minooka
Morris Municipal Building	Morris
Emergency Planning and Management Office	Morris
Verona EOC	Verona

ATTACHMENT K

- Grundy County Repetitive Loss Properties*

** From Data provided by DHS/FEMA dates September 2, 2020*

Grundy County experiences flooding on a regular basis. Many properties are impacted over and over as floods seem to become more frequent and deeper. The county has worked with Jurisdictions on many mitigation measures, including buyouts that were continuing in 2019 at the time of the Mitigation Planning Process. Fourteen of the reported properties have been mitigated in some manner. With 75 of the properties not currently covered by the National Flood Insurance Program, participation in the program is encouraged for all property owners in designated floodplains throughout the county.

Grundy County currently has 153 properties identified by FEMA as Repetitive Loss Properties. Of these 153 properties, 140 are single-family residences, eleven are nonresidential and two classified as other-residential. All of these properties are National Flood Insurance Program (NFIP) Repetitive Loss Properties, with FEMA designating 30 as Severe Repetitive Loss Properties. All but 5 of the FEMA designated Severe Repetitive Loss properties are residential, and they are all in the Morris Zip Code. The five remaining properties are categorized as non-residential, also within the Morris area.

With all of the above-mentioned properties in the designated flood plains of Grundy County, property owners have been made aware of the need for NFIP and zoning requirements for the properties. Grundy County zoning requires compliance with NFIP Guidance for issuance of any building permits. In addition to buyouts, mitigation efforts for these properties could include elevation, regional storm water management projects and other flood reduction efforts.

ATTACHMENT L

Sample Jurisdictional Resolution

RESOLUTION _____

WHEREAS, the Grundy County Multi-jurisdictional Natural Hazards Mitigation Plan has been prepared by the University of Illinois Extension working with the Grundy County Multi-jurisdictional Natural Hazards Mitigation Plan Steering Committee; and,

WHEREAS, the Grundy County Multi-jurisdictional Natural Hazards Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, the **COUNTY OF GRUNDY** is a local unit of government that has afforded the citizens an opportunity to comment and provide input to the Plan and the actions in the Plan; and,

WHEREAS, the **GRUNDY COUNTY BOARD** has reviewed the Plan and affirms to participate in the Workgroup that will review the Plan every year and update it no less than every five years;

NOW THEREFORE, BE IT RESOLVED by the **GRUNDY COUNTY BOARD** that the **COUNTY OF GRUNDY** adopts the Grundy County Multi-jurisdictional Natural Hazards Mitigation Plan as this jurisdiction's Multi-hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this _____ day of _____, 2013 at the meeting of the **GRUNDY COUNTY BOARD.**

_____

(Signature)

_____, Chair

(Print Name)

Attachment M- Grundy County Completed Mitigation Projects from 2013

Grundy County EMA Hosted an annual meeting each year to review progress towards completing mitigation projects. Over the five year life of the plan, 55% of the projects were completed, when county ongoing activities, such as maintaining participations in groups, policies, and mutual aid agreements. While the primary priorities of protecting life and property have not changed, jurisdictions re-evaluated their capacity and reworked project plans accordingly.

Jurisdictional Project Grids 2013 Completed Projects Lined through with
Projects Removed for priority shift Non Participating Communities

Goal	Community	Project Type	Hazard Type	Possible Funding	Project Description	Priority	Lead Implementer/Coordinator	Proposed Schedule	Benefit /Cost
2	Grundy County	C	Flood	FEMA	Clean and Reshape the channel of the Mazon River in Southeast Grundy County	B	County	1-5 yrs	H/H
3	Grundy County	E	All Hazards	Local	Encourage Public and Businesses to purchase and monitor NOAA All Hazards Radio	J	EMA Director	Immediate	H/L
[illegible]	Grundy County	[illegible]	[illegible]	[illegible]	Identify Roadways that often pose a hazard to motorists and mark with appropriate signage	[illegible]	[illegible]	[illegible]	M/M
3	Grundy County	E	All Hazards	Local	Develop and Present public awareness campaign for all natural hazards	J	EMA Director	1-2 yrs	M/M
1	Grundy County	PR	All Hazards	Local/USDA	Establish a county wide public warning system for natural hazards using a variety of means, including IPAWs, to get information to the public	A	EMA/County Board	3-5 yrs	H/M
4	Grundy County	P	All Hazards	Local	Convert the multijurisdictional hazard mitigation plan up-to-date and identify additional projects	B	EMA Director	4-5 yrs	M/M
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1	Diamond	C	Flood	Local	Schedule regular catch basin clean out and maintenance	B	County	Immediate	M/M
1	Diamond	C	Flood	Local	Schedule regular ditch inspection/clean out/maintenance	B	County Highway Department	Immediate	M/H
1	Diamond	C	Tornado	FEMA	Construct underground tornado shelter with generator for trailer court residents and others with no basements.	A	Village Bd	3-5 yrs	H/H
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2	Diamond	C	Earthquake	FEMA/Local	Retrofit WTP and WWTP to better withstand Earthquakes	B	Village Bd	4-5 years	H/L
5	Diamond	P	Flood	Local	Strict enforcement of Village adopted Will County Storm Water Regulations.	J	Village Bd	Immediate	H/L

