2026

HAZARD MITIGATION PLAN

Douglas County, South Dakota



PREPARED BY:

Douglas County Hazard Mitigation Planning Team

TECHNICAL ASSISTANCE PROVIDED BY:

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2026 Douglas 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 Douglas County Hazard Mitigation Plan, which was approved by FEMA in September 2021. The purpose of the plan is to prevent or reduce losses to people and property that may result from future hazard events in Douglas 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 Douglas County in its efforts to mitigate future disaster events.

This is a multi-jurisdictional plan. All the municipalities located within Douglas 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:

- Douglas County
- City of Armour
- City of Corsica
- Town of Delmont

Production of the plan was the ultimate responsibility of the Douglas 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 Douglas County's current plan.

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 Douglas 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:

- Douglas Electric Cooperative
- Randall Community Water District
- South Central Water Development District
- McLaury Engineering
- Douglas County Memorial Hospital, Armour
- Armour School District
- Neighboring counties (Aurora, Bon Homme, Brule, Charles Mix, Davison, Hutchinson)

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 8/04/26	Mtg 2 8/18/26	Mtg 3 10/06/26
John Clem	Planning District III	Planner	Plan author	X	X	X
Shannon Viereck	Planning District III	Planner	Research, Support	X		
Pat Harrington	Douglas County	Emergency Manager	Input, Review	X	X	X
Jim Werkmeister	Douglas County	Commissioner	Input, Review	X	X	X
Dan Koedam	Douglas County	Commissioner	Input, Review	X	X	X
Lori Sparks	Douglas County	Commissioner	Input, Review	X	X	X
Merlin Maas	Douglas County	Commissioner	Input, Review	X	X	X
Jerod Star	Douglas County	Commissioner	Input, Review		X	X
Melissa Bowers	Douglas County	Auditor	Input, Review	X	X	X
Brad Ellwanger	Douglas County	Hwy Superintendent	Input, Review	X		
Callie Nichols	Douglas County	Hwy Dept	Input, Review	X	X	X
Travis Sparks	City of Armour	Mayor	Input, Review	X		
Kari Bertram	City of Armour	Finance Officer	Input, Review		X	
David Majerus	City of Armour	Public Works Director	Input, Review			X
Darwin DeLange	City of Corsica	Public Works Director	Input, Review	X	X	X
Darren Feenstra	City of Corsica	Public Works Dept	Input, Review	X	X	
Barb Dozark	Town of Delmont	Finance Officer	Input, Review	X	X	X
Kevin Czymber	St Peter Church	Pastor	Input, Review	X	X	
Ryan Murtha	McLaury Engineering	Office manager	Input, Review		X	
Lashell Menning	Douglas Co. Ambulance		Input, Review		X	
Nicole Neugebauer	Douglas Co. Ambulance		Input, Review		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 newspaper, information posted online, 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 Douglas 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.
Douglas County Comprehensive Plan	The environmental constraints section of the plan was used to identify areas suitable for development in the county.
Douglas County Highway Plan	The plan includes a list of county roads scheduled for improvements within the next five years.
Armour Stormwater Collection Evaluation Plan	The plan evaluates the existing stormwater collection system in Armour, including a detailed inspection report of every culvert in the city, and proposes various alternatives to improve the system, focused on culvert improvements, drainageway improvements, and collection improvements.
Corsica Comprehensive Plan	The environmental constraints section of the plan was used to identify areas suitable for development within the city.
Delmont Comprehensive Plan	The environmental constraints section of the plan was used to identify areas suitable for development within the city.
Douglas Electric Cooperative Construction Work Plan	The plan provides details about the cooperative's anticipated projects over a five-year period, including location and estimated cost.
Lake Corsica Dam Emergency Preparedness Plan	The plan outlines procedures for warning, evacuation, and care of people living within the area potentially affected by failure of the dam.

Planning Meetings

Several meetings were held to develop the plan, all of which took place at the Douglas 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 Douglas 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 stakeholders, and which was also made available to the public as described earlier in the Public Outreach section.

First Planning Team Meeting

The first planning team meeting began with an introduction to the concept of hazard mitigation for the team members, many of whom had not 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 surveys were collected. The rest of the meeting was spent reviewing the County's current mitigation plan and discussing local mitigation capabilities, focusing on land use regulations, enforcement of building codes, and National Flood Insurance Program activities.

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, based on FEMA's guidance document *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*.

Second Planning Team Meeting

The mitigation strategy began to be developed at this meeting, starting with the identification of hazards to be addressed. Following this, a review was made of the status of the proposed mitigation actions listed in the current plan.

Discussion then turned to identification of the mitigation goals and objectives to be achieved, followed by initial discussion of 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 could be achieved in the foreseeable future.

Activity between meetings

After the second meeting, each jurisdiction further 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. 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 Douglas 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 Pat Harrington for arranging the planning team meetings and for coordinating with the participating jurisdictions. Thanks also are extended to Jim Poppen, Blaire Jonas, and Kyle Kafka 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 Douglas 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

Douglas County is located in southeast South Dakota, as shown in **Figure 1.1**. The county covers approximately 434 square miles in area, and its population according to the 2020 Census was 2,835. There are three incorporated municipalities located within the county - Armour (pop 698), Corsica (pop 561), and Delmont (pop 153). Unincorporated communities within the county include Harrison and New Holland. The county seat is located in Armour. Another populated place within the county is the Greenwood Hutterite Colony, which is located approximately four miles south of Delmont [1]. **Figure 2.1** shows the county's communities and highway network.

Physical Characteristics

Douglas County is lightly settled, with most of the land devoted to agricultural production. The landscape is mostly open, and the terrain is generally fairly level, without any notable features. Prominent bodies of water in the county include Corsica Lake and Joubert Lake.

Table 2.1 provides a breakdown of the land cover in Douglas County, which is shown graphically in **Figure 2.2**. 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 cultivated crops and pastureland, which together comprise approximately 90 percent of the county's total land base. The primary crops include corn, soybeans, and wheat. Developed land makes up a tiny fraction of the Douglas County land base.

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

Figure 2.1 – Douglas County

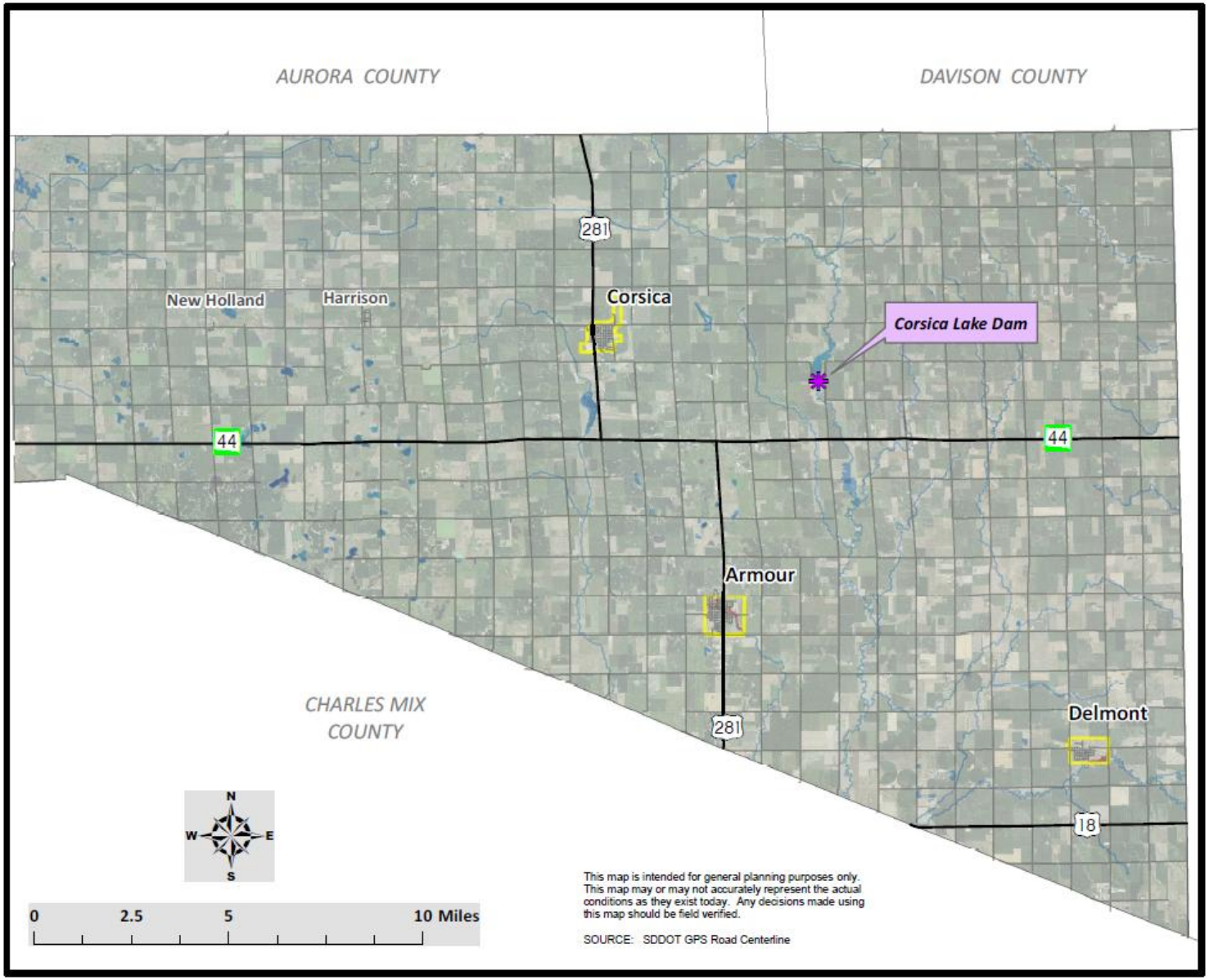


Table 2.1 - Vegetative Land Cover

Cover Type	Square Miles	Percent of Total Area
Cultivated crops	235.5	54.3
Pastureland	149.8	34.5
Developed land (open space)	17.3	4.0
Wetlands	13.8	3.2
Grassland and Shrub/Scrub	9.2	2.1
Open water	3.6	0.8
Forested land	3.2	0.7
Developed land (low to high intensity)	1.4	0.3
Barren land	0.1	0.0

Source: www.mrlc.gov/index.php

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

As in most of South Dakota, the climate of Douglas 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 summer can exceed 100 degrees Fahrenheit [2], while winter lows can drop below -20 degrees. Precipitation averages about 23 inches per year, but during drought years the amount can be much less. Most of the precipitation occurs during the spring and early summer; winter snow is not frequent, but snow cover on the ground is fairly constant during many winters. Blizzards and other types of winter storms are a definite hazard. Following is climate data in the county as reported from the Armour weather station.

Table 2.2 - Monthly Climate Conditions in Douglas County (1896 - 2008)

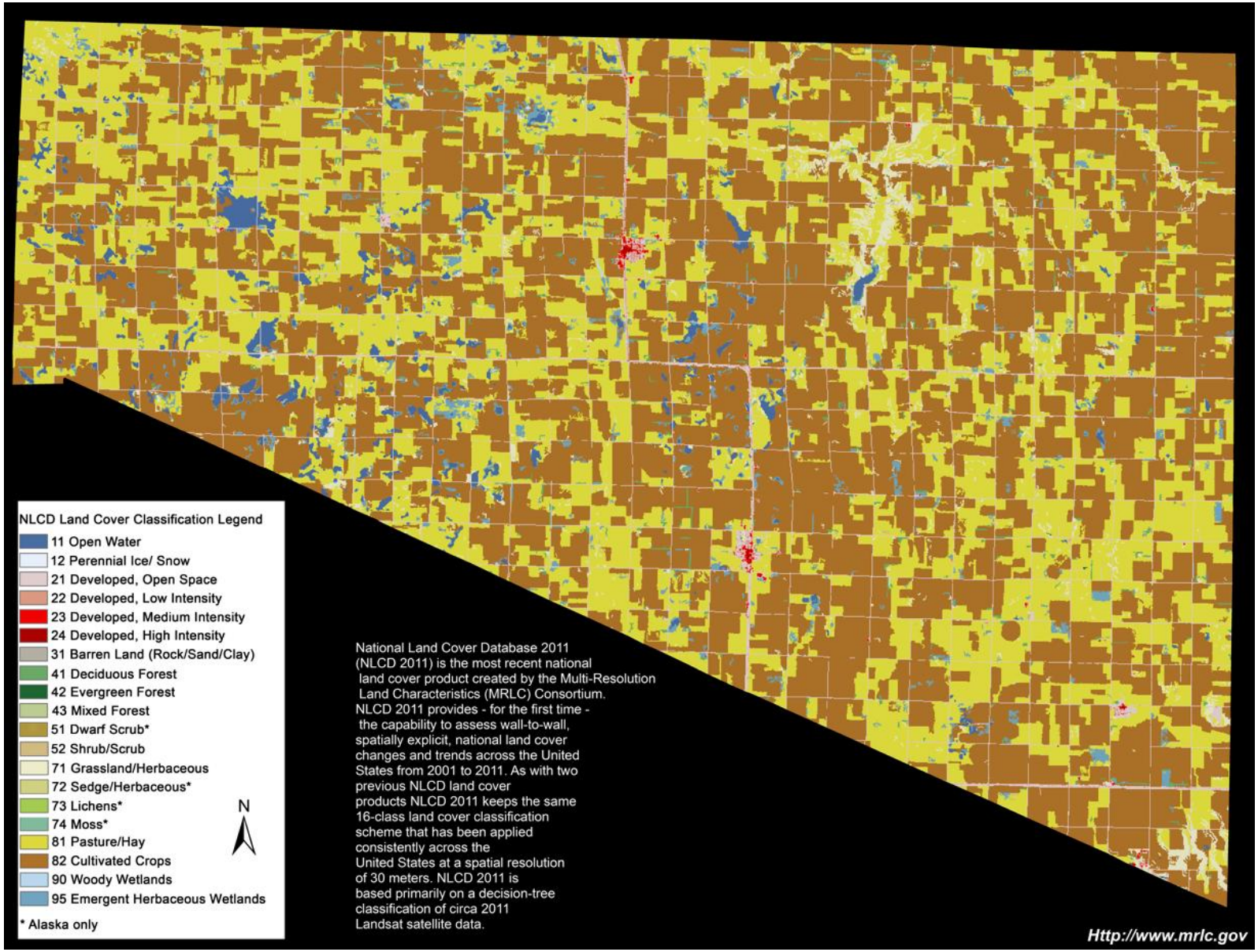
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ave High	29.9	35.0	46.3	61.8	73.2	82.7	89.6	87.6	78.4	65.6	46.8	33.9
Ave Low	7.4	11.8	22.5	35.2	46.6	56.6	61.9	59.9	50.1	37.6	23.8	12.6
Ave Precipitation	0.6	0.7	1.4	2.4	3.2	3.9	2.8	2.8	2.2	1.5	0.9	0.6

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, Douglas County is expected to experience 16 more days per year that reach above 95 degrees Fahrenheit (from 26 days to 42 days per year) and the average annual temperature is expected to increase from 51°F to 53°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

Douglas County has been experiencing a steady population decline for the last several decades. The Census 2020 population of 2,835 is only 50 percent of the population that was recorded in 1950. As the table below shows, the county's population is expected to continue decreasing in the coming decades.

Table 2.3 - Douglas 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
5,636	5,113	4,569	4,181	3,746	3,458	3,002	2,835	2,665	2,582	2,482

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 very high percentage of Douglas County's population is composed of whites compared to South Dakota and the rest of the nation. 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.

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
Douglas Co.	94.0%	0.2%	1.3%	0.1%	0.6%	3.8%	1.9%	26.2%	23.6%	41.6
South Dakota	80.7%	2.0%	8.8%	1.5%	1.7%	5.3%	4.4%	24.1%	18.2%	38.5
United States	61.6%	12.4%	1.1%	6.0%	8.4%	10.2%	18.7%	21.7%	17.3%	39.0

Source: American Community Survey 2022 1-Year Estimates

Income and Education

Income levels in Douglas County are similar to the state and national figures. 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
Douglas Co.	$75,048	14.5%	26.6%	11.9%	91.4%	20.6%	3.5%
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 Douglas County is agriculture. Much of the non-ag employment for people who work in the county is in education and health care. Retail trade is also an important part of the local economy.

