2026

HAZARD MITIGATION PLAN

Gregory County, South Dakota



PREPARED BY:

Gregory County Hazard Mitigation Planning Team

TECHNICAL ASSISTANCE PROVIDED BY:

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2026 Gregory County (SD)
Hazard Mitigation Plan



CHAPTER I

Planning Process

PLANNING & DEVELOPMENT DISTRICT III

CHAPTER I
PLANNING PROCESS

Background

This plan is an update of the Gregory County Hazard Mitigation Plan, which was approved by FEMA in March 2021. The purpose of the plan is to prevent or reduce losses to people and property that may result from future hazard events in Gregory 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 Gregory County in its efforts to mitigate future disaster events.

This is a multi-jurisdictional plan. All the municipalities located within Gregory County were invited to participate in the plan's development. Following is the list of jurisdictions that chose to participate by sending representatives to attend the planning meetings and by providing input into the plan [1]:

- Gregory County
- City of Bonesteel
- City of Burke
- City of Gregory

Production of the plan was the ultimate responsibility of the Gregory 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 hazard mitigation planning team whose members are listed in **Table 1.1**, as well as the public and other stakeholders.

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 hazard mitigation plans for all fifteen of the counties in the District's planning area, including Gregory County's current plan.

[1] The Towns of Dallas, Fairfax, and Herrick did not participate.

Figure 1.1 – County Location



The following staff members of Planning & Development District III were involved in producing the plan. John Clem, a Community Development Specialist, was the project manager and author of the plan. Shannon Viereck assisted in the public outreach and risk assessment efforts, provided additional research assistance, and edited the final copy of the plan. Harry Redman, a Geographic Information Systems Professional, produced maps for the plan, directed the floodplain risk analysis, and completed the county land cover analysis. Jen Moser assisted with the public outreach and survey effort.

Development of Planning Team

The initial planning stages for this plan update began in November 2025 when FEMA funds were awarded to the County. Following this, Mr. Clem and the Gregory County Emergency Management Director began to develop the methodology and strategy that was used to update the plan.

The first step was to organize the hazard mitigation planning team, the group of individuals representing the participating jurisdictions at the planning team meetings. People invited to participate from each jurisdiction included elected officials, finance personnel, public works staff, planning and zoning staff, code enforcement staff, floodplain management staff, and emergency response personnel. These individuals provided information that was used to develop the plan, reviewed drafts of the plan as it was being assembled, and approved the final version of the plan.

Other organizations were also contacted by email and/or telephone to participate in the plan's development. These stakeholders included:

- Rosebud Electric Cooperative
- Tripp County Water User District
- U.S. Army Corps of Engineers
- Burke Community Memorial Hospital
- Avera-Gregory Health Care Center
- Burke School District
- Gregory School District
- South Central School District
- Gregory *Times Advocate*
- Neighboring counties (Brule, Charles Mix, Lyman, and Tripp)

Each individual invited to participate had knowledge in various subject areas pertinent to the plan's development. These subject areas included the following:

- Infrastructure within the county
- Economic development activities within the county
- Floodplain management
- Building codes and other development regulations

- Mapping and GIS
- Natural and cultural resources
- Social services

Table 1.1 lists the individuals who participated in the plan's development, including their contribution to the process. The columns on the right show their attendance at the planning meetings that were held. 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	Role	Mtg 1 3/17/26	Mtg 2 4/07/26	Mtg 3 6/16/26
John Clem	Planning District III	Planner	Plan author	X	X	X
Shannon Viereck	Planning District III	Planner	Research, Support	X	X	
Brad Christensen	Gregory County	Emergency Mgmt Dir	Guidance, Input	X	X	X
Jessy Biggins	Gregory County	Commissioner	Input, Review	X	X	X
Peg Glover	Gregory County	Commissioner	Input, Review	X	X	X
Doug Janousek	Gregory County	Commissioner	Input, Review	X	X	
Byrain Boes	Gregory County	Commissioner	Input, Review	X	X	X
Ray Warner	Gregory County	Commissioner	Input, Review	X	X	X
Julie Bartling	Gregory County	Auditor	Input, Review	X	X	X
Cody Spann	City of Bonesteel	Finance Officer	Input, Review	X	X	X
Mike Glover	City of Burke	Finance Officer	Input, Review	X	X	X
Amber Horn	City of Burke	Development Corp	Input, Review	X		
Mark Green	City of Burke	Fire Chief	Input, Review	X	X	X
Al Cerny	City of Gregory	Mayor	Input, Review	X	X	
Trudy Waterman	City of Gregory	Finance Officer	Input, Review	X	X	X
Laura Peterson	City of Gregory	City Council	Input, Review	X	X	X
Guhner Kepler	City of Gregory	City Council	Input, Review	X		
Ryler Stevicks	City of Gregory	Community member	Input, Review	X		
Vic Warnke	Rosebud Electric Coop	Line Superintendent	Input, Review	X		
Mike Hubert	Corps of Engineers	Staff	Input, Review		X	
Betty Connealy	Gregory Times Advocate	Editor	Input, Review		X	
John Jensen	*(Public)*				X	

Public Outreach

Throughout the plan's development, efforts were made to obtain broader involvement in the plan beyond the core planning team and stakeholders. This outreach effort included press releases that were printed in the local newspapers, information posted on community websites, and social media.

Surveys were also made available to provide another way for people to contribute their thoughts and opinions on hazard mitigation. Survey forms were distributed to all planning team members and to other city and county staff who did not participate in the planning meetings. To generate broader public input, the surveys were also made available online and a press release at the start of the planning process included a QR code so the public could

participate in the survey. Respondents were able to provide their opinion of which hazards have the biggest impact on the county, how those hazards have personally impacted them, and what actions could be taken to mitigate the hazards. See **Appendix A** for documentation of the public outreach effort.

Incorporation of Other Plans

Information from various local plans, studies, and reports was incorporated into this plan. Each of the items listed in the table below was reviewed as this plan was developed, and a brief description is given of how relevant information was incorporated into this plan. In addition to these local resources, a considerable amount of information and data was incorporated into this plan from the South Dakota Hazard Mitigation Plan (both the 2019 version and the current enhanced version).

Table 1.2 – Plans, Studies, and Reports Incorporated Into Plan

Item	Notes
Planning & Development District III Comprehensive Economic Development Strategy (CEDS)	The CEDS analyzes development issues within the District III service area, which includes Gregory County. Economic resiliency, including the role that hazard mitigation can play in helping communities maintain economic strength, is discussed at some length. Regional development priorities and demographic data from the CEDS was incorporated into this plan.
Gregory County Comprehensive Plan	The environmental constraints section of the plan was used to identify areas suitable for development in the county.
Gregory County Highway Plan	The plan includes a list of county roads scheduled for improvements within the next five years, which was useful for development of the mitigation strategy.
Bonesteel Comprehensive Plan	The environmental constraints section of the plan was used to identify areas suitable for development within the city.
Burke Comprehensive Plan	The environmental constraints section of the plan was used to identify areas suitable for development within the city.
Gregory Comprehensive Plan	The environmental constraints section of the plan was used to identify areas suitable for development within the city.
Bonesteel, Burke and Gregory Housing Study Update	The study presents socio-economic and demographic data and outlines potential housing development strategies for these communities.
Rosebud Electric Cooperative 2024 – 2027 Construction Work Plan	The plan provides details about power usage in the Cooperative's service area back to 2000 with projections through 2027, service interruptions since 2018, the status of projects in the previous work plan, and projects expected to occur through 2027.

Planning Meetings

Several meetings were held to develop the plan, all of which took place at the Gregory County courthouse as described below. 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 were provided by Planning & Development District III staff and the Gregory County Emergency Management Director.

Prior to the first planning team meeting, the stakeholders identified earlier in this chapter were contacted and invited to participate in the planning process. A survey instrument was also developed, which was distributed to the planning team members and made available to the public as described earlier in the Public Outreach section.

First Planning Team Meeting

The first meeting began with a reintroduction to the concept of hazard mitigation for the team members, many of whom had participated in the development of the current plan, followed by a discussion about the process by which the plan would be developed over the coming months. The team then reviewed the initial results of the survey and additional hard copies of the survey were distributed. The rest of the meeting was spent reviewing the County's current mitigation plan, focusing on the hazards identified in the plan and the progress being made to implement the mitigation actions listed in the plan.

Activity between meetings

After the meeting, the Planning & Development District III office did a considerable amount of work on the risk assessment using various methods as described in **Chapter III**. The results of this work were shared with the planning team, including a summary of the textual information presented in **Chapter III**, maps showing hazard-prone areas in relation to important assets in each jurisdiction, and information about the value of property at risk to the various hazards impacting the county. Since the next meeting would focus on development of the mitigation strategy, the District III office also distributed a list of potential mitigation actions to the team, which was based on FEMA's guidance document *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*.

Second Planning Team Meeting

Although the second meeting focused on development of the mitigation strategy, the meeting began with a discussion about local mitigation capabilities. Key items reviewed were each of the jurisdiction's activities relating to land use regulations, enforcement of building codes, and the National Flood Insurance Program.

Discussion then turned to identification of the mitigation goals and objectives to be achieved, followed by the specific mitigation actions to include in the plan. The participants were reminded to focus on hazard mitigation, as opposed to preparedness, and they were

encouraged to consider a comprehensive range of actions, regardless of whether they seemed likely to be achievable in the foreseeable future. A preliminary list of actions for each jurisdiction was developed, including such details as estimated cost, timeframe for implementation, and the party responsible for implementation.

Activity between meetings

After the second meeting, each jurisdiction discussed the mitigation actions they wanted to include in the plan. This discussion took place at an official meeting of each jurisdiction's governing body, which ensured that the public could participate in the selection process, since hazard mitigation was an agenda item. The list of mitigation actions selected by the communities is presented in **Chapter IV** (see **Table 4.5**).

Final Planning Team Meeting

Following the jurisdictional meetings, the Planning & Development District III office completed the first draft of the plan. After this, the planning team was brought together again for a final meeting to review the draft and discuss how the plan will be maintained going forward. The importance of integrating the plan into the existing planning mechanisms within the county was emphasized.

Post-meeting activity

After the final planning team meeting, some additional information was added to the plan based on discussion at the meeting, primarily involving clarification of some of the details of the proposed mitigation actions. The plan was then submitted to the South Dakota Office of Emergency Management.

Acknowledgements

The Planning & Development District III office would like to thank the members of the Gregory County Hazard 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 Emergency Management Director Brad Christensen for arranging the planning team meetings and for coordinating with the participating jurisdictions. Thanks also are extended to Jim Poppen, Kyle Kafka, Blaire Jonas, and Marc Macy at the South Dakota Office of Emergency Management for information and guidance that was helpful in developing the plan.

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CHAPTER II

Community Profile

PLANNING & DEVELOPMENT DISTRICT III

CHAPTER II
COMMUNITY PROFILE

Background

This chapter serves as a basic introduction of Gregory County. Topics addressed in this chapter include a general description of the county, its physical characteristics, socio-economic characteristics, infrastructure and utilities, 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

Gregory County is located in southeast South Dakota (see **Figure 1.1**). The county covers approximately 1,045 square miles of area, and its Census 2020 population was 3,994. Its population density is only about 3.8 people per square mile compared to 11.7 people per square mile in South Dakota and 93.8 people per square miles in the United States. Six incorporated municipalities are located within the county – Bonesteel (pop 258), Burke (pop 575), Dallas (pop 89), Fairfax (pop 96), Gregory (pop 1,221), and Herrick (pop 74). The county seat is located in Burke. Unincorporated communities within the county include St. Charles and Lucas. There are also several recreational areas located along the Missouri River containing a mixture of permanent housing and seasonally occupied private camping areas. **Figure 2.1** shows the county's communities and highway network.

Physical Characteristics

Gregory County is very lightly settled, with most of the land devoted to grazing or the raising of such crops as corn, wheat, sunflowers, and sorghum. The landscape is quite open, and the terrain is uneven, especially along the Missouri River, which forms the county's eastern border. Many buttes rise prominently from the landscape. Other than the Missouri River, there are no prominent bodies of water in the county.

Figure 2.1 – Gregory County

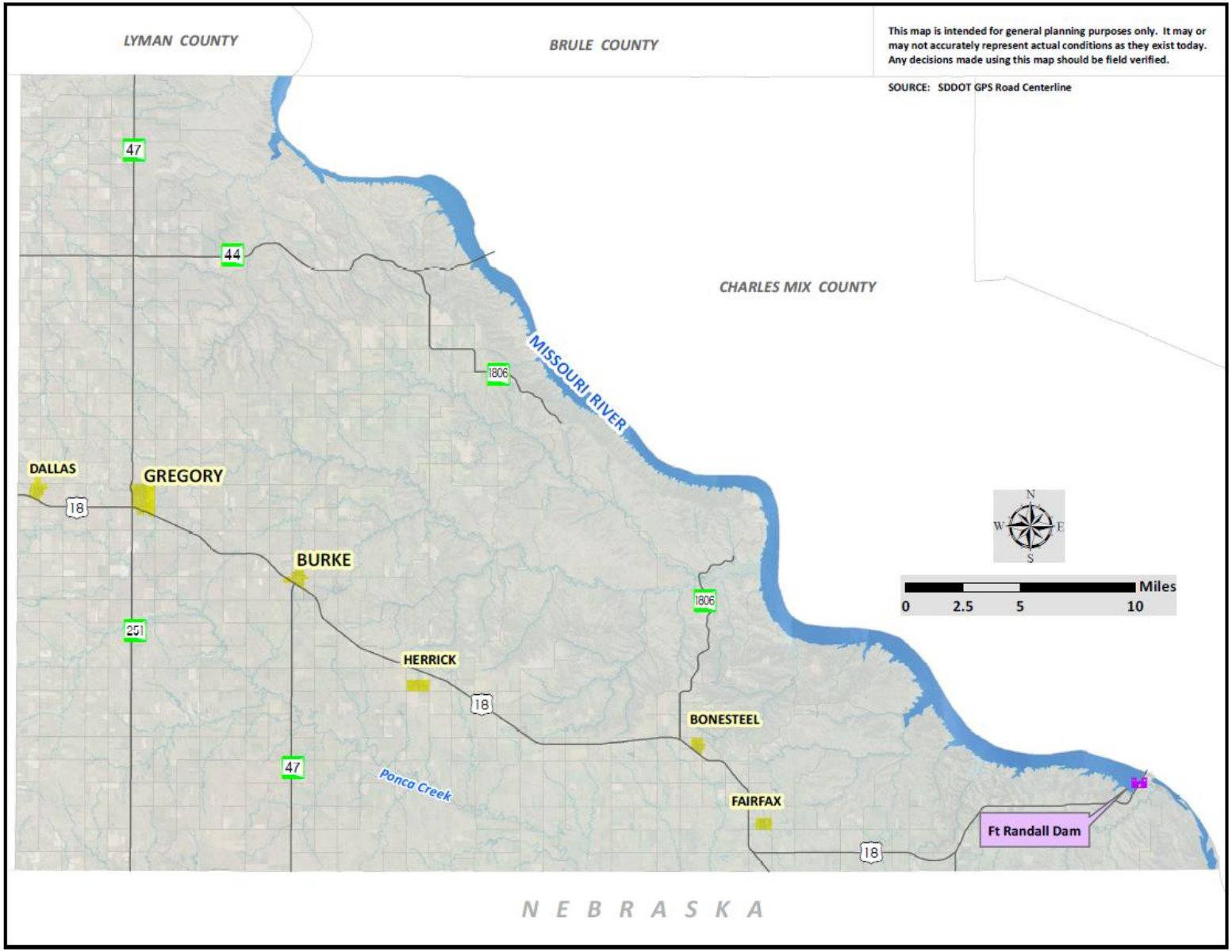


Table 2.1 provides a breakdown of the land cover in Gregory County, which is shown graphically in **Figure 2.2** on the following page. The table is based off satellite imagery from the United States Geological Service's National Land Cover Database. As the table shows, the predominant types of land cover in the county are grassland and cropland, which together comprise approximately 79 percent of the county's total land base. Developed land makes up only a very small fraction of the land area.

Table 2.1 - Vegetative Land Cover

Cover Type	Square Miles	Percent of Total Area
Grassland/Herbaceous land	602.7	57.7
Cultivated crops	224.1	21.4
Forested land	86.9	8.3
Open water	42.1	4.0
Pastureland	35.0	3.3
Developed land (open space)	30.4	2.9
Wetlands	21.5	2.1
Developed land (low to high intensity)	2.6	0.1
Barren land, Shrub/Scrub	0.1	0.1

Source: www.mrlc.gov/index.php

As in most of South Dakota, the climate of Gregory County is characterized as sub-humid and continental, which means that summers are often hot and winters can be very cold. There are no large bodies of water or mountain ranges to mitigate against these extremes. High temperatures in the summer can exceed 100 degrees Fahrenheit [2], while winter lows can drop below -20 degrees. Precipitation averages about 23 inches per year, much of which occurs during the spring and early summer. Following is climate data reported from the Gregory weather station.

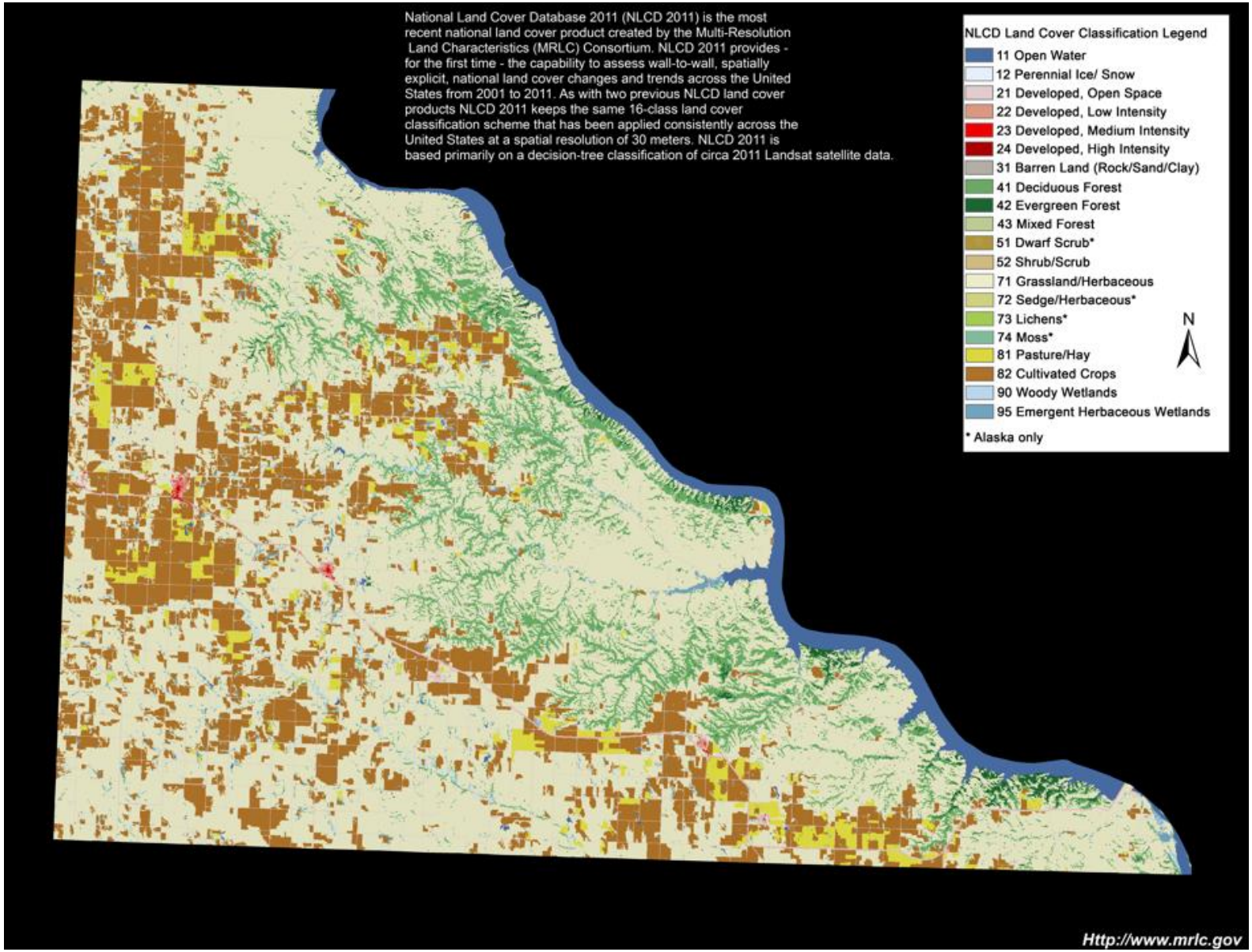
Table 2.2 - Monthly Climate Conditions in Gregory County (1906 - 2013)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ave High	32.2	36.9	46.8	60.7	71.8	81.5	89.2	87.6	78.2	65.7	48.0	36.1
Ave Low	8.9	12.8	22.3	34.1	44.9	55.3	61.2	59.2	49.0	36.9	23.5	13.6
Ave Precipitation	0.5	0.7	1.5	2.7	3.4	4.0	2.7	2.4	2.1	1.7	0.9	0.6

Source: www.weather.gov/wrh/climate
The average high and low are in degrees Fahrenheit; the precipitation figures are in inches.

[2] 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 degree of 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 in which South Dakota is located, especially in the winter. The plan also notes a long-term trend of increasing annual precipitation across South Dakota, among the highest in the country, much of it occurring in the spring and fall seasons.

By 2050, according to research from Headwaters Economics, Gregory County is expected to experience 15 more days per year that reach above 95 degrees Fahrenheit (from 28 days to 43 days per year) and the average annual temperature is expected to increase from 51°F to 54°F. No significant change in average annual precipitation is expected.

There is no consensus yet on climate change science and it is difficult to make any definitive plans for climate change, but it appears likely that communities that are already vulnerable to weather and climate extremes will be stressed even further by more frequent extreme events occurring within an already highly variable climate system. Increased demand for water and energy may constrain development, stress natural resources, and increase competition for water, and new agricultural practices may be needed to cope with changing conditions.

Socioeconomic Description

Population Trends

Gregory County has been experiencing a steady population decline for the last several decades. The county's Census 2020 population of 3,994 is only about 47 percent of the population that was recorded in 1950. As the table below shows, the county's population is expected to continue decreasing.

Table 2.3 - Gregory County Population

Pop 1950	Pop 1960	Pop 1970	Pop 1980	Pop 1990	Pop 2000	Pop 2010	Pop 2020	Pop 2030 Projected	Pop 2040 Projected	Pop 2050 Projected
8,556	7,399	6,710	6,015	5,359	4,792	4,271	3,994	3,784	3,545	3,333

Source: U.S. Census; Projections based on analysis of past population records and current age and sex cohorts

Race and Age

The following table shows that a relatively high percentage of Gregory County's population is composed of whites, as compared to South Dakota and the rest of the nation. However, there is a significant Native American presence in Gregory County, many of whom live on Rosebud Sioux tribal trust land, which is scattered throughout the county in small parcels. The table also shows that the county's population is relatively old, which is an indication that many of

the young people are leaving the county to look for opportunities elsewhere and that the current declining population trend is likely to continue for the foreseeable future.

Table 2.4 - Racial and Age Characteristics

	White Pop	Black Pop	American Indian Pop	Asian Pop	Other Race	Two or More Races	Hispanic Pop	Pop Under 18	Pop 65 and Over	Median Age
Gregory Co.	87.7%	0.2%	6.7%	0.6%	0.4%	4.4%	1.3%	23.8%	25.2%	45.7
South Dakota	80.7%	2.0%	8.8%	1.5%	1.8%	5.3%	4.4%	24.1%	18.2%	38.5
United States	61.6%	12.4%	1.1%	6.0%	8.6%	10.2%	18.7%	21.7%	17.3%	39.0

Source: American Community Survey 2022 1-Year Estimates

Income and Education

Income levels in Gregory County are well below state and national figures, although poverty rates are near the state and federal level. Educational attainment lags behind state and national averages.

Table 2.5 – Income and Education

	Median Household Income	Poverty Rate – All People	Poverty Rate – Under 18	Poverty Rate – Over 65	High School Grad or Higher	Bachelor's Degree or Higher	Graduate Degree
Gregory Co.	$48,272	12.8%	16.1%	9.0%	90.4%	19.1%	7.2%
South Dakota	$69,728	12.5%	15.2%	10.9%	93.1%	31.6%	9.9%
United States	$74,755	12.6%	16.3%	10.9%	89.6%	35.7%	14.0%

Source: American Community Survey 2022 1-Year Estimates

Employment

The primary economic base of Gregory County is agriculture. Much of the non-ag employment for people who work in the county is in education and health care. Industry and manufacturing are not significant.

