# Burleigh County
# Multi-Hazard Mitigation Plan

*Draft*


**FEMA Approved: Pending**

(Page intentionally left blank)

# Table of Contents

Page

# Introduction

The Burleigh County Multi-Hazard Mitigation Plan (MHMP) is an update of the County's 2020 Multi-Hazard Mitigation Plan. Hazard mitigation plans are required by the Federal Emergency Management Agency (FEMA) to be updated every five years to maintain eligibility for grant funding. The plan is not necessarily limited to Federal, State, or locally declared disasters or emergencies; any time incidents occur that produce an opportunity for mitigation actions; they will be developed and incorporated into the Burleigh County Multi-Hazard Mitigation Plan.

**Purpose:** Reduce the vulnerability of potential harm to life, information, operations, environment, and/or property in Burleigh County from the impacts of natural, technological, or human-caused occurrences.

**Authority:** The Burleigh County Multi-Hazard Mitigation Plan has been prepared in accordance with federal laws, including the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended; the National Flood Insurance Act of 1968, as amended; and the National Dam Safety Program Act, as amended. Section 322 of the Disaster Mitigation Act of 2000 requires each mitigation plan developed by a local government shall:

(1) describe actions to mitigate hazards, risks, and vulnerabilities identified under the plan; and
(2) establish a strategy to implement those actions.

The North Dakota Century Code 37-17.1-07 (Local or regional emergency management organizations.) states that "Each local or regional emergency management organization shall prepare and keep current a local disaster or emergency operational plan for its area." Burleigh County and incorporated cities consider the Mitigation Plan an integral part of the Burleigh County Emergency Management Program.

# Planning Process

The planning process included the following activities:

- Public Input Survey
- Public Meetings
- Meetings with jurisdictions (review data, risk assessment, and mitigation actions)
- Jurisdictional review of proposed MHMP

Additional emails and conversations were completed via phone and email to complete the final draft. Throughout the process, research was completed along with data gathering and outreach (phone calls, meetings, and/or emails) to regulatory agencies and other governmental entities (US Army Corps of Engineers, ND Department of Water Resources, Burleigh County Water Resource Board, ND Forest Service, ND Fire Marshal's Office, US National Weather Service).

**Planning Team Members**

| Jurisdiction | Contact | Title | Agency |
|---|---|---|---|
| Burleigh County | Mary Senger | Emergency Manager | Burleigh County Emergency Mgt |
| Burleigh County | Brian Bitner | Chair | Burleigh County Commission |
| Burleigh County | Mitch Flanagan | Building Official, Floodplain Administrator | Burleigh Building/Planning/Zoning |
| Burleigh County | Greg Carlson | GIS Coordinator | Burleigh County Highway Dept |
| Burleigh County | Marcus Hall | Engineer | Burleigh County Highway Dept |
| Burleigh County | Kelly Leben | Sheriff | Burleigh County Sheriff's Dept |
| Burleigh County | Dustin Theurer | Chief | Bismarck Rural Fire Dept |
| Burleigh County | Renae Moch | Director | Bismarck/Burleigh Public Health |
| Burleigh County | Crystalynn Kuntz | Emergency Preparedness Coord | Bismarck/Burleigh Public Health |
| City of Lincoln | Keli Berglund | Mayor | City of Lincoln |
| City of Lincoln | Matt Giddings | Chief | City of Lincoln Police Department |
| City of Lincoln | Terry Schutt | Director | City of Lincoln Public Works |
| City of Regan | Marvin Gillig | Mayor | City of Regan |
| City of Regan | Kelly Bauer | Auditor | City of Regan |
| City of Wilton | LeeAnn Domonoske-Keller | Mayor | City of Wilton |
| City of Wilton | Marlin Schaaf | Chief | City of Wilton Fire Dept |
| City of Wilton | Dean Larson | Supervisor | City of Wilton Public Works |
| City of Wing | Julie Hein | Mayor | City of Wing |
| City of Wing | Frank Hein | Chief | City of Wing Fire Dept |
| City of Wing | Kobe Bryant | Department Head | City of Wing Public Works |

Multi-hazard mitigation planning is a continuous process whereby risk analyses, updating the situation assessment, research, coordinating, disaster response or other activities are occurring simultaneously.

The goal is to maintain the Burleigh County Hazard Mitigation Plan and obtain federal approval every five years. The original plan was developed in 2003 and subsequently updated in 2009, 2015, and 2020. The current plan update process began in 2024 with the Emergency Manager collecting data and soliciting technical advice and guidance from the ND Department of Emergency Services' Mitigation Division prior to the beginning of the official update plan process. In addition, throughout 2025, the Emergency Manager hosted and/or attended public meetings to revisit the current Multi-Hazard Mitigation Plan and incorporate information where applicable.

11-19-24 Annual, publicized, Local Emergency Planning Committee Meeting with agenda item to discuss the Multi-Hazard Mitigation Plan (update process, mitigation projects, grant opportunities). Also discussed the "Shelter in Place" brochure and the "Every Season to Prepare" pamphlet; both items are included as ongoing mitigation projects to promote community preparedness and response to hazards in Burleigh County. An adequate supply of both items is maintained through Emergency Management and other stakeholders as well as being available throughout the community and the Burleigh County website.

02-26-25 Multi-Hazard Mitigation Plan planning meeting with Department Heads.

03-25-25 Virtual Flood Annex Update; reviewed map updates and mitigation projects (status updates as well as new projects) and posted on the Burleigh County website.

04-09-25 A regular, publicized, meeting of the Burleigh County Water Resource District with an agenda item for the Emergency Manager to discuss the Multi-Hazard Mitigation Plan process, survey, and solicit projects from the district.

03-20-25
Thru
04-10-25 Burleigh County Emergency Management published an electronic survey to gather input from the public. Questions were selected to make the experience brief while soliciting hazard vulnerability as well as public's view of the most likely community hazards. Open-ended responses were also included to collect responses the community felt relative to the survey and hazards. A total of 90 responses were received. The survey was emailed to area stakeholders, community responders, and contiguous counties. Results and information captured were compared to the risks analysis and closely aligned. Additionally, information received was factored into the mitigation projects. See Appendix C: Burleigh County Public Survey. The survey was publicly advertised: Radio, Television, The Bismarck Tribune, Burleigh County website, Burleigh County social media, City of Bismarck website, City of Bismarck social media, and Dakota Media Access.

05-14-25 A regular, publicized, meeting of the Burleigh County Water Resource District with an agenda item for the Emergency Manager to discuss the Multi-Hazard Mitigation Plan process, survey, and solicit projects from the district.

05-19-25 Draft Mitigation Plan published on the website.

06-18-25 A regular, publicized, meeting of the Burleigh County Water Resource District with an agenda item for the Emergency Manager to discuss the Multi-Hazard Mitigation Plan process, survey, and solicit projects from the district.

07-16-25 A regular, publicized, meeting of the Burleigh County Water Resource District with an agenda item for the Emergency Manager to discuss the Multi-Hazard Mitigation Plan process, survey, and solicit projects from the district.

The Emergency Manager scheduled a meeting with the Cities of Regan and Wilton to review the current draft of the Mitigation Plan and Emergency Operations Plan. Mitigation projects and priorities were discussed along with the opportunity to add projects at any time.

The Emergency Manager scheduled a meeting with the City of Wing to review the current draft of the Mitigation Plan and Emergency Operations Plan. Mitigation projects and priorities were discussed along with the opportunity to add projects at any time.

The Emergency Manager scheduled a meeting with the City of Lincoln to review the current draft of the Mitigation Plan and Emergency Operations Plan. Mitigation projects and priorities were discussed along with the opportunity to add projects at any time.

Mitigation Plan presentation and adoption at the Burleigh County Commission Meeting and advertised through a variety of media.

Final draft (available via website) provided to stakeholders to review and provide comment.

**Participating Jurisdictions**

| Jurisdictions Located within Burleigh County | Jurisdictions Asked to Participate in the Plan | Jurisdictions Represented in the Plan | Participation Status |
|---|---|---|---|
| Burleigh County | Burleigh County | Burleigh County | Continuing Participation (2003, 2008, 2014, 2020, 2025) |
| City of Bismarck | City of Bismarck | City of Bismarck | *Continuing Participation (2003, 2008, 2014, 2020, 2025) |
| City of Lincoln | City of Lincoln | City of Lincoln | Continuing Participation (2003, 2008, 2014, 2020, 2025) |
| City of Regan | City of Regan | City of Regan | Continuing Participation (2003, 2008, 2014, 2020, 2025) |
| City of Wilton | City of Wilton | City of Wilton | Continuing Participation (2003, 2008, 2014, 2020, 2025) |
| City of Wing | City of Wing | City of Wing | Continuing Participation (2003, 2008, 2014, 2020, 2025) |

*The City of Bismarck develops an independent Mitigation Plan for their jurisdiction.

Outreach to contiguous counties was accomplished through phone, meeting invites, and online survey invitation.

## Adoption Resolutions

**Burleigh County**

*Burleigh County*
Emergency Management
221 N 5th St
Bismarck ND 58501
(701) 222-6727

### Burleigh County Multi-Hazard Mitigation Plan

**Whereas**, Burleigh County recognizes the threat that natural, man-made or technological hazards pose to people and property within our community; and

**Whereas,** undertaking hazard mitigation actions will reduce and/or eliminate the potential for harm to people and property from future hazard occurrences; and

**Whereas,** an adopted Multi-Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple Federal Emergency Management Agency (FEMA) pre- and post-disaster mitigation grant programs; and

**Whereas,** Burleigh County participated in the preparation of this plan in accordance with the Disaster Mitigation Act of 2000; and

**Whereas,** adoption of the Burleigh County Multi-Hazard Mitigation Plan demonstrates the commitment to hazard mitigation; and

**Now, therefore, be it resolved,** that the Burleigh County Commission adopts the Burleigh County Multi-Hazard Mitigation Plan.

Signed this 16th day of March, 2020

Jerry Woodcox, Chairperson
Burleigh County Board of Commissioners

**City of Lincoln**

RESOLUTION NO. 2020-3

## Burleigh County Multi-Hazard Mitigation Plan

**Whereas**, the City of Lincoln recognizes the threat that natural, man-made or technological hazards pose to people and property within our community; and

**Whereas,** undertaking hazard mitigation actions will reduce and/or eliminate the potential for harm to people and property from future hazard occurrences; and

**Whereas,** an adopted Multi-Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple Federal Emergency Management Agency (FEMA) pre- and post-disaster mitigation grant programs; and

**Whereas,** the City of Lincoln participated in the preparation of this plan in accordance with the Disaster Mitigation Act of 2000; and

**Whereas,** adoption of the Burleigh County Multi-Hazard Mitigation Plan demonstrates the commitment to hazard mitigation; and

**Now, therefore, be it resolved,** that the Lincoln City Commission adopts the Burleigh County Multi-Hazard Mitigation Plan.

Signed this 5th day of March, 2020.

Attested: _____
Shawn Surface, Auditor

Signed: _____
Gerarld Wise, Mayor
Lincoln City Commission

**City of Regan**

## Burleigh County Multi-Hazard Mitigation Plan

**Whereas**, the City of Regan recognizes the threat that natural, man-made or technological hazards pose to people and property within our community; and

**Whereas,** undertaking hazard mitigation actions will reduce and/or eliminate the potential for harm to people and property from future hazard occurrences; and

**Whereas,** an adopted Multi-Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple Federal Emergency Management Agency (FEMA) pre- and post-disaster mitigation grant programs; and

**Whereas,** the City of Regan participated in the preparation of this plan in accordance with the Disaster Mitigation Act of 2000; and

**Whereas,** adoption of the Burleigh County Multi-Hazard Mitigation Plan demonstrates the commitment to hazard mitigation; and

**Now, therefore, be it resolved,** that the Regan City Commission adopts the Burleigh County Multi-Hazard Mitigation Plan.

