

# **HANSON COUNTY, SOUTH DAKOTA**

## **HAZARD MITIGATION PLAN**

**SEPTEMBER 2021**



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# CHAPTER I

## PLANNING PROCESS

### Background

This plan is an update of the Hanson County Pre-Disaster Mitigation Plan, which was approved by FEMA in December 2016. The purpose of the plan is to prevent or reduce losses to people and property that may result from future hazard events in Hanson County. The plan identifies and analyzes the hazards that the county is susceptible to, and proposes a mitigation strategy to minimize future damage that may be caused by those hazards. The document will serve as a strategic planning tool for use by Hanson County in its efforts to mitigate against future disaster events.

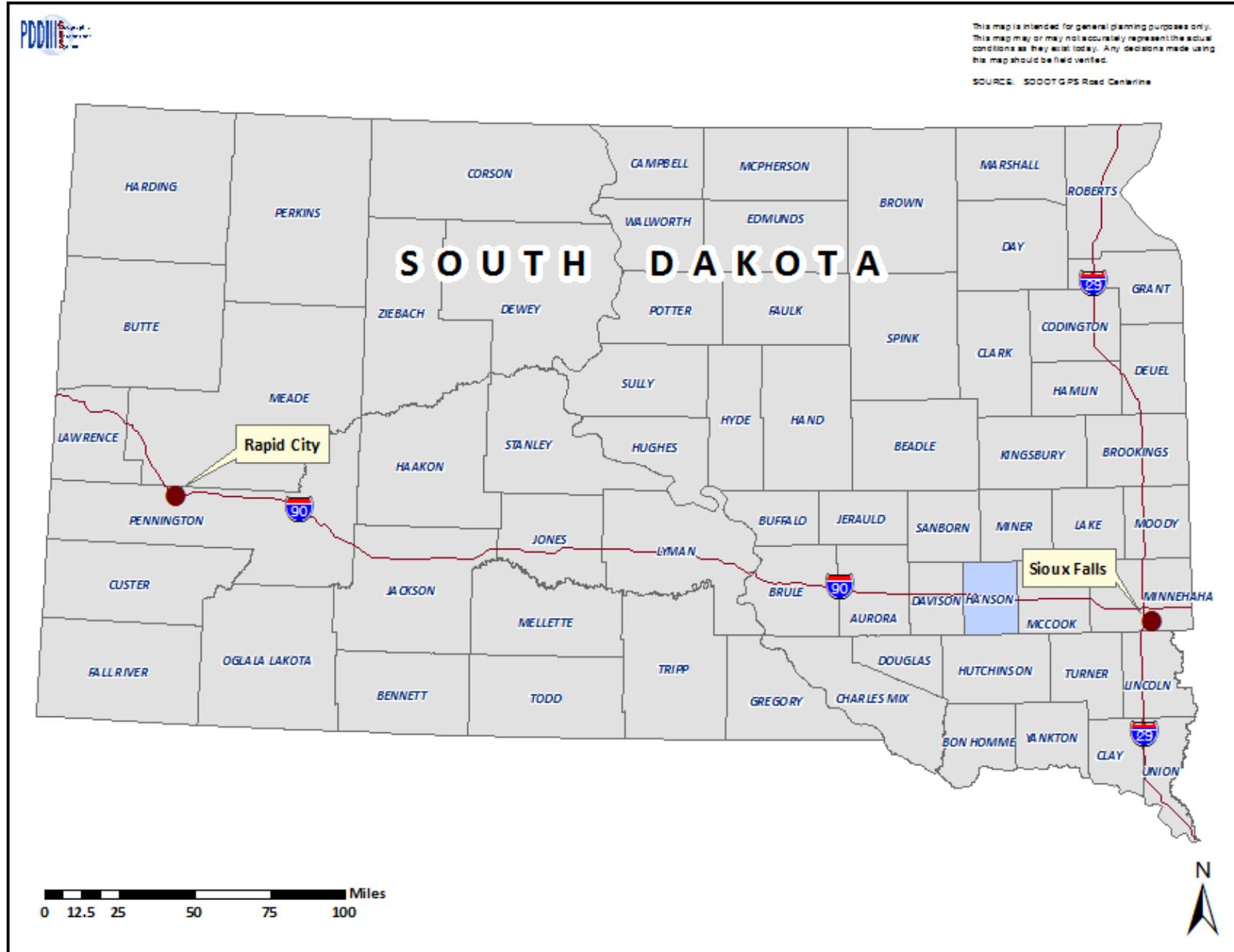
This is a multi-jurisdictional plan. All of the municipalities located within Hanson County were invited to participate in the plan's development, as they had when the current plan (that is, the plan now being updated) was being developed. Following is the list of jurisdictions that participated in the plan's development by having a representative attend the planning meetings and by providing input into the plan:

- Hanson County
- City of Alexandria
- City of Emery
- Town of Fulton

Production of the plan was the ultimate responsibility of the Hanson County Emergency Management Director, who served as the county's point of contact for all activities associated with this plan. Input was received from a disaster mitigation planning team that was put together by the Emergency Management Director and whose members are listed in **Table 1.1** on page 4.

The plan itself was written by an outside contractor, Planning & Development District III of Yankton, South Dakota, one of the state's six regional planning entities. The office has an extensive amount of experience in producing various kinds of planning documents, including municipal ordinances, land use plans, and zoning ordinances, and it is an acknowledged leader in geographic information systems (GIS) technology in South Dakota. Furthermore, its staff has written disaster mitigation plans for all sixteen of the counties in the District's planning area, including Hanson County's current plan.

Figure 1.1 – County Location



The following staff members of Planning & Development District III were involved in the production of the plan. John Clem, a Community Development Specialist, was the project manager and author of the plan. Assisting Mr. Clem was Harry Redman, a Geographic Information Systems Professional, who produced maps for the plan, directed the floodplain risk analysis (see **Chapter III**), and completed the county land cover analysis (see **Chapter II**).

## **Development of Planning Team**

The initial planning stages for this plan update began in 2018 when an application was submitted to FEMA for Hazard Mitigation Grant Program (HMGP) funds to help pay for the update. The HMGP funds were awarded to the County in September 2020. Following this, John Clem and the Hanson County Emergency Management Director began to develop the methodology and strategy to be used to update the plan.

The first step was to organize the disaster mitigation planning team, the group of individuals representing the participating jurisdictions and other stakeholders at the planning team meetings. These individuals provided information and various documents that were used to produce the plan, reviewed drafts of the plan as it was being assembled, and reviewed and approved the final version of the plan. Personnel at the county and municipal level with the authority to regulate development were a priority for inclusion on the team. Invited to participate on the planning team were representatives from the following groups:

- Hanson County (county commissioners, auditor, planning/zoning officials, floodplain administrator, GIS staff, director of equalization, highway superintendent, etc.)
- Municipalities (city council members, finance officer, public works staff, etc.)
- Utility providers, including the Central Electric Cooperative, the Southeastern Electric Cooperative, and the Hanson Rural Water System
- Fire districts
- James River Water Development District

Each individual on the planning team had at least one of the following attributes to contribute to the planning process:

- Significant understanding of how hazards affect the county and participating jurisdictions.
- Substantial knowledge of the county's infrastructure system.
- Resources at their disposal to assist in the planning effort, such as maps or data on past hazard events.
- The authority to help implement the mitigation strategy that was developed.

**Table 1.1** lists the planning team members, including their attendance at the planning meetings that were held as the plan was being developed. Additional meetings took place

in the participating jurisdictions; those meetings are not reflected in the table, but documentation is provided in Appendix B.

**Table 1.1 – Participation in Plan Development**

Name	Representing	Position	Meeting Attendance	
			Mtg 1 07/21/21	Mtg 2 09/07/21
John Clem	Planning District III	Plan author	X	X
Don Huber	Hanson County	Emergency Mgmt Director	X	X
Richard Waldera	Hanson County	Commissioner	X	
Lesla Trabing	Hanson County	Auditor		X
Brandon Wingert	Hanson County	Sheriff	X	X
Nick Mentele	Hanson County	Highway superintendent	X	
Justin Friese	Hanson County	Highway department	X	
Kyle Kampshoff	City of Alexandria	Utility manager	X	X
Clarissa Weber	City of Emery	City council	X	
Kristi Wollmann	City of Emery	Finance officer	X	X
Brian Leitheiser	City of Emery	Fire chief	X	
Kay Miller	Town of Fulton	Mayor	X	X
Dennis Waldner	Rosedale Colony	Fire department	X	
George Waldner	Rosedale Colony	Fire department	X	
Mark Waldner	Rosedale Colony	Fire department	X	
Owen Reitzel	Alexandria Herald		X	

## Outreach Effort

Throughout the plan's development, efforts were made to obtain involvement in the plan beyond just the planning team. Emails were distributed, and a press release was printed in the local newspaper prior to the first planning meeting<sup>1</sup>. Outreach also was made to emergency management directors in nearby counties, as well as the South Dakota Office of Emergency Management. At the end of the process, a press release was printed in the local newspaper and posted on the Hanson County website announcing that the plan was complete and available for public review and comment. See **Appendix A** for documentation of the public outreach effort.

## Planning Meetings

Several meetings were held to develop the plan, as described in further detail below. The primary purpose of the first meeting was to inform the planning team members about the mitigation planning process and to begin development of the risk assessment. After this initial meeting, additional meetings were held in each participating jurisdiction to develop

<sup>1</sup> The press release resulted in a response from a Hanson County resident (see p.63).

the mitigation strategy, including the specific mitigation actions to be included in the plan. A final meeting reconvened the planning team members at the end of the process to review a first draft of the completed plan, refine the mitigation strategy, and to discuss how the plan will be implemented.

The planning process associated with the plan's development was relaxed and informal, and free-flowing discussion was always encouraged. No subcommittees were formed, no votes were taken or motions made, and decisions were made by mutual consensus of the planning team members. Everyone's opinion was respected, and nobody was discouraged from voicing his/her opinion. Leadership and guidance at the meetings was provided by Planning & Development District III staff and the Hanson County Emergency Management Director.

#### *Planning Team Meeting 1 – Introduction and Risk Assessment*

The first meeting of the planning team introduced the participants to the mitigation planning process. Discussion occurred about how the plan would be developed in the coming months, and about the basic goals to be achieved with the mitigation plan.

Following this, the county's current disaster mitigation plan was reviewed, particularly the risk assessment section. Discussion occurred about how various hazards impact the county, especially the most important community assets and critical facilities in the jurisdictions. The assets are shown on the hazard vulnerability maps included at the end of **Chapter III** and are listed in **Appendix D**. Discussion also occurred regarding the existing resources and capabilities to mitigate against the hazards, and whether other risks not analyzed in the current plan should be addressed.

A review of the progress toward implementing the proposed mitigation actions included in the current plan also was made. A list summarizing progress on the actions is included in **Chapter IV**.

Discussion also occurred about how to get broader public input into the planning process, and whether any other potential stakeholders not already present should be invited to participate in the planning process.

#### *Jurisdictional Meetings – Develop Mitigation Strategy*

After the initial planning team meeting, the risk assessment was completed by the Planning & Development District III office using various methods, as discussed in **Chapter III**. The next step in the process was development of the mitigation strategy. To assist the communities in developing the strategy, the results of the risk assessment, including a summary of the textual information presented in **Chapter III**, maps showing hazard-prone areas in each jurisdiction, and tables showing the value of property at risk, were distributed to the planning team members. A list of potential mitigation actions based on FEMA's guidance document *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards* also was distributed.

Each jurisdiction was responsible for selecting the mitigation actions it wanted to include in the plan. The selection of the actions took place during city council meetings, which ensured that a broad representation of people would be present, and that the process was open to public involvement. The jurisdictions were encouraged to consider a wide range of actions, whether or not they seemed likely to be achievable in the foreseeable future. Details about the actions, such as estimated cost, the party responsible for implementation, and priority level, were discussed. The final list of actions proposed by the participating jurisdictions is presented in **Chapter IV** (see **Table 4.2**).

#### *Planning Team Meeting 2 – Plan Review and Plan Implementation*

Following the jurisdictional meetings, the Planning & Development District III office completed a first draft of the plan. After this, the planning team was brought together again to review the draft and to discuss how the plan would be implemented. Discussion also occurred about how the plan will be incorporated into the existing planning mechanisms at the county and local levels. Maintenance of the plan was another topic of discussion, specifically how the plan will be monitored, evaluated, and updated in the coming years.

After the meeting, some additional information was added to the plan based on discussion at the meeting, and the plan was made available for public review. After a short comment period, the plan was submitted to the South Dakota Office of Emergency Management.

## **Acknowledgements**

The Planning & Development District III office would like to thank the members of the Hanson County Disaster Mitigation Planning team for participating in the planning meetings that were held, and for supplying information that was used to develop the plan. We would particularly like to thank County Emergency Management Director Don Huber for arranging the planning team meetings and for coordinating with the participating jurisdictions.

Thanks also are extended to Heather Allemang, Jim Poppen, Kyle Kafka, and Marc Macy at the South Dakota Office of Emergency Management for information and guidance in developing the plan.

# CHAPTER II

## COMMUNITY PROFILE

### Background

This chapter serves as a basic introduction of the county. Topics addressed in this chapter cover the county's physical conditions, its population and socio-economic characteristics, utilities and infrastructure, and services. Following chapters are devoted to assessing risks in the county, presenting the county's mitigation strategy, and discussing how the plan will be implemented.

### General Description

Hanson County is located in southeast South Dakota, as shown in **Figure 1.1**. The county covers about 435 square miles in area, and its population according to the 2010 Census was 3,331. Four incorporated municipalities are located within the county - Alexandria (pop 615), Emery (pop 447), Farmer (pop 10), and Fulton (pop 98). The county seat is located in Alexandria. Other populated places within the county include the Millbrook, Oaklane, Rockport, and Rosedale Hutterite Colonies, each of which has approximately 100 to 150 residents<sup>2</sup>. **Figure 2.1** shows the county's communities and highway network.

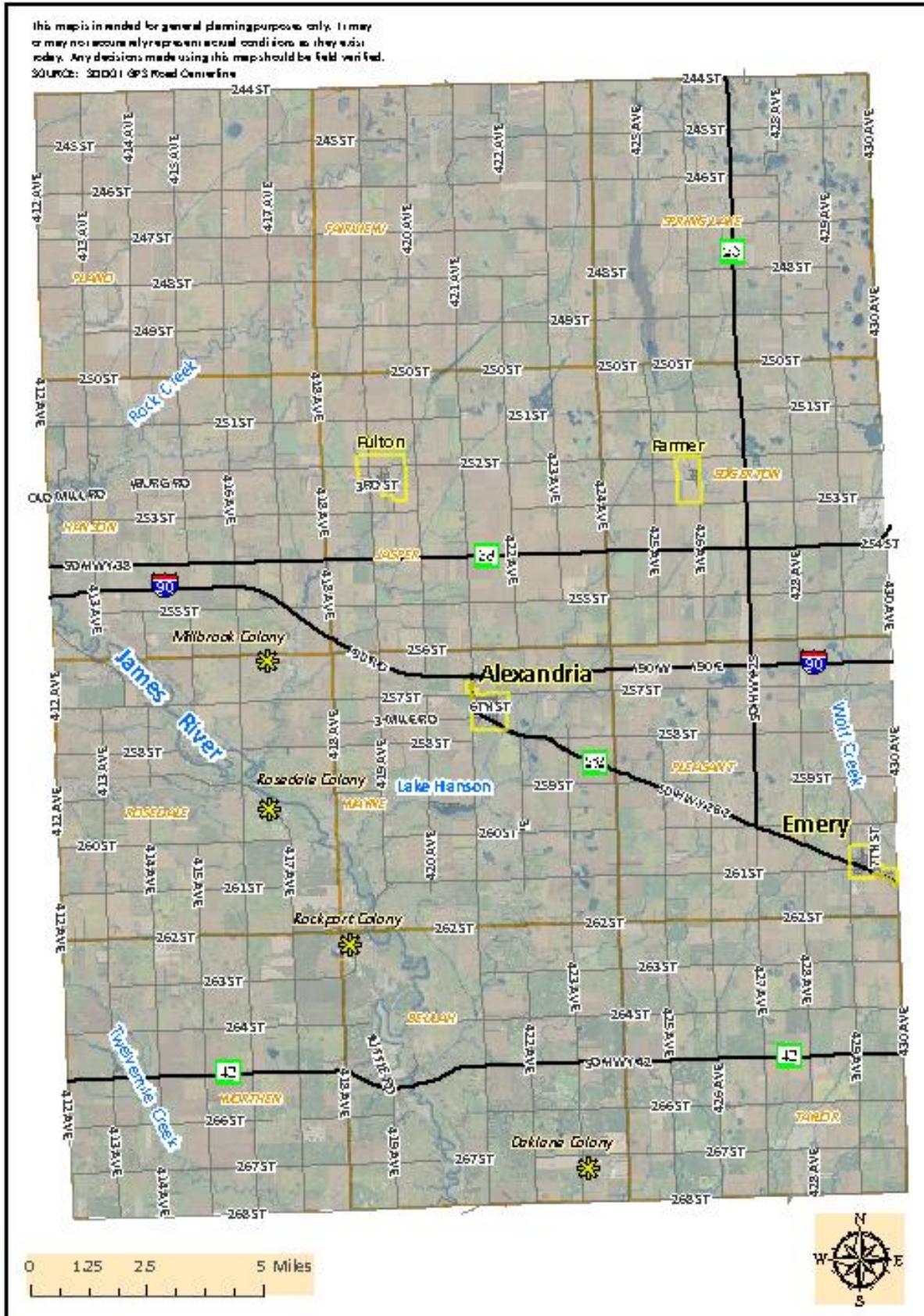
### Physical Characteristics

Hanson County is lightly settled, with most of the land devoted to agricultural production. The landscape is mostly open, and the terrain is generally level throughout. Much of the land in the county is devoted to agricultural production, primarily row crops such as corn, soybeans, and wheat, and there is also a considerable amount of pastureland. Livestock production, especially cattle and hogs, is a very important part of the ag economy. The most prominent body of water in Hanson County is the James River, which flows in a southeasterly direction through the county. Other prominent bodies of water in the county include Lake Hanson and Long Lake.

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<sup>2</sup> Hutterite Colonies are rural, agriculturally-based communities occupied by descendants of German people who cling to many of their traditional ways. There are more than 400 Hutterite colonies located in the north-central United States and Canada.

Figure 2.1 – Political Map



**Table 2.1** provides a breakdown of the land cover in Hanson County, based off satellite imagery from the United States Geological Service's National Land Cover Database. The predominant types of land cover in the county are cultivated crops and pasture land, which together comprise over 80 percent of the county's area. Developed land makes up a tiny fraction of the land area. **Figure 2.2** is a graphic representation of the county's land cover.

**Table 2.1 - Vegetative Land Cover**

Cover Type	Sq Miles	% Total Area
Cultivated crops	257.6	59.2
Pasture land	102.9	23.6
Grassland and Shrub/Scrub	30.5	7.0
Wetlands	18.0	4.1
Developed land (open space)	17.2	4.0
Open water	3.7	0.9
Forested land	3.0	0.7
Developed land (low to high intensity)	1.9	0.4
Barren land	0.4	0.1
<b>Total Area</b>	<b>435.2</b>	<b>100.0</b>

Source: <http://www.mrlc.gov/index.php>

Most soil in the county is fertile and well-drained, and therefore conducive to agriculture, as long as there is sufficient soil moisture. Excessive slopes and rocky soils are rare. Drainage is generally good, but there are many wetlands in the county, some of which are now used as waterfowl or wildlife production areas, while others have been drained for farming.

As in most of South Dakota, the climate of Hanson County is characterized as sub-humid and continental, meaning summers are often very hot and winters very cold. There are no large bodies of water or mountain ranges to mitigate against these extremes. High temperatures in summer can exceed 100 degrees Fahrenheit<sup>3</sup>, while winter lows can drop below -20 degrees. Precipitation averages about 23 inches per year, much of it occurring in the spring and early summer; winter snow is not frequent, but snow cover on the ground is fairly constant during some winters. Following is climate data in the county as reported from the Alexandria weather station.

**Table 2.2 - Monthly Climate Conditions in Hanson County (1893 - 2013)**

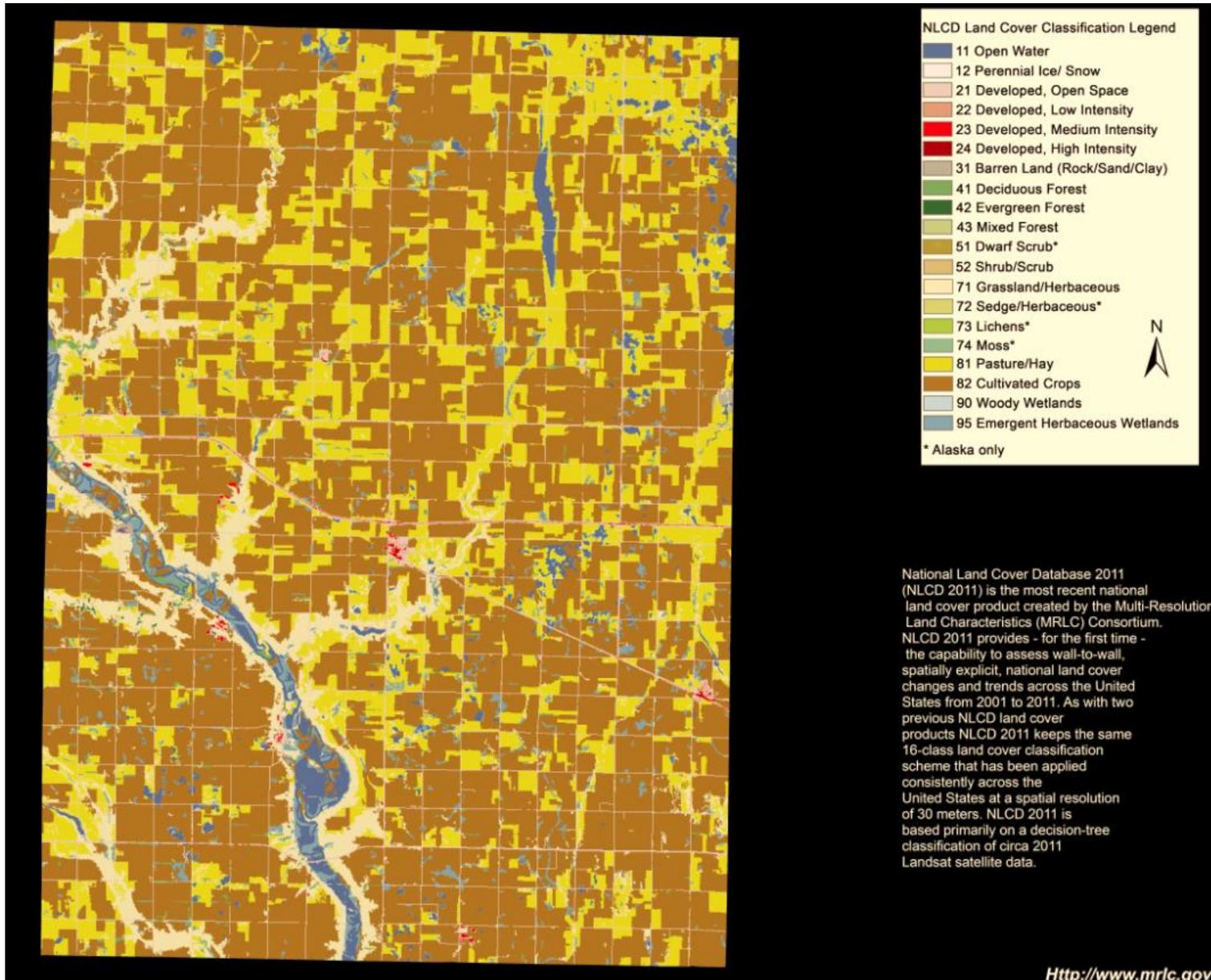
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Ave High</b>	27.2	32.1	44.7	61.5	72.8	82.0	88.3	86.4	77.3	64.7	45.9	31.7
<b>Ave Low</b>	6.1	10.5	22.4	35.3	46.7	56.7	62.0	59.9	50.0	37.8	23.7	11.6
<b>Ave Precipitation</b>	0.5	0.6	1.2	2.5	3.0	4.0	2.8	2.6	2.3	1.6	0.8	0.5
<b>Ave Snowfall</b>	5.4	5.9	6.3	2.5	0.0	0.0	0.0	0.0	0.0	0.6	3.2	5.4

Source: High Plains Regional Climate Center ([www.hprcc.unl.edu/data/historical/](http://www.hprcc.unl.edu/data/historical/))

The average high and low are in degrees Fahrenheit; the precipitation figures are in inches

<sup>3</sup> According to the National Weather Service, Sioux Falls, South Dakota has averaged about two days per year of 100 degree temperatures since records began to be kept in 1893.