Table 2.6 – Employment Sectors

	Gregory County	South Dakota	United States
Agriculture, Forestry, Fishing, Mining	13.2%	6.4%	1.6%
Construction	8.3%	7.4%	6.9%
Manufacturing	3.2%	9.9%	9.9%
Wholesale Trade	1.7%	2.1%	2.2%
Retail Trade	15.6%	11.4%	11.1%
Transportation, Warehousing, Utilities	8.8%	4.4%	6.0%
Information	0.3%	1.5%	1.9%
Finance, Insurance, Real Estate	6.1%	6.0%	6.7%
Professional, Scientific, Management	4.9%	6.7%	12.6%
Education, Health Care, Social Assistance	23.8%	26.3%	23.1%
Arts, Entertainment, Recreation, Accommodation, Food Service	7.1%	8.8%	8.7%
Other Services	4.5%	4.3%	4.7%
Public Administration	2.4%	4.8%	4.6%

Source: American Community Survey 2022 1-Year Estimates

Vulnerable Populations

There are certain populations and social groups within Gregory County that may be particularly susceptible to the adverse impacts of hazards, suffering disproportionate rates of death, injury, loss, or disruption of livelihood when hazard events occur. Various social, economic, demographic, and housing characteristics are considered here that may influence the community's ability to prepare for, respond to, cope with, recover from, and adapt to environmental hazards.

Available data indicates that Gregory County has a low proportion of vulnerable people. The Centers for Disease Control Social Vulnerability Index shows Gregory County with a rating of .1817 (0 being least vulnerable and 1 being most vulnerable), which indicates a low level of vulnerability. FEMA's Resilience and Planning Tool shows that the county's Income Inequality Index is .45, which is close to the state and national figures. The Community Resilience Challenges Index (CRCI) percentile is 28 on a scale of 1 (lowest vulnerability relative to the rest of the United States) to 100 (highest); the county's top three drivers of CCRI value are Low Access to Communication, Age, and Median Income.

Infrastructure and Utilities

Transportation

Gregory County's main transportation route is U.S. Highway 18, which connects all the municipalities in the county. Other important highways include SD Hwy 47, which runs north-south, and SD Hwy 44, which runs east-west. There is no railroad line in the county, and the only airport is a very small municipal airport in Gregory that is busiest during the fall hunting season.

Utilities

Water service is provided to most county residents by the Tripp County Water User District (TCWUD), which gets its water from wells located south of Winner, in neighboring Tripp County. The City of Gregory operates its own water system, although TCWUD can provide water for the city in emergency situations. Each municipality has its own wastewater collection and treatment system. Rural residences use individual septic tanks and drainfields.

Solid waste service is provided by the Southern Missouri Recycling and Waste Management District, which operates a landfill located near Lake Andes in Charles Mix County. Most of the household waste generated within Gregory County ends up at the landfill. Designated rubble sites are located outside Bonesteel, Dallas, Fairfax, and Gregory.

Electric power is provided to most county residents by the Rosebud Electric Cooperative. The City of Burke operates its own municipal system, although Rosebud Electric provides maintenance. Natural gas service is not available anywhere within the county.

Services

Medical Services

The primary medical facilities in Gregory County are the Burke Community Memorial Hospital and the Avera-Gregory Health Care Center, both of which are considered critical access care facilities. People needing serious medical attention can be transported to trauma center hospitals in Sioux Falls or elsewhere

Fire and Emergency Response

Several fire departments are based in Gregory County. Each department has basic firefighting and rescue equipment, and they all respond to structural fires, wildland fires, and to accident situations. Some of the departments have some capabilities regarding hazardous material (hazmat) response, but a serious incident likely would require assistance from outside the county.

Education

In Gregory County, schools are located in Bonesteel, Burke, and Gregory. Post-secondary education is not available in the county.

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CHAPTER III

Risk Assessment

PLANNING & DEVELOPMENT DISTRICT III

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 Gregory County become disaster resilient and keep county residents safe, and it answers the following questions: What are the hazards that could affect Gregory 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?

Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from hazards. FEMA defines risk assessment terminology as follows:

- **Natural Hazard**—A source of harm created by a meteorological, environmental, or geologic event.
- **Assets** – This includes people, structures (e.g. homes, critical facilities, and infrastructure), systems and networks, other resources important to the community, and activities important to the community.
- **Risk**—The potential for damage or loss created by the interaction of natural hazards with assets.

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) analyzing impacts. 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.

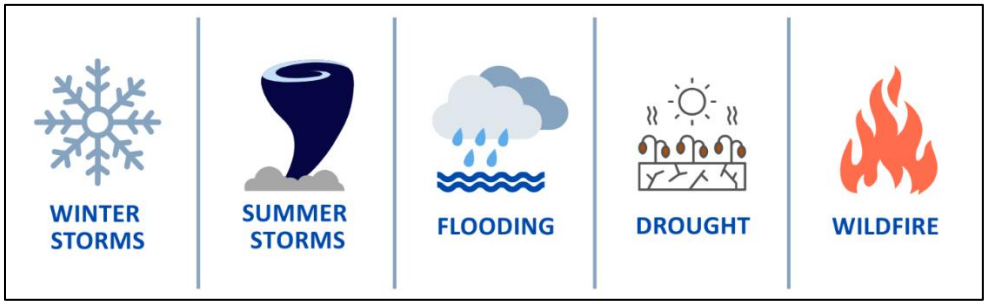
After reviewing the risk assessment section of the current plan, the planning team decided that no major changes were needed to the risk assessment. This determination was made because of the lack of population growth and development in the county and because no natural disasters have had a major impact on the county since the current plan was completed. However, many of the tables have been updated with more current information, including **Table C.2** in **Appendix C**, which lists significant hazard events that have occurred in the county through 2024.

Identifying Hazards

To determine which hazards to address in this plan, the planning team first reviewed the county's current mitigation plan. The team also considered the results of the survey that was

conducted at the start of the planning process, especially the question about the hazards that most impact the county. 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**). At the end of this process, the planning team decided to focus on the following hazards:

- **Winter storms**
- **Summer storms**
- **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 – earthquakes and landslides are profiled in the South Dakota Hazard Mitigation Plan, but the overall significance of such hazards is rated as low. A map generated through the U.S. Geological Service Earthquake Hazards Program website indicates that there is only about a two percent chance that a quake of at least magnitude 5 will occur in Gregory County in any 100-year period, and virtually no chance of a magnitude 6 or greater earthquake [3]. The largest earthquake recorded in the county was a 3.8 magnitude quake, which occurred in November 1938. Regarding landslides, a review of the United States Geological Survey's Landslide Incidence and Susceptibility Map indicates the potential of a landslide occurring in Gregory County along the Missouri River, but any such event likely would be localized and minor in scale. No landslide has ever caused serious damage in the county, but minor land shifting has impacted roads in the bluffs along the Missouri River, and some homeowners there have built retaining walls for their homes.
- Agricultural pests and diseases - this hazard is profiled in the South Dakota Hazard Mitigation Plan. However, despite the obvious importance of agriculture to the

[3] 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.

local economy, the planning team considered the subject matter to be outside the intended focus of this plan.

- Technological and human-caused hazards – some of these hazards, including hazardous materials releases, are analyzed in the South Dakota Hazard Mitigation Plan. Again, the planning team considered the subject matter to be outside the scope of this 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 Gregory County, its ***extent***, the ***history*** of the hazard's occurrence in the county, and the ***probability*** of future events occurring. 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 with equal frequency. Flooding and wildfires, however, do pose a greater risk in specific areas of the county than in other locations.
- ***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 winter storms can be measured by snowfall accumulation or 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**, which includes a table of the major disaster declarations in Gregory County, a table showing a comprehensive list of weather-related hazard events recorded in the county from the National Climatic Data Center's Storm Events Database, and tables showing crop loss to Gregory County farmers.
- ***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 fewer than twice per ten years. Probability for some of the hazards was determined by reviewing the frequency of past hazard events in the Storm Events Database.

Winter Storm

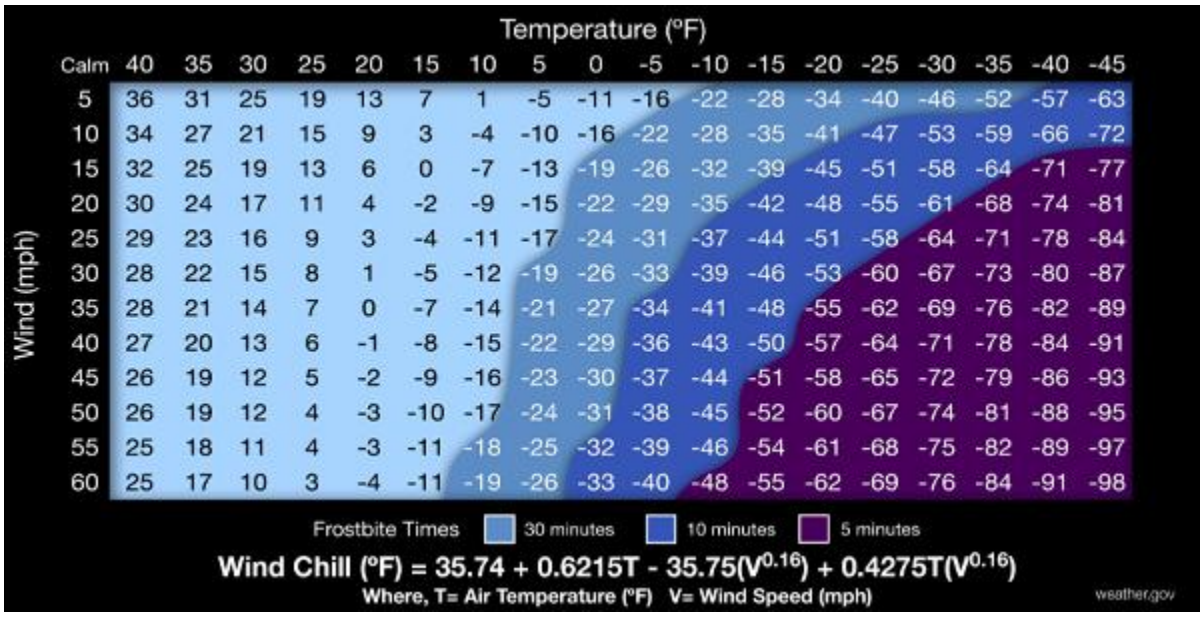
Description

Winter storms include snow events, freezing rain, and sleet, with some storms taking on the characteristics of these categories during distinct phases of the storm. They typically occur

from late fall to the middle of spring, varying in intensity from mild to severe. A long warning time is associated with most winter storms, giving people time to prepare, but they still have a major impact in South Dakota. They can immobilize a region by blocking transportation routes, thus disrupting emergency and medical services, hampering the flow of supplies, and isolating homes and farms. Heavy snow can collapse roofs and knock down trees and power lines. Unprotected livestock may be lost. Economic impacts of winter storms include the cost of snow removal, damage repair, and business losses. Respondents to the survey conducted for this plan considered winter storms to be the fourth most serious hazard facing the county.

The most dangerous of all winter storms are blizzards, which occur when snow is combined with winds of at least 35 mph reducing visibility to less than ¼ mile for at least three hours. 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. Freezing rain is also dangerous because it coats objects with ice and can make travel especially hazardous. Sleet does not generally cling to objects like freezing rain, but it makes the ground slippery, increasing the number of traffic accidents and injuries due to falls.

Extreme cold often accompanies winter storms or is left in their wake. Prolonged exposure to the cold can cause frostbite or hypothermia and can become life threatening. Infants and the elderly are most susceptible. Property damage is also possible when pipes freeze and burst in homes or buildings that are poorly insulated or without heat. The following chart shows how quickly frostbite can occur at a given combination of temperature and windspeed.



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 they 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 Gregory County and most of the state, 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

The extent of winter storms in Gregory County can be quite substantial. In terms of snowfall, many winter storms in the county have dropped more than 10 inches 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, blizzards and high wind events during the winter can be accompanied by winds over 50 knots (about 58 miles per hour).

History

Table C.2 in **Appendix C** lists many significant winter storms that have impacted the county. Following are details about the winter storms that resulted in a major disaster declaration (see also **Table C.1** in **Appendix C**).

One of the most serious winter storms occurred in the state 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 Gregory 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 was estimated at over $13 million, and approximately 30,290 households were affected by power outages.

Another very serious winter storm to impact Gregory County occurred in late November 2005 when heavy freezing rain coated roads and power lines with ice up to three inches thick throughout much of southeast South Dakota. The storm resulted in FEMA Disaster Declaration 1620. In the affected area, a total of 9,400 power poles were damaged, leaving approximately 56,000 people without electricity for varying amounts of time. The impact of the storm was much worse in areas east of Gregory County, but the Rosebud Electric Cooperative did suffer about $29,000 of damage to its infrastructure within the county.

A severe winter storm accompanied by record snowfall and high winds in December 2009 resulted in FEMA Disaster Declaration 1886. Prolonged snowfall from two days before to the day after Christmas produced heavy accumulations ranging up to over 20 inches in several areas. The snowfall was accompanied by increasing north to northwest winds that caused widespread blizzard conditions.

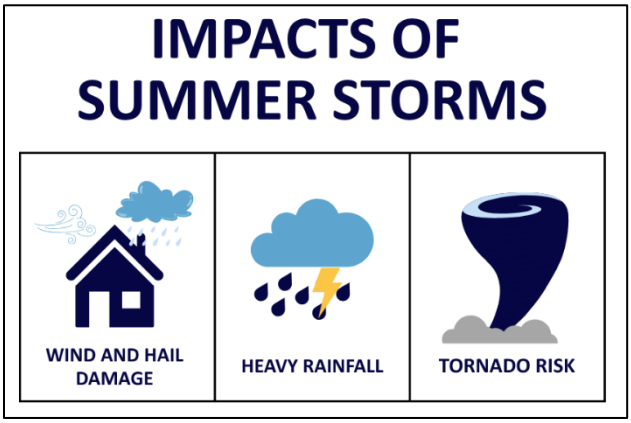
Probability

A total of 84 winter storm events, including blizzards, ice storms, heavy snow, and extreme cold events, have been recorded in Gregory County since the mid-1990s, an average of almost three per year (see **Table C.2 in Appendix C**). Therefore, based on the historic evidence, the probability of a significant winter storm affecting Gregory 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.

Summer storm

Description

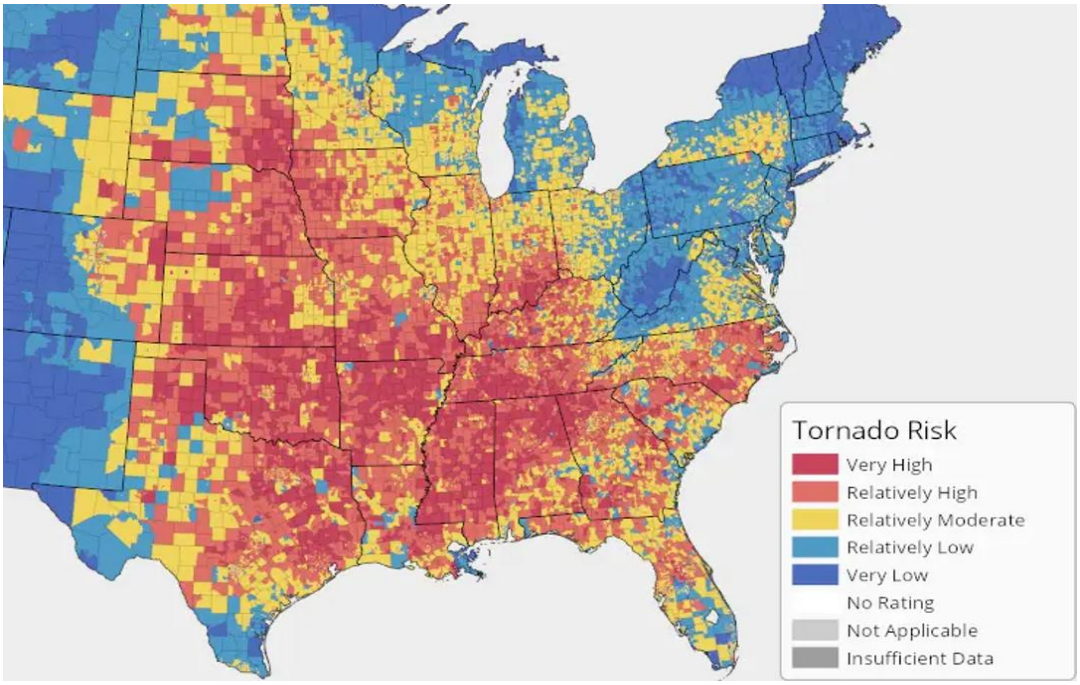
Summer storms can include heavy rainfall, hail, tornadoes, and thunderstorm activity. These events usually are associated with unstable weather conditions. In Gregory County, most damage from summer storms occurs because of high wind events and/or hail. Hail is always closely connected with thunderstorms. 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 Gregory County reports some kind of hail damage to crops or property. Survey respondents ranked hail as the sixth greatest hazard facing the county.



Tornadoes are the most dramatic type of summer storm experienced in Gregory 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. Survey respondents considered tornadoes to be the second most serious hazard facing the county.

South Dakota is located near the northern edge of the core area of tornado activity in the United States, as shown in the image on the following page (it is difficult to tell at this scale, but Gregory County is in the 'Relatively High' risk category). Often referred to as "tornado alley", this part of the country is susceptible to the conditions that favor the formation of tornadoes: warm air from the Gulf of Mexico coming in contact with cool Canadian air fronts and dry air systems from the Rocky Mountains. 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 27th in the nation in tornado damage, with average annual losses of $3.8 million.



Source: hazards.fema.gov/nri/tornado

Location

Summer storms are equally likely to occur in all parts of Gregory 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 27 thunderstorms that produced wind speeds of at least 60 knots, four of which were over 70 knots. **Table C.2** also shows 56 events with hail at least one inch in diameter, including 16 events with hail at least two inches in diameter, and five records of a tornado with a magnitude greater than F1. 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. The following tables show classifications of hail size, wind speeds, lightning activity, and tornado strength.

Table 3.1 - Hail Size Comparison

Size (Inches)	Object Comparison
0.5 “	Marble or moth ball
1.0”	Quarter
1.5”	Walnut or ping pong ball
2.0”	Hen’s egg
2.5”	Tennis ball
3.0”	Tea cup
4.0”	Softball
4.5”	Grapefruit

Table 3.2 - Beaufort Wind Scale

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects On Land
0	Under 1	Calm	Calm, smoke rises vertically
1	1 to 3	Light Air	Smoke drift indicates wind direction, still wind vanes
2	4 to 6	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
3	7 to 10	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
4	11 to 16	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches move
5	17 to 21	Fresh Breeze	Small trees in leaf begin to sway
6	22 to 27	Strong Breeze	Larger tree branches moving, whistling in wires
7	28 to 33	Near Gale	Whole trees moving, resistance felt walking against wind
8	34 to 40	Gale	Twigs breaking off trees, generally impedes progress
9	41 to 47	Strong Gale	Slight structural damage occurs, slate blows off roofs
10	48 to 55	Storm	Trees broken or uprooted, much structural damage (seldom experienced)
11	56 to 63	Violent Storm	
12	64 +	Hurricane	

Table 3.3 - Lightning Activity Levels

Level	Description
LAL 1	No thunderstorms.
LAL 2	Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent, 1 to 5 cloud to ground strikes in a 5 minute period.
LAL 3	Widely scattered thunderstorms. Light to moderate rain will reach the ground. Lightning is infrequent, 6 to 10 cloud to ground strikes in a 5 minute period.
LAL 4	Scattered thunderstorms. Moderate rain is commonly produced. Lightning is frequent, 11 to 15 cloud to ground strinkes in a 5 minute period.
LAL 5	Numerous thunderstorms. Rainfall is moderate to heavy. Lightning is frequent and intense, greater than 15 cloud to ground strikes in a 5 minute period.
LAL 6	Dry lightning. This type of lightning has the potential for extreme fire activity and is normally highlighted in fire weather forecasts with Red Flag Warning.

Table 3.4 – 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 may be overturned; heavy cars lifted off ground and thrown; structures with weak foundations badly damaged.
EF4	166 to 200	Devasting damage. Frame homes are completely destroyed and some may be swept away; cars and other large objects are thrown in the air.
EF5	Over 200	Incredible damage. Nearly all buildings aside from heavily built structures are destroyed; frame houses and brick homes are swept away; cars are thrown hundreds of yards.

Source: en.wikipedia.org/wiki/Enhanced_Fujita_scale

History

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

Notable summer storms in Gregory County include a tornado that struck near Herrick in August 2002 and a tornado that touched down in the heart of Burke in August 2019. The tornado in Burke, pictured on the cover of this plan, severely damaged several structures, including the Gregory County courthouse and the Burke school, and destroyed the community center and other buildings.

Probability

A total of 105 summer storm events, including hailstorms, thunderstorms, lightning, and tornadoes, have been recorded in Gregory County since 1960, an average of about 1.6 per year (see **Table C.2 in Appendix C**). Twenty-one of these storms involved a tornado. From this information, the probability of a summer storm affecting Gregory County each year should be considered high, although the probability of a storm causing significant damage (e.g., damaging hail or a tornado) can be considered low to moderate.

Flooding

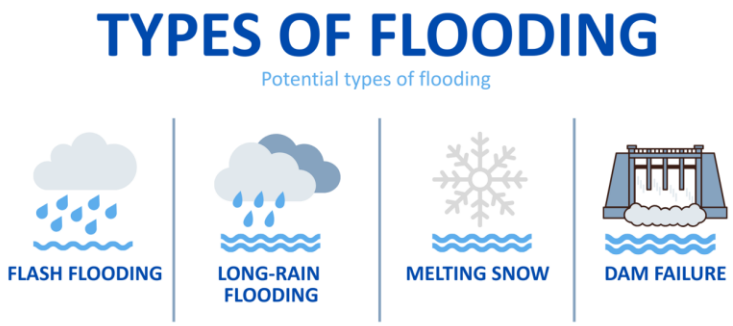
Description

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. Survey respondents considered flooding to be the least serious of the eight disaster types they could choose from.

Following is a description of the four types of flooding that have the potential of impacting South Dakota, 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. This high intensity rainfall is commonly caused by powerful thunderstorms that cover a small geographic area. The flood that occurs because 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 "waterlogged," 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. Gregory County is vulnerable to this type of flood because of the dams that impound the Missouri River, including the Fort Randall Dam, and the Ponca Dam, which are classified as high hazard dams [4].



Location

In the past, the greatest flooding threat in Gregory County was along the Missouri River, which flows south/southeastward across South Dakota in a deep, wide channel, draining almost the entire state. Flooding along the river used to be an annual threat until a series of huge dams along the river, including Fort Randall, were constructed in the 1950s. Now, most of the Missouri River within South Dakota consists of a chain of reservoirs impounded by the dams. From north to south, these dams are Oahe, Big Bend, Fort Randall, and Gavins Point, which were built for flood control, to provide water for irrigation, and for the generation of hydroelectricity. The Fort Randall Dam impounds the Missouri River near the southeastern tip of Gregory County, forming Lake Francis Case (see **Figure 2.1**).

Because of the dams, the threat of flooding from the Missouri River has been greatly reduced, although it has not been eliminated. In 2011, significant flooding along the river did occur, with substantial damage. The primary cause of the flooding was very heavy snowmelt at the river's source in the Rocky Mountains, along with extremely high spring rains throughout much of the river's drainage basin. The complicated politics concerning river management also played a role in the disaster that unfolded over the next few months.

In addition to land along the Missouri River, other areas of the county are vulnerable to flooding. However, there are no designated flood hazard zones within Gregory County.

[4] A high hazard dam is one whose loss would cause major economic loss, and in which there are anywhere from a few to hundreds of inhabited structures located in the predicted area of inundation.

Extent

The extent of flooding in Gregory County has rarely been truly significant, and even the Missouri River flooding in 2011 did not cause as much damage to Gregory County as it did to counties on the river's eastern shore. 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. The following table shows a description of the various stages of flooding.

Table 3.5 – Flood Stages and Associated Impacts

Flood Stage	Impact
Minor Flood	Minimal or no property damage, but possibly some public threat (e.g. road inundation).
Moderate Flood	Some inundation of structures and roads near stream, evacuations of people and/or transfer of property to higher elevations.
Major Flood	Extensive inundation of structures and roads, significant evacuations of people and/or transfer of property to higher elevation.

The image on the following page shows the current river gauge chart for the Missouri River at the Fort Randall Dam in comparison with the minor, moderate, and major flood categories.