Signed this 21 day of April, 2020.

Attested: _____ Signed: _____
Kelly Bauer, Auditor
Marvin Gillig, Mayor
Regan City Commission

**City of Wilton**

## Burleigh County Multi-Hazard Mitigation Plan

**Whereas**, the City of Wilton recognizes the threat that natural, man-made or technological hazards pose to people and property within our community; and

**Whereas,** undertaking hazard mitigation actions will reduce and/or eliminate the potential for harm to people and property from future hazard occurrences; and

**Whereas,** an adopted Multi-Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple Federal Emergency Management Agency (FEMA) pre- and post-disaster mitigation grant programs; and

**Whereas,** the City of Wilton participated in the preparation of this plan in accordance with the Disaster Mitigation Act of 2000; and

**Whereas,** adoption of the Burleigh County Multi-Hazard Mitigation Plan demonstrates the commitment to hazard mitigation; and

**Now, therefore, be it resolved,** that the Wilton City Commission adopts the Burleigh County Multi-Hazard Mitigation Plan.

Signed this 5 day of March, 2020.

Signed: _____

LeeAnn Domonoske-Kellar, Mayor
Wilton City Commission

**City of Wing**

## Burleigh County Multi-Hazard Mitigation Plan

**Whereas**, the City of Wing recognizes the threat that natural, man-made or technological hazards pose to people and property within our community; and

**Whereas,** undertaking hazard mitigation actions will reduce and/or eliminate the potential for harm to people and property from future hazard occurrences; and

**Whereas,** an adopted Multi-Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple Federal Emergency Management Agency (FEMA) pre- and post-disaster mitigation grant programs; and

**Whereas,** the City of Wing participated in the preparation of this plan in accordance with the Disaster Mitigation Act of 2000; and

**Whereas,** adoption of the Burleigh County Multi-Hazard Mitigation Plan demonstrates the commitment to hazard mitigation; and

**Now, therefore, be it resolved,** that the Wing City Commission adopts the Burleigh County Multi-Hazard Mitigation Plan.

Signed this 7th day of May, 2020.

Attested: Jean M Snyder Signed: Julie Hein

Julie Hein, Mayor
Wing City Commission

## Existing Plans, Studies, Reports, and Technical Information

The Burleigh County Multi-Hazard Mitigation Plan was developed in coordination with local, state, and federal agencies, non-profit organizations, local businesses, schools, and the public. The Cities of Lincoln, Regan, Wing and Wilton support county-led planning initiatives. Additionally, the Planning Team will continue to ensure the Mitigation Plan informs the plans and programs listed below by incorporating risk assessment data and mitigation actions.

| Agency | Plans and Programs |
|---|---|
| American Red Cross (West Dakota) | • Shelter<br>• Mass Care<br>• Windshield Damage Assessment<br>• Disaster Recovery |
| Bismarck Community Development | • Plat Reviews |
| Bismarck/Burleigh Public Health | • Shelters<br>• Community Education<br>• Vulnerable Populations |
| Burleigh County Auditor | • Fiscal Management<br>• Emergency Reserve Fund |
| Burleigh County Board of Health | • Public Health Programs |
| Burleigh County Building/Planning/Zoning | • Development<br>• Floodplain Administration<br>• Inspections<br>• Planning |
| Burleigh County Comprehensive Plan | • Development<br>• Planning |
| Burleigh County Commission | • Disaster/Emergency Declarations<br>• Budget Allocations<br>• County Ordinances |
| Burleigh County Community Wildfire Protection Plan | • Fuel Loads<br>• Mitigation Projects |
| Burleigh County Emergency Management | • Local Emergency Operations Plan<br>• Multi-Hazard Mitigation Plan<br>• Evacuation Annex<br>• Shelter Annex<br>• Mass Care Annex<br>• Public Information Officer<br>• Social Media Coordinator<br>• Website Administrator<br>• Disaster Recovery<br>• Local Emergency Planning Committee<br>• Grants Coordination<br>• Emergency Notification |

| Agency | Plans and Programs |
|---|---|
| Burleigh County Emergency Management | • Local Emergency Operations Plan<br>• Multi-Hazard Mitigation Plan<br>• Evacuation Annex<br>• Shelter Annex<br>• Mass Care Annex<br>• Public Information Officer<br>• Social Media Coordinator<br>• Website Administrator<br>• Disaster Recovery<br>• Local Emergency Planning Committee<br>• Grants Coordination<br>• Emergency Notification |
| Burleigh County Extension Service | • Animal Health<br>• Plant Health<br>• Community Education |
| Burleigh County GIS | • Hazard Mapping<br>• Online (public) Flood and Elevation Mapping Tool |
| Burleigh County Highway Department | • Primary Routes<br>• Bridges<br>• Debris Removal<br>• Self-Fill Sandbag Sites |
| Burleigh County Local Emergency Planning Committee | • Tier II Reporting<br>• Community Education<br>• Planning and Training |
| Burleigh County Multi-Hazard Mitigation Plan | • Reviewed and updated<br>• Mitigation projects reviewed for status<br>• Mitigation projects developed |
| Burleigh County Schools | • Curriculum Standards (safety drills) |
| Burleigh County School Superintendent | • Curriculum Standards (safety drills) |
| Burleigh County Sheriff's Department | • Traffic Control and Safety<br>• Evacuation Routes<br>• Emergency Notification |
| Burleigh County Snowmobile CERT | • Alternate Transportation<br>• Safety Checks<br>• Planning and Training |
| Burleigh County State's Attorney | • Legal Review |
| Burleigh County Water Resource Board | • Permitted Uses<br>• Planning Commission<br>• Flood Protection Projects |

| Agency | Plans and Programs |
|---|---|
| Burleigh County Zoning Ordinance | • Floodplain Management<br>• South Central Regional Water Project<br>• Missouri River Joint Water Resource<br>• ND Flood Risk Management Study |
| Central Dakota Amateur Radio Club | • Alternate Communications<br>• Weather Spotters |
| Central Dakota Communications Center (9-1-1) | • Alert and Warning<br>• Communications<br>• Emergency/Disaster Procedures |
| Crisis Care Chaplaincy | • Mental Health<br>• Disaster Recovery |
| Lewis and Clark Regional Development Council | • Comprehensive Economic Development Strategy |
| Lincoln City Attorney | • Legal Review |
| Lincoln City Commission | • Disaster/Emergency Declarations<br>• Budget Allocations<br>• Building and Inspections<br>• City Ordinances<br>• Comprehensive Plan<br>• Planning and Zoning Commission |
| Metropolitan Planning Organization | • Hazardous Materials Route Mapping (In Progress)<br>• Transportation Routes<br>• Planning |
| National Climatic Data Center (NCDC | • Weather Event Statistics |
| National Fire and Incident Reporting System (NFIRS) | • Fire Incident Statistics |
| ND Department of Agriculture | • Plant and Animal Statistics |
| ND Department of Emergency Services | • Enhanced Multi-Hazard Mitigation Plan<br>• Review<br>• Technical Assistance |
| ND Department of Health | • Disease Statistics |
| ND Department of Transportation | • Traffic Statistics |
| ND Forest Service | • Fire Incident Statistics |
| ND Pipeline Association | • Maps<br>• Education/Training<br>• Planning and Zoning |
| ND Water Resources | • Dam Inventory<br>• NFIP Data<br>• Water Basin Data |

| Agency | Plans and Programs |
|---|---|
| Regan City Commission | • Disaster/Emergency Declarations<br>• Budget Allocations<br>• City Ordinances |
| Salvation Army | • Canteen (mobile feeding)<br>• Shelter<br>• Mass Care<br>• Windshield Damage Assessment<br>• Disaster Recovery |
| South Central Regional Water | • Rural Water<br>• Planning |
| Southwest Central Emergency Preparedness | • Points of Distribution<br>• Mass Inoculation<br>• SWC Regional Strategic National Stockpile<br>• SWC Regional EOP Mental Health<br>• SWC Regional EOP Pandemic Influenza<br>• SWC Regional EOP Mass Fatality |
| US Army Corps of Engineers | • Planning Assistance (Section 22) |
| US Census | • Demographics<br>• Population Estimates |
| US Drought Monitor | • Drought Statistics<br>• Maps |
| US Geological Survey | • Creek/River Gages |
| US National Weather Service | • Hazard Advisories<br>• Outlooks<br>• Statistics<br>• Weather Advisories |
| Wilton City Commission | • Disaster/Emergency Declarations<br>• Budget Allocations<br>• City Ordinances<br>• Planning and Zoning Board |
| Wing City Commission | • Disaster/Emergency Declarations<br>• Budget Allocations<br>• City Ordinances |

The Burleigh County Commission and Burleigh County Highway Department utilize the mitigation projects as appropriate when developing future budgets and road priorities.

Flood mitigation projects are closely tied to the Burleigh County Water Resource Board and their continuing discussions as well as the Burleigh County Flood Annex.

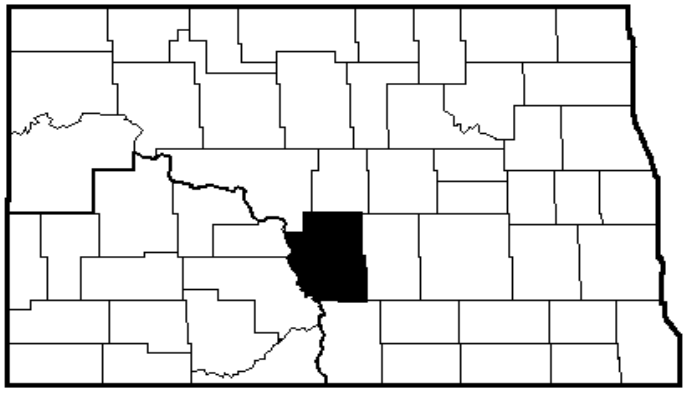
The Burleigh County Zoning Floodplain Ordinance is evaluated and based on NFIP guidelines.

Communicable Disease activities parallel the Southwest Central Emergency Preparedness planning efforts.

The US National Weather Service (Bismarck Office) remains in close contact with Burleigh County Emergency Management and Skywarn Spotters to “truth” forecasts and/or impacts.

