TRIPP COUNTY, SOUTH DAKOTA

HAZARD MITIGATION PLAN

JULY 2025

Prepared by:

Tripp County Hazard Mitigation Planning Team

Technical Assistance Provided By:

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CHAPTER I
PLANNING PROCESS

Background

This plan is an update of the Tripp County Hazard Mitigation Plan, which was approved by FEMA in November 2020. The purpose of the plan is to prevent or reduce losses to people and property that may result from future hazard events in Tripp 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 Tripp County in its efforts to mitigate against future disaster events.

This is a multi-jurisdictional plan. All the municipalities located within Tripp County were invited to participate in the plan's development, as they had when the current plan (that is, the plan now being updated) was being developed. Following is the list of jurisdictions that participated in the plan's development by having a representative attending the planning meetings and by providing input into the plan [1]:

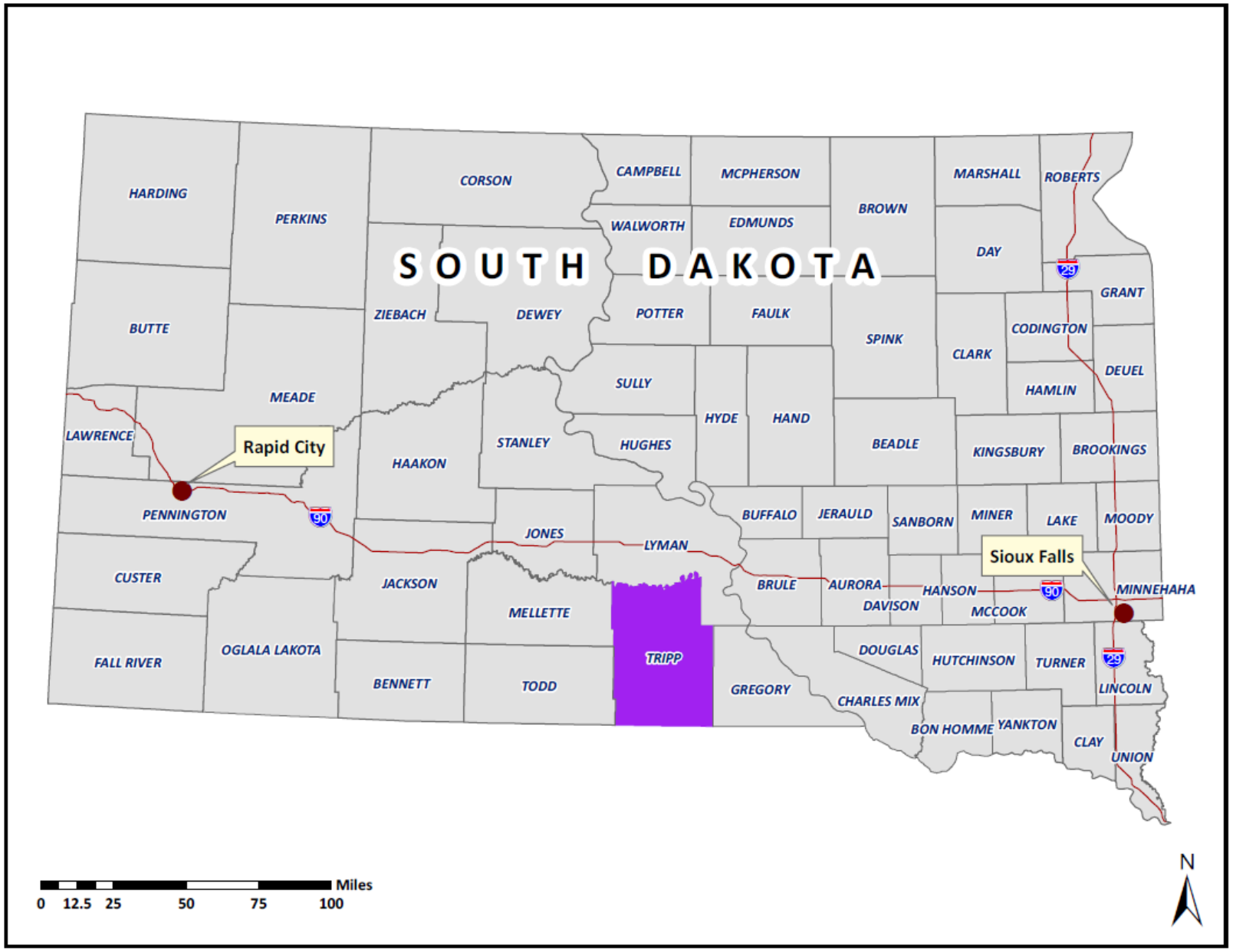
- Tripp County
- City of Colome
- Town of New Witten
- City of Winner

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

[1] The Town of New Witten, which has fewer than 100 residents, was represented at the meetings but did not adopt the 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. Eric Ambroson assisted in the public outreach and risk assessment efforts and gathered some of the demographic data used in 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 and Shannon Viereck provided additional research assistance and edited the final copy of the plan.

Development of Planning Team

The initial planning stages for this plan update began in 2023 when an application was submitted to FEMA for funding to help pay for the update. The funds were awarded to the County in November 2024. Following this, Mr. Clem and the Tripp 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 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 invited to participate in the plan's development. These stakeholders included the following:

- Rosebud Sioux Tribe
- Rosebud Electric Cooperative
- Tripp County Water User District
- Winner Regional Hospital
- Winner *Advocate*
- Colome School District
- Winner School District
- Neighboring counties (Gregory, Lyman, and Todd)

Each individual invited to participate in the plan's development had knowledge in one or more of the following subject areas that helped contribute to the planning process:

- Infrastructure within the county.
- Economic development activities within the county.
- Natural and cultural resources.

- Floodplain management.
- Building codes and other development regulations.
- Mapping and GIS.
- Social services, including vulnerable populations.
- Other technical expertise or specialized knowledge to assist in the planning effort.

Table 1.1 lists the individuals who participated in the plan's development, including their contribution to the process. The columns on the right show their attendance at the planning meetings that were held. Additional meetings took place in the participating jurisdictions; those meetings are not reflected in the table, but documentation is provided in **Appendix B**.

Table 1.1 – Participation in Plan Development

Name	Representing	Position	Role	Mtg 1 3/25/25	Mtg 2 5/13/25	Mtg 3 _/__/__
John Clem	Planning District III	Planner	Plan author	X	X	
Eric Ambroson	Planning District III	Planner	Research, Support	X		
Shannon Viereck	Planning District III	Planner	Research, Support	X	X	
Jon Burdette	Tripp County	Emergency Mgmt Dir	Guidance, Review	X	X	
Darryl Suess	Tripp County	Emergency Mgmt	Guidance	X	X	
Mike Novotny	Tripp County	County Commission	Input, Review	X	X	
Dan Forgey	Tripp County	County Commission	Input, Review	X	X	
Joyce Kartak	Tripp County	County Commission	Input, Review	X	X	
Cody Jorgensen	Tripp County	County Commission	Input, Review		X	
Larry Wilcox	Tripp County	County Commission	Input, Review		X	
Barb DeSersa	Tripp County	Auditor	Input, Data, Review	X		
Shawn Pettit	Tripp County	Sheriff	Input, Review	X	X	
Janiece Weber	Tripp County	Dir of Equalization	Input, Data, Review		X	
Roger Sund	Tripp County	Hwy Superintendent	Input, Data, Review		X	
Harly Koenig	City of Winner	Finance Officer	Input, Data, Review	X		
Troy Kruger	City of Winner	Public Works Director	Input, Data, Review	X		
Dan Furness	City of Winner	Planning/Zoning	Input, Data, Review	X		
Curt Haskinson	City of Winner	Electric Supervisor	Input, Data, Review	X	X	
Mitch Miller	City of Winner	Public Safety	Input, Review	X		
Darren Nelson	City of Winner	Fire Dept	Input, Review	X		
Marc Kvorak	City of Winner	Police Dept	Input, Review	X		
Brandy Osborn	City of Winner	Utility Dept	Input, Review		X	
Bobbi Harter	City of Colome	Finance Officer	Input, Data, Review	X		
Casey Harter	City of Colome	Utility Manager	Input, Data, Review	X		
Glenn Sealey	City of Colome	Fire Dept	Input, Review		X	
Neal Shutt	Town of New Witten	Fire Dept	Input, Review		X	
Jason Orel	Tripp County Water User District	Staff	Input, Data, Review	X	X	
Vic Warnke	Rosebud Electric Coop	Manager	Input, Data, Review	X		
Kathie Cole	Tripp County Ambulance	Staff	Input, Review	X		
Betsy Crosston	Winner Regional Hospital	Staff	Input, Review	X		
Mindi Miller	Winner Regional Hospital	Staff	Input, Review	X		
Samantha West	Colome School District	Superintendent	Input, Review	X		
Dan Bechtold	Winner Advocate	Editor	Public outreach	X	X	
Brent Kolstad	SD Emergency Management	Region 5 Coordinator	Guidance	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 on community websites, and social media.

New for this update, surveys were 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, as well as to other city and county staff who did not participate in the planning meetings and other stakeholders. To generate broader public input, the surveys were also made available on the community websites and through social media, survey posters with a QR code were placed in various public locations throughout the county [2], and a press release at the start of the planning process included a QR code so that 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 Tripp 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.
Tripp County Highway Plan	The plan includes a list of county roads scheduled for improvements within the next five years, which was useful for development of the mitigation strategy.
Tripp County Local Emergency Operations Plan (LEOP)	The hazard assessment and emergency response sections of the LEOP were reviewed.

[2] Posters were placed at the courthouse, city offices, grocery stores and other retail locations, local schools, and at the Winner nursing home.

City of Winner Comprehensive Plan	The plan was reviewed to identify areas suitable for development within the city. Especially useful were chapters dealing with land use and future development, which include maps showing areas ideally suited to future growth.
Winner Electric System Study & Capital Improvements Plan	Analyzes the City's electric distribution system and recommends improvements to eliminate deficiencies. It covers a ten-year period and provides cost estimates for fiscal planning.
Facility Plan for the Stormwater System in Winner	This document, which was developed by the City's engineering consultant, evaluates the community's stormwater system and outlines various projects to upgrade the system.
Rosebud Electric Cooperative 2024 – 2027 Construction Work Plan	The plan provides details about the cooperative's anticipated projects over the next four years, including location and estimated cost.
Beaulieu Dam Emergency Preparedness Plan	The plan includes a map showing the predicted area of inundation if the dam were to fail.

Planning Meetings

Several meetings were held to develop the plan, 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 was provided by Planning & Development District III staff and the Tripp 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, since many of the team members had not participated when the current plan was developed. The county's current mitigation plan was then reviewed, focusing on the hazards identified in the plan and the progress being made to implement the mitigation actions listed in the plan. Discussion also occurred about other local plans and policies that could be incorporated into this plan.

The planning team also reviewed the initial results of the survey, which helped determine which hazards to address in the plan, and additional hard copies of the survey were distributed. The meeting ended with a discussion about the process by which the plan would be developed over the coming months.

Activity between meetings

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

Second Planning Team Meeting

Development of the mitigation strategy was the focus of the second meeting. It began with identification of the mitigation goals and objectives to be achieved, followed by a discussion about local mitigation capabilities. Discussion about the specific mitigation actions to include in the plan followed, the participants being reminded that they should focus on hazard mitigation - *sustained action* taken to reduce the long-term risk to people and property from hazards – as opposed to preparedness. They were also encouraged to consider a comprehensive range of actions, regardless of whether they seemed likely to be achievable in the foreseeable future. A preliminary list of actions for each jurisdiction was developed, including details about the actions, such as estimated cost, timeframe for implementation, and the party responsible for implementation.

Activity between meetings

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

Final Planning Team Meeting

Following the jurisdictional meetings, the Planning & Development District III office completed the first draft of the plan. After this, the planning team was brought together again for a final meeting to review the draft and discuss how the plan will be maintained going forward. The importance of integrating the plan into the existing planning mechanisms within the county was emphasized. The public was given another opportunity to provide input into the plan through a press release that was run in the local newspaper and posted on the community websites and social media prior to the meeting.

Post-meeting activity

After the final planning team meeting, some additional information was added to the plan based on discussion at the meeting, primarily involving clarification of some of the details of

the proposed mitigation actions. The plan was then submitted to the South Dakota Office of Emergency Management.

Acknowledgements

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

CHAPTER II
COMMUNITY PROFILE

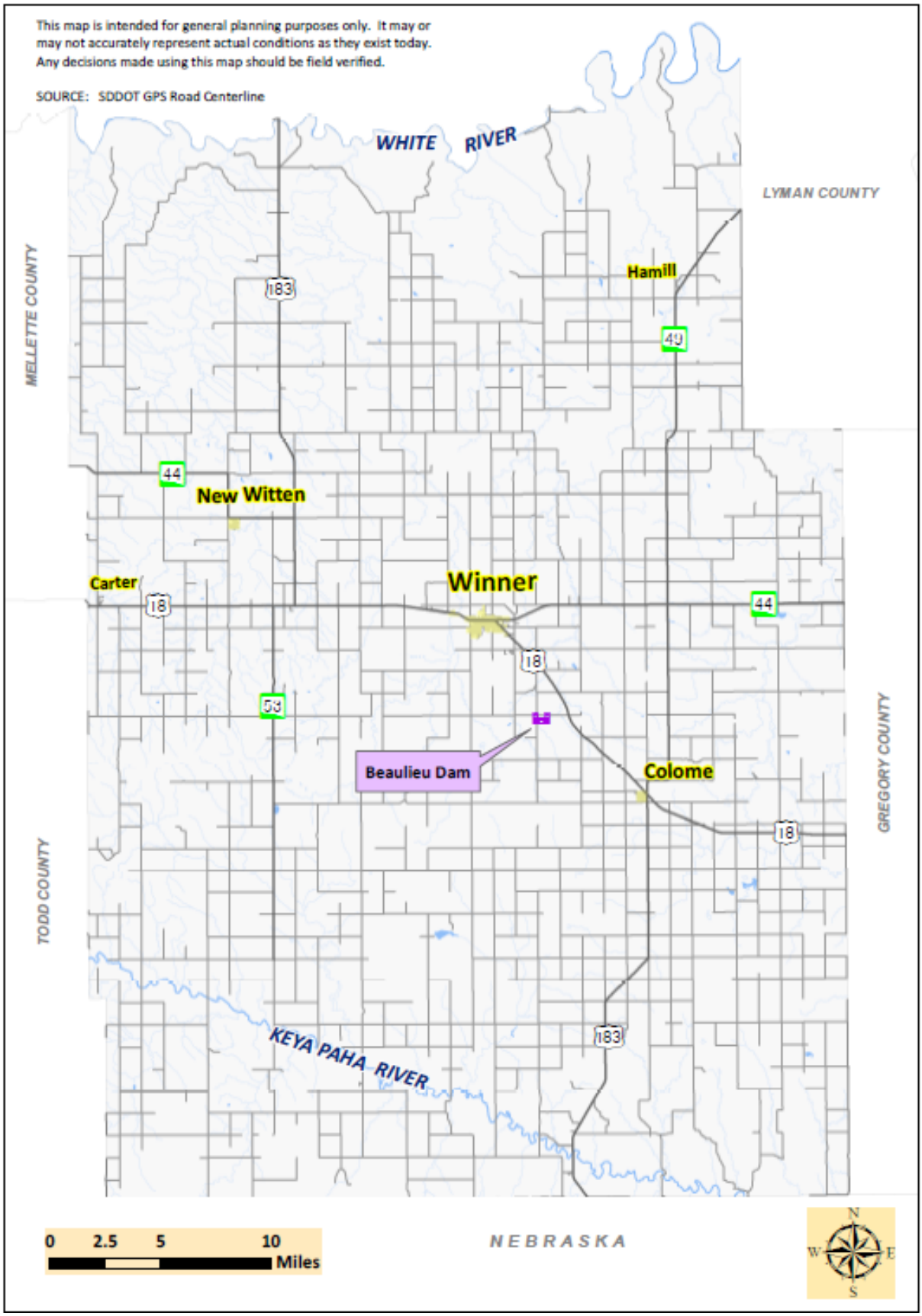
Background

This chapter serves as a basic introduction of Tripp 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

Tripp County is located in south central South Dakota (see **Figure 1.1**). The county covers 1,617 square miles in area, and its Census 2020 population was 5,624. Its population density is only 3.5 people per square mile compared to 11.7 people per square mile in South Dakota and 93.8 people per square miles in the United States. There are three incorporated municipalities located within the county - Colome (pop 331), New Witten (pop 54), and Winner (pop 2,921). The county seat is located in Winner. Unincorporated communities within the county include Carter and Hamill. **Figure 2.1** shows the county's communities and highway network.