Figure 2.2 - County Land Cover



The impact that climate change may have on the county is difficult to predict with any certainty. The South Dakota Hazard Mitigation Plan discusses climate change in some depth, analyzing its possible impacts for each of the hazards affecting the state. According to the plan, mean temperatures have been increasing in the northern Great Plains region where South Dakota is located, especially in the winter. This trend may lead to increased evaporation and drought frequency, which will compound water scarcity problems. Across South Dakota, there is a long-term trend of increasing annual precipitation, among the highest in the country. The majority of this increase is occurring in the spring and fall seasons, and there is high confidence that precipitation extremes will increase in frequency and intensity that could exacerbate flooding.

Communities that are already the most vulnerable to weather and climate extremes will be stressed even further by more frequent extreme events occurring within an already highly variable climate system. According to the plan, increased demand for water and energy will constrain development, stress natural resources, and increase competition for water. New agricultural practices will be needed to cope with changing conditions. Still, there is no consensus as of yet on climate change science, and therefore it is difficult to make any definitive plans for climate change at this time.

## **Socioeconomic Description**

Hanson County is sparsely populated. The county had a Census 2010 population of 3,331, and its population density is only 7.7 people per square mile. In comparison, the State of South Dakota, which is one of the least densely populated states in the nation, has a population density of 10.5 per square mile, and the national figure is 89.5.

Like many other rural counties in the state, Hanson County suffered a significant population decrease during the last half of the twentieth century, as **Table 2.3** shows, but the population has rebounded since reaching a low in 1990. This is likely due to the county's proximity to the thriving cities of Mitchell, located less than 15 miles west of Alexandria, and to Sioux Falls, 50 miles to the east. Both cities are within commuting range of people living in Hanson County. The population is expected to continue increasing in the future.

**Table 2.3 - Hanson County Population Change**

Pop 1950	Pop 1960	Pop 1970	Pop 1980	Pop 1990	Pop 2000	Pop 2010	Pop 2019 Estimate	Pop 2030 Projected
4,896	4,584	3,781	3,415	2,994	3,139	3,331	3,453	4,635

Sources: U.S. Census ([factfinder.census.gov/faces/nav/jsf/pages/index.xhtml](http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml)); University of South Dakota Governmental Research Bureau

**Table 2.4** provides basic demographic information for the county. The table shows that a very high percentage of the county's population is composed of whites, as compared to South Dakota and the rest of the nation. The median age of the county's population is lower than the South Dakota figure, an indication that many of the young people are able to

stay in the county for jobs, or work in nearby Mitchell or Sioux Falls, rather than going elsewhere for opportunities.

**Table 2.4 - Racial and Age Characteristics (2010)**

Entity	White Population	Black Population	American Indian Population	Asian Population	Other Racial Group	Population Under 20	Population 65 and Over	Median Age
Hanson Co	95.1%	2.3%	1.8%	0.2%	0.6%	34.2%	14.0%	35.6
South Dakota	85.3%	1.5%	8.8%	1.1%	3.3%	27.6%	14.6%	36.8
United States	73.9%	12.6%	0.8%	5.0%	7.7%	26.3%	13.7%	37.4

Source: U.S. Census ([factfinder.census.gov/faces/nav/jsf/pages/index.xhtml](http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml))

Hanson County’s primary economic base is agriculture. Much of the non-ag employment for people who work in the county is in education, health care, or local government. Tourism is not significant, except during the fall hunting season when many people from outside the state come to hunt pheasants and other game. During the summer, many tourists heading west to the Black Hills and other places of interest pass through the county on Interstate Highway 90. Unlike many other small counties in South Dakota, personal income in Hanson County is comparable to state and national figures.

**Table 2.5 – Socioeconomic Characteristics (2010)**

Entity	Median Family Income	Family Poverty Rate	High School Grad or Higher	Bachelor's Degree or Higher
Hanson Co.	\$61,573	13.3%	88.0%	22.2%
South Dakota	\$62,967	8.7%	90.1%	26.0%
United States	\$64,585	10.9%	85.7%	28.5%

Source: U.S. Census ([factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml](http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml))

## **Infrastructure and Utilities**

### *Transportation*

The primary transportation route in Hanson County is Interstate Highway 90, which runs east-west through the county. Other important routes are SD Highways 38, 42, and 262, which also run east-west, and SD Hwy 25, which runs north to south. A railroad line operated by the Burlington Northern Santa Fe Railroad runs east-west through the county roughly parallel to Highway 262.

### *Utilities*

Water service throughout most of Hanson County is provided by the Hanson Rural Water System, which also provides bulk water to Alexandria and Emery. Alexandria and Emery have their own wastewater collection system, while rural households, including people in Farmer and Fulton, must rely on individual septic tanks and drainfields.

Household waste generated within Hanson County is sent to the Mitchell Regional Landfill, located approximately two miles southeast of Mitchell in neighboring Davison County. Designated rubble sites are located outside Alexandria and Emery.

Electric power is provided to most rural county residents by the Central Electric Cooperative. Xcel Energy serves residents of Alexandria, Emery, and Fulton. The Southeastern Electric Cooperative serves a small area in the northeast part of Hanson County, including the Town of Farmer. Northwestern Energy provides natural gas to Alexandria and some of the Hutterite colonies.

## **Services**

### *Medical Services*

There are no medical facilities in Hanson County. Most county residents needing medical care go to Mitchell or Sioux Falls for service.

### *Fire and Emergency Response*

State-accredited fire departments are based in Alexandria, Emery, and at the Rosedale Hutterite Colony. The departments have basic firefighting and rescue equipment, and they respond to structural fires, wildland fires, and to accident situations. The Alexandria and Emery departments also have some capabilities regarding hazardous material (hazmat) response, but a serious incident would require outside assistance. See **Table 3.5** for more information about the departments.

### *Education*

Public school education is available in Alexandria and Emery, and a small, private school consortium operates just south of Fulton. Education up through the high school level is available for children living at the Hutterite colonies.

# CHAPTER III

## RISK ASSESSMENT

### Background

The risk assessment provides the foundation for the rest of the mitigation planning process. It sets the stage for identifying mitigation goals and actions to help Hanson County become disaster resilient and keep county residents safe, and it answers the following questions: What are the hazards that could affect Hanson County? What could happen as a result of those hazards? How likely are the possible outcomes? When the outcomes occur, what are the likely consequences and losses?

As outlined in the South Dakota Hazard Mitigation Plan, the Federal Emergency Management Agency defines risk assessment terminology as follows:

- **Hazard**—A hazard is an act or phenomenon that has the potential to produce harm or other undesirable consequences to a person or thing.
- **Vulnerability**—Vulnerability is susceptibility to physical injury, harm, damage, or economic loss. It depends on an asset’s construction, contents, and economic value of its functions.
- **Exposure**—Exposure describes the people, property, systems, or functions that could be lost to a hazard. Generally, exposure includes what lies in the area the hazard could affect.
- **Risk**—Risk depends on hazards, vulnerability, and exposure. It is the estimated impact that a hazard would have on people, services, facilities, and structures in a community. It refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage.
- **Risk Assessment**—Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from hazards.

According to FEMA's mitigation planning guidance, the basic components of the risk assessment are: 1) identifying hazards that affect the community, 2) profiling the hazards, 3) conducting an inventory of community assets, and 4) estimating losses. This process measures the potential loss of life, personal injury, economic injury, and property damage resulting from natural hazards by assessing the vulnerability of people, buildings and other property, and infrastructure to natural hazards.

After reviewing the risk assessment section of the current plan, the planning team decided that no major changes were needed to the risk assessment. However, many of the tables have been updated with more current information, including **Table C.2** in **Appendix C**, which lists significant hazard events in the county. Also, it was felt that the flood risk

analysis needed to be updated, because the information in the current plan was becoming dated and because of the major flooding impacts that occurred in the county in 2019. This analysis was done under the direction of Harry Redman, GIS specialist with Planning & Development District III.

## **Identifying Hazards**

The planning team began the risk assessment by reviewing the South Dakota Hazard Mitigation Plan, focusing on the hazards identified in that plan. The team also reviewed the risk assessment section of the county's current mitigation plan, and it was decided that all of the hazards discussed in that plan should be kept for this update, with no other hazards added or deleted.

Following this, the planning participants reviewed historical records of hazard events that have occurred in the county, relying on the National Climatic Data Center's Storm Events Database. See **Table C.2** in **Appendix C** for a list of the storm events.

After reviewing these sources, the planning team settled on the hazards they wanted to address in this plan, those that they considered to pose a significant threat to the county. Following are the hazards addressed in this plan as selected by the team:

- **Winter storms (includes blizzards, heavy snow, icing, and high wind events)**
- **Summer storms (includes thunderstorms, tornados, hail, and high wind events)**
- **Flooding**
- **Drought**
- **Wildfire**

The planning team acknowledges that additional hazards could have been addressed in this plan. High wind events, for instance, are not considered separate from winter storms and summer storms. Following is a list of other hazards the team considered but chose not to include in this plan, with a justification for their omission:

- **Geologic Hazards** – these hazards, which include earthquakes and landslides, are given a limited level of planning analysis in the South Dakota Hazard Mitigation Plan, but the state is not particularly vulnerable to such events. For example, the plan states that earthquakes have never caused significant damage in South Dakota. A map generated through the U.S. Geological Service Earthquake Hazards Program website indicates that there is only about a one or two percent chance that a quake of at least magnitude 5 will occur in Hanson County in any 100 year period, and almost no chance of a magnitude 6 or greater earthquake <sup>4</sup>. No significant earthquake has ever been recorded in Hanson County. Regarding

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<sup>4</sup> A magnitude 5 earthquake is considered moderate, potentially causing varying amounts of damage to poorly constructed buildings, but significant damage would be unlikely to occur. A magnitude 6 quake is strong, with the potential to cause damage to well-built structures.

landslides, a review of the United States Geological Survey's Landslide Incidence and Susceptibility Map shows virtually no chance of a landslide occurring in Hanson County.

- Agricultural pests and diseases - this hazard is given a moderate level of planning analysis in the South Dakota Hazard Mitigation Plan. However, the planning team considered the subject matter to be outside the intended focus of this plan.
- Hazardous materials – the planning team considered the subject matter to be outside the scope of this plan. This plan can serve as a complement to Hanson County's existing hazardous materials plan.

## **Hazard Profiles**

In this section, each of the hazards the planning team chose to focus on is described in terms of the hazard's **location** within Hanson County, its **extent**, the **history** of the hazard's occurrence in the county, the **probability** of future events, and the local **resources and capabilities** available to mitigate against the hazard. In addition, a background description of each hazard is presented at the beginning of each hazard's profile.

- **Location** is the geographic areas within the county that are affected by each of the hazards. Some of the hazards - winter storms, summer storms, and drought - do not have a geographic definition at this level of analysis, since they occur in all areas of the county more or less with equal frequency. Flooding and wildfires, however, do impact specific areas of the county more than others. The maps presented at the end of this chapter show locations vulnerable to flooding.
- **Extent** is the strength or magnitude of the hazard, which is described in a variety of ways depending on the type of hazard. For example, tornado strength is measured on the Fujita Scale, high wind events are measured by speed, fire is measured in terms of acres affected, and certain hazards are measured in terms of the duration of the event.
- A brief section on the **history** of each hazard's occurrence in the county is presented, with a description of some of the most significant events. More information about the hazard events that have impacted the county is presented in **Appendix C**, including a comprehensive list of weather-related hazard events that have occurred in the county since 1960, and records of hazard events that resulted in a major disaster declaration in the county.
- **Probability** of occurrence of a hazard impacting an area is the likelihood that such an event will occur. In this plan, a hazard with a "high" probability is one that is expected to occur at least five times over a ten year period, a "moderate" probability hazard is expected to occur from two to five times in any given ten year period, and a "low" probability hazard would be expected to occur no more than twice per ten year period. Determination as to the probability of hazard events occurring in the future was based largely on an analysis of the frequency

of past hazard events in Hanson County and through discussions with members of the planning team.

- Information about the existing **resources and capabilities** to mitigate against each hazard is included. This includes plans and regulatory mechanisms, administrative and technical resources, financial resources, and education and outreach.

## **Winter Storm**

### *Description*

Winter storms historically occur from late fall to the middle of spring, varying in intensity from mild to severe. There is a long warning time associated with most winter storms, giving people time to prepare, but they still have a major impact in South Dakota, regularly destroying property and killing livestock. Such storms are generally classified into four categories - freezing rain, sleet, snow, and blizzard - with some taking the characteristics of different categories during distinct phases of the storm.

Freezing rain coats objects with ice, creating dangerous conditions. Sleet does not generally cling to objects like freezing rain, but it does make the ground very slippery, increasing the number of traffic accidents and personal injuries due to falls. Heavy snow can make travel difficult, and can collapse roofs.

Blizzards occur when snow is combined with high wind, producing blowing snow that results in low visibility. When such conditions arise, blizzard warnings are issued. These warnings take effect when wind conditions are at least 35 mph and temperatures of 20 degrees Fahrenheit or less over an extended period of time are expected. Severe blizzard conditions exist when heavy snow is accompanied by winds of at least 45 mph and temperatures of 10 degrees Fahrenheit or lower. Early blizzards in South Dakota were so devastating that the state once had the dubious distinction of being called the Blizzard State.

Winter storms can have a major impact on the power lines operated by rural electric providers, especially when they are accompanied by high winds or freezing rain. They can knock down power lines, which tend to be the most vulnerable elements of the electrical grid, and can even snap the poles.

### *Location*

The topography of South Dakota is such that no part of the state is immune from the effects of winter storms. Farmland and grassland, which covers most of the state (including Hanson County) offers little resistance to high winds and drifting snow, and there are no large bodies of water or mountain ranges to mitigate against temperature extremes. All areas of the county are equally likely to be impacted.

### *Extent*

Winter storms in South Dakota can pack quite a punch. The extent of such storms can be measured in many ways. In terms of snowfall, many winter storms in Hanson County have

dropped several inches or more of snow. In terms of duration, some winter storms in the county have resulted in power outages of over a week in some locations, although typical outages last for no more than a few hours. Regarding wind speed, **Table C.2 in Appendix C** shows numerous records of high wind events occurring during the winter months with wind speeds in excess of 50 miles an hour.

### *History*

**Table C.2 in Appendix C** lists many significant winter storms that have impacted the county. As **Table C.1 in Appendix C** shows, there have been several major disaster declarations involving a winter storm that have affected Hanson County.

One of the most serious winter storms to occur in the state happened between October 22 and 24, 1995, resulting in FEMA Disaster Declaration 1075, which was declared in January 1996. As the storm moved eastward across South Dakota, ice and five to 15 inches of wet snow formed on electric lines, poles, and trees. Winds associated with the storm caused lines to slap together and poles to snap, producing widespread power outages to large portions of rural South Dakota, including Hanson County. The damage included broken poles, broken wires, and substation failures due to transmission line damage. The storm also forced major transportation delays because of snow accumulation on roadways and poor visibility. The combination of power outages and travel difficulty resulted in numerous cancellations and delays in school openings. Total statewide damage from the event was estimated at over \$13 million, and approximately 30,290 households were affected by power outages. Crews from electric cooperatives in neighboring states assisted local cooperatives with line repairs.

The 1997 storm resulted in FEMA Disaster Declaration 1156. Statewide in the affected counties the event caused over \$19,000,000 in reported damage.

The 2001 storm resulted in FEMA Disaster Declaration 1375. Statewide in the affected counties the event caused over \$10,000,000 in reported damage. In Hanson County, public assistance costs were over \$41,000.

The 2005 storm resulted in FEMA Disaster Declaration 1620. This ice storm damaged 9,400 power poles and left 56,000 people without electricity throughout the affected area. The storm resulted in over \$15,000 in public assistance costs to Hanson County, and over \$1.9 million dollars of public assistance to the Central Electric Cooperative for its infrastructure located within Hanson County. Many roads were shut down for extended periods, and most schools and businesses were forced to close. Some households were without power for up to a week as power lines were being repaired.

A late-season winter storm struck South Dakota in March 2019, resulting in FEMA Disaster Declaration 4440. The storm resulted in approximately \$160,000 of public assistance funds allocated in Hanson County.

### Probability

**Table C.2** shows over 100 records of significant winter storm events in Hanson County since the mid-1990s, an average of over four per year. Therefore, based on the historic evidence, the probability of a significant winter storm affecting Hanson County in a given year is high. The probability of a winter storm causing substantial damage (e.g. power lines blown down) in any given year is at least moderate.

### Resources and Capabilities

Following is a description of the local resources and capabilities available for dealing with winter storm events.

- The following facilities can be used to provide shelter to people following a disaster event or other emergency situation.

**Table 3.1 – Relief Shelter Facilities**

Community	Facility	Capacity	Generator	Kitchen/Feeding Capacity	Med Supplies
Alexandria	County courthouse	100	30 kW	100	Basic
Alexandria	Fire hall	100	10 kW	100	None
Alexandria	St Mary’s Church	250	10 kW	300	Basic
Alexandria	Hanson Co. School	300	None	300	Basic
Emery	City hall	100	50 kW	100	Basic
Emery	School auditorium	< 200	None	< 100	None
Emery	Fire hall	< 50	10 kW	< 50	None
Fulton	Town hall	< 50	25, 55, 62kW	100	None

- The county and each of the towns has equipment for dealing with winter storms. A list of the equipment can be found in the Hanson County Local Emergency Operations Plan, which is updated regularly.
- All of the electric cooperatives serving the county maintain a list of priority projects in their work plans, and each cooperative is a party to the South Dakota Electric Cooperatives Mutual Aid Plan, which commits participating cooperatives to come to the aid of other cooperatives in times of emergency.
- The Hanson County Local Emergency Planning Committee (LEPC) plans for winter operations annually, which helps ensure a safe and efficient response for people in need of emergency assistance.

### Summer storm

#### Description

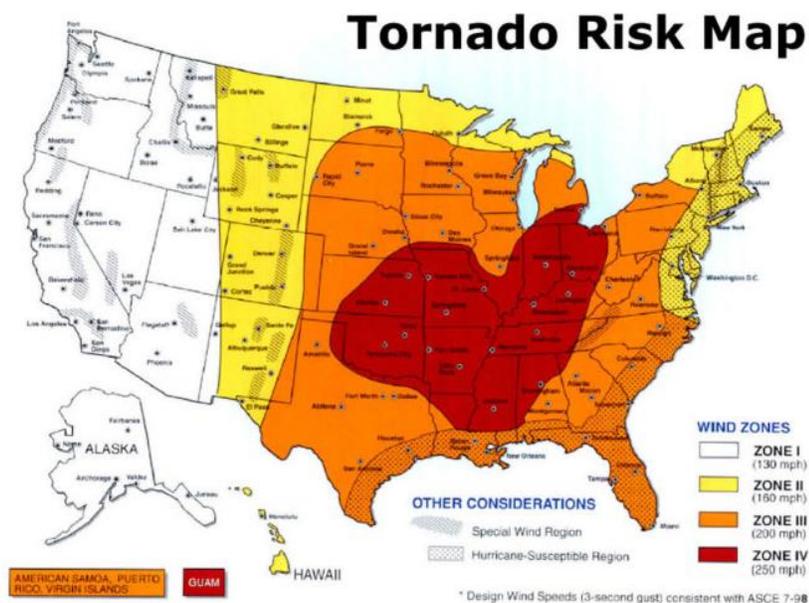
Summer storms can include heavy rainfall, hail, tornadoes, and thunderstorm activity. These events usually are associated with unstable weather conditions. In Hanson County, most damage from summer storms occurs because of high wind events and/or hail. Hail is always closely connected with thunderstorms. Hailstones can be pea-sized, up to the size of baseballs. Large hailstones are dangerous to people and animals, but most hail damage is

typically suffered by crops or structures. Almost every year someone in Hanson County reports some kind of hail damage to crops or buildings.

Tornadoes are the most dramatic type of summer storm experienced in Hanson County, and are a special source of concern. They are one of nature's most violent storms, capable of tremendous destruction with wind speeds of 250 mph or more. Damage paths can be a mile wide and can extend for more than 50 miles. Tornadoes mostly occur in South Dakota during the months of May, June, and July. The greatest period of tornado activity is between 4 PM and 6 PM. Tornadoes present a difficult mitigation challenge, since few structures can withstand the violent winds of a twister.

South Dakota is located near the northwest edge of the core area of tornado activity in the United States, as shown in this image. Often referred to as “tornado alley”, this part of the

country is particularly susceptible to tornadoes in part because the terrain is relatively flat, which allows warm, humid air from the Gulf of Mexico and cool, dry air from Canada to crash into each other, creating large super cells. According to the National Oceanic and Atmospheric Administration’s Storm Prediction Center,



South Dakota ranked eighth in the nation in the frequency of tornadoes from 1950 to 1994, with a total of 1,139 tornadoes reported in the state (an average of 25.3 per year). During this period, there were 11 deaths in the state attributed to tornadoes, and 243 injuries. South Dakota ranked 27<sup>th</sup> in the nation in tornado damage, with average annual losses of \$3.8 million.

### *Location*

Summer storms are equally likely to occur in all parts of the county.

### *Extent*

The extent of summer storms can be measured in many ways. In terms of wind speed, **Table C.2 in Appendix C** shows several records of thunderstorms that produced wind speeds over 60 knots (about 69 miles per hour), as well as several other summer high wind events with wind speeds over 50 knots. **Table C.2** also shows many events with hail at least one inch diameter, including three events of two-inch or greater hail. In terms of onset,

summer storms typically develop with a long warning time, although certain hazards associated with such storms, such as hail or tornadoes, can develop more suddenly.

Regarding tornadoes, **Table C.2** shows four records of a tornado with a magnitude greater than F1. The following table lists the entire range of tornado strength according to the enhanced Fujita scale.

**Table 3.2 – Enhanced Fujita Scale**

Scale	Wind Speed (MPH)	Potential Damage
EFO	65 to 85	Minor damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF1	86 to 110	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111 to 135	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136 to 165	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings; trains overturned; trees debarked; heavy cars lifted off ground and thrown; structures with weak foundations badly damaged.
EF4	166 to 200	Devastating damage. Well-constructed and whole-frame houses completely leveled; some frame homes may be swept away; cars and other large objects thrown and small missiles generated.
EF5	Over 200	Incredible damage. Well-built frame houses destroyed with foundations swept clean of debris; steel-reinforced concrete structures critically damaged; tall buildings collapse or have severe structural deformations; cars, trucks, and trains can be thrown approximately 1 mile.

[https://en.wikipedia.org/wiki/Enhanced\\_Fujita\\_scale](https://en.wikipedia.org/wiki/Enhanced_Fujita_scale)

### *History*

As **Table C.1** in **Appendix C** shows, there have been several major disaster declarations involving a summer storm that have affected Hanson County. **Table C.2** in **Appendix C** lists many other significant summer storms that have impacted the county.

### *Probability*

**Table C.2** shows that numerous significant summer storm events have occurred in Hanson County, well over one per year on average. Therefore, based on the historical evidence, the probability of a summer storm occurring somewhere in the county in a given year is high. However, the probability of a storm causing significant damage (e.g. damaging hail or a tornado) in the county in a given year is low to moderate.

Regarding tornadoes, **Table C.2** shows only nine days in which a tornado was recorded in Hanson County since 1960, an average of about one every six or seven years. It is likely that

other tornadoes occurred in the county during this period and were unnoticed or unreported.

### *Resources and Capabilities*

Following is a description of the local resources and capabilities available for dealing with summer storms.