# Community Profile

Burleigh County is in south-central North Dakota with five incorporated cities including the county seat, Bismarck, and the Missouri River as the western boundary.



| City | Population |
|---|---|
| Burleigh County | 98,458 |
| Bismarck | 75,092 |
| Lincoln | 4,257 |
| Regan | 35 |
| Wilton | 718 |
| Wing | 132 |

Source: US Census Bureau 2020 Census

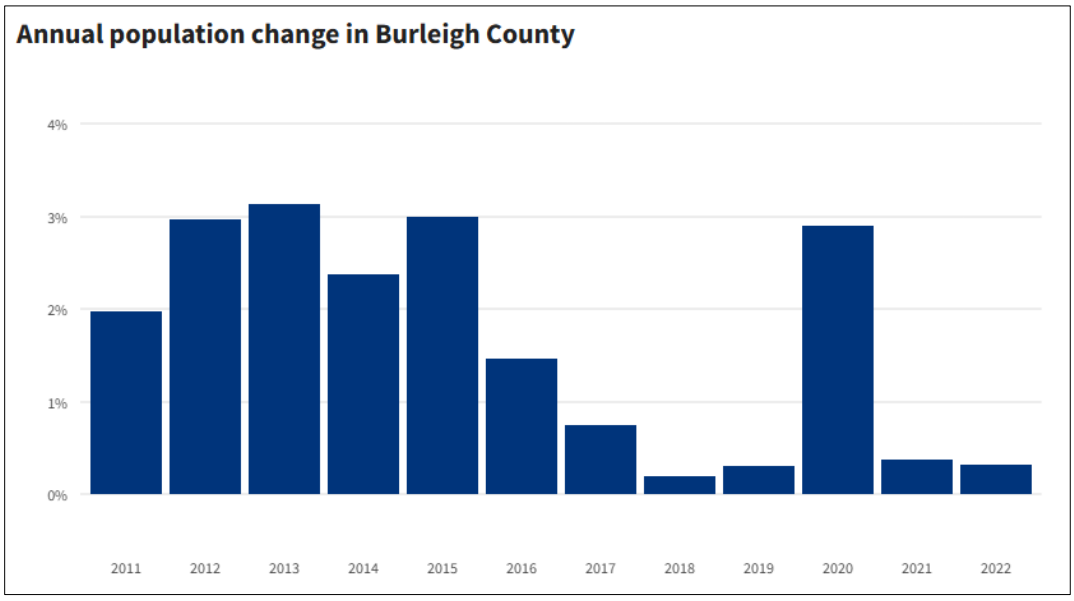
Burleigh County has 1,632.7 square miles of land area and is the 13th largest county in North Dakota by total area with a population of 98,458 (US Census Bureau). Residential and commercial development is concentrated in the incorporated areas of Burleigh County with the largest, single concentration occurring in and around the City of Bismarck.

Burleigh County is on the western side of the continental divide and drains through the Missouri River drainage system.

| Rivers |
|---|
| Missouri River, Apple Creek, Burnt Creek, and Hay Creek |

## Demographics

The 2024 population estimate is 103,107; a 4.7% increase from the 2020 population of 98,458.



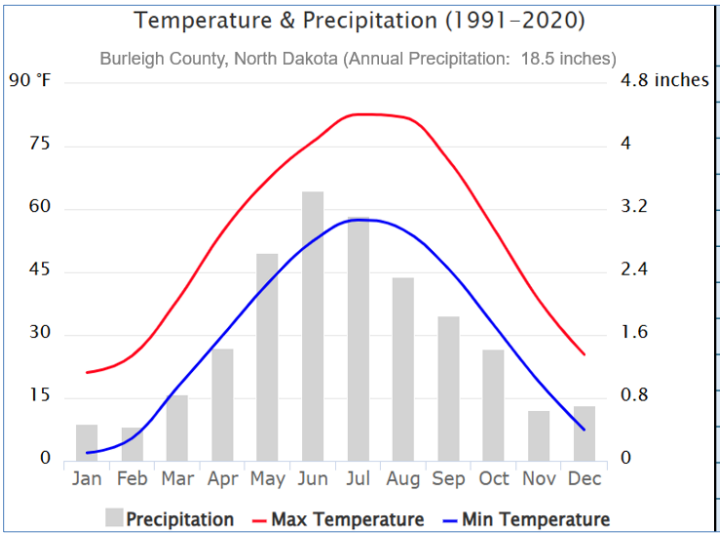

Source: US Census Bureau

## Climate

**General Climate Type - Continental.** Temperature and precipitation are the two parameters traditionally used to describe general, large-scale climate types.

**Temperature.** The Northern Great Plains (NGP) region in general and South-central North Dakota (Burleigh County) in particular, has an extreme continental climate characterized by a very high annual variation in temperature (warm summers and cold winters) and a high daily range in temperatures, as compared to maritime climates. These high ranges in temperature are mainly due to the area's location: in the mid-north latitudes (between 45.935° and 49.00 ° N), along the north border of the continental United States, centered in the North American Continent, and far from the modifying effect of oceans.

**Precipitation.** Moisture is a second key component of climate, with North Dakota effectively straddling "the transition from the moist eastern United States and the semiarid West" (Frankson, 2022). A high daily range in temperature is primarily due to the lower heat capacity of dry air and dry soils as compared to humid air and either moist soils or large bodies of water, so that dryer air and dryer soil will both warm and cool at a faster rate than wetter air or soil (Wikipedia: Climate of ND, 2023).

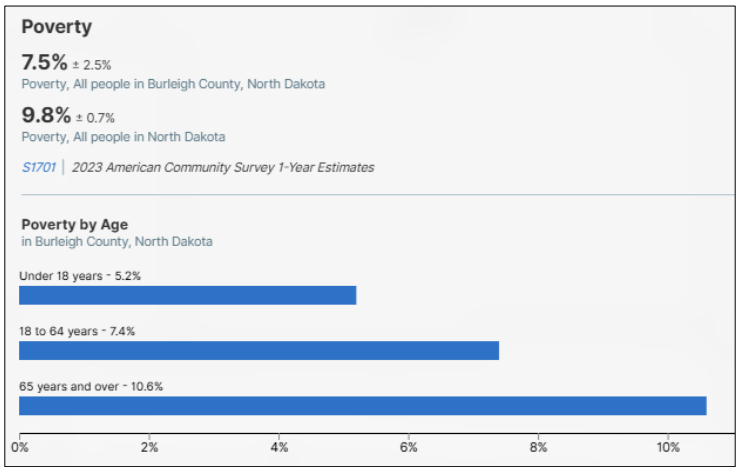



| Month | Pcpn(in.) Normal | Tmax(F) Normal | Tmin(F) Normal | Tavg(F) Normal |
|---|---|---|---|---|
| Jan | 0.4 | 20.9 | 1.7 | 11.3 |
| Feb | 0.36 | 24.9 | 5.2 | 15.1 |
| Mar | 0.78 | 38.1 | 17.4 | 27.8 |
| Apr | 1.36 | 54.4 | 29.7 | 42.1 |
| May | 2.58 | 66.9 | 42.1 | 54.5 |
| Jun | 3.37 | 75.9 | 52.2 | 64.1 |
| Jul | 3.05 | 82.4 | 57.2 | 69.8 |
| Aug | 2.27 | 81.8 | 54.9 | 68.4 |
| Sep | 1.78 | 71.5 | 45.6 | 58.6 |
| Oct | 1.35 | 55.2 | 32.2 | 43.7 |
| Nov | 0.64 | 38.1 | 18.7 | 28.4 |
| Dec | 0.57 | 25.2 | 7.2 | 16.2 |
| Annual | 18.51 | 52.9 | 30.3 | 41.6 |

The figure above shows the average monthly precipitation and the range of monthly average high and low temperatures for the Burleigh County area during the most recent 30-year climate normal period, 1991-2020 (XM-ACIS, 2025; Climate Toolbox, 2024).

## Economy

The largest percentage of population (23.8%) is employed in "Educational services, and health care and social assistance", median household income was $85,172, with poverty at 7.5%.
Source: US Census Bureau 2023 American Community Survey

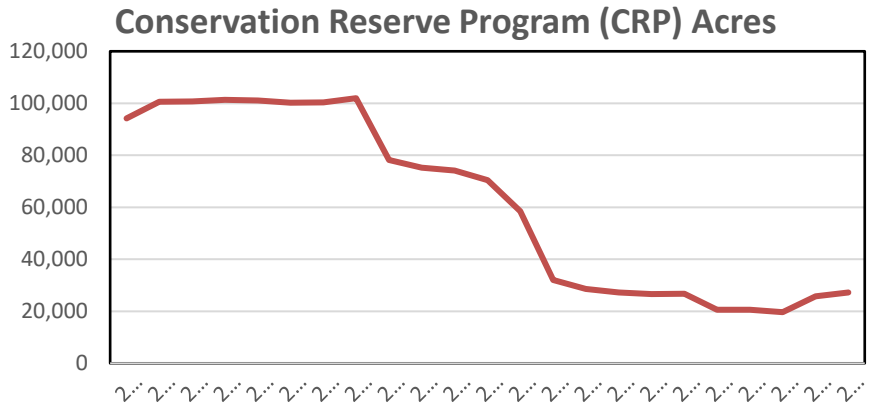



Source: US Census Bureau 2023 American Community Survey

## Land Use Concerns

The primary landscape of Burleigh County, 73%, is equally split between rolling pasturelands and croplands, with less than 7% developed as residential or commercial property. The remaining 20% is composed of rolling prairie, wetlands, small lakes, and federal or state wildlife management areas (USDA, 2022; Stout, 1974). Woodlands make up less than 1% of the landscape in the county, primarily as homestead shelterbelts or urban plantings (Claeys, 2020).

There were 709 farms in 2022 (10% decrease from 2017) averaging 1,103 acres per farm. (Source: USDA Census of Agriculture) Soil erosion due to wind and water remains a problem. On steep gradients, rain washes out gullies in cultivated fields, and fields cultivated in the fall suffer wind damage. Acreage (27,264) in the 2022 Conservation Reserve Program helped mitigate some erosion.




Data Source: US Department of Agriculture, Farm Service Agency

Burleigh County continues to study a variety of mitigation activities. Soil erosion, water supply, and water quality are concerns of the county.

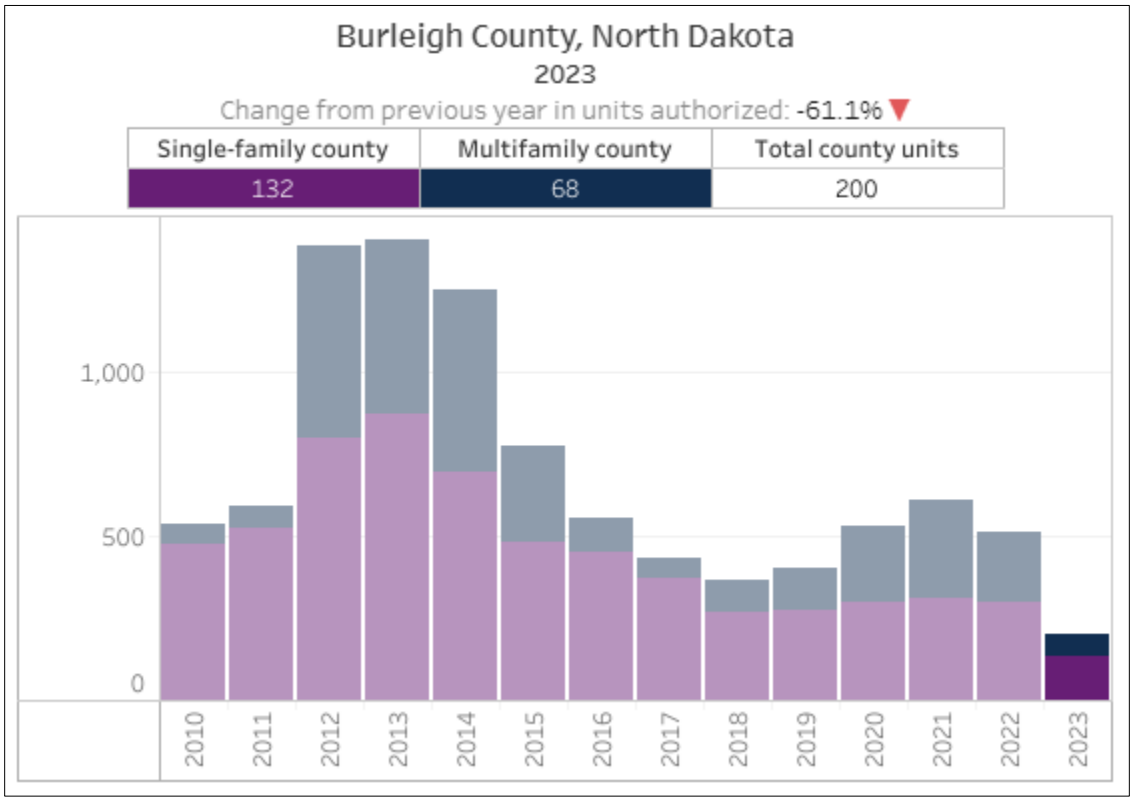
The Burleigh County floodplain ordinance was last updated in 2024: Additionally, the Burleigh County Water Resource District utilizes previous flood event data when considering flood control projects and includes non-structural project recommendations such as amending floodplain ordinances in direct correlation with National Flood Insurance Program recommendations and FEMA's flood insurance rate map data.