Figure 2.1 – Tripp County



Physical Characteristics

Tripp County is very lightly settled, with most of the land consisting of grassland and pastureland, although some crops are grown, including corn, wheat, sunflower, and sorghum. The landscape is open, and the topography is generally fairly level, except for the many buttes that occur in the county, and for some highly eroded areas along streams. The major streams in the county are the White River, which forms the county's northern border, and the Keya Peha River, which is located in the southern part of the county.

Table 2.1 provides a breakdown of the land cover in Tripp 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 grassland and cropland, which together comprise over 90 percent of the county's area. Developed land makes up only a very small fraction of the land area. The table also tracks the change over time in land cover since 1985; pastureland has had the greatest absolute and relative increase. Developed land has also shown significant relative growth.

Table 2.1 - Vegetative Land Cover

Cover Type	Sq Miles (1985)	Sq Miles (2023)	% Change	% Total Area
Grassland	1,006.4	1,011.1	0.5%	62.5%
Cultivated Crops	518.5	491.0	-5.3%	30.4%
Wetlands	42.9	43.3	1.0%	2.7%
Developed Land (Low to High Intensity)	11.1	22.8	105.5%	1.4%
Developed, Open Space	26.6	21.7	-18.3%	1.3%
Pasture/Hay	4.3	18.6	329.3%	1.2%
Open Water	4.5	4.9	10.0%	0.3%
Forested Land	1.8	2.2	26.1%	0.1%
Barren Land	1.3	1.6	21.4%	0.1%

Source: www.mrlc.gov/index.php

Most soil in the county is only somewhat fertile, and the low amount of rainfall the county normally receives tends to limit agricultural production. Drainage is generally good, but there are many wetlands in the county, some of which are now used as waterfowl or wildlife production areas, although others have been drained and are now farmed.

As in most of South Dakota, the climate of Tripp County is characterized as sub-humid and continental, which means that summers are often hot and winters can be very cold. There are no large bodies of water or mountain ranges to mitigate against these extremes. High temperatures in the summer can exceed 100 degrees Fahrenheit [3], while winter lows can

[3] 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.

drop below -20 degrees. Precipitation averages about 21.5 inches per year, much of which occurs during the spring and early summer. Following is climate data in the county as reported from the Winner weather station.

Table 2.2 - Monthly Climate Conditions in Tripp County (1910 - 2013)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ave High	33.6	38.0	47.6	61.9	72.8	82.1	90.2	88.5	78.8	65.7	48.4	36.5
Ave Low	11.2	14.9	23.7	35.6	46.6	56.5	62.7	60.8	50.8	39.2	25.6	15.2
Ave Precipitation	0.5	0.6	1.4	2.5	3.2	3.7	2.6	2.4	1.8	1.5	0.7	0.5

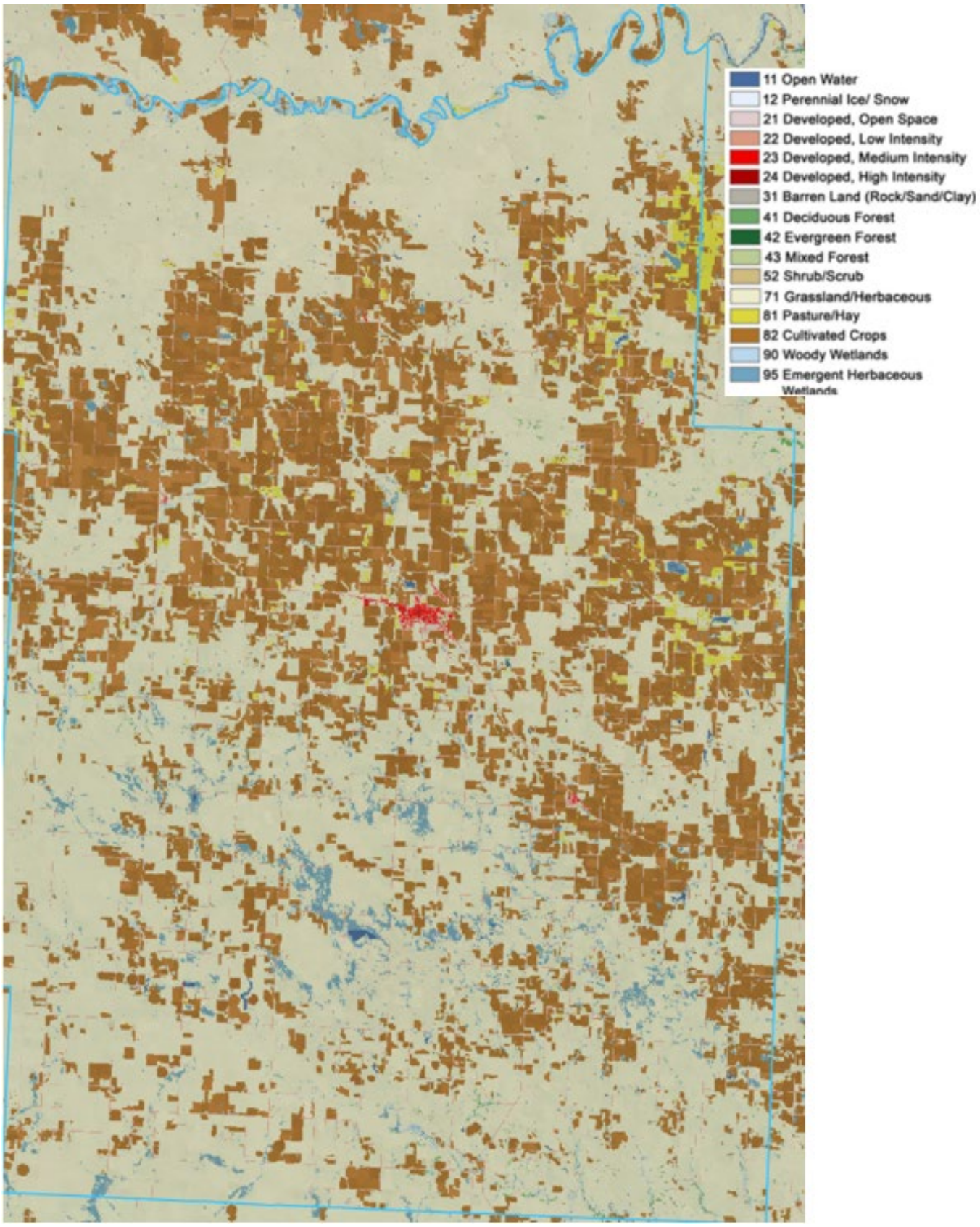
Source: www.weather.gov/wrh/climate
The average high and low are in degrees Fahrenheit; the precipitation figures are in inches.

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, Tripp County is expected to experience 16 more days per year that reach above 95 degrees Fahrenheit (from 33 days to 49 days per year) and the average annual temperature is expected to increase from 51°F to 54°F. No significant change in average annual precipitation is expected.

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

Figure 2.2 - County Land Cover (2023)



Socioeconomic Description

Population Trends

Like many other rural counties in the Midwest, Tripp County has been experiencing a steady population decline over the last several decades. The county's Census 2020 population of 5,624 is only 61 percent of the population that was recorded in 1950. As the table below shows, Tripp County's population is expected to continue decreasing. The projections are based on an analysis of past population records and current age and sex cohorts in the county.

Table 2.3 - Tripp 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
9,139	8,761	8,171	7,268	6,924	6,430	5,644	5,624	5,347	5,155	4,906

Source: U.S. Census

Race and Age

The population of Tripp County is fairly homogenous, as the table below indicates, but the county does have a large – and growing – population of American Indians. The current 17.5% representation of American Indians in the county is a significant increase over the 2010 figure of 13.2%. The population is also relatively old, which indicates that many of the young people are forced to leave the county to look for jobs and 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
Tripp County	76.9%	0.2%	17.5%	0.1%	0.4%	4.9%	1.0%	22.8%	23.0%	44.7
South Dakota	80.7%	2.0%	8.8%	1.5%	1.8%	5.3%	4.4%	24.1%	18.2%	38.5
United States	61.6%	12.4%	1.1%	6.0%	8.6%	10.2%	18.7%	21.7%	17.3%	39.0

Source: American Community Survey 2022 1-Year Estimates

Income and Education

Income levels in Tripp County are below state and national figures. The overall poverty rate in the county is higher than the state and national figures, and much higher among those under 18. Educational attainment also lags somewhat 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
Tripp County	$56,758	21.9%	43.0%	7.5%	89.8%	17.1%	13.6%
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 Tripp County is agriculture. Much of the non-ag employment for people who work in the county is in education and health care. Manufacturing is almost nonexistent. Tourism is significant, especially during the fall hunting season when many people from outside the state come to hunt pheasants and other game.

Table 2.6 – Employment Sectors

	Tripp County	South Dakota	United States
Agriculture, Forestry, Fishing, Mining	20.0%	6.4%	1.6%
Construction	4.2%	7.4%	6.9%
Manufacturing	1.6%	9.9%	9.9%
Wholesale Trade	0.7%	2.1%	2.2%
Retail Trade	12.7%	11.4%	11.1%
Transportation, Warehousing, Utilities	5.5%	4.4%	6.0%
Information	0.0%	1.5%	1.9%
Finance, Insurance, Real Estate	4.4%	6.0%	6.7%
Professional, Scientific, Management	4.1%	6.7%	12.6%
Education, Health Care, Social Assistance	27.9%	26.3%	23.1%
Arts, Entertainment, Recreation, Accommodation, Food Service	7.4%	8.8%	8.7%
Other Services	4.0%	4.3%	4.7%
Public Administration	7.6%	4.8%	4.6%

Source: American Community Survey 2022 1-Year Estimates

Vulnerable Populations

There are certain populations and social groups within Tripp 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 Tripp County has a significant proportion of vulnerable people. The Centers for Disease Control Social Vulnerability Index shows Tripp County with a rating of .6236 (0 being least vulnerable and 1 being most vulnerable), which is considered a medium to high level of vulnerability. For comparison, 15 of South Dakota's 66 counties have a higher vulnerability score. FEMA's Resilience and Planning Tool shows that the county's Community Resilience Challenges Index (CRCI) percentile is 38 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 Unemployed Women, Poverty, and No Smartphone.

The following table shows the percentage of the population in Tripp County and each of the municipalities that fall into key metrics of social vulnerability, which is compared to the state

and national average. The county is significantly above the state and national averages for people living in poverty, indicating higher vulnerability. At the community level, each of the towns also has a higher poverty rate, Colome and Winner have a relatively high percentage of people without health insurance, and New Witten is very high in several categories.

Table 2.7 – Social Vulnerability Indicators

Characteristic	Tripp County	Colome	New Witten	Winner	South Dakota	United States
People living in poverty	21.9%	39.6%	37.0%	27.9%	12.5%	12.6%
People with a disability	8.6%	7.7%	24.7%	10.8%	13.2%	13.4%
People without health insurance	10.9%	17.7%	5.5%	15.9%	8.1%	8.0%
Adults without high school diploma	10.2%	15.7%	25.1%	13.1%	6.9%	10.4%
Population under 18	22.8%	41.9%	6.8%	20.3%	24.1%	21.7%
Population over 65	23.0%	10.5%	53.4%	21.5%	18.2%	17.3%
People with limited English proficiency	1.3%	0.0%	4.1%	2.2%	2.1%	8.4%
Households without internet subscription	17.0%	17.7%	50.9%	16.7%	13.0%	11.5%
Households without a vehicle	4.4%	9.5%	0.0%	9.6%	4.5%	7.5%

Source: American Community Survey 2022 1-Year Estimates

The margin of error for Colome and New Witten is over 10% in some instances, due to their small size.

Infrastructure and Utilities

Transportation

Tripp County's main transportation routes are US Highway 18, US Highway 183, SD Highway 44, and SD Highway 49. There is no railroad in the county, but the City of Winner does have a municipal airport, which is most heavily used during the fall hunting season.

Utilities

Water service is provided throughout rural Tripp County by the Tripp County Water User District (TCWUD), which gets its water from wells located south of Winner. Winner and Colome both have their own municipal water system. Regarding wastewater disposal, Colome and Winner have a municipal wastewater collection and treatment system. Rural residences, and households in New Witten, rely on individual septic tanks and drainfields.

Solid waste service is provided by the Tri-County Landfill, which operates a landfill located in Brule County. Most of the household waste generated within Tripp County ends up at the landfill. A designated rubble site is located outside of Winner.

Electric power is provided throughout the county, except in Winner, by the Rosebud Electric Cooperative. Winner operates its own municipal power system. Natural gas is not available anywhere in Tripp County.

Services

Medical Services

The primary medical facility in Tripp County is the Winner Regional Hospital, which is classified as a critical access hospital. The hospital has 25 beds and has a generator for backup power. People needing serious medical attention can be transported to trauma-center hospitals in Sioux Falls or elsewhere.

Fire and Emergency Response

The primary fire departments in Tripp County are based in Colome and Winner, each in conjunction with an ambulance service. The New Witten fire department also has firefighting equipment, but most fires in their primary response area require outside assistance from the other departments. The departments have basic firefighting and rescue equipment, and they respond to structural fires, wildland fires, and to accidents and other emergency situations. The departments also have some capabilities regarding hazardous material (hazmat) response, but a serious incident likely would require assistance from outside the county.

Education

High schools are located in Colome and Winner. Post-secondary education is not available in the county.

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 Tripp County become disaster resilient and keep county residents safe, and it answers the following questions: What are the hazards that could affect Tripp 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 [4]. 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. 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 – these hazards, which include earthquakes, landslides, and expansive soils, are profiled in the South Dakota Hazard Mitigation Plan, but the overall significance of such hazards is rated as low, and the state does not appear to be particularly vulnerable to such events. 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 Tripp County in any 100-year period, and virtually no chance of a magnitude 6 or greater earthquake [5]. The biggest earthquake recorded in the county occurred in 1916, but the magnitude of the quake is not known. Regarding landslides, a review of the United States Geological Survey's Landslide Incidence and Susceptibility Map indicates potential for a landslide to occur in Tripp County, primarily in the northern half of the county, but such an event likely would be localized and minor in scale. Earthquakes and landslides were the two lowest ranking hazards facing the county, according to the survey conducted for this plan.
- 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.

[4] Although Flooding did not rank highly among the concerns of survey respondents, the planning team felt it was important to consider this hazard.

[5] 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.

- Technological and human-caused hazards – some of these hazards, including hazardous materials releases, are analyzed in the South Dakota Hazard Mitigation Plan. Again, the planning team considered the subject matter to be outside the scope of this plan.

Hazard Profiles

In this section, each of the hazards the planning team chose to focus on is described in terms of the hazard's ***location*** within Tripp 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 more or less 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 comprehensive list of weather-related hazard events recorded in the county from the National Climatic Data Center's Storm Events Database and records of hazard events that resulted in a major disaster declaration in the county.
- ***Probability*** of occurrence of a hazard impacting an area is the likelihood that such an event will occur. In this plan, a hazard with a "high" probability is one that is expected to occur at least five times over a ten-year period, a "moderate" probability hazard is expected to occur from two to five times in any given ten-year period, and a "low" probability hazard would be expected to occur no more than twice per ten-year period. 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 historically occur from late fall to the middle of spring, varying in intensity from mild to severe. There is a long warning time associated with most winter storms, giving people time to prepare, but they

still have a major impact in South Dakota, regularly destroying property and killing livestock. These storms can immobilize a region by blocking transportation routes, which can disrupt emergency and medical services, hamper the flow of supplies, and isolate homes and farms, sometimes for days. 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. According to the survey conducted for this plan, winter storms are the second most serious hazard facing the county, behind only drought.