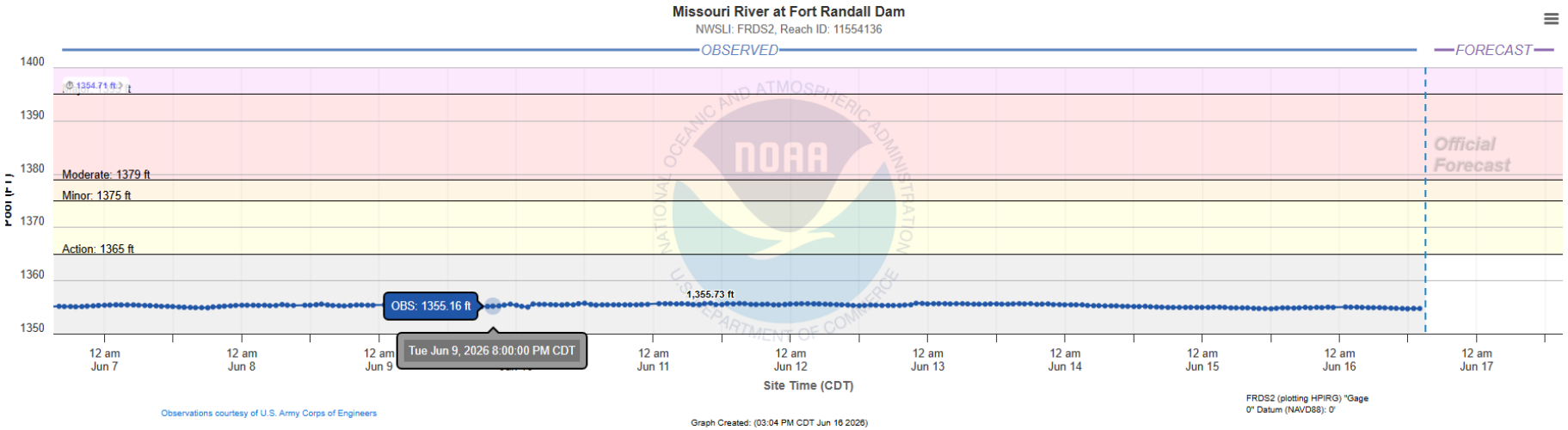
History

Table C.2 in **Appendix C** lists many significant flooding events that have impacted the county. Following are details about some of the most notable events that resulted in a major disaster declaration (see also **Table C.1** in **Appendix C**).

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.

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. 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.

River Gauge Chart – Missouri River



Graphic from: water.noaa.gov/gauges/FRDS2

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 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 snowpack, 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.

Flooding in 2008 resulted in FEMA Disaster Declaration 1774. The event caused over $56,000 of public assistance costs throughout the county, primarily due to flooding of county and township roads.

Flooding in the spring and summer of 2010 was the worst in a decade, resulting in FEMA Disaster Declaration 1915. The event caused over $192,000 of public assistance costs throughout the county, again primarily due to flooding of county and township roads.

The Missouri River flood of 2011 may have been the most notable flooding event ever to occur in the recorded history of South Dakota, resulting in FEMA Disaster Declaration 1984. Although Gregory County did not suffer as much damage as some other counties located along the river, the county was impacted by the event.

Flooding in 2019 had a major impact throughout the year in Gregory County, starting in March when heavy rainfall fell on frozen ground, which led to considerable overland flooding. This event resulted in FEMA Disaster Declaration 4440, with over $1 million of public assistance costs in the county. Flooding continued during the summer and became even more severe when heavy rainfall in September caused additional flooding. Considerable damage to county and township roads occurred due to the flooding of 2019, and agricultural producers also were heavily impacted.

In June 2024, heavy rainfall across Gregory County on top of an already wet spring caused overland flooding, with several township roads damaged by flood waters. This event resulted in FEMA Disaster Declaration 4807.

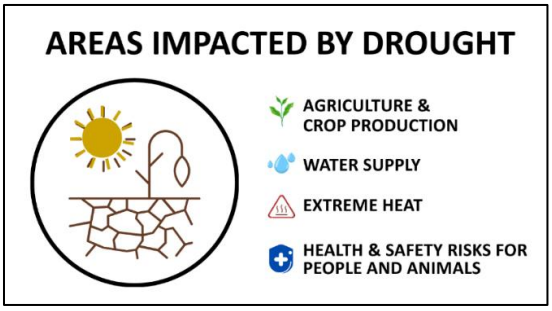
Probability

Table C.2 shows that 15 flooding events have been recorded in Gregory County since the mid-1990s. Excluding the events that were a recording of ongoing flood conditions, it appears there have been about 10 separate flood events in Gregory County since the mid-1990s, an average of about one every three years. Based on this analysis, the probability of flooding occurring somewhere in the county in a given year can be considered moderate. **Table C.1** shows that several floods were significant enough to result in a disaster declaration. It is certain that flooding will continue to impact the area to some degree, no matter what mitigation actions are pursued.

Drought

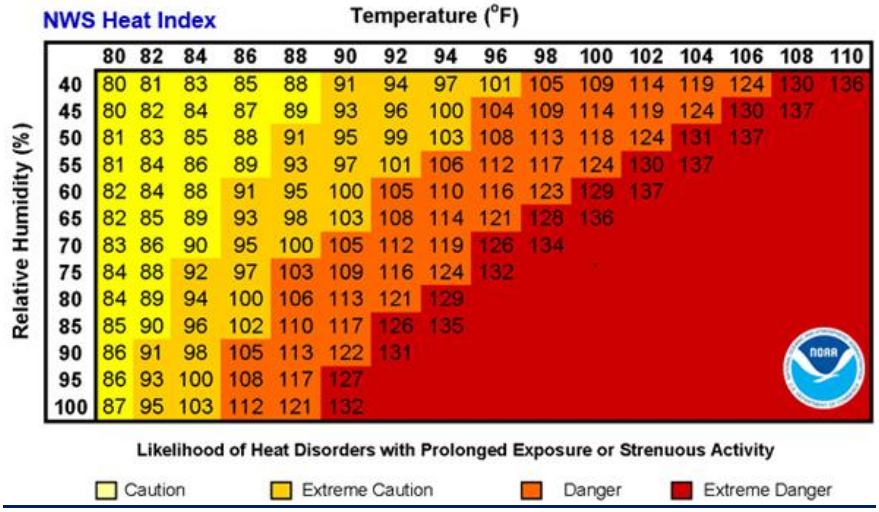
Description

Drought is a deficiency in precipitation over an extended period, 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 drought. Survey respondents ranked drought as the greatest hazard facing the county [5].



Droughts can occur at any time of the year, but the consequences are worse during the summer growing season, especially after dry winters. 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, which is defined by FEMA as a condition in which the air temperature hovers at least 10° Fahrenheit above the average high temperature for the region and lasts for several weeks. Drought and extreme heat often exist together and compound negative effects. According to the National Weather Service, among natural hazards, only the cold of winter 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. Elderly people, small children, people with certain medical conditions, and those on certain medications are particularly susceptible to heat stress. The following table shows the likelihood of heat disorder given the combination of air temperature and relative humidity.



[5] It should be noted that the survey was taken during an extended regional drought, which may have influenced the results. Still, there is no doubt that drought is a serious hazard facing the county.

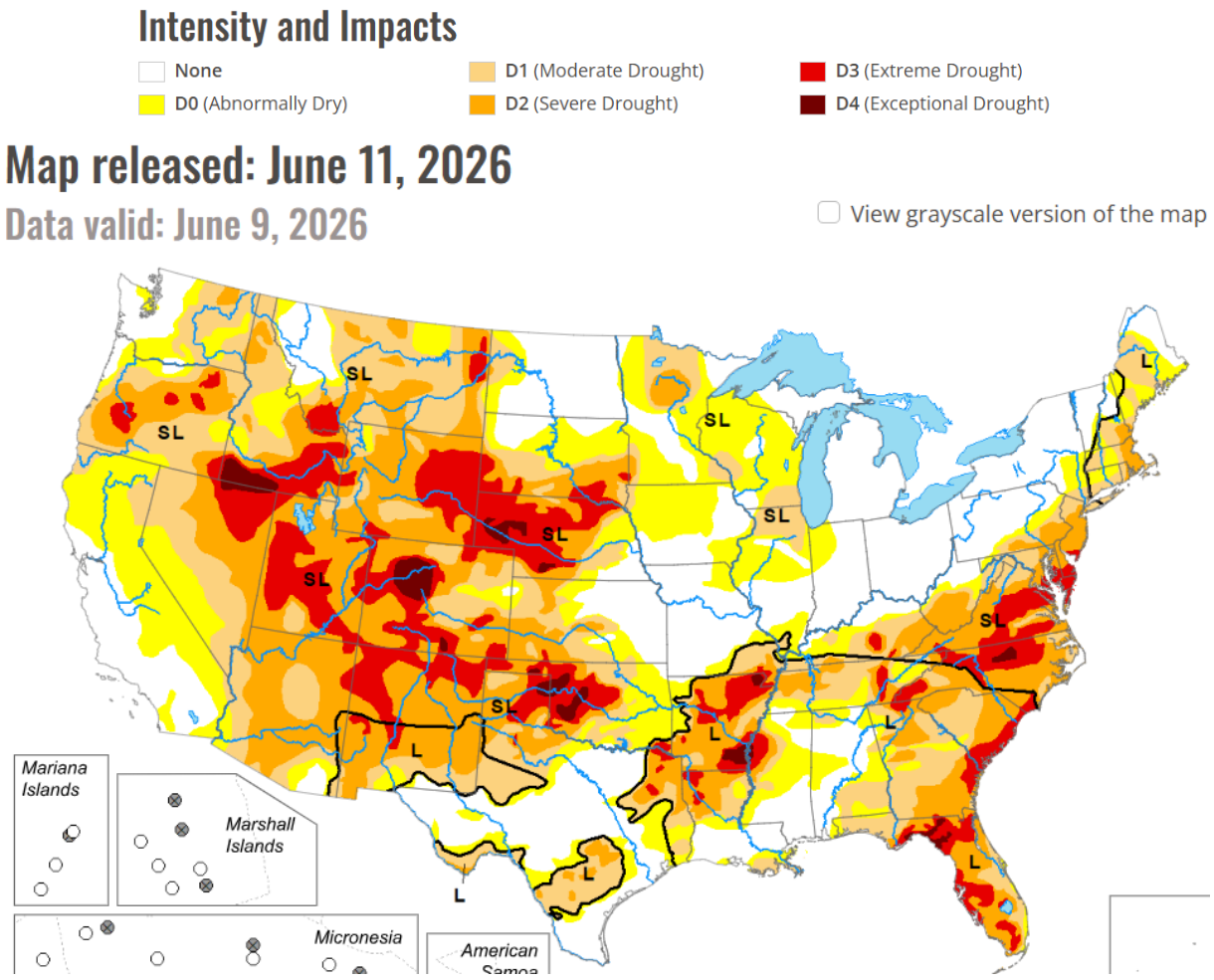
Location

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, Gregory County has experienced many years of below average annual precipitation, including 13 years between 1930 and 2023 in which precipitation was less than two thirds of normal. In terms of duration, it is not unusual for Gregory 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.

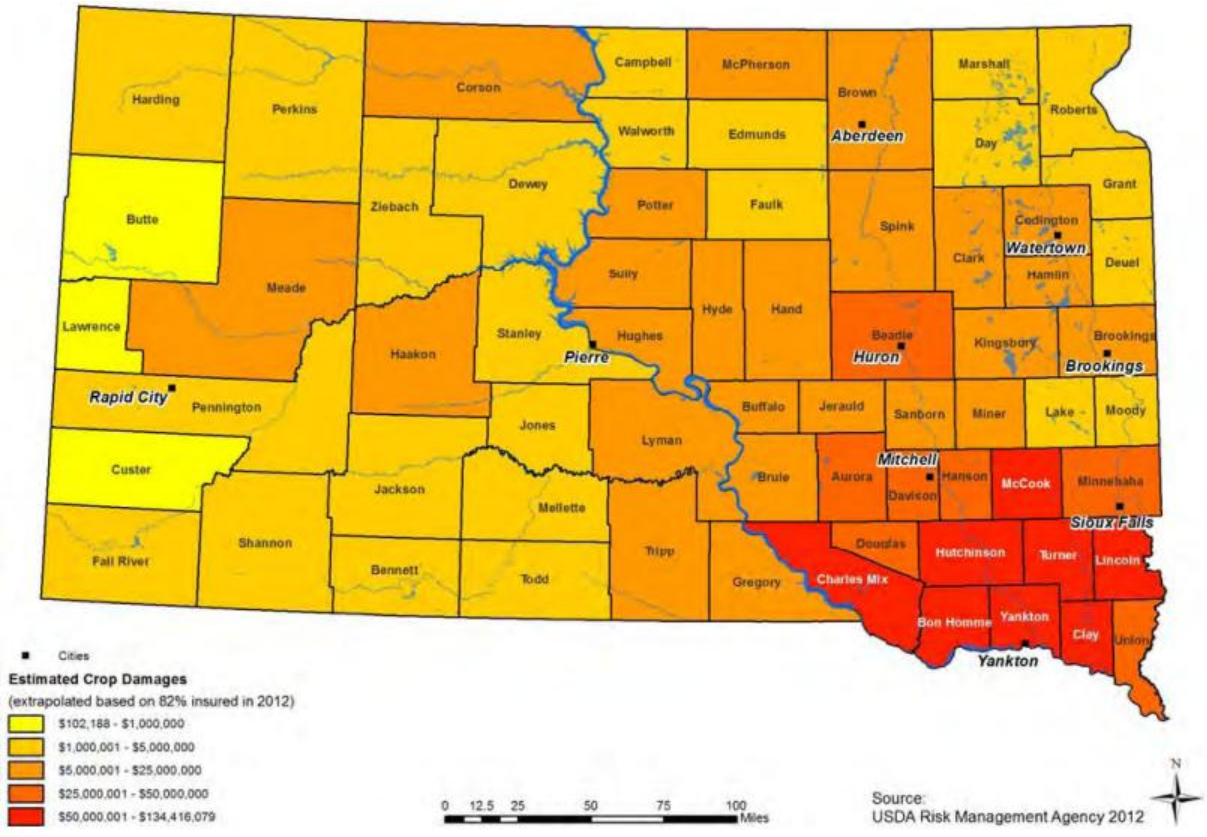
The U.S. Drought Monitor (USDM) has established the drought scale shown below, which is much like those that rate hurricanes and tornadoes. The "D-scale" speaks to the "unusualness" of a drought episode, with D1 conditions expected to occur about 10 to 20 percent of the time and D4 being much rarer, expected less than 2 percent of the time. Following the scale is the current drought severity index map of the United States.



History

Gregory County has experienced many severe droughts, the most significant of which occurred in the 1930s, the so-called dust bowl years. 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 so thick they concealed the sun for several days at a time. The severity of the drought was compounded by years of land management practices that left topsoil susceptible to the forces of the wind.

The drought of 1976 was one of the most severe in recent years, resulting in South Dakota's only drought emergency declaration to date. Drought in 1980 and 1981 affected the entire state of South Dakota and was rated as a 10-to-25-year event. The Drought in 2012 was so devastating that the State of South Dakota activated a Drought Task Force. The statewide impact on agricultural producers was tremendous. The figure below, as reproduced from the South Dakota Drought Mitigation Plan, shows the 2012 drought's impact statewide.



Probability

Table C.2 in **Appendix C** shows at least one drought record in Gregory County in ten 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.

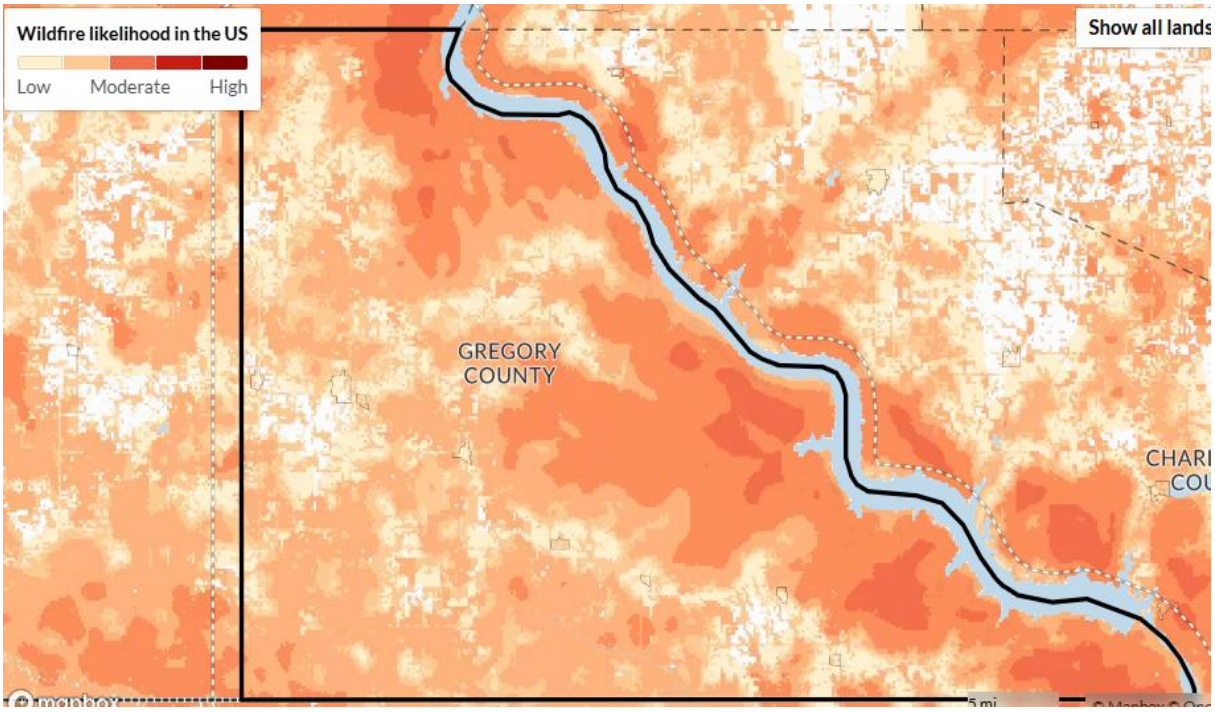
Wildfire

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. Wildfire is not as serious a concern in Gregory County as it is 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. Survey respondents considered wildfire to be the fifth most serious hazard facing the county.

Location

Wildfires in Gregory County are most likely to occur in large areas of extensive brush or unmanaged vegetation, including grassland and forested land, which together make up approximately 66 percent of the county's land base. The hills and draws along the Missouri River, which contain a significant amount of eastern red cedar trees and thick brush, experience wildfires rather frequently. Another concern is controlled burns that get out of control, which can occur almost anywhere in the county. This map, from the U.S. Forest Service's Wildfire Risk to Communities website, shows where wildfires are most likely to occur in the county (it does not reflect the intensity of fire).



Extent

The following table shows the number of wildfires according to various size classes that have occurred in Gregory County from 2000 through 2024 as reported to the South Dakota Department of Public Safety [6]. It shows that most of the fires have been fairly small, most impacting fewer than ten acres.

Table 3.6 – Wildfires in Gregory County (2000 - 2024)

1 to 9 Acres	10 to 49 Acres	50 to 99 Acres	100 to 249 Acres	250 to 499 Acres	500 Acres or More	Average Annual Acres Burned
88	26	5	8	0	1	120.9

Source: South Dakota Department of Public Safety

History

Some notable wildfires have occurred in Gregory County, but nothing on a truly destructive scale. The largest fire since 2000 occurred near Gregory in 2014, burning 800 acres. There are two wildfire records for Gregory County in the National Climatic Data Center's Storm Events Database. As shown in **Table C.2**, these events occurred in October 2011 and August 2012, burning 90 acres and 146 acres respectively.

Probability

Wildfires affecting fewer than ten acres are likely to occur somewhere in Gregory County most years, but large-scale wildfires are much less common. **Table 3.6** shows only one wildfire at least 500 acres in size occurred between 2000 and 2024. Based on this period of analysis, the probability of a significant wildfire occurring each year within Gregory County can be considered low.

Community Assets

Hazards can affect all parts of the community, but their impact on certain community assets is particularly important to consider. In this section, the most important community assets and facilities in Gregory County are identified, including those that would play an important role in helping the communities prepare for and respond to a hazard event.

Government Offices

- Gregory County Courthouse, Burke
- City offices in Bonesteel, Burke, Dallas, Fairfax, Gregory, and Herrick

Emergency preparedness and response

- Gregory County Emergency Management Office

[6] Since the data is reported by volunteer fire departments, and not all wildfire incidents are reported to the Department, the table may not reflect all wildfires that have occurred in the county.

- Gregory County Sheriff's Office, Burke
- Police departments in Bonesteel, Burke, and Gregory
- Fire departments in Bonesteel, Burke, Dallas, Fairfax, and Gregory
- Gregory County Highway Department, Burke
- Disaster relief shelters (*see p.59*)
- Emergency storm shelters (*see p.59*)

Medical facilities

- Burke Community Memorial Hospital
- Avera-Gregory Health Care Center

Educational facilities

- Burke School (K-12)
- Gregory School (K-12)
- South Central School (Bonesteel) (K-5)

Other important assets

- U.S. Army Corps of Engineers Fort Randall Dam
- Rosebud Electric Cooperative, Gregory
- Bonesteel Community Center
- Burke Community Center
- Dallas Community Center
- Gregory Community Center

Hazard Impact Analysis

This section assesses the vulnerability of Gregory County and the participating jurisdictions to each of the hazards that have been profiled. Vulnerability is defined as the extent to which people and property are exposed to harm or damage 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'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. It is an especially helpful planning tool for communities that have not been

mapped by the National Flood Insurance Program [7].

- 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.
- Data on the population living in wildfire risk zones was used to estimate potential wildfire losses.

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 Gregory County following major disaster declarations through FEMA's Public Assistance program.
- Data from the U.S. Dept of Agriculture Risk Management Agency was used to assess crop loss from natural hazards (see **Tables C.3 through C.6** in **Appendix C**).
- Information from the National Drought Mitigation Center's Drought Impact Reporter was used to assess the local impact of droughts.

At the conclusion of the vulnerability assessment for each hazard, an attempt is made to determine how vulnerability might change in the future. Census data and population projections were used in this analysis, as well as data on the volume of building permits that have been issued in the county in recent years and discussion with local officials about general development trends within the county. Other factors, including the possible impact of climate change, were also 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.

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, trees falling, 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.

[7] A limitation of HAZUS is the inadequacies associated with its hydrologic and hydraulic modeling, especially in sparsely populated areas. Also, HAZUS uses default national databases that may not be applicable at the local level.

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 and they cannot travel into town for groceries, medical supplies, or other important items.

To assess the county's vulnerability to winter storms, the methodology that was used in the South Dakota Hazard Mitigation Plan was essentially followed for this plan. The following 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:

A total of 84 winter weather events, including blizzards, heavy snow, ice storms, and winter storms, are shown in the National Climatic Data Center's Storm Events Database for Gregory County (see **Table C.2 in Appendix C**). In comparison, the average for South Dakota counties is 104 winter weather events, indicating that Gregory County may be somewhat less prone to adverse winter weather than other counties in the state.

Past Damage Amounts:

It is not easy to determine how much damage winter storms have caused in the county. The National Climatic Data Center's Storm Events Database records winter storm damage by forecast zones, not by county, so the data does not lend itself to analysis at the county level. Nevertheless, **Table C.2** indicates that many winter storms have caused significant damage in Gregory County.

Winter storms can have a major impact on agricultural production. Farmers typically protect themselves from the impacts of adverse weather 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. **Table C.3** in **Appendix C** provides information on indemnity payouts for crop loss to Gregory County farmers due to various types of winter weather events between 2000 and 2023. During this period of analysis, winter weather-related payouts averaged approximately $118,230 per year in Gregory County compared to the state average of $322,350 per year.

Building Exposure:

The total value of buildings in Gregory County is approximately $500 million, according to the South Dakota Hazard Mitigation Plan, which ranks 38th among the state's 66 counties. The median figure for South Dakota counties is approximately $620 million. From this

information, the county's building exposure can be considered moderate relative to other South Dakota counties.

Population Density:

Gregory County is sparsely populated, with an average of just 3.8 people per square mile, less than the state figure of 11.7 people per square mile and far below the national figure of 93.8. Gregory County would have to be rated low in terms of population density.

Future Vulnerability

No development has occurred anywhere in Gregory County since the previous plan was approved to affect any of the jurisdictions' vulnerability to winter storms. Looking ahead, vulnerability to winter storms may actually decrease if the population continues to decline as expected.

One factor that could impact vulnerability is climate change. 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 Gregory 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, Gregory County is especially vulnerable to summer storms accompanied by high wind because the landscape is open and there is very little topographic relief to block the wind.

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
- Housing stock characteristics in each community

Prior Events:

A total of 105 summer storm events (tornadoes, lightning, thunderstorms with wind gusts of at least 60 knots, and hail at least one inch in diameter) are shown in the National Climatic Data Center's Storm Events Database for Gregory County from 1960 through 2024 (see **Table C.2 in Appendix C**). In comparison, the average for South Dakota counties is 257 summer storm events, which indicates that Gregory County may be less prone to summer storms than other counties in the state.

Past Damage Amounts:

Many summer storm events have caused significant damage in Gregory County, as shown in **Table C.2**. According to the South Dakota Hazard Mitigation Plan, whose authors researched property damage from tornadoes in the state as reported in the National Climatic Data Center's Storm Events Database, the average annual loss from tornadoes in Gregory County between 1950 and 2016 was $341,882. The average annual loss during this period for South Dakota counties was approximately $163,730, indicating that Gregory County may be more vulnerable to suffering tornado damage than other counties in the state.