## Development

The Bismarck Mandan Chamber EDC and local jurisdictions promote and encourage opportunities for the area as a destination to live, work, and play.

The ND oil boom peaked in 2012-2013 which resulted in increased population and development.

(Source: US Census Bureau)



# Risk Assessment

The 15 hazards identified by the ND Department of Emergency Services were utilized for the risk assessment. (Source: ND Enhanced Mitigation Mission Area Operations Plan, 2024-2029)

| Natural Hazards | Technological Hazards | Human-Caused Incidents |
|---|---|---|
| Drought | Dam Failure | Civil Disturbance |
| Flood | Hazardous Materials Release | Criminal Attack |
| Geologic Hazards | Transportation Incident | Cyberattack |
| Infectious Disease and Pest Infestation | | Terrorist or Nation-State Attack |
| Severe Summer Weather | | |
| Severe Winter Weather | | |
| Space Weather | | |
| Wildfire/Urban Fire | | |

- **Natural hazards**: acts of nature. The natural hazards identified in this plan are Flood, Fire, Drought, Severe Winter Weather, Severe Summer Weather, Infectious Disease and Pest Infestation, Space Weather and Geologic Hazards.
- **Technological hazards**: accidents or the failures of systems and structures. Technological hazards in this plan include Dam Failure, Hazardous Material Release, and Transportation Incidents.
- **Human-caused incidents**: the intentional actions of an adversary. Human-caused incidents in this plan include Cyberattack, Criminal Attack, Civil Disturbance and Terrorist or Nation-State Attack.

| Risk Assessment by Jurisdiction | | | | | |
|---|---|---|---|---|---|
| **Hazard** | **Burleigh County** | **Lincoln** | **Regan** | **Wilton** | **Wing** |
| Civil Disturbance | X | X | X | X | X |
| Criminal, Terrorist or Nation-State Attack | X | X | X | X | X |
| Cyberattack | X | X | X | X | X |
| Dam Failure | X | X | | | |
| Drought | X | X | X | X | X |
| Fire (urban and wildland) | X | X | X | X | X |
| Flood | X | X | X | X | X |
| Geologic Hazards | X | | | | |
| Hazardous Materials Release | X | X | X | X | X |
| Infectious Disease and Pest Infestation | X | X | X | X | X |
| Severe Summer Weather | X | X | X | X | X |
| Severe Winter | X | X | X | X | X |
| Space Weather | X | X | X | X | X |
| Transportation | X | X | | X | X |

The jurisdictions are affected by the hazards with slight variances in susceptibility.

**Civil Disturbance and Criminal, Terrorist, or Nation/State Attack**
All jurisdictions could be impacted; however, greater vulnerability would be anticipated in the most populous city and capital of North Dakota—City of Bismarck. The greatest threat would be significant impact to critical facilities and/or infrastructure.

**Dam Failure**
Two, high-hazard dams present significant risks to several sections of Burleigh County. Failure of the Garrison Dam in McLean County could affect the southwest section of Burleigh County (including the Cities of Bismarck and Lincoln) as discussed in the Dam Failure section. Failure of the Heart Butte Dam in Grant County could affect portions in far southwest Burleigh County.

**Drought and Fire**
Rural Burleigh County (farmland acreage) would suffer significant agricultural losses, and grain elevators (Regan, Sterling, Wilton, and Wing) and agronomy centers may suffer losses due to drought and loss of crops.

Water Supplies: The South Central Regional Water District is the major supplier for Burleigh County. The City of Bismarck Public Works supplies water to the City of Lincoln and areas of Burleigh County that border the City of Bismarck. Water supply is adequate with rare requests to decrease water consumption during periods of drought/extreme heat.

In addition to South Central Regional Water:

- City of Lincoln has two, gravity-fed water towers with a 500,000-gallon capacity for each tower.
- City of Regan continues to have maintained wells and individual septic systems.
- City of Wilton has one, gravity-fed water tower with a 300,000-gallon capacity.
- City of Wing has one, gravity-fed water tower with a 50,000-gallon capacity.

Resources for potable water supplies are identified in the Burleigh County Emergency Operations Plan.

The impacts of drought and wildland fire could impact city residents in several ways; however, rural Burleigh County is more susceptible to these hazards due to open prairie and agricultural activities especially in areas around the cities (wildland urban interface). The incorporated cities are more vulnerable to urban fire with losses greater in the more populated cities.

**Flood**
The following figure displays that no jurisdiction is immune to flood vulnerability and has either experienced the vulnerability or has the increasing susceptibility to experience the vulnerability. Additionally, inundation maps show the vulnerability and can be found in the Attachments.

| Flood Vulnerabilities by Jurisdiction | | | | | | |
|---|---|---|---|---|---|---|
| | **Burleigh County** | **Bismarck** | **Lincoln** | **Regan** | **Wilton** | **Wing** |
| Creek/River Flooding | X | X | X | | | |
| Overland Flooding | X | X | X | X | X | X |
| Ice Jam Flooding | X | X | X | | | |
| Lift Stations | X | X | Gravity Flow | | Gravity Flow | X |
| Lagoon Overruns | X | X | X | | | |
| Road Washouts | X | X | X | X | X | X |

**Geologic Hazards**
No jurisdictions have significant history of this hazard.

An area of rural SW Burleigh County along the southern portion of Apple Creek has experienced some bank failures and slumping; no structures affected. University of Mary is currently undergoing a bank stabilization project uphill from Apple Creek. Areas along River Road in north Bismarck and rural Burleigh County (Western County border) also experience some sloughing from the grade of the eastern ridge with no structures affected. Both areas are monitored by the Burleigh County Highway Department via drone photography.

The Double Ditch Indian Village State Historical Site (SW Burleigh County) suffered severe erosion caused by the 2011 Missouri River flood and has undergone bank stabilization. The site is monitored by the ND Historical Society on a biannual basis to include drone aerial inspections.

**Hazardous Materials Release and Transportation Incident**
Varied levels of susceptibility are apparent for all jurisdictions. Highway 83 runs through the western side of Burleigh County (including the Cities of Bismarck and Wilton). Additionally, Interstate 94 transects the middle of Burleigh County through the City of Bismarck and near the City of Lincoln. Railroad tracks run through Burleigh County, Bismarck, and Wilton. The City of Regan is located approximately ½ mile north of Highway 36, which is not a major transportation route. Throughout the year, farmers transport anhydrous ammonia in pup tanks.

The City of Bismarck is far more susceptible to the hazards due to being an urban center with the highest population density in Burleigh County. Other factors increasing susceptibility include:

- State Capitol
- Government Buildings (local, state, and federal)
- Higher Education Facilities
- Numerous Medical Facilities
- Tourism Destination
- Commercial and Agricultural Industries
- Increased Number of Impervious Surfaces
- Increased Transportation Flow

| Hazardous Materials Release and Transportation Incident | | | | | | |
|---|---|---|---|---|---|---|
| | **Burleigh County** | **Bismarck** | **Lincoln** | **Regan** | **Wilton** | **Wing** |
| Anhydrous Ammonia | **X** | **X** | **X** | **X** | **X** | **X** |
| Bulk Fuel | **X** | **X** | **X** | | **X** | **X** |
| Bulk Fertilizer | **X** | **X** | | | | |
| Farm Chemicals | **X** | **X** | **X** | **X** | **X** | **X** |
| Propane | **X** | **X** | **X** | | **X** | **X** |
| Fuel and Gas | **X** | **X** | **X** | **X** | **X** | **X** |
| Natural Gas | **X** | **X** | **X** | | **X** | |
| Major Transportation Route | **X** | **X** | **X** | | **X** | |
| Railroad | **X** | **X** | **X** | | **X** | |

**Infectious Diseases and Pest Infestations**
Each jurisdiction is susceptible to infectious diseases and pest infestations; however, the more rural communities of Regan, Wilton, and Wing and unincorporated Burleigh County are particularly susceptible to diseases that impact plants and animals. The cities are more susceptible to communicable disease due to population density.

**Severe Summer Weather and Severe Winter Weather**
All jurisdictions are impacted. Severe summer weather incidents may cause major economic losses based on the level of impact. Severe winter weather often results in blocked roads and can affect each jurisdiction and may lead to economic loss dependent upon severity and length of time. Rural Burleigh County residents have backup power sources (generators and/or coal or wood-burning stoves) and extra fuel sources (gas and propane). Windstorms may result in downed power lines coupled with damage from flying debris and damage to facilities. Mobile home dwellings are encouraged to have tie-downs.

The communities of Bismarck, Lincoln, Wilton, and Wing each maintain and test outdoor warning sirens. Wilton and Wing also utilize their sirens to alert fire or ambulance crews.

**Space Weather**
No jurisdictions have any significant history of this hazard. Disruption of critical facilities and infrastructure would have a significant effect on each jurisdiction to include medical, law, fire, and facilities dependents on satellite data. Emergency services will continue to operate in a diminished capacity if there is a disruption to communications technology.

Bismarck/Burleigh: Critical facilities with backup power include both hospitals, the City/County Building, Central Dakota Communications Center (911), Emergency Operations Center, Bismarck Police Department, Burleigh County Sheriff's Office.

Lincoln: Lincoln City Hall/Lincoln Police Department has a backup generator; however, the following critical facilities do not have backup power: Lincoln Public Works Facility, two Pump Stations, and Lift Station (listed as mitigation projects in Attachments)

Wilton: The Wilton Ambulance and Wilton Senior Center (utilized as a shelter) have a backup generator; however, the following critical facilities do not have backup power: Wilton City Hall, and Wilton Water Tower.

Wing: Critical facilities without backup power include the City of Wing Fire Department/City Hall, Water Tower, two Wells, and two Lift Stations (listed as mitigation projects in Attachments).

**Critical Facilities**

Critical facilities and infrastructure are assets essential to public safety and continuity of government operations. Damaged or destroyed facilities or infrastructure could have debilitating effects on safety, security, public health, or the economy in Burleigh County.

The hazards most likely to impact critical facilities are cyberattack, flood, hazardous materials release, severe summer weather, severe winter weather, and space weather.

- Cyberattack: Critical facilities utilize computerized system(s) as a main function of providing services.

- Flood: Flooding of the Missouri River and Apple Creek cause damage to homes in the western part Burleigh County and the City of Bismarck as well as farmland and rural homes along the creek areas. During flooding events, roads may become inundated with water and cut off accessibility to critical facilities.

- Hazardous Materials Release: Hazardous materials are transported via three modes into and within Burleigh County: Highways, Railroad, and Air. Dependent upon location of release, critical facilities could be affected with damage or complete loss.