Table 2.6 – Employment Sectors

	Douglas County	South Dakota	United States
Agriculture, Forestry, Fishing, Mining	21.4%	6.4%	1.6%
Construction	6.7%	7.4%	6.9%
Manufacturing	4.8%	9.9%	9.9%
Wholesale Trade	1.8%	2.1%	2.2%
Retail Trade	13.1%	11.4%	11.1%
Transportation, Warehousing, Utilities	4.8%	4.4%	6.0%
Information	0.7%	1.5%	1.9%
Finance, Insurance, Real Estate	2.9%	6.0%	6.7%
Professional, Scientific, Management	2.3%	6.7%	12.6%
Education, Health Care, Social Assistance	20.8%	26.3%	23.1%
Arts, Entertainment, Recreation, Accommodation, Food Service	7.4%	8.8%	8.7%
Other Services	6.7%	4.3%	4.7%
Public Administration	6.6%	4.8%	4.6%

Source: American Community Survey 2022 1-Year Estimates

Vulnerable Populations

There are certain populations and social groups within Douglas 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 Douglas County has a fairly low proportion of vulnerable people. The Centers for Disease Control Social Vulnerability Index shows Douglas County with a rating of .3166 (0 being least vulnerable and 1 being most vulnerable), which indicates a low to medium level of vulnerability. FEMA's Resilience and Planning Tool shows that the county's Income Inequality Index is .44, which is close to the state and national figures. The Community Resilience Challenges Index (CRCI) percentile is 13 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 Uninsured Population, Age, and Civic Organizations.

Infrastructure and Utilities

Transportation

The primary transportation routes in Douglas County are U.S. Highway 281, which runs north-south through the county, and South Dakota Highway 44, which runs east-west. U.S. Highway 18 runs through the southern tip of the county. There are no railroad lines in the county. A small airport with a grass runway is located just outside Corsica.

Utilities

Water service throughout most of Douglas County is provided by the Randall Community Water District, which also provides bulk water directly to Armour, Corsica, and Delmont. The Bon Homme-Yankton Rural Water System provides service to the northeast part of the county. Both Randall and Bon Homme-Yankton get their water from the Missouri River. Each municipality has a wastewater collection system that stores effluent in stabilization ponds, where it is allowed to evaporate over time. Rural households, including residents of Harrison and New Holland, must rely on 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 Douglas County ends up at the landfill. Designated rubble sites are located outside Armour, Corsica, and Delmont.

Electric power is provided to the rural areas of the county, including the communities of Harrison and New Holland, by the Douglas Electric Cooperative. The cooperative has a total of approximately 501 miles of powerlines in its system, of which 104 miles (about 21%) are

now underground. Northwestern Public Service supplies power to Armour, Corsica, and Delmont. There is no natural gas service available anywhere in Douglas County.

Services

Medical Services

The major medical facility in Douglas County is the Douglas County Memorial Hospital in Armour, which serves the county and surrounding area. The hospital has 11 beds and is considered a critical access facility. It has an emergency generator if power is disrupted. People needing serious medical attention can be transported to trauma center hospitals in Sioux Falls or elsewhere.

Fire and Emergency Response

Fire departments are based in Armour, Corsica, and Delmont. The departments have basic firefighting and rescue equipment, and they respond to structural fires, wildland fires, and to accident situations. The departments also have some capabilities regarding hazardous material (hazmat) response, but a serious incident would require assistance from outside the county.

Education

K-12 education is available in Armour and Corsica. Education up through the middle school level is available for children living at the Greenwood Hutterite Colony. See p.36 for further details.

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

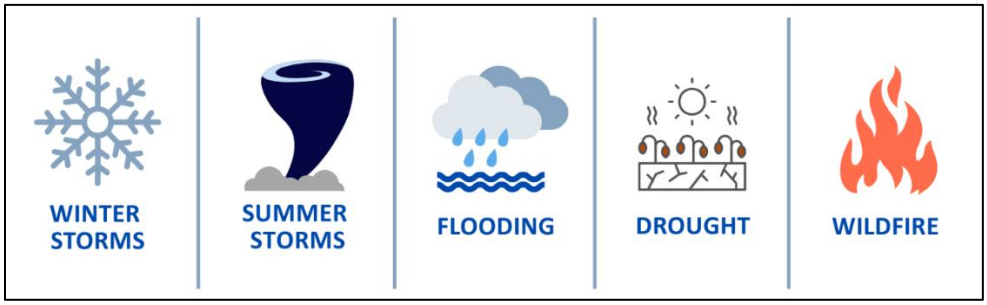
After reviewing the risk assessment section of the current plan, the planning team decided that no major changes were needed to the risk assessment. This determination was made because of the lack of population growth and development in the county and because no natural disasters have had a major impact 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 Douglas County in any 100-year period, and virtually no chance of a magnitude 6 or greater earthquake [3]. Furthermore, no significant earthquake has ever been recorded in the county. Regarding landslides, a review of the United States Geological Survey's Landslide Incidence and Susceptibility Map shows virtually no chance of a significant landslide occurring in Douglas County.
- Agricultural pests and diseases - this hazard is profiled in the South Dakota Hazard Mitigation Plan. However, despite the obvious importance of agriculture to the 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

[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.

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 Douglas 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 Douglas 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 Douglas 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

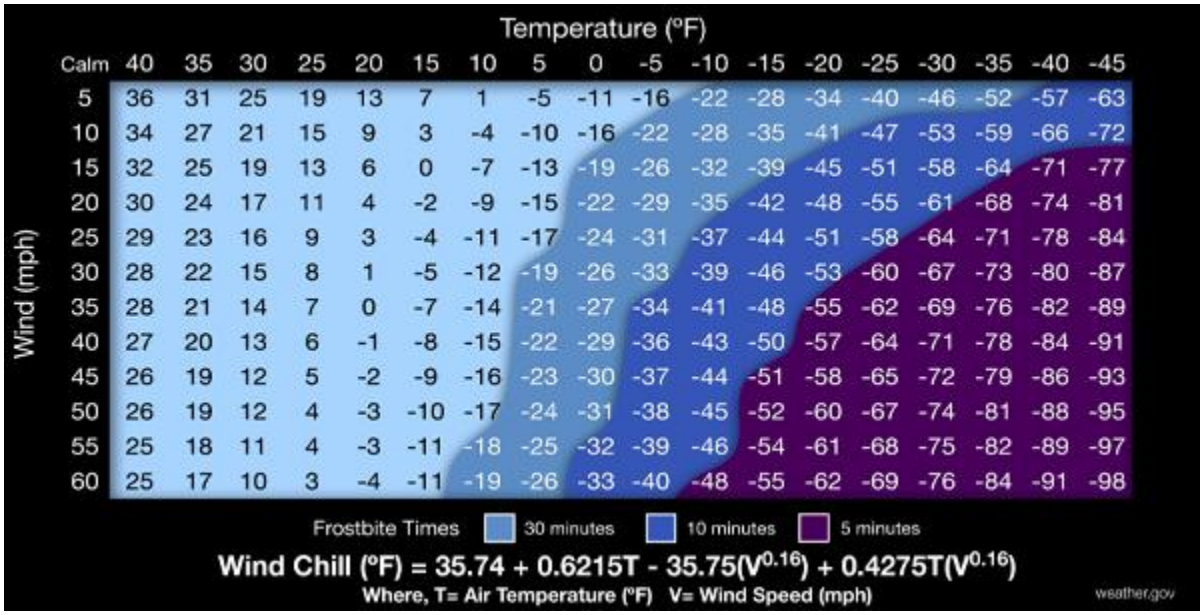
Description

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

Another very serious winter storm to impact Douglas 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 Douglas Electric Cooperative lost approximately 450 polls and suffered damages that resulted in public assistance funding of $346,750. Many roads were shut down for extended periods, and most schools and businesses were forced to close. Some households were without power for up to a week as power lines were being repaired.

A very unusual late-season winter storm struck much of eastern South Dakota in mid-April 2013, resulting in FEMA Disaster Declaration 4115. The storm featured heavy, wet snow and icing that brought down power lines and trees in many areas. Several power outages were reported, and travel was impossible in many areas, resulting in schools and businesses being forced to close. Sleet and snow accumulations reached 8.5 inches near Armour.

Another late-season winter storm struck South Dakota in March 2019, resulting in FEMA Disaster Declaration 4440. The storm resulted in approximately $515,000 of public assistance funds allocated in Douglas County.

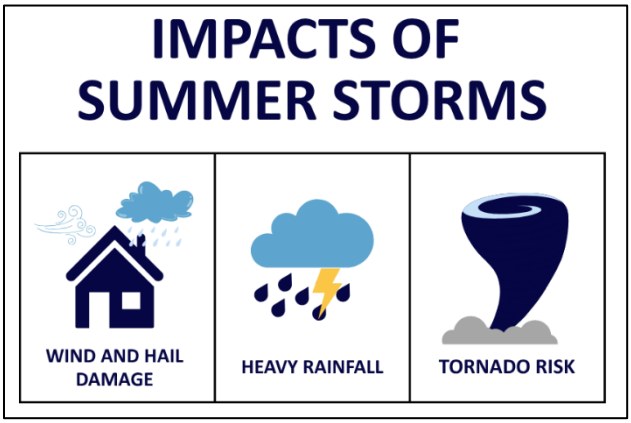
Probability

A total of 82 winter storm events, including blizzards, ice storms, and heavy snow, have been recorded in Douglas County since the mid-1990s, an average of about 2.7 per year (see **Table C.2 in Appendix C**). Therefore, based on the historic evidence, the probability of a significant winter storm affecting Douglas 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

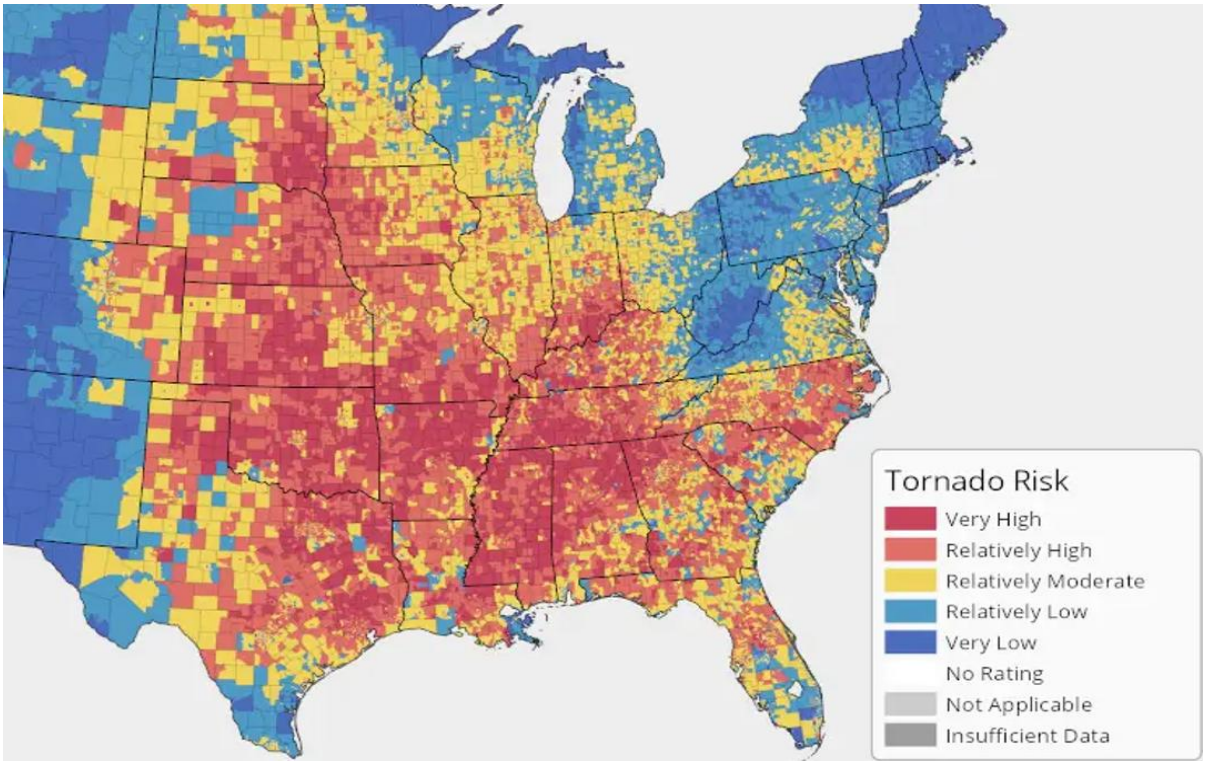
Summer storms can include heavy rainfall, hail, tornadoes, and thunderstorm activity. These events usually are associated with unstable weather conditions. In Douglas County, most damage from summer storms occurs because of high wind events and/or hail. Hail is always closely connected with thunderstorms. 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 Douglas 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 Douglas 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 fifth 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 Douglas County is in the 'Very 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 Douglas 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 22 thunderstorms that produced wind speeds of at least 60 knots, five of which were over 70 knots. **Table C.2** also shows 25 events with hail at least one inch in diameter, including eight events with hail at least two inches in diameter, and four 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 Douglas County. **Table C.2** in **Appendix C** lists many other significant summer storms that have impacted the county.

The most destructive tornado in the history of the county occurred in May 2015 when an EF2 tornado tore through the west side of Delmont, destroying or severely damaging about 50 structures, including the town's new fire hall, which was built in 2014, and the Zion Lutheran Church. The Douglas Electric Cooperative suffered $13,174 of damage from this event.

Probability

A total of 74 summer storm events, including hailstorms, thunderstorms, lightning, and tornadoes, have been recorded in Douglas County since 1960, an average of about 1.1 per year (see **Table C.2 in Appendix C**). Twenty five of these storms involved a tornado. From this information, the probability of a summer storm affecting Douglas 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

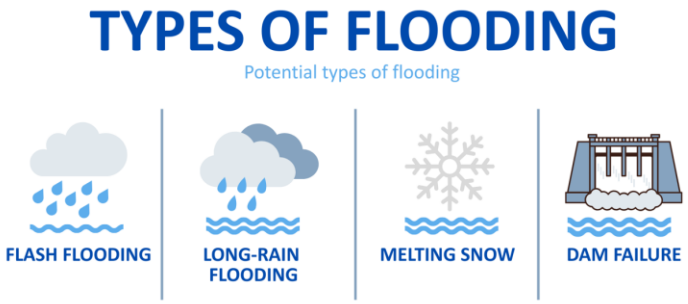
Description

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 seventh most serious hazard facing the county.

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 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 snow and ice melting.
- **Dam failure**, resulting from natural or man-made causes. Douglas County is vulnerable to this type of flood primarily because of the Lake Corsica Dam, which is classified as a high hazard dam (see **Figure 2.1**) [4].



Location

Many areas of Douglas County are vulnerable to minor flooding. The flooding that occurs typically happens during wet springs after winters with heavy snow cover, but flash flooding

[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.

after very heavy rain also causes trouble. Typical damage includes washed out or damaged roads and culverts. Designated flood hazard zones are located in Armour and Delmont.

Extent

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

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 1986 resulted in FEMA Disaster Declaration 764. This event caused over $5 million of damage in the affected counties.

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

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 of the sub grade, 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 residential sewage. The total damage estimate in the affected counties was over $35 million, which included $9.3 million in damage to public infrastructure.

Flooding in 1997 resulted in FEMA Disaster Declaration 1173, which was declared for all counties in South Dakota. At the time, the event was considered one of the top ten natural disasters ranked by FEMA relief costs. From November 1996 through February 1997, the weather across the eastern part of the state was cold and very wet, with record setting snowfall in many places. The persistent cold greatly limited snowmelt between storms, which caused snow to pile up from 10 to 24 inches deep. An early April blizzard added to the snow pack, and then 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. Riverine flooding destroyed or damaged many homes and businesses, impacted water and sewage treatment plants, and damaged or destroyed many roads and bridges. The flood caused over $87 million in damage statewide, and took the lives of two people.

The 2008 flood resulted in FEMA Disaster Declaration 1774. The event caused approximately $65,000 of public assistance costs in Douglas County.

Flooding in 2010 in eastern South Dakota was the worst in a decade, resulting in FEMA Disaster Declaration 1915. The event resulted in $200,000 of public assistance costs in Douglas County.

Flooding in 2019 had a major impact throughout the year in Douglas County, starting in March when heavy rainfall fell on frozen ground, which led to considerable overland flooding of agricultural land and inundation of numerous roads. This event resulted in FEMA Disaster Declaration 4440. Flooding continued during the summer, and became even more severe in September when very heavy rainfall caused the closure of numerous county and township roads, two of which remain closed (see **Figure 3.1**). This event resulted in FEMA Disaster Declaration 4469. The total public assistance cost in the county due to flooding in 2019 was over a half million dollars.

In June 2024, heavy rainfall across Douglas 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. The estimated loss to public infrastructure across the county was approximately $582,000.