- Outdoor warning sirens are located in Alexandria, Emery, and Fulton, as well as Lake Hanson. Most of the sirens have battery backup, and each can be activated locally or by the Mitchell 911 Center.
- Weather spotters are in place throughout the county.
- The Hanson County Emergency Management office actively participates in severe weather public awareness campaigns in conjunction with the State Office of Emergency Management and the National Weather Service. The office communicates regularly with local officials regarding severe weather awareness and training opportunities.
- As described earlier, all of the electric cooperatives serving the county maintain a list of priority projects in their work plans, and each cooperative is a party to the South Dakota Electric Cooperatives Mutual Aid Plan.

## **Flooding**

### *Description*

Floods are among the most serious and costly disaster events. In South Dakota, there are two main climatologic causes of flooding: runoff from rainfall and runoff from melting snow. The water from rainfall or melting snow flows overland until it reaches a nearby river or lake. If the river or lake cannot hold all of the water that is entering it, some of the water will begin to overflow, causing flooding. The size of the flood is influenced by such factors as the intensity or length of the rainfall, melting rate of the snow, and the infiltration of the water into the ground.

Following is a description of the four types of flooding that have the potential of impacting Hanson County, based on information in the South Dakota Hazard Mitigation Plan:

- Flash flooding, which results from several inches or more of rain falling in a very short period of time. This high intensity rainfall is commonly caused by powerful thunderstorms that cover a small geographic area. The flood that occurs as a result of this runoff happens very rapidly, and is generally very destructive, although usually only a small area is affected.
- Long-rain flooding, which results after several days or even weeks of fairly low-intensity rainfall over a widespread area. This is the most common cause of major flooding. The ground becomes "water logged," and the water can no longer infiltrate into the ground. The flooding that results is often widespread, covering hundreds of square miles, and can last for several days or many weeks.
- Flooding resulting from melting snow in the spring. This type has characteristics of both flash floods and long-rain floods. The area covered is generally not as

large as that covered by the long-rain flood, but is typically larger than that covered by the flash flood. Generally, the flood lasts for several days, occurring when large amounts of snow melt rapidly due to warm temperatures. The flooding can be made worse if the ground remains frozen while the snow is melting, causing the melt water to run off to nearby rivers and lakes rather than infiltrating into the ground. Some of the largest floods in South Dakota have been the result of melting snow and ice.

- Dam failure, resulting from natural or man-made causes. Although there are no high or significant hazard dams in Hanson County, there is some local vulnerability to this type of flooding.

### *Location*

The main area impacted by flooding in Hanson County is along the James River, which, according to the South Dakota Hazard Mitigation Plan, is one of the most flood prone rivers in South Dakota. Draining 12,609 square miles of land in South Dakota, the James flows through the southwest portion of Hanson County. The river lacks good drainage features (the slope of the river is only .28 feet per mile), and the river's valley is up to three miles wide in places. Consequently, the James overruns its banks frequently during the spring snow melt, much of the drainage remaining in small swales and basins.

### *Extent*

The extent of flooding in Hanson County has rarely been truly significant. Minor, localized flooding typically occurs in the county after very heavy rain events, especially in the spring following snowy winters. Floodwater depth is usually not significant. In terms of duration, flooding can cause road closures lasting from less than a day to several weeks or longer.

However, major flooding can occur when the James River overflows its banks. Given the river's large drainage basin and the fact that it moves so slowly, excess water from snowmelt and spring rains simply has nowhere to go. During these major flood events, considerable damage occurs to farmland along the river, ruining crops that have already been planted or making planting impossible. James River flooding can also impact county roads, which often remain closed for long periods of time. During the worst years of flooding along the river, the river rises so high that some bridges over the river have to be closed.

Possibly the most serious flooding the county has experienced was in 2019, when the James River crested at 5.95 feet above flood stage in March, and 8.05 feet above flood stage in September, which was the 4<sup>th</sup> highest crest on record. Many county and township roads were inundated, as was SD Highway 42, and a great amount of agricultural land was flooded.

### *History*

As shown in **Table C.1** in **Appendix C**, several flood events have resulted in a major disaster declaration in Hanson County. **Table C.2** in **Appendix C** shows many other flooding events

that have impacted the county. Following is a summary of some of the more significant floods the county has experienced.

Serious flooding in 1984 resulted in FEMA Disaster Declaration 717, which caused almost \$4.5 million of damage in the affected counties.

Flooding in 1993 resulted in FEMA Disaster Declaration 999, which impacted 39 counties in South Dakota. The flood caused \$53,427,320 in damage throughout the state, and \$11,024,621 of damage to public infrastructure. At the time, the disaster was considered one of the top ten natural disasters ranked by FEMA relief costs. In Hanson County, the James River inundated thousands of acres of farmland.

Flooding in 1994 resulted in FEMA Disaster Declaration 1031, which caused over \$8 million of damage in the affected counties.

Flooding in 1995 resulted in FEMA Disaster Declaration 1052. All of South Dakota had above normal precipitation from January through May, with many weather stations in the central and eastern portions of the state experiencing their all-time wettest Spring. Damage was caused by ground saturation and flooding due to very high residual groundwater tables from 1994, heavy winter snow and spring rain, and rapid snowmelt. Flooding occurred along the James River from the end of March through April. Many roads were under water due to high groundwater saturation, causing interruption of emergency services. Damage also included power transmission and distribution facilities owned by rural electric cooperatives. In the area impacted by the flood, surveys identified over 3,000 homes with some type of damage, the majority caused by groundwater seepage of one to three inches into basements. In many areas the water table rose almost to the surface, saturating septic drain fields and preventing proper treatment of wastewater. The total damage estimate in the affected counties was over \$35 million, which included \$9.3 million in damage to public infrastructure.

Flooding in 1997 resulted in FEMA Disaster Declaration 1173, which was declared for all counties in South Dakota. At the time, the event was considered one of the top ten natural disasters ranked by FEMA relief costs. From November 1996 through February 1997, the weather across the eastern part of the state was cold and very wet, with record setting snowfall in many places. The persistent cold greatly limited snowmelt between storms, which caused snow to pile up from 10 to 24 inches deep. An early April blizzard added to the snow pack, and heavy rain later in the month combined to further saturate the ground. Prairie potholes turned into lakes, causing many people to be evacuated from their homes and farms, and preventing farmers from planting thousands of acres of land. The flood caused over \$87 million in damage statewide, and took the lives of two people. The James River Water Development District estimated that five years of flooding had destroyed or severely damaged approximately 75 percent of the forested areas in the James River valley.

The 2008 flood resulted in FEMA Disaster Declaration 1774. The event caused over \$70,000 of public assistance costs in Hanson County.

Flooding in 2010 in eastern South Dakota was the worst in a decade, resulting in FEMA Disaster Declaration 1915. The James River met or set records for highest ever flood stage at several locations along the river. Farmland and low-lying areas along the river basin were inundated, and some of the bridges over the river had to be closed until floodwaters subsided, including the South Dakota Highway 42 bridge.

Flooding in 2019 had a major impact in Hanson County, starting in March when heavy rainfall fell on frozen ground, leading to considerable overland flooding of farmland and inundation of numerous roads. This event resulted in FEMA Disaster Declaration 4440. Flooding continued during the summer, and became even more severe when heavy rain in September caused additional flooding, resulting in FEMA Disaster Declaration 4469. Farmland and roads throughout the county were flooded, and many residential properties were damaged, including one home that was declared a total loss. Some of the Hutterite colonies also suffered damage, especially the Rosedale Colony. Another casualty was the spillway at the Lake Hanson Dam, which was washed out, causing damage to roads below the dam. Overall, flooding in 2019 resulted in over \$700,000 of public assistance costs in Hanson County (see **Table C.1** in **Appendix C**).

*Probability*

Based on the historic evidence, the probability of minor flooding occurring somewhere in the county in a given year is moderate, but the probability of flooding resulting in significant damage is low. It is a certainty that flooding will continue to impact the county to some degree, no matter what mitigation actions are pursued.

*Resources and Capabilities*

Hanson County and Alexandria participate in the National Flood Insurance Program (NFIP), and each entity is in good standing with the program. The following table provides information on NFIP participation in the county.

**Table 3.3 – National Flood Insurance Program Information**

Jurisdiction	NFIP Participation Status	Program Date	Current Effective Map Date	Insurance Policies in Force	Amount of Coverage	Number of Claims	Total Claims Paid	Repetitive Loss Properties
Hanson Co.	Yes	07/01/98	09/02/09	9	\$1,948,500	8	\$156,881	3
Alexandria	Yes	01/19/10	09/02/09	1	\$28,000	2	\$10,047	
Emery	Yes	06/03/20	(NSFHA)					
Farmer	No							
Fulton	Yes	03/23/20	09/02/09					

Sources: [www.fema.gov/policy-claim-statistics-flood-insurance](http://www.fema.gov/policy-claim-statistics-flood-insurance); Marc Macy, SD NFIP Coordinator

Following is a description of other local resources and capabilities available for mitigating damage from flooding.

- In 2010, Hanson County adopted an official drainage ordinance that provides a framework for landowners in the county to help them plan and execute drainage

activities that could affect their land and neighboring land. The ordinance is enforced by a Drainage Administrator, working under the direction of the Hanson County Commission, acting as a drainage board.

- Hanson County is a member of the James River Water Development District. The Hanson County Commission works with the district regarding James River management issues. Actions in Hanson County that have been funded by the district include removal of downed trees in the James River and its tributaries, and restoration of the Lake Hanson Dam after the spillway washed out during the 2019 flood.
- The City of Alexandria recently completed a long-term project to upgrade the town's storm sewer system. A total of approximately \$600,000 was spent on the project.
- Inspection and maintenance of dams, culverts, and other drainage structures is performed regularly in the county.

## **Drought**

### *Description*

Drought is a deficiency in precipitation over an extended period of time, usually a season or more, resulting in a water shortage causing adverse impacts on vegetation, animals, and/or people. It is a normal, recurrent feature of climate that occurs in virtually all climate zones. Human factors, such as water demand and water management, can exacerbate the impact that drought has on a region.

Droughts can occur at any time of the year, but the consequences are worse during the summer growing season, especially after winters with below normal precipitation. A small departure in normal precipitation during the months of June through August can have a significantly negative impact on crop production. The demand for water for multiple uses also impacts water availability. Rural water systems that were originally designed to supply water for people are now also being used for cattle and to fight wildfires, taxing the limits of the systems.

Drought in South Dakota is often accompanied by periods of extreme heat. According to the National Weather Service, among natural hazards, only the cold of winter—not lightning, hurricanes, tornadoes, floods, or earthquakes—takes a greater toll on human life. Between 1936 and 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation, and in the heat wave of 1980, more than 1,250 people died. Elderly people, small children, people with certain medical conditions, and those on certain medications are particularly susceptible to heat stress.

### *Location*

All areas of the county are equally likely to be impacted by drought.

### *Extent*

Drought severity, the most commonly used term for measuring drought, is a combination of the magnitude and duration of the drought. In terms of magnitude, Hanson County has experienced four years of annual precipitation less than two thirds its average amount since 1960. Those years were 1967, 1974, 1976, and 1980. In terms of duration, it is not unusual for Hanson County to experience periods of below normal precipitation that last for several months. During the 1930s, drought conditions persisted for multiple years. In an area that is so highly dependent on agriculture, the impact of a major drought can be significant. Although most agricultural producers now have crop insurance and agricultural practices today are more advanced, the impacts of drought can still be serious.

### *History*

Hanson County has experienced many significant droughts. The drought of 1976 was one of the most severe in memory, resulting in South Dakota's only drought emergency declaration to date. Only 13.1 inches of rain was recorded for the year at the Alexandria weather station. Drought in 1980 and 1981 affected the entire state of South Dakota, and was rated as a 10 to 25 year event. Drought in 2012 was so devastating that the State of South Dakota activated a Drought Task Force.

The most significant drought in the area's history occurred in the 1930s, the so called dust bowl years. The drought came in three waves, 1934, 1936, and 1939-1940, but some parts of the Great Plains experienced drought conditions for as many as eight consecutive years. The soil, depleted of moisture, was lifted by the wind into great clouds of dust and sand which were so thick they concealed the sun for several days at a time. The "black blizzards" were caused by sustained drought conditions, compounded by years of land management practices that left topsoil susceptible to the forces of the wind.

### *Probability*

**Table C.2 in Appendix C** shows at least one drought record in Hanson County in five of the years since 1999. Based on this, the probability of a significant drought occurring in the county in any given year is moderate. The probability of a truly severe drought impacting the county, such as occurred in 2012, is low, expected to occur no more than twice per ten years.

At the statewide level, the developers of the South Dakota Hazard Mitigation Plan cite tree ring research spanning a period of about 400 years indicating that multi-year droughts as significant as the 1930s drought occur on average every 57 years in South Dakota. Based on historical records, notable droughts have occurred somewhere in the state on average about every 12 years.

### *Resources and Capabilities*

Resources at the local level in Hanson County to mitigate the impacts of drought are available. The Hanson Rural Water System has restrictions on the amount of water that it will distribute within its service area, and could take such action during extreme drought

conditions. Likewise, the communities served by the water system could enact regulations restricting non-essential water use, such as for watering lawns and washing cars<sup>5</sup>.

In the agricultural sector, most farmers in Hanson County have crop insurance, which helps lessen the financial impact of drought. Furthermore, modern agricultural practices are more advanced (such as no-till farming and the development of more drought-tolerant crops), so farmers can better withstand years of below average rainfall.

Resources available at the state or regional level include the State Drought Task Force, which was activated during the severe drought of 2012. The goal of the task force is to monitor drought conditions by gathering the most current data available and to make sure that South Dakotans have access to that information as quickly as possible. The group coordinates the exchange of drought information among government agencies and agriculture groups, fire managers, and water-supply organizations. Another resource is the Natural Resource Conservation Service, which has information available about how to deal with droughts.

## **Wildfire**

### *Description*

Wildfires are uncontrolled conflagrations that spread freely through the environment. Such fires that occur near populated areas pose threats not only to natural resources, but also to human life and personal property. Wildfires are not as serious a concern in Hanson County as they are in other more forested parts of the country, but the opinion of the planning team is that the hazard does warrant some attention in this plan.

### *Location*

Wildfires in Hanson County are most likely to occur in large areas of extensive brush or unmanaged vegetation, including pastures and other types of grassland. Wildlife production areas are particularly susceptible to fire because they consist of unmanaged vegetation. Another concern is controlled burns that get out of control, which can occur almost anywhere in the county.

### *Extent*

Each of the fire departments in the county submits reports to the South Dakota Division of Wildland Fire about the fires they fight. The division compiles the reports and produces a comprehensive database of all the records, which the planning team was able to obtain for fires occurring in the county from 2000 through 2019. The following table summarizes this information in terms of the size of the fires that have been fought. It shows that most of the fires have been fairly small, most impacting no more than a few acres.

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<sup>5</sup> During the extreme drought of 2012, Hanson Rural Water did ask people to voluntarily cut back on non-essential water usage. The system has since increased its capacity to deliver water.

**Table 3.4 – Wildfires in Hanson County (2000 – 2019)**

1 to 10 Acres	10 to 49 Acres	50 to 99 Acres	100 to 249 Acres	250 + Acres
22	12	3	1	0

Source: South Dakota Division of Wildland Fire (based on reports from the local fire departments)

The cause of most of the fires is unknown. Information is not available on the amount of damage caused by any of the wildfires, or whether any injuries or deaths occurred.

#### *History*

Many wildfires have occurred in Hanson County, but nothing on a truly destructive scale. The largest fire in recent years occurred in May 2013 when a wildfire burned 160 acres of grassland on the Rosedale Colony.

#### *Probability*

Wildfires affecting less than ten acres are likely to occur somewhere in Hanson County most years, but large scale wildfires are much less common. **Table 3.4** shows only one wildfire over 100 acres in size between 2000 and 2019. Based on this period of analysis, the probability of a significant wildfire can be considered low. The probability of a wildfire causing serious damage also is low.

#### *Resources and Capabilities*

Each fire department in the county has volunteer firefighters who have had training in fighting wildfires; the level of training varies from basic to advanced. The departments also have adequate equipment and protective gear needed to fight most of the wildfires they are likely to encounter. Various mutual aid agreements also are in place which helps ensure that assistance is available during particularly serious wildfires and other emergency events. A summary of the capabilities of the departments is presented in the following table.

**Table 3.5 - Fire Department Resources and Capabilities**

Department	Members	Vehicles	HazMat Capability
Alexandria	32	7 vehicles	Awareness
Emery	30	4 vehicles	Awareness
Rosedale Colony	18	1 vehicle	None

Following is a summary of the other local resources and capabilities available for dealing with wildfires.

- Hanson County is aggressive in issuing burn bans to help reduce the threat of fires when conditions warrant. The county commission issues the bans, in coordination with the Hanson County LEPC and the local fire departments.
- A requirement is in place that those wanting to start controlled burns in Hanson County must first contact the E-911 dispatch center in Mitchell.

## **Vulnerability and Loss Potential**

This section assesses the vulnerability of Hanson County and the participating jurisdictions to each of the hazards just profiled. Vulnerability is defined as the extent to which people and property are exposed to harm or damages created by a hazard. The method of determining vulnerability varies by the type of hazard and the availability of data, but each methodology is based on either potential for loss or actual losses. Following is a description of each specific methodology used.

### **Potential Loss Methodologies**

- FEMA digital Flood Insurance Rate Maps were used to identify 100-year flood zones in the county.
- FEMA's HAZUS loss estimation software was used to estimate potential losses from flooding in each community. HAZUS produces a flood polygon and flood-depth grid that represents the 100-year floodplain, with losses calculated using national baseline inventories (buildings and population) at the census block level. The maps generated by HAZUS are not as accurate as FEMA's Flood Insurance Rate Maps, nor is the resulting data, but HAZUS is still a helpful planning tool for communities that have not been mapped by the National Flood Insurance Program <sup>6</sup>.
- Data on the population living in wildfire threat zones was used to estimate potential wildfire losses.
- The value of buildings within the county was used to estimate potential losses due to winter storms and summer storms (building exposure).
- Population density within the county was used to estimate potential losses due to winter storms and summer storms.

### **Actual Loss Methodologies**

- The National Climatic Data Center's Storm Events Database was consulted for historical information regarding weather-related events (see **Table C.2 in Appendix C**).
- Records from FEMA were consulted for federal assistance provided to Hanson County following major disaster declarations through FEMA's Public Assistance program (see **Table C.1 in Appendix C**).
- Data from the U.S. Dept of Agriculture Risk Management Agency was used to assess crop loss due to a variety of natural hazards.

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<sup>6</sup> A limitation of HAZUS is the inadequacies associated with its hydrologic and hydraulic modeling, especially in sparsely populated areas where census blocks - the basis of the loss calculations - are large. The software assumes the population and building inventory to be evenly distributed over the census blocks, whereas in reality flooding may occur only in a small part of the block where there are few buildings or people. Also, HAZUS uses default national databases that may not be applicable at the local level.

- Information from the National Drought Mitigation Center's Drought Impact Reporter was used to assess the local impact of droughts.
- Data from the South Dakota Division of Wildland Fire was used to assess the historical impact of wildfires in the county.

At the conclusion of the vulnerability assessment for each hazard, development trends are considered to determine whether the county's vulnerability to the hazard might increase in the future. Information on development trends in the county was obtained by analyzing population trends and projections, and through discussion with local officials about where housing development and other growth may be likely to occur. Other factors, including the possible impact of climate change, also are considered.

At the end of the chapter, the county's vulnerability to each hazard is summarized. Vulnerability is characterized as either "low", "moderate", or "high", based on the results of the risk analysis. A brief discussion of vulnerable populations within the county also is presented.

### **Winter Storms**

All areas of South Dakota are vulnerable to winter storms, and the consequences of such storms can be great. They can disrupt the power supply when electrical lines are brought down by high winds, falling trees, or extreme ice buildup. Everyday activities can be significantly disrupted when road conditions deteriorate because of snow cover or precipitation that freezes on road pavement. In extreme situations, roads can be closed because of accumulated snow for days or even weeks. Winter storms also can kill or injure livestock, and can cause significant crop losses when they occur early in the growing season.

The rural areas of the county may be somewhat more vulnerable to winter storms than the towns. For example, transmission of electricity in rural areas is dependent on many miles of power lines located in open country that is highly susceptible to high wind events, especially when combined with freezing rain (high winds can snap power poles, and freezing rain and sleet forms ice on the lines, making them heavy and more susceptible to being blown down). Rural residents also are vulnerable if roads are blocked by snow for an extended period of time and they cannot travel into town for groceries, medical supplies, or other important items.

To assess vulnerability to winter storms, the methodology used in the South Dakota Hazard Mitigation Plan was essentially followed for this plan. These factors were considered:

- The number of prior winter storm events in the county
- Past damage amounts
- The county's building exposure
- Population density

Prior Events:

**Tables C.1 and C.2 in Appendix C** show that numerous significant winter storms have occurred in Hanson County, including blizzards, ice storms, heavy snows, and extreme cold events. The authors of the South Dakota Hazard Mitigation Plan found that there were 83 total winter storm events in the National Climatic Data Center’s Storm Events Database between January 1993 and August 2016 for Hanson County, ranking the county tied for 10<sup>th</sup> among the state’s counties.

Past Damage Amounts:

Winter storms have the potential to cause significant amounts of damage. For instance, the ice storm that occurred in November 2005 resulted in over \$1.9 million of public assistance costs to the Central Electric Cooperative for its infrastructure in Hanson County.

Given Hanson County's agriculturally-based economy, another method to determine risk is to look at the impact of winter storms on agricultural producers. Farmers typically protect themselves from the impacts of adverse weather and other natural hazards by insuring their crops against losses through multi-peril crop insurance, which is underwritten by the Risk Management Agency, a part of the U.S. Dept of Agriculture. Data on indemnity payouts for crop loss in Hanson County due to various types of winter weather events between 2000 and 2017 was obtained from the Risk Management Agency, and is presented in the following table. During this period of analysis, winter weather-related payouts represented approximately 3% of all indemnity payouts in Hanson County.

**Table 3.6 – Crop Loss Due to Winter Weather**

Year	Frost	Freeze	Cold Winter	Cold Wet Weather
2000	\$14,810	\$0	\$46,370	\$0
2001	\$0	\$0	\$230,614	\$0
2002	\$21,292	\$14,037	\$2,525	\$8,193
2003	\$0	\$0	\$16,741	\$0
2004	\$0	\$0	\$1,971	\$2,098
2005	\$30,015	\$4,652	\$0	\$3,415
2006	\$0	\$4,087	\$2,620	\$0
2007	\$889	\$691,951	\$117,867	\$18,701
2008	\$0	\$0	\$1,982	\$0
2009	\$0	\$0	\$306,068	\$15,773
2010	\$0	\$0	\$0	\$57,076
2011	\$0	\$22,771	\$20,487	\$114,834
2012	\$5,464	\$0	\$1,884	\$0
2013	\$0	\$41,929	\$9,216	\$497
2014	\$1,592	\$11,165	\$129,783	\$1,954
2015	\$0	\$28,734	\$108,204	\$0
2016	\$0	\$0	\$3,252	\$41,714
2017	\$0	\$5,223	\$22,452	\$42,190

Source: USDA Risk Management Agency ([www.rma.usda.gov/data/cause.html](http://www.rma.usda.gov/data/cause.html))

### Building Exposure:

The total value of buildings in Hanson County is approximately \$376,000,000, according to the South Dakota Hazard Mitigation Plan, which ranks the county 45<sup>th</sup> among the state's 66 counties. The median figure for South Dakota counties is \$605,000,000. The county's building exposure can be considered low.

### Population Density:

Hanson County is sparsely populated, with an average of just 7.7 people per square mile, less than the state figure of 10.5 people per square mile. Given that South Dakota is itself considered to be very rural, Hanson County would have to be rated low in terms of population density.

### *Development Trends*

Looking ahead, the county's expected modest population growth may increase vulnerability to winter storms, but probably not to a significant degree. Climate change also may have an impact on local vulnerability to winter storms. According to the South Dakota Hazard Mitigation Plan, the winter season is warming at a faster rate than any other season in South Dakota, but winter storms and blizzards will continue to be a severe weather hazard in the state. Warmer winter temperatures could mean more ice and freezing rain events, which would impact electrical utilities and communication systems, the transportation system, and livestock. An increase in the frequency of large snowfall events also is being experienced in the northern U.S. There remains some uncertainty in projections for the coming decades, but the rising trend of extreme precipitation events is something that needs to be considered.