- Space Weather: Solar flares would impact communications, solar radiation storms will impact satellites, and geomagnetic storms will cause the greatest damage—disrupting navigation systems such as the Global Navigation Satellite System (GNSS) and creating harmful geomagnetic-induced currents (GICs) in the power grid and pipelines. It's possible for these storms to cause power grid energy spikes, which could trigger fires, power blackouts and physically harm individuals coming into contact with storm-spiked wires or pipelines.

- Summer Weather: Extreme heat, hail, lightning, high winds, and tornadoes may cause damage or complete loss to some critical facilities in Burleigh County.

- Winter Weather: Major arterials are vulnerable to becoming blocked with snow making them impassible. Many county and township roads become blocked during winter storms and cities are largely affected by winter storms.

**Major facilities and infrastructure:**

| Category | Type |
|---|---|
| Communications | Cell Towers<br>Communication Towers<br>Information/Data/Record Centers<br>Media |
| Emergency Services | Law<br>Fire<br>Emergency Medical Services (EMS)<br>ND National Guard<br>Public Safety Answering Points (PSAPs)/911 Centers<br>Public Works |
| Energy/Utility | Electric Power Generation and Substations<br>Pipelines<br>Transmission Lines<br>Utility Companies<br>Water Distribution Systems<br>Water Towers<br>Water Treatment Plants |
| Financial Institutions | Banks<br>Credit Unions |
| Government | Courthouses<br>Jails<br>Schools |
| Industrial and Storage | Food Processing and/or Storage<br>Fuel<br>Health and Medical Supplies<br>Major Industries |
| Medical | Clinics<br>Hospitals<br>Long-Term Care Facilities<br>Pharmacies |
| Transportation | Airports<br>Highways/Bridges<br>Railroads |

**Hazards Excluded or Minimally Addressed in this Plan**

| Hazard | Notes |
|---|---|
| Avalanche | Avalanches require slopes that generally do not exist in Burleigh County. Burleigh County is not covered by the National Avalanche Center and has no history of declared avalanche disasters. |
| Climate Change | Climate change is addressed as a condition that impacts most hazards and not as a separate hazard. |
| Coastal Erosion | Burleigh County does not have an ocean coastline. |
| Coastal Storm | Burleigh County does not have an ocean coastline. |
| Hurricane | Burleigh County does not have an ocean coastline. |
| Public Utility Failure | Utility failure is viewed as a consequence of other hazards and not as a separate hazard. |
| Shortage/Outage of Critical Materials | Lack of critical materials is viewed as a consequence of other hazards and not as a separate hazard. |
| Tsunami | Burleigh County does not have an ocean coastline. |
| Volcano | Burleigh County has no identified volcanoes; however, volcanic ashfall can occur over Burleigh County, but the frequency is rare, and the potential impacts are not expected to exceed local capabilities. The impact of an external volcano is discussed in geologic hazards. |
| Windstorm | Windstorms are identified as severe summer and severe winter weather and not as a separate hazard. |

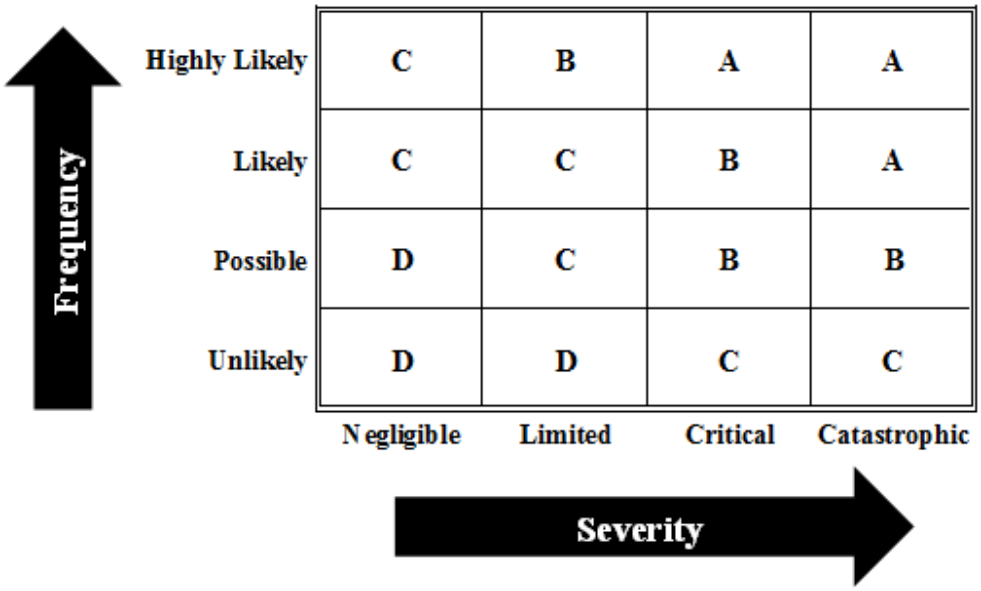
## Risk Analysis Worksheet

**Frequency:** How often is this hazard likely to develop in this area?

| | |
|---|---|
| Highly Likely | Nearly 100% probability in the next year |
| Likely | 10–100% probability in the next year, or at least 1 chance in next 10 years |
| Possible | 1–10% probability in the next year, or at least 1 chance in next 100 years |
| Unlikely | Less than 1% probability in next 100 years |

**Severity:** What is the expected extent of damage caused by this type of hazard?

| | |
|---|---|
| Catastrophic | More than 50% of jurisdiction affected |
| Critical | 25–50% of jurisdiction affected |
| Limited | 10–25% of jurisdiction affected |
| Negligible | Less than 10% of jurisdiction affected |




(Source: FEMA Multi-Hazard Identification and Risk Assessment, January 1, 1997, Risk Assessment Approaches – Chapter/Section Number: Part 3)

**Risk Class:** Classification of the overall risk posed to the jurisdiction and immediacy of necessary action:

**Seasonal Pattern:** When is the type of hazard most likely to occur?

**Probable Duration:** How long will this event typically have an impact on the community?

**Speed of Onset:** How much advance warning does the community have for this type of event?

**Location/Jurisdiction**: Which areas are affected?

**Risks:** Types of situations that might result from the hazard.

| **Hazard** |
| --- |
| **Frequency:** _____ |
| **Severity:** _____ |
| **Risk Class:** _____ |
| **Seasonal Pattern:** _____ |
| **Duration:** _____ |
| **Speed of Onset:** _____ |

DESCRIPTION:

IDENTIFIED IMPACTS:

HISTORY:

## Hazard Risk Analysis Chart with Vulnerabilities for each Hazard

| Risk Class: | C | C | B | B | C | C | C | D | B | B | B | A | B | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **HAZARD:** | Civil Disturbance | Criminal, terrorist, or Nation-State Attack | Cyberattack | Dam Failure | Drought | Fire | Flood | Geologic Hazards | Hazardous Materials Release | Infections Disease and Pest Infestation | Severe Summer Weather | Severe Winter Weather | Space Weather | Transportation Accident |
| Blocked Roads | X | X | X | X | | X | X | X | X | | X | X | X | X |
| Building Collapse | | X | | X | | X | X | X | X | | X | X | | |
| Business Interruptions | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Delayed Emergency Response | X | X | X | X | | X | X | X | X | X | X | X | X | X |
| Downed Power Lines | | X | | X | | X | X | X | X | | X | X | | |
| Downed Trees | | | | X | | X | X | X | X | | X | X | | |
| Evacuation (Full) | | | | X | | | | | X | | | | | |
| Evacuation (Localized) | X | X | | X | | X | X | X | X | | X | X | | X |
| Explosion | | X | | | | X | | | X | | X | | | X |
| Flooding (Street) | | | | X | | | X | | | | X | | | |
| Flooding (Structure) | | | | X | | | X | | | | X | | | |
| HAZMAT Release | | X | | X | | X | X | | X | | X | X | | X |
| Increased Fire Potential | | | | | X | X | | | X | | X | X | X | |
| Increased Public Safety Runs | X | X | | X | | X | X | | X | X | X | X | X | X |
| Livestock Injury/Death | | X | | X | X | X | X | | X | X | X | X | | |
| Loss of Economy | | X | X | X | X | X | X | | X | X | X | X | X | X |
| Loss/Overcrowded Medical Facilities | | X | | X | | X | X | | X | X | X | X | X | X |
| Loss of Potable Water | | X | | X | X | | X | X | X | X | X | X | | |
| Loss of Power | | X | X | X | | X | X | X | X | | X | X | X | |
| Mass Casualties | | X | | X | | X | X | | X | X | X | | X | X |
| Property Damage | X | X | | X | X | X | X | X | X | | X | X | X | X |
| School Closure | | X | | X | | X | X | | X | X | X | X | X | |
| Sewer Backup | | | | X | | | X | | | | X | | | |
| Wind Chill | | | | | | | | | | | | X | | |

## Overall Vulnerability Summary

| HAZARD | Description |
|---|---|
| Civil Disturbance | No change. |
| Criminal, Terrorist or Nation-State Attack | No change. |
| Cyberattack | No change. |
| Dam Failure | No change. |
| Drought | No change. |
| Fire | No change. |
| Flood | No change. |
| Geologic Hazards | No change. |
| Hazardous Materials Release | No change. |
| Infectious Diseases and Pest Infestations | No change. |
| Severe Summer Weather | No change. |
| Severe Winter Weather | No change. |
| Space Weather | No change. |
| Transportation Accident | No change. |

## THIRA Survey

| | | Very Likely | Likely | Possible | Unlikely | Improbable |
|---|---|---|---|---|---|---|
| | Score | 5 | 4 | 3 | 2 | 1 |
| **Catastrophic** | 5 | | | • Dam Failure | • Nuclear Terrorism Attack | |
| **Significant** | 4 | | | | • Biological Terrorism Attack<br>• Chemical Terrorism Attack<br>• RDD Terrorism Attack | |
| **Moderate** | 3 | • Summer Storms<br>• Winter Storms | | • Aircraft as a Weapon<br>• Chemical Substance Spill/Release<br>• Explosives Terrorism Attack | • Radiological Substance Release | |
| **Minor** | 2 | | | • Armed Assault<br>• Biological Food Contamination<br>• Chemical/Biological Food Production Attack<br>• Human Pandemic Outbreak<br>• Supply Chain Disruption<br>• Transportation Incident | | |
| **None/ Negligible** | 1 | | • Cyber Attack | • Animal Disease Outbreak<br>• Civil Disorder<br>• Flood<br>• Wildfire | | |