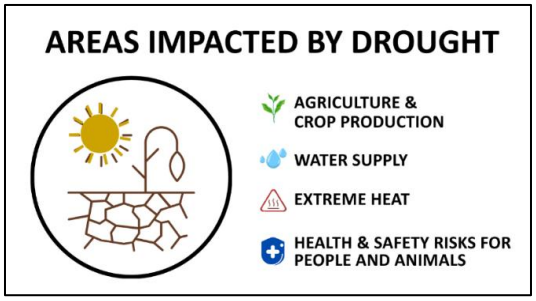
Probability

Table C.2 shows that 17 flooding events have been recorded in Douglas County since the mid-1990s, an average of about one every other year. Based on this analysis, the probability of flooding occurring somewhere in the county in a given year can be considered high. **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

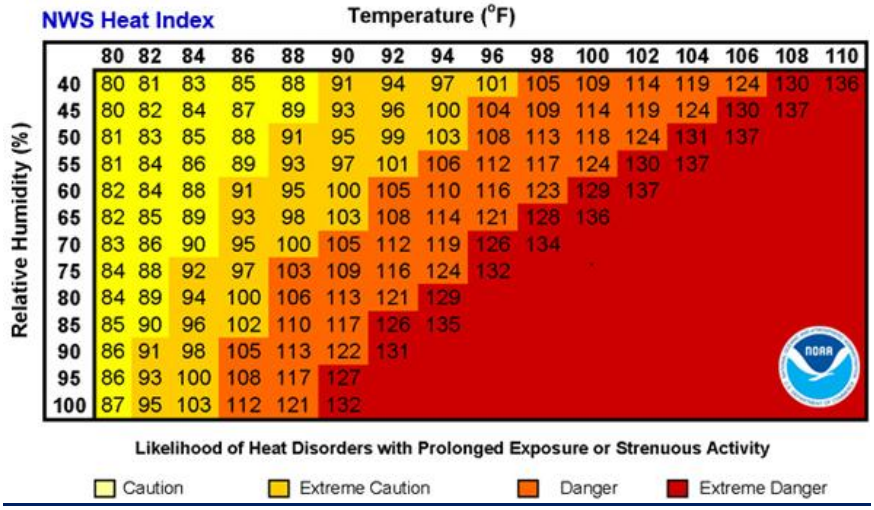
Description

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.

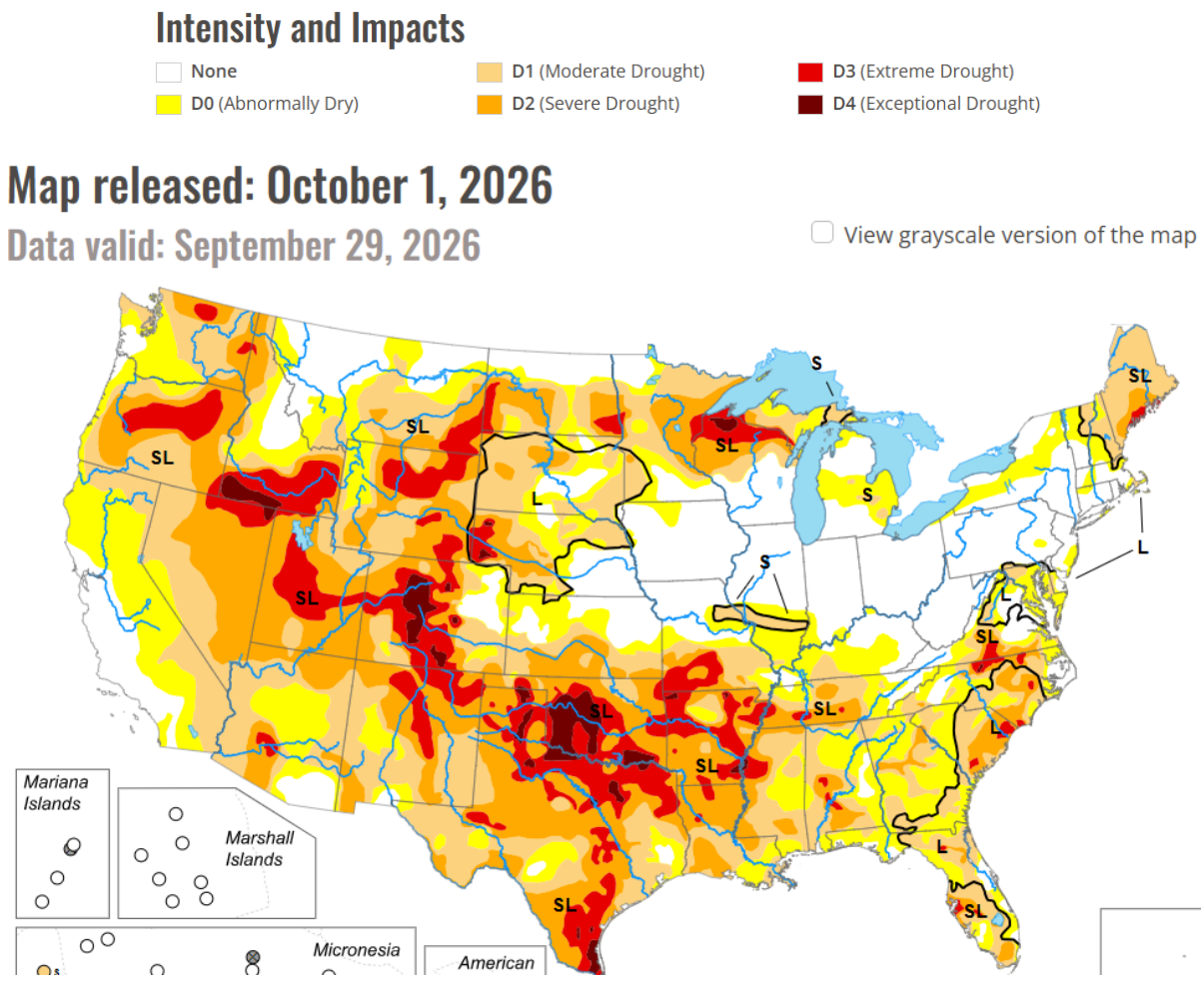
Location

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, Douglas County has experienced many years of below average annual precipitation, including some years in which precipitation was less than two thirds of normal. In terms of duration, it is not unusual for Douglas 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.

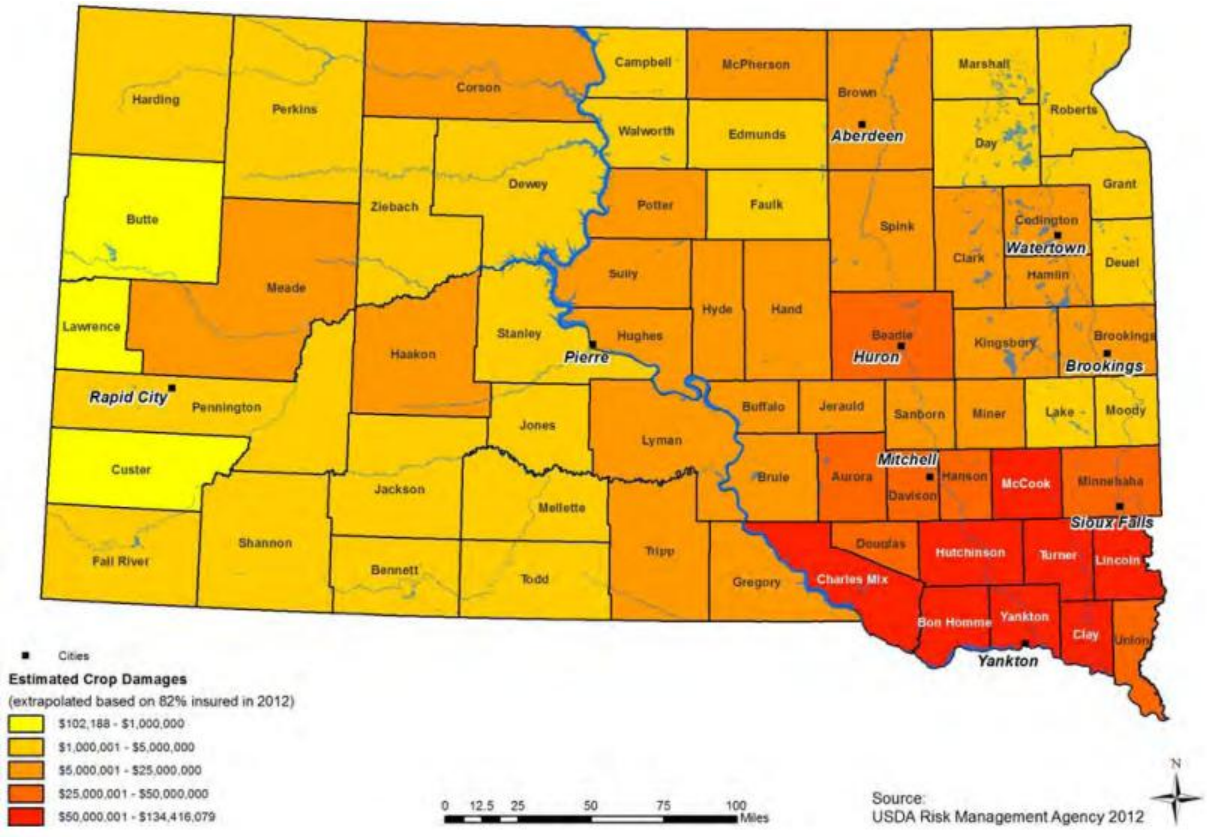
The U.S. Drought Monitor (USDM) has established the drought scale shown below, which is much like those that rate hurricanes and tornadoes. The "D-scale" speaks to the "unusualness" of a drought episode, with D1 conditions expected to occur about 10 to 20 percent of the time and D4 conditions expected less than 2 percent of the time. Following the scale is the drought severity index map of the United States as of October 1, 2026.



History

Douglas 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 Douglas County in nine 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.

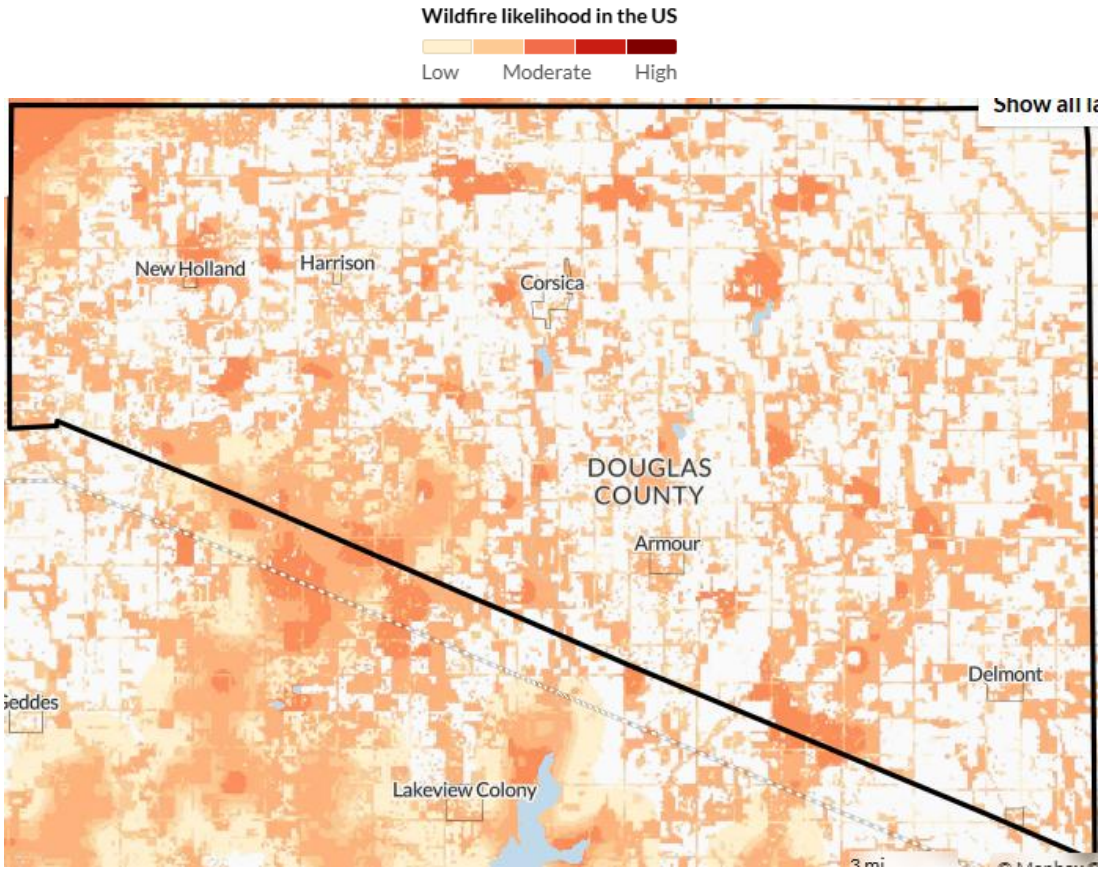
Wildfire

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 Douglas 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 least serious of the eight disaster types they could choose from.

Location

Wildfires in Douglas County are most likely to occur in large areas of extensive brush or unmanaged vegetation, including pastureland and grassland, which together make up approximately 36 percent of the county's land base. 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 Douglas 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 fifty acres.

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

1 to 9 Acres	10 to 49 Acres	50 to 99 Acres	100 to 249 Acres	250 Acres or More	Average Annual Acres Burned
61	66	14	6	0	138.9

Source: South Dakota Department of Public Safety

History

Some notable wildfires have occurred in Douglas County, but nothing on a truly destructive scale. Since 2000, the largest fire was one that burned 200 acres nine miles west of Armour in April 2002.

Probability

Wildfires affecting fewer than ten acres are likely to occur somewhere in Douglas County most years, but large-scale wildfires are much less common. **Table 3.6** shows no wildfires of 250 acres or more in size occurred between 2000 and 2024. Based on this period of analysis, the probability of a significant wildfire occurring each year within Douglas 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 Douglas 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

- Douglas County Courthouse, Armour
- City offices in Armour, Corsica, and Delmont

Emergency preparedness and response

- Douglas County Emergency Management Office, Armour
- Douglas County Sheriff's Office, Armour
- Fire departments in Armour, Corsica, and Delmont

[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.

- Douglas County Highway Department, Armour
- Disaster relief shelters (*see p.54*)
- Emergency storm shelters (*see p.54*)

Medical facilities

- Douglas County Memorial Hospital, Armour

Educational facilities

- Armour Public School (K-12)
- Corsica Public School (6-12)
- Netherlands Reformed Christian School, Corsica (K-12)
- Dakota Christian School (K-12)

Other important assets

- Douglas County 4-H Building, Armour
- Armour Community Center
- Corsica Community Center
- Delmont Community Center
- Douglas Electric Cooperative, Armour

Hazard Impact Analysis

This section assesses the vulnerability of Douglas 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].

[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 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 Douglas 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.

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 82 winter storm events, including blizzards, ice storms, and heavy snow, are shown in the National Climatic Data Center's Storm Events Database for Douglas County through 2024 (see **Table C.2 in Appendix C**). In comparison, the average for South Dakota counties is 104 winter weather events, indicating that Douglas 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 Douglas 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 Douglas 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 $167,250 per year in Douglas County compared to the state average of $322,350 per year.

Building Exposure:

The total value of buildings in Douglas County is approximately $410 million, according to the South Dakota Hazard Mitigation Plan, which ranks 42nd 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 low relative to other South Dakota counties.

Population Density:

Douglas County is sparsely populated, with an average of just 6.5 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. Douglas County would have to be rated low in terms of population density.

Future Vulnerability

No development has occurred anywhere in Douglas 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 Douglas 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, Douglas 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 74 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 Douglas County 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 Douglas 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 Douglas 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 Douglas County between 1950 and 2016 was $51,109. The average annual loss during this period for South Dakota counties was approximately $163,730, indicating that Douglas County may be less vulnerable to suffering tornado damage than other counties in the state.

Douglas 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 Douglas County due to severe summer weather between 2000 and 2023. During this period of analysis, summer storm-related payouts averaged approximately $347,835 per year in Douglas County compared to the state average of $461,120 per year.

Building Exposure:

The total value of buildings in Douglas County is approximately $410 million, according to the South Dakota Hazard Mitigation Plan, which ranks 42nd among the state's 66 counties. The median figure for South Dakota counties is approximately $620 million. The county's building exposure can be considered low relative to other South Dakota counties.

Population Density:

Douglas County is sparsely populated, with an average of just 6.5 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. Douglas 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.