Gregory County farmers are quite vulnerable to the impact of summer storms. **Table C.4** in **Appendix C** provides information on indemnity payouts for crop loss in Gregory County due to severe summer weather between 2000 and 2023. During this period of analysis, summer storm-related payouts averaged approximately $156,710 per year in Gregory County compared to the state average of $461,120 per year.

Building Exposure:

The total value of buildings in Gregory County is approximately $500 million, according to the South Dakota Hazard Mitigation Plan, which ranks 38th among the state's 66 counties. The median figure for South Dakota counties is approximately $620 million. From this information, the county's building exposure can be considered moderate relative to other South Dakota counties.

Population Density:

Gregory County is sparsely populated, with an average of just 3.8 people per square mile, less than the state figure of 11.7 people per square mile and far below the national figure of 93.8. Gregory County would have to be rated low in terms of population density.

Housing Stock Characteristics

Differences in the local housing stock were analyzed to help determine vulnerability at the local level. The table below shows that the housing stock in each of the communities is older than the typical house in South Dakota, and an assumption can be made that some of the older houses may not be as structurally sound as a newer home, putting the occupants at higher risk to a powerful summer storm, such as a tornado or other high wind event. The impact on human life might be especially bad in Dallas, Gregory, and especially Fairfax given their high percentage of mobile homes, which are vulnerable to being overturned by tornadoes and other high wind events if not anchored properly.

Table 3.7 – Housing Stock Characteristics

Community	Houses Built Before 1940	Houses Built Since 2000	Mobile Homes
Bonesteel	43.4%	9.7%	7.1%
Burke	21.1%	21.5%	4.4%
Dallas	65.7%	0.0%	11.4%
Fairfax	38.2%	22.1%	25.0%
Gregory	28.9%	8.7%	6.0%
Herrick	36.7%	3.3%	13.3%
South Dakota	*14.6%*	*31.5%*	*6.4%*

Source: 2020 US Census (DP04 Selected Housing Characteristics)

Future Vulnerability

No development has occurred anywhere in Gregory County since the previous plan was approved to affect any of the jurisdictions' vulnerability to summer storms. Looking ahead, vulnerability to summer storms may in fact decrease if the population continues declining.

Regarding the impact of climate change, the South Dakota Hazard Mitigation Plan cites the Climate Science Special Report from 2017, which states that damage 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 21st century. The expected increase in the number of days above 95 degrees by midcentury could create conditions favorable to the formation of severe thunderstorms. There is some uncertainty in these projections, but severe thunderstorms and tornadoes will remain a hazard in the state.

Flooding

Like all counties in South Dakota, Gregory County is vulnerable to flooding. Because of the specific nature of flooding, vulnerability 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 that was run for the South Dakota Hazard Mitigation Plan, Gregory County's potential building damage loss ratio from flooding (the percent of the total building inventory value that could be damaged by flooding in any given year) of 0.2 percent is well below the median statewide figure of 0.75 percent. Likewise, the 1.1 percent of the county's population potentially displaced by flooding is far below the state figure of 4.6 percent.

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.

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. **Table C.5** in **Appendix C** provides information on indemnity payouts for crop loss in Gregory County due to flooding and excess moisture between 2000 and 2023. During this period of analysis, flood-related payouts averaged approximately $521,880 per year in Gregory County compared to the state average of $2,204,140 per year.

Approximately 49% of the flood-related indemnity payouts to Gregory County farmers were due to the severe flooding that occurred in 2019, which may have been 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. In Gregory County, approximately 35,200 acres of land were not planted, which was about 6% of land that would have otherwise been planted, ranking the county 41st in South Dakota.

Local Flood Vulnerability

At the community level, vulnerability was determined by using FEMA's HAZUS loss estimation software to estimate potential losses during a 100-year flood event. Vulnerability was also assessed by using GIS software to overlay areas of flood risk on parcel data to determine the assessed value of property at risk. The following table summarizes the results of the analysis (note that both analyses included some land outside the municipal boundaries).

Table 3.8 – Community Flood Loss Estimation

Community	Building Structural Damage	Debris Generated (Tons)	Displaced Households	People Needing Shelter	Assessed Value of Property at Risk
Bonesteel	$0	1	1	0	$346,500
Burke	$81,000	65	3	0	$0
Dallas	*(HAZUS FAILED TO RUN)*				
Fairfax	*(HAZUS FAILED TO RUN)*				
Gregory	$34,500	21	18	5	$419,000
Herrick	*(HAZUS FAILED TO RUN)*				

Sources: FEMA HAZUS loss estimation software; Gregory County Director of Equalization

Flood risk was also analyzed using the RiskFactor website, which uses a probabilistic flood model that shows any location's risk of flooding from rain, rivers, tides, and storm surges. According to the RiskFactor analysis, there is only minor flood risk in each of the communities.

Future Vulnerability

No development has occurred in flood prone locations or anywhere else within Gregory County since the previous plan was approved to affect any of the jurisdictions' vulnerability

to flooding. Looking ahead, vulnerability to flooding may decrease if the population continues to decline as expected.

One factor that may increase vulnerability is the continuing conversion of wetlands and other marginal land to agricultural production. Farming these marginal lands can increase 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 Gregory County are not available, but future updates to this plan could explore this trend in more depth.

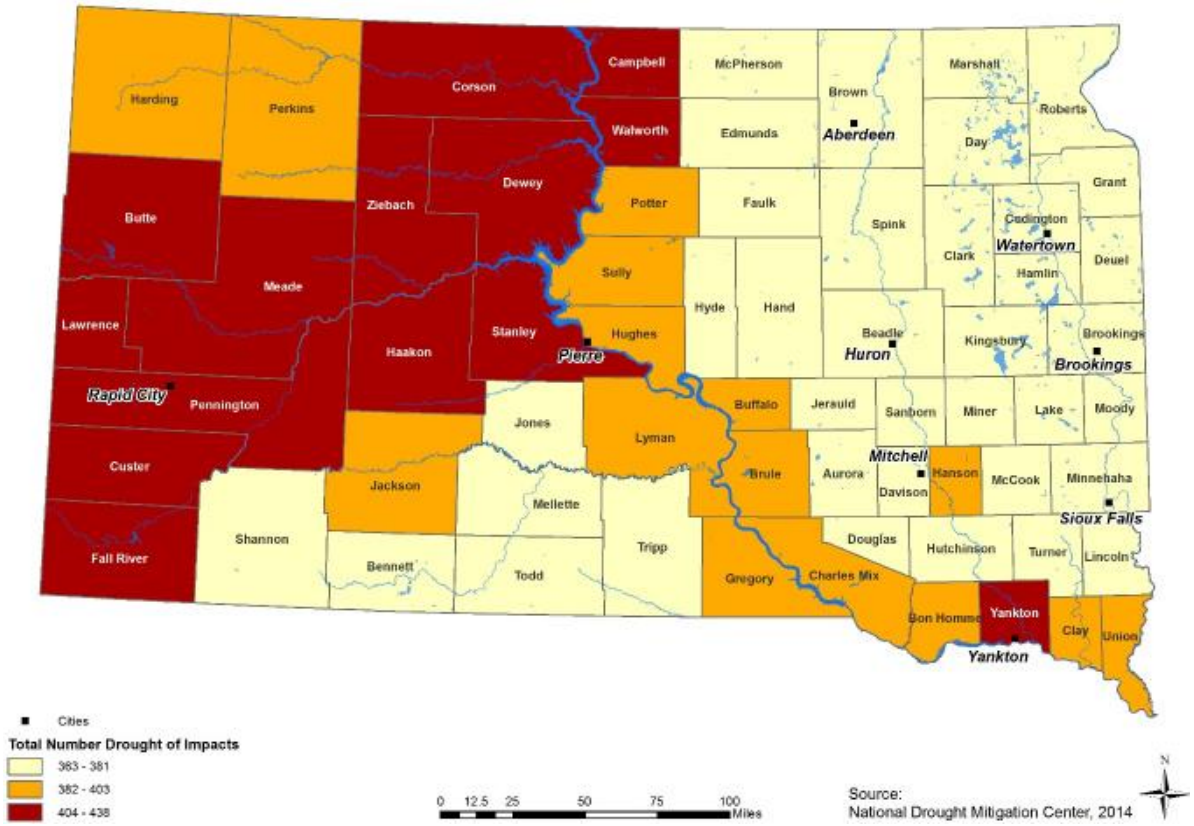
The nature and frequency of flooding also could be altered by climate change. The South Dakota Hazard Mitigation Plan notes a long-term trend of increasing annual precipitation across South Dakota, among the highest in the country, much of it occurring in the spring and fall seasons, and there is high confidence that precipitation extremes will increase in frequency and intensity that could exacerbate flooding.

Drought

Without question, Gregory County is vulnerable to drought, with the biggest impact being in the agricultural sector. Non-irrigated cropland is most susceptible to drought, and yield reductions due to moisture shortages can be aggravated by wind-induced soil erosion. Most farmers in Gregory County have crop insurance, which lessens the financial impact of droughts. Modern agricultural practices, such as no-till farming and the development of drought-tolerant crops, also help farmers withstand years of low rainfall. **Table C.6** in **Appendix C** provides information on indemnity payouts for crop loss in Gregory County due to drought and heat between 2000 and 2023. During this period of analysis, drought-related payouts averaged about $2,300,890 per year in Gregory County compared to the state average of $2,942,115 per year. About 28% of the payouts were due to the 2012 drought.

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. Gregory County's loss ratio of 6.4% was slightly higher than the 3.1% average for South Dakota counties. The authors of the South Dakota Drought Mitigation Plan assigned Gregory County a rating of "Moderate" 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, which analyzes a broad range of drought impacts, including the social, economic, and environmental realms. As shown in the figure on the following page from the South Dakota Drought Mitigation Plan, Gregory County is in the medium range of counties in terms of the number of drought impacts.



Future Vulnerability

No development has occurred anywhere within Gregory County since the previous plan was approved to affect any of the jurisdictions' vulnerability to drought. Looking ahead, vulnerability to drought may increase 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. The expected increase in Gregory County's average annual temperature and the number of days over 95 degrees may lead to increased evaporation and drought frequency, which would compound water scarcity problems.

Wildfire

Wildfire risk in Gregory County was analyzed using two different sources. According to the U.S. Forest Service's Wildfire Risk to Communities website, Gregory County's overall risk is considered medium, with homes in the county having a greater wildfire risk than 63% of South Dakota counties and 67% of counties nationwide. Information from the SILVIS Lab at the University of Wisconsin shows that 1,337 housing units in the county are located in the Wildland-Urban Interface, which are locations vulnerable to wildfire because of a combination of dense housing and vegetation. The housing units at risk represent approximately 61% of the total housing stock in Gregory County, whereas the statewide figure is about 26%.

Future Vulnerability

No recent development since the previous plan was approved has occurred in areas prone to wildfire, or anywhere else within Gregory County, to affect vulnerability to wildfire. The proposed Scalp Mountain development, with the potential for up to 70 homes to be built among the Missouri River bluffs, would increase risk because of the surrounding trees and because there is no water supply on hand to fight a fire. However, it is unknown when, if ever, the development will be built.

One factor that could increase wildfire vulnerability is the continued spread of eastern red cedar trees. These trees are spreading quickly in the county, especially in the hilly terrain along the Missouri River, and efforts to control their spread have met with only limited success. The fuel load they represent could turn an otherwise routine brushfire into a very serious situation.

The possible impact of climate change also needs to be considered. The South Dakota Hazard Mitigation Plan cites a U.S. Forest Service study that indicates a likely increase in 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 Gregory County and each of the participating jurisdictions to each of the hazards profiled is summarized. Maps are presented at the end of the section to augment the analysis, showing areas vulnerable to flooding; the graphic on page 35 showed areas where wildfire is most likely to occur. Vulnerability to winter storms, summer storms, and drought is not mapped, as those hazards are likely to impact all areas of the county equally.

- **Winter Storms**

Gregory County's vulnerability to winter storms can be considered high. The authors of the South Dakota Hazard Mitigation Plan assigned Gregory a rating of High when considering prior winter storm events in the county, building exposure, and population density. 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, some of whom are more than 25 miles from the nearest place with groceries, medical service and supplies, and other important items, puts them at increased 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, especially when winter storms are accompanied by high winds and freezing precipitation that can cause ice to build up on powerlines, which can then cause the lines and poles to come down. Elderly residents who rely on home medical apparatus

dependent on a constant supply of power are particularly vulnerable during these times and they are often less able to withstand extreme cold events.

- **Summer Storms**

Gregory County's vulnerability to summer storms can be considered moderate to high. The authors of the South Dakota Hazard Mitigation Plan assigned Gregory a rating of Moderate when considering prior tornado events in the county, building exposure, and population density. All areas of the county are vulnerable to summer storms. 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. Vulnerability may be somewhat higher in Dallas, Fairfax, and Herrick, which have a relatively high percentage of mobile homes.

- **Flooding**

The overall vulnerability of Gregory County to flooding can be described as low to moderate. According to the vulnerability analysis conducted for the South Dakota Hazard Mitigation Plan, the county's estimated flood loss in terms of building damage and displaced people is well below the state average. Much of the vulnerability is to cropland and to rural county roads, although some vulnerability also exists along the Missouri River due to the possibility of dam failure. The flooding that occurred in the county in 2019 was the worst in at least 30 years, with roads throughout the county being impacted. Following is a summary of vulnerability to flooding in each of the communities:

Bonesteel: There is a minor degree of vulnerability here, as shown in **Table 3.8**. The vulnerable area is on the southern edge of the city; no critical facilities or important infrastructure is at risk. Minor flood damage occurred in Bonesteel in 2019.

Burke: There is a minor degree of vulnerability here, as shown in **Table 3.8**. Flood damage in Burke in 2019 was significant, with numerous houses receiving basement flooding, at least three of which suffered significant damage.

Dallas: There appears to be little vulnerability to flooding here, but an area along North Main Street near the grain elevator has suffered some minor flooding in the past. Minor flood damage occurred in Dallas in 2019.

Fairfax: There appears to be little vulnerability to flooding here. Minor flood damage occurred in Fairfax in 2019.

Gregory: There is a minor degree of vulnerability here, as shown in **Table 3.8**. The Rosebud Electric Cooperative's office just east of Gregory is located on property partially located within a flood prone area, but the facility has never suffered any flood damage. Flood damage in Gregory in 2019 was significant, with several houses receiving basement flooding.

Herrick: There is a minor degree of vulnerability to flooding here. Flood damage in Herrick in 2019 was fairly significant, with some houses receiving basement flooding. After the event, the Town received FEMA Public Assistance funding to help replace damaged culverts.

- **Drought**

Gregory County's vulnerability to drought can be considered moderate to high and is certain to continue for the foreseeable future. The impact is primarily on the agricultural sector, where serious losses have occurred. The South Dakota Hazard Mitigation Plan assigned a vulnerability rating of Moderate for Gregory County in terms of drought's impact to crops between 2000 and 2014. Residential and commercial impacts of drought are minor, although the City of Burke has requested its residents to limit non-essential water usage during dry very periods.

- **Wildfire**

The overall vulnerability to wildfire in Gregory County can be considered moderate. Although no truly destructive wildfire has ever occurred in the county, approximately 61% of the county's population lives in a location considered to be vulnerable to wildfire, well above the statewide figure of 26%.