### **Summer Storms**

All areas of Hanson County are vulnerable to summer storms, especially those that are accompanied by tornadoes, lightning, or large hail. Typical damage from summer storms includes blown down power lines, crop damage from hail and high wind, property damage if a populated area is struck, and flooding as the result of heavy rain. Like the rest of the Great Plains, Hanson County is especially vulnerable to summer storms accompanied by high wind because the landscape is open and there is little topographic relief to block the wind. Infrastructure and facilities located at higher elevations is somewhat more vulnerable to high wind events.

Vulnerable populations include the elderly, the sick, those with a mobility limitation, and people who happen to be outside during a storm event. People living in mobile homes are also vulnerable, since such structures can be overturned by winds of 60 to 70 miles per hour if they are not anchored properly.

As with winter storms, the methodology that was used in the South Dakota Hazard Mitigation Plan to assess vulnerability to summer storms was followed for this plan. The following factors were considered:

- The number of prior summer storm events in the county

- Past damage amounts
- The county's building exposure
- Population density

Prior events:

**Table C.2 in Appendix C** shows many significant summer storms that have been recorded in Hanson County, including hailstorms, thunderstorms, lightning, and tornadoes. The table shows 17 recorded tornadoes.. The authors of the South Dakota Hazard Mitigation Plan assigned a rating of 2 (out of 10 maximum) to Hanson County in terms of the frequency of tornadoes recorded between 1950 and 2016, and assigned a rating of 4 for tornadoes of magnitude F1 or greater.

Past Damage Amounts:

Summer storms have the potential to cause significant amounts of damage. As shown in **Table C.2**, many summer storm events have caused property and/or crop damage in the county.

As with winter storms, another method to determine the county's vulnerability to summer storms is to look at the impact of such storms on the county's agricultural producers. Summer storms can cause a lot of damage to cropland, especially when they are accompanied by hail. Data on indemnity payouts for crop loss in Hanson County due to hail as well as high wind events between 2000 and 2017 was obtained from the Risk Management Agency, and is presented in the following table. During this period of analysis, summer storm-related payouts represented just under 2% of all indemnity payouts in Hanson County.

**Table 3.7 – Crop Loss Due to Severe Summer Weather**

Year	Hail	High Wind	Year	Hail	High Wind
2000	\$419,830	\$448	2009	\$129,298	\$4,016
2001	\$19,937	\$0	2010	\$3,150	\$0
2002	\$45,634	\$0	2011	\$20,986	\$7,646
2003	\$123,425	\$5,571	2012	\$106,886	\$1,363
2004	\$135,606	\$11,419	2013	\$367	\$0
2005	\$732	\$21,619	2014	\$295,550	\$0
2006	\$20,194	\$0	2015	\$40,445	\$3,653
2007	\$0	\$23,686	2016	\$5,691	\$5,081
2008	\$186,334	\$20,846	2017	\$19,046	\$0

Source: USDA Risk Management Agency ([www.rma.usda.gov/data/cause.html](http://www.rma.usda.gov/data/cause.html))

Building Exposure:

The total value of buildings in Hanson County is approximately \$376,000,000, according to the South Dakota Hazard Mitigation Plan, which ranks the county 45<sup>th</sup> among the state's 66

counties. The median figure for South Dakota counties is \$605,000,000. The county's building exposure can be considered low.

#### Population Density:

Hanson County is sparsely populated, with an average of just 7.7 people per square mile, less than the state figure of 10.5 people per square mile. Given that South Dakota is itself considered to be very rural, Hanson County would have to be rated low in terms of population density.

#### *Development Trends*

Looking ahead, the county's expected modest population growth suggests that vulnerability to summer storms is not likely to increase much in the future. Regarding the impact of climate change, the South Dakota Hazard Mitigation Plan cites the Climate Science Special Report from 2017, which states that damages from convective weather hazards, such as severe thunderstorms and tornadoes, have undergone the greatest increase relative to other extreme weather since 1980. The plan states that the tornado season is getting longer, and that an increase in potential days for severe thunderstorms is projected for the mid to late 21<sup>st</sup> century, although the largest increases are projected for neighboring regions of the Midwest and the southern plains. There is some uncertainty in these projections, but severe thunderstorms and tornadoes will remain a hazard in South Dakota.

#### **Flooding**

Like all counties in South Dakota, Hanson is vulnerable to flooding. Because of the specific nature of flooding, the county's vulnerability to flooding will be analyzed first on a general county-level basis, and then specifically for each community. Given the degree to which flooding is geographically-based, this approach made the most sense to the planning team.

#### *General Flood Vulnerability*

According to the HAZUS analysis run for the South Dakota Hazard Mitigation Plan (see Table 3-45 of that plan), the potential building damage loss from flooding in Hanson County is \$1,368,000. The median figure for all South Dakota counties is approximately \$2,800,000. Overall, Hanson ranks 47th among the state's 66 counties in this measure of vulnerability. The potential displaced population in the county was determined to be 94 people.

As of July 2021, there are a total of 10 National Flood Insurance Program policies in Hanson County, and 10 claims have been paid since 1978. There are three repetitive loss properties in the county, with seven losses totaling \$70,582 in payments. See **Table 3.3** on page 25 for further details about NFIP participation in the county.

In addition to impacting buildings and other structures, a good deal of public infrastructure throughout the county is vulnerable to flooding. Flood damage frequently involves washed out or damaged roads and drainage culverts, often occurring in the spring, especially following winters with heavy snow. Roads and infrastructure throughout the county are vulnerable.

Flooding also has a major impact on agriculture. Spring flooding can delay farmers getting into their fields to plant, and later in the growing season it can damage crops. Data on indemnity payouts for crop loss in Hanson County due to flooding, as well as excess moisture/precipitation, between 2000 and 2017 was obtained from the Risk Management Agency, and is presented in the following table. During this period of analysis, flood-related payouts represented just under 30% of all indemnity payouts in Hanson County, second only to drought.

**Table 3.8 – Crop Loss Due to Flooding**

Year	Flooding	Excess Moisture/ Precipitation	Year	Flooding	Excess Moisture/ Precipitation
2000	\$97	\$202,968	2009	\$0	\$1,135,570
2001	\$1,412	\$2,039,851	2010	\$2,100	\$3,943,867
2002	\$405	\$153,062	2011	\$0	\$6,555,099
2003	\$609	\$320,127	2012	\$0	\$812,604
2004	\$0	\$610,891	2013	\$1,004	\$484,200
2005	\$12,304	\$315,846	2014	\$0	\$81,859
2006	\$0	\$44,753	2015	\$0	\$139,757
2007	\$37,995	\$4,276,191	2016	\$0	\$2,149,371
2008	\$10,025	\$2,599,421	2017	\$0	\$171,261

Source: USDA Risk Management Agency ([www.rma.usda.gov/data/cause.html](http://www.rma.usda.gov/data/cause.html))

2019 was probably the worst year ever in terms of flooding’s impact on South Dakota’s agricultural producers. The state ranked first in the nation with almost 4 million acres of farmland prevented from being planted due to flooding, more than double the next nearest state. Hanson County ranked 12<sup>th</sup> in the state with a total of approximately 103,000 acres not planted.

Hanson County also is vulnerable to flooding due to dam failure. There are several small dams within the county, including the Lake Hanson Dam, which is located south of Alexandria. As discussed earlier, the spillway was washed out following major rainfall in September 2019, which caused substantial damage to downstream roads, but only minor property damage.

#### *Local Flood Vulnerability*

At the community level, flood vulnerability was determined by using FEMA's HAZUS loss estimation software to estimate potential losses from flooding during a 100-year flood event, and by using GIS software to determine the value of property at risk of being flooded. The following table summarizes the results of the HAZUS analysis, showing vulnerability in Alexandria and Fulton. It should be noted that the HAZUS runs included some land outside the cities’ incorporated limits.

**Table 3.9 – HAZUS Base Flood Loss Estimation Results**

Community	Building Structural Damage	Debris Generated	Households Displaced	People Needing Shelter
Alexandria	\$714,100	1,970 tons	5	0
Emery	\$0	0 tons	1	0
Fulton	\$25,200	39 tons	5	0

Source: FEMA HAZUS loss estimation software

The following table shows the amount and value of property at risk of flooding. The analysis was done by using GIS software to overlay areas of known flood risk (either the 100 year floodplain or areas identified by HAZUS as flood prone) on parcel data supplied by the county. In Alexandria, almost all the vulnerable land lies just outside the city limits, not within the city itself.

**Table 3.10 – Property in Flood Prone Areas**

Community	Assessed Property Value
Alexandria	\$0
Emery	\$0
Fulton	\$15,310

Sources: FEMA Flood Insurance Rate Maps; FEMA HAZUS loss estimation software; Hanson County Director of Equalization

### *Development Trends*

Looking ahead, the expected modest population growth in the county probably will not significantly increase the county's vulnerability to flooding. However, development now occurring in the northeast corner of Alexandria is close to an area identified by HAZUS as flood prone (see **Figure 3.2**).

A factor likely to increase the county's vulnerability to flooding is the continuing conversion of wetlands and other marginal land to agricultural production. Farming these marginal lands is increasing the probability and severity of flooding in certain areas as the land's natural capacity to absorb excess surface water is decreased. The primary impact is on rural roads and infrastructure. Precise statistics on the amount of road damage that flooding has caused over the years in Hanson County are not available, but there appears to be little doubt that county and township roads are suffering more flood-related damage than they used to. Future updates to this plan could explore this trend in more depth.

The nature and frequency of flooding also could be altered by climate change. There is no comprehensive assessment of how climate change might affect flooding in South Dakota, but regional trends for the northern Great Plains show a trend toward less frequent, but more intense, rain events. Climate projections indicate that 1-day, 20-year return events may increase in frequency by 8% to 16% in the coming decades. In the northern Great Plains region, this is compounded by an overall wetter trend of about 15% increase when

comparing the years 1986-2015 to 1901-1960. The additional moisture overall can add to the increase in precipitation per extreme event.

### **Drought**

Without question, Hanson County is vulnerable to drought. As shown in **Table C.2** in **Appendix C**, there are 17 drought records for the county in the Storm Events Database just since 1999, with many more droughts known to have occurred before then. The biggest impact of drought in Hanson County is in the agricultural sector, which is not surprising, given the county's heavy reliance on farming. Non-irrigated cropland is most susceptible to drought, and yield reductions due to moisture shortages can be aggravated by wind-induced soil erosion.

Data on indemnity payouts for crop loss in Hanson County due to drought and heat between 2000 and 2017 was obtained from the Risk Management Agency, and is presented in the following table. During this period of analysis, drought-related payouts accounted for just under 60% of all indemnity payouts in Hanson County, much higher than any other type of payout. It is safe to say that drought is one of the costliest natural hazards facing Hanson County farmers <sup>7</sup>.

**Table 3.11 – Crop Loss Due to Drought and Heat**

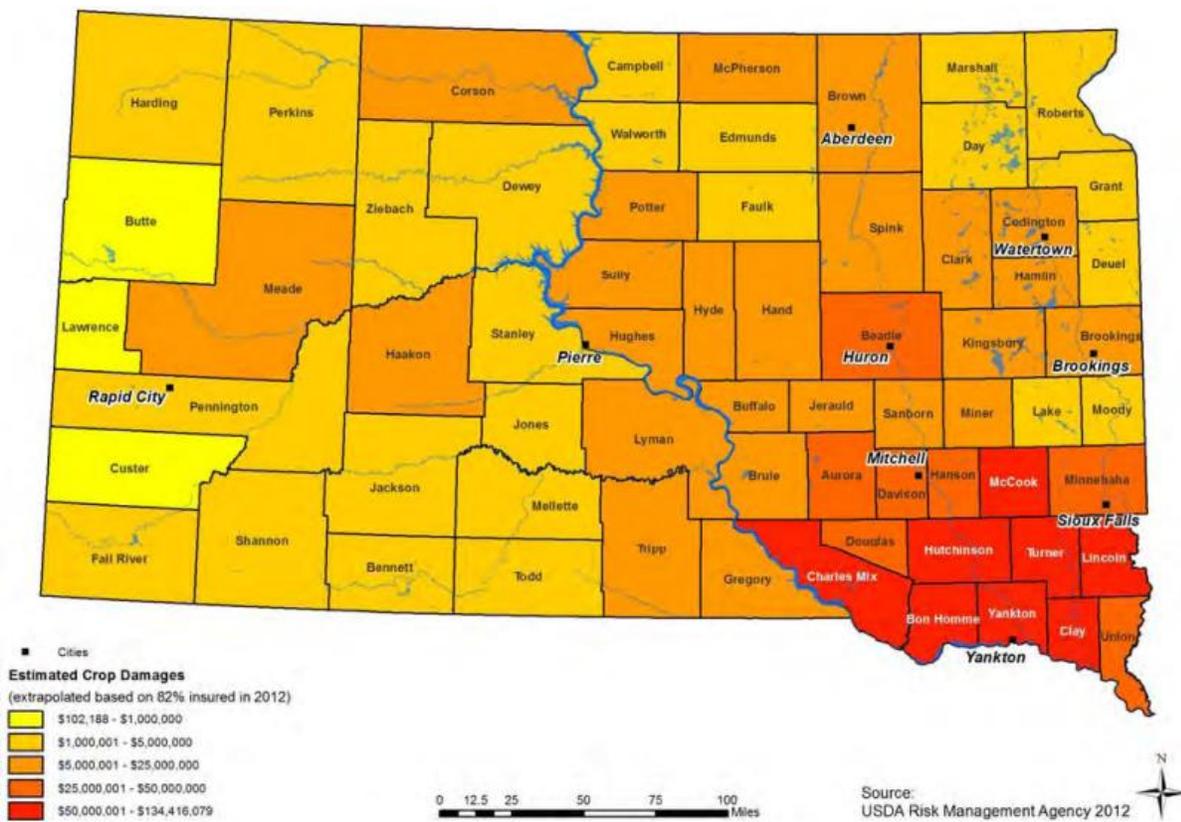
Year	Drought	Heat	Year	Drought	Heat
2000	\$167,676	\$3,096	2009	\$15,960	\$0
2001	\$405,331	\$1,309	2010	\$0	\$0
2002	\$3,298,202	\$76,422	2011	\$127,782	\$26,536
2003	\$805,982	\$19,805	2012	\$28,962,606	\$364,424
2004	\$73,529	\$4,747	2013	\$214,938	\$309
2005	\$3,256,830	\$213,707	2014	\$70,592	\$2,278
2006	\$8,468,816	\$470,664	2015	\$239,681	\$0
2007	\$649,788	\$38,392	2016	\$1,519,289	\$0
2008	\$1,974,789	\$55,309	2017	\$674,087	\$3,660

Source: USDA Risk Management Agency ([www.rma.usda.gov/data/cause.html](http://www.rma.usda.gov/data/cause.html))

As the table shows, the 2012 drought had by far the biggest impact on the county's agricultural production. Hanson County ranked 13<sup>th</sup> in the state in the amount of crop loss suffered. The figure on the next page, as reproduced from the South Dakota Drought Mitigation Plan, shows the 2012 drought's impact statewide.

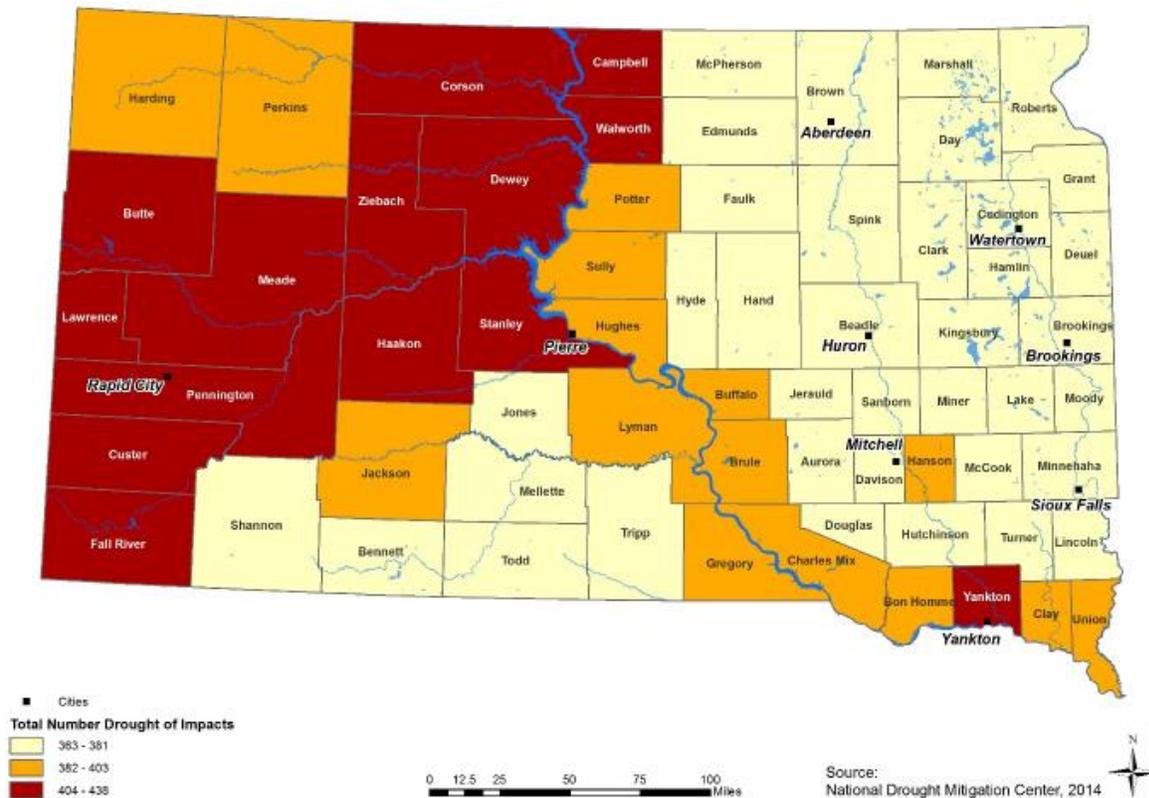
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<sup>7</sup> Drought also appears to be the costliest natural hazard statewide for South Dakota farmers. From 2000 through 2017, drought payouts accounted for approximately 50% of all indemnity payouts in the state.



To determine which areas of the state are most vulnerable to the agricultural impacts of drought, the authors of the South Dakota Drought Mitigation Plan conducted an analysis comparing crop losses in each county to the total value of the county’s crops. Crop value was taken from the 2012 Census of Agriculture, while crop loss was based on the Risk Management Agency’s crop indemnity data for the period 2000 to 2014. The resulting loss ratio is the average annual loss divided by total crop value; the higher the ratio the higher the vulnerability. Hanson County’s average annual loss from drought for the 2000 – 2014 period was \$3,722,609, compared to a total crop value of \$67,135,000, resulting in a loss ratio of 5.5%. In comparison, the average loss ratio figure for South Dakota counties was 3.1%. The authors of the South Dakota Drought Mitigation Plan assigned a “Moderate” vulnerability rating for Hanson County for this measure of drought vulnerability.

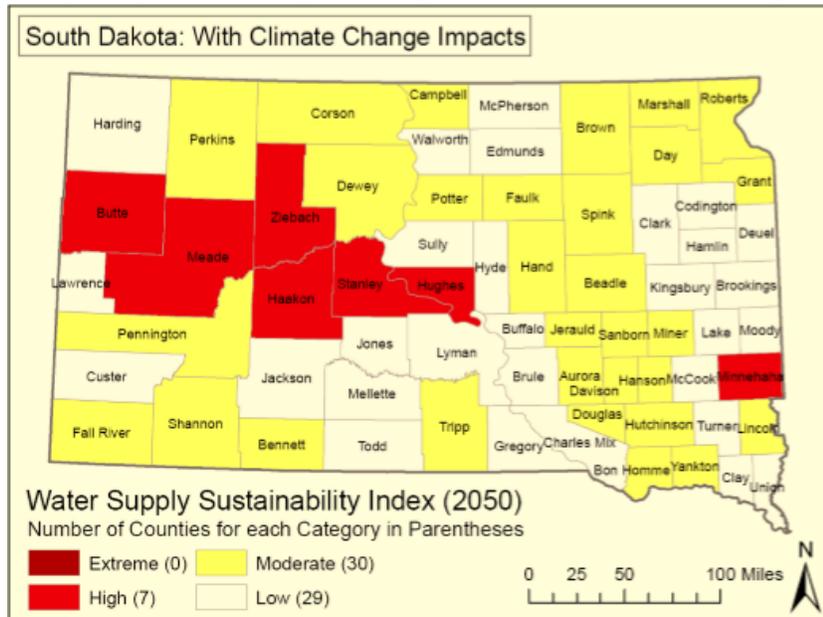
Vulnerability also was assessed by reviewing the South Dakota Drought Mitigation Plan’s section on the National Drought Mitigation Center’s Drought Impact Reporter. The Drought Impact Reporter analyzes drought impact information from a broad range of areas, including the social, economic, and environmental realms. As shown in the figure on the next page from the South Dakota Drought Mitigation Plan, Hanson County is in the middle range of counties in terms of number of drought impacts.



### Development Trends

Vulnerability to drought may increase in coming years if current land use trends continue and more marginal land in the county is brought into agricultural production. Climate change also may increase the frequency and severity of droughts in the future, according to many climate prediction models.

As described in the South Dakota Drought Mitigation Plan, a new analysis performed for the Natural Resources Defense Council examined the effects of climate change on water supply and demand in the United States. The study found that more than 1,100 counties may face higher risks of water shortages by mid-century as a result of climate change. In South Dakota, more than half of the state's counties could face higher risks of water shortages by mid-century as a result of increasing potential for drought due to climate change impacts.



from the Natural Resources Defense Council, as reproduced from the South Dakota Drought Mitigation Plan, shows that Hanson County is one of the counties that could face moderate water shortages in the future due to climate change.

### **Wildfire**

Wildfire risk in Hanson County can be determined by analyzing historical records of actual wildfire losses in the county (see **Table 3.4**), or by estimating potential wildfire losses. To analyze potential wildfire loss in the county, data from the SILVIS Lab at the University of Wisconsin was used. The SILVIS data is classified into various categories based on the density of housing and vegetation in specific areas. Areas are classified as High, Moderate, or Low Risk threat zones. High Risk zones are areas of moderate to high density housing within heavily vegetated areas, Moderate Risk zones are areas of lower housing unit density within areas of high vegetation, and Low Risk zones have little vegetation and/or very low density housing. The map that was generated using SILVIS data showed only a few very small areas of high risk in the county. The total population living in the high and moderate risk zones is summarized in the table below, which is based on 2010 Census Block data.

**Table 3.12 – Population in Wildfire Risk Zones in Hanson County**

<b>Housing Units</b>	<b>Total Population</b>	<b>Median Home Value</b>	<b>Total Home Value</b>
24	77	\$87,300	\$2,095,200

Source: South Dakota Hazard Mitigation Plan, based on data from the SILVIS Lab at the University of Wisconsin

The population of 77 living in a High or Moderate Risk threat zone represents just two percent of Hanson County's population, and it ranks Hanson County 57th among South Dakota counties. Putting things in perspective, in South Dakota as a whole about 25% of the population lives in a wildfire threat zone.

This is not to say that there is no threat. Even in areas of the county without much woody vegetation, wildfires are possible. They can occur in pastures and other types of grassland, wetlands (many of which dry out in the summer), and wildlife production areas. The loss potential from these fires is generally slight, although occasional damage has been reported.

### ***Development Trends***

Looking ahead, the county's expected modest population growth suggests that vulnerability to wildfires is not likely to significantly increase. However, the recent construction of Cargill's large grain storage facility on the outskirts of Emery may increase local vulnerability to fires or hazmat incidents, given the combustible nature of dry grain. By far the largest grain facility in Hanson County, and one of the largest in the region, it can store over 550,000 bushels of grain. Another factor that could increase wildfire vulnerability is the continued spread of cedar trees in Hanson County. The fuel load they represent could turn an otherwise routine brush fire into a very serious situation.