Table 3.7 – Housing Stock Characteristics

Community	Houses Built Before 1940	Houses Built Since 2000	Mobile Homes
Armour	42.8%	11.5%	4.5%
Corsica	22.8%	8.3%	1.4%
Delmont	45.7%	10.6%	2.1%
South Dakota	***14.6%***	***31.5%***	***6.4%***

Source: 2020 US Census (DP04 Selected Housing Characteristics)

Future Vulnerability

No development has occurred anywhere in Douglas 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, Douglas 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, Douglas 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 0.5 percent is below the median statewide figure of 0.75 percent. However, the 5.4 percent of the county's population potentially displaced by flooding is above 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 Douglas County due to flooding and excess moisture between 2000 and 2023. During this period of analysis, flood-related payouts averaged approximately $1,842,100 per year in Douglas County compared to the state average of $2,204,140 per year.

Approximately 63% of the flood-related indemnity payouts to Douglas 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 Douglas County, approximately 120,825 acres of land were not planted, which was almost 88% of land that would have otherwise been planted, the second highest percentage 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.

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
Armour	$5,574,400	4,900	281	121	$2,609,300
Corsica	$8,600	6	2	0	$0
Delmont	$44,800	50	24	10	$117,200

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

Future Vulnerability

No development has occurred in flood prone locations or anywhere else within Douglas 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 Douglas 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.

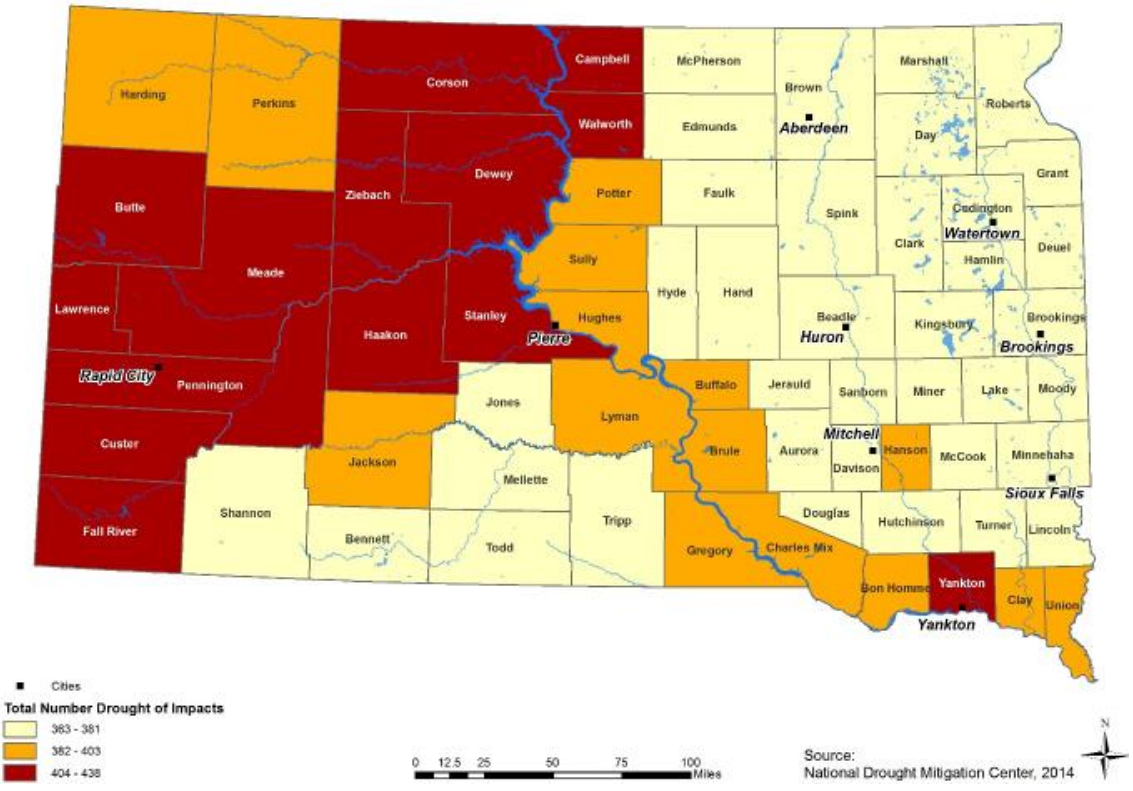
Drought

Without question, Douglas 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.

Fortunately, most farmers in Douglas 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 Douglas County due to drought and heat between 2000 and 2023. During this period of analysis, drought-related payouts averaged approximately $3,341,910 per year in Douglas County compared to the state average of $2,942,115 per year. Approximately 58% of the payouts were due to the 2012 and 2022 droughts.

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. Douglas County's loss ratio of 10.2% was well above the 3.1% average for South Dakota counties, ranking third among all South Dakota counties. The authors of the South Dakota Drought Mitigation Plan assigned Douglas County a rating of "Very High" for this measure of drought vulnerability.

Vulnerability also was assessed by reviewing the South Dakota Drought Mitigation Plan's section on the National Drought Mitigation Center's Drought Impact Reporter. The Drought Impact Reporter analyzes drought impact information from a broad range of areas, including the social, economic, and environmental realms. This figure from the South Dakota Drought Mitigation Plan shows Douglas County is in the lower range in the number of drought impacts.



Future Vulnerability

No development has occurred anywhere within Douglas 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 Douglas 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 Douglas County was analyzed using two different sources. According to the U.S. Forest Service's Wildfire Risk to Communities website, Douglas County's overall risk is considered low, with homes in the county having a greater wildfire risk than 20% of South Dakota counties and 40% of counties nationwide. Information from the SILVIS Lab at the University of Wisconsin shows that only four 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 less than 1% of the total housing stock in Douglas County, whereas the statewide figure is about 26%.

Future Vulnerability

No development has occurred in areas prone to wildfire or anywhere else within Douglas County since the previous plan was approved to affect any of the jurisdictions' vulnerability to wildfire. Looking ahead, vulnerability to wildfire may decrease if the population continues to decline as expected.

One factor that could increase wildfire vulnerability is the continued spread of cedar trees. These trees are spreading quickly in the county 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 Douglas County and 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 34 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**

Douglas County's vulnerability to winter storms can be considered high. The authors of the South Dakota Hazard Mitigation Plan assigned Douglas 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 10 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**

Douglas County's vulnerability to summer storms can be considered moderate to high. The authors of the South Dakota Hazard Mitigation Plan assigned Douglas 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.

- **Flooding**

The overall vulnerability of Douglas County to flooding can be described as 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 is below the state average, while the percentage of displaced people is slightly above the state average. Much of the vulnerability is to cropland and to rural county roads. 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:

Armour: The city is quite vulnerable to flooding, as shown in **Table 3.8**. Many residential properties are located in the flood hazard area, as well as one business along U.S. Highway 281. Flooding in 2019 had a significant impact here, with many properties suffering varying degrees of damage and an estimated 70% of houses experiencing water in the basement. Significant street flooding also occurred.

Corsica: The city is somewhat vulnerable to flooding. Flooding in 2019 had a significant impact in the city, with many properties suffering varying degrees of

damage and an estimated 70% of houses experiencing water in the basement. Two blocks were completely flooded during the September 2019 flooding, and several people had to be rescued by boat.

Delmont: The town is somewhat vulnerable to flooding. Flooding in 2019 had a significant impact in the town, especially in September when all roads into Delmont became impassable, with six inches or more of water flowing over the roads. Several homes experienced water in the basement, and street damage also occurred, especially on the east side of town.

- **Drought**

Douglas County's vulnerability to drought can be considered 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 Very High for Douglas County in terms of drought's impact to crops between 2000 and 2014, which was one of only four such ratings in the state. Residential and commercial impacts of drought are minor. The Randall Community Water District has never had difficulty delivering enough water to county residents and even during the severe drought of 2012 there were no water use restrictions anywhere in the county.

- **Wildfire**

The overall vulnerability to wildfire in Douglas County can be considered low. No truly destructive wildfire has ever occurred in the county, and less than 1% of the county's population lives in a location considered to be vulnerable to wildfire, well below the statewide figure of 26%.

Figure 3.1 – Armour

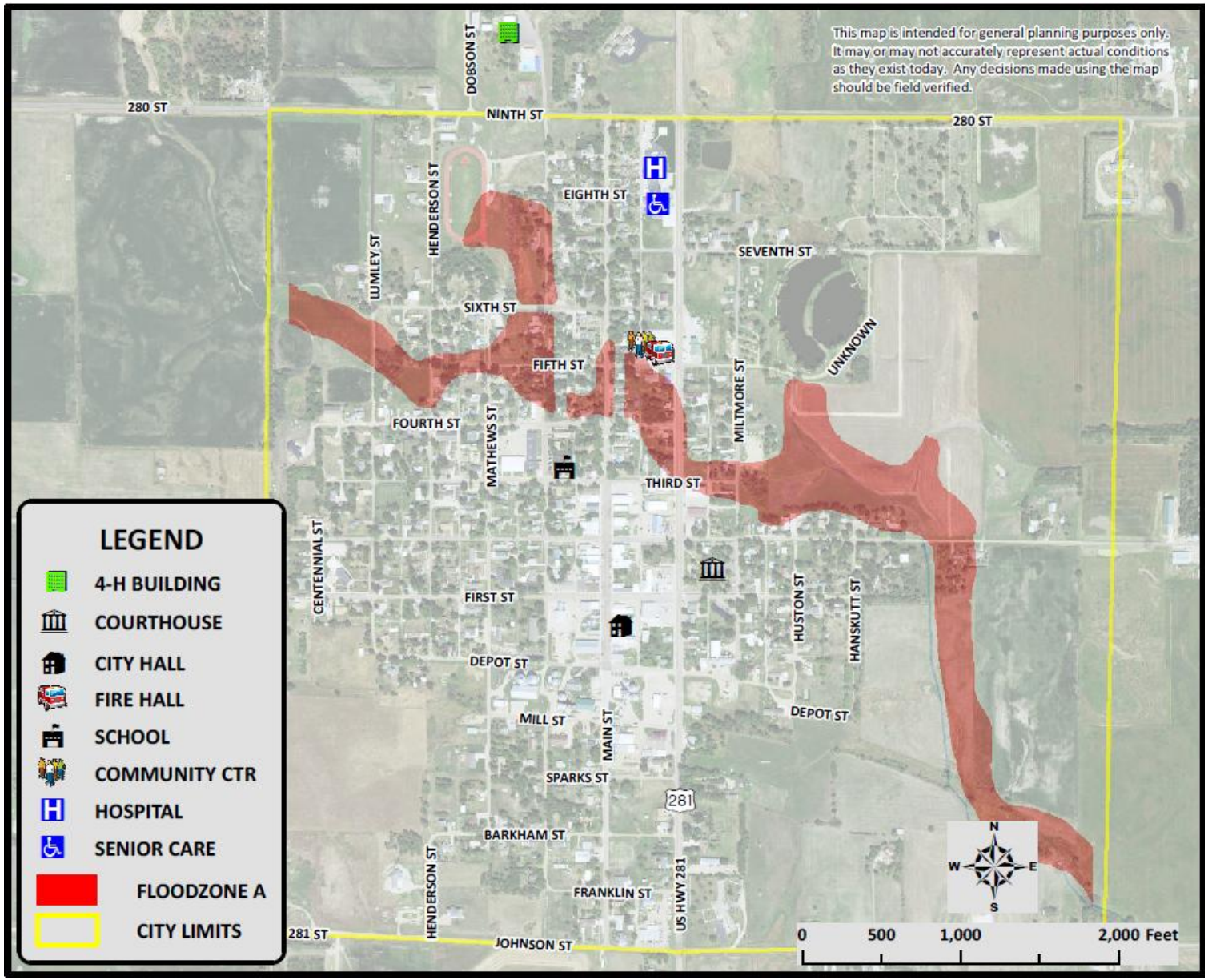


Figure 3.2 – Corsica

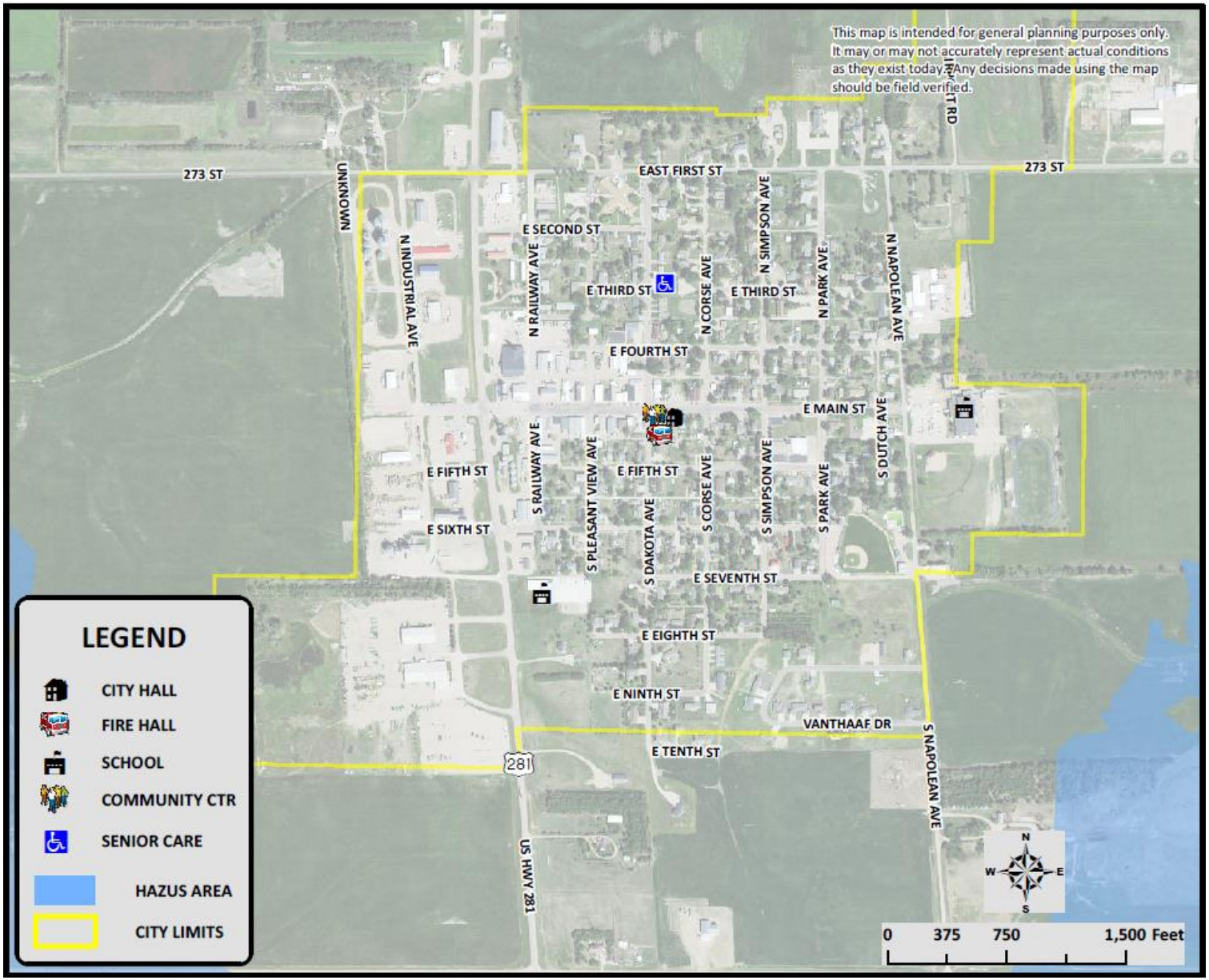
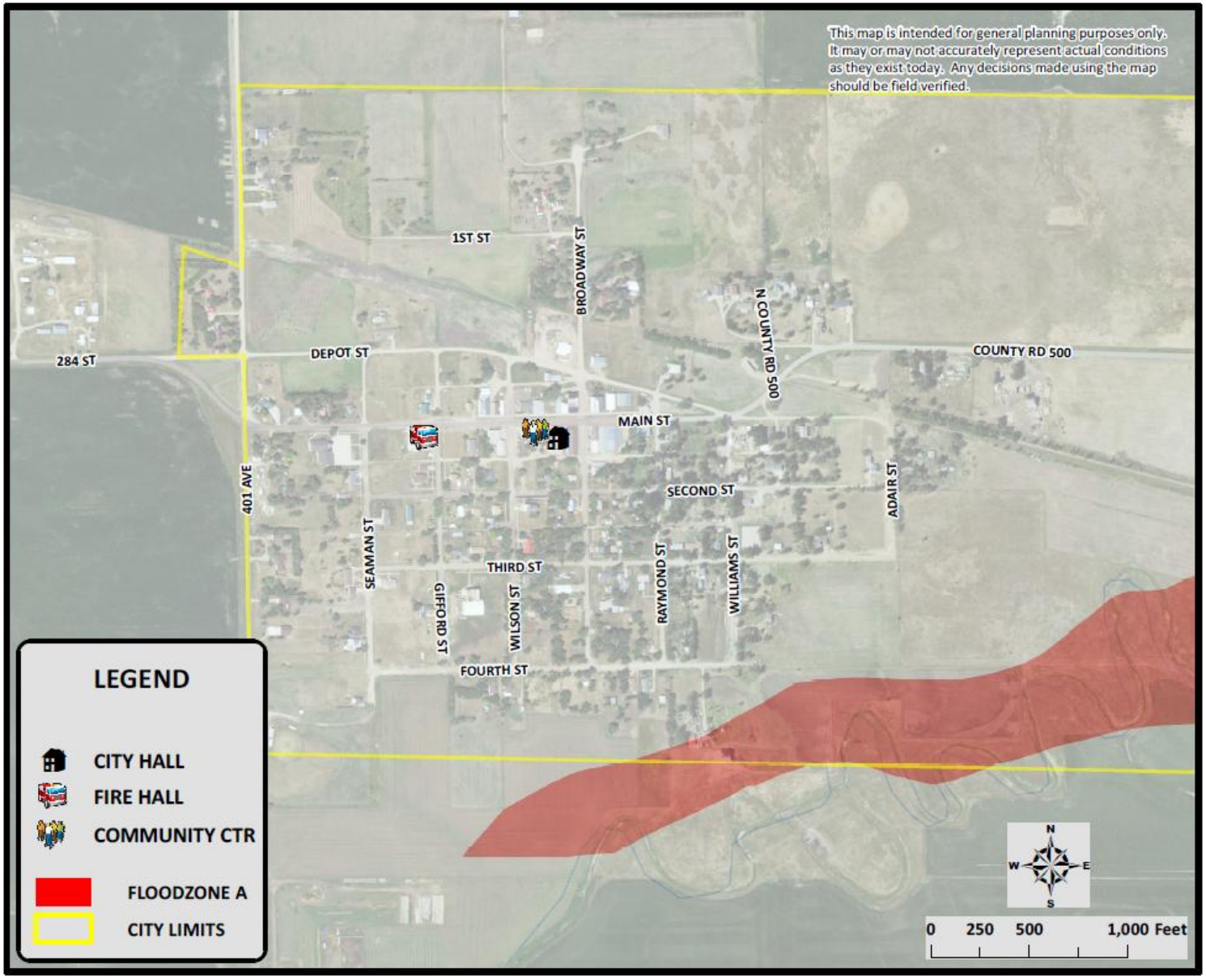