Figure 3.1 – Bonesteel

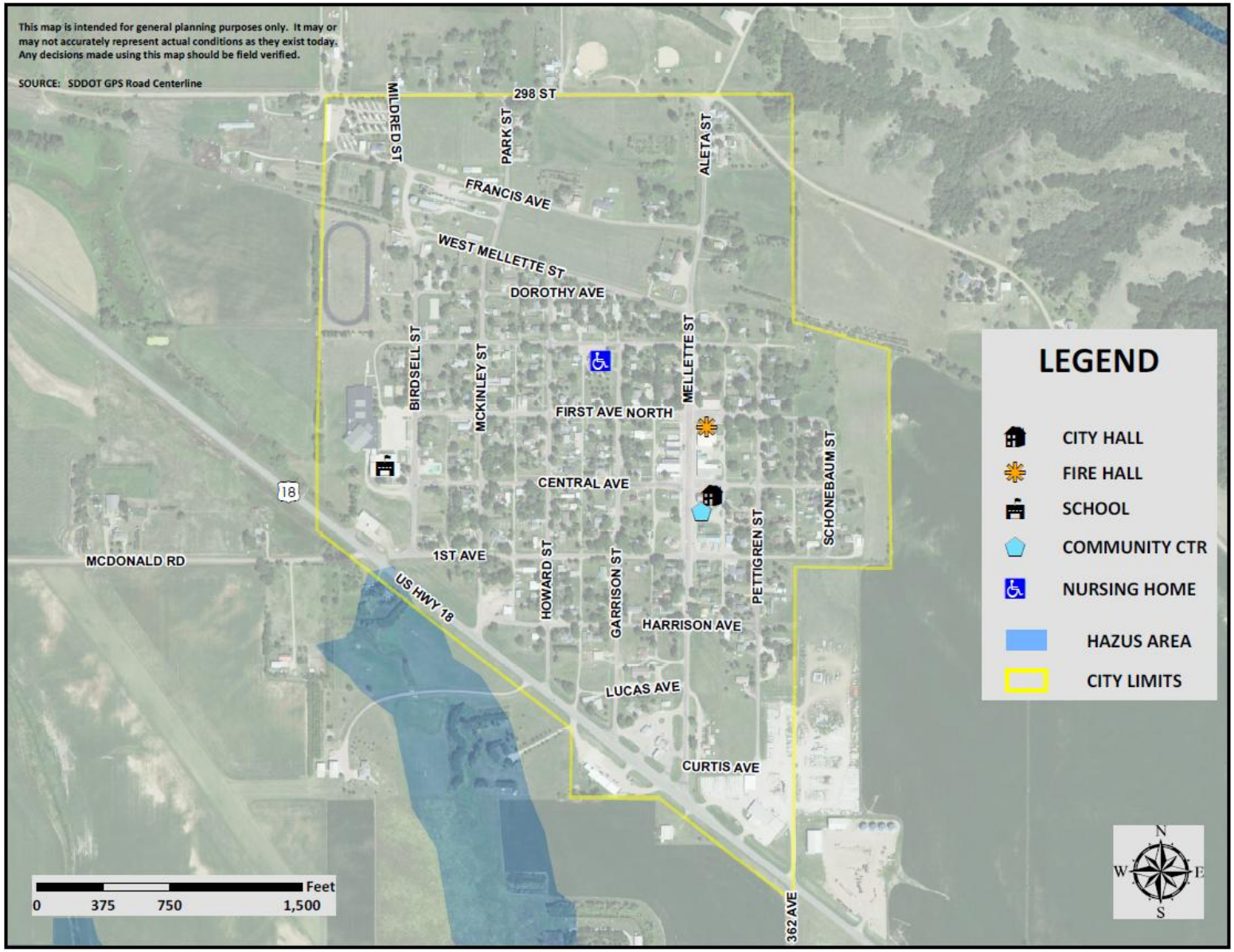


Figure 3.2 - Burke

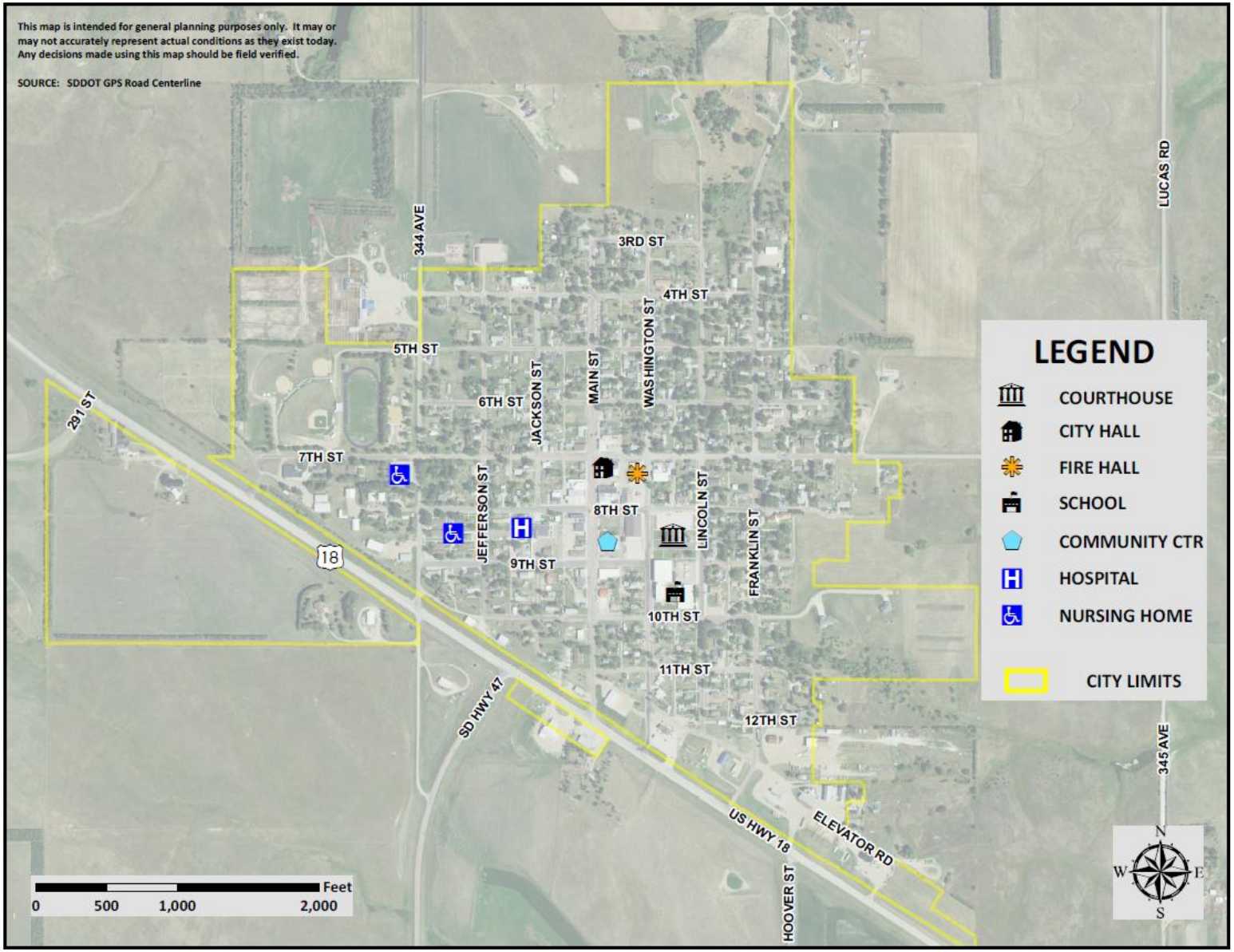


Figure 3.3 – Dallas



Figure 3.4 – Fairfax

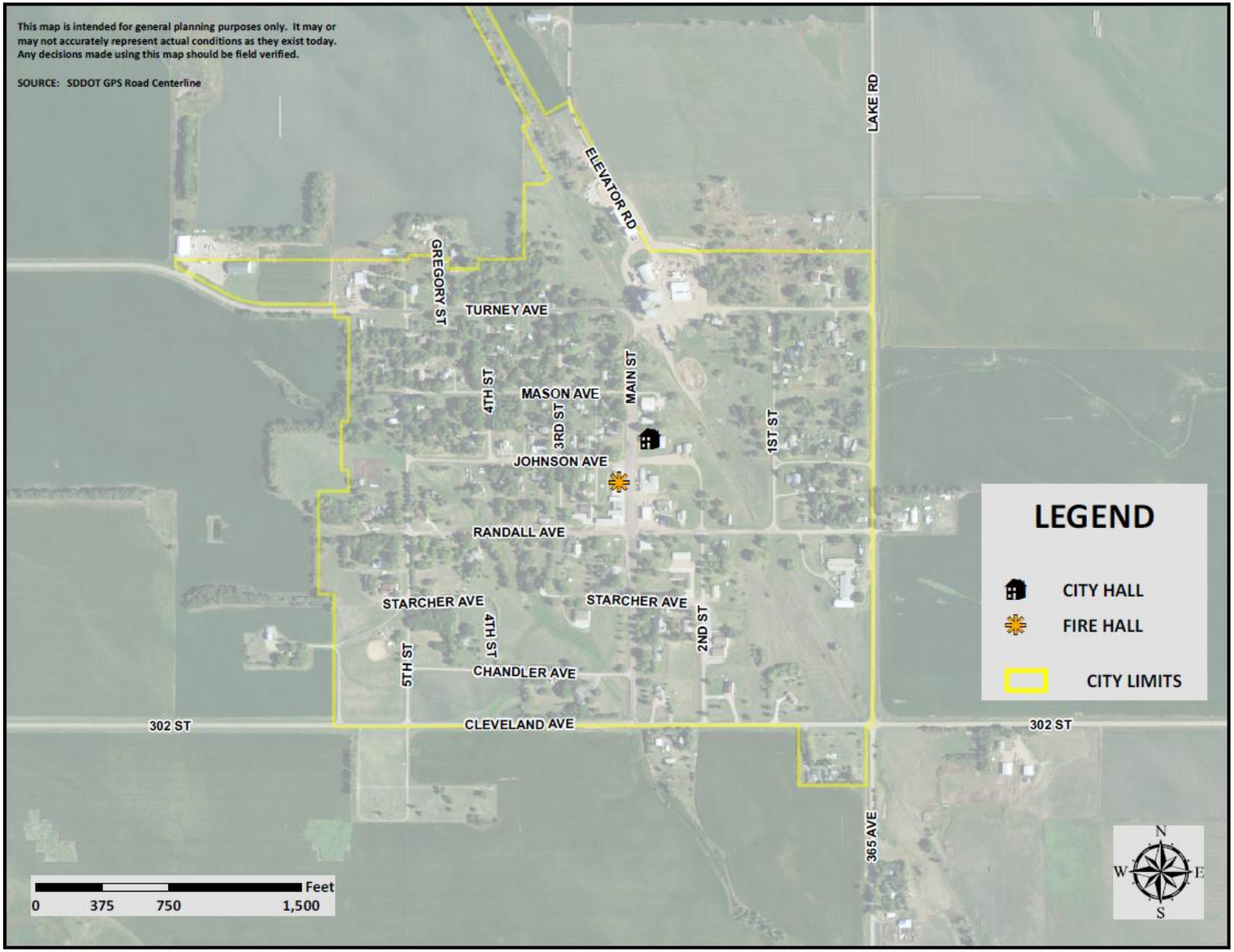


Figure 3.5 – Gregory

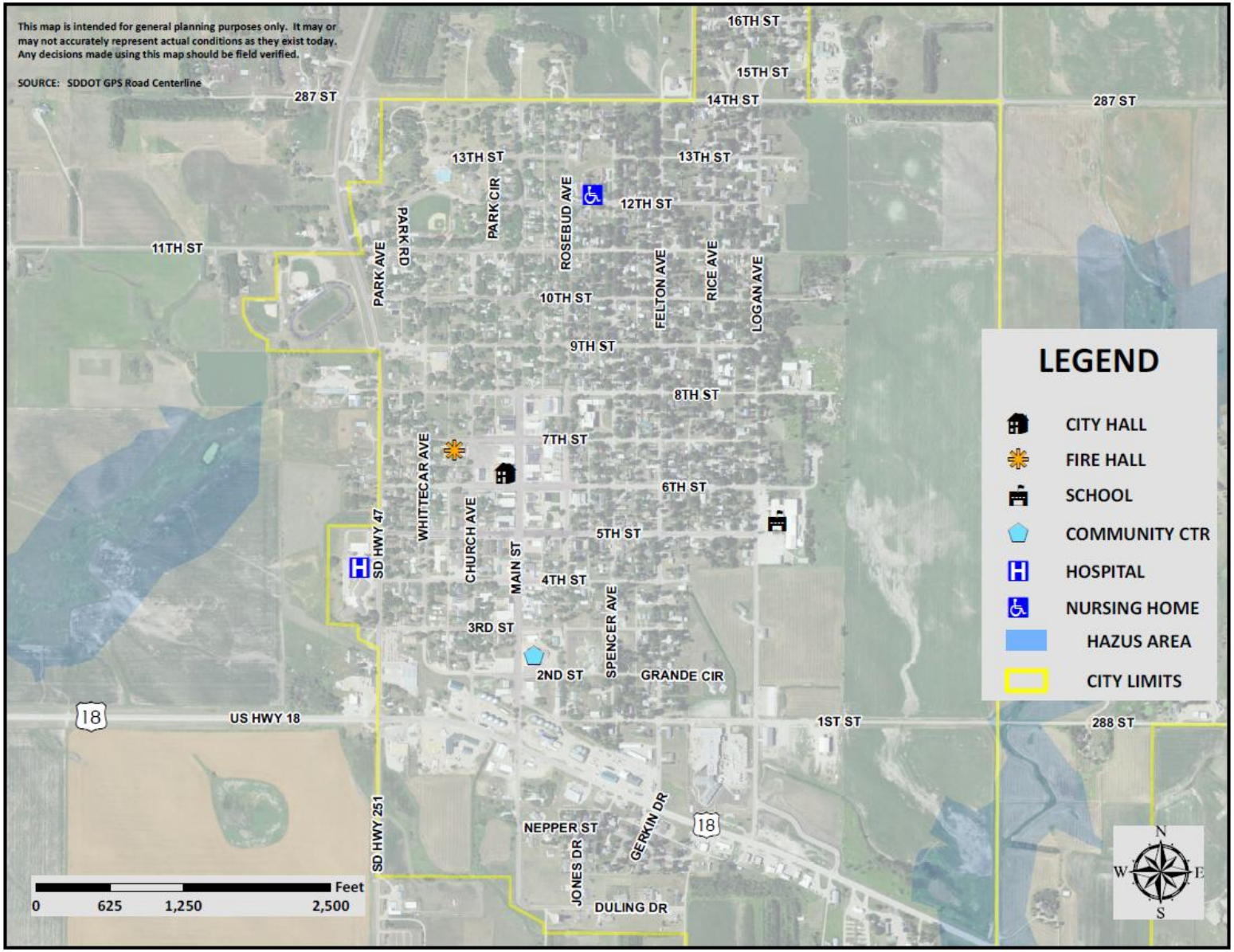
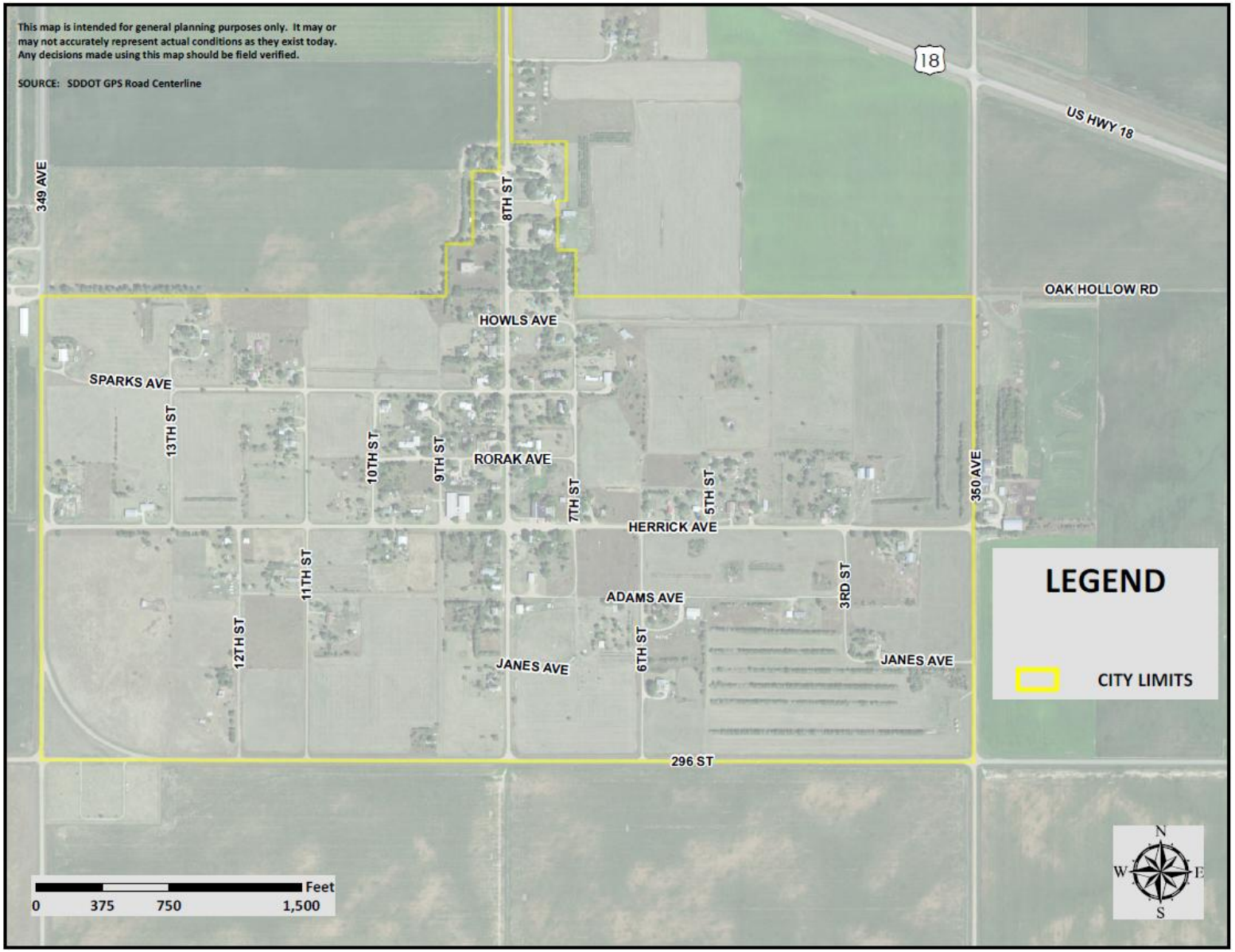


Figure 3.6 – Herrick



2026 Gregory County (SD)
Hazard Mitigation Plan



CHAPTER IV

Risk Mitigation Strategy

PLANNING & DEVELOPMENT DISTRICT III

CHAPTER IV
RISK MITIGATION STRATEGY

Background

The previous chapter described the types of hazards most likely to impact Gregory County and discussed the county's vulnerability to each of the hazards. This chapter describes the local resources and capabilities available to support hazard mitigation, 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. **Table 4.5** at the end of the chapter provides information about each of the proposed actions.

Community Capabilities

Resources are available at the local level to support mitigation activities and efforts in Gregory County. For the purposes of this plan, these resources are divided into regulatory mechanisms and other capabilities.

Regulatory Mechanisms

Regulatory mechanisms and authorities to mitigate the various hazards that impact Gregory County are limited. For instance, none of the jurisdictions have adopted a building code ordinance. By South Dakota state law, any local unit of government that has not adopted building codes is required to follow the most recent edition of the International Building Code, but there is no local enforcement mechanism in any of the jurisdictions. The following table summarizes the formal regulatory policies within Gregory County that can support the local mitigation strategy.

Table 4.1 – Regulatory Mechanisms

Item	Notes
Gregory County Zoning Ordinance	The ordinance, which is based on the Gregory County Comprehensive Plan, controls where growth and development can occur within the county.
Gregory County Open Burning Ban	The County passed a resolution in 2024 that prohibits open burning when climatic conditions indicate the threat of wildfire. The resolution goes into effect upon action by the county commission in consultation with the Gregory County Open Burning Advisory Board.
Bonesteel Zoning Ordinance	The ordinance, which is based on the City's comprehensive plan, controls where growth and development can occur in the community.
Burke Zoning Ordinance	The ordinance, which is based on the City's comprehensive plan, controls where growth and development can occur in the community.
Gregory Zoning Ordinance	The ordinance, which is based on the City's comprehensive plan, controls where growth and development can occur in the community.

Regulatory authority also exists within Gregory County to mitigate the impact of other hazards. For example, during times of severe drought, each community can enact regulations limiting residential and commercial water usage. To date, none of the communities has had to enact such regulations, but Burke and Gregory have requested residents to voluntarily limit water usage during very dry periods.

As shown in the following table, not all of the communities participate in the National Flood Insurance Program (NFIP) and none have been mapped for flood risk. Since none of them have been mapped, there are no NFIP requirements to promote or enforce. Furthermore, since there are no Special Flood Hazard Areas within the county, there are no areas to regulate for substantial damage and improvement provisions. Training and information on NFIP for many of the jurisdictions has not been passed down over the years as positions have turned over, which has resulted in a situation where current staff in some of the communities have little knowledge about the NFIP program. To address this issue, each jurisdiction has committed to improving its knowledge of and capacity to implement the NFIP program.

Table 4.2 – National Flood Insurance Program Participation

Jurisdiction	Current Effective Map Date	Reg-Emer Date	Appointed Designee	Floodplain Regulation Enforcement	Substantial Improvements Provisions
Gregory Co	(NSFHA)	06/08/1998	Auditor	There are no floodplain regulations to administer.	Not applicable
Bonesteel	*(Community does not participate in the NFIP program)*				
Burke	(NSFHA)	06/08/1998	Finance Officer	There are no floodplain regulations to administer.	Not applicable
Dallas	(NSFHA)	03/18/1986	Finance Officer	There are no floodplain regulations to administer.	Not applicable
Fairfax	*(Community does not participate in the NFIP program)*				
Gregory	(NSFHA)	12/09/1985	Mayor	There are no floodplain regulations to administer.	Not applicable
Herrick	*(Community does not participate in the NFIP program)*				

There are two active National Flood Insurance Program policies in Gregory County providing a total of $577,000 of coverage. A total of three losses have been recorded with $167,335 in claims. No repetitive losses or severe repetitive losses have ever been recorded in the county.

Other Capabilities

Other resources and capabilities exist within Gregory County to support the mitigation strategy. This includes administrative and technical resources, financial resources, and education and outreach efforts, as well as physical assets, which are summarized in the following table and discussed in further detail below.

Table 4.3 – Other Local Capabilities to Support Hazard Mitigation

	Gregory Co.	Bonesteel	Burke	Dallas	Fairfax	Gregory	Herrick
ADMINISTRATIVE & TECHNICAL							
Emergency management	X						
Land use planning	X	X	X			X	
Public works		X	X			X	
Municipal electric system			X				
Floodplain management	X		X	X		X	
Wildfire management	X	X	X	X		X	
Building code enforcement							
FINANCIAL							
Budgeting process	X	X	X	X	X	X	X
Levy/Project surcharge for specific purposes		X	X			X	
EDUCATION AND OUTREACH							
Severe Weather Awareness Week	X						
Emergency alerts/notification to cellphones		X	X			X	
Social media	X	X	X			X	
PHYSICAL ASSETS							
Warning siren		X	X	X	X	X	X
Storm shelter			X			X	
Relief shelter		X	X	X		X	

Administrative and technical expertise to support hazard mitigation efforts in the county is limited. For instance, the Gregory County emergency management position is less than full-time and there are no other support staff. However, the current emergency management director has taken a more proactive approach toward hazard mitigation than previous individuals in the position.

The availability of financial resources is critical to the success of this plan. Since there are no specific local funding sources available to support hazard mitigation in Gregory County, the budgeting process is where the "rubber meets the road" if hazard mitigation is to be achieved. Therefore, the mitigation actions listed in **Table 4.5** should be considered when the jurisdictions begin developing 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. To help ensure 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.

Education and outreach to support hazard mitigation in Gregory County is limited, but efforts are being made. The Gregory County Emergency Management office participates in severe weather public awareness campaigns in conjunction with the State Office of Emergency Management and the National Weather Service and communicates regularly with local officials regarding severe weather awareness and training opportunities. Hazard mitigation

information is also available on the Gregory County website. Alerts for adverse weather and other emergencies are texted to residents of Bonesteel, Burke, and Gregory.

There are many physical assets in Gregory County that can help protect people prior to, during, or after a disaster event or other emergency situation. Following is a listing of these assets.

- Warning sirens – sirens to warn people of impending severe weather are located in each community.
- Storm shelters - public facilities that can serve as emergency shelter from a tornado or other severe weather include:
  - Burke Community Memorial Hospital basement
  - Gregory School Auditorium basement
- Relief shelters – facilities that can provide short-term relief, such as a warm meal or overnight lodging, following a disaster event include [8]:
  - Bonesteel Community Center
  - Bonesteel City Hall
  - Burke Community Center
  - Dallas American Legion building
  - Gregory Auditorium

The ability of Gregory County and the other jurisdictions to enhance their mitigation capabilities is limited. For instance, none of the jurisdictions have the financial resources to hire specialized staff such as engineers to develop hydrology studies or do precise elevation measurements, professionals to enforce building codes, or grant writers to develop applications for hazard mitigation funds. However, through their membership in Planning & Development District III, each of these jurisdictions has become more familiar with hazard mitigation concepts, and their continued participation as this plan is updated in future years will allow them to further develop their knowledge and capabilities. District III staff, which have decades of experience working on various planning and community development activities within Gregory County, wrote the county's current hazard mitigation plan and helped develop applications to fund previous hazard mitigation projects within the county.

Mitigation Goals and Objectives

For this plan update, there are no significant changes in Gregory County's hazard mitigation strategy. The community priorities have not changed, and the planning team decided to keep all the goals and objectives from the current mitigation plan. This decision was based in part on the results of the survey, but even more so on the fact that there has been no significant

[8] There are no relief shelters in Fairfax or Herrick. Residents of Fairfax can drive five miles to use shelters in Bonesteel and Herrick residents can drive seven miles to Burke.

development anywhere in the county since the current plan was adopted and no changes in community vulnerability [9]. The following goals were identified:

- Minimize loss of life and injuries from hazards.
- Minimize damage to existing and future structures within hazard prone areas.
- Reduce losses to critical facilities, utilities, and infrastructure from hazards.
- Reduce impacts to the economy and the environment from hazards.

After the team had settled on the goals, they turned their focus to each of the hazards facing the County. Following are the specific mitigation objectives identified 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 the 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, crop, and infrastructure losses due to wildfires.

Mitigation Action Plan

With the mitigation capabilities, goals, and objectives identified, the planning team began the process of selecting mitigation actions to accomplish the mitigation strategy. This followed up and built upon the earlier review of the progress being made to implement the actions listed in the county's current hazard mitigation plan. A list of the actions and a summary of the implementation status of each action is shown in the following table.

[9] The lack of development is shown by the fact that a total of only 107 building permits were issued throughout Gregory County between 2010 and 2022, an average of about eight per year.

Table 4.4 – Progress on Implementing Previously Proposed Actions

Mitigation Action	Hazard	Current Status
GREGORY COUNTY		
Powerline burial.	Winter storm	Progress is being made. The Rosebud Electric Coop averages about 15 miles per year of line burial or upgrades.
Implement drainage improvements along county roads.	Flooding	Small scale projects, such as replacement of culverts, are being implemented.
Generator acquisition for courthouse.	Winter storm	Completed with FEMA hazard mitigation funding in 2026.
Install warning sirens in Lucas and St. Charles.	Summer storm	No progress has been made.
Join StormReady program.	Summer storm	The County has looked into the program but has not joined yet.
Join Firewise USA program.	Wildfire	The County has looked into the program but has not joined yet.
CITY OF BONESTEEL		
Generator acquisition for fire hall.	Winter storm	A generator is scheduled to be installed later in 2026.
Generator acquisition for community center/city hall.	Winter storm	No progress has been made.
Contact state NFIP coordinator regarding participation in National Flood Insurance Program.	Flooding	No progress has been made.
Join StormReady program.	Summer storm	No progress has been made.
Join Firewise USA program.	Wildfire	No progress has been made.
CITY OF BURKE		
Powerline burial.	Winter storm	Progress continues to be made. The City typically buries a block or two of line each year.
Generator acquisition for community center.	Winter storm	No progress has been made.
Address water drainage on West 8th and 9th Streets.	Flooding	Some progress has been made, but more work is needed.
Join Firewise USA program.	Wildfire	No progress has been made.
CITY OF GREGORY		
Make drainage improvements in various locations.	Flooding	Some progress has been made, but more work is needed.
Generator acquisition for community center.	Winter storm	No progress has been made.
Join StormReady program.	Summer storm	No progress has been made.

The participants were encouraged to consider a broad range of mitigation actions, including measures designed to avoid, avert, or adapt to the hazards they face. To guide the

jurisdictions in this process, a list of potential mitigation actions based on FEMA guidance was distributed to the team and they were reminded that they should focus on hazard mitigation as opposed to preparedness. The actions discussed and considered can be grouped into the following general categories:

- Plans and regulations: Government authorities, policies, or codes 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.

- Structure and Infrastructure Projects: Modifying existing infrastructure to remove it from a hazard area or construction of new structures to reduce impacts of hazards. Examples include:
  - Upgrading stormwater infrastructure, such as culverts and storm sewer piping.
  - Replacing overhead utility lines with underground lines.
  - Building tornado safe rooms.

- Natural Systems Protection: Actions that minimize damage and losses and also preserve or restore the functions of natural systems. Examples include:
  - Using low-lying areas as natural water retention ponds.
  - Restoring and preserving wetlands and stream corridors.
  - Forest and vegetation management.
  - Providing incentives for xeriscaping.

- Education and Awareness Programs: Programs to educate the public and decision makers about hazard risks and community mitigation programs. Examples include:
  - Developing a hazard 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 conserve water during droughts.

The final list of mitigation actions identified by the jurisdictions is shown in **Table 4.5**. The table contains the following information for each action:

- The local priority rating.
- The project lead primarily responsible for implementing the action.

- The estimated time frame needed to accomplish the action. Short-term actions can be completed within two years, Mid-term actions from two to five years, and Long-term actions will take more than five years to implement.
- The estimated cost to implement the action.
- Resources that may be available to help fund the action.
- Notes and details about the proposed action.

Prioritizing the actions is important because not all of them can be pursued simultaneously, especially when costly projects are considered. Actions providing the most 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 based on the following criteria helped guide the process:

- 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?

Of these criteria, financial considerations are especially important, because neither Gregory 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)
- Flood Mitigation Assistance (FMA)
- Public Assistance Section 406 funds

Other grant and loan programs/sources

- US Economic Development Administration
- US Department of Agriculture Rural Development grant/loan program

- US Bureau of Reclamation WaterSMART program
- South Dakota Community Development Block Grant program
- South Dakota State Homeland Security Program
- South Dakota Dept. of Agriculture and Natural Resources
- South Dakota Dept. of Transportation
- Natural Resource Conservation Service
- Western States Wildland Urban Interface Grant Program

Table 4.5 - Proposed Mitigation Actions

GREGORY COUNTY ACTIONS	HAZARD	PRIORITY	PROJECT LEAD	TIME	COST	FUNDING	NOTES
Continue participation in the National Flood Insurance Program.	Flooding	High	Auditor	Ongoing	Minimal	Staff time	The auditor will contact the South Dakota floodplain coordinator to learn more about the NFIP program and participate in future training sessions.
Implement drainage improvements along county roads.	Flooding	High	Hwy Superintendent	Mid	≈$1 mil	SDDOT; FEMA; Highway Fund	The County may apply for funding for projects that pass a benefit-cost analysis.
Bury powerlines.	Winter storm	High	Rosebud Electric Coop; Emergency Mgmt Office	Ongoing	≈$1 mil to $2 mil	FEMA; Rosebud Electric Coop	The Rosebud Electric Coop averages about 15 miles per year of line burial or upgrades. The Coop may work with Gregory County to apply for mitigation funds as they are available and would be the lead in the development of any application for mitigation funds.
Develop a prescribed burning plan with landowners.	Wildfire	High	Emergency Mgmt Director	Ongoing	≈$25,000	WUIGP; General fund	The Emergency Management Director works with the Mid Missouri River Prescribed Burn Association to promote prescribed fire as a rangeland management tool. He encourages all landowners with pasture to join the association. One of the goals is to control the spread of cedar trees, which are spreading and increasing fire risk.
Develop an ordinance regulating open burning.	Wildfire	High	Emergency Mgmt Director	Short	Minimal	Staff time	The Emergency Management Director is working with the county commission and States Attorney to implement the ordinance. The current burn ban resolution is inadequate because violators cannot be fined or penalized.
Install warning sirens in Lucas and St. Charles.	Summer storm	Medium	County Commission	Mid	$50,000	FEMA; General fund	The County may apply for funding.
Participate in the Storm Ready program.	Summer storm	Medium	Emergency Mgmt Director	Short	Minimal	Staff time	The Emergency Management Director will look into the program and would work with the towns to implement it.
Participate in the Firewise Program.	Wildfire	Medium	Emergency Mgmt Director	Short	Minimal	Staff time	The Emergency Management Director will look into the program and would work with the towns to implement it.
Conduct outreach to educate people about water conservation.	Drought	Medium	Emergency Mgmt Director	Short	Minimal	Staff time	The Emergency Management Director will work with the towns on public outreach, including school groups.
Educate farmers on soil and water conservation practices.	Drought	Medium	Emergency Mgmt Director	Short	Minimal	Staff time	The Emergency Management Director will work with county extension office staff on outreach to local farmers.