The most dangerous of all winter storms are blizzards, which occur when snow is combined with winds of at least 35 mph that reduces 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 does make the ground very slippery, increasing the number of traffic accidents and personal 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.

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

Location

The topography of South Dakota is such that no part of the state is immune from the effects of winter storms. Farmland and grassland, which covers Tripp 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 Tripp 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, **Table C.2** in **Appendix C** shows numerous records of high wind events occurring during the winter months with wind speeds in excess of 50 knots (about 58 miles per hour).

History

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

One of the most serious winter storms occurred in the state between October 22 and 24, 1995, resulting in FEMA Disaster Declaration 1075. 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 Tripp County. The damage included broken poles, broken wires, and substation failures due to transmission line damage. Major transportation delays occurred because of snow on roadways and poor visibility. Total statewide damage from the event was estimated at over $13 million, and approximately 30,290 households were affected by power outages.

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

A winter storm in 2001 resulted in FEMA Disaster Declaration 1375. Statewide, the event caused over $10,000,000 in estimated damage. In Tripp County, there was approximately $20,000 in public assistance costs to the county.

A severe ice storm that occurred in November 2005 resulted in FEMA Disaster Declaration 1620. Throughout the affected area, the storm damaged 9,400 power poles and left 56,000 people without electricity. Although Tripp County was not included in the official disaster declaration, a fairly significant amount of damage occurred in the county, and the Rosebud Electric Cooperative reported over $36,000 of damage to its infrastructure in Tripp County.

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

A winter storm in March 2019 resulted in FEMA Disaster Declaration 4440; approximately $750,000 of public assistance funds were allocated in Tripp County. Severe winter storms accompanied by very heavy snowfall in December 2022 resulted in FEMA Disaster Declaration 4689. Snow accumulated up to several inches in some places.

Probability

A total of 78 winter storm events, including blizzards, ice storms, heavy snow, and extreme cold events, have been recorded in Tripp County since the mid-1990s, an average of over two per year (see **Table C.2 in Appendix C**). Therefore, based on the historic evidence, the probability of a significant winter storm affecting Tripp 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.

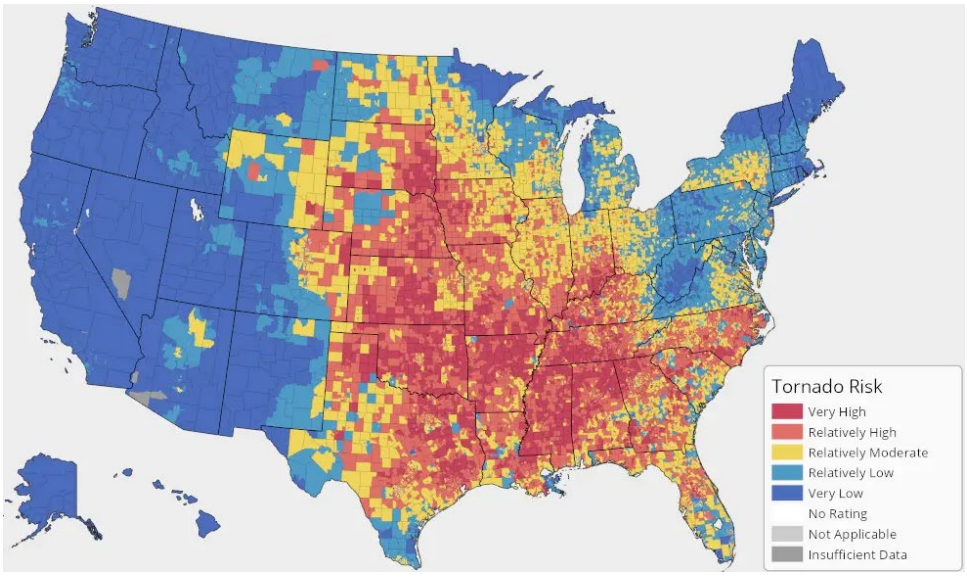
Summer storm

Description

Summer storms can include heavy rainfall, hail, tornadoes, and thunderstorm activity. These events usually are associated with unstable weather conditions. In Tripp 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 Tripp County reports some kind of hail damage to crops or property.

Tornadoes are the most dramatic type of summer storm experienced in Tripp 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. According to the survey, tornadoes are the third most serious hazard facing the county, behind drought and winter storms.

South Dakota is located near the northern edge of the core area of tornado activity in the United States (it is difficult to tell at the scale of the image below, but Tripp County is in the 'Relatively High' 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 meeting 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 number 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. The state ranked 27th 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 Tripp 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 more than 40 thunderstorms and high wind events that produced wind speeds over 60 knots, including 14 that were over 70 knots. **Table C.2** shows almost 80 events with hail at least one inch in diameter and 13 events with hail at least two inches in diameter. In terms of onset, summer storms typically develop with a long warning time, although certain hazards associated with such storms, such as hail or tornadoes, can develop more suddenly.

Regarding tornadoes, **Table C.2** shows three records of a tornado with a magnitude greater than F1 – two F2 tornadoes and an F5, which was the strongest tornado ever recorded in South Dakota. The following table lists the entire range of tornado strength according to the enhanced Fujita scale.

Table 3.1 – 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 Tripp County. **Table C.2** in **Appendix C** lists many other significant summer storms that have impacted the county. The most damaging tornado strike in Tripp County occurred in May 1965, when a tornado tracked across the eastern part of the county and damaged or destroyed 23 houses and other structures from near Colome north to Hamill

(see **Table C.2**). Summer storms in 2004, 2007, and 2008 resulted in substantial public assistance costs to the county and to the Rosebud Electric Cooperative.

Probability

As shown in **Table C.2 in Appendix C**, almost 200 summer storm events, including hailstorms, thunderstorms, lightning, and tornadoes, have been recorded in Tripp County since 1960, an average of almost three per year. Thirty of these storms involved a tornado. From this information, the probability of a summer storm affecting Tripp County in a given year is high and the probability of a storm causing significant damage (e.g., damaging hail or a tornado) can be considered at least 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. According to the survey, flooding ranks below all other hazards facing the county, except for landslides and earthquakes.

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

- Flash flooding, which results from several inches or more of rain falling in a very short period. This high intensity rainfall is commonly caused by powerful thunderstorms that cover a small geographic area. The flood that occurs because of this runoff happens very rapidly, and is generally very destructive, although usually only a small area is affected.
- Long-rain flooding, which results after several days or even weeks of fairly low-intensity rainfall over a widespread area. This is the most common cause of major flooding. The ground becomes "waterlogged," and the water can no longer infiltrate into the ground. The flooding that results is often widespread, covering hundreds of square miles, and can last for several days or many weeks.
- Flooding resulting from melting snow in the spring. This type has characteristics of both flash floods and long-rain floods. The area covered is generally not as large as that covered by the long-rain flood, but is typically larger than that covered by the flash flood. Generally, the flood lasts for several days, occurring when large amounts of snow melt rapidly due to warm temperatures. The flooding can be made worse if the ground remains frozen while the snow is melting, causing the melt water to run off to nearby rivers and lakes rather than infiltrating into the ground. Some of the largest floods in South Dakota have been the result of melting snow and ice.

- Dam failure, resulting from natural or man-made causes. Tripp County is vulnerable to this type of flood primarily because of the Beaulieu Dam, which is classified as a high hazard dam [6].

Location

Many areas of Tripp County are vulnerable to flooding. The flooding that occurs typically happens during wet springs after winters with heavy snow cover, but flash flooding after very heavy rain also causes trouble. Typical damage includes washed out or damaged roads and culverts. Flooding of land adjacent to the White River occasionally occurs, especially when ice jams occur during the spring thaw and block the flow of water. These ice jams have caused water to flow onto the road surface of the U.S. Highway 183 bridge, but the highway has never been closed due to flooding.

Extent

The extent of flooding in Tripp 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 flooding that occurred in Tripp County in 2019 was notable for its severity, as well as its widespread impact throughout the county, with 26 of the county's townships submitting a declaration for FEMA assistance. The flooding caused some roads to be closed for up to several weeks.

History

Table C.2 in **Appendix C** lists many significant flooding events that have impacted the county. Following are details about the 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 1995 resulted in FEMA Disaster Declaration 1052. All of South Dakota had above normal precipitation from January through May, with many weather stations in the central and eastern portions of the state experiencing their all-time wettest Spring. Damage was caused by ground saturation and flooding due to very high residual groundwater tables from 1994, heavy winter snow and spring rain, and rapid snowmelt. Many roads were under water due to high groundwater saturation, causing interruption of emergency services. Damage also included power transmission and distribution facilities owned by rural electric cooperatives. In the area impacted by the flood, surveys identified over 3,000 homes with some type of damage, the majority caused by groundwater seepage of one to three inches into basements. In many areas the water table rose almost to the surface, saturating septic

[6] 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.

drain fields and preventing proper treatment of wastewater. The total damage estimate in the affected counties was over $35 million, which included $9.3 million in damage to public infrastructure. In New Witten, much of Main Street was flooded, resulting in the loss of two houses.

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

Flooding in 2004 resulted in FEMA Disaster Declaration 1531, which caused over $2 million in damage in the affected counties. The public assistance cost in Tripp County was approximately $130,000.

Flooding in 2008 resulted in FEMA Disaster Declaration 1774. The event caused about $355,000 of public assistance to the county, primarily due to flooding of county and township roads.

Flooding in 2010 in eastern South Dakota was the worst in a decade, resulting in FEMA Disaster Declaration 1915. About $235,000 in public assistance costs to the county resulted.

Flooding in 2019 had a major impact throughout the year in Tripp County, starting in March when heavy rainfall fell on frozen ground, which led to considerable overland flooding of agricultural lands and inundation of numerous roads. The Tripp County Water User District had nine washouts in Tripp and Gregory Counties due to flooding, which caused washouts or hill slides, breaking its waterlines. This event resulted in FEMA Disaster Declaration 4440. Additional flooding in the summer resulted in FEMA Disaster Declaration 4463. The total public assistance cost due to flooding in Tripp County in 2019 was over $1 million. Overall, this was probably the worst year of flooding in Tripp County in at least 30 years.

Probability

Table C.2 shows that 26 flooding events have been recorded in Tripp County since the mid-1990s, but some of the events appear to have been a recording of ongoing flood conditions. Excluding these events, it appears that there have been 17 separate flood events in Tripp County since the mid-1990s, or about six every ten years. 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 of time, usually a season or more, resulting in a water shortage causing adverse impacts on vegetation, animals, and/or people. It is a normal, recurrent feature of climate that occurs in virtually all climate zones. Human factors, such as water demand and water management, can exacerbate the impact that drought has on a region. According to the survey, drought is the most serious hazard facing the county.

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

Drought in South Dakota is often accompanied by periods of extreme heat, 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.

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, Tripp County has experienced eleven years since 1930 in which precipitation was less than two thirds of its average annual amount and 19 years in which precipitation was less than 75 percent of normal. The table on the following page shows the total annual precipitation received at the Winner weather station from 1930 through 2023.

Table 3.2 – Annual Precipitation in Tripp County (1930 - 2023)

Year	Annual Precip	Year	Annual Precip	Year	Annual Precip	Year	Annual Precip	Year	Annual Precip
1930	*(N/A)*	***1949***	19.4	***1968***	25.4	***1987***	25.4	***2006***	15.7
1931	12.7	***1950***	20.0	***1969***	14.8	***1988***	23.7	***2007***	32.0
1932	21.2	***1951***	29.0	***1970***	17.2	***1989***	13.6	***2008***	24.0
1933	11.7	***1952***	17.1	***1971***	20.5	***1990***	23.0	***2009***	23.0
1934	10.9	***1953***	19.7	***1972***	23.5	***1991***	26.6	***2010***	25.2
1935	20.0	***1954***	17.8	***1973***	27.4	***1992***	21.9	***2011***	23.3
1936	13.3	***1955***	16.6	***1974***	13.7	***1993***	24.0	***2012***	9.7
1937	17.3	***1956***	19.5	***1975***	18.9	***1994***	24.5	***2013***	23.2
1938	19.8	***1957***	25.9	***1976***	13.1	***1995***	30.5	***2014***	15.0
1939	20.4	***1958***	19.9	***1977***	38.9	***1996***	27.1	***2015***	23.3
1940	12.5	***1959***	22.4	***1978***	22.5	***1997***	23.4	***2016***	19.0
1941	19.5	***1960***	22.1	***1979***	24.6	***1998***	23.2	***2017***	19.8
1942	20.6	***1961***	21.2	***1980***	19.0	***1999***	23.3	***2018***	23.5
1943	13.8	***1962***	40.7	***1981***	23.9	***2000***	14.6	***2019***	32.8
1944	24.1	***1963***	22.9	***1982***	32.8	***2001***	26.4	***2020***	15.7
1945	18.2	***1964***	24.3	***1983***	25.0	***2002***	14.6	***2021***	17.3
1946	22.8	***1965***	26.4	***1984***	25.5	***2003***	14.7	***2022***	13.7
1947	14.6	***1966***	23.1	***1985***	21.2	***2004***	22.4	***2023***	27.0
1948	20.0	***1967***	18.0	***1986***	30.4	***2005***	22.7		

Source: www.weather.gov/wrh/climate

In terms of duration, it is not unusual for Tripp County to experience periods of below normal precipitation that last for several months. During the 1930s, drought conditions persisted for multiple years. In an area that is so highly dependent on agriculture, the impact of a major drought can be significant. Although most agricultural producers now have crop insurance and agricultural practices today are more advanced, the impacts of drought can still be serious.

History

Tripp County has experienced many significant droughts in its history. 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. Drought in 2012 was so devastating that the State of South Dakota activated a Drought Task Force.

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

Probability

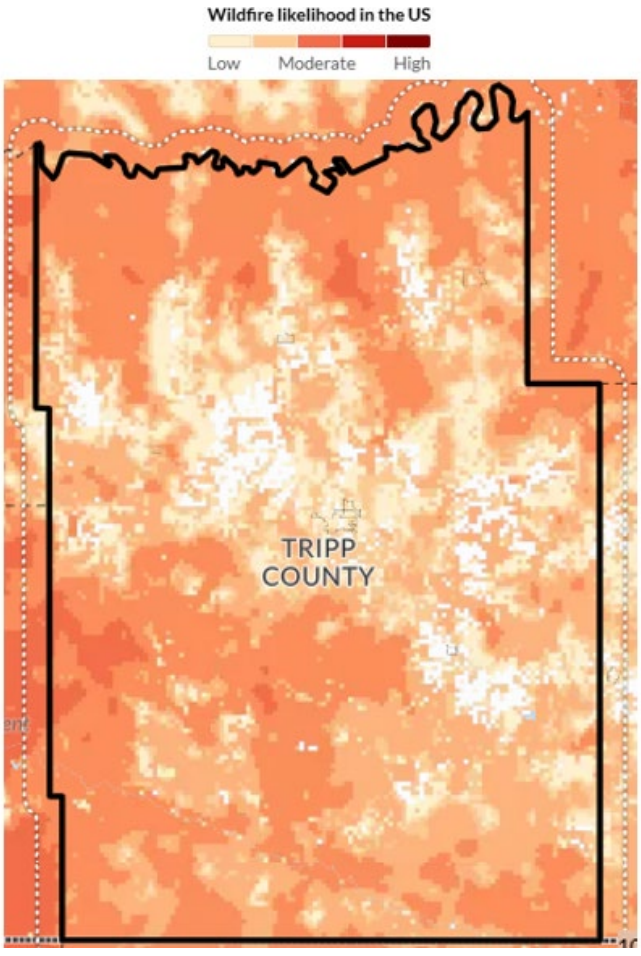
The National Climatic Data Center's Storm Events Database has no drought records for Tripp County, although the database has numerous drought records for counties adjacent to Tripp. Based on the records for these neighboring counties, the probability of a significant drought occurring in the area in any given year can be considered 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. Wildfires are not as serious a concern in Tripp County as they are in other more forested parts of the country, but the opinion of the planning team is that the hazard does warrant some attention in this plan. According to the survey, wildfire is the fifth most serious hazard facing the county.