Figure 3.3 – Delmont



2026 Douglas 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 Douglas 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 Douglas 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 Douglas County are limited, although Armour and Corsica have adopted a building code ordinance. Delmont does not enforce building code standards [8]. The following table summarizes the formal regulatory policies within Douglas County that can support the local mitigation strategy.

Table 4.1 – Regulatory Mechanisms

Item	Notes
Douglas County Zoning Ordinance	The ordinance, which is based on the Douglas County Comprehensive Plan, controls where growth and development can occur within the county.
Douglas County Floodplain Ordinance	Regulates development within flood hazard areas (see **Table 4.2**).
Douglas County Drainage Ordinance	Any property owner in Douglas County requesting to complete any type of drainage work must complete an application for a drainage permit before starting the work.
Douglas County Burn Ban Ordinance	This ordinance prohibits open burning during very dry periods. They are issued by the Douglas County Emergency Management Office acting in conjunction with the fire chiefs of Armour, Corsica, and Delmont. The bans are communicated via the county website, social media, and radio.
Armour Floodplain Ordinance	Regulates development within flood hazard areas (see **Table 4.2**).

[8] By South Dakota state law, any local unit of government that has not adopted building codes is required to follow the current edition of the International Building Code, but there is no enforcement in Delmont.

Armour Building Code	The City enforces the current edition of the Uniform Building Code, which regulates how new residential and commercial buildings are built.
Corsica Zoning Ordinance	The ordinance, which is based on the City's comprehensive plan, controls where growth and development can occur in the community.
Corsica Floodplain Ordinance	Regulates development within flood hazard areas (see **Table 4.2**).
Corsica Building Code	The City enforces the current edition of the International Building Code, which regulates how new residential and commercial buildings are built.
Delmont Zoning Ordinance	The ordinance, which is based on the City's comprehensive plan, controls where growth and development can occur in the community.
Delmont Floodplain Ordinance	Regulates development within flood hazard areas (see **Table 4.2**).

Regulatory authority also exists within Douglas 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.

As shown in the following table, all the jurisdictions participate in the National Flood Insurance Program (NFIP). However, training and information on NFIP for some 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 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
Douglas Co	N/A	09/21/20	Emergency Management Director	Requires floodplain development permit, floodproofing certificate, and description of the extent to which any watercourse will be altered.	New construction and substantial improvements must be designed and adequately anchored to prevent flotation, collapse or lateral movement of the structure and must have lowest floor elevated at least one foot above base flood elevation.
Armour	10/01/86	10/01/86	Finance Officer	Requires floodplain development permit, floodproofing certificate, and description of the extent to which any watercourse will be altered.	Residential construction and substantial improvements must have lowest floor elevated to or above base flood elevation
Corsica	N/A	08/05/20	Mayor	Requires floodplain development permit.	All new construction and substantial improvements in flood prone locations must be designed and anchored to prevent flotation, collapse, or lateral movement of the structure and must be constructed by methods and practices that minimize flood damage.

Delmont	08/05/86	08/05/86	Finance Officer	Requires floodplain development permit, floodproofing certificate, and description of the extent to which any watercourse will be altered.	All new construction and substantial improvements in flood prone locations must be designed and anchored to prevent flotation, collapse, or lateral movement of the structure and must be constructed by methods and practices that minimize flood damage.

There are no active National Flood Insurance Program policies in Douglas County, but a claim for $520 was paid for a property in Armour that is no longer insured. No repetitive losses or severe repetitive losses have ever been recorded anywhere in the county.

Other Capabilities

Other resources and capabilities exist within Douglas 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

	Douglas Co.	Armour	Corsica	Delmont
ADMINISTRATIVE & TECHNICAL				
Emergency management	X			
Land use planning			X	X
Public works		X	X	X
Municipal electric system				
Floodplain management	X	X	X	X
Building code enforcement		X	X	
FINANCIAL				
Budgeting process	X	X	X	X
Levy/Project surcharge for specific purposes		X	X	X
EDUCATION AND OUTREACH				
Internet / Social media	X	X		
Emergency alerts to cellphones	X	X	X	
PHYSICAL ASSETS				
Relief shelter		X	X	X
Storm shelter	X	X		X
Warning siren		X	X	X

Administrative and technical staff to support hazard mitigation in the county are limited. For instance, Douglas County has an emergency manager, but the position is only half-time and there are no support staff. Planning and engineering staff in the county are also limited.

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 Douglas 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 Douglas County is limited, but efforts are being made. The Douglas 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 Douglas County and Armour websites.

There are many physical assets in Douglas County that can help protect people prior to, during, or after a disaster event or other emergency situation. Outdoor sirens to warn people of impending severe weather are located in each community. Public facilities that can serve as emergency shelter from a tornado or other severe weather include the basement of the Douglas County courthouse and two small tornado safe rooms in Delmont [9]. Designated facilities that can provide shelter following a disaster are the Armour fire hall, the Corsica community center, and the Delmont community center, each of which has a kitchen, bathrooms, and large areas to place cots. All are wheelchair accessible, and each facility has a backup generator. The Armour high school and Corsica high school are alternate shelters.

The ability of Douglas County and the other jurisdictions to enhance their mitigation capabilities is limited. For instance, none of the jurisdictions have financial resources to hire specialized staff such as engineers to develop hydrology studies or do precise elevation measurements 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 Douglas County, wrote the county's current hazard mitigation plan and helped develop applications to fund hazard mitigation projects within the county.

Mitigation Goals and Objectives

For this plan update, there are no significant changes in Douglas County's hazard mitigation strategy. The community priorities have not changed, and the planning team decided to keep

[9] The tornado safe rooms in Delmont are located in front of the community center and at the city park. Both structures, which were acquired with FEMA hazard mitigation funds, can withstand an EF-4 tornado and can hold about 15 people.

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 development anywhere in the county since the current plan was adopted and no changes in community vulnerability [10]. 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

[10] The lack of development is shown by the fact that a total of only 95 building permits were issued throughout Douglas County between 2010 and 2022, an average of about seven per year.

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.

Table 4.4 – Progress on Implementing Previously Proposed Actions

Mitigation Action	Hazard	Current Status
DOUGLAS COUNTY		
Ensure continued NFIP compliance. County will contact the state NFIP coordinator to inquire about the process of having FEMA analyze flood risk in the county.	Flooding	The Emergency Management Director has maintained contact with the South Dakota floodplain coordinator.
Make drainage improvements along county roads.	Flooding	Some progress has been made, but additional work is needed.
Powerline burial.	Winter storm	Progress continues to be made by the Douglas Electric Cooperative to upgrade its powerline infrastructure. The Coop averages about ten miles per year of strengthening or burying power lines within Douglas County.
Install warning siren at Corsica Lake Campground.	Summer storm	No progress due to lack of funds.
Participate in Storm Ready Community Program.	Summer storm	The Emergency Management Director has looked into the program.
CITY OF ARMOUR		
Ensure continued NFIP compliance. City will contact the state NFIP coordinator regarding the city's flood hazard map.	Flooding	The City has maintained contact with FEMA and the South Dakota Office of Emergency Management regarding the NFIP and flooding issues.
Upgrade storm sewer infrastructure.	Flooding	Some improvements have been made, but additional work is needed.
Construct tornado safe room.	Summer storm	No progress due to lack of funds.
Acquire sandbagging machine.	Flooding	No progress due to lack of funds.
Install additional warning siren.	Summer storm	No progress due to lack of funds.
Acquire a power takeoff (PTO) pump to help move floodwater.	Flooding	No progress due to lack of funds.
Loop waterlines on southeast side of town to improve water flow for fire control.	Fire	Some work has been done, but additional looping would help further increase water pressure.
CITY OF CORSICA		
Ensure continued NFIP compliance. City will contact the state NFIP coordinator to inquire about the process of having FEMA analyze flood risk in the city.	Flooding	The City has maintained contact with FEMA and the South Dakota Office of Emergency Management regarding the NFIP and flooding issues.
Upgrade storm sewer infrastructure.	Flooding	Upgrades have been made on the north side of the community.
Acquire additional warning sirens.	Summer storm	No progress due to lack of funds.

Mitigation Action	Hazard	Current Status
Generator acquisition for critical facilities.	Winter storm	A generator has been acquired for the community center, but additional generators are needed for the city's wastewater system.
Adopt and enforce building code standards.	Summer storm	This has been accomplished.
TOWN OF DELMONT		
Ensure continued NFIP compliance. Town will contact the state NFIP coordinator regarding the town's flood hazard map.	Flooding	No progress due to staff turnover in the city office.
Stormwater improvements on the north side of town.	Flooding	The County has made improvements to the county road entering Delmont from the west.
Acquire additional warning siren.	Summer storms	No progress due to lack of funds.
Bury overhead power lines.	Winter storms	No progress due to lack of funds.

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 Douglas 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)
- Building Resilient Infrastructure and Communities Program (BRIC)
- Flood Mitigation Assistance Program (FMA)
- High Hazard Potential Dam Grant Program (HHPD)

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

Table 4.5 - Proposed Mitigation Actions

DOUGLAS COUNTY ACTIONS	HAZARD	PRIORITY	PROJECT LEAD	TIME	ESTIMATED COST	FUNDING	NOTES
Continue participation in the National Flood Insurance Program.	Flooding	High	Emergency Mgmt Director	Ongoing	Minimal	Staff time	The Emergency Management Director will contact the South Dakota floodplain coordinator to learn more about the NFIP program and participate in training events.
Continue to pursue flood mitigation and drainage work along county and township roads.	Flooding	High	Hwy superintendent	Ongoing	≈ $1 million to $3 million	Highway fund; FEMA; SDDOT	The County will continue to implement projects along county and township roads prone to flooding and may apply for grant funding for projects that pass a benefit-cost analysis.
Bury overhead powerlines.	Winter storm; Summer storm	High	Douglas Electric Coop; Emergency Mgmt Director	Ongoing	≈ $5 million to $10 million	FEMA	The Coop plans to continue burying lines in the county and may work with Douglas County to apply for mitigation funds as they are available. The Coop would be the lead in the development of any application for mitigation funds.
Acquire generator for the 4-H Building.	Winter storm; Summer storm	High	County commission	Mid	$100,000	General fund; FEMA	Reliable power is needed at the 4-H Building because the facility is a backup relief shelter. The County may pursue grant funding.
Install warning siren at Corsica Lake campground.	Summer Storm	Medium	County commission	Mid	$30,000	General fund; FEMA	The County may pursue grant funding to install a warning siren at the campground.
Participate in the Storm Ready Program.	Summer storm	Medium	Emergency Mgmt Director	Short	Minimal	Staff time	The Emergency Management Director will continue looking 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 outreach methods and target audiences, 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 continue working with the county extension office on outreach to local farmers.

ARMOUR ACTIONS	HAZARD	PRIORITY	PROJECT LEAD	TIME	ESTIMATED 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 training events.
Implement drainage improvements in the city.	Flooding	High	Public Works Director	Long	≈$900,000	General fund; DANR; FEMA	Various projects are proposed, including replacing undersized or deficient culverts, clearing and reshaping the drainage channel that runs through the city, and obtaining a perpetual easement on a property on the northwest edge of Armour for the purpose of changing the ground cover and thereby reducing runoff into the city. Stormwater projects are also proposed for Dobson Street from Sparks to Barkham and for Depot Street from Dobson to Braddock. The City intends to apply for grant funding for one or more of these projects.
Acquire generators for sewage system.	Winter storm; Summer storm	High	Public Works Director	Mid	$50,000 (each)	General fund; FEMA	Backup power is needed for the sewage lift stations, which are a critical component of the sewage system. If power is unavailable, raw sewage will begin backing up into homes. The City intends to pursue grant funding.
Participate in the Storm Ready Program.	Summer storm	Medium	City council	Short	Minimal	Staff time	The City would work with the County to implement the program.
Construct a tornado shelter or retrofit an existing structure	Summer Storm	Medium	City council	Mid	≈$250,000 to $750,000	General fund; FEMA	The City may pursue grant funding to build a tornado safe room at a location to be determined or to retrofit an existing structure.
Acquire additional warning siren.	Summer Storm	Medium	City council	Mid	$30,000	General fund; FEMA	The City may pursue grant funding.
Loop waterlines to improve water flow.	Wildfire	High	Public Works Director	Long	$375,000	General fund; DANR	There are some dead ends in the system, which results in low water pressure, which in turn reduces the ability to fight fires. The proposed East Water Loop from Johnson to First Street is a high priority. The City may apply for grant funding.
Participate in the Firewise Program.	Wildfire	Medium	Fire chief	Short	Minimal	Staff time	The City would work with the County to implement the program.

Conduct outreach to educate people about water conservation.	Drought	Medium	City council	Short	Minimal	Staff time	The City will work with the County on outreach to the public, including school groups. Other methods might also be used, such as including information with utility bills.
Enact restrictions on water usage.	Drought	Medium	City council	Short	Minimal	Staff time	Under the direction of the Randall Community Water District, the City will take steps to reduce local residential and commercial water usage as needed.
CORSICA ACTIONS	**HAZARD**	**PRIORITY**	**PROJECT LEAD**	**TIME**	**ESTIMATED COST**	**FUNDING**	**NOTES**
Continue participation in the National Flood Insurance Program	Flooding	High	Mayor	Ongoing	Minimal	Staff time	The mayor will contact the South Dakota floodplain coordinator to learn more about the NFIP program and participate in training events.
Implement drainage improvements in the city.	Flooding	High	Public Works Director	Long	≈$750,000	General fund; DANR; FEMA	Upgrades are needed to build on the work that has been done in the northern part of Corsica. The City may apply for grant funding.
Acquire generators for sewage system.	Winter storm; Summer storm	High	Public Works Director	Mid	$50,000 (each)	General fund; FEMA	The City has three sewage lift stations, each of which is critical to the proper functioning of the sewage system. If power is unavailable for an extended period, raw sewage can begin backing up into homes in some parts of the community. The City intends to pursue grant funding.
Acquire additional warning siren.	Summer Storm	High	City council	Mid	≈ $30,000	General fund; FEMA	A siren would be helpful on the south side of the community. The City may pursue grant funding.
Construct a tornado shelter or retrofit an existing structure	Summer Storm	Medium	City council	Mid	≈$300,000	General fund; FEMA	The City may pursue grant funding to build a tornado safe room at a location to be determined or to retrofit an existing structure.
Participate in the Storm Ready Program.	Summer storm	Medium	City council	Short	Minimal	Staff time	The City would work with the County to implement the program.
Participate in the Firewise Program.	Wildfire	Medium	Fire chief	Short	Minimal	Staff time	The City would work with the County to implement the program.
Conduct outreach to educate people about water conservation.	Drought	Medium	City council	Short	Minimal	Staff time	The City will work with the County on outreach to the public, including school groups. Other methods might also be used, such as including information with utility bills.