BONESTEEL ACTIONS	HAZARD	PRIORITY	PROJECT LEAD	TIME	COST	FUNDING	NOTES
Consider participation in the National Flood Insurance Program.	Flooding	High	Finance officer	Ongoing	Minimal	Staff time	The finance officer will contact the state floodplain coordinator to learn more about the NFIP program.
Acquire generator for community center/city hall.	Winter storm	High	City council	Mid	≈$50,000	FEMA; General fund	The community center is Bonesteel's designated relief shelter. The City may apply for funding.
Participate in the Storm Ready program.	Summer storm	Medium	City council	Short	Minimal	Staff time	The City would work with the County emergency manager to implement the program.
Participate in the Firewise Program.	Wildfire	Medium	Fire dept chief	Short	Minimal	Staff time	The City would work with the County emergency manager to implement this program.
Conduct outreach to educate people about water conservation.	Drought	Medium	Town board	Short	Minimal	Staff time	The Town will work with the County emergency manager on outreach to the public, including school groups.
BURKE ACTIONS	**HAZARD**	**PRIORITY**	**PROJECT LEAD**	**TIME**	**COST**	**FUNDING**	**NOTES**
Continue participation in the National Flood Insurance Program.	Flooding	High	Finance officer	Ongoing	Minimal	Staff time	The finance officer will contact the South Dakota floodplain coordinator to learn more about the NFIP program and participate in future training sessions.
Bury powerlines.	Winter storm	High	Utility manager	Ongoing	≈ $250,000	FEMA; Electrical fund	The City may apply for funding for projects that pass a benefit-cost analysis.
Acquire generator for the community center.	Winter storm	High	City council	Mid	≈ $50,000	FEMA; General fund	The community center is Burke's designated relief shelter. The City may apply for funding.
Implement water drainage project on West 8th and 9th Streets.	Flooding	High	Utility manager	Long	≈ $500,000	DANR; SDDOT; General fund	The City may apply for funding.
Participate in the Storm Ready program.	Summer storm	Medium	City council	Short	Minimal	Staff time	The City would work with the County emergency manager to implement the program.
Participate in the Firewise Program.	Wildfire	Medium	Fire chief	Short	Minimal	Staff time	The City would work with the County emergency manager to implement this program.
Conduct outreach to educate people about water conservation.	Drought	Medium	City council	Short	Minimal	Staff time	The City will work with the County emergency manager on outreach to the public, including school groups.
GREGORY ACTIONS	**HAZARD**	**PRIORITY**	**PROJECT LEAD**	**TIME**	**COST**	**FUNDING**	**NOTES**
Continue participation in the National Flood Insurance Program.	Flooding	High	Finance officer	Ongoing	Minimal	Staff time	The finance officer will contact the South Dakota floodplain coordinator to learn more about the NFIP program and participate in future training sessions.

Implement drainage improvements in various locations.	Flooding	High	Public Works Director	Long	≈ $500,000	DANR; General fund	The City may apply for funding to upgrade the stormwater system, including the possibility of constructing a detention pond to hold excess water.
Acquire generator for community center/auditorium.	Winter storm	High	City council	Mid	≈ $50,000	FEMA; General fund	The community center/auditorium is Gregory's designated relief shelter. The City may apply for funding.
Construct storm shelter at the pool.	Summer storm	High	City council	High	≈ $1,000,000	FEMA; General fund	The City may apply for funding.
Participate in the Storm Ready program.	Summer storm	Medium	City council	Short	Minimal	Staff time	The City would work with the County emergency manager to implement the program.
Participate in the Firewise Program.	Wildfire	Medium	Fire chief	Short	Minimal	Staff time	The City would work with the County emergency manager to implement this program.
Conduct outreach to educate people about water conservation.	Drought	Medium	City council	Short	Minimal	Staff time	The City will work with the County emergency manager on outreach to the public, including school groups.

Potential Resources for Funding Assistance:

DANR South Dakota Dept of Agriculture and Natural Resources
SCWDD South Central Water Development District
WUIGP Wildland Urban Interface Grant Program
FEMA FEMA Hazard Mitigation Assistance (BRIC or HMGP)
SDDOT South Dakota Dept of Transportation

2026 Gregory County (SD)
Hazard Mitigation Plan



CHAPTER V

Plan Maintenance

PLANNING & DEVELOPMENT DISTRICT III

CHAPTER V
PLAN MAINTENANCE

Background

Plan maintenance is a continuous process that requires long-term commitment and focused effort. The process involves evaluating the plan's effectiveness at achieving its goals, updating the plan as needed to keep it current, and making sure it is integrated into other local planning mechanisms. These activities provide the foundation for an ongoing mitigation program and will ensure that the plan remains relevant and effective. This chapter addresses how Gregory County officials intend to implement the plan so that it remains a dynamic, useful tool for mitigating against the impacts of future hazard events.

Public Participation

The plan can be accessed on the Gregory County, Bonesteel, Burke, and Gregory websites, and a copy is also available for review at the Gregory County courthouse and in the finance office of each participating jurisdiction. Going forward, Gregory County and each of the jurisdictions will continue their efforts to make the public more informed about the plan. Outreach efforts will likely evolve over time as different methods are used to get greater public participation in the mitigation planning process. Activities may include any of the following:

- Meetings of the Gregory County Local Emergency Planning Committee.
- Press releases and social media posts.
- Surveys to get feedback from the public about mitigation priorities.
- Community visits by the Gregory County Emergency Management Director to discuss mitigation planning (local schools, civic meetings, etc.).

Any comments and suggestions received from the public through any of the forums described above will be included in the public outreach section of the plan.

Monitoring, Evaluating, and Updating the Plan

The Gregory County Emergency Management Director is ultimately responsible for implementing this plan. The director will work under the direction of the Gregory County Commission and with the support of the Gregory County Local Emergency Planning Committee (LEPC) to ensure that the plan's mitigation strategy is carried out, coordinating his/her activities with other county departments or the other participating jurisdictions as needed. The jurisdictions will also 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.

An important part of implementing the plan is plan monitoring and evaluation, which will be performed by the Gregory County Emergency Management Director with the support of the LEPC. The plan will be evaluated at least annually by the LEPC, and it may also be reviewed at other times as the need arises, such as following a significant hazard event or as federal funding for hazard mitigation becomes available.

All major elements of the plan – the planning process, the risk assessment, and the mitigation strategy - will be evaluated. Following are the specific criteria that will be used to measure whether the plan is achieving its goals:

Planning Process

- Could anything from the initial planning process be done more efficiently?
- Has the public become more aware of the plan? How can public participation improve?
- Have there been any public outreach activities to promote awareness of the plan?

Risk Assessment

- Have any recent disaster events impacted any of the jurisdictions?
- Should any hazards be added or removed from the plan?
- Have there been any changes in the nature or magnitude of risks?
- Has any new development occurred that might impact risk?
- Are new data sources for any of the hazards available?
- Do any new critical facilities or infrastructure need to be added to the community asset list?

Mitigation Strategy

- Is the mitigation strategy being carried out as expected? How many of the proposed mitigation actions have been completed or are in progress?
- Have there been any changes in mitigation priorities in any of the jurisdictions?
- Are there any new mitigation actions to consider? Should existing actions be revised or removed from the plan?
- Have parts of the plan been integrated into other planning mechanisms?
- Have any jurisdictions adopted new policies, plans, or regulations that could support the plan?
- Has NFIP participation changed in the participating jurisdictions?
- Is progress being made in education and outreach? How many outreach events have taken place?

Future updates to this plan may occur at any time in response to a change in any of the criteria identified above. However, barring a significant change in any of these factors, Gregory

County will begin the process of updating this plan approximately two years prior to the plan's expiration date. Led by the Emergency Management Director, the process will consist of the following general steps:

- Apply for funding assistance to update the plan
- Funding assistance obtained
- 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

Plan Integration

The Gregory County Hazard Mitigation Plan is the backbone for hazard mitigation planning within the county, but to remain useful the plan cannot exist in a vacuum. It is designed to work with the planning mechanisms and development regulations that exist within the county, and local officials and policy makers should therefore be familiar with this plan. Neither this plan nor any of the others will work effectively if they contain contrary goals or policy recommendations. Following is a description of the process by which integration will occur into the local planning mechanisms [10].

- Gregory County Comprehensive Plan and Zoning Ordinance – the Planning & Development District III office developed the comprehensive plan and zoning ordinance working with the Gregory County planning commission. The County and District III will integrate relevant information acquired through the development of this plan into the environmental constraints section of the comprehensive plan when it is next updated. The zoning ordinance will also be modified if needed. For example, if this plan identifies certain areas as unsuitable for development due to environmental hazards, this should be reflected in the zoning ordinance.
- Gregory County Highway Plan – the highway plan is developed by the Gregory County Highway Superintendent. It includes a table of significant county road projects scheduled to occur for the next five years. The South Dakota Dept of Transportation requires that the highway plan be updated annually and approved by the county commission. The highway superintendent will be able to utilize information learned during the development of this plan to identify and plan for road projects that may be

[10] Nothing is shown for Dallas, Fairfax, and Herrick because they have no planning mechanisms or policies.

eligible for FEMA funding, such as those that involve drainage improvements to mitigate flooding.

- Bonesteel Comprehensive Plan and Zoning Ordinance – the Planning & Development District III office developed the comprehensive plan and zoning ordinance working with the city planning board. The City and District III will integrate relevant information acquired through the development of this plan into the environmental constraints section of the comprehensive plan when it is next updated. The zoning ordinance will also be modified if needed. For example, if this plan identifies certain areas as unsuitable for development due to environmental hazards, this should be reflected in the zoning ordinance.
- Burke Comprehensive Plan and Zoning Ordinance – the Planning & Development District III office developed the comprehensive plan and zoning ordinance working with the city planning board. The City and District III will integrate relevant information acquired through the development of this plan into the environmental constraints section of the comprehensive plan when it is next updated. The zoning ordinance will also be modified if needed. For example, if this plan identifies certain areas as unsuitable for development due to environmental hazards, this should be reflected in the zoning ordinance.
- Gregory Comprehensive Plan and Zoning Ordinance – the Planning & Development District III office developed the comprehensive plan and zoning ordinance working with the city planning board. The City and District III will integrate relevant information acquired through the development of this plan into the environmental constraints section of the comprehensive plan when it is next updated. The zoning ordinance will also be modified if needed. For example, if this plan identifies certain areas as unsuitable for development due to environmental hazards, this should be reflected in the zoning ordinance.

Perhaps the best example to date of the county's current mitigation plan being incorporated into other planning mechanisms occurred during the 2024 update of the Comprehensive Economic Development Strategy (CEDS) for the Planning & Development District III region, which includes Gregory County. In particular, the risk analysis and mitigation strategy of the plan were reviewed as the CEDS was being updated.

Each jurisdiction will use this plan to help them as they prepare their annual budget each year. The process will be essentially the same in each jurisdiction, beginning with a review of the plan at the outset of the budgeting process, which typically begins in the summer. Each jurisdiction will especially note their list of proposed mitigation actions in **Table 4.5**. Those that are interested in seeking funds for a specific project listed in the table will be able to utilize knowledge gained during the development of this plan, including FEMA grant deadlines and the grant eligibility of specific types of mitigation projects, as they develop their budgets.

To expand on these efforts, each community should continue to participate in future updates to this plan. This will continue to expose them to the basic concepts of hazard mitigation, which may be the only practical way for some of the jurisdictions to expand their capabilities.

An important part in this process will be played by the Gregory County Emergency Management Director, who will continue to reach out to each community at least annually to review their hazard mitigation needs and priorities.

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Hazard Mitigation Plan



APPENDICES

- Appendix A: Outreach Effort
- Appendix B: Documentation of Meetings
- Appendix C: History of Previous Hazard Occurrences
- Appendix D: References

PLANNING & DEVELOPMENT DISTRICT III

APPENDIX A: Outreach Effort

A major effort was made to solicit input into this plan. Outreach included press releases that were printed in the local newspapers, information posted on community websites and social media, and surveys that were made available to the public. This section documents the outreach effort.

Press Release in Gregory Times-Advocate Prior to First Meeting:



39.65
57.20
57.09
59.45
17.49
53.72
03.42
17.99
71.80
58.62
37.08
56.66
00.54
26.67
26.67
27.21
2, 2026
ahler,
board
kular,
fficer

D. Rachelle Bloom Present Plans for Downtown Park GED member Rachelle Bloom presented the council with an initial plan for the downtown park. The plan showed walkways, trees, benches, and an open rear area for future

$114.61; Express Collections Inc, $189.66; Rose Marie, $50.00; Breit & Boomsma, P.C., $189.66; Ace's Car Wash, $96.00; Aflac, $474.68; Gregory/Dallas Chamber Of Comm, $3,125.00; SDRS, $2,855.30; Rose-

(Published twice at the total approximate cost of $18.43 and may be viewed free of charge at www.sdpublicnotices.com.)

see MORE LEGALS pg. 10

HAZARD MITIGATION MEETING

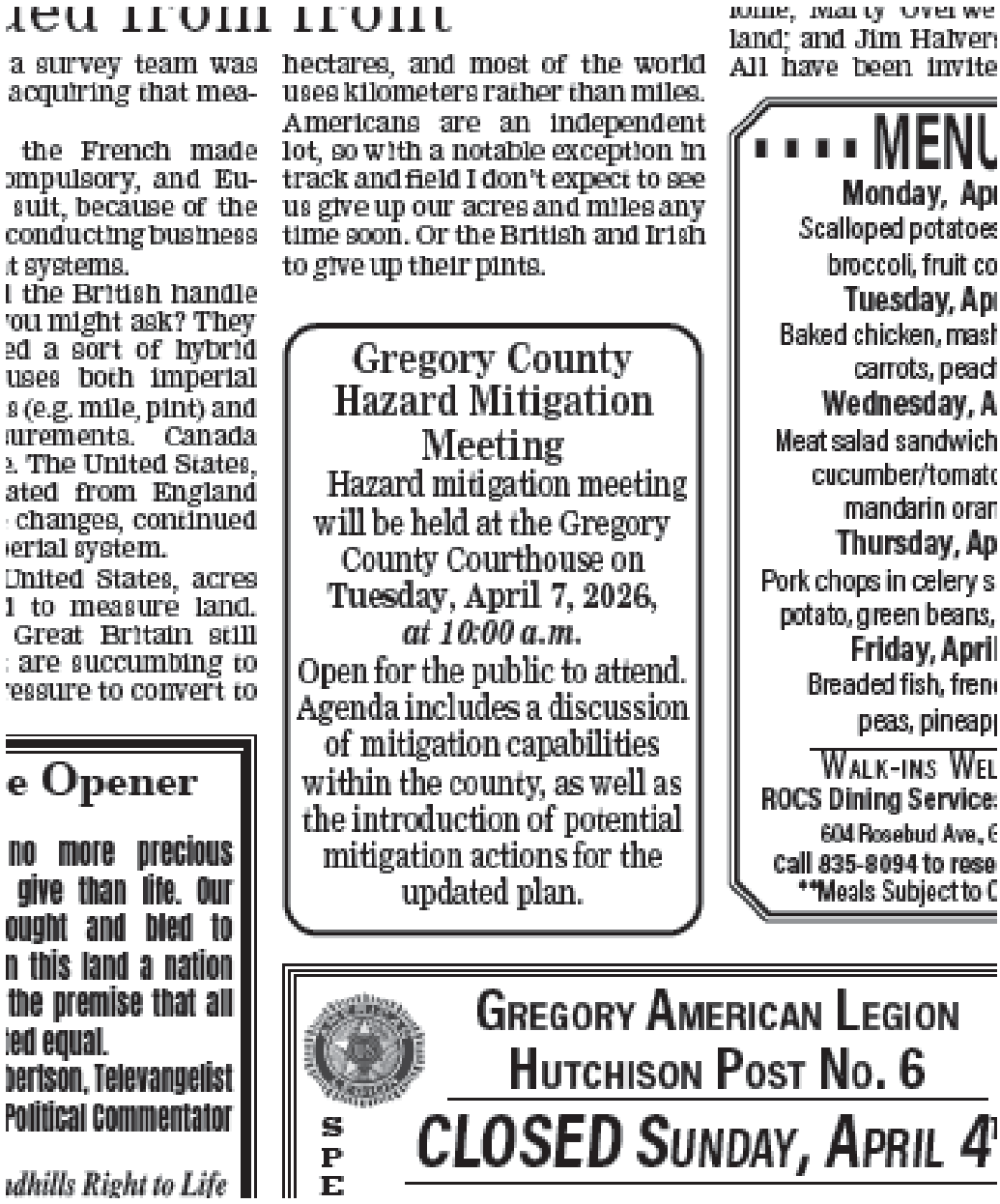
Blizzards, tornadoes, and floods are a few of the natural hazards that strike this part of the country. Events like this have the potential of causing thousands of dollars annually in damage to property. To lessen the impact of these disasters in the future, Gregory County is beginning the process of updating its current Hazard Mitigation Plan.

A series of meetings, which are open for the public to attend, will occur this year to obtain input as the plan is developed. The first meeting will be held at the **Gregory County Courthouse** on **March 17, 2026, at 10:30 a.m.** Agenda items for this kickoff meeting will include a discussion of hazard mitigation concepts, a review of the County's current hazard mitigation plan, and a discussion about the planning process going forward.

Another way to contribute to the planning process is to fill out a survey. A copy of the survey can be obtained at the Gregory County Emergency Management Office, or by going to www.districtiii.org.

For more information, please contact the Gregory County Emergency Management Office at **gregfire@gwtc.net** or by calling **(605) 775-2664**. You can also contact John Clem at (800) 952-3562, or by email at John.Clem@districtiii.org.

Press Release in Gregory Times-Advocate Prior to Second Meeting:



...ted from front

a survey team was acquiring that mea-

the French made ompulsory, and Eu- suit, because of the conducting business t systems.

l the British handle ou might ask? They ed a sort of hybrid uses both imperial s (e.g. mile, pint) and urements. Canada . The United States, ated from England changes, continued erial system.

United States, acres l to measure land. Great Britain still are succumbing to essure to convert to

hectares, and most of the world uses kilometers rather than miles. Americans are an independent lot, so with a notable exception in track and field I don't expect to see us give up our acres and miles any time soon. Or the British and Irish to give up their pints.

...lone, Marty Overwe... land; and Jim Halver... All have been invite...

Gregory County Hazard Mitigation Meeting

Hazard mitigation meeting will be held at the Gregory County Courthouse on **Tuesday, April 7, 2026,** *at 10:00 a.m.*

Open for the public to attend. Agenda includes a discussion of mitigation capabilities within the county, as well as the introduction of potential mitigation actions for the updated plan.

MENU

Monday, Apr
Scalloped potatoes
broccoli, fruit co

Tuesday, Apr
Baked chicken, mash
carrots, peach

Wednesday, A
Meat salad sandwich
cucumber/tomato
mandarin oran

Thursday, Ap
Pork chops in celery s
potato, green beans,

Friday, April
Breaded fish, fren
peas, pineapp

WALK-INS WEL
ROCS Dining Service
604 Rosebud Ave., G
Call 835-8094 to rese
**Meals Subject to C

e Opener

no more precious give than life. Our ought and bled to n this land a nation the premise that all ed equal.

bertson, Televangelist Political Commentator

dhills Right to Life

GREGORY AMERICAN LEGION HUTCHISON POST NO. 6

CLOSED SUNDAY, APRIL 4

SPE

Survey Poster

PUBLIC PARTICIPATION NEEDED!

GREGORY COUNTY



HAZARD MITIGATION PLAN PUBLIC SURVEY

The Gregory County Office of Emergency Management is in the process of updating the County's Hazard Mitigation Plan. Hazard mitigation planning helps local leaders better understand risks from natural hazards, promoting the development of long-term strategies to reduce the effects of disaster-related events and their negative impact on people, property, and environment. Gregory County is seeking feedback from stakeholders and the public to incorporate into the plan.

WHAT IS A HAZARD MITIGATION PLAN & WHY IS IT IMPORTANT?

The hazard mitigation plan represents Gregory County's commitment to reduce risks from natural hazards, such as flooding, severe summer and winter weather, drought, and wildfires. The plan serves as a guide for local decision makers as they commit resources to reducing the effects of natural hazards, and it creates a framework for Gregory County to reduce negative impacts from future disasters on lives, property, and the local economy.

TAKE THE SURVEY

www.districtiii.org

PUBLIC PARTICIPATION IN HAZARD MITIGATION PLANNING

Public participation in the Gregory County Hazard Mitigation Plan is an opportunity for county residents to evaluate a variety of potential hazards affecting the county and it is important to the overall success of the plan. Once approved, the plan will make Gregory County and the participating municipalities eligible to apply for FEMA hazard mitigation funding.

PHONE: (605) 775-2664
EMAIL: GREGFIRE@GWTC.NET

Survey Form with Responses

GREGORY COUNTY HAZARD MITIGATION SURVEY (*RESPONSES IN RED TYPE*)

The Gregory County Office of Emergency Management is in the process of updating the County's Hazard Mitigation Plan. Hazard mitigation planning helps local leaders better understand risks from natural hazards and promotes the development of long-term strategies to reduce the effects of disaster-related events. Gregory County is seeking feedback from stakeholders and the public to incorporate into the plan. We would greatly appreciate it if you would complete the survey. Participation is voluntary and anonymous.

GENERAL HOUSEHOLD INFORMATION

First, we would appreciate any information you are willing to share with us about your household. This information will remain confidential and is for survey use only.

1. What county do you live in? **GREGORY COUNTY (ALL)**

2. What town do you live in? **BONESTEEL: 7; BURKE: 17; GREGORY: 6; NO ANSWER: 5**

3. How long have you lived in South Dakota?

   Less than 1 year: **0**
   1-5 years: **0**
   6-10 years: **0**
   More than 10 years: **35**

4. Before receiving this survey, were you aware of the county's hazard mitigation plan?

Yes: 20 **No: 15**

5. During the past 5 years, in the county you currently reside in, have you or someone in your household directly experienced a natural disaster? This could be a flood, severe windstorm, wildfire, or other type of natural disaster. **Yes: 11** **No: 24**

6. How concerned are you about the following natural disasters affecting your county? (Check the corresponding box for each hazard)

Natural Disaster	Very Concerned	Somewhat Concerned	Neutral	Not Very Concerned	Not Concerned	Weighted Results
Drought	19	12	2	2	0	48
Extreme Heat	8	14	9	4	0	26
Flood	1	6	5	16	7	-22
Hail	11	18	2	2	2	34
Tornado	15	17	3	0	0	47
Wildfire	12	16	3	3	1	35
Winsdstorm	11	20	2	1	1	39
Winter storm/Blizzard	11	19	2	2	1	37

7. Which of the following community assets do you see as being vulnerable in your community? (*You may check more than one*)

Human (Loss of life and/or injuries) **22**
Economic (Business closures and/or job losses) **30**
Infrastructure (Damage or loss of bridges, utilities, schools, etc.) **25**
Environmental (Damage or loss of forests, rangeland, waterways, etc.) **10**
Government (Ability to maintain order and/or provide public amenities and services) **9**

8. Please check the box that best matches your opinion of the following strategies to reduce risk and loss associated with natural disasters.

Community- wide Strategies	Strongly Agree	Agree	Neutral/ Not Sure	Disagree	Strongly Disagree	Weighted Results
I support implementing government rules and regulations to reduce risk	3	16	12	1	3	15
I support policies to prohibit development in areas subject to natural hazards	3	18	11	1	2	19
I support enhancing the function of natural systems (e.g., streams, wetlands)	7	17	11	0	0	31
I support the use of tax dollars to compensate landowners for not developing in areas subject to natural hazards	2	8	17	3	5	-1
I support the use of tax dollars to reduce risks and losses from natural disasters	3	22	6	1	3	21
I support the disclosure of natural hazard risks during real estate transactions	8	21	6	0	0	37

9. How important are each of these priorities to you in planning for natural hazards?

Statements	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important	Weighted Results
Protecting private property	20	11	4	0	0	51
Protecting critical facilities (e.g., transportation networks, hospitals, fire stations)	29	5	1	0	0	63
Protecting utilities and infrastructure	28	5	2	0	0	61
Protecting historic and cultural landmarks	12	14	7	1	1	35
Strengthening emergency services (fire, police, etc.)	30	1	3	1	0	60

APPENDIX B: Documentation of Meetings

This appendix includes the following items:

- Signup sheets from the planning team meetings.
- Minutes from each of the participating jurisdictions' meetings as they discussed the mitigation actions they wanted to include in the plan.

SIGNUP SHEET – FIRST PLANNING TEAM MEETING:

Gregory County Hazard Mitigation Planning Meeting

March 17, 2026

NAME	REPRESENTING
Trudy Waterman	City of Gregory
Amber Horn	City of Burke
Mike Glover	City of Burke
Laura Peterson	City of Gregory
Gunnar Kepler	City of Gregory
AJ Cerny	City of Gregory
Zeke Twomey	District III
Shannon Vierneck	District III
Vic Wiemke	Rosebud Electric
Mark Green	City of Burke
Cody Spann	City of Bonesteel
Tyler Stevicks	City of Gregory
Brad Christensen	Gregory County EM
Jessy Biggins	Gregory County Comm. Chair
Doug Jarousek	Gregory County Comm. V-Chair
Byron Boes	Gregory County Comm.
Peg Glover	Gregory County Comm.
Ray Warner	Gregory County Comm.
Julie Bartling	Gregory County Auditor
John Clem	Planning District III

SIGNUP SHEET – SECOND PLANNING TEAM MEETING:

Gregory County Hazard Mitigation Planning Meeting

April 7, 2026

NAME	REPRESENTING
Jessy Biggins	Commissioner
Doug JANOUSEK	Commissioner
Byron Boes	Commissioner
Peg Glover	commissioners
Ray [illegible]	commissioner
[illegible]	Public
[illegible] Peterson	Gregory Council
[illegible]	Gregory Mayor
Mike Glover	City of Burke
Patty Connealy	Gregory Times-Advocate
Trudy Waterman	City of Gregory
Mark Green	City of Burke
Mike Hubert	USACE Fort Randall Project
Brad Christensen	Gregory County EM
Cody Spaeth	City of Bonesteel / Sher. Office
John Klem	Planning District III
Shannon Viereck	Planning Dist III

SIGNUP SHEET – FINAL PLANNING TEAM MEETING:

Gregory County Hazard Mitigation Planning Meeting

June 16, 2026

NAME	REPRESENTING
Cody Spann	City of Bonesteel
Mark Green	City of Burke
Brad Christensen	Gregory County EM
Peggy Biggins	Commissioner
Raymond Mann	Commissioner
Peggy A. Flower	Commissioner
Byron Bass	Commissioner
Tammy Peterson	City of Gregory
Mike Horn	City of Burke
Julie Bartlett	Gregory County Auditor
Trudy Waterman	City of Gregory (Remotely)
John Clem	Planning District III (Remotely)

GREGORY COUNTY MINUTES

Gregory County Commission Proceedings

The regular meeting of the Gregory County Commission was held Tuesday, May 5, 2026 at 9:00 a.m. in Burke at the Gregory County Courthouse, with the following members present: Jessy Biggins, Doug Janousek, Byrain Boes, Peg Glover and Ray Warner. Also present: Julie Bartling, Auditor.