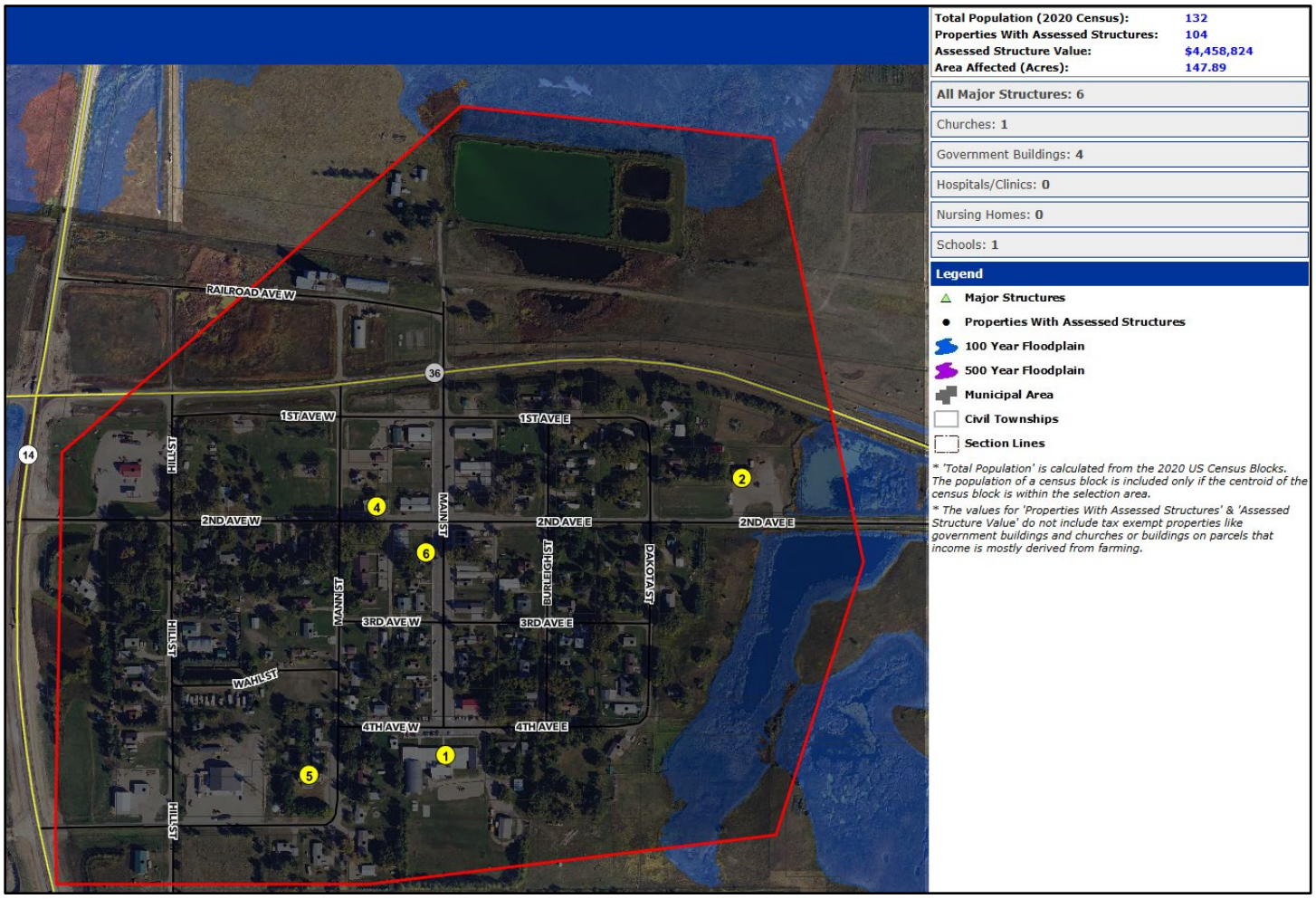
*Based on 29 responses

THIRA Step 2 complete.

THIRA Steps 3-4 completed in 2020 and reviewed in 2024.

## Damage Assessment

An in-house GIS mapping application was created to assess damages from nearly any hazard.




Source: Burleigh County GIS

The assessment includes:

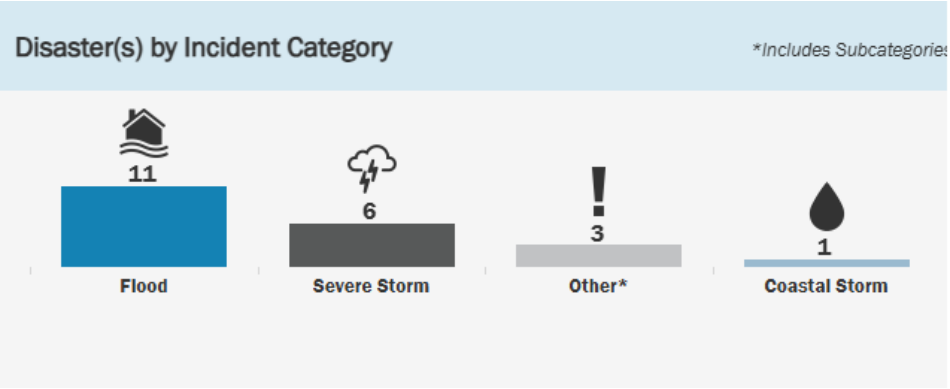
- Any geometric shape
- Population within the shape
- Critical infrastructure
- Properties with assessed structures
- Assessed structure values
- Breakdown of the major structure types

**Burleigh County Disaster Declarations**

| Number | Declared | Description |
|---|---|---|
| 4509 | 04/01/2020 | COVID-10 Pandemic |
| 1981 | 5/10/2011 | Flooding |
| 1901 | 4/21/2010 | Severe Winter Storm |
| 1829 | 3/24/2009 | Severe Storms and Flooding |
| 1376 | 5/28/2001 | Floods |
| 1334 | 6/27/2000 | Severe Storms and Flooding |
| 1279 | 6/8/1999 | Severe Storms, Tornadoes, Snow and Ice, Flooding, Ground Saturation, Landslides and Mudslides |
| 1174 | 4/7/1997 | Severe Storms/Flooding |
| 1157 | 1/12/1997 | Severe Winter Storms/Blizzards |
| 1118 | 6/5/1996 | Flooding |
| 1050 | 5/16/1995 | Severe Storms, Flooding, Ground Saturation |
| 1001 | 7/26/1993 | Flooding, Severe Storms |
| 581 | 4/26/1979 | Storms, Snowmelt, Flooding |
| 554 | 4/17/1978 | Storms, Ice Jams, Snowmelt, Flooding |
| 287 | 6/5/1970 | Severe Storms, Flooding |
| 256 | 4/18/1969 | Flooding |

**Burleigh County Emergency Declarations**

| Number | Declared | Description |
|---|---|---|
| 3477 | 3/13/2020 | COVID-19 |
| 3318 | 4/7/2011 | Flooding |
| 3309 | 3/14/2010 | Flooding |
| 3247 | 9/13/2005 | Hurricane Katrina Evacuation |
| 3016 | 7/21/1976 | Drought |
| 3012 | 4/13/1976 | Severe Flooding |




Source: Source: http://www.fema.gov/disasters

# Hazards

## Civil Disturbance

| | |
|---|---|
| **Frequency** | Likely (10-100% probability in the next year, or at least 1 chance in next 10 years) |
| **Severity** | Limited (10-25% of jurisdiction affected) |
| **Risk Class** | C |
| **Seasonal Pattern** | None |
| **Duration** | Hours/Days |
| **Speed of Onset** | No warning |
| **Location** | Countywide |
| **Impacts** | Blocked Roads, Business Interruptions, Delayed Emergency Response, Increased Public Safety Runs, Property Damage |

### Description

Civil disturbances are defined as group acts of violence and disorders prejudicial to public law and order; terrorist incidents, a form of civil disturbance, are defined as distinct criminal acts committed or threatened to be committed by a group or individual to advance a political objective. (Source: U.S. Department of Justice Office of Justice Programs)

Civil disturbances can occur anywhere in Burleigh County. Most civil disturbances are local in scale and within the capability and responsibility of local law enforcement. It is not possible to predict the location of a civil disturbance; however, large venue locations such as stadiums, government facilities, industrial facilities, and locations with correctional facilities may be more susceptible to such incidents.

### History

Smaller-scale riots and assaults can and have occurred in correctional facilities located within Burleigh County:

- Bismarck Transition Center
- Burleigh/Morton Detention Center
- ND Missouri River Correctional Center
- ND State Penitentiary

2016: The Dakota Access Pipeline (DAPL) project resulted in multiple criminal activities including acts of vandalism, trespassing, riots, vehicles, hay bales and tires set on fire, and the arrest of 709 protesters. The protestors gathered to express concern about the installation of an 1134-mile-long crude oil pipeline across North Dakota and other states. The protest transitioned into an unlawful assembly and civil disorder on August 10, 2016, when individuals attempted to block access to construction activities associated with the pipeline. Originally an environmental-focused event, it quickly grew from a few hundred participants to numbers estimated near 10,000. It also expanded its scope to include real or perceived concerns surrounding Native American rights, as well as a myriad of other environmental concerns not necessarily associated with construction of the DAPL. Widespread criminal activity spawned from the protest, to include vandalism, terroristic threats, and intimidation tactics directed at local landowners as well as law enforcement and their families, doxing of law enforcement and other officials (doxing is the Internet-based practice of researching and broadcasting private or identifiable information), arson, poaching, and the theft and killing of livestock in the area. The majority of activities occurred in Morton and Sioux Counties; however, Burleigh and Emmons Counties also experienced activity on a smaller scale. (Source: ND State Emergency Operations Plan, December 2018)

### Criminal, Terrorist, or Nation-State Attack

| | |
|---|---|
| **Frequency** | Possible (1-10% probability in next year, or at least 1 chance in next 100 years) |
| **Severity** | Limited (10-25% of jurisdiction affected) |
| **Risk Class** | C |
| **Seasonal Pattern** | None |
| **Duration** | Hours/Days |
| **Speed of Onset** | No warning |
| **Location** | Countywide |
| **Impacts** | Blocked Roads, Building Collapse, Business Interruptions, Delayed Emergency Response, Downed Power Lines, Evacuation (Localized), Explosion, HAZMAT Release, Increased Public Safety Runs, Livestock Injury/Death, Loss of Economy, Loss/Overcrowded Medical Facilities, Loss of Potable Water, Loss of Power, Mass Casualties, Property Damage, School Closure |

**Description**

International Humanitarian Law defines attacks as acts of violence against the adversary, whether in offense or defense in whatever territory conducted Criminal attack can occur anywhere, including a residence. Mass attacks, such as shooting, are more likely to occur where there is a gathering of people with the potential to be victims.

The Federal Bureau of Investigation (FBI) identifies two categories:

> **International terrorism**: Violent, criminal acts committed by individuals and/or groups who are inspired by, or associated with, designated foreign terrorist organizations or nations (state-sponsored)
>
> **Domestic terrorism**: Violent, criminal acts committed by individuals and/or groups to further ideological goals stemming from domestic influences, such as those of a political, religious, social, racial, or environmental nature

As one of the largest urban centers and the State Capital, Bismarck is far more susceptible to this risk than other jurisdictions within the County.

**History**
Although there have been no National Security Emergencies specific to Burleigh County, any suspicious activity is reported to the ND State and Local Intelligence Center.

| Jurisdiction | Number of Crimes | | |
|---|---|---|---|
| | 2023 | 2022 | 2021 |
| Bismarck Police Department | 6,515 | 6,793 | 7,731 |
| Bismarck State College | 25 | 18 | |
| Burleigh County Sheriff's Office | 991 | 865 | 1,036 |
| Lincoln Police Department | 196 | 255 | 211 |

Source: ND Bureau of Criminal Investigation

## Cyberattack

| | |
|---|---|
| **Frequency** | Possible (1-10% probability in next year, or at least 1 chance in next 100 years) |
| **Severity** | Critical (25-50% of jurisdiction affected) |
| **Risk Class** | B |
| **Seasonal Pattern** | None |
| **Duration** | Days/Weeks |
| **Speed of Onset** | None |
| **Location** | Countywide |

**Description**
Hacker, attacker, or intruder — These terms are applied to the people who seek to exploit weaknesses in software and computer systems for their own gain. Although their intentions are sometimes benign and motivated by curiosity, their actions are typically in violation of the intended use of the systems they are exploiting. The results can range from mere mischief (creating a virus with no intentionally negative impact) to malicious activity (stealing or altering information). Source: Cybersecurity and Infrastructure Security Agency

**Unified Cybersecurity Approach**
April 11, 2019: Senate Bill 2110 was signed by the Governor to make ND the first state to authorize a central, shared service approach to cybersecurity strategy across all aspects of state government including state, local, legislative, judicial, K-12 education and higher education. The state network has 252,000 daily users and more than 400 entities.