Enact restrictions on water usage.	Drought	Medium	City council	Short	Minimal	Staff time	Under the direction of the Randall Community Water District, the City will take steps to reduce local residential and commercial water usage as needed.
DELMONT ACTIONS	**HAZARD**	**PRIORITY**	**PROJECT LEAD**	**TIME**	**ESTIMATED 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 training events.
Implement drainage improvements in the city.	Flooding	Medium	Public Works Director	Long	≈$500,000	General fund; DANR; SCWDD	Additional upgrades would help build on the work the County has done in northwest Delmont. The Town may apply for grant funding.
Acquire generator for water tower.	Winter storm; Summer storm	Medium	Town board	Mid	$75,000	General fund; FEMA	Power should always be available to the tower, otherwise an extended power outage would cause water in the pipe stand to freeze, leaving the town without drinking water or enough water for fire suppression. The Town may apply for grant funding.
Participate in the Storm Ready Program.	Summer storm	Medium	Town board	Short	Minimal	Staff time	The Town would work with the County to implement the program.
Acquire additional warning siren.	Summer Storm	Medium	Town board	Mid	$30,000	General fund; FEMA	The Town may pursue grant funding.
Participate in the Firewise Program.	Wildfire	Medium	Fire chief	Short	Minimal	Staff time	The Town would work with the County to implement the program.
Conduct outreach to educate people about water conservation.	Drought	Medium	Town board	Short	Minimal	Staff time	The Town will work with the County on outreach to the public, including school groups. Other methods might also be used, such as including information with utility bills.
Enact restrictions on water usage.	Drought	Medium	Town board	Short	Minimal	Staff time	Under the direction of the Randall Community Water District, the City will take steps to reduce local residential and commercial water usage as needed.

Potential Resources for Funding Assistance:

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

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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 Douglas 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 Douglas County, Armour, and Corsica websites, and a copy is also available for review at the Douglas County courthouse and in the finance office of each participating jurisdiction. Going forward, Douglas 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 Douglas 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 Douglas 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 Douglas County Emergency Management Director is ultimately responsible for implementing this plan. The director will work under the direction of the Douglas County Commission and with the support of the Douglas 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 Douglas 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 available to assess the risk for any of the hazards?
- 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, Douglas

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 Douglas 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.

- Douglas County Comprehensive Plan and Zoning Ordinance – the Planning & Development District III office developed the comprehensive plan and zoning ordinance working with the Douglas 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.
- Douglas County Highway Plan – the highway plan is developed by the Douglas 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 eligible for FEMA funding, such as those that involve drainage improvements to mitigate flooding.

- Armour Stormwater Collection Evaluation Plan – this plan, which analyzes Armour's existing stormwater system and outlines the improvements city leaders would like to accomplish, is being used as the basis for a reanalysis of the city's stormwater system needs. The City and its engineering consultant will integrate relevant information acquired through the development of this plan into the planning process for the analysis, which is currently underway.
- Corsica 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.
- Delmont Comprehensive Plan and Zoning Ordinance – the Planning & Development District III office developed the comprehensive plan and zoning ordinance working with the town planning board. The Town 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 most recent update of the Comprehensive Economic Development Strategy (CEDS) for the Planning & Development District III region, which includes Douglas County. In particular, the risk analysis and mitigation strategy of the plan were utilized as the CEDS was updated in 2024.

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 Douglas 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 online, and surveys that were made available to the public.

Press Release in Douglas County Publishing Prior to First Meeting:



las County Publishing

Hazard Mitigation Meeting

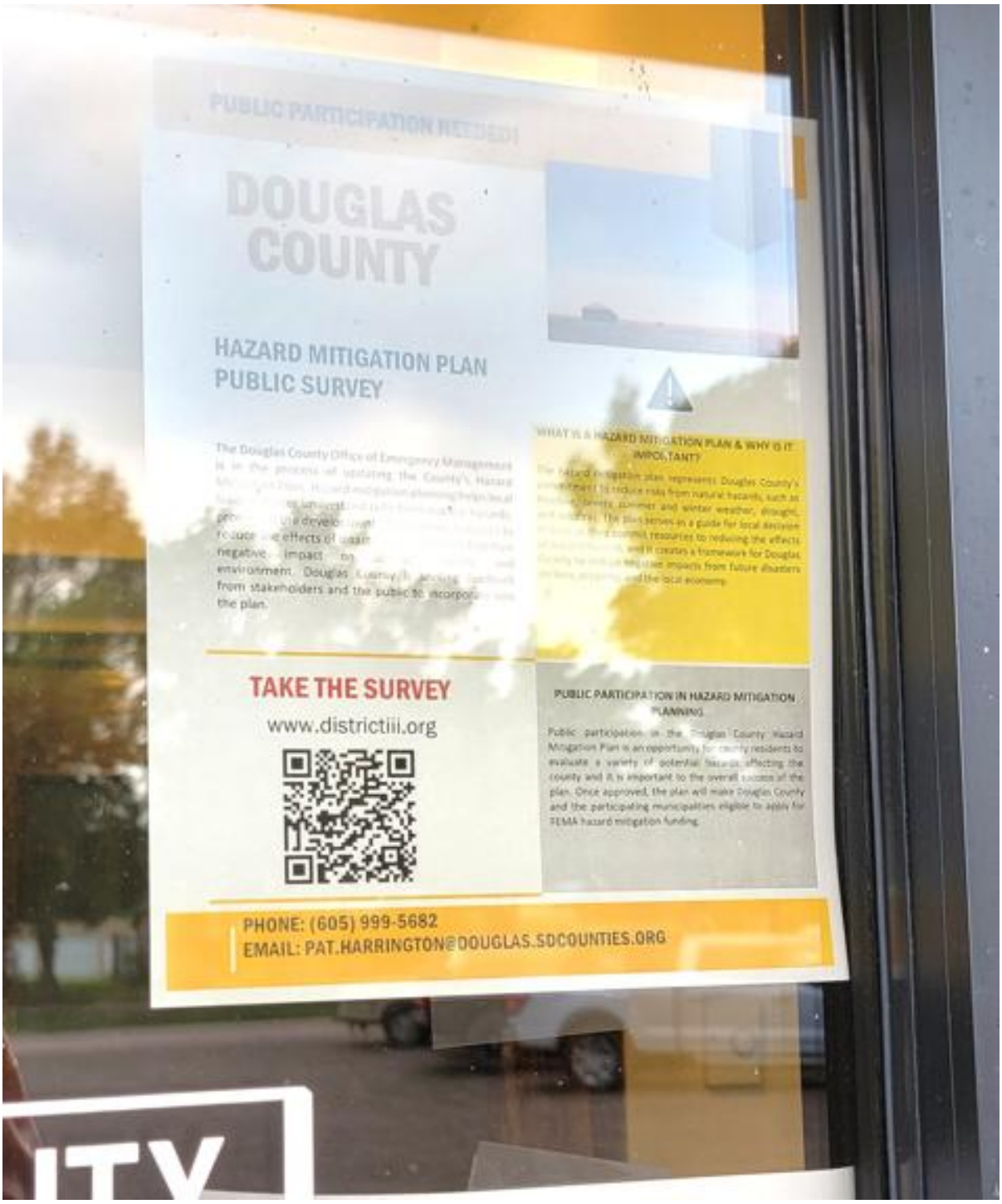
Blizzards, tornadoes, and floods are a few of the natural hazards that strike this part of the country. Events like this have the potential of causing thousands of dollars annually in damage to property. To lessen the impact of these disasters in the future, Douglas County is beginning the process of 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 Douglas County Courthouse on August 4, 2026 at 10:00 AM. 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 Douglas County Emergency Management Office, by going to www.districtiii.org, or by scanning this QR code:

For more information, please contact the Douglas County Emergency Management Office at pat.harrington@douglas.sdcounties.org or by calling 605 999-5682. You can also contact John Clem at 800 952-3562 or by email at John.Clem@districtiii.org.

Survey Posted at Courthouse Entrance:



Press Release in Douglas County Publishing Prior to Final Meeting:

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opportunity to talk about their accomplishments. His greatest joy was following their lives, cheering them on, and celebrating their successes.

Jim was a devoted Catholic whose faith guided his life. He was a faithful member of St. Paul the Apostle Catholic Church in Armour, a member of the Knights of Columbus, and served as a Eucharistic Minister. His faith was reflected not only in his words but in his daily actions of kindness, service, and generosity.

Jim was also a proud recovering alcoholic who celebrated more than 40 years of sobriety. As one of the longest-standing members of the Armour chapter of Alcoholics Anonymous, he sponsored and mentored countless individuals on their own journeys to recovery. His willingness to share his experience, strength, and hope changed many lives and remains one of his most meaningful legacies.

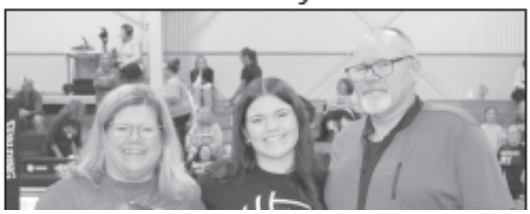
A lifelong sports fan, Jim was a devoted supporter and shareholder of the Green Bay Packers and made

Douglas County Hazard Mitigation Plan

The final meeting to update the Douglas County Hazard Mitigation Plan will take place on Tuesday October 6 at 10:00 AM at the Douglas County Courthouse. The focus of the meeting will be to review the first draft of the hazard mitigation plan, which is available for public review at the Douglas County Emergency Management Office. The plan can also be accessed on the Douglas County website and at www.districtiii.org.

The public is invited to attend the meeting or to provide comments and suggestions regarding the plan, which can be sent to the Douglas County Emergency Management Office at pat.harrington@douglas.sdcounties.org or by calling 605 999-5682. All comments received will be included in the final copy of the plan that will be submitted for approval to the State and FEMA.

TDA volleyball senior night held



Left: Senior Statistician Belle Hotchkiss and her parents Becky Fechner and Rob Hotchkiss.

Survey Poster

PUBLIC PARTICIPATION NEEDED!

DOUGLAS COUNTY



HAZARD MITIGATION PLAN PUBLIC SURVEY

The Douglas 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. Douglas 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 Douglas 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 Douglas 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 Douglas 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 Douglas County and the participating municipalities eligible to apply for FEMA hazard mitigation funding.

PHONE: (605) 999-5682
EMAIL: PAT.HARRINGTON@DOUGLAS.SDCOUNTIES.ORG

Survey Form with Responses

DOUGLAS COUNTY HAZARD MITIGATION SURVEY (*WITH RESPONSES IN RED TYPE*)

The Douglas 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. Douglas 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? **Douglas County (All)**

2. What town do you live in? **Armour: 6; Corsica: 5; Delmont: 7; Rural: 2**

3. How long have you lived in South Dakota?

   Less than 1 year: **0**
   1-5 years: **1**
   6-10 years: **2**
   More than 10 years: **17**

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

Yes: 13 **No: 7**

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: 8** **No: 12**

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	13	5	2	0	0		31
Extreme Heat	10	9	1	0	0		29
Flood	4	6	8	1	1		11
Hail	6	6	6	1	1		15
Tornado	7	7	4	2	0		19
Wildfire	3	6	5	5	1		5
Winsdstorm	9	7	3	0	1		23
Winter storm/Blizzard	8	9	2	1	0		24

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) **11**
Economic (Business closures and/or job losses) **13**
Infrastructure (Damage or loss of bridges, utilities, schools, etc.) **14**
Environmental (Damage or loss of forests, rangeland, waterways, etc.) **6**
Government (Ability to maintain order and/or provide public amenities and services) **7**

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	5	6	7	2	0		14
I support policies to prohibit development in areas subject to natural hazards	3	10	7	0	0		16
I support enhancing the function of natural systems (e.g., streams, wetlands)	6	10	3	1	0		21
I support the use of tax dollars to compensate landowners for not developing in areas subject to natural hazards	2	5	10	2	1		5
I support the use of tax dollars to reduce risks and losses from natural disasters	2	11	7	0	0		15
I support the disclosure of natural hazard risks during real estate transactions	4	9	7	0	0		17

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	14	5	1	0	0		33
Protecting critical facilities (e.g., transportation networks, hospitals, fire stations)	17	2	1	0	0		36
Protecting utilities and infrastructure	15	3	2	0	0		33
Protecting historic and cultural landmarks	4	8	6	0	2		12
Strengthening emergency services (fire, police, etc.)	15	4	1	0	0		34

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:

Douglas County Hazard Mitigation Planning Meeting

August 4, 2026

NAME	REPRESENTING
Shannon Viereck	Planning & Dev DIII
Pat Harrington	Douglas County EM
Jim Werkmeister	Douglas County Commission
Dan Koedam	Douglas County Commission
Darwin DeLange	City of Corsica - maintenance
Daron Feenstra	City of Corsica - maintenance
Travis Soares	City of Armour mayor
Lori Sparks	District 3, Commission Chair
Marlin Maas	District 1, Commissioner
Kevin Czymbor	St. Peter Lutheran, Armour Pastor
Melissa Bowers	DC Auditor
Callie Nichols	Douglas County Highways
Brad Ellwanger	Douglas County Highway
Barb Dozark	City of Delmont - Finance Office
Red Sparks	Self
John Clem	Planning District III

SIGNUP SHEET – SECOND PLANNING TEAM MEETING:

Douglas County Hazard Mitigation Planning Meeting

August 18, 2026

NAME	REPRESENTING
John Clem	Planning District III
Rocci Sparks	D.C. Commission
Callie Nichols	Highway Dept.
Red Sparks	
CRAIG LAIB	
Daren Feenstra	City of Corsica
Ryan Murtha	McLaury Engineering
Darwin Delapaz	City of Corsica
Pat Hamm	Douglas County EM
Craig Parkhurst	
Pastor Kevin Caymber	
Marlin Maas	Commissioner
Jerod [illegible]	Commissioner
Dan Koedam	Commissioner
Jim Werkmeister	Commissioner
Kari Bertram	City of Armour
Barb Dozark	City of Delmont
Lashell Menning	Corsica Ambulance
Nicole Neugebauer	DC Armour Ambulance

SIGNUP SHEET – FINAL PLANNING TEAM MEETING:

Douglas County Hazard Mitigation Planning Meeting

October 6, 2026

NAME	REPRESENTING
John Clem	Planning/ District III
Pat Harrington	Douglas County
Melissa Borell	Auditor
Callie Nichols	Douglas County Highway
Barb Dozark	Detmert
Darwin DeLange	Corsica
David Majerus	Armour
Jerod Star	Corsica
Dan Koedam	Corsica
Aki Sparks.	District 3 Douglas Co
Jay Spaans	Douglas Electric Cooperative
Jim Werkmeister	Distr 4 Douglas Co
Marlin Mass	Dist 1 Douglas Co.
Tim Goldammer	Self

DOUGLAS COUNTY MINUTES

Douglas County Commissioner Meeting Minutes
September 1, 2026

PURSUANT TO ADJOURNMENT The Board of County Commissioners met at the Douglas County Courthouse in Armour SD at 9:00 a.m. on September 1, 2026. Members present were Jerod Star, Dan Koedam, Lori Sparks and Jim Werkmeister. Auditor Melissa Bowers was also present. The Pledge of Allegiance was recited. A motion was made by Star and seconded by Koedam to adopt the agenda. All members voted in favor of this action; motion carried.

PUBLIC COMMENT
There were four county residents present to express concerns regarding the Sheriff's office. No action was taken.
Chairperson Sparks requested Vice-Chairman Werkmeister take control of the meeting at 9:15 a.m.

2027 PROVISIONAL BUDGET
As advertised, the Commissioners reviewed the 2027 Provisional Budget. No one from the public was present to contest. A motion was made by Sparks and seconded by Koedam to approve the 2027 Provisional Budget as published. All present voted in favor of this action; motion carried. Any necessary changes will be made before adoption of the Annual Budget at the September 22nd meeting.