Chair Jessy Biggins called the meeting to order and all present recited the Pledge of Allegiance.

Approval of Agenda: Motion by Byrain Boes, second by Doug Janousek to approve the agenda with the following additions: Appointment of Planning & Zoning Commission member, Hazard Mitigation Project Selection, and travel request approval. All members present voted aye. Motion carried.

Approval of Minutes: Motion by Ray Warner, second by Peg Glover to approve the minutes of the April 21, 2026 Commission meeting with the following correction: Jessy Biggins appeared via telephone; and the April 21, 2026 County Board of Equalization meeting as read; and to correct the minutes of the April 7, 2026 meeting clarifying that the date of the limited free use day at the landfill site for county residents is Saturday, May 16, 2026. All members present voted aye. Motion carried.

Conflicts of Interest: The Chair asked if there were any conflicts of interest from members present. None were notated.

Ex-Parte Communications: The Chair inquired if there have been any ex-parte communications by any member present. None were notated.

Public Input: The Chair open the floor for public input. No one appeared at the meeting.

Travel Request: Motion by Peg Glover, second by Byrain Boes to approve travel for the Commissioners, Auditor, Treasurer and Register of Deeds to attend the Randall Reservoir Association meeting on May 18, 2026 in Mellette County. All members present voted aye. Motion carried.

Planning & Zoning Commission Appointment: Motion by Ray Warner, second by Byrain Boes to approve the appointment of Kyle Wilhelmsen to the Planning and Zoning Commission, fulfilling the term of Matt Steffen. All members present voted aye. Motion carried.

Approval of Claims: Motion by Ray Warner, second by Byrain Boes to approve the following claims with a correction to the budgetary account that the claim of Rob Kehn Trucking, LLC is paid from:

Statement of fees collected in the Register of Deeds Office for the month ending April 30, 2026 in the amount of $5,795.41.

Statement of fees collected in the Sheriff's Office for the month ending April 30, 2026 in the amount of $1,227.20.

Statement of fees collected in the Clerk of Courts Office for the month ending March 31, 2026 in the amount of $5,598.41 and for the month ending April 30, 2026 in the amount of $6,006.60.

April 30 2026:

Wellmark $23,670.05
AFLAC $870.24
SDSRP $200.00
SDRS $16,773.94
Innovative Benefit Consultants, Inc $260.00
Office of Child Support $786.58

Legislative Visit: Representative Jim Halverson of Winner (District 21) stopped by the meeting to discuss legislative priorities with the Commission.

Complaint of Property Sold: Herman (Butch) Rolf of Gregory appeared before the Commission to raise concerns over property sold by the County through tax deed proceedings.

Mr. Rolf questioned the process by which the property was taken and accuses the Sheriff's department of taking personal property off of the property. Tim Drey, Sheriff, informed the Board that the new owner was advised by the States Attorney regarding any personal property on the lots.

Kathy Serr, Treasurer, informed the group how tax deed proceedings work.

Chair Biggins confirmed with Mr. Rolf that the County followed statute in the taking of property through tax deed and the property was sold legally. Mr. Rolf agreed with the Chair's comments.

The Chair reminded all that Mr. Rolf's issues are private matter and should be handled through civil proceedings.

1st Reading – Ordinance for the Regulation of Open Burning and Declaration of Fire Danger Emergencies in Gregory County: The Chair opened the hearing for the 1st reading of Ordinance 2026-02 for the regulation of open burning in Gregory County. The proposed ordinance is on file in the office of the County Auditor. No one appeared at the reading.

Motion by Peg Glover, second by Byrain Boes to approve the proposed ordinance and to schedule the 2nd and Final Reading of the ordinance for May 19, 2026 at 10:00 a.m. All members present voted aye. Motion carried.

Haul Road Agreement for C.R. 7: Bob Nelson, Highway Superintendent, advised the Commission that he will be sending a haul road agreement for C.R. 7 to Osbourne Construction (street work in Gregory City). Dust and speed issues need to be addressed with the contractor.

Gravel Hauling Fuel Surcharge Discussion: The Board was asked about considering the allowance of a fuel surcharge for the gravel haulers, in light of the rising fuel costs. The Board agreed that the accepted bids of the gravel haulers must be adhered to.

Surplus Property: Motion by Byrain Boes, second by Doug Janousek to surplus the following equipment and to take sealed bids on June 3, 2026 at 10:00 a.m.:

- 1999 Chevrolet 1500 Pickup
- 1995 International 4900 - DT466E Truck
- 2000 International 4900 – 6 x 4 Truck
- 1992 Ford L9000 – Dump Truck

All members present voted aye. Motion carried.

Highway Department Report: Bob Nelson, Highway Superintendent, reported on activity ongoing at the Highway Department:

- Graveling roads continuing
- Culverts continue to be installed
- Odenbach Bay – June 1st start
- C.R. 23 culverts (sale barn road) to be installed

Executive Session: Motion by Ray Warner, second by Byrain Boes to enter into executive session at 10:30 a.m. to discuss personnel. All members present voted aye. Motion carried.

The Chair declared the executive session ended at 11:05 a.m.

Hazard Mitigation Projects/Actions: The Commission reviewed the following projects/actions for the Hazard Mitigation Plan:

- Continue participation in the National Flood Insurance Program.
- Implement drainage improvements along county roads.
- Develop an ordinance regulating open burning.
- Install warning sirens in Lucas and St. Charles.
- Develop a prescribed burning plan with landowners.
- Participate in the Storm Ready Program.
- Participate in the Firewise Program.
- Conduct outreach to educate people about water conservation.
- Educate farmers on soil and water conservation practices.

Motion by Byrain Boes, second by Peg Glover to approve the list of projects for the 2026 Hazard Mitigation Plan. All members present voted aye. Motion carried.

Adjourn: Moton by Ray Warner, second by Doug Janousek to adjourn. All members present voted aye. Motion carried.

ATTEST: _____ _____

Julie Bartling, Gregory Co. Auditor Jessy Biggins, Chair

BONESTEEL MINUTES

REGULAR MEETING OF COMMON COUNCIL, CITY OF BONESTEEL, MAY 7, 2026

Mayor Shelly Jons called the meeting to order on May 7, 2026 at 6:30pm in the Community Room located at 402 Mellette Street. Present: ~~Council~~ members Sue Vogt, Maritta Brown, Terry Burke, Lynne Bentz and John Moor. Absent: Dean Bentz. Others present: ~~City~~ Administrator Cody Spann

Agenda
Motion by Lynne Bentz, seconded by Terry Burke, to approve the agenda as presented, all stated aye; motion carried.

Previous Minutes
Motion by Maritta Brown, seconded by Sue Vogt, to approve the minutes of April 6, 2026 Council Meeting, all stated aye; motion carried.

5 Minute Public Discussion
None

Old Business
Discussion on the Hazard Mitigation Plan through District III and projects that are to be added to the All-Hazards Plan. There were five projects/actions that were presented. 1. Consider participation in the National Flood Insurance Program, 2. Acquire generator for community center/city hall, 3. Participate in the Storm Ready Program, 4. Conduct outreach to educate people about water conservation, 5. Participate in the Firewise Program. Motion by Lynne Bentz, seconded by John Moor to approve the five projects for the All-Hazards Plan, all stated aye; motion carried.
The City Administrator presented a light quote for the large baseball field for $11,135.80. This would replace the damaged lights from the tornado and upgrade them to LEDs. Motion by Sue Vogt, seconded by Lynne Bentz to purchase the lights for the large ball field, all stated aye; motion carried.

New Business
Building permits 2026-003, 2026-004 & 2026-005 were presented to the council for final approval. Motion by Sue Vogt, seconded by Terry Burke to approve building permits 2026-003, 2026-004 & 2026-005 as presented, all stated aye, motion carried. The City Administrator presented two applications for the summer maintenance position. Motion by Terry Burke, seconded by Maritta Brown to hire Larry Charging Hawk with a wage of $14.50 per hour for the summer maintenance position, all stated aye; motion carried. The City Administrator presented 12 applications for pool staff. Motion by Sue Vogt, seconded by Lynne Bentz to hire all twelve applicants (Elizabeth Bernt, Brylie Pistulka, Aurora Ziebro, Adisyn Indahl, Brock Wahl, Emmie Hausmann, Lillie Jamison, Daytona Paris, Kyrie Matucha, Mackenzie Lomme, Sarah Spann and Izaria Koenig) for the pool, to give all returning lifeguards a $0.25 per hour raise along with the state raise and new lifeguards to start out at minimum wage $11.85 per hour, to hire Jamie Divine as swimming instructor at $14.25 per hour, all stated aye; motion carried. Discussion on repairing or building a new City Hall. Mayor Shelly Jons recommended that a fund request be started for people to donate towards building a new city hall building. The donations would be combined with grants to help cover the cost on building a new building. Discussion on purchasing new chairs for the community room. Motion by Sue Vogt, seconded by John Moor to purchase 80 padded folding chairs and a chair dolly for the community room, all sated aye; motion carried. Discussion on conducting a city-wide cleanup. The dates for the free dump days are the 13th and 14th for Cities and the 16th for individuals this month. Loads must be ~~sorted~~ and separated prior to taking up to the county landfill. The City Administrator will put something out on the City Facebook page in regards of the dump days.

Streets Report
No report given.

Maintenance Report
No report given.

Parks & Rec Report
Discussion on the pool being cleaned and getting it ready for the summer. Discussion on all parks having water on and ready for summer events.

Water & Sewer Report
Discussion on the Water Loss Report.

Zoning Report
No report given.

Code Enforcement
Law Enforcement Report given.

Finance Report
The City Administrator presented the finance report for review and the following claims and payroll were presented for the month as follows.

General Fund Claims
Bonesteel Enterprise, Publishing…$153.44, Cahoy's General, Supplies…$164.41, Chris Davis, Reimbursement…$35.00, Golden West, Phone/Internet…$120.68, Jim's Garbage Services, Services…$140.00, Menards-Yankton, Supplies…$47.96, Rosebud Electric Coop, Utilities…$1,379.15, Schmitz Electric & HVAC, Repairs & Maintenance…$5,112.07, Tran Source, Supplies…$2,934.50
April Payroll, Salaries…$5,600.67, Social Security & Medicare…$1,128.92, SDRS, Retirement Investment…$794.44

Water Fund Claims
FFB, ACH Billing Fee…$25.00, Koenig Lumber, Supplies…$6.18, Rosebud Electric Coop, Utilities…$122.71, SDARW, Annual Fees…$205.00, SD Dept of Health, Testing Fee…$20.00, TCWUD, Water…$2,303.66, US Bank, DW SRF Loan…$5,439.50

Sewer Fund Claims
City of Burke, Jetter Services…$360.00, NRWA, Loan Payment…$1,931.21, SDARW, Annual Fees…$205.00, US Bank, CW SRF Loan…$4,844.47

Motion by John Moor, seconded by Maritta Brown, to approve payment of monthly bills and pay roll, all stated aye; motion carried.

Executive Session
None

Meeting Date
Discussion on moving June's meeting date. Motion by Sue Vogt, seconded by Terry Burke to move June's meeting date from the first Monday to the second Monday June 8, 2026, all stated aye; motion carried. The next council meeting will be held on Monday June 8, 2026 at 6:30pm at the community room located at 402 Mellette Street.

Adjourn
Motion by Lynne Bentz, seconded by John Moor to adjourn at 7:53pm, all stated aye; motion carried.

_____
Shelly Jons, Mayor

ATTEST: _____
Cody Spann, City Administrator/Finance Officer

BURKE MINUTES

Burke City Council
Regular Meeting
May 11, 2026

The regular meeting of the Burke City Council was called to order by Mayor Thomas Glover at 7:02 PM in the Municipal Building Meeting Room. Council members present were Tyler Van Metre, Mark Benter, Wyatt Reis, JJ Wolf & Ben Hosford. Also, present was Finance Officer Mike Glover, City Attorney Rachelle Norberg, Chief of Police Mark Green, Superintendent of Utilities Wade Broome, Economic Development Professional Amber Horn, Becky Hoffman, Zeb Carlson & David Green. Absent was Megan Lindholm.

Mayor Glover led the group in the Pledge of Allegiance.

Approve Agenda:
Motion by Wyatt Reis, second by Ben Hosford to approve the agenda as presented with the addition of Health Insurance for Amber Horn. Motion carried.

Conflict of Interest:
Councilman Wyatt Reis had a conflict with a building permit application.

Public Input:
None.

Approve Minutes:
Minutes of the April 13, 2026 Regular Meeting:
Motion by JJ Wolf, second by Mark Benter to approve the minutes of the April 13, 2026 Regular Meeting. Motion carried.

Approve Reports:
Motion by Mark Benter, second by Tyler Van Metre to approve the April 2026 financial statement. Motion carried.
The April 2026 expense and revenue budget analysis lists were given for informational purposes.

Claims:
The claims were presented for approval. After some discussion motion by Tyler Van Metre, second by Wyatt Reis to approve and authorize payment of claims presented by the Finance Officer, with the addition of SD One Call & SD DANR. Motion carried.

Payroll: Finance Office-3,851.44; Electric-3,428.53; Police-3,800.41; Streets-3,626.92; Shop-3,180.16; Economic Development-1,544.60; Sewer-1,883.97; Library-1,869.75; First Fidelity Bank, WH & OASI- 6,744.06; SD Retirement System- 3,686.95; AFLAC-232.07; Lincoln National Life Insurance Co.- 215.01; AVESIS-19.05; Colonial Life-76.84.

General Fund: (*deleted*)

Electric Fund: VFW, Lighting Rebate, 458.85; City of Burke, Utilities-3,007.70; SD One Call, Message Fees April-5.25; SD State Treasurer, Sales Tax-3,346.60; MRES, AMI Monthly Fee-132.90; MRES, Power Purchases-5,742.48; Rosebud Electric COOP, Maint Contract, Wheeling, &

Repairs-11,727.80; WAPA, Power Purchases-16,022.60.

Water Fund: City of Burke, Utilities-673.67; Core & Main, LP, Meters & Supplies-47.37; SD DANR, Water Samples-20.00; MRES, AMI Monthly Fee-132.90; Rosebud Electric, Utilities-128.01; Tripp County Water Dist., Minimums-2,100.00; Bulk Water-6,400.66; US Bank, 8th & 9th St Loan-5,694.60.

Sewer Fund: Rosebud Electric, Utilities-144.87.

Supt of Utilities:
The water loss for April was 29.00%, with 663,395 gallons lost.

Building Permits:
Building Permit #2025-5-12B for David Allum was presented for an extension. Motion by JJ Wolf, second by Mark Benter to approve the extension for 1 year of building permit #2025-5-12B of David Allum to install a chain-link fence. Motion carried.

Building Permit #2026-5-11A for Brad Smith was presented for approval. Motion by Mark Benter, second by Wyatt Reis to approve building permit #2026-5-11A of Brad Smith to install an 8′ x 10′ deck on south side of house at 329 West 4th St. Motion carried.

Building Permit #2026-5-11B for Wyatt Reis was presented for approval. Motion by Mark Benter, second by Ben Hosford to approve building permit #2026-5-11B of Wyatt Reis to move an 8′ x 20′ shipping container on to the property at 302 Washington St. Motion carried. Wyatt Reis abstained.

Building Permit #2026-5-11C for Matthew Lamp was presented for approval. Motion by Wyatt Reis, second by JJ Wolf to approve building permit #2026-5-11C of Matthew Lamp to install a 12′ x 30′ back patio at 126 E 5th St. Motion carried.

Fire Department Side by Side:
Superintendent of Utilities, Wade Broome informed the council of the possibility of the Burke Fire Department having their Side by Side for sale. The Fire Department has not officially decided on what they want to do with the Side by Side. Wade will wait until the Fire Department has their next meeting & they make a decision on what they want to do.

Police:
Chief Green gave his monthly report.
Chief Green handed out a copy of his Police Personnel Policy Manual for them to review. He will ask for approval at a later meeting.

Axon Quote:
The Taser contract is set to expire at the end of the year. Chief Green presented a quote from Axon for a new Taser, Body Camera & Dash Camera. All three devices are from the same company & will be connected to each other. The quote is for $27,000. Which can be paid over five years similar to the previous agreement. After some discussion, motion by Wyatt Reis, second by Mark Benter to approve the quote from Axon for all 3 pieces of equipment for $27,000 paid over five years. Motion carried.

Code Enforcement:
The Code Enforcement Officer was here about 2 weeks ago & did an inspection of the town. The

Finance Officer is waiting for a copy of the list & letters that went out.

Economic Development:
Amber gave an update on what has been happening at the city. On April 30 we gave away 18 trees to the Burke 5th graders. This is part of the requirement when applying for Tree City USA.

Stampede Rodeo Special Act Sponsorship:
Amber informed the council that the Riding Club is asking for the city to help sponsor a special act they have coming to the rodeo this year. They are asking for a $2,000 additional donation. Motion by Mark Benter, second by Ben Hosford to approve helping sponsor the special act for the rodeo in the amount of a $2,000 donation. Motion carried.

Burke Housing:
Becky Hoffman with the Burke Housing was back to meet with the council to discuss the utility accounts at the housing. Becky presented a proposal to change the number of minimum charges on the northwest 2 buildings from 12 to 4 minimums. Before the council makes any decision, city attorney Rachelle Norberg would like to meet with Becky & her representative from the state. Next Rachelle talked about a memo she had Finance Officer Mike Glover send to the council that explained what she found during her research of the ability of the city to charge different sewer rates to different accounts. The conclusion was that the city cannot legally discriminate with how they charge customers. One option to help the Burke Housing would be to possibly give them a donation each year. But before any decisions are made Rachelle first will have the meeting with Becky.

Wide-Open Spaces:
Zeb Carlson from the Wide-Open Spaces board presented a handout that had pictures, the phases & timeline of the project they are wanting to get accomplished at the rodeo/4H grounds.

House Bill 1245:
Finance Officer, Mike Glover presented the council with a hand out that outlined the CAPs (Community Action Program) Programming Guide & Implementation Process. Discussion followed about the process & the benefits of what a CAP tax can provide. House Bill 1245 will become law on July 1, 2026. The earliest the tax can be implemented would be July 1, 2027.

CDL Changes:
Effective July 1, 2026, the State of South Dakota will adopt federal regulation 49 CFR 391.11, which requires most Commercial Driver License (CDL) holders to maintain a valid Medical Examiner's Certificate (medical card). This change removes the previous state exception that allowed certain drivers to indicate they were not required to hold a Medical Certificate. There are 3 options to keep your CDL valid & the action must be taken before July 1, 2026. The options are, 1 - Self Certify as Non-Excepted Interstate (NI), 2 - Self Certify as an Excepted Interstate (EI) & 3 - Self Certify as Non-Expected Intrastate (NA). The city workers can use option 2 as they are exempt because of being a municipal government employee. They must go to a SD Driver Exam Station & submit an application, pay $43 application fee & provide 2 documents showing your residential address. Motion by Wyatt Reis, second by Ben Hosford to reimburse the application fee the city employees have to pay to keep their CDL valid. Motion carried.

Water & Sewer Rates:
After some discussion the following action was taken.
Motion by Tyler Van Metre, second by Wyatt Reis to raise the sewer rate by $1 to $43 per month in

city limits & $86 per month outside of city limits upon the first reading of Sewer Rate Ordinance #53.037E. Motion carried. The second reading will be held at the June 8th regular meeting. The increase will go into place on July 1, 2026 & will start to be billed on August 1, 2026. Motion carried.
Motion by Wyatt Reis, second by Mark Benter to raise the water minimum by $2 to $24 per month in city limits & $48 per month outside city limits upon the first reading of Water Rate Ordinance #52.23 – Part E. Motion carried. The second reading will be held at the June 8th regular meeting. The increase will go into place on July 1, 2026 & will start to be billed on August 1, 2026. Motion carried.

Hazard Mitigation Project Selection:
Finance Officer, Mike Glover presented the council a list of projects/actions to be included in the Gregory County Mitigation Plan. There are 7 projects/actions that were presented. They are: Continue participation in the National Flood Insurance Program; Powerline Burial; Acquire generator for the Civic Center; Implement water drainage project around the Burke School & Gregory County Courthouse; Participate in the Storm Ready Program; Conduct outreach to educate people about water conservation; Participate in the Firewise Program. Motion by Mark Benter, second by Tyler Van Metre to approve the projects/actions presented to be included in the Gregory County Hazard Mitigation Plan. Motion carried.

Amber Horn Health Insurance:
Amber informed the council that with her husband changing jobs that her health insurance is changing a little. She has 2 options, go on the city plan for $1,121.04 per month or she can be added to her husband's policy for $286.66 per month. Amber is asking the council if they would cover the $286.66 cost to add her to her husband's plan. To receive the $286.66, she would need to add $353 per month to her wage. By allowing Amber to receive the additional $353 per month instead of going on the city's plan, it would save the city approximately $9,200.00 per year. No decision can be made tonight. The council was in agreement to add the $353 per month to her wages. This item will be added to the agenda for the June 8th meeting.

Adjournment:
Mayor Glover declared the meeting adjourned at 8:44 pm.

ATTEST: _____ _____
Mike Glover, Finance Officer Thomas Glover, Mayor

GREGORY MINUTES

CITY OF GREGORY COUNCIL MEETING MINUTES
MONDAY MAY 4, 2026 | AT 5.:30 PM
GREGORY CITY HALL, 120 W 6TH ST, GREGORY, SD 57533

The Gregory City Council met in regular session on Monday May 4, 2026, at 5:30 pm with Mayor Al Cerny presiding. The City Council members present were Kristi Drey, Alex Hamilton, Ashley Lozano, Laura Petersen, and Stacey Boes. Absent was Maurice Schlaht. Also present were Reporter Patty Connealy, City Attorney Rachelle Norberg, Chamber Director Jaimie Braun, and Finance Officer Trudy Waterman. Guests included Justin Jelinek.

5:30 pm Call to Order/Pledge of Allegiance

Agenda Corrections/Additions/Approval Motion to approve the Agenda as posted made by Kristi Drey, seconded by Stacey Boes. All ayes. Motion carried.

Approval of Regular Council Minutes for April 20, 2026 Motion to approve the minutes for April 20, 2026, as written, made by Ashley Lozano, seconded by Kristi Drey. All ayes. Motion carried.

Public Forum/Visitors - None

Council Concerns – The need to begin street sweeping was addressed. The street sweeper was down for repairs, but the issue is resolved.

Department Head Reports Chamber Director Jaimie Braun announced that Tuesday May 19, at 12:00 pm at City Hall, there is a 'Super Group' meeting. They will include discussion of the commodity program and the community meals. Ms. Braun also announced that on Friday July 3, 2026 there will be an alumni flag football game.

Mayor Reports - None

Committee Reports Public Works Committee reiterated that they held an HR meeting with the city crew.

Conflict of Interest - None

Old Business

A. **Cruise Night for May 30** Justin Jelinek addressed the council with more information on the cruise night planned for May 30, 2026. Planners are hoping for a discounted drive-in movie, door prizes, popcorn from the theater, beverages from Day Spring, a food vendor or fundraiser, and music. The cruise would run from 5-8 pm. Council approved by consensus.

B. **Final Hazard Mitigation List** District III added the items the council decided on from April 20, 2026 to the ongoing list for the hazard mitigation. The entire list was presented to council for approval. The list is as follows:
   - Continue participation in the National Flood Insurance Program.
   - Make drainage improvements in various locations.
   - Acquire generator for auditorium.
   - Construct storm shelter at the pool.
   - Participate in the Storm Ready Program.
   - Conduct outreach to educate people about water conservation.
   - Participate in the Firewise Program.