**Identified Impacts**
- Blocked Roads
- Business Interruptions
- Delayed Emergency Response
- Loss of Economy
- Loss of Power

**History**
Cyberattacks occur daily and are mitigated through protected networks and servers through the ND Department of Information Technology (NDITD) and the City of Bismarck Information Technology Department. NDITD has a robust service for cyber security, governance, and risk and compliance services for political subdivisions (including Burleigh County). Source: NDITD Website

**Publicly Known Attacks**
2025, February: Cyberattack shut down most systems at Lee Enterprises, the parent company of The Bismarck Tribune. The Bismarck Tribune returned to normal operations by the end of March, 2025. (Source: The Bismarck Tribune, 2025)

2025, January: Bismarck along with other North Dakota school districts, was impacted by a nationwide data breach involving PowerSchool, a software company that manages sensitive student and staff data for many school systems. The breach involved PowerSchool's customer support portal, PowerSource, where an unknown entity gained unauthorized access and downloaded an undisclosed number of records. An investigation by cybersecurity company CrowdStrike found that a prior hack occurred between August and September of 2024. PowerSchool reached a financial agreement with the hackers to have the sensitive information destroyed. (Source: KFYR TV, 2025)

2022, October: CommonSpirit Health, the fourth-largest health system in the nation, had to reschedule surgeries and appointments due to a ransomware attack. St. Alexius Health was among the CommonSpirit hospitals hit in the attack. It took five days to restore regular business. Ambulances and life-sustaining surgeries were not impacted in Bismarck. (Source: The Bismarck Tribune, 2022).

2022, June: ND Workforce Safety and Insurance was a victim of a cybersecurity attack involving personal data via an email attachment. (Source: ND Workforce Safety and Insurance website)

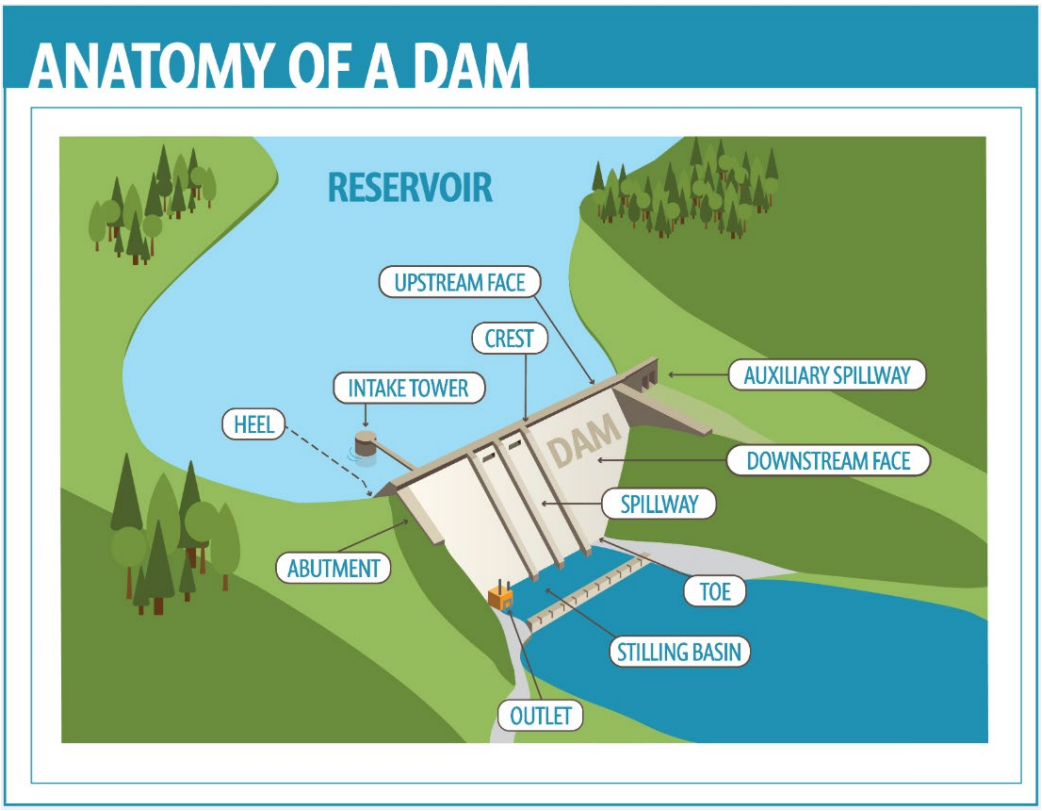
2019, February: Bismarck Public Schools suffered a vicious malware attack resulting in a severe data breach (names, addresses, emails, and phone numbers of individuals had been accessed). It should be noted that this was a nationwide breach through a software and other schools throughout the State of North Dakota were also affected.

2016: During the Dakota Access Pipeline (DAPL) criminal protests, unknown individual(s) released personally identifying information of local officials and law enforcement officers who assisted in the protest response with the intent to have others harass and/or intimidate them or their families. This attack was accomplished through Doxing emails and social media posts, which publicly identifies or publishes private information about someone, especially as a form of punishment or revenge.

## Dam Failure

| | |
|---|---|
| **Frequency** | Possible (1-10% probability in next year, or at least 1 chance in next 100 years) |
| **Severity** | Critical (25-50% of jurisdiction affected) |
| **Risk Class** | B |
| **Seasonal Pattern** | Spring/Summer |
| **Duration** | Days/Weeks |
| **Speed of Onset** | Little warning |
| **Location** | Countywide |

**Description**
A dam is a structure that is built across a river or body of water to hold, divert, or regulate water. Often the body of water stored behind a dam is referred to as the reservoir or lake.




Source: United States Army Corps of Engineers National Inventory of Dams

**Identified Impacts**

- Blocked Roads
- Building Collapse
- Business Interruptions
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Full)
- Evacuation (Localized)
- Flooding (Street)
- Flooding (Structure)
- HAZMAT Release
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Potable Water
- Loss of Power
- Mass Casualties
- Property Damage
- School Closure
- Sewer Backup

**History** – There is no history of a dam failure within the County.

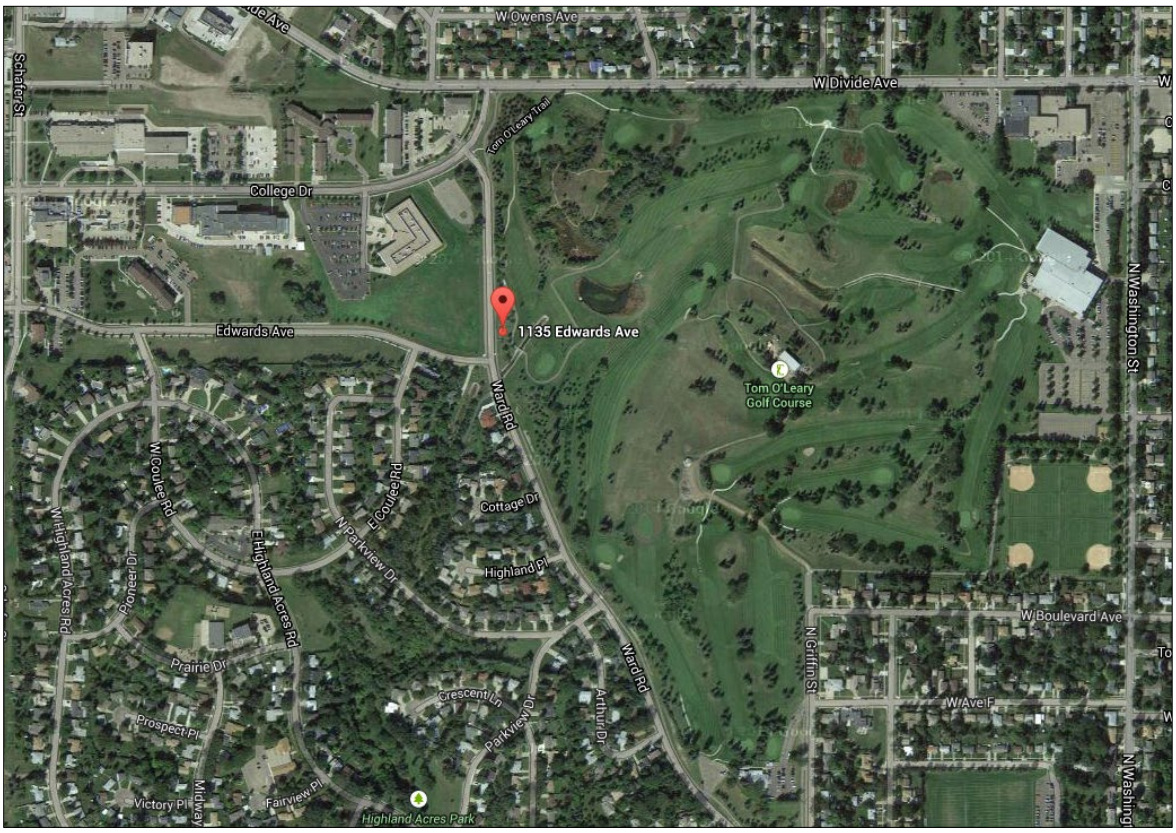
The ND Department of Water Resources identifies 257 dams (structure type) in Burleigh County. All dams have an element of hazard to cause loss of life and property damage should the dam fail. One dam is classified as "Significant", and one dam is classified as "High"; both have Emergency Action Plans. Rural Burleigh County, Bismarck, and Lincoln are at risk for dam failure while dams do not pose a threat to the cities of Regan, Wilton, and Wing. No other dam failures in the jurisdiction affect critical infrastructure but may cause agricultural or environmental damage.

| Location | Type | Status | Structure Name | Purpose | Hazard Class |
|---|---|---|---|---|---|
| 14107604CA | Dam | Intact | Neideffer Flood Control Dam | Flood Control | Low |
| 13908032ABB | Dam | Intact | Jackman Coulee Dam 1 | Flood Control | Low |
| 13908032ABC | Dam | Intact | Jackman Coulee Dam 2 | Flood Control | High |
| 14307906CB | Dam | Intact | Aune Dam; Earl | Flood Control | Undetermined |
| 13908027ADA | Dam | Removed | Hay Creek Overflow Dam | Flood Control | Low |
| 13907927DC | Dam | Intact | McDowell Dam | Recreation | Significant |
| 14007605BC | Dam | Intact | Rice Lake Dam | Recreation | Low |
| 14207611AB | Dam | Intact | ND No Name Dam 122 | Recreation | Low |
| 14108006CB | Dam | Intact | Lange Dam; Donald | Recreation | Undetermined |
| 14307934D | Dam | Breached | Quain Dam | Recreation | Undetermined |

Source: ND Department of Water Resources

The "Jackman Coulee Dam 2" is flood control structure located within the City of Bismarck (1135 Edwards Avenue). The structure is on the western edge of the "Tom O'Leary Golf Course". Failure of the urban dam classified as "high" would most likely result in environmental and home damages (200+) and/or loss due to location.