Climate change also may increase local wildfire vulnerability. The South Dakota Hazard Mitigation Plan cites a U.S. Forest Service study that indicates the potential for an increase in future lightning activity and a higher frequency of weather patterns conducive to surface drying. These factors, together with higher summer temperatures, will likely increase the annual window of high fire risk by 10 to 30%. The plan states that predictions past 2040 are largely speculative, but there will be an increase in the potential for drought and the number of days in any given year with flammable fuels, which may extend the fire season.

## **Risk Assessment Summary**

In this section, the vulnerability of Hanson County to each of the hazards profiled is summarized. Maps are presented at the end of the section to augment the analysis, showing areas within each community where vulnerability to flooding exists. Vulnerability to winter storms, summer storms, and drought is not mapped, as those hazards are likely to impact all areas of the county more or less equally. A brief discussion of vulnerable populations within the county also is presented.

- **Winter Storms**

Hanson County's vulnerability to winter storms can be considered high. All areas of the county are vulnerable to winter storms. Major winter storms accompanied by heavy snow or freezing rain contribute to the vulnerability of county residents by making roads dangerous for travel. The isolation of residents living outside the county's major communities puts them at increased risk. Some of these residents are more than 10 miles from the nearest place with groceries, medical service and supplies, or other important items. If roads are blocked by snow for an extended period of time, some rural residents, particularly the elderly, may be at risk. Winter storms accompanied by high winds have the potential to damage residential and commercial property in the county, as well as infrastructure. A major concern is the vulnerability of rural electric power infrastructure. When winter storms are accompanied by high winds and freezing precipitation, ice can build up on powerlines, which can cause the lines and poles to come down. It is a certainty that the county will remain vulnerable to winter storms no matter what mitigation actions are taken.

- **Summer Storms**

Hanson County's vulnerability to summer storms can be considered moderate. All areas of the county are vulnerable to summer storms, and are highly vulnerable to summer storms that are accompanied by tornadoes or hail. Although the county's population density is low and infrastructure development is not extensive, a large amount of cropland in the county is vulnerable to the effects of hail and other violent summer weather.

- **Flooding**

The overall vulnerability of Hanson County to flooding can be described as at least moderate. Most of the vulnerability is to cropland and to county and township roads, and the vulnerability is widespread throughout the county. Severe flooding occurred in 2019

when numerous county and township roads had to be closed; some road segments south of Interstate 90 between Alexandria and Emery are still closed (see **Figure 3.1**). Following is a summary of vulnerability to flooding in each of the communities:

**Alexandria:** There is a fairly significant degree of vulnerability here, as shown in **Table 3.9**. The southwest part of the city, south of the railroad tracks, is low-lying and has drainage infrastructure that is old and in poor condition. Areas on the eastern outskirts of the city along an unnamed tributary also are at risk. However, no important infrastructure, and little residential property, is located in either area. Flooding in 2019 had a major impact throughout the community, with an estimated 90% of homes with basements suffering varying amounts of flood damage. Sewage also backed up into some homes, and some street damage occurred. Approximately \$36,770 of FEMA Public Assistance funds was obligated in the city for flooding in 2019.

**Emery:** Although **Table 3.9** and **Table 3.10** indicate there is little vulnerability to flooding in Emery, some flooding has occurred here. Flooding in 2019 had a significant impact in the community, with at least 50% of homes with basements suffering varying amounts of flood damage. Sewage also backed up into some homes, and some street damage occurred. Approximately \$18,530 of FEMA Public Assistance funds was obligated in the city for flooding in 2019.

**Fulton:** The town is somewhat vulnerable to flooding, as shown in **Table 3.9** and **Table 3.10**. Johnson Creek runs through the east side of Fulton, and some residential properties and the town's grain elevator are located in the area identified by HAZUS as being flood prone. Significant flooding has occurred in this area, but a larger culvert was installed where Johnson Creek intersects the railroad tracks, which has improved the situation considerably. Flooding in 2019 had a major impact in the community, as every home with a basement suffered some amount of flood damage. Street damage also occurred. Approximately \$17,500 of FEMA Public Assistance funds was obligated in the town for flooding in 2019.

- **Drought**

Hanson County's vulnerability to drought can be considered at least moderate, and is certain to continue for the foreseeable future. All areas of the county are vulnerable. The impact is primarily to the agricultural sector, where serious losses have occurred. The water supply to residential and commercial customers through the Hanson Rural Water System is secure. During the drought of 2012, Hanson Rural Water did ask people to voluntarily cut back on non-essential water usage, but the system has since increased its capacity to deliver water.

- **Wildfire**

The overall vulnerability to wildfire in Hanson County is low. Only about 2% of the county's population is considered to be living in a High or Moderate Risk wildfire threat zone, well below the statewide figure of 25%, and no truly destructive wildfire has ever been recorded in the county.

## **Vulnerable Populations**

To conclude the risk assessment summary, the issue of vulnerable populations is considered. Such individuals, including the very young, the elderly, those with physical or mental disabilities, and the very poor, may be particularly vulnerable to disaster events. Populations that tend to be isolated in some way from the rest of the community, such as racial minorities and those who are not fluent in English, also may be more vulnerable.

The South Dakota Hazard Mitigation Plan includes a section on social vulnerability, using the Social Vulnerability Index for the United States. This index, compiled by the University of South Carolina Hazards and Vulnerability Research Institute, measures the social vulnerability of all counties in the nation to environmental hazards. The index synthesizes 30 socioeconomic variables, which research suggests contribute to reduction in a community's ability to prepare for, respond to, and recover from hazards. The primary variables are race and class, wealth, percentage of elderly residents, Hispanic ethnicity, special needs individuals, Native American ethnicity, and service industry employment. According to the index, Hanson County is not in the top 20% of the most socially vulnerable counties in the nation to environmental hazards, and only six counties in South Dakota are considered less vulnerable.

For Hanson County, a specific population of concern is the elderly, even though **Table 2.4** showed that the median age of the population in the county is slightly below the state and national figures. There are no nursing homes or other types of senior care facilities in Hanson County, but the Carmelite Monastery in Alexandria does have some elderly members (the monastery currently has fewer than ten members).

Figure 3.1 - Hanson County

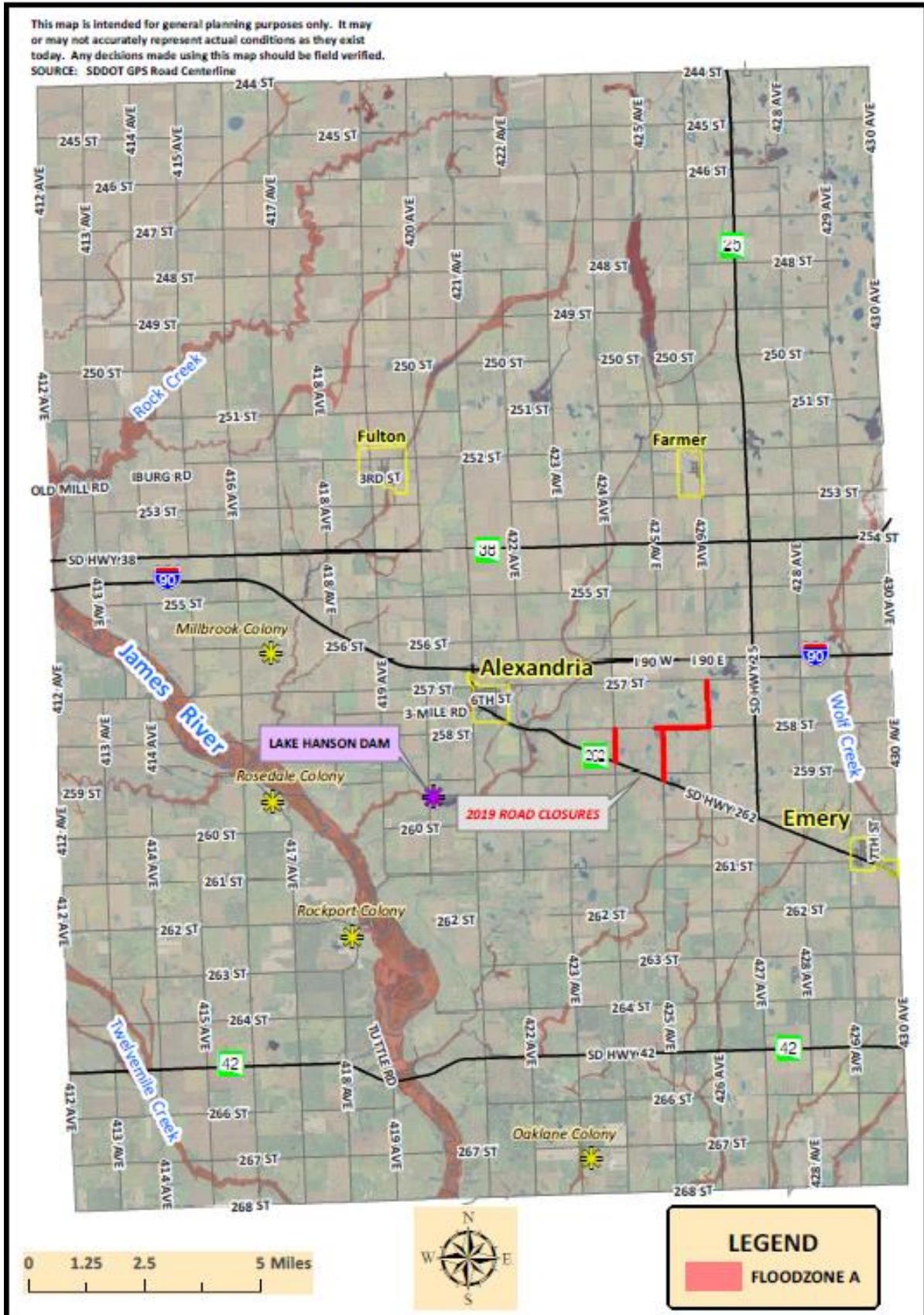


Figure 3.2 – Alexandria

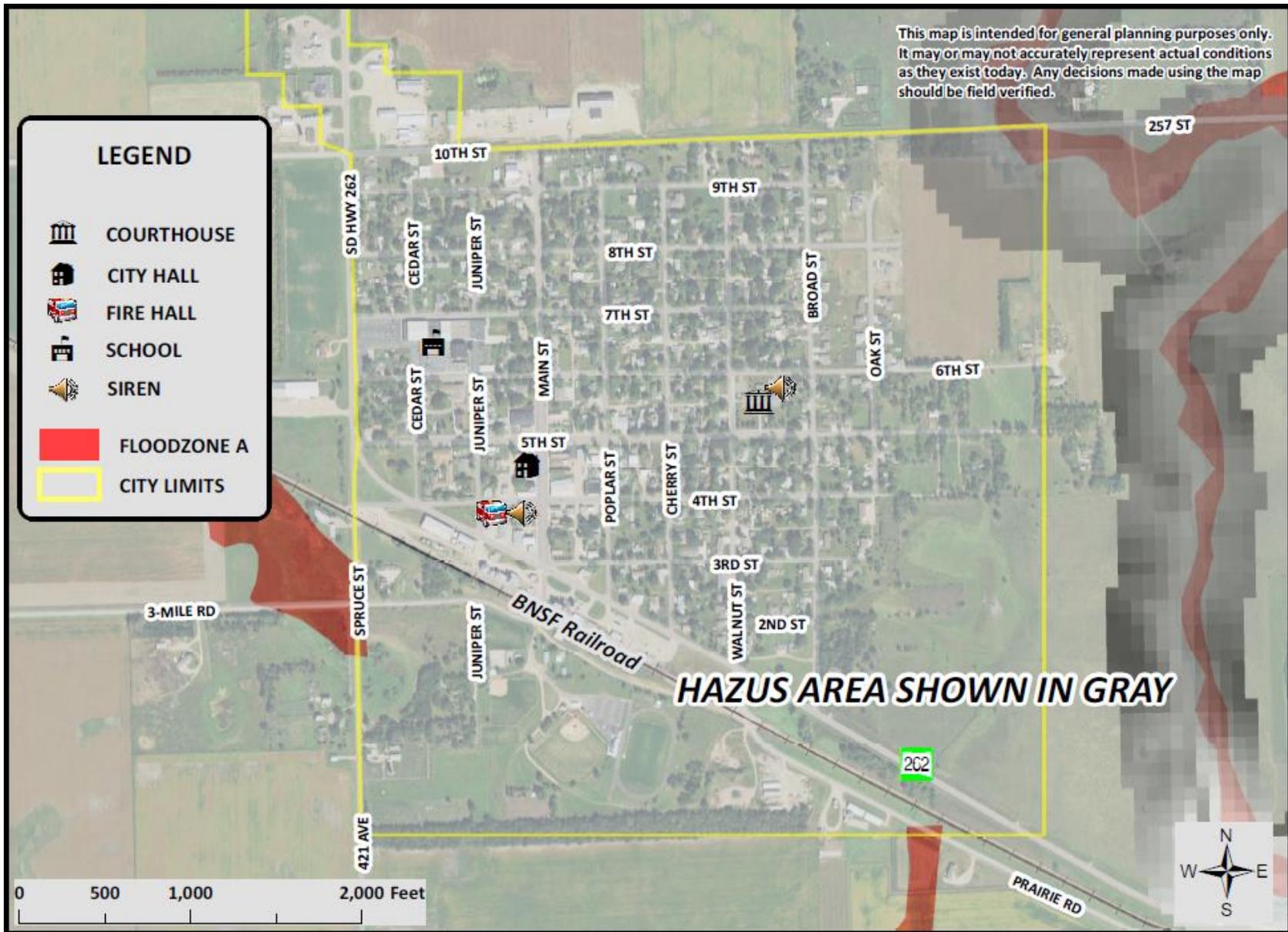


Figure 3.3 – Emery

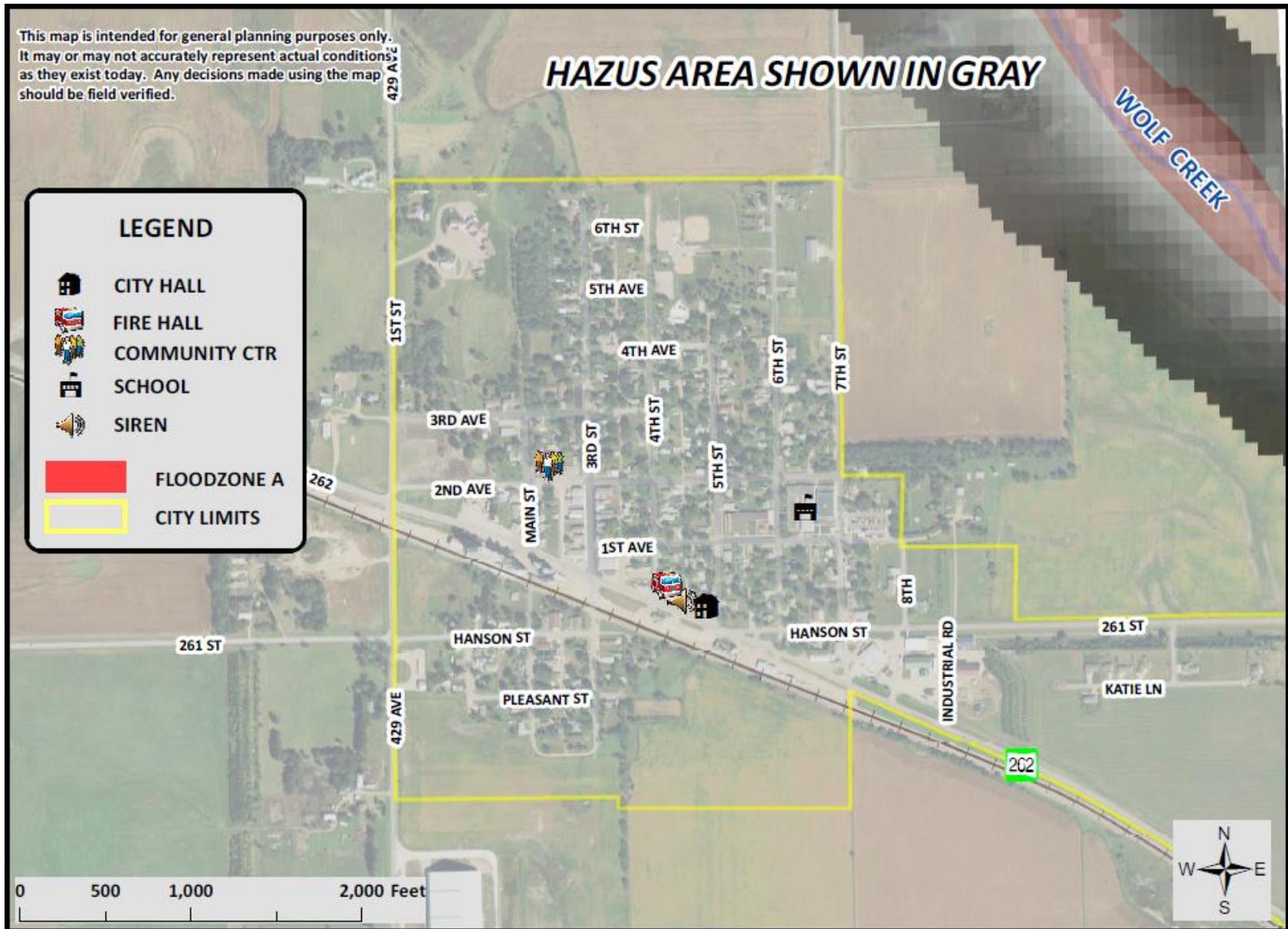
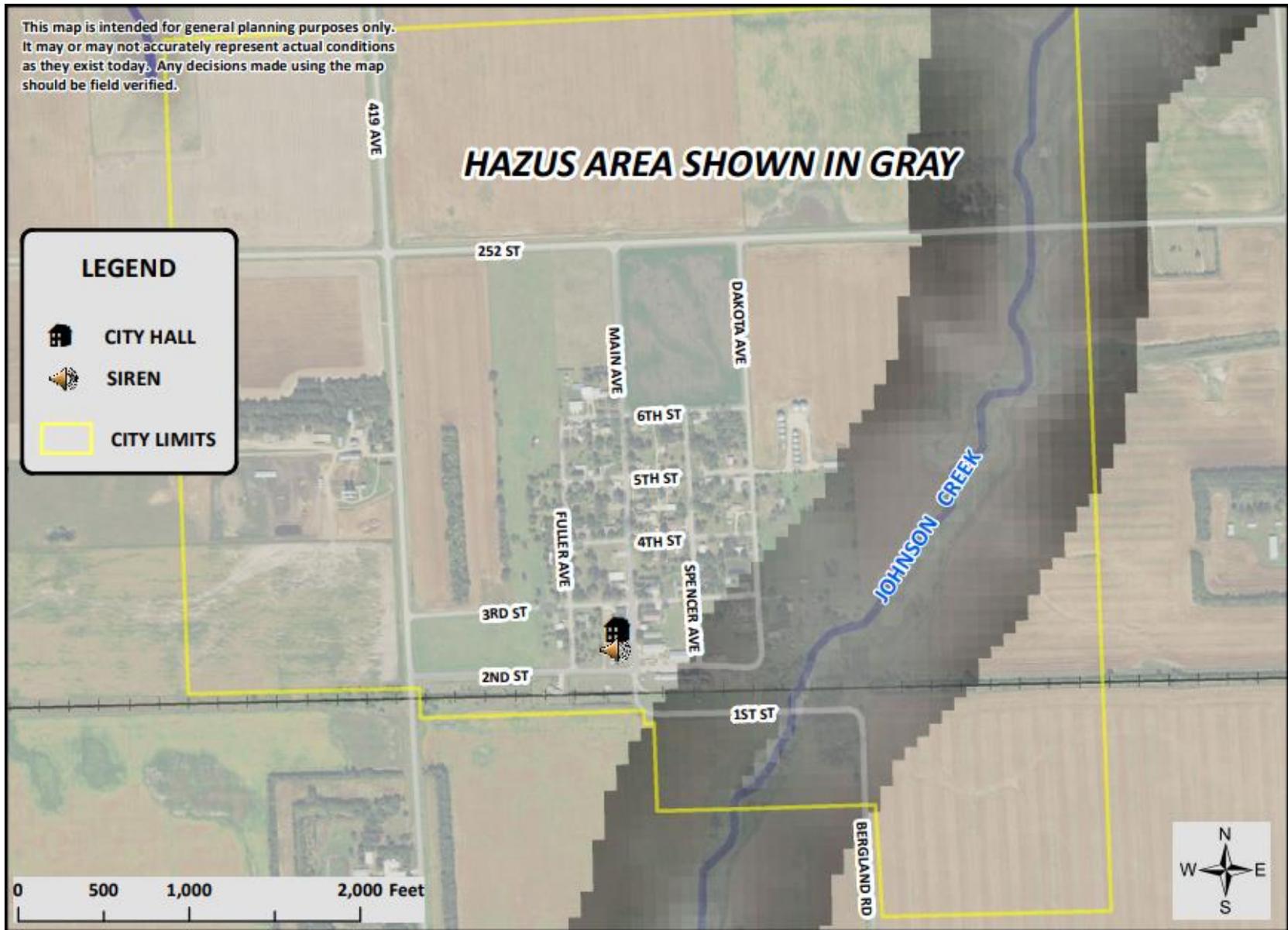


Figure 3.4 – Fulton



# CHAPTER IV

## RISK MITIGATION STRATEGY

### Background

The previous chapter described the types of hazards most likely to impact Hanson County, and discussed the county's vulnerability to each of the hazards. This chapter identifies the hazard mitigation goals and objectives that the planning team decided upon, and then focuses on a presentation of the mitigation actions proposed to achieve the goals and objectives. A table showing all of the proposed actions is included. The chapter concludes with a discussion about how the proposed actions were prioritized.

### Mitigation Goals and Objectives

At the beginning of the planning process, it was determined that the same general goals and objectives as listed in the county's current plan would be kept for this update, with one addition noted below. Among other considerations, the planning team wanted to ensure that the goals and objectives supported the priorities of the other planning documents that were reviewed as this plan was being developed. The following goals were identified:

- Minimize loss of life and injuries from hazards.
- Minimize damage to existing and future structures within hazard areas.
- Reduce losses to critical facilities, utilities, and infrastructure from hazards.
- Reduce impacts to the economy and the environment from hazards.
- Increase internal capabilities for hazard mitigation (new for this plan update).

After the team had settled on the goals, they began to focus more narrowly on each hazard by reviewing the results of the risk assessment and analyzing each jurisdiction's vulnerability to the hazards, and the severity of the threat posed by the hazards. Much of the discussion focused on damage caused by past hazard events, and what could be done to lessen or eliminate damage from future events. The planning team also considered how future development might affect the jurisdictions' vulnerability to each of the hazards faced.

Following are the specific mitigation objectives for each of the hazards:

#### ***Winter storm***

- Reduce property and infrastructure losses due to winter storms.
- Ensure that people are adequately protected from the effects of winter storms.
- Minimize disruptions to the power distribution system.

### **Summer storm**

- Reduce property and infrastructure losses due to summer storms.
- Ensure that people are adequately protected from effects of summer storms.
- Ensure that people have adequate warning when violent weather threatens.

### **Flooding**

- Reduce property and infrastructure losses due to flooding.
- Minimize development in areas that are prone to flooding.
- Maintain the natural and man-made systems that protect people and property from floods.

### **Drought**

- Reduce economic and environmental impacts due to drought.

### **Wildfire**

- Reduce property and infrastructure losses due to wildfires.

## **Mitigation Actions**

With the goals and objectives identified by the planning team, the participating jurisdictions began the process of selecting mitigation actions that could be taken to accomplish the goals. The process began with a review of the actions listed in the county's current disaster mitigation plan and discussion about the progress that had been made to implement the actions. A list of the actions and a summary of the implementation status of each action is shown in the following table.

**Table 4.1 – Progress on Implementing Previously Proposed Actions**

<b>Mitigation Action</b>	<b>Hazard</b>	<b>Current Status</b>
<b>HANSON COUNTY</b>		
Continue National Flood Insurance Program compliance.	Flooding	Continuing
Continue working with James River Water Development District regarding James River management.	Flooding	Continuing; the District helped finance repairs to the Lake Hanson Dam in 2020.
Implement drainage improvements along county roads.	Flooding	No progress – lack of funds, compounded by flooding in 2019, has set the County back.
Continue enforcing burn bans as conditions warrant.	Wildfire	Continuing
<b>CITY OF ALEXANDRIA</b>		
Continue National Flood Insurance Program compliance.	Flooding	Continuing
Upgrade storm sewer infrastructure.	Flooding	Minor progress has been made, but lack of funds has prevented any substantial upgrades.