Location

Wildfires are most likely to occur in large areas of extensive brush or unmanaged vegetation, including grassland, which makes up over 60 percent of Tripp County's land base. Grassland fires are quite dangerous because they tend to spread faster than forest fires and are thus difficult to attack. Another concern is controlled burns that get out of control, which can occur almost anywhere in the county. The map at right, 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 if it occurs).

Extent

Each of the fire departments in the county submits reports to the South Dakota Division of Wildland Fire about the fires they fight. The division compiles the reports and produces a comprehensive database of all the records, which the planning team was able to obtain for fires occurring in the county from 2000 through 2024. The following table summarizes this information in terms of the size of the fires that have been fought. It shows that most of the fires have been fairly small, most impacting no more than a few acres.

Table 3.3 – Wildfires in Tripp 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
83	49	14	5	8	266.7

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

According to the database, the most common causes of wildfires in Tripp County are from lightning, debris that catches fire, and equipment that ignites vegetation. Information is not available on the dollar amount of damage caused by any of the wildfires, or whether any injuries or deaths occurred.

History

Many wildfires have occurred in Tripp County, but nothing on a truly destructive scale. The most significant wildfires in Tripp County in recent years occurred south of Winner in September 2000 when over 1,000 acres were burned, and many cattle were killed or injured (see **Table C.2**).

Probability

Wildfires affecting less than ten acres are likely to occur somewhere in Tripp County most years, but large-scale wildfires are much less common. **Table 3.3** shows eight wildfires over 250 acres in size occurred between 2000 and 2024. Based on this period of analysis, the probability of a significant wildfire occurring each year can be considered moderate. The probability of a wildfire causing substantial damage is 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 Tripp County are identified, including critical facilities and infrastructure, major employers, and other resources and activities important to the community. Assets that would play an important role in helping the community prepare for and respond to a hazard event are also included.

Government offices

- Tripp County Courthouse, Winner
- Colome City Office
- New Witten City Office
- Winner City Office

Community facilities

- Colome Athletic Building
- Tripp County 4-H Center

Utilities

- Colome water tower
- Winner water tower
- Tripp County Water User District tanks (located south of Winner)

Medical facilities

- Winner Regional Hospital

Educational facilities

- Colome public school (K-12)
- Winner elementary school
- Winner middle/high school

Other important resources and activities

- Tripp County Historical Museum, Winner
- Elks Rodeo and regional rodeo held in summer at Tripp County Fairgrounds in Winner
- Winner Labor Day celebration

Emergency preparedness and response

- Tripp County Emergency Management Office, Winner
- Tripp County Sheriff's Office, Winner
- Winner Police Department
- Colome Fire Department
- Winner Fire Department
- Tripp County Highway Department, Winner
- Disaster relief shelters in Colome and Winner (see p.52)
- Emergency shelter in Colome, New Witten, and Winner (see p.52)

Hazard Impact Analysis

This section assesses the vulnerability of Tripp 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 digital Flood Insurance Rate Maps were used to identify 100-year flood zones in the county.
- FEMA's HAZUS loss estimation software was used to estimate potential losses from flooding in each community. HAZUS produces a flood polygon and flood-depth grid that represents the 100-year floodplain, with losses calculated using national baseline inventories (buildings and population) at the census block level. It is an especially helpful planning tool for communities that have not been mapped by the National Flood Insurance Program [7].
- The value of buildings within the county was used to estimate potential losses due to winter storms and summer storms (building exposure).
- Population density within the county was used to estimate potential losses due to winter storms and summer storms.
- Data on the population living in wildfire threat 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 Tripp 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 due to a variety of natural hazards.
- Information from the National Drought Mitigation Center's Drought Impact Reporter was used to assess the local impact of droughts.

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

At the conclusion of the vulnerability assessment for each hazard, an attempt is made to determine how vulnerability might change in the future. Factors considered include development trends in the county, which were obtained through an analysis of Census data and population projections, and through discussion with local officials about where housing development and other growth may be likely to occur. Other factors, including the possible impact of climate change, also are considered.

At the end of the chapter, the county's vulnerability to each hazard is summarized. Vulnerability is characterized as either "Low", "Moderate", or "High", based on the results of the risk analysis.

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 of time 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 78 winter storm events, including blizzards, ice storms, heavy snow, and extreme cold events, are shown in the National Climatic Data Center's Storm Events Database for Tripp County through 2024 (see **Table C.2 in Appendix C**). In comparison, the average for South Dakota counties is 104 winter storm events. This indicates Tripp County might be less prone to experiencing bad winter weather than other counties in the state, especially considering Tripp County's land area is almost half again as much as the average South Dakota county.

Past Damage Amounts:

Winter storms have the potential to cause significant amounts of damage. Substantial damage to the Rosebud Electric Cooperative's infrastructure in Tripp County occurred in 2005 and 2010 due to winter storms. Many other winter weather events have caused significant amounts of damage in the county.

Given Tripp County's agriculturally based economy, another method to determine vulnerability is to look at the impact of winter storms on the county's agricultural producers. Farmers typically protect themselves from the impacts of adverse weather and other natural hazards by insuring their crops against losses through multi-peril crop insurance, which is underwritten by the Risk Management Agency, a part of the U.S. Dept of Agriculture. Data on indemnity payouts for crop loss in Tripp County due to various types of winter weather events between 2000 and 2023 was obtained from the Risk Management Agency and is presented in the following table. During this period of analysis, winter weather-related payouts represented approximately 4% of all indemnity payouts in Tripp County.

Table 3.4 – Crop Loss Due to Winter Weather

Year	Frost	Freeze	Cold Winter	Cold Wet Weather
2000		$435	$120,105	
2001			$1,048,991	$1,574
2002	$7,681	$3,294	$83,955	$18,404
2003		$10,913	$21,977	
2004	$6,946	$22,779	$15,789	$1,297
2005	$8,605	$1,990	$18,881	$1,677
2006			$23,811	
2007	$5,091	$34,020	$81,216	$44,714
2008			$46,972	$28,511
2009	$2,792	$74,584	$251,041	$380,538
2010			$71,116	$13,683
2011	$1,262	$91,092	$92,602	$139,704
2012	$53,900		$20,132	
2013			$168,931	$7,938
2014	$8,671	$108,013	$43,644	$98,481
2015	$7,895	$19,166	$551,389	$11,341
2016		$3,538	$23,608	$12,156
2017		$25,189	$154,211	$9,487
2018		$4,462	$54,549	$73,542
2019		$35,638	$77,944	$719,703
2020			$102,409	$112,467
2021		$4,654	$24,252	$2,124
2022			$74,263	
2023			$72,304	$62,067

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

Building Exposure:

The total value of buildings in Tripp County is approximately $660,350,000, according to the South Dakota Hazard Mitigation Plan, which ranks the county 30th among the state's 66 counties. The median figure for South Dakota counties is approximately $606,000,000. The county's building exposure can thus be considered moderate.

Population Density:

Tripp County is sparsely populated, with an average of just 3.5 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. Tripp County would have to be rated low in terms of population density.

Future Vulnerability

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

Summer Storms

All areas of Tripp 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, Tripp 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:

For this analysis, only the number of tornadoes and major hail events (hail at least one inch in diameter) are considered, due to inconsistencies in how the other types of summer storms are recorded in the National Climatic Data Center's Storm Events Database [8]. A total of 30 tornadoes and 49 major hail events were recorded for Tripp County. In comparison, the average number of tornadoes for South Dakota counties is 28 and the average number of major hail events is 57. This would indicate that Tripp County may be similarly prone to experiencing tornadoes but somewhat less prone to experiencing damaging hail than other counties in the state.

Past Damage Amounts:

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

As with winter storms, another method to determine the county's vulnerability to summer storms is to look at the impact of such storms on the county's agricultural producers. Summer storms can cause a lot of damage to cropland, especially when they are accompanied by hail. Data on indemnity payouts for crop loss in Tripp County due to hail as well as high wind events between 2000 and 2023 was obtained from the Risk Management Agency and is presented in the following table. During this period of analysis, summer storm-related payouts represented approximately 6% of all indemnity payouts in Tripp County.

Table 3.5 – Crop Loss Due to Severe Summer Weather

Year	Hail	High Wind		Year	Hail	High Wind		Year	Hail	High Wind
2000	$90,956	$569		**2008**	$100,153	$28,974		**2016**	$294,479	$34,030
2001	$8,534	$4,840		**2009**	$781,646	$6,006		**2017**	$2,506,024	$70,192
2002	$392,910	$25,361		**2010**	$228,355	$47,548		**2018**	$13,459	
2003	$41,883	$10,570		**2011**	$5,332	$12,396		**2019**	$970,933	
2004	$950	$52,686		**2012**	$7,536	$24,493		**2020**	$7,044	$22,795
2005	$1,070	$15,633		**2013**	$14,698	$218,485		**2021**		$405,553
2006	$997			**2014**	$224,858	$14,171		**2022**	$94,404	$387,040
2007	$97,635	$14,350		**2015**	$81,062	$32,916		**2023**	$19,836	$21,627

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

Building Exposure:

The total value of buildings in Tripp County is approximately $660,350,000, according to the South Dakota Hazard Mitigation Plan, which ranks the county 30th among the state's 66 counties. The median figure for South Dakota counties is approximately $606,000,000. The county's building exposure can thus be considered moderate.

[8] The analysis goes back to 1960 for tornadoes and 2000 for hail events.

Population Density:

Tripp County is sparsely populated, with an average of just 4.1 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. Tripp 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 community level. The following table shows that the housing stock in each of the communities is older than the state average, and an assumption can be made that some of the older houses may not be constructed as sturdily as a newer home, thus putting the occupants at higher risk to a powerful summer storm, such as a tornado or other high wind event. The impact on human life might be somewhat worse in New Witten, given the high percentage of mobile homes there.

Table 3.6 – Housing Stock Characteristics

Community	Housing Stock Built Prior to 1960	Housing Stock Built Since 2000	Mobile Homes
Colome	31.3%	10.2%	13.6%
New Witten	30.2%	3.8%	30.2%
Winner	40.5%	7.4%	12.7%
South Dakota	*26.4%*	*31.5%*	*6.4%*

Source: 2020 US Census (DP04 Selected Housing Characteristics)

Future Vulnerability

Looking ahead, the county's expected decline in population suggests that vulnerability to summer storms is not likely to increase in the future. Regarding the impact of climate change, the South Dakota Hazard Mitigation Plan cites the Climate Science Special Report from 2017, which states that 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 South Dakota.

Flooding

Like all counties in South Dakota, Tripp is vulnerable to flooding. However, there are no repetitive loss or severe repetitive loss properties in the county. Because of the specific nature of flooding, the county's vulnerability to flooding will be analyzed first on a general county-level basis, and then specifically for each community. Given the degree to which flooding is geographically based, this approach made the most sense to the planning team.

General Flood Vulnerability

According to the HAZUS analysis run for the South Dakota Hazard Mitigation Plan (see Table 3-45 of that plan), the potential building damage loss from flooding in Tripp County is $3,470,000, whereas the median figure for all South Dakota counties is approximately $2,800,000. The building damage loss ratio (the percent of the total building inventory value that could be damaged from flooding in any given year) of 0.9 percent is slightly higher than the median value for South Dakota counties of 0.8 percent. The potential displaced population in Tripp County was determined to be 265 people, slightly higher than the median value of South Dakota counties of approximately 255 people.

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. Data on indemnity payouts for crop loss in Tripp County due to flooding, as well as excess moisture/precipitation, between 2000 and 2023 was obtained from the Risk Management Agency and is presented in the following table. During this period of analysis, flood-related payouts represented about 12% of all indemnity payouts in Tripp County.

Table 3.7 – Crop Loss Due to Flooding

Year	Flooding	Excess Moisture/ Precip		Year	Flooding	Excess Moisture/ Precip		Year	Flooding	Excess Moisture/ Precip
2000		$106,366		**2008**		$355,681		**2016**		$591,392
2001	$528	$680,255		**2009**		$1,129,865		**2017**		$131,184
2002		$57,164		**2010**	$534	$473,122		**2018**		$1,448,490
2003		$39,545		**2011**		$12,129		**2019**		$5,847,109
2004		$55,777		**2012**		$37,693		**2020**	$3,005	$2,685,140
2005		$214,680		**2013**		$266,918		**2021**		$9,199
2006		$11,133		**2014**		$83,081		**2022**		$84,659
2007		$84,572		**2015**		$355,681		**2023**		$41,757

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

2019 was probably the worst year ever in terms of flooding's impact on South Dakota's agricultural producers. The state ranked first in the nation with almost 4 million acres of farmland prevented from being planted due to flooding, more than double the next nearest state. However, Tripp County was not impacted as much as most other counties in the state. Approximately 42,300 acres of land in Tripp County were not planted due to flooding in 2019, which was 6% of land that would otherwise have been planted, ranking the county 42nd in South Dakota.

Tripp County also is vulnerable to flooding due to dam failure, primarily because of the Beaulieu Dam, which is located roughly midway between Winner and Colome (see **Figure**

2.1). Built in 1947, the dam has a normal storage capacity of 270 acre-feet, with a maximum capacity of 465 acre-feet. One property located about two miles downstream of the dam is within the predicted area of inundation if the dam failed, and another property lies just outside the flood area. According to the dam's preparedness plan, floodwater would reach the property in 20 minutes. The dam, which had its spillway repaired in 2001 and has had some additional work done to it since then, is in good condition.

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 number of housing units at risk of flooding and the assessed value of residential dwellings and commercial buildings at risk. The following table summarizes the results of the analysis (note that both analyses may have included a small amount of land outside the communities, in which case some of the values in the table could be somewhat inflated).

Table 3.8 – Community Flood Loss Estimation

Community	Building Structural Damage	Debris Generated (Tons)	Households Displaced	People Needing Shelter	Housing Units at Risk	Assessed Value of Property at Risk
Colome	$344,000	400	7	0	8	$286,000
New Witten	$3,300,000	3,073	31	1	10	$709,000
Winner	$14,100,000	14,215	262	4	54	$5,674,000

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

Flood risk was also analyzed using the RiskFactor website, which uses a probabilistic flood model that shows any location's risk of flooding from rain, rivers, tides, and storm surges. According to the RiskFactor analysis, there is some flood risk in each of the communities. There is major residential flood risk in New Witten, moderate risk in Colome, and minor risk in Winner. Approximately 40% of residential properties are at risk in New Witten, 13% of residential properties are at risk in Colome, and 5% of residential properties are at risk in Winner.

Future Vulnerability

Looking ahead, the population of Tripp County is expected to continue declining, and no major development has occurred anywhere in the county since the current plan was developed, both of which indicate that the county's vulnerability to flooding is not likely to increase in the future. One factor that may increase the county's vulnerability to flooding 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 Tripp 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, Tripp County is vulnerable to drought. The biggest impact of drought in Tripp County is in the agricultural sector, which is not surprising, given the county's heavy reliance on farming. Non-irrigated cropland is most susceptible to drought, and yield reductions due to moisture shortages can be aggravated by wind-induced soil erosion. Fortunately, most farmers in Tripp County have crop insurance, which helps lessen the financial impact of droughts and other natural disasters, and modern agricultural practices, such as no-till farming and the development of more drought-tolerant crops, can help farmers better withstand years of below average rainfall.

Data on indemnity payouts for crop loss in Tripp County due to drought and heat between 2000 and 2023 was obtained from the Risk Management Agency and is presented in the following table. During this period of analysis, drought-related payouts accounted for about 70% of all indemnity payouts in Tripp County, by far more than any other hazard. It is safe to say that drought has a major impact on Tripp County farmers [9].