HIGHWAY DEPARTMENT
Brad Ellwanger, Highway Superintendent, and Callie Nichols, Assistant Highway Superintendent, met with the board to update them on their department.
A Motion was made by Star and seconded by Koedam to publish the Invitation to Bid for the Construction of Douglas County CMP Installation on 271st and 402nd Ave. (3 sites) all members voted in favor of this action; motion carried. The bid opening will be at 10:00 a.m. on the September 22nd Commissioner meeting.
A motion was made by Sparks and seconded by Koedam authorizing Ellwanger to attend the SD LTAP Conference October 19th-21st. All present voted in favor of this action; motion carried.
A Motion was made by Star and seconded by Koedam to approve the Highway 5-year plan to be published. All present voted in favor of this action; motion carried.

EMERGENCY MANAGEMENT
Pat Harrington, Emergency Manager, met with board to discuss the Hazard Mitigation Project Selections.

E911
Pat Harrington, Emergency Manager, met with the Board to discuss the need for a backup system for first responders in Douglas County and presented a quote from Iamresponding for an estimated cost of $2455.00 per year, based on call volume. A Motion was made by Koedam seconded by Sparks to purchase a one-year subscription for Iamresponding. All present voted in favor of this action; motion carried.

Commissioner Maas joined the meeting at 10:00 a.m.

EJS GRANT

Phillip Lane, Deputy Sheriff met with board to provide an update on a grant he is currently applying for to purchase and install safety equipment for the courthouse. Lane also discussed the need of fire extinguishers and smoke alarms on each floor of the courthouse. Discussion was held and no action was taken.

GAME FISH AND PARKS

Nick Donnelly, Game Fish and Parks Wildlife Specialist, met with the board to update them on the trapping he has been doing in Douglas County. Discussion was held with no action taken.

AUDITOR

Melissa Bowers, Auditor, had a request by a County Resident to look at Senate Bill 96. Discussion was held with no action taken at this time.

Twin Rivers Old Iron Association requested permission to block off two blocks of Main Street in Delmont during their celebration on September 12th. A motion was made by Sparks and seconded by Star authorizing Twin Rivers Old Iron Association to close two blocks of Delmont's Main St. Voting 'aye': Star, Werkmeister, Maas and Sparks. Voting 'nay': Koedam. Motion carried.

FEES REPORT

Register of Deeds Fees (July 2026): $11431.00

Clerk of Courts Fees (July 2026): $6554.08

CLAIMS

The following claims were approved for payment: (DELETED)

ADJOURNMENT

A motion was made by Star and seconded by Koedam to adjourn the meeting at 11:33 a.m. until the next regular meeting scheduled on Tuesday September 22, 2026, at 9:00 a.m. All present voted in favor of this action; motion carried.

SIGNED: _____

Jim Werkmeister, Vice-Chair

Board of County Commissioners

ATTEST: _____

Melissa Bowers, Auditor

ARMOUR MINUTES

September 9, 2026
Armour City Council Proceedings

A meeting of the Armour City Council was held at City Hall, Armour, South Dakota, on Wednesday, September 9, 2026, with the following members present: Mayor Travis Sparks. Council Members: Rodney Dally, Nate Rus, Nathan Nuss, Josh Spaans, and Tara Ziebart. Absent: Terry Weerheim. Also present: Kari Bertram, finance officer; Dave Majerus, city superintendent; Philip Lane, deputy sheriff; Chad Lau, reporter; Chris Urquieta, Brittany Leibel, Craig Holbeck, Otto Fousek, and Burnell Glanzer.

Mayor Sparks called the meeting to order at 6:00 p.m. The Pledge of Allegiance was recited.

Rus declared a conflict of interest with the approval of building permits.

Rus moved and Spaans seconded the motion to approve the agenda with the addition of a building permit for Nate Rus. All voted aye. Motion carried.

A motion was made by Nuss and seconded by Dally to approve the minutes from the August 11, 2026, city council meeting. All voted aye. Motion carried.

MONTHLY REPORTS

Law Enforcement: The council reviewed law enforcement reports. Deputy Lane was present to answer questions.

City Attorney: The council reviewed information from Mike Fink pertaining to public records requests.

City Maintenance: Majerus gave an update on the status of lead water lines in Armour. The pool has been winterized. Majerus will be attending a cybersecurity class in Wagner on September 30 at no cost to the city.

Library: Ziebart moved and Dally seconded the motion to approve the library minutes and finance report for August 2026. All voted aye. Motion carried.

Code Enforcement: The council reviewed the code enforcement report. Discussion was held on trees along Highway 281 that are obstructing the view and need to be trimmed.

Finance: A motion was made by Rus and seconded by Dally to approve the August 2026 financial report. All voted aye. Motion carried.

Receipts/Revenue: General Fund $44,027.42, Water Fund $31,813.29, Sewer Fund $14,833.71. **Total Revenue:** $90,674.42. **Disbursements:** General Fund $47,928.27, Water Fund $25,074.71, Sewer Fund $8,770.34. **Total Disbursements:** $81,773.32.

Recreation: An update was read from Eric DeWaard on work being done at the ballfields.

OTHER BUSINESS

Brittany Leibel and Craig Holbeck met with the council to offer information and answer questions about the potential building project for the school. A public meeting will be held on

September 30, 2026 and there is a website with information on the project available. They also inquired about the process to vacate a portion of 3rd Street if the public approves the project.

Burnell Glanzer met with the council to discuss stormwater drainage that is causing erosion of the creek embankment by his property on Dobson Avenue. Dally moved and Nuss seconded the motion to fix the drainage problem at an approximate cost of $8,000 to the city. All voted aye. Motion carried.

Otto Fousek met with the council to discuss the possibility of acquiring an unused portion of Mill Street that adjoins property that he recently purchased. Fousek would have to go through the process of vacating the street and the street would be split among adjoining property owners.

Dally moved and Ziebart seconded the motion to approve and send the 2027 property tax appropriation request to the county auditor. All voted aye. Motion carried.

A motion was made by Dally and seconded by Nuss to purchase a 2026 CAT 926 Payloader under a Sourcewell contract for 2027 at a cost of $124,600.00 after trade-in plus interest over 5 years. All voted aye. Motion carried.

The second reading of Ordinance 2026-6 was held. A motion was made by Dally and seconded by Rus to adopt Ordinance 2026-6: an ordinance revising Armour Municipal Ordinance "TITLE XV: LAND USAGE." A roll call vote was taken. Voting aye: Spaans, Ziebart, Nuss, Rus, and Dally. Voting nay: none. Absent: Weerheim. Abstaining: none. Motion carried. The ordinance will be published separately from the minutes.

Dally moved and Spaans seconded the motion to approve a propane quote from CHS Farmer's Alliance for $1.30/gallon for 2026-2027. All voted aye. Motion carried.

The council reviewed and discussed a list of projects to be included in the Douglas County Hazard Mitigation Plan. The council was agreeable to the projects listed and did not have any additional projects to add.

The council reviewed a possible floor plan for the city hall renovation and discussed possible changes.

Dally moved and Ziebart seconded the motion to pay the bills. All voted aye. Motion carried.

Public Comment: none.

The next regular meeting will be October 5, 2026, at 5:30 p.m.

A motion by Dally was seconded by Spaans to adjourn the meeting at 7:00 p.m. All voted aye. Motion carried.

Kari Bertram	Travis Sparks
Finance Officer	Mayor

CORSICA MINUTES

OFFICIAL PROCEEDINGS – CORSICA CITY COUNCIL – SEPTEMBER 14, 2026

The City Council of Corsica, SD met on September 14, 2026 at 7pm in the city office. Present: Mayor Luebke; Council members; Bamberg, Sonnenberg, Blom, Hellenga & Denning. Also present: Steve & Cindy Groseth, Darwin DeLange, Daren Feenstra & Deputy Phillip Lane.
Mayor Luebke called the meeting to order.
Motion by Sonnenberg, Blom seconded to approve the agenda. All 'aye'. Carried.
Bamberg moved, Hellenga seconded to approve the minutes from the August 10th, 2026 meeting. All 'aye'. Carried.

Public discussion time: No one.

Police Report: Report received via e-mail. Deputy Lane was present.

Drainage: Steve & Cindy Groseth were present to explain a drainage issue at the end of their driveway & the city street with getting the water to flow west to the culvert. Groseth's came with an estimate of $1,890.00 for a drainage apron that they plan to have done. Discussion was held. Denning moved; Hellenga seconded for the city to pay half of this. All 'aye'. Carried.

Maintenance Report: updated on spraying, pothole patching & preparing for the chip sealing of some of the streets starting this week.

Industrial Road: Discussion was held on Industrial Road & possible future improvements. Motion by Bamberg, Sonnenberg seconded to move forward with recommendation from Ryan Murtha, McLaury Engineering for the boring & study of the road. All 'aye'. Carried.

Douglas County Hazard Mitigation Plan: The plan was presented & discussed. Denning moved; Blom seconded to move forward with the preliminary project plan working with Douglas County & District III. All 'aye'. Carried.

2027 Appropriation Ordinance: Bamberg moved, Hellenga seconded to approve & proceed with the 1st reading of the 2027 Appropriation Ordinance. All 'aye'. Carried.

Building Permits Granted: (written appeals within 5 days of this publication). There were no permits this month.

Motion by Sonnenberg, Blom seconded to approve the following bills for payment. All 'aye'. Carried.

Blom moved; Bamberg seconded to adjourn. All 'aye'. Carried.

_____ _____

Lori A. Heidinger, Finance Officer Austin Luebke, Mayor

DELMONT MINUTES

Town Board of Trustees Proceedings

The Delmont Town Board of Trustees met in regular session on September 8, 2026 at 6:30 pm in the Delmont Community Center. Vice-President Kazmierczak called the meeting to order with the following Board members present: Jes Kazmierczak, Nathan Lagg, Bryce Roth. Absent Board members: Larry Clouse, Jesse Goulette.

City employees present were: Barb Dozark, Lloyd Stiles, Russ Dozark,

Visitors present: Dennis Stahlecker, Nola Redd

The Pledge of Allegiance was said.

A motion made by Roth and seconded by Lagg to approve the agenda. All present voted aye. Motion carried.

Vice-President Kazmierczak called the planning and zoning commission meeting to order. Building permit for Jon Reichel was discussed. Roth made motion and seconded by Lagg to recommend approval to the board. All present voted aye. Motion carried.

Vice-President Kazmierczak declared the meeting back in regular session.

A motion made by Roth and seconded by Lagg to approve the minutes from the August 3, 2026 regular meeting. All present voted aye. Motion carried.

The following bills were presented to Board: (*DELETED*)

Motion made by Lagg and seconded by Roth to approve paying bills as presented. All present voted aye. Motion carried

The Monthly Financial Statements of the balances in each account was presented. Motion made by Lagg and seconded by Roth to approve as presented. All present voted aye. Motion carried.

Employee Reports: Water tower repair went well. There will be a modem replaced at the water tower this week. Replaced the cellular antennae at the RCWD water vault. The fall cleanup has been completed.

Finance officer report:
Attended two meetings with the PDD III for updating the Douglas County Hazard Mitigation plan. The next meeting will be in October. We are invited to a public meeting on September 22 concerning the five-year plan for highway bridge improvement plan. Worked with Bankwest for setting up ACH collections for utility billing.

Old Business:
Tabled the water meter discussion.

Discussion was held on what is wanted in the storage container ordinance. Mike Fink, attorney, will prepare the ordinance for the first reading and email to Barb.

New Business:
Resolution 2026-05 Brown Bag permit for Mary Grosz was read.

The South Dakota Open Meetings Law Brochure was reviewed per SB 74.

Motion made by Lagg and seconded by Roth to approve 1st reading of Ordinance 2027 Annual Appropriations, Ordinance No. 0-3-26 All present voted aye. Motion carried.

Motion made by Roth and seconded by Lagg to approve 1st Reading of Ordinance No 2026-04 Amending Section 807 Conditional Uses. All present voted aye. Motion carried.

Motion made by Roth and seconded by Lagg to approve 1st Reading of Ordinance No. 2026-05 Amending Chapter VII (offenses and Misdemeanors), Article 2, (Nuisances), Paragraph C, Section 2 --IPMC. All present voted aye. Motion carried.

Motion made by Roth and seconded by Lagg to approve the Hazard Mitigation Project Selection list that was discussed at the Douglas County Courthouse. All present voted aye. Motion carried.

Motion made by Lagg and seconded by Roth to approve Lloyd Stiles to attend the Annual Technical Conference January 12-13, 2027 in Pierre with lodging 2 nights. All present voted aye. Motion carried.

Motion made by Roth and seconded by Lagg to approve Building Permit 2026-05 privacy fence for Jon Reichel. All present voted aye. Motion carried.

At 6:53pm Vice-President Kazmierczak asked to enter executive session for SDCL 1-25-2 employee matter. A motion made by Lagg and a second by Roth to enter executive session. All present voted aye. Motion carried.
At 7:22pm Vice-President Kazmierczak declared the meeting back in regular session.

Public Input: None

Motion made by Roth and seconded by Lagg to adjourn the meeting. All present voted aye. Motion carried.

Next regular meeting October 5, 2026.

Jesse Kazmierczak
Jesse Kazmierczak, Vice-President

Barbara Dozark
Barbara Dozark, Finance Officer

APPENDIX C: History of Previous Hazard Occurrences

This section provides details about hazard events that have impacted Douglas County in the past, beginning with the following table showing the major disaster declarations in which Douglas 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 Douglas County farmers.

Major Disasters

Table C.1 lists all the events since 1970 that resulted in a major disaster declaration in which Douglas County was part of the designated area. Records from FEMA were consulted for federal assistance provided following each disaster through FEMA's Public Assistance program.

Table C.1 – Major Disaster Declarations Affecting Douglas County

Dec #	Declaration Date	Type	Primary Damage Impact	Obligated Amount
3015	Jun 1976	Drought		
764	May 1986	Severe Storm; Flood		
999	Jul 1993	Flood; Severe Storm; Tornado		
1052	May 1995	Severe Storm; Flood		
1075	Jan 1996	Ice Storm		
1156	Feb 1997	Severe Winter Storm; Blizzard		
1173	Apr 1997	Severe Storm; Flood		
1620	Dec 2005	Severe Winter Storm		$5,243
1774	Jul 2008	Severe Storm; Flood	Roads, bridges	$70,825
1887	Mar 2010	Severe Winter Storm	Utilities	
1915	May 2010	Flood	Roads, bridges	$210,604
4115	May 2013	Severe Winter Storm	Debris removal	
4440	Jun 2019	Severe Winter Storm; Flooding	Roads, bridges	$605,644
4469	Nov 2019	Severe Storms; Flooding	Roads, bridges	$95,422
4807	Aug 2024	Severe Storms; Straight-line Winds; Flooding	Roads, bridges	$267,109

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

Significant Hazard Events

Table C.2 is a list of significant hazard events reported for Douglas County from 1960 through 2024, as recorded in the National Climatic Data Center's Storm Events Database. The National Climatic Data Center receives 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 prior to 1996, the only event types recorded by the National Weather Service were tornadoes, thunderstorm winds, and hail. Another issue is that damage amounts in some cases are estimates and for larger-scale events, such as winter storms and drought, the data is collected 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 Douglas County

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
6/26/1960	Tornado		F1	2.5	
5/14/1962	Tornado		F3		
6/28/1965	Tornado		F1		
7/30/1968	Hail		2.00 in.		
6/25/1969	Tornado		F2	25	
6/8/1971	Tornado		F0		

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
5/26/1972	Tornado		F0		
6/21/1974	Hail		1.75 in.		
6/19/1975	Tornado		F0	250	
6/6/1980	Hail		2.75 in.		
6/6/1980	Tornado		F0		
7/19/1981	Thunderstorm Wind		65 kts.		
7/20/1982	Thunderstorm Wind		61 kts.		
7/28/1983	Thunderstorm Wind		61 kts.		
6/22/1984	Tornado		F0		
6/22/1984	Tornado		F0		
6/22/1984	Tornado		F0		
5/11/1985	Tornado		F0		
5/11/1985	Tornado		F0		
5/30/1985	Hail		1.75 in.		
9/4/1985	Tornado		F0	2.5	
6/10/1986	Tornado		F0		
6/10/1986	Tornado		F0		
7/28/1986	Tornado		F2	250	
7/28/1986	Tornado		F1	25	
7/11/1987	Thunderstorm Wind		70 kts.		
7/21/1995	Thunderstorm Wind		61 kts.		
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.			
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.		
7/6/1996	Lightning	Lightning struck a city distribution substation, damaging a transformer and leaving the entire town of Armour without power for seven hours. The damage was such that the breaker couldn't be closed to re-route the electricity.		10	
8/6/1996	Thunderstorm Wind		65 kts.		