Mitigation Action	Hazard	Current Status
Generator acquisition for fire hall.	Winter storm	A 2015 FEMA Hazard Mitigation Assistance application was denied funding.
Tornado safe room construction/acquisition.	Summer storm	No progress – lack of funds.
<b>CITY OF EMERY</b>		
Participate in National Flood Insurance Program.	Flooding	Community joined NFIP in 2020.
Generator acquisition for school auditorium.	Winter storm	Portable generators are now available at the auditorium.
Tornado safe room construction/acquisition.	Summer storm	No progress – lack of funds.
<b>TOWN OF FULTON</b>		
Participate in National Flood Insurance Program.	Flooding	Community joined NFIP in 2020.
Tornado safe room construction/acquisition.	Summer storm	No progress – lack of funds.

Following this review, a list of potential mitigation actions based on FEMA's guidance document *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards* was reviewed. The actions on the list can be grouped into the following general categories:

- **Prevention:** Government administrative or regulatory actions or processes that influence building and development. Examples include:
  - Adopting zoning regulations.
  - Preserving open space.
  - Reviewing and strengthening local flood ordinances.
  - Adopting stormwater management regulations.
  - Adopting National Building Code standards.
  - Enacting measures to restrict non-essential water usage.
  
- **Education and Outreach:** Actions to inform and educate elected officials, stakeholders, property owners, and the general public about potential risks from hazards and potential ways to mitigate them. Examples include:
  - Developing a disaster mitigation public awareness program.
  - Participating in the StormReady program.
  - Participating in the Firewise Communities program.
  - Making presentations to school groups or neighborhood organizations.
  - Mailings to residents in hazard-prone areas.
  - Encouraging people to take various water-saving measures.
  
- **Property Protection:** Actions that modify existing buildings or infrastructure to protect them or remove them from a hazard. Examples include:
  - Property acquisition, elevation, or relocation, including elevating roads in flood-prone areas.
  - Making structural retrofits to facilities.
  - Replacing overhead utility lines with underground lines.

- Natural Resource Protection: Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples include:
  - Using low-lying areas as natural water retention ponds.
  - Restoring and preserving wetlands.
  - Restoring stream corridors.
  - Forest and vegetation management.
  - Providing incentives for xeriscaping.
- Structural Projects: Actions that involve the construction of new structures to reduce the impact of a hazard. Examples include:
  - Upgrading stormwater infrastructure, such as culverts and storm sewer piping.
  - Building floodwalls.
  - Building tornado safe rooms.

It was explained that hazard mitigation is defined as *sustained action* taken to reduce or eliminate the long-term risk to people and property from hazards, as opposed to preparedness planning. Still, some actions to enhance disaster preparedness were discussed. Actions considered in this category included installing warning sirens in areas currently not well served and acquiring emergency power generators for critical facilities.

The final list of mitigation actions identified by the jurisdictions is shown in **Table 4.2**, which contains the following information for each action:

- The local priority rating – either High or Medium.
- The individual (party) primarily responsible for implementing the action.
- The estimated time frame needed to accomplish the action. Short term actions are those that can be completed within a few years; Long term actions may take several years or more to accomplish due to cost or other factors.
- The estimated cost to implement the action.
- Resources that may be available to help fund the action.

Prioritizing the actions is important because it is unlikely that all of them can be pursued simultaneously, especially when costly projects are being considered. Those actions providing the most overall benefit in terms of cost are likely to be pursued first, while some lower priority actions may never be implemented. The prioritization process was informal and somewhat subjective, but a methodology did help guide the process. This framework, which was suggested by the Planning & Development District III office, is based on the following criteria:

- Overall benefit - how many lives or how much property will be protected, and how much disruption will be prevented? Are there any critical facilities or important public infrastructure that will be protected?

- Financial feasibility - how expensive will the action be? Could the action qualify for grant or loan funding?
- Political feasibility – will the public support the action? Are there any groups or interests that may be opposed to the action and thus prevent it from being implemented?
- Technical feasibility – does the technology exist for the action to be implemented? Is the action likely to function as intended?
- Environmental feasibility - does the action have the potential to have an adverse impact on the environment?
- Legal feasibility – are there any legal issues that might prevent the action from being implemented?

Guesswork was kept to a minimum during the prioritization process. For instance, in determining the potential benefit of a given action, the amount of property that would be protected by the action could in some cases be estimated with a fair amount of certainty. Assessing the proposed actions in relation to the other criteria was sometimes more difficult. Determining the political feasibility of the actions may have been the most subjective part of the process, but the jurisdiction representatives generally had a good idea of how the public and vested interests would support the actions.

Funding considerations also are critical, because neither Hanson County nor any of the other participating jurisdictions have much discretionary money available to fund mitigation activities. Given this reality, it is unlikely that any mitigation action requiring substantial financial resources could be implemented locally without grant assistance. Following are potential sources of outside funding to help the jurisdictions accomplish mitigation projects:

#### FEMA grant programs

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)

#### Other grant and loan programs/sources

- US Economic Development Administration
- US Department of Agriculture Rural Development grant/loan program
- South Dakota Community Development Block Grant program
- South Dakota State Homeland Security Program
- South Dakota Dept. of Environment and Natural Resources
- South Dakota Dept. of Transportation
- James River Water Development District

**Table 4.2 - Proposed Mitigation Actions**

<b>HANSON COUNTY ACTIONS</b>	<b>HAZARD</b>	<b>PRIORITY</b>	<b>PROJECT LEAD</b>	<b>TIME</b>	<b>COST</b>	<b>FUNDING</b>	<b>STATUS</b>
Ensure continued NFIP compliance. County will continue community outreach efforts.	Flooding	HIGH	Floodplain coordinator (Director of Equalization)	SHORT	N/A	N/A	County will make this a priority.
Hydrology study of water flow in Hanson County.	Flooding	HIGH	Hwy Superintendent	SHORT	≈\$500,000	FEMA	The County had applied for hazard mitigation funds, but was denied; County intends to submit again as opportunities develop.
Drainage improvement projects along county and township roads.	Flooding	HIGH	Hwy Superintendent	LONG	Unknown	DOT; FEMA; JRWDD	It is hoped that the hydrology study will identify a cost effective project, in which case the County will apply for funding.
Storm shelter for Lake Hanson area.	Summer storm	MED	Emergency Management Director	MID	Unknown	FEMA	County will develop a proposal and may submit for funding as opportunities develop.
Generator acquisition for critical facilities, including Hanson County School.	Winter storm	MED	Emergency Management Director	MID	≈\$25,000	FEMA	County may apply for funding as opportunities develop.
<b>ALEXANDRIA ACTIONS</b>	<b>HAZARD</b>	<b>PRIORITY</b>	<b>PROJECT LEAD</b>	<b>TIME</b>	<b>COST</b>	<b>FUNDING</b>	<b>STATUS</b>
Ensure continued NFIP compliance. City will continue community outreach efforts.	Flooding	HIGH	Floodplain coordinator (Finance Officer)	SHORT	N/A	N/A	City will make this a priority.
Upgrade storm sewer infrastructure.	Flooding	HIGH	Public Works Director	LONG	Unknown	FEMA; DANR	Projects are in the early planning phase.
Storm shelter acquisition.	Summer storm	MED	Public Works Director	MID	≈\$250,000	FEMA	City intends to apply for funding for a multi-use shelter in the city park.
<b>EMERY ACTIONS</b>	<b>HAZARD</b>	<b>PRIORITY</b>	<b>PROJECT LEAD</b>	<b>TIME</b>	<b>COST</b>	<b>FUNDING</b>	<b>STATUS</b>
Ensure continued NFIP compliance. More training and program information will be requested from state NFIP coordinator.	Flooding	HIGH	Floodplain coordinator (Finance Officer)	SHORT	N/A	N/A	City will make this a priority.
Upgrade storm sewer infrastructure.	Flooding	HIGH	Public Works Director	LONG	Unknown	FEMA; DANR	Projects are in the early planning phase.

Generator acquisition for critical facilities.	Winter storm	MED	City council	MID	≈\$25,000	FEMA	City will identify facilities and apply for funding as opportunities develop.
Storm shelter acquisition.	Summer storm	MED	Public Works Director	MID	Unknown	FEMA	City intends to develop a proposal and apply for funding as opportunities develop.
<b>FULTON ACTIONS</b>	<b>HAZARD</b>	<b>PRIORITY</b>	<b>PROJECT LEAD</b>	<b>TIME</b>	<b>COST</b>	<b>FUNDING</b>	<b>STATUS</b>
Ensure continued NFIP compliance. More training and program information will be requested from state NFIP coordinator.	Flooding	HIGH	Floodplain coordinator (Finance Officer)	SHORT	N/A	N/A	Town will make this a priority.
Storm shelter acquisition.	Summer storm	HIGH	Town board	MID	Unknown	FEMA	Town intends to develop a proposal and apply for funding as opportunities develop.

**Potential Resources for Funding Assistance:**

CDBG      Community Development Block Grant  
 DOT      SD Dept of Transportation  
 JRWDD    James River Water Development District

DANR  
 FEMA

South Dakota Dept of Agriculture and Natural Resources  
 FEMA Hazard Mitigation Grant Program

## Mitigation Action Plan

The Hanson County Hazard Mitigation Plan is the backbone for disaster mitigation planning within the county. To remain useful, the plan cannot exist in a vacuum – it is designed to work with other local planning and development tools and mechanisms, and local officials and policy makers need to be familiar with it. This section first describes how the mitigation plan will be incorporated into existing planning mechanisms, and concludes by describing how the mitigation strategy will be implemented.

### Plan Incorporation

It is important that the goals and actions included in this plan be integrated with the other plans and policies within the county that may affect land use and development. Neither this plan nor any of the others will work effectively if they contain contrary goals or policy recommendations. The following table shows the planning-related technical documents that currently exist within the county, each of which was reviewed as this plan was being developed. Looking ahead, future updates of this plan should not be made without reviewing these planning tools.

**Table 4.3 – Local Planning Mechanisms**

	Capital Improvement Plan	Comprehensive Land Use Plan	Zoning ordinance	Building codes	Electrical Construction Plan	Housing Plan	Flood damage prevention ordinance	Drainage ordinance	Five Year Highway Improvement Plan	Fire Management Plan
<b>Hanson County</b>		X	X				X	X	X	
<b>Alexandria</b>		X	X			X	X			
<b>Emery</b>							X			
<b>Fulton</b>							X			

Hazard mitigation concepts should be incorporated where appropriate into the policy documents listed in the table. It is also important that major development projects within the jurisdictions be undertaken based on sound hazard mitigation planning.

Hazard mitigation also is discussed in the 2019 Comprehensive Economic Development Strategy (CEDS) for the Planning & Development District III region, which includes Hanson County. The CEDS, which is produced for the Economic Development Administration, analyzes development issues, opportunities, and challenges from a regional perspective. It is being updated at this time with a greater emphasis on the subject of economic resiliency, including the role that hazard mitigation can play in helping communities maintain their economic wellbeing. Information from this plan will be used as the CEDS is updated.

## Plan Implementation

The Hanson County Emergency Management Director is ultimately responsible for ensuring that the plan's mitigation strategy is implemented effectively. The director will work under the authority of the county commission to implement the strategy, and will coordinate his/her activities with other county departments and other agencies as needed. Each jurisdiction participating in this plan also will play a critical role in carrying out the action plan by identifying and prioritizing the actions they want to pursue, allocating resources for their implementation, and applying for funding assistance as needed. If and when they are able to secure funding, they will move forward with implementing their actions.

The availability of funding is critical to the success of this plan, and therefore the mitigation actions listed in **Table 4.2** should be considered when the jurisdictions begin the process of working on their annual budgets. In this way, the plan will not become a mere "wish list" of ideas for which there is no practical funding mechanism. For those jurisdictions that lack any other planning tools and mechanisms, this may be the only practical way for the plan to be implemented. To help ensure that this happens, the Emergency Management Director will continue reaching out to each community at least annually to discuss hazard mitigation, including the possibility of obtaining funds through FEMA or other sources for the projects they have identified.

If FEMA mitigation funds are awarded for a project, grant administration will be the responsibility of the local jurisdiction, which will appoint an individual who will be responsible for ensuring that the project is completed as proposed and that all grant award conditions and requirements are followed. A resource that can help the jurisdictions meet the FEMA grant requirements (and help develop the grant applications) is the Planning & Development District III office. District III staff have decades of experience working on various planning and community development activities within Hanson County, and over a decade of experience working with the county's emergency management office.

# CHAPTER V

## PLAN MAINTENANCE

### Background

Plan maintenance is a continuous process, which involves monitoring, evaluating, and updating the plan. It provides the foundation for an ongoing mitigation program and helps ensure that the plan remains relevant and effective. This chapter addresses how Hanson County officials intend to ensure that the plan will remain a dynamic, useful tool for mitigating against the impact of future disaster events.

### Plan Monitoring and Evaluation

Ultimate responsibility for monitoring the plan and evaluating its effectiveness lies with the Hanson County Emergency Management Director. The director will work with the support of the Hanson County Local Emergency Planning Committee (LEPC), which meets quarterly and includes representation from each jurisdiction participating in this plan.

The LEPC will review the plan annually. Major points of discussion will include whether the risk assessment remains valid because of new development or other factors that may impact vulnerability to hazards, whether the mitigation goals and objectives identified in the plan remain sound, and whether progress is being made on implementing the mitigation actions identified in the plan. An opportunity also will be provided to add additional mitigation actions to the plan as needed. If any new projects are identified, the South Dakota Office of Emergency Management will be notified so that the project will be eligible for hazard mitigation assistance in the next funding cycle.

After the LEPC's plan review meeting, the Emergency Management Director will meet with the Hanson County commission and the other participating jurisdictions to discuss the progress being made to implement the plan. At this time, a determination will be made about whether the implementation strategy needs to be revised or the plan itself needs to be updated.

Plan evaluation must be an ongoing process. This will help ensure that the plan remains relevant and able to meet local conditions and priorities, which can change. Following are some of the factors that can have a major impact on mitigation planning:

- Occurrence of a significant disaster event – Serious events can reveal flaws in local jurisdictions' disaster preparedness plans. The 9/11 terrorist strikes are a dramatic example of this type of event.
- Change in the nature or magnitude of risks – Changing environmental conditions, increased development in sensitive areas, and other factors can be significant

enough to cause localities to rethink their mitigation strategies. As discussed earlier, climate change may increase the county's vulnerability to drought, and possibly other hazards.

- Change in funding availability – The availability of money often determines whether an action can be implemented. For example, local budget cuts can delay, or prevent altogether, a mitigation project's implementation. On the other hand, grant opportunities for specific types of mitigation actions may argue for their implementation.
- Change in local priorities – Local priorities regarding mitigation projects can change for a number of reasons. Regular meetings between the Hanson County commission and the local township boards are one way in which the county stays current on the townships' needs regarding their roads, bridges, and other infrastructure.
- Legal factors – Laws and regulatory requirements may change, which may make certain mitigation actions more or less feasible or desirable.
- Technological change – Advances in technology may make it possible in the future to address certain types of hazards more effectively or at lower cost.
- Other factors – There are many other factors that can have an impact on local disaster mitigation priorities and strategies. For example, a detailed engineering analysis may indicate that a proposed mitigation action may be much costlier than first estimated, which could make the action unpractical to pursue.

## **Updating the Plan**

Updating the plan may occur at any time in response to the factors identified above. Otherwise, it is expected that the County will begin the process of updating the plan approximately two years prior to the plan's expiration date. Plan updates will reflect changes in growth and development, changing mitigation priorities, and progress in implementing the mitigation actions listed in this plan. Led by the Emergency Management Director, the process will consist of the following general steps:

- Obtain funding assistance
- Hire contractor to write the plan
- Organize planning team
- Begin soliciting public participation and input
- Hold meetings of planning team to develop the plan
- Make draft of the plan available for public review and comment
- Submit plan for State review
- Revise plan as needed based on reviewer comments
- Plan submitted by State to FEMA
- Revise plan as needed based on reviewer comments
- Jurisdictional adoption of approved plan

## **Public Involvement**

Throughout the development of this plan update, a sustained effort was made to involve the general public in the plan. Outreach included press releases that were printed in the local newspaper and posted on the Hanson County website. Looking forward, the outreach strategy will evolve over time as different methods are used to get greater public participation in the mitigation planning process. Once approved, the plan will be available for the public to see at the county courthouse and in each city office. It also will be made available on the community websites. Other outreach activities may include:

- Community visits by the Emergency Management Director to discuss the plan (local schools, civic meetings, etc.)
- Press releases and articles about the plan published in the *Alexandria Herald*.
- Information about the plan included with utility billing statements.

Another way for the public to participate in the mitigation planning process will be through the mitigation plan review meeting of the Hanson County LEPC. The meeting will be made known to the public through a public notice in the *Alexandria Herald* stating that the plan will be reviewed at the meeting and that comments from the public are encouraged. All comments and suggestions received from the public through any of the forums described above will be included in a public comment section in the plan's appendix.

# APPENDICES

Appendix A	Outreach Effort
Appendix B	Documentation of Meetings
Appendix C	History of Previous Hazard Occurrences
Appendix D	Community Assets
Appendix E	References

## **APPENDIX A: Outreach Effort**

This section documents the outreach effort that was used to solicit input into the plan.

### **Meeting #1 - Email to Planning Team:**

**From:** John Clem  
**Sent:** Wednesday, June 30, 2021 8:57 AM  
**To:** Trabing, Lesa <Lesa.Trabing@state.sd.us>; City of Alexandria <mgcityofalec@triotel.net>; City of Emery <emerycity@triotel.net>; Fulton Town <fultontown@triotel.net>  
**Cc:** Don Huber <hansoncoe-m@triotel.net>  
**Subject:** Hanson County PDM Plan

Good morning,

Hanson County is beginning the process of updating its Pre-Disaster Mitigation (PDM) Plan, which is something we do every five years. We'll be having a couple of meetings this year to gather information from the County and each of the communities. The first meeting will be held July 21 at 8:00 PM in the Commissioners' Room at the Hanson County Courthouse.

One of the things we'll be discussing is the status of the projects listed in the County's current PDM plan, which I will forward to you shortly. We'll also discuss how hazards like summer storms, winter storms, and flooding impact the County and each community. The meeting will take no more than an hour.

Let me or Don know if there are any questions about the meeting, or the planning process in general.

John Clem  
Planning & Development District III  
Yankton, SD 57078  
800 952-3562  
[John.Clem@districtiii.org](mailto:John.Clem@districtiii.org)

### **Meeting #1 - Email to Emergency Management Directors in Other Counties:**

**From:** John Clem  
**Sent:** Monday, July 12, 2021 10:47 AM  
**To:** Allemang, Heather <Heather.Allemang@state.sd.us>; Poppen, Jim <Jim.Poppen@state.sd.us>; Kafka, Kyle <Kyle.Kafka@state.sd.us>; Jeff Bathke <jeffb@davisoncounty.org>; Brian Humphrey <bhumphrey@hutchinsoncounty.org>; Jason Coenen <deputyjason@santel.net>  
**Cc:** hansoncoe-m@triotel.net; Trabing, Lesa <Lesa.Trabing@state.sd.us>  
**Subject:** Hanson County PDM Plan Meeting

Good morning folks –

This is just an FYI that **Hanson County** is beginning the process of updating its current Pre-Disaster Mitigation Plan. The first meeting will be held at the Hanson County Courthouse on July 21 at 8:00 PM. We welcome your participation, but note that it's an in-person meeting only. Let me know if there are any questions about the meeting.

John Clem  
Planning & Development District III  
Yankton, SD 57078  
800 952-3562  
[John.Clem@districtiii.org](mailto:John.Clem@districtiii.org)

24-101-57, pending an easement on 29th Ave., as the easement has been s not affect gov- y, does not drain e lake, does not fered lake, does r county. It does ributing land to i, erosion poten- y impact to water y, ag production nronmental qual- esthetics will be nd wildlife values ng watercourse age is a reason- it and aid to the ral system, drain- le artificial drain int of water to be iable, the design cts of the drain impact of suson- able. All voted rd. further business l, a motion was econded by Fox ng. All voted aye,

Chairman Drainage Board ditor at the approxi-

**District 30-1**

7311 proposals for Engi- cool District is re- its for a track and : Hanson School g into replacing cck with a new hey are also look- /relocating their s part of the proj- loe like to look at l stadium seating rea with secured rth the press box. of District is plan- onstruction Man- Delivery Method

of contact for the istrict will be Mr. estions, as well as nation regarding proposals require- addressed to Mr. nct information proposals are due 4, 230 6th Street, 57311 by Friday,

Mr. Jim Bridge  
230 6th Street  
Alexandria, SD 57311  
Phone: (605)239-4387  
Email Address: james.bridge@k12.sd.us

The Hanson School District will not be responsible for any cost associated with preparing this proposal or for costs that may be incurred for potential interviews. The Hanson School District Reserves the right to reject all proposals.

Published twice at the approximate cost of \$ 11.88 (AH0708/0715-1)

**In The State Of South Dakota, County Of Hanson In Circuit Court, First Judicial Circuit**

30PRO021 Estate of Donald Prouty, deceased

Notice to Creditors Notice is given that on 6th day of July, 2021, in the Circuit Court of Hanson County, Betty Jean Prouty was informally appointed as personal representative of the estate of Donald Prouty.

Creditors of decedent must file their claims within four months after the date of the first publication of this notice or their claims may be barred.

Claims may be filed with the personal representative or may be filed with the Hanson County Clerk of Court and a copy of the claim mailed to the personal representative.

Pam Koupal, Clerk of Court Hanson County Courthouse PO Box 127 Alexandria, SD 57311 (605)239-4446 Dated this 6th day of July, 2021 Betty Jean Prouty 131 Broad Street Alexandria, SD 57311 (605)999-4977 Prepared by: Micheal D. Sharp, Esq. The Sharp Firm, Prof. LLC 143 N. 3rd Street P.O. Box 303 Emery, SD 57332 (605) 550-3000

Published three times at the approximate cost of \$ 47.25 (AH0715/0722/0729-1)

**Disaster Mitigation Meeting** Blizzards, tornadoes, and floods are a few of the natural hazards that strike this part of the country. Events like this have the potential of causing thousands of dollars annually in damage to property. To lessen the impact of these disasters in the future, Hanson County is

beginning the process of updating its current Disaster Mitigation Plan.

A series of meetings will be held to obtain input as the plan is developed. These meetings are open to everyone. If you have an idea about what can be done to prepare for future disaster events occurring in Hanson County, you are urged to attend the meetings.

The first meeting will be held on July 21 at 8:00 p.m. in the Commissioners' Room of the Hanson County Courthouse. Agenda items for the initial meeting include a discussion of hazard mitigation concepts, a review of the county's current disaster mitigation plan, and identification and profiling of the hazards that impact the county.

Additional information about the meeting can be obtained by contacting the Hanson County Emergency Management Office at hansoncoe-m@triotel.net or by calling 605 239-4218. You can also contact John Clem at 800-952-3562 or by email at John.Clem@districtiii.org.

Published twice at the approximate cost of \$ 17.38 (AH0715-2)

**COLLEGE NEWS**

Dean's List Announced Minnesota State University, Mankato MN, College of Social & Behavioral Sciences announces that Eloise Reitzel, Alexandria, has been named to the Dean's List for spring semester 2021.

The list includes the name of all the students who earned at least a 3.5 GPA last semester.

**the classifieds**

Phone 605-428-5600 or 800-621-0801 to place an ad, or E-mail to hberg@ncppub.com

**Thank you Help Wanted**

EDITOR/NEWSWRITER: The Pioneer Review in Philip, SD is seeking an Editor/NewsWriter for its weekly publication. Applicants should be self-motivated, detail oriented, and willing to work as a team. Wage Negotiable/DOE. For more info or to apply, contact Beau or Don 605-859-2516.