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1	Diamond	BO	Flood	FEMA	Buy out properties in the floodplain for green space adjacent to the village.	A	Village Bd	3-5 yrs	H/H
1	Diamond	P	All Hazards	Local	Maintain membership in IPWMAN for public works mutual aid.	J	Village Bd	Immediate	M/L
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Continue participating with Grundy County on [illegible] region and multi-jurisdictions.	[illegible]	[illegible]	[illegible]	[illegible]
1	Mazon	C	All Hazards	FEMA	To provide a storm shelter	A	Village Bd	3-5 yrs	H/H
1,2	Mazon	C	Flood	Local	Erect levee to stop flooding of homes on the south side of Village as well as diverting water back to the creek	A	Village Public Works	3-5 yrs	H/H
1	Mazon	PR	All Hazards	Local/USDA	Enhance the early warning system, especially to the two elementary schools	B	Fire Dept	1-3 yrs	H/M
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	In-Ground Shelter/heating and cooling center at the Village Hall and EOC	[illegible]	[illegible]	[illegible]	H/H
4	Minooka	COM	All Hazards	Local	[illegible]	B	Emergency Services	3-5 yrs	M/M
1	Minooka	PR	Tornado	Local/FEMA	[illegible]	B	Emergency Services	[illegible]	M/M
2	Minooka	PR	All Hazards	Local	[illegible]	B	Social Services Network	[illegible]	M/L
[illegible]	[illegible]	[illegible]	Winter Storms and Floods	[illegible]	Emergency Patrol and Rescue having access to snow	[illegible]	Emergency Services	[illegible]	L
1	Mazon	C	Flood	Local/FEMA	[illegible] flooding during heavy rainfall	1	City Public Works	[illegible]	[illegible]
2	Morris	C	All Hazards	Local/USDA	Require Backup generators for essential city services, including Fire Dept, City Water Wells, and city sewer treatment, etc.	A	City Council	3-5 yrs	H/H

2	Morris	P	All Hazards	Local	Install a web portal system that would allow city employees to work from home or be notified of emergency actions that needed to be undertaken during natural disasters or emergency events	B	City Clerk/IT	1-4 yrs	M/M
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Improve Capabilities to prepare for and respond to all disasters	[illegible]	Emergency Services	[illegible]	[illegible]
1	Morris	C	All Hazards	Local/USDA	Purchase mobile generator's for backup power at lift stations and water supplies during power outages	A	Public Works	2-5 yrs	H/M
4	Morris	P	All Hazards	Local	Participate in County-Wide mutual aid agreements and multi-jurisdictional hazard mitigation/long term recovery committee	J	City Council	Immediate	H/L
1	Morris	E	All Hazards	Local	Encourage all City of Morris Residents and businesses to purchase and use NOAA all Hazard Radios	B	EMA	1-2 yrs	H/L
2	Morris	P	All Hazards	Local/USDA	Purchase thermal imaging camera and emergency lighting for police, fire and public works use during emergency situations	A	Police Dept	1-2 yrs	H/M
2	[illegible]	[illegible]	[illegible]	[illegible]	Prune and remove trees as needed in public right of ways	[illegible]	[illegible]	[illegible]	[illegible]
1	Seneca	C	All Hazards	FEMA	Develop and maintain a multi use shelter for severe weather, heating and cooling.	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Apply for and maintain membership in IPWMAN for public works mutual aid	[illegible]	[illegible]	[illegible]	[illegible]
2	Seneca	C	Flood	Local/USDA	Install and maintain a back-up generator for lift station	B	Water Dept	1-2 yrs	H/M
3	Seneca	E	All Hazards	Local	Develop a public awareness campaign for homes and business to purchase NOAA Radios at a discount	B	EMA	1-2 yrs	H/L
3	Seneca	E	All Hazards	Local	Provide Educational information on the Village website and Facebook Page	B	IT/Village Staff	1 year	H/L
2	South Wilmington	C	Flood	FEMA	Clean and Reshape the channel of the Mazon River in South Wilmington	B	County and Village	1-5 yrs	H/H
4	South Wilmington	P	All Hazards	Local	Participate in County-Wide mutual aid agreements and multi-jurisdictional hazard mitigation/long term recovery committee	J	Village Board	Immediate	h/l