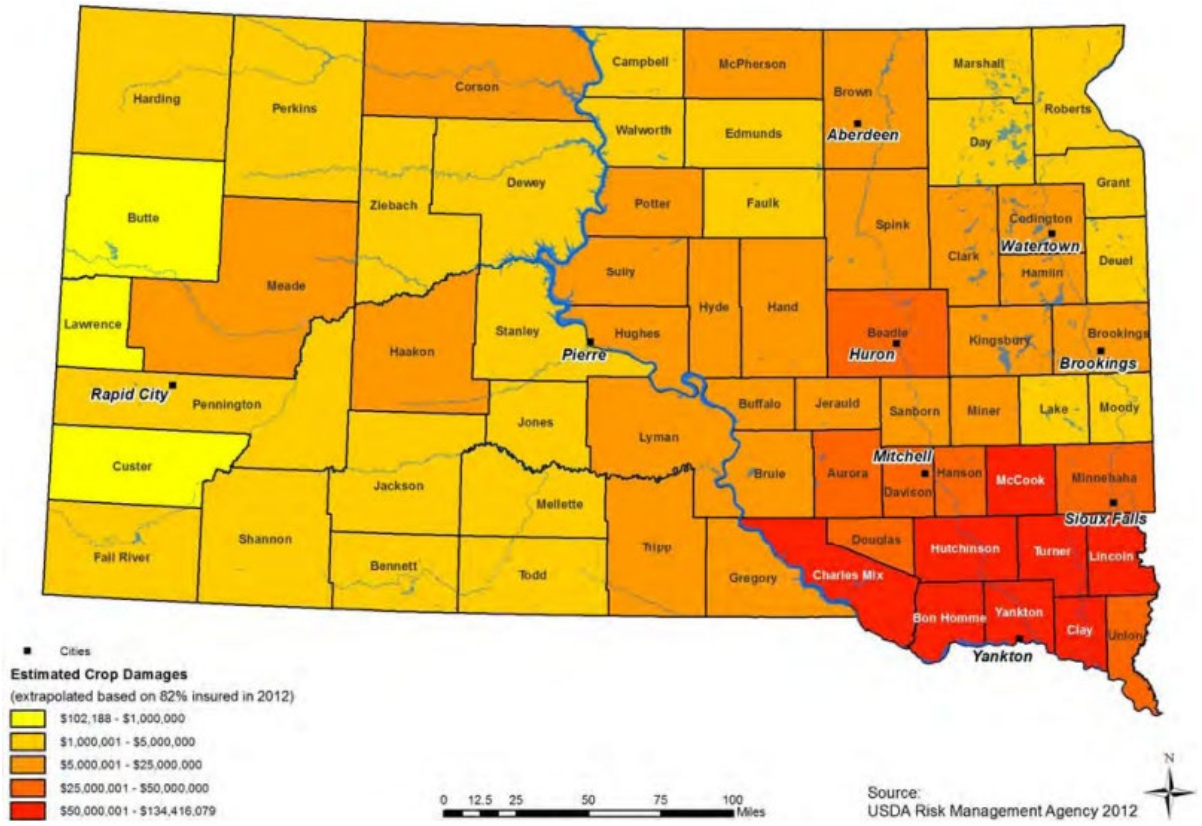
Table 3.9 – Crop Loss Due to Drought and Heat

Year	Drought	Heat		Year	Drought	Heat		Year	Drought	Heat
2000	$2,835,842	$141,310		**2008**	$735,707	$96,254		**2016**	$285,113	$11,512
2001	$698,763	$23,549		**2009**	$112,519	$2,388		**2017**	$3,753,054	$28,906
2002	$7,241,434	$419,526		**2010**	$16,336	$44,161		**2018**	$181,076	$7,030
2003	$2,396,798	$84,360		**2011**	$19,063	$10,983		**2019**		$7,467
2004	$3,916,612	$11,526		**2012**	$17,199,332	$1,318,008		**2020**	$174,139	$2,572
2005	$1,319,040	$14,404		**2013**	$1,078,187	$4,227		**2021**	$14,104,326	$1,892,187
2006	$6,053,483	$47,611		**2014**	$481,946	$34,281		**2022**	$18,163,644	$1,924,971
2007	$300,403	$62,144		**2015**	$470,686	$12,418		**2023**	$1,941,664	$254,963

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

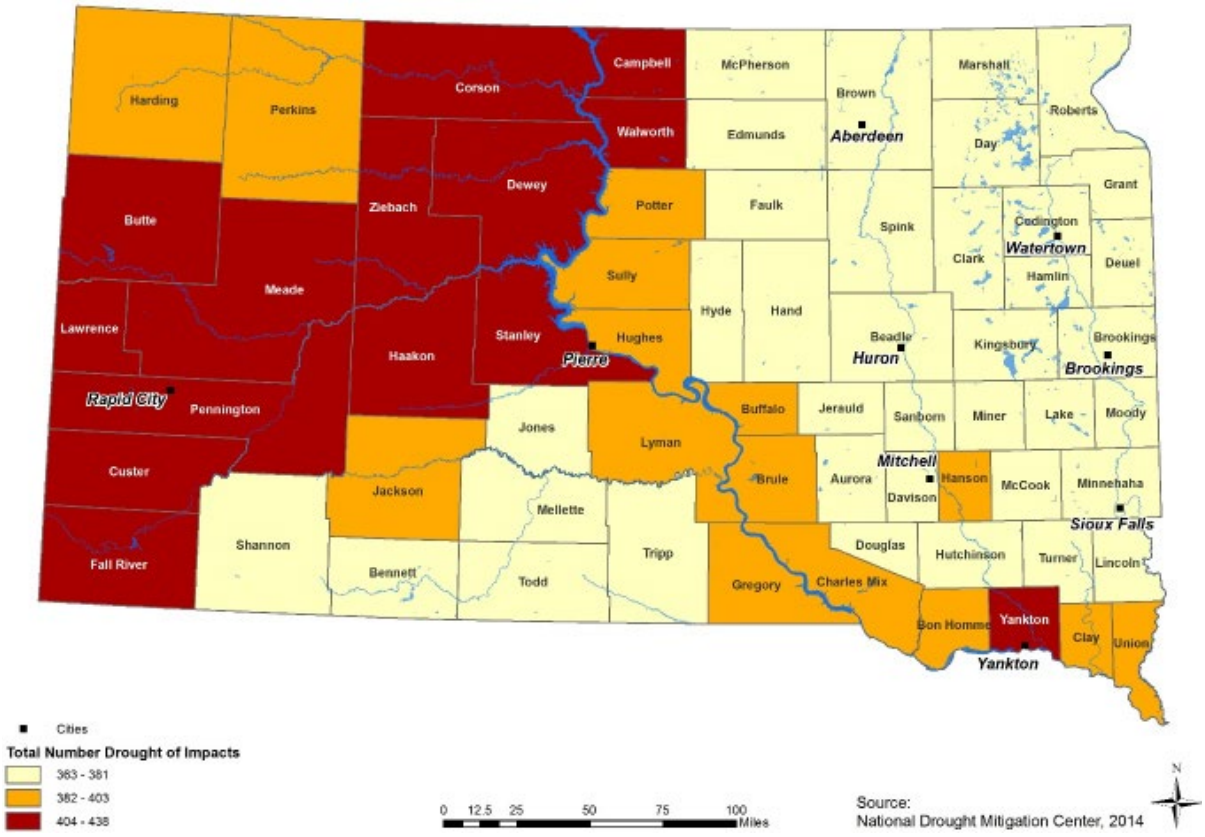
The 2012 drought had a major impact on the state's agricultural producers. Tripp did not suffer as much crop loss that year as counties in the southeastern part of South Dakota did, but the impact was still considerable. The figure on the next page, as reproduced from the South Dakota Drought Mitigation Plan, shows the 2012 drought's impact statewide.

[9] 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.



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. Tripp County's average annual loss from drought for the 2000 – 2014 period was $3,407,512, compared to a total crop value of $86,671,000, resulting in a loss ratio of 3.9%. In comparison, the average loss ratio figure for South Dakota counties was 3.1%. The authors of the South Dakota Drought Mitigation Plan assigned a "Moderate" vulnerability rating for Tripp County for this measure of drought vulnerability.

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



Future Vulnerability

Vulnerability to drought may increase in coming years if current land use trends continue and more marginal land in the county is brought into agricultural production. Climate change also may increase the frequency and severity of droughts in the future. The expected increase in Tripp 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 Tripp County was analyzed using two different sources. According to the U.S. Forest Service's Wildfire Risk to Communities website, Tripp County's overall wildfire risk is considered medium, higher than 66% of the counties in the United States and 59% of South Dakota's counties. Information from the SILVIS Lab at the University of Wisconsin shows a total of 71 housing units located in the Wildland-Urban Interface, which are locations vulnerable to wildfires because of a combination of dense housing and vegetation. These 71 housing units represent 2.6% of the total housing stock in Tripp County. For comparison, the statewide figure is 25.9%. The following table summarizes the overall risk in Tripp County.

Table 3.10 – Housing Stock in Wildfire Risk Zones in Tripp County

Houses At Risk	Median Housing Value in Tripp Co.	Total Value of Homes at Risk
71	$128,100	$9,095,100

Sources: silvis.forest.wisc.edu/data/wui-change; 2020 U.S. Census/American Community Survey

Future Vulnerability

Looking ahead, the population of Tripp County is expected to continue to decline, so vulnerability to wildfires is not likely to increase. One factor that could increase wildfire vulnerability is the continued spread of cedar trees. These trees are spreading quickly in Tripp 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 Tripp County and each of the participating jurisdictions to each of the hazards profiled is summarized. Maps are presented at the end of the section to augment the analysis, showing areas vulnerable to flooding; the graphic on page 30 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 more or less equally.

- **Winter Storms**

Tripp County's vulnerability to winter storms can be considered at least moderate. The authors of the South Dakota Hazard Mitigation Plan assigned Tripp a rating of Moderate when considering prior winter storm events in the county, the county's building exposure, and the county's population density. The hazard assessment section of the LEOP gives a rating of Significant to winter storms. 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 of Winner or Colome puts them at increased risk. If roads are blocked by snow for extended periods of time, residents outside these communities may not have access to groceries, medical supplies, or other essential items. 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**

Tripp County's vulnerability to summer storms can be considered moderate. The authors of the South Dakota Hazard Mitigation Plan assigned Tripp a rating of Moderate when considering prior tornado events in the county, the county's building exposure, and the county's population density. The hazard assessment section of the LEOP gives a rating of Significant to high wind and tornado events. All areas of the county are vulnerable to summer storms. Although the county's population density is low and infrastructure development is not extensive, a large amount of cropland in the county is vulnerable to the effects of hail and other violent summer weather. Vulnerability may be somewhat higher in New Witten, where 30% of the housing stock consists of mobile homes, which can be overturned by winds of 60 to 70 miles per hour if they are not anchored properly. Winner enforces building codes, which helps mitigate vulnerability to summer storms accompanied by high winds.

- **Flooding**

The overall vulnerability of Tripp County to flooding can be described as moderate. According to the vulnerability analysis conducted for the South Dakota Hazard Mitigation Plan, Tripp's estimated flood loss is in the middle tier of counties. The hazard assessment section of the LEOP gives a rating of Limited to flooding. Much of the vulnerability is to cropland and to rural county roads, especially near the White River. Some vulnerability also exists because of the Beaulieu Dam. Flooding in 2019 resulted in 26 of the county's townships submitting a declaration for FEMA assistance, and Tripp County Water User District reported damage to three of their waterlines. Following is a summary of vulnerability in each of the communities:

Colome is vulnerable to flooding, as indicated in **Table 3.8**. Most of the risk is on the east side of the city, where several residential properties are located in a flood hazard zone (see **Figure 3.1**). The RiskFactor analysis found moderate flood risk to residential properties in the community. No serious flooding has ever occurred in Colome, although heavy rain events typically cause water to pool temporarily in low-lying areas, resulting in minor, localized flooding. Flooding in 2019 washed out a culvert on Main Street, damaged the city's sewage lagoon, and had a minor impact on residential property.

New Witten is quite vulnerable to flooding, as shown in **Table 3.8**. HAZUS identified most of the community south of Conway Avenue as flood prone (see **Figure 3.2**). Non-residential properties in this area include the fire hall and the town's grain elevators. The RiskFactor analysis found major flood risk to residential properties in the community. Flooding in 2019 caused some road damage and had a minor impact on residential property.

Winner is quite vulnerable to flooding, as shown in **Table 3.8**. HAZUS identified parts of the northeast side of the city and a large area on the western fringe of the community as vulnerable to flooding (see **Figure 3.3**). In addition to residential property in these areas, many businesses and some city property, including the Winner fire hall, are at risk. The community is particularly vulnerable because groundwater easily infiltrates into the city's sewer system, which largely consists of old clay piping, when the subsurface becomes soaked with water during wet periods.

Such infiltration has resulted in sewer backups in low-lying areas of the community on many occasions. The City has taken action in recent years to replace some of the older sewer pipe, which has improved the situation. The RiskFactor analysis found minor flood risk to residential properties in the community. Flooding in 2019 had varying degrees of impact on approximately 50% of the city's residential property, with many homes experiencing significant water in their basements.

- **Drought**

Tripp County's vulnerability to drought can be considered at least moderate and is certain to continue for the foreseeable future. The hazard assessment section of the LEOP gives a rating of Moderate to Significant to drought. The impact is primarily to the agricultural sector, where serious losses have occurred. The South Dakota Hazard Mitigation Plan assigned a vulnerability rating of Moderate for Tripp County in terms of drought's impact to crops between 2000 and 2014. Residential and commercial impacts of drought are minor, as the water supply is considered reliable and secure, but during the extreme drought of 2012 the City of Winner implemented restrictions on non-essential water use.

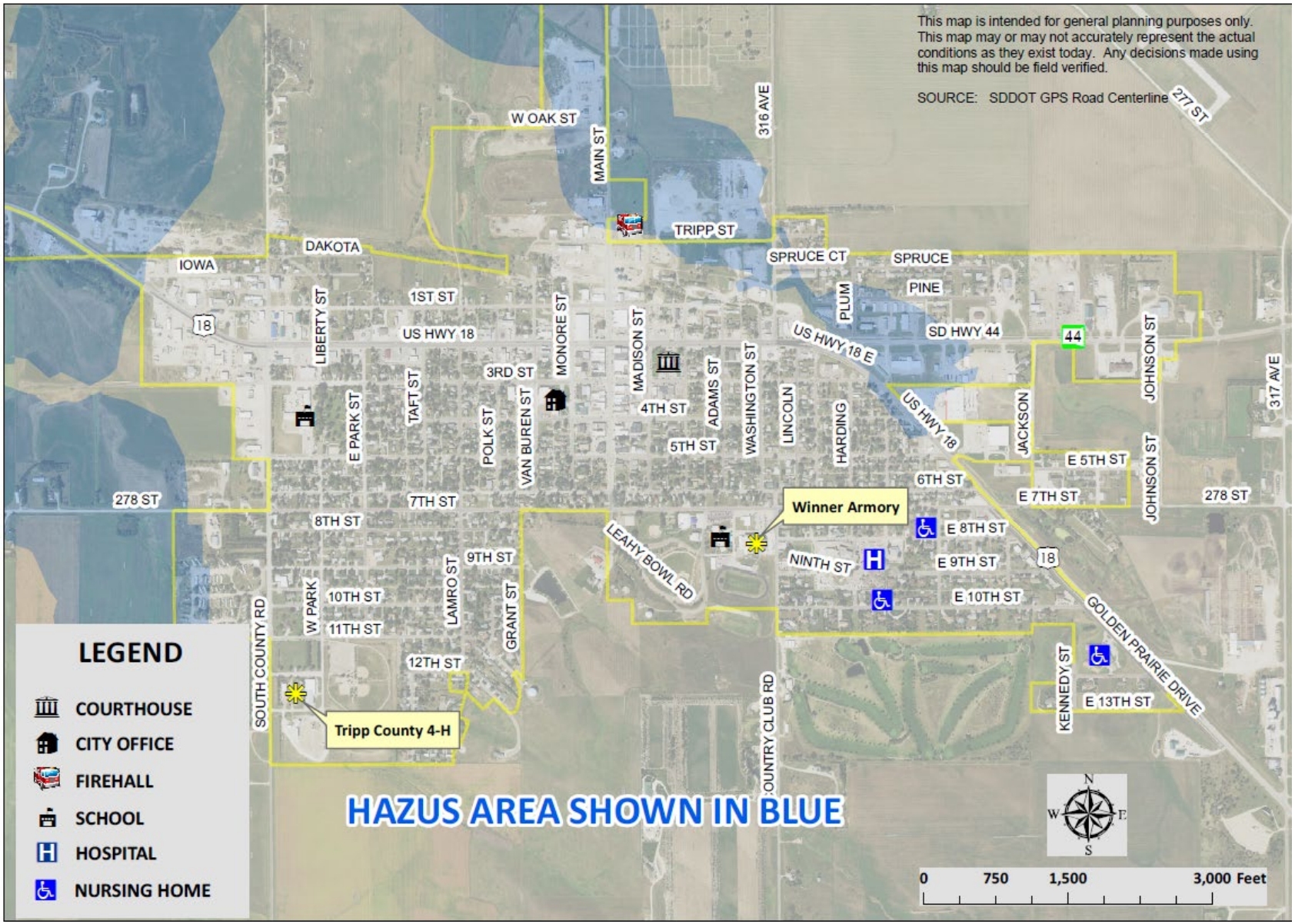
- **Wildfire**

The overall vulnerability to wildfire in Tripp County can be considered moderate. The hazard assessment section of the LEOP gives a rating of Moderate to wildfire. Approximately 3% of the county's population lives in a location vulnerable to wildfire, well below the statewide figure of 26%. Although no truly destructive wildfire has ever been recorded in the county, several fairly large fires have been reported in the county since 2000, at least one of which caused significant damage. The risk assessment conducted for the South Dakota Hazard Mitigation Plan assigned a rating of Low for Tripp County regarding aggregate wildland fire vulnerability.