ELECTRICAL APPRENTICE AND MAINTENANCE EMPLOYEE - McLaughlin, SD. Assists electrical lineman in constructing, maintaining, and repairing powerlines and other duties as assigned in the water, sewer, streets, garbage, and park departments. Position is open until filled. Applications may be picked up at the City Finance Office or send resume to: City of McLaughlin, PO Box 169, McLaughlin, SD 57642 Telephone: 605-823-4428 Fax: 605-823-4429

HARDWARE MANAGER RETIRING. Golden Opportunity to train for management position in Mission, SD. Great salary, health insurance, 401 K. Resume to: msteck58@gmail.com or fax 605 856 2713.

STRASBURG CARE CENTER nursing positions open. 1)RN Nurse Manager-Full time. 2)RN/LPN for days/pm's, every 4th weekend. 3)RN/LPN for nights, 3 twelve-hour shifts/week, every 4th weekend. Competitive pay and benefits. For applications or questions, contact Bev Davis, DON at sccdon@bektel.com, call 701-336-2651, or get application www.strasburgcare-center.org

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**THANK YOU**  
Robert and Norma Moe would like to thank everyone for the many beautiful cards, phone calls, Facebook notes and greetings for our 60th anniversary. God Bless! Thanks again.  
Bob and Norma Moe  
307012

*Let's work together*  
**TO PROMOTE YOUR BUSINESS**

**Response to Press Release in Alexandria Herald:**

**From:** Dale Dykes <daled@triotel.net>  
**Sent:** Sunday, August 8, 2021 6:31 PM  
**To:** DistrictIII <DistrictIII@districtiii.org>  
**Subject:** Web Inquiry pre disaster mitigation plan

The Alexandria Herald had an article about pre -disaster mitigation plan headed up by John Clem that asked for suggestions. There is a problem on Johnson Creek in section 4 of Jasper township. It is a natural blockage but the natural blockage was caused by Hanson county replacing a drive way on private land after it was removed....It was replaced with only two culverts and higher on section 34 of Fairview Township upstream from this driveway there is an 8 foot culvert and 7 eighteen inch culvert draining in Johnson Creek. The flow of water is so slow that natural blockage occurs. This is a disaster that happens often and has destroyed roads, buildings, wildlife habit, and crops.

## Meeting #2 - Email to Planning Team:

**From:** John Clem

**Sent:** Wednesday, September 1, 2021 9:39 AM

**To:** Don Huber <hansoncoe-m@triotel.net>; Trabing, Lesa <Lesa.Trabing@state.sd.us>; mgcityofalec@triotel.net; Kyle Kampshoff <k\_kampshoff@hotmail.com>; City of Emery <emerycity@triotel.net>; fultontown@triotel.net; Kay Miller <hbark@triotel.net>

**Subject:** PDM plan meeting

Good morning folks,

Just a reminder that we'll have our second (and final) meeting for the Hanson County Pre-Disaster Mitigation Plan on **Tuesday Sept 7 at 1:00** at the courthouse. Please make sure your community is represented at the meeting. Our focus will be to review the first draft of the plan that I sent out a couple of weeks ago, especially the list of mitigation projects for each community. I can send the draft again if needed, just let me know.

Thanks again for your help, and let me know if there are any questions.

John Clem

Planning & Development District III

PO Box 687

Yankton, SD 57078

800 952-3562

[John.Clem@districtiii.org](mailto:John.Clem@districtiii.org)

## Meeting #2 - Email to Emergency Management Directors in Other Counties:

**From:** John Clem

**Sent:** Wednesday, September 1, 2021 9:43 AM

**To:** Allemang, Heather <Heather.Allemang@state.sd.us>; Poppen, Jim <Jim.Poppen@state.sd.us>; Kafka, Kyle <Kyle.Kafka@state.sd.us>; jeffb@davisoncounty.org; Brian Humphrey <bhumphrey@hutchinsoncounty.org>; Jason Coenen <deputyjason@santel.net>

**Cc:** Don Huber <hansoncoe-m@triotel.net>

**Subject:** Hanson County PDM Plan Meeting

Good morning folks –

This is just an FYI that **Hanson County** will be holding its final meeting to update the Pre-Disaster Mitigation Plan. The meeting will be held at the Hanson County courthouse on September 7 at 1:00 PM. You are all invited to participate, but please note this is an in-person meeting only. Let me or Don know if there are any questions about the meeting.

John Clem

Planning & Development District III

PO Box 687

Yankton, SD 57078

800 952-3562

[John.Clem@districtiii.org](mailto:John.Clem@districtiii.org)

**Press Release in Alexandria *Herald* After Completion of Plan:**





**HANSON COUNTY COMMISSIONERS  
MINUTES OF PROCEEDINGS  
Tuesday, August 17, 2021**

Chairman Schoenrock with members Fox, Kjetland and Waldera present, called the regular meeting of the Hanson County Board of Commissioners to order on Tuesday, August 17, 2021. Bumgardner was absent.

Conflict of interest disclosure: Waldera for the James River Archers one day liquor license.

Motion Kjetland, seconded by Waldera to approve the agenda.

Motion Fox, seconded by Waldera to approve the August 3<sup>rd</sup> meeting minutes.

Clerk of Courts fees collected for the month of July 2021 totaled \$10,707.45.

Don Patzlaff spoke during the citizens input session asking that townships be included in discussion that takes place regarding haul road agreements hoping to make businesses/entities more responsible for the roads.

Annette Steilen, Hanson County Conservation District, joined the meeting to discuss and review their 2022 budget request.

Justin Friese, Hwy Superintendent, review his departments 2022 budget request with the Board and discussed anticipated revenue due yet from FEMA.

Motion Kjetland, seconded by Waldera to authorize the Auditor to conduct an auto supplement of \$72,412.50 to the Road & Bridge budget for revenue received from Wieman's auction. All voted aye, motion carried.

The Board approved the purchase of two additional security cameras, from On Sight, that will be installed on the west hwy building.

Friese discussed the Township Instructure process for receiving funds, renting a side dump and the gravel crushing bids that will be opened on September 7<sup>th</sup>.

Motion Fox, seconded by Waldera and carried to recess Board of Commissioners to conduct business as the Drainage Board.

Reconvene Board of Commissioners.

Don Huber, Emergency Manager, reviewed the Pre-Disaster Mitigation Plan with the Commissioners. The current projects included in the plan are a hydrology study of water flow in Hanson County, drainage improvements along county and township roads, storm shelter for Lake Hanson and generator acquisition for critical facilities.

Motion Kjetland, seconded by Waldera to again decline joining the States 2022 LEMPG program. All voted aye, motion was carried.

Motion Kjetland, seconded by Waldera approving an operating transfer of \$10,000.00 from the General Fund to the Emergency & Disaster Fund to cover budgeted expenses for 2021. All voted aye, motion carried.

Motion Fox, seconded by Waldera to approve and authorize the Auditor to conduct an auto supplement of \$1,463.00 to the Sheriff's budget for auction proceeds. All voted aye, motion carried.

Brandon Wingert, Sheriff, gave an update on the County website which will be up and running soon.

Motion Waldera, seconded by Kjetland to enter into executive session at 10:19 a.m., with the Sheriff, to discuss personnel defined in SDCL 1-25-2.1. All voted aye, motion carried.

Executive session ended at 10:29 a.m.

As Jordan Johnson has completed the six-month probation period a motion was made by Waldera, seconded by Kjetland to increase Deputy Johnson's salary \$500.00. All voted aye, motion carried.

Kay Thomas joined the meeting to inquire about holding a Memorial Day program on the Courthouse lawn near the Veteran Memorial on May 30, 2022. The Board finds no problem with this request.

Due to the County Opt-Out Election, the September 21<sup>st</sup> Commissioners meeting will be moved to Thursday, September 23, 2021.

Jim Davies, States Attorney, presented a draft ordinance pertaining to the additional requirements needed regarding medical cannabis. At the recommendation of the States Attorney a motion was made by Fox, seconded by Waldera to table any action on this ordinance until Tuesday, September 7<sup>th</sup> as things are constantly changing. All voted aye, motion carried.

Motion Kjetland, seconded by Waldera to set the Hanson County Courthouse as the polling place for the Hanson County Opt-Out Election on Tuesday, September 21, 2021. All voted aye, motion carried. All registered voters in Hanson County will vote in the Courtroom of the Hanson County Courthouse.

Davies will look at and present information to clarify what information can and can't legally be published in meeting minutes.

Discussion on planting, fencing and trees in the County right-of-way took place. A letter will be mailed to all Ag landowners as a reminder of this and to notify anyone in violation of SDCL 31-32-7 that action will be taken by the Highway Department, starting in 2022, to clear or remove anything within the right-of-way.

Davies further discussed the fireworks ordinance and requested additions to his 2022 budget request.

RJ Rylance, Morgan Theeler LLP, presented a 2022 budget request for the County's Court Appointed Attorney contract. As cases continue to rise in Hanson County the request reflects a 5% increase from last year.

As advertised, a public hearing for the one-day liquor license for the James River Archers to operate at Granite Springs Lodge on September 5, 2021 was held. As no one was present to oppose this, it was moved by Kjetland, seconded by Fox to approve the license. Waldera abstained, all others voted aye, motion carried.

As advertised, a public hearing for the one-day liquor license for the James River Archers to operate at Granite Springs Lodge on September 18, 2021 was held. As no one was present to oppose this, it was moved by Fox, seconded by Kjetland to approve the license. Waldera abstained, all others voted aye, motion carried.

As advertised, a public hearing for the one-day liquor license for the James River Archers to operate at Granite Springs Lodge on September 25, 2021 was held. As no one was present to oppose this, it was moved by Kjetland, seconded by Fox to approve the license. Waldera abstained, all others voted aye, motion carried.

Brian McGinnis, District III Planning & Development met with the Board to gather the County's revenue, expenses and upcoming road and bridge projects to prepare informational maps and graphs to present at the public meeting on August 24<sup>th</sup> regarding the opt-out.

The 2022 Provisional Budget was adjusted and prepared for publishing. The final Annual Budget will be approved on September 23, 2021.

Motion Fox, seconded by Waldera and carried to allow payment of the following bills.(DELETED)

Being as there was no further business for the day, motion Kjetland, seconded by Fox to adjourn until 7:00 p.m. on Tuesday, August 24, 2021 for a special meeting concerning the County Opt-Out. All members voted aye, motion carried.

Gary Schoenrock, Chairman, Hanson County Board of Commissioners

ATTEST:

Lesla Trabing, Auditor

## City Council Meeting of Alexandria

The meeting of the **City Council of Alexandria**, Hanson County, South Dakota, was held at the Alexandria City Hall on the 4th day of August 2021, with the following members present: Mayor: Carmody, Alderman: Haynes, Kayser, DeRouchey, Persson, Degen, and Berg. Others present: Jessica Bahmuller and Kyle Kampshoff.

The meeting of council members was called to order by Mayor Carmody.

Mayor Carmody started the meeting with the Pledge of Allegiance.

Berg made the motion to approve the agenda as is. Degen seconded. Motion carried.

Minutes of the July 6<sup>th</sup> meeting were read Haynes made a motion to approve and Kayser seconded. Motion carried.

Jim Davies could not attend the meeting but, left the council with information pertaining to Initiated Measures and the Medical Marijuana which was recently passed into South Dakota law. Ordinance Number 367 an Ordinance to Regulate Medical Marijuana was given its 1<sup>st</sup> reading.

Kyle Kampshoff and the council discussed the city's water usage and water sold. The city surveillance cameras will be installed. Kampshoff discussed the lagoon repairs. Kampshoff presented the board with a quote for the water tower repairs. Maquire Iron will be completing routine maintenance for the water tower. Kampshoff discussed a base charge on meters with the council. This charge is a monthly maintenance charge for replacing the meters over the lifetime of the meter. A resolution will be written and decided on in the future. Kampshoff discussed the roof repairs and will reach out to local contractors for completing the repairs. Kampshoff discussed replacing a storm drain. The drain will be replaced next year. **Kampshoff attended a Hazard Mitigation meeting. The city is looking into options for a storm shelter being built and available funding for the project.** The council accepted a bid from Commercial Asphalt for street repairs prior to the chip sealing which will be completed this fall.

The council and finance officer discussed delinquent accounts for the month.

City Bills (DELETED)

Haynes made a motion to approve the bills as read. Degen seconded. Motion carried.

The finance officer and the council discussed the Finance officer report and the revenues and expenses for the month.

The council discussed a 3<sup>rd</sup> TIF. Terry Aaker of SPN Engineering is currently writing up proposals.

The council discussed nuisance properties.

1<sup>st</sup> Reading of Ordinance Number 368 an Annual Appropriations Ordinance was given. The council directed the Finance Officer on changes to the budget.

The council discussed the rubble site and hiring a new supervisor. An advertisement will be made public. The council also discussed the possibility of new operating hours of the rubble site.

The road to the park will be sprayed to deter dust.

The next regular meeting of the City Council will be held on September 8th, 2021 at 7:00 pm.

Therefore, being no further action to come before this meeting a motion by Degen and seconded by Berg to adjourn. Motion carried.

ATTEST: Jessica Bahmuller, Finance Officer APPROVED: Brian Carmody, Mayor

Published once at an approximate cost of \_\_\_\_\_.

## MINUTES OF THE FULTON TOWN BOARD

The Fulton Town Board met in regular session on August 2, 2021 at 7:30 am.

Present: Miller, Bartscher, Schoenrock, and Haiar.

Meeting called to order by Miller.

Additions to the agenda: None.

Public Input: None

Motion by Schoenrock, second by Bartscher to approve the agenda. Motion carried

Motion by Schoenrock, second by Bartscher to approve 7-13-21 minutes. Motion carried.

Bills:

Hanson Rural Water \$26.75, Joe Bartscher, labor & fuel reimb. \$117.12, Xcel Energy \$437.58, Central Electric, street light \$64.58, Gessner Welding, gravel/mileage \$2,250.00, Mike Mentele, blading \$1,402.50, Addy disposal, dumpster \$498.56, EMC Insurance-\$25.00 and IMT Insurance \$1,428.00.

Motion by Schoenrock to approve bills, second Bartscher, Motion carried

Old Business: Tables & Chairs / Town Hall, Mosquito grant

**New Business: Hazard mitigation project/storm shelter, 2021 budget.**

The next regular meeting of the Town Board will be Monday September 7, 2021 at 7:30 a.m.

There being no further business Chairman Miller adjourned the meeting at 7:52 a.m.

Executive session: None.

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Kay Miller, Chairman

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Brad Haiar, Finance Officer

**Minutes of Emery City Council Meeting  
August 9, 2021  
7:00 pm at City Office**

The City Council of the City of Emery, South Dakota met in regular session on Monday, August 9, 2021, at the City Office. The meeting was called to order by Council President Ben Schulz at 7:00 pm with the following members present: Aldermen Cory Dye, Andy Erickson (arrived at 7:06 pm), Paul Nelson, and Clarissa Weber, Maintenance Supervisor Travis Kampshoff, Finance Officer Kristi Wollmann, Daycare Director Kelly Tschetter and Daycare Co-Director Brittany Wingert. Visitor in attendance was Mike Fink. Mayor Joshua Kayser and Alderman Kenny Kayser were unable to attend.

Motion Weber, seconded by Dye and carried to approve the agenda. All votes aye.

Motion Dye, seconded by Nelson and carried to approve the minutes of the regular meeting July 12, 2021. All votes aye.

**Public Comment** – none

**Visitors** –

Mike Fink discussed moving forward with adding an ordinance to create licensing provisions for medical cannabis.

**Daycare Report** – Financials were discussed. The Daycare is looking for more Part Time and Full Time workers. New rates were discussed and will take into effect with the new school year.

**Executive Session** – Motion Dye, seconded by Erickson and carried to enter into Executive Session at 7:56 pm pursuant to SDCL 1-25-2(4) Personnel. All votes aye. Dye declared out of Executive Session at 8:23 pm. No action taken.

**Maintenance Report** – Travis is working on exercising valves and he will be flushing hydrants soon. The pool liner will be installed in September. Council reviewed a quote to repair the motor on one basketball hoop at the auditorium. A quote was presented from SD Association of Rural Water Systems for locates for all valves and curb stops. Motion Dye, seconded by Nelson and carried to accept the quote at a cost of \$3,100.00 from SDARWS to complete GPS above ground water system appurtenances, including: valves, wells, hydrants, flushing devices, pump station, tanks, towers including one 36" x 42" map. All votes aye.

**Garbage Contract Discussion** - The current garbage contract was reviewed and discussed

**Finance Officer Report**- Council reviewed all claims to approve. Financial reports were reviewed and discussed.

**July 2021 Gross Wages by Department** - Finance \$3,143.15; Streets \$5,880.42; Solid Waste \$2,322.63; Sewer \$2,371.83; Water \$2,841.92; Pool \$10,742.04; Parks \$1,927.66; Daycare \$26,854.57

**Claims to approve (prior to meeting) (DELETED)**

**Claims to approve (at meeting) (DELETED)**

Motion Erickson, seconded by Dye and carried to approve the above claims be allowed and paid. All votes aye.

Motion Dye, seconded by Weber and carried to approve the financial reports as presented. All votes aye.

**Old Business**

**Nuisance Properties** – Nuisance properties were discussed and letters will be sent.

**New Business**

**1<sup>st</sup> Reading Ordinance 2021-06** – The 2022 Budget report was reviewed and a discussion was held. Ordinance 2021-06 Appropriation for 2022 was presented for a first reading. Motion Weber, seconded by Erickson and carried to approve the 1<sup>st</sup> reading of Ordinance 2021-06, 2022 Budget Appropriations Ordinance. All votes aye.

**Pre-Disaster Mitigation Plan Discussion** – A discussion was held on projects to include for the Hanson County Pre-Disaster Mitigation (PDM) Plan. The following hazard mitigation projects were recommended for Emery: Stormwater system improvements, generators for critical facilities and a storm shelter.

**Mayor Replacement** – table and discuss further at a later date.

**Adjourn** – Motion Dye, seconded by Nelson and carried to adjourn at 9:20 p.m. All votes aye.

The next regular council meeting will be September 12, 2021 at 7:00 pm.

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Joshua Kaiser, Mayor

ATTEST:

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Kristi Wollmann, Finance Officer

## **APPENDIX C: History of Previous Hazard Occurrences**

This appendix provides details about hazard events that have impacted Hanson County in the past. **Table C.1** below lists all of the events since 1970 that resulted in a major disaster declaration in which Hanson County was part of the designated area. Records from FEMA were consulted for federal assistance provided following each disaster through FEMA's Public Assistance program.

**Table C.1 – Major Disaster Declarations Affecting Hanson County**

<b>Dec #</b>	<b>Date Disaster Declared</b>	<b>Type</b>	<b>Primary Damage Impact</b>	<b>Public Assistance To County</b>
3015	Jun 1976	Drought		
717	Jul 1984	Severe Storm; Flood		
999	Jul 1993	Flood; Severe Storm; Tornado		
1031	Jun 1994	Severe Storm; Flood		
1052	May 1995	Severe Storm; Flood		
1075	Jan 1996	Ice Storm		
1156	Feb 1997	Severe Winter Storm; Blizzard		
1173	Apr 1997	Severe Storm; Flood		
1218	Jun 1998	Severe Storm; Tornado; Flood		
1375	May 2001	Severe Storm		≈\$40,000
1620	Dec 2005	Severe Winter Storm		≈\$15,000
1702	May 2007	Severe Storm; Tornado; Flood		≈\$350,000
1774	Jul 2008	Severe Storm; Flood	Roads, bridges	≈\$50,000
1915	May 2010	Flood	Roads, bridges	≈\$150,000
1984	May 2011	Flood	Roads	≈\$155,000
4186	Jul 2014	Severe Storm; Tornado; Flood	Roads, bridges	≈\$25,000
4440	Jun 2019	Severe winter storm; Flooding	Roads, bridges	≈\$160,000
4463	Sep 2019	Severe storms; Flooding	Roads, bridges	≈\$35,000
4469	Nov 2019	Severe storms; Tornado; Flooding	Roads, bridges	≈\$510,000

Sources: [www.fema.gov/disasters/grid/state-tribal-government/72](http://www.fema.gov/disasters/grid/state-tribal-government/72); [www.fema.gov/data-feeds/openfema-dataset-public-assistance-funded-projects-summaries-v1](http://www.fema.gov/data-feeds/openfema-dataset-public-assistance-funded-projects-summaries-v1)

**Table C.2** is a comprehensive list of the most significant hazard events reported for Hanson County from 1960 through 2020, as recorded in the National Climatic Data Center's Storm Events Database. The National Climatic Data Center receives storm data from the National Weather Service, which gets its information from a variety of sources, including county, state and federal emergency management officials, local law enforcement officials, National Weather Service damage surveys, the insurance industry, and the general public.

The Storm Events Database is useful, but it does have limitations. One problem is that records for certain hazard events, including winter storms and blizzards, only go back to the 1990s. Another issue is that damage amounts in most cases are estimates, especially for events that impacted multiple counties. Also note that the database contains a

preponderance of records from recent times. This is due to an inconsistency in data reporting over the years, and does not indicate an increase in the frequency of events affecting the county.

The table includes the following information about the events:

- Date - multiple events may be shown for a single day because a storm system may contain many specific storm events affecting different locations.
- Type of event.
- Descriptive information - details are provided for some of the more noteworthy events back to the 1990s.
- Magnitude - the magnitude of tornadoes, hail, thunderstorm winds, and high wind events is given. For events occurring since 2000 the speed is represented by either the highest measured wind gust (M) or the highest estimated wind gust (E). Note that speeds are shown in knots - multiply figure by 1.15 to get approximate speed in miles per hour.
- Property and crop damage - the National Weather Service uses all available data from the sources identified above in compiling the damage amounts, but the figures should be considered as broad estimates. In many cases, damage amounts are unknown.