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
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	
12/14/1996	Heavy Snow				
12/16/1996	Blizzard				
1/4/1997	Blizzard				
1/9/1997	Blizzard	Strong winds, gusting as high as 60 mph, combined with loose heavy snow cover and 1 to 3 inches of new snow to produce widespread and prolonged blizzard conditions. Wind chills as cold as 80 below zero also occurred. Transportation, schools, and commerce were halted as roads were blocked by drifting and zero visibility otherwise made travel impossible. Drifts as high as 20 feet were reported. Livestock losses were suspected to be in the thousands as many died during the blizzard and stress was expected to produce additional losses with time. Some roofs collapsed from the weight of snow, especially on farm buildings. Some power outages occurred from broken lines and poles, mainly in rural areas.		20	
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				
6/11/1997	Flash Flood	Rainfall of 3 to 6 inches flooded roads, basements, and some vehicles and homes. The flooding resulted from overflow of drainage ditches, sewer systems, at least one creek, and simple ponding of water in low areas.		20	
6/20/1997	Thunderstorm Wind	Thunderstorm winds caused widespread damage in and near Armour. The roof was blown off of the high school and the school sustained additional damage. A house sustained heavy damage when the roof of the school landed on it. Numerous other structures including many homes suffered damage. There was widespread damage to trees and power lines, and much of the damage to structures was caused by tree debris.	70 kts.	1,000	
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	
7/6/1998	Hail	Large hail devastated crops, broke windows, and caused other damage to buildings and vehicles.	3.00 in.	200	1,000
11/10/1998	Blizzard	Snow accumulating 4 to 14 inches combined with winds gusting as high as 60 mph caused zero visibilities in snow and blowing snow, drifting snow, and damage to trees and power lines with resultant power outages. Some of the power outages lasted over 2 days. Most roads were closed and many people were stranded in vehicles after the sudden onset of the heavy snow.		20	
1/1/1999	Winter Storm				
9/4/1999	Flash Flood	Heavy rain of up to four inches closed a road just east of Delmont, and caused farmland and other lowland flooding.			

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
11/1/1999	Drought	Generally dry weather that began in August continued through November. Dry surface and soil conditions became quite pronounced in November. Water levels fell, especially in small streams and lakes. Damage to winter wheat crops was feared. The area experienced the third driest fall (September through November) period on record. Unusually warm weather during the month contributed to the drying. The most noticeable manifestation of the dry conditions was the large number of grass fires across the area. While damage was mainly limited to the grasslands, considerable manpower and expense was needed to fight the fires.			
12/1/1999	Drought				
2/1/2000	Drought	Dry weather that prevailed during the fall continued in February, Dry surface and soil conditions remained quite pronounced. Water levels continued to fall slowly. especially in wetlands, small streams, and lakes. Above normal temperatures contributed to further drying. Grass fires were again a problem in some areas.			
3/1/2000	Drought				
3/6/2000	Wildfire	A controlled burn went out of control, exacerbated by strong winds. The fire caused fatal burns to one firefighter and injured another. Damage was confined to grassland.		5	
4/1/2000	Drought				
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. 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				
1/15/2003	Heavy Snow				
4/6/2003	Heavy Snow				
6/24/2003	Thunderstorm Wind		61 kts. E	50	
6/24/2003	Tornado		F0		
6/24/2003	Tornado		F0		
7/3/2003	Hail		1.25 in.		
11/22/2003	Winter Storm				
12/8/2003	Winter Storm				
3/15/2004	Heavy Snow				
7/20/2004	Hail		1.50 in.		
8/2/2004	Thunderstorm Wind		61 kts. E		
1/4/2005	Heavy Snow				
5/7/2005	Thunderstorm Wind		61 kts. E		

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
8/18/2005	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. A 79 year old man died from exposure north of Harrison when he became stuck in a barbed wire fence after the tractor he was driving became entangled in the fence.		100	
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. Snowfall totals varied from 6 to 10 inches, with winds gusting over 35 mph, which 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				
9/16/2006	Hail		4.25 in.		
9/16/2006	Tornado		F0		
12/20/2006	Winter Storm	Freezing rain caused significant icing of around a quarter inch, which caused branches and power lines to break in a few places. The freezing rain was followed by 1 to 3 inches of snow. Travel was greatly slowed. Classes for December 21st were cancelled at several schools.		20	
12/30/2006	Winter Storm				
2/24/2007	Winter Storm	Rain changed to freezing rain, causing light icing before the precipitation quickly changed to snow. Snow accumulated 5 to 7 inches. The icing and subsequent snow accumulation made travel very difficult, with several vehicle accidents and numerous vehicles sliding into ditches.			
2/28/2007	Heavy Snow				
3/1/2007	Blizzard				
4/21/2007	Hail		1.25 in.		
5/22/2007	Flash Flood				
6/21/2007	Flash Flood				
7/17/2007	Thunderstorm Wind		61 kts. E	15	
8/3/2007	Thunderstorm Wind		61 kts. E		

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
8/3/2007	Flash Flood				
8/21/2007	Hail		1.75 in.		
4/10/2008	Blizzard				
4/25/2008	Heavy Snow				
6/5/2008	Flash Flood				
11/6/2008	Blizzard				
12/14/2008	Blizzard				
3/31/2009	Blizzard				
4/4/2009	Blizzard				
6/24/2009	Tornado		EF0		
6/25/2009	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 3 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 Armour, where law enforcement reported near zero visibilities in the blizzard. 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.			
7/6/2010	Hail		2.75 in.	15	
7/6/2010	Tornado		EF0		
7/6/2010	Tornado		EF0		
7/23/2010	Thunderstorm Wind		61 kts. E	10	
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				
7/15/2011	Extreme heat	An extended period of excessive heat produced daytime temperatures reaching the 90s and dew points in the 70s to lower 80s, with heat indices often reaching or exceeding 115 degrees. Nighttime temperatures often in the mid 70s to lower 80s with continued high humidity provided little if any relief. The heat and humidity caused prolonged stress on people and livestock. Over 50 cattle were reported to have died from the heat in the county.		25	

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
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.			
6/13/2012	Hail		2.75 in.		
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				
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				
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				
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 quickly producing moderate to heavy ice accumulations, ranging up to more than a quarter of an inch. The precipitation then changed to sleet and then snow, with sleet and snow accumulations reaching 8.5 inches near Armour. Numerous branches and power lines were downed by the weight of ice and accompanying wind, with much of the power line damage		10,000	

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
		affecting rural electric cooperatives. Trees and tree debris blocked roads, and damaged some vehicles and homes. Several power outages were reported. The winter precipitation made travel impossible in many areas, resulting in schools and businesses being forced to close.			
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.			
7/26/2014	Hail		2.75 in.		
7/26/2014	Thunderstorm Wind	Thunderstorm winds blew the roof off a church, damaged structures and seating aT a baseball park, and caused widespread tree damage, with one tree falling on a car.	61 kts. E	40	
8/23/2014	Flash Flood				
12/15/2014	Winter Storm				
4/24/2015	Hail		1.00 in.		
5/10/2015	Tornado	44 structures with major damage, including new fire hall; nine injured	EF2	1,500	
6/20/2015	Thunderstorm Wind		61 kts. EG		
11/20/2015	Heavy Snow				
11/30/2015	Winter Storm				
12/25/2015	Winter Storm				
3/23/2016	Winter Storm				
6/10/2016	Extreme heat				
7/19/2016	Extreme heat				
11/17/2016	Winter Storm				
12/17/2016	Extreme cold				
1/24/2017	Winter Storm				
2/23/2017	Winter Storm				
5/15/2017	Thunderstorm Wind	Buildings were damaged in Armour, and a truck was blown off the road.	65 kts. EG	60	
6/13/2017	Hail		1.75 in.		
6/27/2017	Hail		1.25 in.		
6/29/2017	Hail		1.25 in.		
8/13/2017	Hail		1.00 in.		
8/21/2017	Hail		1.75 in.		
12/26/2017	Extreme cold				
12/31/2017	Extreme Cold	Low temperatures were around -20.			
1/15/2018	Extreme cold				
1/21/2018	Winter Storm				
2/10/2018	Extreme cold				
2/22/2018	Winter Storm				
3/5/2018	Blizzard				

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
4/13/2018	Blizzard	Life threatening conditions developed, as a mix of rain, sleet and snow changed to all snow. Brutal winds gusting as high as 45 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 12.6 inches was measured in the northwest part of Douglas County.			
4/13/2018	Hail		1.00 in.		
4/18/2018	Winter Storm				
7/3/2018	Extreme heat				
7/8/2018	Extreme heat				
7/11/2018	Extreme heat				
7/12/2018	Flash Flood				
7/13/2018	Flood				
1/1/2019	Extreme Cold				
3/13/2019	Flood	Rainfall of one to three inches on frozen ground and into a snow pack with between 2 and 5 inches of liquid water equivalent resulted in considerable overland flooding. Widespread flooding damage to county and township roads was reported. Numerous culverts were washed out along with several gravel roads.		670	
3/14/2019	Blizzard				
4/11/2019	Blizzard				
6/28/2019	Heat				
6/29/2019	Extreme Heat				
6/30/2019	Heat				
7/17/2019	Thunderstorm Wind		70 kts. EG	10	
9/10/2019	Thunderstorm Wind		61 kts. EG	15	
9/10/2019	Flash Flood	All roads into Delmont became impassable, with 6 inches or more of water flowing over the roads. Numerous township roads in southeast Douglas County were also under water, with several washed out culverts.		100	
9/12/2019	Flood	Water was ponding over SD Hwy 44 a half mile west of US Hwy 281 junction. Numerous county and township roads were inundated with water for several days.		20	
11/29/2019	Winter Storm				
12/1/2019	Winter Storm				
12/28/2019	Blizzard	Light mixed precipitation resulted in a minor glaze of ice accumulation, then heavy snowfall (almost 16 inches near Armour) and high wind resulted in white out conditions. Snow drifts to several feet were common.			
1/17/2020	Blizzard	High wind and snow reduced visibility, with travel not recommended. Sowfall reached 3.7 inches near Dimock.			
1/18/2020	Cold/wind Chill				
4/11/2020	Winter Storm				
6/8/2020	Hail		1.00 in.		11
6/9/2020	Thunderstorm Wind		74 kts. EG	50	
7/6/2020	Hail		1.25 in.		

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
7/6/2020	Flash Flood	Heavy rainfall flooded roads in Armour, with water encroaching on several buildings. Numerous intersections along SD Highway 44 had standing water.		10	
8/8/2020	Thunderstorm Wind		61 kts. EG	40	
12/23/2020	Blizzard				
12/29/2020	Winter Storm				
2/14/2021	Extreme cold				
3/14/2021	Winter Storm				
6/1/2021	Drought				564
7/1/2021	Drought				870
8/1/2021	Drought				418
9/1/2021	Drought				2
10/1/2021	Drought				
11/1/2021	Drought				
12/1/2021	Drought				
12/10/2021	Winter Storm				
12/31/2021	Cold/wind Chill				
1/1/2022	Cold/wind Chill				
1/6/2022	Extreme cold				
2/22/2022	Cold/wind Chill				
3/5/2022	Winter Storm				
4/1/2022	Drought				
4/7/2022	High Wind		60 kts. MG		
4/12/2022	Hail		1.75 in.		
4/23/2022	Wildfire	High winds gusting over 50 mph sparked a wildfire that consumed about 200 acres of grassland and light timber. One tractor was a complete loss when it burned attempting to plow a fire line.			
5/1/2022	Drought				
5/12/2022	Thunderstorm Wind	A highly unstable environment generated scattered storms with damaging winds. With many fields unplanted, a huge amount of dirt was lofted into the leading edge of the storms, which took on the characteristics of a haboob reducing visibility to near zero. Winds from 70 to 100 mph devastated much of southeast South Dakota, causing extensive tree and structural damage and many injuries. Vehicles were blown off several roads, shutting down traffic on Interstates 29 and 90. Power was disrupted in a widespread area, with estimates of over 45,000 customers impacted at one time. Many schools were closed due to damage and power issues. The storm resulted in a Presidential Disaster Declaration for damage to public infrastructure at an estimated cost of 6.7 million dollars across 20 counties and two reservations.	54 kts. MG		1
6/1/2022	Drought				
6/20/2022	Thunderstorm Wind		65 kts. EG		
8/2/2022	Drought				

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
8/5/2022	Excessive Heat				
9/1/2022	Drought				
10/1/2022	Drought				
11/1/2022	Drought				
12/1/2022	Drought				
12/14/2022	Blizzard				
12/21/2022	Blizzard/Extreme Cold				
1/1/2023	Drought				
1/2/2023	Winter Storm				
1/27/2023	Winter Storm				
2/1/2023	Drought				
2/21/2023	Blizzard				
2/23/2023	Cold/wind Chill				
6/6/2023	Drought				
7/1/2023	Drought				2,680
7/26/2023	Excessive Heat				
7/30/2023	Hail		2.50 in.		
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	Rainfall amounts across Douglas County from June 20-22 ranged from 3 to 5 inches. Some overland flooding ensued with several township roads damaged by flood waters. In addition, three homes reported water damage. Preliminary damage assessments estimate loss to public infrastructure across the county to be 582 thousand dollars.		582	
7/13/2024	Excessive Heat				
7/29/2024	Thunderstorm Wind		76 kts. MG		
7/31/2024	Heat				
8/25/2024	Excessive Heat				
10/29/2024	Drought				
11/1/2024	Drought				

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 Douglas 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 3% of all indemnity payouts in Douglas County.

Table C.3 – Crop Loss Due to Winter Weather

Year	Frost	Freeze	Cold Winter	Cold Wet Weather
2000	$374		$17,378	
2001		$785	$424,526	$1,689
2002	$8,087	$13,924	$4,455	$2,053
2003	$2,507		$3,832	
2004	$3,035		$4,926	$360
2005	$2,603	$7,872	$2,598	
2006			$2,548	
2007		$1,064	$13,162	$4,606
2008			$14,606	$35,831
2009		$1,485	$287,286	$37,086
2010				$27,876
2011	$3,734		$34,006	$100,917
2012			$4,685	
2013			$717,208	$1,678
2014			$320,280	
2015	$33,009	$20,415	$960,996	
2016	$5,287			$29,437
2017				$14,881
2018			$18,248	$6,216
2019			$1,845	$356,554
2020		$3,018	$5,871	$84,692
2021				$18,038
2022	$4,269	$11,538		
2023		$11,170	$319,454	
Ave Payout =	**$2,621**	**$2,970**	**$131,580**	**$30,080**

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 6% of all indemnity payouts in Douglas County.

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

Year	Hail	High Wind
2000	$422	$7,146
2001	$59,863	$5,418
2002	$178,269	$2,455
2003	$30,722	$444
2004	$39,727	$7,379
2005	$46,847	$9,425
2006		
2007		$6,316
2008	$366	
2009	$48,424	
2010	$97,703	$36,523
2011	$273,311	$7,010
2012	$92,486	
2013		
2014	$5,029,244	$306,644
2015	$5,876	
2016	$2,290	$25,518
2017	$1,614,915	$65,135
2018	$80,215	
2019	$176,904	$15,530
2020	$14,140	$532
2021	$957	
2022	$13,409	$6,153
2023	$40,294	
Ave Payout =	**$326,933**	**$20,901**

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 31% of all indemnity payouts in Douglas County.

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

Year	Flooding	Excess Moisture
2000		$35,888
2001		$1,087,638
2002		$79,352
2003		$25,189
2004	$7,374	$49,652
2005		$46,075
2006	$11,681	$17,240
2007	$4,462	$547,824
2008	$10,260	$2,095,343
2009		$267,788
2010	$15,277	$1,573,067
2011		$1,544,160
2012		$48,640
2013		$5,356
2014	$28,481	$8,291
2015		$204,109
2016	$21,698	$2,130,139
2017	$4,520	$41,565
2018		$1,326,479
2019	$3,828	$28,046,306
2020	$18,465	$4,384,407
2021	$6,122	$170,849
2022	$1,015	$270,580
2023	$71,317	
Ave Payout =	**$8,521**	**$1,833,581**

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 56% of all indemnity payouts in Douglas County, far more than any other type of hazard [11].

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

Year	Drought	Heat
2000	$522,691	$4,218
2001	$134,849	$16,002
2002	$5,463,315	$106,664
2003	$669,295	$49,657
2004	$1,292,284	$2,755
2005	$2,702,712	$169,416
2006	$6,568,169	$188,792
2007	$157,755	$45,406
2008	$497,869	$40,219
2009	$7,908	$6,477
2010		
2011	$128,420	$5,205
2012	$35,614,043	$1,105,068
2013	$950,581	$5,449
2014	$2,089,567	$15,872
2015	$553,797	$2,136
2016	$573,730	$8,139
2017	$2,349,416	
2018		
2019		
2020		
2021	$2,640,755	$144,021
2022	$11,808,389	$379,152
2023	$3,126,653	$59,061
Ave Payout =	**$3,243,842**	**$98,071**

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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