Figure 3.1 – Colome

Figure 3.2 – New Witten

Figure 3.3 – Winner



CHAPTER IV
RISK MITIGATION STRATEGY

Background

The previous chapter described the types of hazards most likely to impact Tripp 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 Tripp County. For the purposes of this plan, these resources are divided into regulatory mechanisms and other capabilities.

Regulatory Mechanisms

Regulatory mechanisms and authorities in Tripp County are somewhat limited. The following table summarizes the existing policies, programs, and resources within Tripp County that can support the local mitigation strategy.

Table 4.1 – Regulatory Mechanisms

Item	Notes
Tripp County Burn Ban Ordinance	This ordinance, which was adopted in 2025, prohibits open burning during fire danger periods. Burn bans are issued by the county commission after consultation with local fire and law enforcement officials.
Colome Floodplain Ordinance	Regulates development within flood hazard areas (see **Table 4.2**).
Winner Zoning Ordinance	The ordinance, which is based on the City's comprehensive plan, controls where growth and development can occur within the city.
Winner Building Code	Winner enforces the International Building Code, 2018 edition, which regulates how new residential and commercial buildings are constructed.

Tripp County, Colome, and Winner participate in the National Flood Insurance Program (NFIP). The Town of New Witten does not participate in the program because no Flood Insurance Rate Map or Flood Hazard Boundary Map has been issued for the jurisdiction, nor are there any repetitive loss structures within the community. Currently there is one active National Flood Insurance Program policy in Tripp County with a value of $60,000. The following table provides information on NFIP participation in the county.

Table 4.2 – National Flood Insurance Program Participation

Jurisdiction	CID	Current Effective Map Date	Reg-Emer Date	Appointed Designee	Implementation/Enforcement
Tripp Co.	460289	(NSFHA)	04/25/97	N/A	The County has been a part of the NFIP program since 1997, but it has not been mapped and therefore there are no floodplain regulations.
Colome	460084	05/01/86	05/01/86	Finance officer	Requires floodplain development permit, which must include lowest floor elevation, certification that flood-proofing methods for non-residential construction meet the ordinance's criteria, and the extent to which any watercourse will be altered by the development. New construction and substantial improvements of residential structures must have the lowest floor (including basement) elevated to or above the base flood elevation.
New Witten	*(The community does not participate in the NFIP program)*				
Winner	460303	(NSFHA)	06/08/98	N/A	The City has been a part of the NFIP program since 1998, but it has not been mapped and therefore there are no floodplain regulations.

Other Capabilities

Other resources and capabilities exist within Tripp 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

	Tripp County	Colome	New Witten	Winner
ADMINISTRATIVE & TECHNICAL				
Emergency management staff	X			
Planning & zoning staff	X			X
Engineering/Public works staff		X		X
Floodplain management staff	X	X		X
Code enforcement staff				X
FINANCIAL				
Budgeting process	X	X	X	X
Levy/Project surcharge for specific purposes				X
EDUCATION AND OUTREACH				
StormReady Program	X			
Severe Weather Awareness Week	X			
Social media	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, Tripp County has an emergency manager, but the position is less than half time. As the largest community within the county, the City of Winner has the most technical staff expertise.

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 Tripp County, the budgeting process is where the "rubber meets the road" if hazard mitigation is to be achieved [10]. 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 Tripp County is limited, but efforts are being made. The Tripp 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. Colome and Winner send out text alerts when severe weather is forecasted.

There are many physical assets in Tripp 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. Each siren is tested regularly, each has a backup source of power, and each can be activated remotely by local officials or from the 911 dispatch center in Winner. Public facilities that can serve as emergency shelter from a tornado or other severe weather include the basement of the courthouse in Winner, the Colome Athletic Building, and a small tornado safe room structure in New Witten (acquired with FEMA hazard mitigation assistance funds) that can shelter up to about 15 people. Facilities that can provide short-term relief following a disaster include the St Isidore Church in Colome, which has the capacity to shelter approximately 100 people, the Winner Armory, which has a backup generator and can shelter approximately 200 people, and the Tripp County courthouse in Winner, which has a generator and can shelter about 100 people.

[10] The City of Winner continues to make improvements to its stormwater and electrical systems. The city typically budgets around $200,000 for electrical system improvements, mainly for burying overhead powerlines. In an average year, about 5,000 feet of lines are buried.

Despite limited resources, Tripp County and each of the jurisdictions participating in this plan can enhance their mitigation capabilities. For instance, the City of Winner has just updated its comprehensive plan and will begin revising its zoning ordinance. A good way for the jurisdictions to expand their capabilities is through their partnership with the Planning & Development District III office. District III has decades of experience working on various planning and community development activities within Tripp County, and over a decade of experience working with the county's emergency management office. District III wrote Tripp County's current hazard mitigation plan, and its staff has helped develop applications to fund mitigation projects within the county. After funds have been awarded for a project, District III can help ensure that the project is completed satisfactorily and that all FEMA grant award conditions and requirements are followed.

Mitigation Goals and Objectives

For this plan update, there were no significant changes in community priorities, as the planning team decided to keep the goals and objectives listed in the current mitigation plan. This decision was based in part on the results of the survey, which identified the protection of critical facilities as the highest mitigation priority. The team also wanted to ensure that the goals and objectives of this plan supported the priorities of the other local planning resources. The following goals were identified:

- Minimize loss of life and injuries from hazards.
- 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.
- Minimize development in areas that are prone to wildfires.

Mitigation Action Plan

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

Table 4.4 – Progress on Implementing Previously Proposed Actions

Mitigation Action	Hazard	Current Status
TRIPP COUNTY		
Powerline burial.	Winter Storm	No progress - lack of funds.
Drainage improvements along county and township roads	Flooding	Replace or enlarge culverts, elevate roads, clean waterways, etc. Some progress has been made.
CITY OF COLOME		
Storm shelter at the city park.	Summer Storm	No progress - lack of funds.
Generator acquisition for well field.	Winter Storm	No progress - lack of funds
Drainage improvements in the city.	Flooding	No progress - lack of funds.
CITY OF WINNER		
Powerline burial.	Winter Storm	About 25% of the power lines have been buried, but much work remains.
Generator for city hall complex.	Winter Storm	No progress - lack of funds.
Safe room/storm shelters for the city.	Summer Storm	No progress - lack of funds.
Floodplain mapping for the city.	Flooding	A stormwater study was done in 2016.
Shade trees to prevent wind erosion.	High Wind	Some progress, but no longer a high priority.

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 are those that can be completed within a few years, while Long term actions may take several years or more to accomplish due to cost or other factors.
- The estimated cost to implement the action.
- Resources that may be available to help fund the action.
- 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?

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

Financial considerations are critical, because neither Tripp 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:

<u>FEMA grant programs</u>

- Hazard Mitigation Grant Program (HMGP)
- Flood Mitigation Assistance (FMA)
- Public Assistance Section 406 funds

<u>Other grant and loan programs/sources</u>

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

- South Dakota Community Development Block Grant program
- South Dakota State Homeland Security Program
- South Dakota Dept. of Agriculture and Natural Resources
- South Dakota Dept. of Transportation
- Natural Resource Conservation Service
- Western States Wildland Urban Interface Grant Program
- Clean Water Act Section 319 Grant program
- High Hazard Potential Dam Program

Table 4.5 - Proposed Mitigation Actions

TRIPP COUNTY ACTIONS	PRIORITY	PROJECT LEAD	TIME	COST	FUNDING	NOTES
Continue participation in the National Flood Insurance Program	HIGH	Director of Equalization	SHORT	N/A	N/A	The DOE will contact the South Dakota floodplain coordinator to learn more about the NFIP program.
Improve drainage along county and township roads	HIGH	Highway Superintendent	LONG	Unknown	DOT; HMGP	County may pursue grant funding if a project appears to be grant eligible.
Develop a prescribed burning plan with landowners to reduce spread of cedar trees	HIGH	County commission	MID	Unknown	WUIGP; Local funds	County may budget for this or pursue grant funding.
Acquire generator for 4-H Center Building	HIGH	Emergency Mgmt Director	MID	Unknown	HMGP	County intends to pursue grant funding.
Put up snow fences or plant trees to limit blowing & drifting of snow over roads	MID	Highway Superintendent	MID	Unknown	DOT; Local funds	County may budget for this or pursue grant funding.
Construct tornado shelter in Ideal	MID	County commission	MID	Unknown	HMGP	County may pursue grant funding.
COLOME ACTIONS	**PRIORITY**	**PROJECT LEAD**	**TIME**	**COST**	**FUNDING**	**NOTES**
Continue participation in the National Flood Insurance Program	HIGH	Finance Officer	SHORT	N/A	N/A	The finance officer will contact the South Dakota floodplain coordinator to learn more about the NFIP program.
Generator acquisition for well field	HIGH	City council	MID	≈$30,000	HMGP	City may pursue grant funding.
Construct tornado shelter	HIGH	City council	MID	Unknown	HMGP	City may pursue grant funding for a shelter to be constructed in the city park or elsewhere.
Upgrade fire department capabilities	HIGH	Fire chief	MID	Unknown	AFG	The City may pursue grant funding for training, equipment upgrades, or vehicle purchase.
WINNER ACTIONS	**PRIORITY**	**PROJECT LEAD**	**TIME**	**COST**	**FUNDING**	**NOTES**
Continue participation in the National Flood Insurance Program	HIGH	Finance Officer	SHORT	N/A	N/A	The finance officer will contact the South Dakota floodplain coordinator to learn more about the NFIP program.

Upgrade electrical distribution system.	HIGH	Electric system superintendent	MID	Unknown	HMGP	City may pursue grant funding to bury additional overhead power lines if a project appears to be grant eligible.
Construct tornado shelter	HIGH	City council	MID	Unknown	HMGP	City may pursue grant funding for a multi-purpose facility.
Upgrade stormwater infrastructure	HIGH	Utility manager	LONG	Unknown	DANR; HMGP	City may pursue grant funding if a project appears to be grant eligible.
Upgrade fire department capabilities	HIGH	Fire chief	MID	Unknown	AFG	The City may pursue grant funding for training, equipment upgrades, or vehicle purchase.

Potential Resources for Funding Assistance:

AFG FEMA Assistance to Firefighters Grant Program
HMGP FEMA Hazard Mitigation Grant Program
WUIGP Wildland Urban Interface Grant Program
DANR South Dakota Dept of Agriculture and Natural Resources
DOT South Dakota Dept of Transportation

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 Tripp 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 Tripp County, City of Colome, and City of Winner websites, and a hard copy is available for review at the Tripp County courthouse and in each city office. Going forward, Tripp County and each of the participating 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 Tripp 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 Tripp 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 Tripp County Emergency Management Director is ultimately responsible for implementing this plan. The director will work under the direction of the Tripp County Commission and with the support of the Tripp 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 also will play a critical role in carrying out the action plan by identifying and

prioritizing the actions they want to pursue, allocating resources for their implementation, and applying for funding assistance as needed.

An important part of implementing the plan is plan monitoring and evaluation, which will be performed by the Tripp County Emergency Management Director with the support of the LEPC. The plan will be reviewed 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.

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

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

- Occurrence of a significant disaster event – Serious events can reveal flaws in local jurisdictions' disaster preparedness plans. The 9/11 terrorist strikes are a dramatic example of this type of event.
- Change in the nature or magnitude of risks – Changing environmental conditions can be significant enough to make jurisdictions reevaluate their mitigation strategy. As previously discussed, climate change may increase the County's vulnerability to certain types of hazards.
- Changes in development – Population change and increased development in sensitive areas can impact risk.
- Change in local priorities – Local priorities regarding mitigation projects can change for a number of reasons. Regular meetings between the Tripp County commission and the local township boards are one way in which the county stays current on the townships' needs regarding their roads, bridges, and other infrastructure.
- Funding availability – The availability of money often determines whether an action can be implemented. For example, local budget cuts can delay, or prevent altogether, a mitigation project's implementation. On the other hand, grant opportunities for specific types of mitigation projects may argue for their implementation.
- Other factors – Many other factors can have an impact on hazard mitigation efforts. Political realities, including changes in local leadership, can influence local mitigation strategies. Changes in laws and regulatory requirements may make certain mitigation actions more or less feasible or desirable. Advances in

technology may make it possible in the future to address certain types of hazards more effectively or at lower cost.

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

Tripp County and each of the participating jurisdictions will integrate relevant information and strategies from this plan into their planning mechanisms and development regulations. The process of integrating the plan will look different in each of the communities, but there are some commonalities. For instance, each jurisdiction prepares an annual budget. Those communities that are interested in seeking funds for hazard mitigation projects 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.

Following are the local planning mechanisms into which information from this plan will be integrated. A summary of the process by which integration is expected to occur is provided.

- Tripp County Highway Plan – the highway plan is developed by the Tripp 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.

- Colome Floodplain Ordinance - the Colome floodplain coordinator will review the floodplain ordinance annually or as needed after a significant flood event. This review process will help ensure the ordinance does not conflict with anything in this plan regarding development in areas at risk of flooding.
- Winner Comprehensive Plan and Zoning Ordinance – working with the city planning board, the Planning & Development District III office has just updated the comprehensive plan and will begin updating the zoning ordinance in the near future. Relevant information acquired through the development of this plan will be integrated into the zoning ordinance. For example, if this plan identifies certain areas as unsuitable for development due to environmental hazards, this will be reflected in the zoning ordinance.
- Winner Electric System Capital Improvements Plan – the CIP is developed by an outside consultant working with the City's electrical superintendent. The plan outlines a schedule for the implementation of major capital needs projects for the next 10 years. City staff responsible for the CIP will be able to utilize the knowledge gained during the development of this plan to identify capital projects that may be eligible for FEMA funding.

It must be acknowledged that little progress has been made to integrate Tripp County's current mitigation plan into other local planning mechanisms, other than the inclusion of some aspects of the plan into the Comprehensive Economic Development Strategy (CEDS) for the Planning & Development District III region, which includes Tripp County. To improve this situation, 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 Tripp County Emergency Management Director, who will continue to reach out to each community at least annually to review their hazard mitigation needs and priorities.