**Table C.2 – History of Significant Hazard Events in Hanson County**

Date	Event Type	Event Description	Mag	Prop Damage (\$1,000s)	Crop Damage (\$1,000s)
8/18/1960	Tornado		F1		8/18/1960
7/7/1964	Hail		3.00 in.		7/7/1964
7/25/1968	Hail		0.75 in.		7/25/1968
6/24/1978	Thunderstorm Wind				6/24/1978
6/24/1978	Tornado				6/24/1978
7/01/1983	Thunderstorm Wind				
6/05/1984	Thunderstorm Wind				
4/19/1985	Thunderstorm Wind		61 kts.		
5/11/1985	Tornado		F0		
5/10/1986	Hail		1.25 in.		
8/16/1986	Thunderstorm Wind		87 kts.		
5/17/1987	Thunderstorm Wind		57 kts		
5/12/1991	Tornado		F0		
5/28/1991	Thunderstorm Wind		60 kts.		
5/7/1993	Thunderstorm Wind		60 kts.	50	
1/17/1996	Blizzard	A blizzard spread across the area from the west. Snow 3 to 12 inches deep was accompanied by 50 to 60 mph winds and very cold temperatures. The wind chill dropped to around -70. Roads and many businesses and schools were shut down. The		40	

Date	Event Type	Event Description	Mag	Prop Damage (\$1,000s)	Crop Damage (\$1,000s)
		total destruction of at least 3 homes by fire was due in part to the inability of firefighters to travel across blocked roads. Several accidents occurred and other vehicles slid into ditches or became stranded. One man died of exposure near Bridgewater after his vehicle was stranded.			
1/24/1996	Heavy Snow				
1/29/1996	Extreme cold	Wind chill readings as cold as 80 below zero occurred as winds over 30 mph combined with temperatures of 10 below to 30 below zero. Many vehicles failed to start, but the main impact was financial with greatly increased heating energy use, and purchase of supplies and services to ensure furnace operation.			
2/10/1996	High Wind		58 kts.	20	
3/24/1996	Blizzard	Snow accumulating 3 to 8 inches was accompanied by winds over 50 mph at times, producing widespread whiteout conditions. Numerous vehicles slid into ditches and many people were stranded in vehicles. There were some rollovers and other accidents.		30	
4/25/1996	High Wind		62 kts.		
10/29/1996	High Wind		57 kts.		
11/14/1996	Ice Storm	Several periods of freezing rain caused widespread damage and paralyzed travel. Widespread damage occurred to electrical poles and lines, leaving thousands without power for up to four days. Numerous accidents occurred. Tree damage was widespread with tree debris blocking several roads and sidewalks. Some farm buildings and other small structures were damaged by the weight of ice and snow on roofs.		30	
12/14/1996	Heavy Snow				
12/16/1996	Blizzard				
1/4/1997	Blizzard	Winds gusting to 45 mph combined with 2 to 4 inches of new snow and existing loose snow cover to cause widespread blizzard conditions in blowing snow. Visibility was frequently reduced to near zero, roads were blocked, and businesses were closed.		30	
1/9/1997	Blizzard				
1/15/1997	Extreme cold	Temperatures a few degrees below zero accompanied by wind gusts over 40 mph created wind chills as cold as 70 below zero. Drifting snow and areas of low visibility in blowing snow also occurred in open areas.			
2/3/1997	Heavy Snow				
3/12/1997	Flood	Widespread snowmelt flooding began in March and continued through the end of the month. Record flooding occurred on the James River. Widespread flooding of farmland and other lowlands occurred, both near and away from major river basins. Many roads, farm buildings, and some homes and businesses were flooded. Many basements were flooded just from groundwater seepage. Travel was severely hampered by flooded roads in some areas. Farmland flooding was severe and widespread.			
4/1/1997	Flood				
4/6/1997	High Wind		63 kts.	10	
4/9/1997	Heavy Snow				
5/1/1997	Flood				
6/20/1997	Thunderstorm Wind	Thunderstorm winds caused widespread damage to homes,	78 kts.	1200	

Date	Event Type	Event Description	Mag	Prop Damage (\$1,000s)	Crop Damage (\$1,000s)
		trailers, barns, other structures, trees, and vehicles at the Oak Lane Hutterite colony south of Alexandria. Three people were injured when their trailer home was flipped and damaged.			
3/31/1998	Heavy Snow	Snowfall of 6 to 16 inches occurred over a large area, causing some damage to power lines resulting in power outages.		5	
5/20/1998	Flood				
5/30/1998	Tornado	A large and strengthening tornado destroyed buildings and other property on five farms and also destroyed trees and power lines before crossing the eastern edge of Hanson County.	F3	1000	100
5/30/1998	Tornado	A tornado damaged trees, power lines, and crops.	F1	20	10
5/30/1998	Tornado	A tornado damaged trees, power lines, and crops.	F1	20	10
5/30/1998	Tornado	A tornado damaged trees and power lines.	F2	50	
5/30/1998	Tornado	A tornado caused tree and power line damage.	F1	50	
5/30/1998	Hail		1.75 in.		
8/24/1998	Hail		1.75 in.		
11/10/1998	Blizzard	Snow accumulating 4 to 14 inches combined with winds gusting as high as 60 mph caused zero visibilities in snow and blowing snow, drifting snow, and damage to trees and power lines with resultant power outages. Some of the power outages lasted over 2 days. Most roads were closed and many people were stranded in vehicles after the sudden onset of the heavy snow.		20	
1/1/1999	Winter Storm				
1/20/1999	Winter Weather				
3/8/1999	Winter Storm				
5/12/1999	Flood				
6/7/1999	Thunderstorm Wind		50 kts.	5	
6/7/1999	Thunderstorm Wind		61 kts.	30	
11/1/1999	Drought	Generally dry weather that began in August continued through November. Dry surface and soil conditions became quite pronounced in November. Water levels fell, especially in small streams and lakes. Damage to winter wheat crops was feared. The area experienced the third driest fall (September through November) period on record. Unusually warm weather during the month contributed to the drying. The most noticeable manifestation of the dry conditions was the large number of grass fires across the area. While damage was mainly limited to the grasslands, considerable manpower and expense was needed to fight the fires.			
12/1/1999	Drought				
2/1/2000	Drought	Dry weather that prevailed during the fall continued in February, Dry surface and soil conditions remained quite pronounced. Water levels continued to fall slowly, especially in wetlands, small streams, and lakes. Above normal temperatures contributed to further drying. Grass fires were again a problem in some areas.			
3/1/2000	Drought				
4/1/2000	Drought				
4/5/2000	High Wind		56 kts. E	17	

Date	Event Type	Event Description	Mag	Prop Damage (\$1,000s)	Crop Damage (\$1,000s)
4/16/2000	Ice Storm	Freezing rain caused significant ice accumulation on trees, power lines, and other exposed surfaces. The ice caused tree damage, much of it minor. A few power lines and poles were also pulled down by the weight of the ice.			
8/5/2000	Thunderstorm Wind		61 kts. E		
11/6/2000	Winter Storm				
11/11/2000	Winter Storm				
12/16/2000	Blizzard				
12/28/2000	High Wind		52 kts. E		
1/29/2001	Winter Storm				
2/7/2001	Winter Storm				
2/24/2001	Winter Storm				
4/4/2001	Flood				
5/1/2001	Flood				
11/26/2001	Heavy Snow				
2/11/2002	High Wind		50 kts. E		
3/14/2002	Winter Storm				
6/25/2002	Hail		1.75 in.		
2/14/2003	Winter Storm				
4/6/2003	Winter Weather				
6/9/2003	Thunderstorm Wind	Thunderstorm winds destroyed a mobile home, causing minor injuries to the couple inside at the time. The winds also caused damage to trees and sheds.	69 kts. E	100	
7/4/2003	Thunderstorm Wind		61 kts. E		
11/3/2003	Winter Weather				
11/23/2003	Winter Storm				
12/2/2003	Winter Weather				
12/8/2003	Winter Storm				
1/25/2004	Winter Storm				
2/11/2004	Winter Weather				
3/15/2004	Winter Weather				
5/16/2004	Thunderstorm Wind		61 kts. E	50	
7/3/2004	Hail		1.75 in.		
7/20/2004	Hail		1.75 in.		
8/3/2004	Lightning	Lightning struck a house, starting a fire which destroyed the top floor of the house. The fire took three hours to extinguish.		50	
8/3/2004	Thunderstorm Wind		65 kts. E		
8/3/2004	Thunderstorm Wind		65 kts. E		
10/30/2004	High Wind		50 kts. E		
12/20/2004	Winter Weather				

Date	Event Type	Event Description	Mag	Prop Damage (\$1,000s)	Crop Damage (\$1,000s)
1/4/2005	Heavy Snow				
3/10/2005	High Wind		54 kts. E	10	
3/18/2005	Heavy Snow				
5/7/2005	Thunderstorm Wind		61 kts. E	5	
8/3/2005	Hail		1.75 in.	5	
11/8/2005	High Wind		52 kts. E		
11/27/2005	Ice Storm	Heavy freezing rain coated roads, and power lines with ice up to 3 inches thick throughout SE South Dakota. Many roads were shut down for extended periods. Most schools and businesses were forced to close. Many miles of power lines and thousands of poles were brought down, resulting in power outages to thousands of households. In some rural areas, power was out for more than two weeks. Many people took shelter wherever they could. Damage to power poles and lines was so great that repairs required assistance from crews from eight states.		1000	
11/28/2005	Blizzard	Snowfall from 4 to 15 inches combined with winds gusting over 50 mph to produce blizzard conditions. Heaviest snowfall was near and west of the James River, in the area where a severe ice storm immediately preceded the blizzard. Several reports of 6 to 8 foot drifts were received. Travel was made impossible in many areas as roads were closed for extended periods. Most schools and businesses not already closed because of the ice storm were forced to close. The winds during the blizzard continued to bring down power lines and poles, most of which had been coated and weighted down by ice in the area hit by the ice storm.		100	
11/30/2005	Winter Weather				
1/1/2006	Winter Weather				
3/12/2006	Winter Weather				
7/18/2006	Drought				
8/1/2006	Drought				
9/16/2006	Hail		1.75 in.		
12/20/2006	Winter Weather				
2/12/2007	Winter Weather				
2/24/2007	Winter Storm	Rain changed to freezing rain, causing light icing before the precipitation quickly changed to snow. Snow accumulated 5 to 7 inches. The icing and subsequent snow accumulation made travel very difficult, with several vehicle accidents and numerous vehicles sliding into ditches.			
2/28/2007	Heavy Snow				
3/1/2007	Blizzard				
3/12/2007	Flood				
4/10/2007	Winter Weather				
5/4/2007	Tornado	A tornado damaged a house, garage, barn, and power lines.	EF1		
5/4/2007	Tornado		EF0		
5/5/2007	Tornado	A tornado caused damage to trees and a junk yard after crossing over from McCook County.	EF2	10	

Date	Event Type	Event Description	Mag	Prop Damage (\$1,000s)	Crop Damage (\$1,000s)
5/5/2007	Tornado	A tornado damaged a farmstead, blowing the roof off a gust house. The tornado also caused tree damage. The tornado crossed into eastern Davison County before dissipating.	EF1	10	
5/5/2007	Tornado	A tornado damaged barns and blew out windows.	EF1	10	
5/5/2007	Hail		1.75 in.		
5/5/2007	Thunderstorm Wind		61 kts. E	5	
5/5/2007	Flood	Heavy rainfall caused flooding of low areas including fields, homes, businesses, schools, roads, streams, and bridges. The flooding was a longer term event than flash flooding, which also had resulted. Long term major flooding of the James River also resulted. Some parks and other recreation areas were affected. A few roads and bridges were washed out by the high water. The flooding delayed planting of crops in some areas.		100	
5/5/2007	Flash Flood				
6/1/2007	Flood				
12/1/2007	Winter Weather				
12/25/2007	Winter Weather				
2/11/2008	Winter Weather				
3/31/2008	Heavy Snow				
4/10/2008	Blizzard				
4/25/2008	Heavy Snow				
6/4/2008	Flash Flood	Heavy rainfall caused flash flooding of several county and township roads near South Dakota Highway 42.			
6/6/2008	Flood				
11/6/2008	Winter Weather				
12/14/2008	Blizzard				
12/20/2008	Winter Weather				
1/12/2009	Winter Weather				
2/26/2009	Winter Weather				
3/31/2009	Blizzard				
4/1/2009	Flood				
4/4/2009	Blizzard				
5/1/2009	Flood				
5/31/2009	Hail		1.75 in.		
6/1/2009	Flood				
6/24/2009	Tornado		EF0		
6/24/2009	Tornado		EF0		
7/1/2009	Flood				
7/9/2009	Thunderstorm Wind		61 kts. E		
8/1/2009	Flood				
8/2/2009	Hail		2.00 in.	50	

Date	Event Type	Event Description	Mag	Prop Damage (\$1,000s)	Crop Damage (\$1,000s)
8/8/2009	Hail		2.75 in.	10	
12/8/2009	Winter Weather				
12/23/2009	Blizzard	Prolonged snowfall produced heavy accumulations over southeast South Dakota, ranging up to over 20 inches in several areas. The snowfall took place from two days before to the day after Christmas. The snowfall was accompanied by increasing north to northwest winds which caused widespread blizzard conditions on Christmas day and the start of the next day.			
1/6/2010	Blizzard	Snowfall of 3 to 6 inches, previously existing snow cover, and northwest winds gusting to over 40 mph produced widespread blizzard conditions, with visibilities less than a quarter mile. Schools and businesses were closed, and travel became impossible in much of the area. The wind combined with cold temperatures to produce wind chills colder than 35 below zero during the latter part of the storm. This extreme cold continued into the next day, Friday, January 8th.			
1/7/2010	Extreme cold	Persistent north/northwest winds combined with very cold air to produce wind chill values that dropped to 35 below zero.			
1/25/2010	Winter Weather				
2/13/2010	Winter Weather				
3/11/2010	Flood				
4/1/2010	Flood				
5/1/2010	Flood				
6/1/2010	Flood				
7/1/2010	Flood				
7/23/2010	Thunderstorm Wind		61 kts. E		
8/1/2010	Flood				
8/3/2010	Tornado		EFO		
8/19/2010	Thunderstorm Wind		56 kts. E	5	
9/20/2010	Flood				
10/26/2010	High Wind		52 kts. E		
11/20/2010	Winter Weather				
12/10/2010	Blizzard				
12/20/2010	Winter Weather				
12/30/2010	Winter Weather				
1/9/2011	Winter Weather				
1/31/2011	Winter Weather				
2/1/2011	Extreme cold	North/northwest winds averaging 15 to 30 mph combined with temperatures dropping below zero to produce wind chills of 35 to 40 below zero.			
2/20/2011	Heavy Snow				
3/16/2011	Flood				
4/1/2011	Flood	Major flooding of the James River, as well as flooding of small streams and lakes in the county, continued through April. Much farmland remained flooded, both near to and away		500	

Date	Event Type	Event Description	Mag	Prop Damage (\$1,000s)	Crop Damage (\$1,000s)
		from the James River. The James River was at its highest on April 1st, and fell very slowly during the month. A large area of land and numerous roads were flooded at the start of the month. Water was running over other roads, from flooded streams, creeks, and fields as well as from the James River. Many roads were heavily damaged. Some homes and businesses were also flooded, with the flooding of these places slowly alleviating through the month. High water and groundwater levels from record precipitation in the year 2010, a main reason the flooding onset was so fast in March, was also a main reason that the flooding subsided so slowly during April.			
5/1/2011	Flood				
6/1/2011	Flood	Moderate to major flooding of the James River, ongoing since the snowmelt season in March, continued through June. Farmland and other lowlands near the river remained flooded, with the water level first falling slowly, then rising due to runoff from heavy rain. The highest water levels were generally at the end of the month, though the river remained below the peak levels of May.			
6/13/2011	Flash Flood				
7/1/2011	Flood	Moderate to major flooding of the James River, ongoing since the snowmelt season in March, continued through July. Farmland and other lowlands near the river remained flooded, with the water level varying slightly up and down due to sporadic heavy rainfall.			
7/15/2011	Excessive Heat				
8/1/2011	Flood	Moderate to major flooding of the James River, ongoing since the snowmelt season in March, continued into early August, with the flooding continuing but very slowly abating through the month. Flooding of farmland and other lowlands near the river very slowly abated.			
8/28/2011	Hail		1.75 in.		
1/20/2012	Winter Weather				
2/13/2012	Winter Weather				
5/1/2012	Hail		1.25 in.		
5/5/2012	Hail		1.75 in.		
5/5/2012	Hail		1.75 in.		
5/5/2012	Flash Flood				
5/6/2012	Flood				
6/26/2012	Excessive Heat				
7/1/2012	Drought	Drought conditions became established over the area. Stress on crops increased with no relief during the month. Hot weather added to the stress. Crop damage became certain. Severe non-ag water supply problems were not observed, but the long term dry conditions raised fears for the future.			
7/2/2012	Excessive Heat				
7/15/2012	Excessive Heat				
7/18/2012	Excessive Heat				
8/1/2012	Excessive Heat				

Date	Event Type	Event Description	Mag	Prop Damage (\$1,000s)	Crop Damage (\$1,000s)
8/1/2012	Drought	Drought was generally listed as severe to extreme for the area, and was being compared to the worst of the dust bowl years, though not yet over as long a time period. Stress on crops continued, even though August was less hot than July. Crop damage was quite evident. Many local governments had water use restrictions in place.			
9/1/2012	Drought	Drought conditions continued over all of southeast South Dakota. Rainfall for the month varied from around half to less than a quarter of normal. Stress on crops that prevailed over the growing season became even more evident with the start of harvest. Local governments continued to use water use restrictions in an effort to prevent serious water supply problems.			
10/1/2012	Drought	Drought conditions continued over all of southeast South Dakota in October with well below normal rainfall keeping soil and vegetation dry.			
10/17/2012	High Wind		52 kts. E		
11/1/2012	Drought	Drought conditions continued over all of southeast South Dakota in November.			
12/1/2012	Drought	Drought conditions continued over all of southeast South Dakota in December. Although precipitation was generally normal to above normal, the amount of excess over the low winter normals was not enough to relieve the dry conditions. The effects of the drought on farmers and ranchers continued. Hunting was also affected, with low pheasant numbers, and disease in the deer population.			
12/9/2012	Blizzard				
12/18/2012	Winter Weather				
12/27/2012	Winter Weather				
1/1/2013	Drought				
2/1/2013	Drought				
2/10/2013	Blizzard	Variable snowfall of 2 to 8 inches, northwest winds up to 45 mph, and existing snow cover produced blizzard conditions with visibilities below a quarter mile in many areas. The low visibilities and drifting snow forced businesses to close, and also forced several school closings on Monday February 11th.			
3/1/2013	Drought				
4/1/2013	Drought				
4/9/2013	Winter Storm	An extended period of precipitation began with freezing rain and freezing drizzle producing light to moderate ice accumulations, then changing to sleet and then snow, with sleet and snow accumulations reaching the 5 to 8 inch range. Several branches and power lines were downed by the weight of ice and accompanying wind. The winter precipitation made travel very difficult to impossible, resulting in schools and businesses being forced to close. Power was out for three days in Alexandria.			
12/3/2013	Winter Storm	Heavy snow accumulated up to 8 inches from the evening of December 3rd through the afternoon of December 4th. Difficult travel conditions forced delayed openings or early closings of some schools and businesses on December 4th.			
1/16/2014	High Wind		50 kts. E		
1/26/2014	High Wind		50 kts. E		
11/15/2014	Winter Weather				

Date	Event Type	Event Description	Mag	Prop Damage (\$1,000s)	Crop Damage (\$1,000s)
12/15/2014	Winter Weather				
1/5/2015	Winter Weather				
1/8/2015	Winter Weather				
1/31/2015	Winter Weather				
2/1/2015	Winter Weather				
3/3/2015	Winter Weather				
5/10/2015	Hail		1.50 in.		
8/9/2015	Hail		1.25 in.		
8/9/2015	Thunderstorm Wind		52 kts. EG		
11/20/2015	Winter Weather				
11/30/2015	Winter Storm				
12/25/2015	Winter Storm				
1/16/2016	Extreme Cold				
2/2/2016	Winter Weather				
2/29/2016	Winter Weather				
3/23/2016	Winter Weather				
6/10/2016	Excessive Heat				
7/19/2016	Excessive Heat				
8/18/2016	Thunderstorm Wind		61 kts. EG		
11/18/2016	Winter Storm				
12/17/2016	Cold/wind Chill				
12/24/2016	Winter Weather				
1/24/2017	Winter Storm				
2/23/2017	Winter Storm				
6/13/2017	Hail		1.00 in.		
7/11/2017	Thunderstorm Wind		52 kts. EG		
8/13/2017	Hail		1.00 in.		
12/21/2017	Winter Weather				
12/25/2017	Cold/wind Chill				
12/31/2017	Extreme Cold	Record low high temperature of -9 at Alexandria.			
1/11/2018	Cold/wind Chill				
1/15/2018	Cold/wind Chill				
1/21/2018	Winter Weather				
2/5/2018	Winter Weather				
2/8/2018	Winter Weather				
2/10/2018	Cold/wind Chill				
2/19/2018	Winter Weather				

Date	Event Type	Event Description	Mag	Prop Damage (\$1,000s)	Crop Damage (\$1,000s)
2/22/2018	Winter Weather				
2/24/2018	Winter Weather				
3/5/2018	Blizzard				
3/16/2018	Winter Weather				
3/18/2018	Flood				
4/2/2018	Winter Weather				
4/13/2018	Blizzard	Life threatening conditions developed, as a mix of rain, sleet and snow changed to all snow. Brutal winds gusting as high as 60 mph whipped visibility to less than a quarter mile at times. Businesses and schools were closed. Travel was not recommended for a two day period. I-90 was closed from Chamberlain to Sioux Falls for two days. Total snowfall of 8 inches was measured at Alexandria.			
4/18/2018	Winter Weather				
4/23/2018	Flood	Snow melt and runoff from periods of heavy rainfall produced minor flooding which impacted lowland agricultural areas.			
7/3/2018	Heat				
7/11/2018	Heat				
1/1/2019	Extreme Cold				
3/1/2019	Winter Weather				
3/3/2019	Extreme Cold				
3/9/2019	Winter Weather				
3/14/2019	Flood	A historic flooding event unfolded as heavy rainfall drenched the area on March 13-14, 2019. With frozen and impervious ground, full and rapid runoff was maximized. In addition to the rainfall, between 1 and 3 inches of snow water equivalent remained in the snow pack south of Interstate 90, with 3 to 6 inches of snow water equivalent north of Interstate 90. Fifteen river gage sites measured record stages around the area. Winds gusted to 50 to 70 mph at times, and colder air filtering into the system at the end of the storm produced a light accumulation of ice west of the James River and from 1 to 4 inches of snowfall in parts of southeast South Dakota. The James River at Mitchell reached major flood stage and the 5th highest crest on record to date, 6.6 feet above flood stage, on March 25			
4/1/2019	Flood				
4/11/2019	Blizzard				
5/1/2019	Flood				
6/1/2019	Flood				
6/24/2019	Hail		1.00 in.		
6/27/2019	Hail		1.00 in.		
6/28/2019	Heat				
6/29/2019	Extreme Heat				
6/30/2019	Heat				
7/1/2019	Flood				

Date	Event Type	Event Description	Mag	Prop Damage (\$1,000s)	Crop Damage (\$1,000s)
7/12/2019	Hail		1.25 in.		
7/20/2019	Thunderstorm Wind		64 kts. MG		
8/1/2019	Flood			5	
9/1/2019	Flood			50	
9/11/2019	Flood	September 10-12 brought up to 8 inches of rainfall at Alexandria, producing widespread flooding. The spillway at Hanson Lake washed out and damaged the roadway below the spillway. Numerous state, county and township roads were impassable due to water, including SD Hwy 42 east of Ethan.		500	
10/1/2019	Flood	A continuation of flooding from September, as the James River near Mitchell spent most of the month at minor flood stage. Significant amounts of agricultural land remained flooded.		5	
11/1/2019	Flood	A continuation of flooding from October, as the James River near Mitchell spent the entire month at minor flood stage, cresting at 2.64 ft above flood stage on November 27. Significant amounts of agricultural land remained flooded.			
11/5/2019	Winter Weather				
11/26/2019	Winter Weather				
11/29/2019	Winter Weather				
12/1/2019	Flood	A continuation of flooding from November, as the James River near Mitchell spent the entire month in minor flood stage, with a brief period in moderate flood state from December 10 to 16. Significant amounts of agricultural land remained flooded.			
12/1/2019	Winter Weather				
12/28/2019	Blizzard	<b>Light mixed precipitation resulted in a minor glaze of ice accumulation, then heavy snowfall (14 inches in Alexandria) and high wind resulted in white out conditions . Travel was not recommended. Snow drifts to several feet were common.</b>			
1/1/2020	Flood				
1/17/2020	Blizzard	Wind and snow reduced visibility. Interstate 90 was closed from 19:00 January 17 through 13:00 January 18, with travel not recommended on other roadways. Snowfall reached 3.0 inches at Alexandria.			
2/1/2020	Flood				
2/12/2020	Blizzard	High wind and snow reduced visibility for several hours.			
2/26/2020	Flood				
3/1/2020	Flood				
3/19/2020	Winter Weather				
4/1/2020	Flood				
4/11/2020	Winter Storm				
5/1/2020	Flood				
6/1/2020	Flood				
6/25/2020	Thunderstorm Wind		57 kts. MG		
7/1/2020	Flood				
7/6/2020	Hail		2.75 in.		2

Date	Event Type	Event Description	Mag	Prop Damage (\$1,000s)	Crop Damage (\$1,000s)
7/17/2020	Hail		1.00 in.		
8/9/2020	Thunderstorm Wind		56 kts. MG		
10/22/2020	Winter Weather				
11/10/2020	Winter Weather				

Source: [www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=46,SOUTH DAKOTA](http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=46,SOUTH DAKOTA)

## **APPENDIX D: Community Assets**

Following is a list of important community facilities and assets within the county, including those that would play a critical role in helping the community prepare for and respond to a hazard event.

### *Government Offices*

- Hanson County Courthouse, Alexandria
- Municipal Finance Offices in Alexandria, Emery, and Fulton

### *Emergency Response*

- Hanson County Emergency Management Office, Alexandria
- Hanson County Sheriff's Office, Alexandria
- Alexandria Fire Department
- Emery Fire Department
- Rosedale Colony Fire Department
- Hanson County Highway Department, Alexandria

### *Educational Facilities*

- Alexandria public school (K-12)
- Emery public school (K-4, 9-12)

### *Shelters*

- Facilities that can provide short term shelter relief after a disaster event are located in each community (see page 19).

### *Notification*

- A warning siren is located in each community, and at Lake Hanson.

## **APPENDIX E: References**

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