   Motion to approve the list in its entirety made by Laura Petersen, seconded by Kristi Drey. All ayes. Motion carried

New Business

Motion to enter Board of Adjustment made by Kristi Drey, seconded by Stacey Boes. All ayes. Motion carried.

A. **Building Permits** **All P & Z Approved**
   1. Wenger – Mr. G's – Addition 2026-03C
   2. L McKeen – Shed 2026-04
   3. St Joseph's – Building 2026-05C

   Motion to approve all three permits previously approved by the P & Z made by Stacey Boes, seconded by Kristi Drey. All ayes. Motion carried.

CITY OF GREGORY COUNCIL MEETING MINUTES
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   Motion to approve all three permits previously approved by the P & Z made by Stacey Boes, seconded by Kristi Drey. All ayes. Motion carried.

APPENDIX C: History of Previous Hazard Occurrences

This section provides details about hazard events that have impacted Gregory County in the past, beginning with the following table showing the major disaster declarations in which Gregory County was part of the designated disaster area. The next several pages are a comprehensive list of weather-related hazard events recorded in the county from the National Climatic Data Center's Storm Events Database. The section ends with several tables showing crop loss to Gregory County farmers.

Major Disasters

Table C.1 lists all the events since 1970 that resulted in a major disaster declaration in which Gregory County was part of the designated area.

Table C.1 – Major Disaster Declarations Affecting Gregory County

Dec #	Declaration Date	Type	Primary Damage Impact
3015	Jun 1976	Drought	
999	Jul 1993	Severe storms, Tornado	
1052	May 1995	Severe storms, Flooding	
1075	Jan 1996	Ice storm	
1156	Feb 1997	Severe winter storm, Blizzard	
1173	Apr 1997	Severe storms, Flooding	
1375	May 2001	Severe storms	
1620	Dec 2005	Severe winter storm	
1702	May 2007	Severe storms, Tornado, Flooding	
1774	Jul 2008	Severe storms, Flooding	Roads and bridges
1886	Mar 2010	Severe winter storm	Emergency Protection
1887	Mar 2010	Severe winter storm	Utilities
1915	May 2010	Flooding	Roads and bridges
1984	May 2011	Flooding	Roads
4440	Jun 2019	Severe winter storms, Flooding	Roads and bridges
4463	Sep 2019	Severe storms, Flooding	Roads and bridges
4467	Oct 2019	Severe storms, Tornado, Flooding	Roads and bridges
4469	Nov 2019	Severe storms, Tornado, Flooding	Roads and bridges
4807	Aug 2024	Severe Storms, Straight-line Winds, Flooding	Roads and bridges

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

Significant Hazard Events

Table C.2 is a list of significant hazard events reported for Gregory County from 1960 through 2024, 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 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 hazards, including winter weather and drought, only go back to the 1990s. Another issue is that damage amounts in some cases are estimates and for certain types of events, such as winter storms, the data is tracked by forecast zone and thus does not lend itself to analysis at the county level. The database also contains a preponderance of records from the last few decades. 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:

- 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 thunderstorms and high wind events, only events with wind speeds of at least 60 knots are included in the table and only hail of at least one inch diameter is shown. 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 Gregory County

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
8/9/1961	Hail		1.75 in.		
5/15/1962	Tornado		F3		
5/21/1962	Tornado		F1	2,500	
6/12/1962	Tornado		F0		
5/8/1965	Tornado		F3	2.5	
7/12/1965	Hail		3.00 in.		
6/4/1966	Tornado		F2	250	

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
6/18/1967	Tornado				
6/18/1967	Tornado				
6/20/1968	Tornado		F2		
7/29/1979	Hail		1.75 in.		
6/6/1980	Hail		1.75 in.		
5/28/1985	Hail		1.75 in.		
5/28/1985	Tornado		F0		
5/30/1985	Tornado		F0		
9/4/1985	Tornado		F1	2.5	
6/6/1986	Thunderstorm Wind		69 kts.		
8/5/1987	Thunderstorm Wind		70 kts.		
7/29/1988	Hail		1.75 in.		
8/3/1988	Hail		2.75 in.		
8/25/1990	Hail		1.75 in.		
6/30/1991	Hail		2.75 in.		
6/16/1992	Hail		1.75 in.		
6/16/1992	Thunderstorm Wind		60 kts.		
9/1/1993	Hail		1.75 in.		
6/6/1994	Hail		1.75 in.		
6/6/1994	Thunderstorm Wind		69 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 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. Power outages occurred, one due to a transformer exploding in Gregory County.		150	
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.			
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.		10	
4/25/1996	High Wind		62 kts.	80	
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 siedwalks. Some farm buildings and other small structures were damaged by the weight of ice and snow on roofs.		10	

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
12/16/1996	Blizzard				
12/25/1996	Heavy Snow				
1/4/1997	Blizzard				
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				
4/1/1997	Flood				
4/6/1997	High Wind		63 kts.	10	
4/9/1997	Heavy Snow				
7/27/1997	Thunderstorm Wind		61 kts.	10	10
8/29/1997	Thunderstorm Wind		61 kts.	5	
9/8/1997	Thunderstorm Wind		61 kts.	50	
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.			
5/14/1998	Hail		2.00 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	
5/10/1999	Hail		1.75 in.		
6/7/1999	Hail		1.50 in.		
6/22/1999	Hail		1.75 in.		
6/22/1999	Tornado		F0		
7/2/1999	Hail		1.50 in.	500	1,000
7/18/1999	Hail		1.50 in.		
7/18/1999	Thunderstorm Wind		65 kts.		
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			

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
		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				
5/11/2000	Hail		1.25 in.	5	
9/18/2000	Lightning				
11/11/2000	Winter Storm				
12/16/2000	Blizzard				
1/29/2001	Blizzard				
2/7/2001	Winter Storm				
2/24/2001	Winter Storm				
11/26/2001	Heavy Snow	Most areas of southeast South Dakota received at least 8 inches of snow, with Bonesteel receiving 16 inches. The snowfall closed many schools and businesses, closed some government offices, and severely hampered transportation. The wet and heavy nature of the snow made it difficult to clear away.			
3/14/2002	Winter Storm				
6/7/2002	Thunderstorm Wind		61 kts. E	10	
8/9/2002	Hail		1.75 in.	100	
8/9/2002	Thunderstorm Wind		65 kts. E		
8/9/2002	Tornado	A tornado destroyed a church, a county highway shop, several garages, several small sheds, a mobile home, a camper, and a ten thousand bushel silo. The church was ripped from its foundation, with debris and contents blown over a wide area. Tree damage includes uprooted trees, and power lines were blown down. A resulting power outage lasted for several hours. Windows in many homes and some businesses were broken. The Herrick Honey House was severely damaged, and a honey truck was tipped over. Holes were punched in the walls of some houses by flying debris.	F2	1,000	
8/21/2002	Hail		1.75 in.		
1/15/2003	Heavy Snow				
4/6/2003	Heavy Snow				
6/9/2003	Tornado		F0		
6/9/2003	Tornado		F0		
6/11/2003	Hail		1.50 in.		
6/24/2003	Thunderstorm Wind		61 kts. E	10	
8/19/2003	Thunderstorm Wind		61 kts. E	5	
11/22/2003	Winter Storm				
12/8/2003	Winter Storm				
3/15/2004	Heavy Snow				
7/12/2004	Hail		2.75 in.		
8/2/2004	Hail		1.75 in.		
1/4/2005	Heavy Snow				

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
6/7/2005	Hail		1.25 in.		
6/7/2005	Thunderstorm Wind		61 kts. E		
8/25/2005	Hail		1.75 in.		
9/18/2005	Hail		1.75 in.		
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.		1,000	
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	
3/12/2006	Winter Storm				
3/19/2006	Winter Storm	A prolonged period of snowfall spread into the area from the west and south, and continued for over a day, with 24 inches recorded at Burke. Winds gusting over 35 mph caused near blizzard conditions. The storm halted travel in the area of the heaviest snow, and greatly curtailed travel in other areas. Numerous schools and businesses were closed. Power outages were reported from collapsed lines due to the heavy snow and winds.			
7/18/2006	Drought				
8/1/2006	Drought				
8/10/2006	Thunderstorm Wind		69 kts. E		
12/20/2006	Winter Storm	Freezing rain caused significant icing of a quarter to a half inch, which caused branches and power lines to break in several places. The freezing rain was followed by 4 to 7 inches of snow, with the 7 inch report northwest of the town of Gregory. Travel was greatly slowed and was brought to a standstill in places. Several vehicles slid off roads. Classes for December 21st were cancelled at several schools.		40	
12/29/2006	Winter Storm	Freezing rain was followed by 3 to 6 inches of snow. The freezing rain caused significant icing of roads, with travel greatly slowed, and several vehicles sliding into ditches.			
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.			
3/1/2007	Blizzard				
4/21/2007	Hail		2.50 in.		
5/5/2007	Thunderstorm Wind		65 kts. E	30	
5/5/2007	Tornado		EF0		

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
5/5/2007	Tornado		EF0		
6/21/2007	Hail		1.75 in.		
8/13/2007	Hail		1.50 in.		
4/10/2008	Blizzard				
6/5/2008	Flash Flood				
6/17/2008	Hail		1.75 in.	100	
7/10/2008	Hail		1.75 in.		
7/28/2008	Thunderstorm Wind		69 kts. E	5	
8/11/2008	Hail		1.75 in.		
11/6/2008	Blizzard				
12/14/2008	Blizzard				
3/30/2009	Blizzard	Snowfall of 4 to 12 inches, accompanied by northerly winds gusting over 45 mph, produced blizzard conditions that brought travel and commerce to a standstill. Numerous businesses, schools, and roads were closed; and many roads not officially closed were impassable. The town of Gregory reported 10 inches of snow.			
4/4/2009	Blizzard				
6/17/2009	Hail		1.75 in.	100	
8/3/2009	Hail	Large hail, up to two inches in diameter, fell in a swath a few miles wide from northwestern to south central Gregory County. The hail broke numerous windows, severely damaged siding and roofs of homes and other buildings, and severely damaged vehicles, while covering the ground in several places. Property damage was especially severe in the town of Gregory. Crop damage was also severe along the swath, with corn crops in some areas destroyed to the point of only small stubble left.	2.00 in.	2,000	1,000
8/15/2009	Flash Flood				
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 2 to 5 inches, previously existing snow cover, and northwest winds gusting to over 40 mph produced widespread blizzard conditions, with visibilities less than a quarter mile. New snowfall included 4 inches at the town of Gregory. 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.			
5/24/2010	Hail		1.75 in.		
5/29/2010	Hail		1.50 in.		
6/1/2010	Flash Flood				
7/17/2010	Hail		2.00 in.		

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
7/23/2010	Tornado		EF0		
7/23/2010	Tornado		EF0		
8/30/2010	Thunderstorm Wind		61 kts. E		
12/31/2010	Blizzard	Snowfall of 6 to 10 inches and winds gusting to over 40 mph produced widespread blizzard conditions. Roads were closed and many businesses were forced to close as travel became difficult to impossible.			
1/1/2011	Blizzard				
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				
4/15/2011	Heavy Snow				
6/1/2011	Flood	Flooding from upstream spring snowmelt and subsequent heavy rain, affecting mainly the east shore of the Missouri River, also came to effect the Gregory County shore as it increased. A few roads and recreation areas near the river were flooded.			
7/1/2011	Flood	Flooding from upstream spring snowmelt and subsequent heavy rain, affecting mainly the east shore of the Missouri River, also continued to affect parts of the Gregory County shore. A few roads and recreation areas near the river remained flooded.			
7/15/2011	Extreme heat				
8/1/2011	Flood	Major impacts from Missouri River flooding continued into August, with flooding varying from minor to major, and evacuated areas remaining evacuated. Water levels receded very slowly during the month, and effects of the flooding slowly began to abate, but in many places the extent of damage to homes, businesses, and lowlands was beginning to become evident. A few roads and recreational areas near the river remained flooded.			
10/4/2011	Wildfire	Several wildfires broke out during a four day period. Warm and dry weather, strong winds, and dry vegetation contributed to the fires starting and spreading. The fires affected grassland and cropland, including baled hay. Several wildfires damaged grassland and crops. No injuries to humans or livestock were reported. The largest fire started in a bean field 3 miles south and 1 mile west of Burke and burned over a one mile stretch before it was brought under control by four fire departments. The amount of crop damage was not known.			
6/1/2012	Drought	Well below normal rainfall aggravated long term dry soil conditions, producing stress on crops which had been planted unusually early due to a warm late winter and early spring. The crops had begun their growth with ample mid spring rains, but the stress quickly developed with the return to dry conditions which had existed generally since the previous fall.			
6/26/2012	Extreme 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	Extreme heat				
7/15/2012	Extreme heat				
7/18/2012	Extreme 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.			
8/1/2012	Extreme heat				
8/16/2012	Wildfire	A wildfire burned grassland and trees on and near the Karl E. Mundt Wildlife Refuge. No structures were burned. The fire burned 146 acres, including 112 acres on the refuge and 34 acres of private land.			
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				
10/17/2012	High Wind		60 kts. M		
11/1/2012	Drought				
12/1/2012	Drought	Drought conditions continued over all of southeast South Dakota in December. 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				
1/1/2013	Drought				
2/1/2013	Drought				
2/10/2013	Blizzard	Variable snowfall of 2 to 8 inches, northwest winds gusting to 45 mph, and snow cover existing before the storm in part of the area, produced blizzard conditions with visibilities below a quarter mile in blowing snow in many areas. The low visibilities and drifting snow forced some 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 ice accumulations, then changing to sleet and then snow, with sleet and snow accumulations reaching 10.5 inches at Burke. The winter precipitation made travel very difficult, resulting in schools and businesses being forced to close.			
5/1/2013	Drought				
12/3/2013	Winter Storm	Snow, heavy in areas, 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.			
12/15/2014	Winter Storm				
8/6/2015	Thunderstorm Wind		61 kts. EG		
11/20/2015	Heavy Snow				
11/30/2015	Winter Storm				
12/25/2015	Winter Storm				

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
3/23/2016	Winter Storm				
5/25/2016	Hail		1.75 in.		
6/10/2016	Extreme heat				
7/19/2016	Extreme heat				
11/17/2016	Winter Storm				
12/16/2016	Winter Storm				
1/24/2017	Winter Storm				
2/23/2017	Winter Storm				
6/13/2017	Hail		1.50 in.		
7/9/2017	Thunderstorm Wind	A grain bin and outbuildings were damaged near Fairfax.	63 kts. MG		
9/19/2017	Hail		1.25 in.		
12/26/2017	Extreme cold				
12/31/2017	Extreme Cold	Record low high temperature of -5 at Gregory.			
1/15/2018	Extreme cold				
1/21/2018	Winter Storm				
2/10/2018	Extreme cold				
3/5/2018	Blizzard				
4/2/2018	Winter Storm				
4/13/2018	Blizzard	Life threatening conditions developed, as a mix of rain, sleet and snow changed to all snow. Brutal winds gusting over 50 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. Total snowfall of 16 inches was measured at Gregory and Bonesteel and 14 inches near Burke.			
4/18/2018	Winter Storm				
6/1/2018	Thunderstorm Wind		61 kts. EG		
7/8/2018	Extreme heat				
7/11/2018	Extreme heat				
7/12/2018	Flash Flood				
1/1/2019	Extreme Cold				
3/3/2019	Extreme Cold				
3/13/2019	Flood	Flooding resulted in extensive damage to public infrastructure including numerous county and township roads, culverts, and some bridges			
3/14/2019	Blizzard				
4/11/2019	Blizzard				
6/1/2019	Flood				
6/4/2019	Hail		1.75 in.		
6/19/2019	Hail		1.00 in.		
6/28/2019	Heat				

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
6/29/2019	Heat				
6/30/2019	Hail		2.00 in.		
6/30/2019	Tornado		EF0		
6/30/2019	Heat				
8/6/2019	Hail		2.75 in.	5	50
8/6/2019	Thunderstorm Wind		88 kts. EG	100	
8/6/2019	Tornado	A tornado touched down in the heart of Burke near Washington and 7th Streets, which severely damaged several structures, including the Gregory County courthouse and the Burke school, and destroyed the civic center. The start of the school year was delayed by two weeks due to extent of the damage. Two people were directly injured by debris when a garage collapsed on them. Numerous power transmission poles and lines were destroyed by the tornado. Two miles southeast of Burke, the tornado struck a residence causing severe damage to the roof. The tornado's path width reached a maximum of 75 yards within the city of Burke. Up to 3000 trees were damaged by the tornado in and near Burke.	EF1	4,000	
8/9/2019	Flash Flood	Several roads were under a half foot to foot of flowing water in Gregory.		5	
8/9/2019	Flash Flood	Numerous county roads were damaged with culverts or roads washed out		630	
8/17/2019	Hail		1.50 in.		
9/12/2019	Flood			250	3
11/29/2019	Winter Storm				
12/1/2019	Winter Storm				
12/28/2019	Blizzard	Heavy snowfall (over 12 inches in much of the county) and high wind resulted in white out conditions. Snow drifts to several feet were common.			
1/17/2020	Blizzard				
1/18/2020	Cold/wind Chill				
4/11/2020	Winter Storm				
6/20/2020	Hail		2.75 in.	10	10
6/30/2020	Hail		1.00 in.		
8/10/2020	Hail		2.00 in.		
8/10/2020	Thunderstorm Wind		63 kts. MG		
10/24/2020	Winter Storm				
11/10/2020	Drought				75
12/1/2020	Drought				
12/23/2020	Blizzard				
12/29/2020	Winter Storm				
1/1/2021	Drought				
1/14/2021	High Wind		64 kts. MG		
2/14/2021	Extreme cold				
3/14/2021	Winter Storm				

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
6/1/2021	Drought				879
6/23/2021	Hail		1.00 in.		
7/1/2021	Drought				2,420
8/1/2021	Drought				304
9/1/2021	Drought				71
9/16/2021	Hail		1.25 in.		7
9/16/2021	Thunderstorm Wind		70 kts. MG		
10/1/2021	Drought				20
11/1/2021	Drought				21
11/11/2021	High Wind		64 kts. MG		
11/13/2021	High Wind		62 kts. MG		
12/10/2021	Winter Storm				
12/15/2021	High Wind		64 kts. MG		
12/31/2021	Cold/wind Chill				
1/1/2022	Cold/wind Chill				
1/4/2022	High Wind		61 kts. MG		
1/6/2022	Extreme cold				
2/22/2022	Cold/wind Chill				
4/1/2022	Drought				
4/5/2022	High Wind		60 kts. MG		
4/22/2022	High Wind		62 kts. MG		
5/1/2022	Drought				
5/30/2022	Thunderstorm Wind		62 kts. MG		
6/1/2022	Drought				
6/25/2022	Hail		2.00 in.		
7/1/2022	Drought				
8/1/2022	Drought				
8/5/2022	Excessive Heat				
9/1/2022	Drought				
10/1/2022	Drought				
11/1/2022	Drought				
12/1/2022	Drought				
12/8/2022	Winter Storm				
12/13/2022	Blizzard				
12/21/2022	Blizzard/Extreme Cold				
1/1/2023	Drought				
1/2/2023	Winter Storm				

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
1/18/2023	Winter Storm				
1/27/2023	Winter Storm				
2/1/2023	Drought				
2/21/2023	Blizzard				
2/23/2023	Cold/wind Chill				
3/1/2023	Drought				
6/6/2023	Drought				
7/1/2023	Drought				750
7/12/2023	Thunderstorm Wind		63 kts. MG		
7/25/2023	Excessive Heat				
8/19/2023	Heat				
8/21/2023	Excessive Heat				
9/2/2023	Heat				
12/25/2023	Blizzard				
1/7/2024	Winter Storm				
1/12/2024	Extreme cold				
1/13/2024	Blizzard				
1/20/2024	Cold/wind Chill				
3/24/2024	Winter Storm				
6/21/2024	Flood			352	
7/13/2024	Heat				
7/14/2024	Thunderstorm Wind		63 kts. MG		
7/28/2024	Hail		2.75 in.		
7/31/2024	Hail		2.00 in.		
7/31/2024	Heat				
8/2/2024	Heat				
8/18/2024	Hail		1.00 in.		
8/25/2024	Hail		2.75 in.		
8/25/2024	Thunderstorm Wind		72 kts. MG		
8/25/2024	Excessive Heat				
10/29/2024	Drought				
11/1/2024	Drought				
11/20/2024	High Wind		62 kts. MG		

Source: National Climatic Data Center Storm Events Database (www.ncdc.noaa.gov/stormevents)

Crop Loss

As described in **Chapter III**, farmers typically protect themselves from the impacts of adverse weather by insuring their crops against losses through multi-peril crop insurance, which is underwritten by the Risk Management Agency. The tables on the next few pages provide data on indemnity payouts to Gregory County farmers for crop loss due to natural hazard events from 2000 through 2023.

Table C.3 shows indemnity payouts due to winter weather events. During the 2000 – 2023 period of analysis, winter weather-related payouts represented approximately 4% of all indemnity payouts in Gregory County.

Table C.3 – Crop Loss Due to Winter Weather

Year	Frost	Freeze	Cold Winter	Cold Wet Weather
2000			$31,588	
2001		$9,855	$345,981	$1,284
2002	$6,442		$13,167	$3,803
2003			$3,229	$331
2004	$18,536	$8,724		
2005	$5,805	$13,285	$438	
2006		$1,043	$16,696	
2007	$4,830	$55,036	$67,775	$6,101
2008	$2,018	$845	$7,427	$1,263
2009	$6,336	$14,404	$429,199	$14,177
2010			$53,750	$5,049
2011			$11,540	$6,356
2012	$13,073	$2,498		
2013			$257,797	$1,960
2014		$10,864	$34,942	$27,126
2015		$161	$866,427	
2016			$2,416	$9,877
2017		$459	$18,761	
2018	$18,947		$1,073	$31,460
2019			$96,479	$115,678
2020			$14,398	$10,681
2021			$34,073	
2022			$56,301	$9,565
2023			$36,293	
Ave Payout =	**$3,166**	**$4,882**	**$99,990**	**$10,196**

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

Table C.4 shows indemnity payouts due to severe summer weather. During the 2000 – 2023 period of analysis, summer storm-related payouts represented approximately 5% of all indemnity payouts in Gregory County.

Table C.4 – Crop Loss Due to Severe Summer Weather

Year	Hail	High Wind	Tornado
2000	$94,122	$3,957	
2001	$16,020	$2,933	
2002	$666,012		
2003	$55,836	$6,016	
2004	$10,746	$3,454	
2005	$31,884	$1,141	
2006	$1,943		
2007	$534	$2,997	
2008	$400,526	$8,505	
2009	$940,879		
2010	$12,886	$1,438	$6,771
2011	$10,696	$49,833	
2012		$20,154	
2013	$64,473	$93,187	
2014			
2015	$112,912	$22,161	
2016			
2017	$267,105	$5,952	
2018	$37,416	$7,244	
2019	$582,026	$1,058	$2,881
2020	$9,320	$5,039	
2021	$6,837		
2022	$41,388	$135,829	
2023	$15,449	$1,511	
Ave Payout =	**$140,792**	**$15,517**	**$402**

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

Table C.5 shows indemnity payouts due to flooding and excess moisture. During the 2000 – 2023 period of analysis, flood-related payouts represented approximately 16% of all indemnity payouts in Gregory County.

Table C.5 – Crop Loss Due to Flooding and Excess Moisture

Year	Flooding	Excess Moisture
2000		$22,974
2001		$205,688
2002		$27,718
2003		$46,456
2004		$13,991
2005		$80,660
2006		$3,835
2007		$135,776
2008	$691	$411,183
2009		$167,097
2010		$1,282,775
2011		$185,543
2012		$17,896
2013		$49,044
2014		$4,203
2015		$140,050
2016	$8,669	$461,976
2017		$76,413
2018	$720,249	
2019	$6,129,266	
2020	$2,210,791	
2021	$73,308	
2022		$48,238
2023	$680	
Ave Payout =	**$380,986**	**$140,897**

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

Table C.6 shows indemnity payouts due to drought and heat. During the 2000 – 2023 period of analysis, drought-related payouts accounted for approximately 70% of all indemnity payouts in Gregory County, far more than any other type of hazard [11].

Table C.6 – Crop Loss Due to Drought and Heat

Year	Drought	Heat
2000	$1,629,064	$14,042
2001	$329,349	$52,521
2002	$4,700,874	$499,742
2003	$1,716,481	$93,758
2004	$4,610,499	
2005	$1,003,157	$9,064
2006	$2,947,110	$39,346
2007	$424,974	$8,384
2008	$215,889	
2009	$12,427	
2010	$41,228	
2011	$909	$20,122
2012	$15,277,616	$2,322,974
2013	$1,116,805	$1,177
2014	$323,313	$3,365
2015	$324,738	
2016	$40,523	$909
2017	$501,750	$16,453
2018	$3,458	
2019		$3,669
2020	$136,750	$16,197
2021	$4,412,615	$354,018
2022	$10,444,333	$447,204
2023	$1,052,172	$52,451
Ave Payout =	**$2,136,085**	**$164,808**

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

[11] Drought is 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.

APPENDIX D: References

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