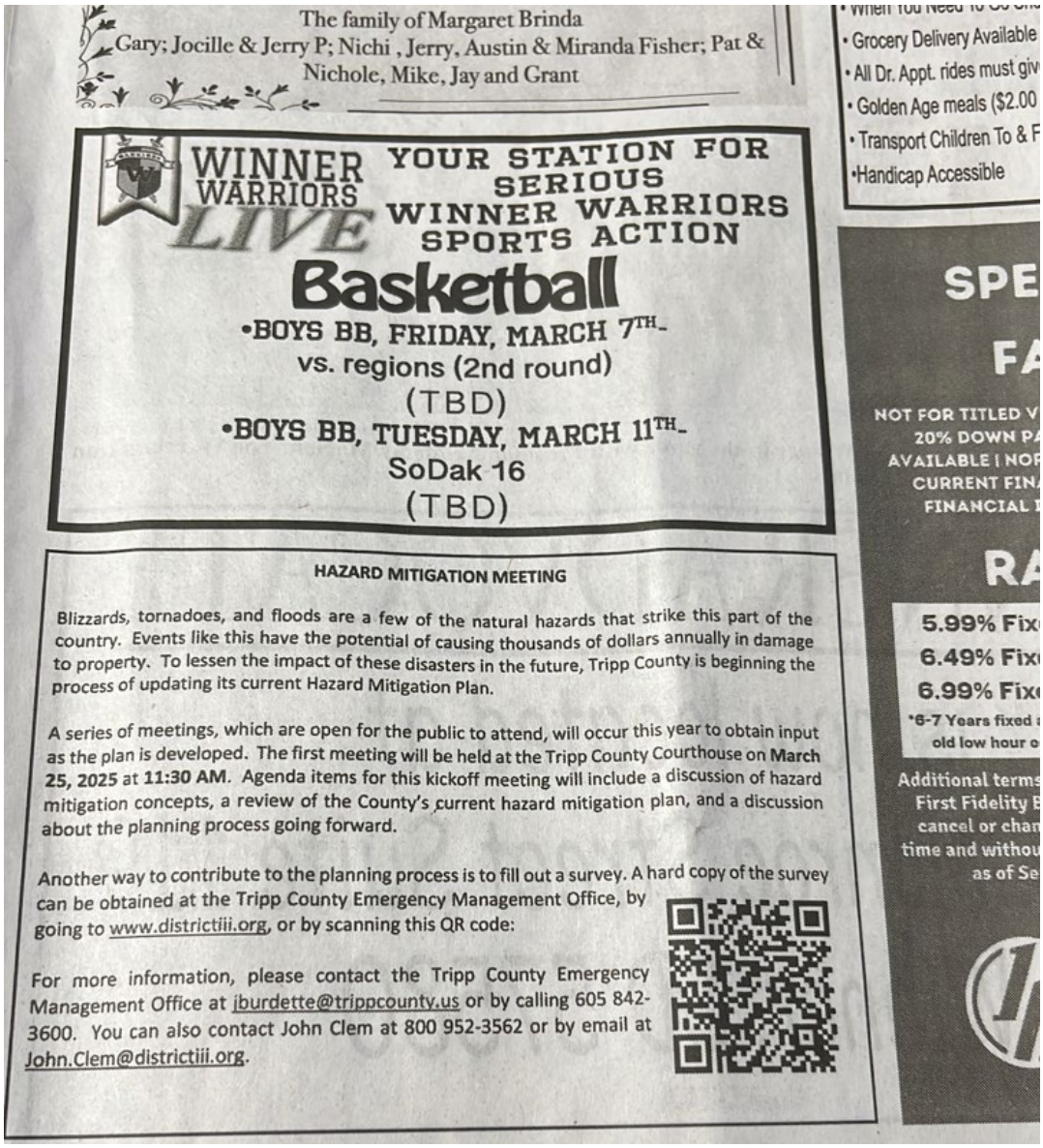
APPENDICES

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

APPENDIX A: Outreach Effort

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

Press Release in Winner *Advocate* Prior to First Meeting:



The family of Margaret Brinda
Gary; Jocille & Jerry P; Nichi , Jerry, Austin & Miranda Fisher; Pat & Nichole, Mike, Jay and Grant

WINNER WARRIORS LIVE
YOUR STATION FOR SERIOUS WINNER WARRIORS SPORTS ACTION

Basketball

•BOYS BB, FRIDAY, MARCH 7TH-
vs. regions (2nd round)
(TBD)
•BOYS BB, TUESDAY, MARCH 11TH-
SoDak 16
(TBD)

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, Tripp 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 Tripp County Courthouse on **March 25, 2025** at **11:30 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 hard copy of the survey can be obtained at the Tripp County Emergency Management Office, by going to www.districtiii.org, or by scanning this QR code:

For more information, please contact the Tripp County Emergency Management Office at jburdette@trippcounty.us or by calling 605 842-3600. You can also contact John Clem at 800 952-3562 or by email at John.Clem@districtiii.org.

• Grocery Delivery Available
• All Dr. Appt. rides must giv
• Golden Age meals ($2.00
• Transport Children To & F
•Handicap Accessible

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Press Release in Winner *Advocate* Before Final Meeting:

Survey Poster

PUBLIC PARTICIPATION NEEDED!

TRIPP COUNTY

HAZARD MITIGATION PLAN PUBLIC SURVEY

The Tripp 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. Tripp County is seeking feedback from stakeholders and the public to incorporate into the plan.

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

A hazard mitigation plan is the representation of the jurisdiction'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 Tripp County to reduce negative impacts from future disasters on lives, property, and the local economy. Efficient hazard mitigation planning can significantly reduce the physical, financial, and emotional losses caused by natural disasters.

TAKE THE SURVEY

www.districtiii.org

PUBLIC PARTICIPATION IN HAZARD MITIGATION PLANNING

Public participation in the Tripp 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 Tripp County and the participating municipalities eligible to apply for FEMA hazard mitigation funding.

PHONE: (605) 842-3600
EMAIL: JBURDETTE@TRIPPCOUNTY.US

Survey Form with Responses

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 MEETING:

Lyman County Hazard Mitigation Planning Meeting

April 22, 2025

NAME	REPRESENTING	Mileage
Shane Neiderwoerter	West Central Electric Co-op	10
Beau Johnson	County Commissioner	18
Lawrence Thompson	County Commissioner	30
Kelli Houchin	County Auditor	—
Ryan Huffman	County Commission	21
Gary Dominiack	Oacoma	26
Bryan Maher	Oacoma	26
Margo Mitchell	Lyman EM	0
Brent Kolstad	SDOEM	240
Staci Gran	DOE	0
Walter Flagel	Fmr Supvr.	0
Jaica Kenzy-Adamson	Oacoma	26
Timothy Feliciano	County Commissioner	28
Shannon Vierect	District III	
ERIC AMBROSON	DISTRICT III	
John Clem	District III	

SIGNUP SHEET – SECOND MEETING:

Lyman County Hazard Mitigation Planning Meeting

April 22, 2025

NAME	REPRESENTING	Mileage
Shane Neiderwerder	West Central Electric Co-op	10
Beau Johnson	County Commissioner	18
Lawrence Thompson	County Commissioner	30
Kelli Houcnin	County Auditor	—
Ryan Huffman	County Commission	21
Gary Dominiack	Oacoma	26
Bryan Mahot	Oacoma	26
Margo Mitchell	Lyman EM	0
Brent Kolstad	SDOEM	240
Stacie Gran	DOE	0
Walter Floyd	Any Super.	0
Jaica Kenzy-Adamson	Oacoma	26
Timothy Feliciano	County Commissioner	28
Shannon Vierect	District III	
Eric Ambrosson	District III	
John Clem	District III	

SIGNUP SHEET – FINAL MEETING:

TRIPP COUNTY MINUTES

COLOME MINUTES

WINNER MINUTES

APPENDIX C: History of Previous Hazard Occurrences

This appendix provides details about hazard events that have impacted Tripp County in the past. **Table C.1** below lists all the events since 1970 that resulted in a major disaster declaration in which Tripp County was part of the designated area.

Table C.1 – Major Disaster Declarations Affecting Tripp County

Dec #	Declaration Date	Type	Primary Damage Impact
3015	Jun 1976	Drought	
764	May 1986	Severe storms; Flooding	
1052	May 1995	Severe storms; Flooding	
1075	Jan 1996	Ice storm	
1156	Feb 1997	Severe winter storm; Blizzard	
1173	Apr 1997	Severe storms; Flooding	
1375	May 2001	Severe storms	
1531	Jul 2004	Severe storms; Flooding	
1620	Dec 2005	Severe winter storm	
1702	May 2007	Severe storms; Tornado; Flood	
1774	Jul 2008	Severe storms; Flooding	Roads and bridges
1886	Mar 2010	Severe winter storm	Emergency Protection
1915	May 2010	Flooding	Roads and bridges
4440	Jun 2019	Severe winter storm; Flooding	Roads and bridges
4463	Sep 2019	Severe storms; Flooding	Roads and bridges
4467	Oct 2019	Severe storms; Tornado; Flood	Roads and bridges
4689	Feb 2023	Severe Winter Storms and Snowstorm	Utilities
4807	Aug 2024	Severe storms; Straightline winds; Flooding	Roads and bridges

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

Table C.2 is a list of the most significant hazard events reported for Tripp County from 1960 through 2024, as recorded in the National Climatic Data Center's Storm Events Database. The National Climatic Data Center receives storm data from the National Weather Service, which gets its information from a variety of sources, including county, state and federal emergency management officials, local law enforcement officials, National Weather Service damage surveys, the insurance industry, and the general public.

The Storm Events Database is useful, but it does have limitations. One problem is that records for certain hazard events, including winter storms and blizzards, only go back to the 1990s. Another issue is that damage amounts in some cases are estimates and for certain types of events, such as winter storms, the data is tracked by forecast zone and thus does not lend itself to analysis at the county level. The database also contains a preponderance of records

from the last few decades. This is due to an inconsistency in data reporting over the years and does not indicate an increase in the frequency of events affecting the county.

The table includes the following information about the events:

- Type of event.
- Descriptive information - details are provided for some of the more noteworthy events back to the 1990s.
- Magnitude - the magnitude of tornadoes, hail, thunderstorm winds, and high wind events is given. For 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 Tripp County

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
8/9/1961	Hail		1.75 in.		
8/10/1962	Tornado		F1		
5/8/1965	Tornado		F2		
5/8/1965	Tornado	A tornado destroyed or damaged 23 houses and other structures from near Colome north to Hamill. The storm included hail up to two inches in diameter, which damaged crops and buildings.	F5	2,500	
6/9/1967	Hail		2.75 in.		
7/9/1967	Hail		1.75 in.		
8/7/1967	Tornado		F1	25	
6/29/1968	Tornado		F1		
6/29/1968	Tornado		F1		
9/15/1968	Tornado		F1	25	
7/10/1969	Tornado		F0		
8/1/1969	Hail		1.75 in.		
6/30/1972	Thunderstorm Wind		70 kts.		
7/16/1972	Tornado		F0		
7/3/1973	Hail		1.75 in.		
8/20/1973	Hail		1.75 in.		
8/20/1973	Thunderstorm Wind		62 kts.		
5/20/1974	Hail		1.75 in.		
6/20/1974	Tornado		F0		

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
6/20/1975	Thunderstorm Wind		85 kts.		
7/13/1979	Tornado		F0		
7/13/1979	Tornado		F0		
6/26/1980	Thunderstorm Wind		69 kts.		
7/5/1980	Thunderstorm Wind		61 kts.		
6/23/1981	Hail		1.75 in.		
7/20/1982	Thunderstorm Wind		69 kts.		
8/21/1982	Tornado		F0		
8/24/1982	Thunderstorm Wind		78 kts.		
8/30/1982	Hail		1.75 in.		
7/25/1984	Thunderstorm Wind		61 kts.		
4/19/1985	Tornado		F1	3	
5/28/1985	Hail		1.75 in.		
7/1/1985	Hail		1.50 in.		
7/16/1985	Hail		2.00 in.		
6/6/1986	Hail		1.75 in.		
8/3/1986	Hail		1.50 in.		
8/6/1986	Hail		4.50 in.		
8/6/1986	Thunderstorm Wind		70 kts.		
8/31/1986	Hail		1.75 in.		
6/16/1987	Hail		1.75 in.		
8/5/1987	Hail		1.75 in.		
8/19/1987	Thunderstorm Wind		66 kts.		
6/16/1988	Hail		1.75 in.		
6/26/1991	Thunderstorm Wind		75 kts.		
5/15/1992	Hail		2.50 in.		
6/16/1992	Hail		1.75 in.		
6/16/1992	Thunderstorm Wind		83 kts.		
7/18/1992	Hail		2.50 in.		
8/4/1992	Hail		1.75 in.		
6/6/1994	Thunderstorm Wind	Several structures were damaged with broken windows and shingles torn off. The roof was blown off a bingo hall, and a mobile home was destroyed.		500	
6/21/1995	Hail		2.75 in.		
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			

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
		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.			
3/23/1996	Blizzard				
4/24/1996	High Wind		69 kts.		
5/28/1996	Flood				
7/5/1996	Thunderstorm Wind		72 kts.		
8/1/1996	Hail		1.75 in.		
11/16/1996	Heavy Snow				
1/4/1997	Blizzard				
1/9/1997	Blizzard				
4/5/1997	Blizzard				
4/9/1997	Winter Storm				
7/1/1997	High Wind		50 kts.		
10/12/1997	High Wind		50 kts.		
12/27/1997	Winter Storm				
3/6/1998	Heavy Snow				
5/14/1998	Hail		1.75 in.	1	
7/8/1998	Tornado		F0		
11/9/1998	Winter Storm				
2/3/1999	High Wind		50 kts.		
3/16/1999	High Wind		50 kts.		
5/5/1999	High Wind		52 kts.		
5/9/1999	Hail		1.75 in.		
5/9/1999	Tornado		F0		
5/9/1999	Tornado		F0		
5/9/1999	Flash Flood	Numerous roads were underwater and several were washed out after thunderstorms dropped 2 to 4 inches of rain in over the area.			
6/5/1999	Tornado		F0		
6/7/1999	Hail		1.75 in.		
7/1/1999	Hail		1.75 in.		
7/2/1999	Thunderstorm Wind		51 kts.	10	
8/29/1999	Hail		1.75 in.		
2/25/2000	Winter Storm				
6/9/2000	Hail		2.00 in.		
7/24/2000	Hail		2.75 in.		

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
7/24/2000	Tornado		F0		
9/9/2000	Thunderstorm Wind		52 kts. E	2	
9/17/2000	Wildfire	Dry lightning and strong downburst winds hit portions of southwestern South Dakota. The lightning caused more than 30 fires throughout the region, most of which were west of Tripp County. In Tripp County, two fires occurred just south of Winner, each around 1,000 acres. Ranchers reported at least 1,500 round bales of hay destroyed. Also, seven cattle were killed and another 20 cattle were badly burned			
11/11/2000	Heavy Snow				
11/19/2000	Winter Storm				
12/15/2000	Winter Storm				
12/28/2000	High Wind		50 kts. M		
1/13/2001	Winter Storm				
1/29/2001	Winter Storm				
2/24/2001	Winter Storm				
4/22/2001	Winter Storm				
6/6/2001	Tornado		F0		
6/6/2001	Tornado		F1	5	
7/30/2001	Thunderstorm Wind		56 kts. M	1	
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.			
2/9/2002	Winter Storm				
2/11/2002	High Wind		53 kts. M		
3/13/2002	Winter Storm				
5/7/2002	Hail		1.75 in.		
8/11/2002	Thunderstorm Wind		52 kts. E	3	
8/26/2002	Thunderstorm Wind		61 kts. E		
1/15/2003	Winter Storm				
4/6/2003	Winter Storm				
6/9/2003	Hail		1.75 in.	50	
6/9/2003	Tornado	Supercell thunderstorms slowly tracked eastward into Tripp County. Numerous reports of dime to golf ball sized hail were reported from Winner and Colome. A tornado developed 3 miles southeast of Winner and tracked toward Colome. The tornado dissipated west of Colome. The tornado was on the ground for about 10 minutes and produced minor damage to a couple of farms.	F1	5	
6/24/2003	Hail		1.25 in.		
8/9/2003	Thunderstorm Wind		61 kts. E		
8/19/2003	Thunderstorm Wind	Strong thunderstorm winds tore roofs off a 100 foot long dairy barn, a smaller barn, and a machine shed. The roofs were carried 50 yards to almost 1/2 mile away.	70 kts. E	100	

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
11/3/2003	Winter Storm				
2/29/2004	Winter Storm				
6/8/2004	Hail		1.75 in.		
6/8/2004	Flash Flood	Severe thunderstorms moved across northeastern parts of Todd County and central Tripp County, producing hail to the size of golf balls and heavy rains. Rainfall totals of 3 to 5 inches were common across these areas, with Okreek and Witten receiving around 8 inches of rain during the evening. Water in creeks across the area rose to bank full with many roads washed out or under water during the overnight. Lightning also struck the Okreek Community Center, completely destroying the building.		200	
8/23/2004	Hail		1.75 in.		
1/4/2005	Winter Storm				
3/10/2005	High Wind		56 kts. M		
3/21/2005	Winter Storm				
4/8/2005	High Wind		55 kts. M		
4/11/2005	Heavy Snow				
5/13/2005	Flood				
6/20/2005	Hail		1.75 in.		
6/20/2005	Thunderstorm Wind		61 kts. E		
6/23/2005	Hail		1.75 in.		
7/24/2005	Thunderstorm Wind		61 kts. M		
11/8/2005	High Wind		52 kts. M		
11/27/2005	Blizzard				
2/15/2006	Winter Storm				
3/19/2006	Winter Storm	A prolonged period of snowfall spread into the area from the west and south, and continued for over a day. 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.			
6/14/2006	Thunderstorm Wind		65 kts. E	10	
7/15/2006	Extreme heat				
8/22/2006	High Wind		54 kts. M		
12/20/2006	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.			
3/2/2007	Blizzard				
4/21/2007	Hail		1.25 in.		
7/9/2007	Thunderstorm Wind		70 kts. E		

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
7/17/2007	Hail		2.50 in.		
7/17/2007	Thunderstorm Wind		70 kts. E		
8/13/2007	Hail		1.75 in.		
3/30/2008	Winter Storm				
4/10/2008	Blizzard				
6/5/2008	Flash Flood	Rapid runoff from heavy rain washed out roads and flooded basements and driveways.		250	
6/5/2008	Flood				
6/17/2008	Hail		1.50 in.		
6/26/2008	Hail		1.75 in.		
7/28/2008	Thunderstorm Wind		85 kts. M		
7/28/2008	Tornado		EF0		
8/11/2008	Hail		1.50 in.		
8/13/2008	Hail		1.50 in.		
10/26/2008	High Wind		53 kts. M		
11/6/2008	Blizzard				
12/13/2008	Blizzard				
1/12/2009	High Wind		52 kts. E		
2/10/2009	Flood				
2/27/2009	Winter Storm				
3/30/2009	Blizzard	Northwest wind gusts to 50 mph produced significant blowing and drifting snow, reducing visibilities to near zero for many hours. Reports of six to 12 inches of snow were common. Many highways were closed for a long time. Livestock losses were heavy, as the storm occurred during the peak of calving and lambing season.		200	
4/4/2009	Blizzard				
5/13/2009	High Wind		52 kts. M		
6/17/2009	Hail		1.75 in.		
6/24/2009	Hail		2.75 in.	4	
6/24/2009	Thunderstorm Wind	Wind gusts to 75 mph downed numerous power poles and trees across south central Tripp County. A few small barns and sheds were also blown over by the wind. The combination of hail and wind destroyed siding on a house south of Winner and flattened crops.	65 kts. E	300	100
7/9/2009	Tornado	A small tornado trouched down on a farm west of the intersection of 286th Street and 313th Avenue. The tornado blew a garage off its foundation, tipped over a combine, and snapped large cottonwood trees. Event times were estimated from radar data.	EF1	3	
7/9/2009	Tornado		EF1	2	
8/3/2009	Hail		2.00 in.	15	
12/25/2009	Blizzard	A powerful winter storm moved across the Northern and Central Plains, bringing heavy snow and very strong winds. The worst part of the storm impacted the area from Christmas		50	

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
		morning through the morning of December 26, when snow and wind gusts to 80 mph produced near zero visibilities. Six inches to over two feet of snow fell across the plains.			
1/6/2010	Winter Storm				
3/8/2010	Flood				
4/13/2010	High Wind		54 kts. M		
5/22/2010	Hail		1.75 in.	5	
5/22/2010	Thunderstorm Wind		65 kts. E		
5/22/2010	Tornado	A tornado tracked along East 3rd Street in Winner, blowing down carports, trees, and tractor-trailers. A large barn was destroyed east of Winner; the curved roof was blown off in one piece and tossed across a corral. Another machine shed was blown apart. Based on the extent of the damage, wind speeds were estimated around 75 mph through town with peak winds 95 to 115 mph.	EF2	80	
5/24/2010	High Wind		50 kts. M		
5/29/2010	Hail	Golfball to baseball sized hail damaged homes and automobiles in Colome. A woman was hit in the head by a hail stone.	2.75 in.	600	
7/3/2010	Thunderstorm Wind		61 kts. E	20	
10/26/2010	High Wind		53 kts. M		
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.			
2/16/2011	Flood				
2/20/2011	Blizzard				
3/2/2011	Flood				
3/12/2011	Flood				
4/14/2011	Winter Storm				
4/30/2011	High Wind		52 kts. M		
6/14/2011	Hail		1.75 in.		
6/22/2011	Flood				
6/30/2011	Thunderstorm Wind		61 kts. E	1	
8/11/2011	Hail		1.75 in.		
8/17/2011	Hail		1.75 in.	50	
10/6/2011	High Wind		50 kts. M		
11/26/2011	High Wind		52 kts. M		
2/28/2012	Winter Storm				
3/27/2012	High Wind		55 kts. M		
7/12/2012	Thunderstorm Wind		63 kts. M		
10/17/2012	High Wind		62 kts. M		
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			

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
		and drifting snow forced some businesses to close, and also forced several school closings on Monday February 11th.			
3/4/2013	Winter Storm				
7/14/2013	Flood	Heavy rain caused Cottonwood Creek, Two Nations Creek, and Little Dog Creek in northwestern Tripp County and Sand Creek in southwestern Tripp County to overflow. Highway 44 was flooded in six locations and numerous county roads were damaged.		10	
12/3/2013	Winter Storm	Snow, heavy in areas, accumulated up to 8 inches from the evening of December 3rd through the afternoon of December 4th. Difficult travel conditions forced delayed openings or early closings of some schools and businesses on December 4th.			
12/28/2013	High Wind		52 kts. M		
1/5/2014	Extreme cold				
1/16/2014	High Wind		56 kts. M		
1/20/2014	High Wind		56 kts. M		
1/26/2014	High Wind		59 kts. M		
2/20/2014	High Wind		51 kts. M		
3/12/2014	Flood	Warm temperatures caused rapid snowmelt and ice break-up along area rivers. Minor flooding occurred along the White River from north of Hamill to the Missouri River			
6/21/2014	Thunderstorm Wind		52 kts. E		
7/10/2014	Thunderstorm Wind		54 kts. M		
8/31/2014	Thunderstorm Wind		56 kts. M		
9/3/2014	Thunderstorm Wind		64 kts. M		
3/3/2015	Winter Storm				
6/20/2015	Thunderstorm Wind		63 kts. MG		
6/22/2015	Thunderstorm Wind		61 kts. EG		
7/5/2015	Thunderstorm Wind		71 kts. MG		
7/5/2015	Flash Flood	A section of US Highway 183 was washed out.		1	
7/19/2015	Hail		1.00 in.		
7/25/2015	Thunderstorm Wind		52 kts. EG		
7/27/2015	Thunderstorm Wind		52 kts. EG		
9/7/2015	Thunderstorm Wind		58 kts. MG		
9/23/2015	Flash Flood				
11/18/2015	High Wind		55 kts. MG		
11/30/2015	Winter Storm				
12/25/2015	Winter Storm				
2/7/2016	High Wind		56 kts. MG		
2/19/2016	High Wind		64 kts. MG		
5/22/2016	Thunderstorm Wind		52 kts. EG	5	

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
5/22/2016	Tornado	A brief tornado touched down in southwestern Tripp County and tracked across a farm, causing considerable property damage. There were no injuries.	EF1	25	
5/22/2016	Flood	Street flooding occurred in Colome and several county roads in southeastern Tripp County were flooded.		10	
6/29/2016	Thunderstorm Wind		53 kts. MG		
7/26/2016	Hail		1.00 in.		
8/10/2016	Thunderstorm Wind		52 kts. EG		
9/4/2016	Thunderstorm Wind		52 kts. EG		
11/17/2016	Winter Storm				
12/17/2016	Extreme Cold				
12/25/2016	High Wind		60 kts. MG		
1/24/2017	Winter Storm				
2/23/2017	Winter Storm				
4/10/2017	Winter Storm				
7/5/2017	Thunderstorm Wind		61 kts. EG		
7/19/2017	Hail		1.00 in.		
7/25/2017	Thunderstorm Wind		52 kts. EG		
7/30/2017	Thunderstorm Wind		61 kts. EG		
8/1/2017	Thunderstorm Wind		52 kts. EG		
8/6/2017	Hail		1.00 in.		
8/12/2017	Hail		1.75 in.		
8/25/2017	Hail		1.75 in.		
12/30/2017	Extreme Cold	Lows reached -15 in the county.			
1/21/2018	Winter Storm				
2/19/2018	Winter Storm				
3/5/2018	Blizzard				
3/16/2018	Winter Storm				
4/13/2018	Blizzard	A rare mid-April blizzard caused business and school closures. Livestock losses were substantial as the storm hit during calving season.			
5/24/2018	Hail		1.00 in.		
6/1/2018	Hail		1.00 in.		
6/6/2018	Hail		1.00 in.		
6/8/2018	Thunderstorm Wind		55 kts. MG		
6/13/2018	Hail		1.00 in.		
6/21/2018	Flood	Minor flooding of agricultural land occurred along the White River near Oacoma. The river gauge southwest of Oacoma along SD Hwy 47 crested at 0.6 feet above flood stage.			
7/18/2018	Thunderstorm Wind		79 kts. EG		
7/18/2018	Tornado	A brief tornado developed northeast of Hamill, which damaged agricultural equipment.	EF1		

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
7/24/2018	Hail		1.50 in.		
1/27/2019	High Wind		55 kts. MG		
3/13/2019	Blizzard				
3/14/2019	Flood	Major flooding occurred along the White River, and a large ice jam formed along the White River around the Highway 47 bridge just east of the county. Water backed up behind the ice, causing hundreds of acres of agricultural land to be flooded.			
3/20/2019	Flood				
4/10/2019	Winter Storm				
5/13/2019	Thunderstorm Wind		56 kts. MG		
5/21/2019	Flood				
5/24/2019	Flood				
5/27/2019	Flood				
6/1/2019	Flood				
6/30/2019	Hail		1.75 in.		
6/30/2019	Thunderstorm Wind		65 kts. EG		
7/3/2019	Hail		1.00 in.		
7/3/2019	Thunderstorm Wind		54 kts. MG		
7/9/2019	Hail		1.00 in.		
7/9/2019	Thunderstorm Wind		62 kts. MG		
7/14/2019	Hail		1.00 in.		
8/9/2019	Hail		1.00 in.		
8/9/2019	Thunderstorm Wind		54 kts. MG		
8/11/2019	Thunderstorm Wind		51 kts. MG		
8/17/2019	Thunderstorm Wind		59 kts. MG		
9/10/2019	Hail		1.00 in.		
9/10/2019	Thunderstorm Wind		52 kts. EG		
11/30/2019	Winter Storm				
12/29/2019	Winter Storm				
1/17/2020	High Wind		52 kts. MG		
4/11/2020	Winter Storm				
4/28/2020	High Wind		63 kts. MG		
6/6/2020	Thunderstorm Wind		56 kts. MG		
6/7/2020	High Wind		56 kts. MG		
6/14/2020	Thunderstorm Wind		50 kts. MG		
6/27/2020	Hail		1.00 in.		
7/2/2020	Thunderstorm Wind		54 kts. MG		
7/5/2020	Thunderstorm Wind		52 kts. EG		

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
7/6/2020	Thunderstorm Wind		65 kts. MG		
8/4/2020	Hail		2.00 in.		
8/4/2020	Tornado		EF0		
8/4/2020	Tornado		EF0		
8/8/2020	Thunderstorm Wind		67 kts. MG		
10/24/2020	Winter Storm				
12/23/2020	High Wind		57 kts. MG		
1/13/2021	High Wind		64 kts. MG		
2/14/2021	Cold/wind Chill				
3/14/2021	Winter Storm				
3/29/2021	High Wind		50 kts. MG		
5/23/2021	Thunderstorm Wind		54 kts. MG		
6/1/2021	Thunderstorm Wind		52 kts. EG		
6/23/2021	Thunderstorm Wind		52 kts. EG		
8/6/2021	Thunderstorm Wind		56 kts. MG		
8/31/2021	Thunderstorm Wind	Power was out for about three hours in the Keya Paha area.	52 kts. EG		
10/13/2021	High Wind		59 kts. MG		
11/11/2021	High Wind		61 kts. MG		
11/13/2021	High Wind		62 kts. MG		
12/9/2021	Winter Storm				
12/15/2021	High Wind		53 kts. MG		
1/4/2022	High Wind		52 kts. MG		
2/8/2022	High Wind		51 kts. MG		
4/5/2022	High Wind		59 kts. MG		
4/22/2022	Hail		1.25 in.		
4/30/2022	High Wind		52 kts. MG		
5/7/2022	Thunderstorm Wind		53 kts. MG		
5/11/2022	Hail		1.50 in.		
6/12/2022	Hail		1.50 in.		
6/29/2022	Thunderstorm Wind		64 kts. MG		
7/5/2022	Thunderstorm Wind		55 kts. MG		
8/2/2022	Thunderstorm Wind		63 kts. MG		
8/24/2022	Thunderstorm Wind		63 kts. MG		
10/13/2022	High Wind		54 kts. MG		
12/13/2022	Blizzard				
12/20/2022	Blizzard/Extreme Cold				
1/2/2023	Winter Storm				

Date	Event Type	Event Description	Mag	Prop Damage ($1,000s)	Crop Damage ($1,000s)
1/18/2023	Winter Storm				
1/27/2023	Winter Storm				
2/22/2023	Winter Storm				
5/6/2023	Hail		1.00 in.		
5/29/2023	Hail		1.00 in.		
6/22/2023	Flash Flood				
6/24/2023	Thunderstorm Wind		57 kts. MG		
7/12/2023	Thunderstorm Wind		60 kts. MG		
8/4/2023	Hail		1.75 in.		
12/25/2023	Blizzard				
1/12/2024	Extreme cold				
1/20/2024	High Wind		57 kts. MG		
3/24/2024	Winter Storm				
5/14/2024	Thunderstorm Wind		50 kts. MG		
6/2/2024	Thunderstorm Wind		56 kts. MG		
6/20/2024	Flash Flood	Runoff from heavy rain caused flash flooding. At least 12 county roads were inundated with water and debris. The hardest hit areas were around Witten, Winner, and Hamill.		30	
7/14/2024	Thunderstorm Wind		59 kts. MG		
7/29/2024	Thunderstorm Wind		73 kts. MG		
8/18/2024	Thunderstorm Wind		67 kts. MG	1	
8/25/2024	Thunderstorm Wind		52 kts. EG		
11/19/2024	High Wind		61 kts. MG		

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

APPENDIX D: References

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