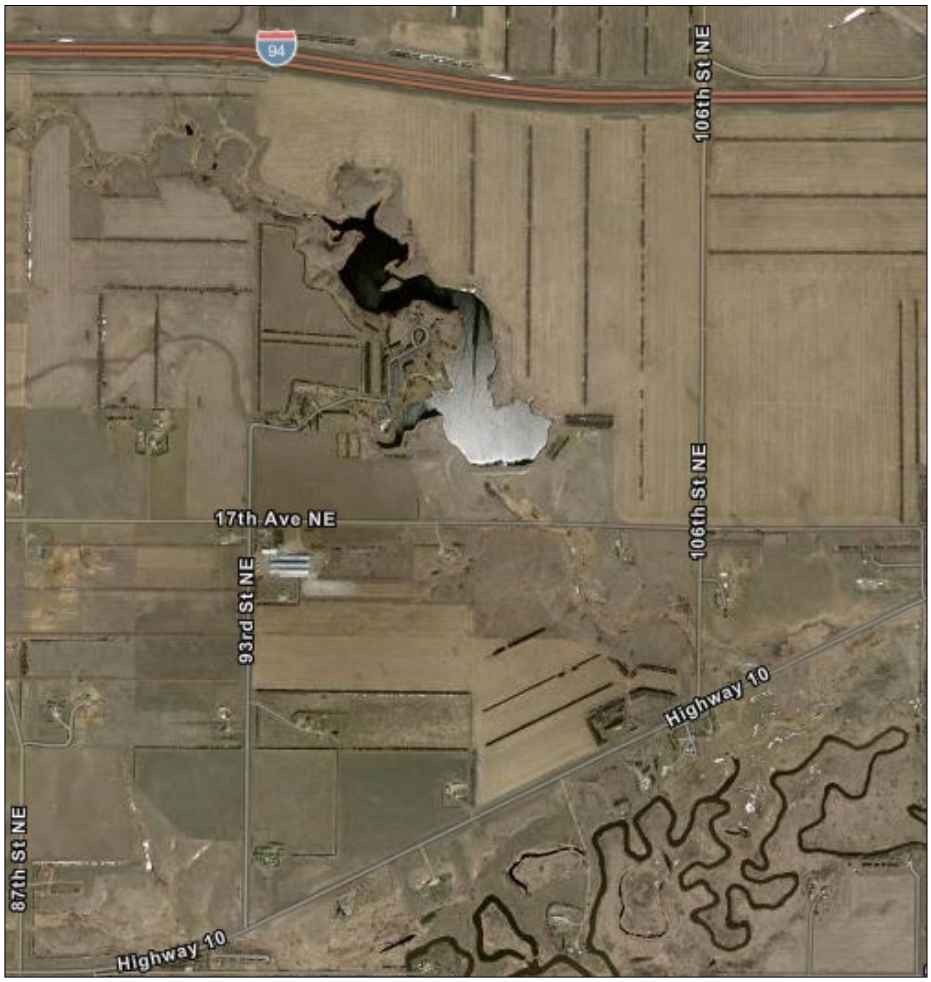
Source: ND Department of Water Resources




Source: Google Maps Website

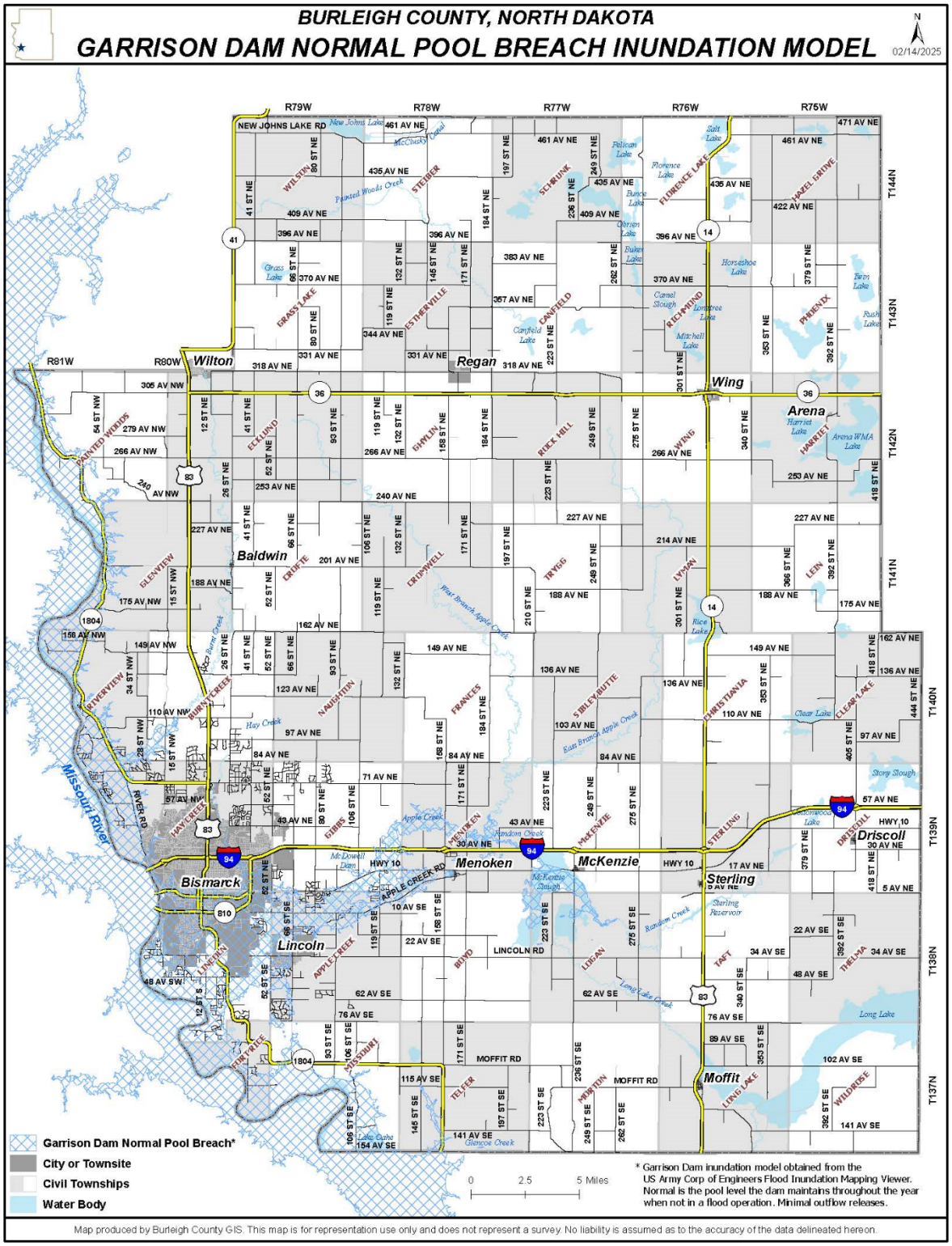
McDowell Dam is a recreation area located five miles east of Bismarck (1951 93rd Street NE). Available activities include swimming, boating, fishing, and paddle boating. Failure of the rural dam classified as "significant" would most likely result in environmental and home loss (approximately 100) due to location.

Source: ND Department of Water Resources




Source: ND Game and Fish

Lake Sakakawea was formed by construction of the Garrison Dam in 1953, covering 368,000 surface acres with maximum storage of 24.5 million acre-feet, and 1,600 miles of shoreline in six counties. Total failure of the dam could affect approximately 21,568 people and 6,465 properties with an assessed value of $1,845,005,873 utilizing the Burleigh County Damage Estimator.

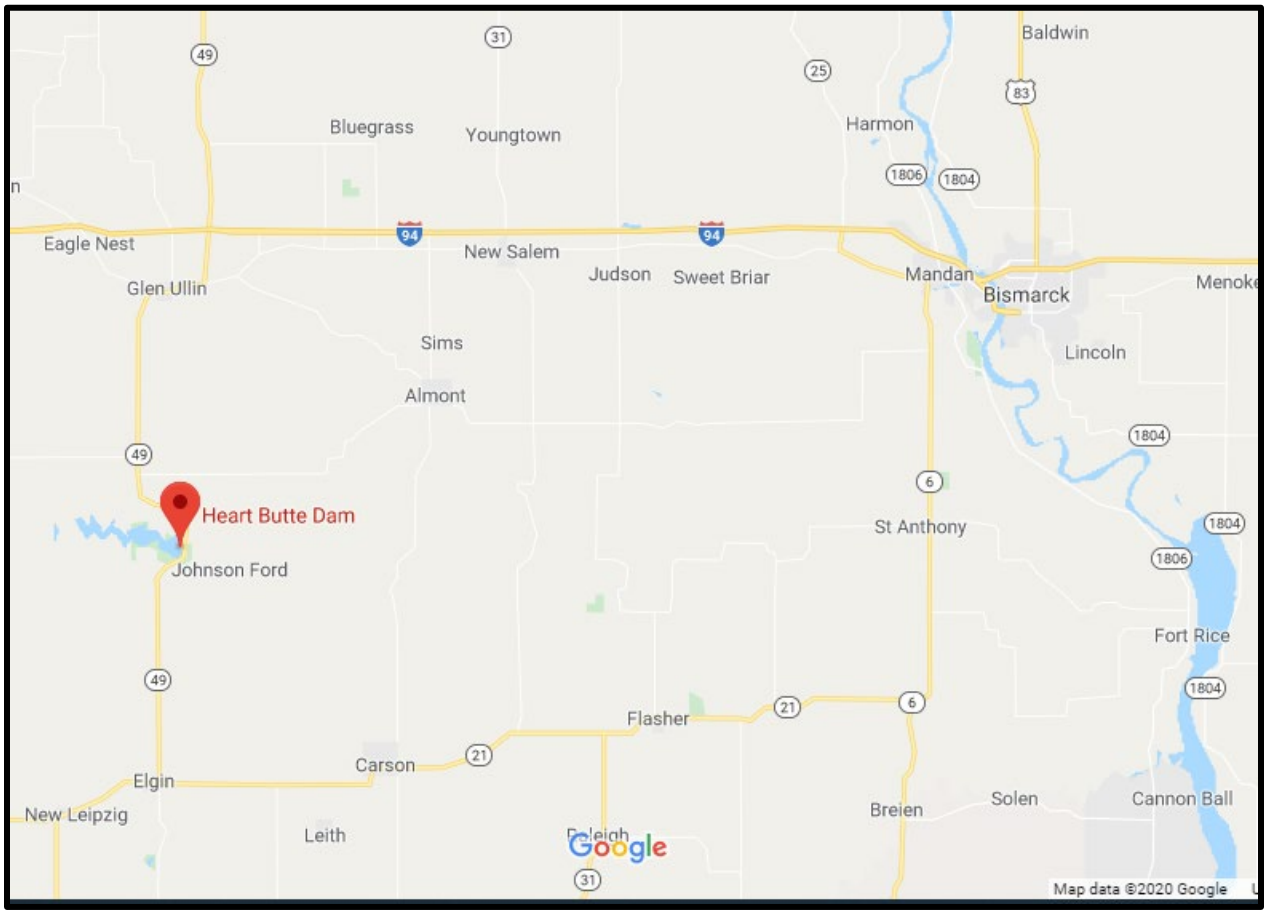



Source: Burleigh County GIS

Heart Butte Dam and Reservoir, or Lake Tschida (renamed in 1958), is in Grant County in the southwestern part of North Dakota and approximately 70 miles southwest of Bismarck (Burleigh County).

Heart Butte Reservoir has a total capacity of 214,169 acre-feet at the top of the exclusive flood control, of which 147,027 acre-feet are for flood control storage, 67,142 acre-feet for active conservation, and 5,227 acre-feet for dead storage. The lake covers an area of 6,738 acres at the top of flood control. (Source: Heart Butte Reservoir Resource Management Plan, December 2006)

A Heart Butte Dam hydrologically induced static failure scenario could affect approximately 23,517 people and 7,375 properties with assessed value of $2,279,321,037 utilizing the Burleigh County Damage Estimator.




Source: Google Map Data

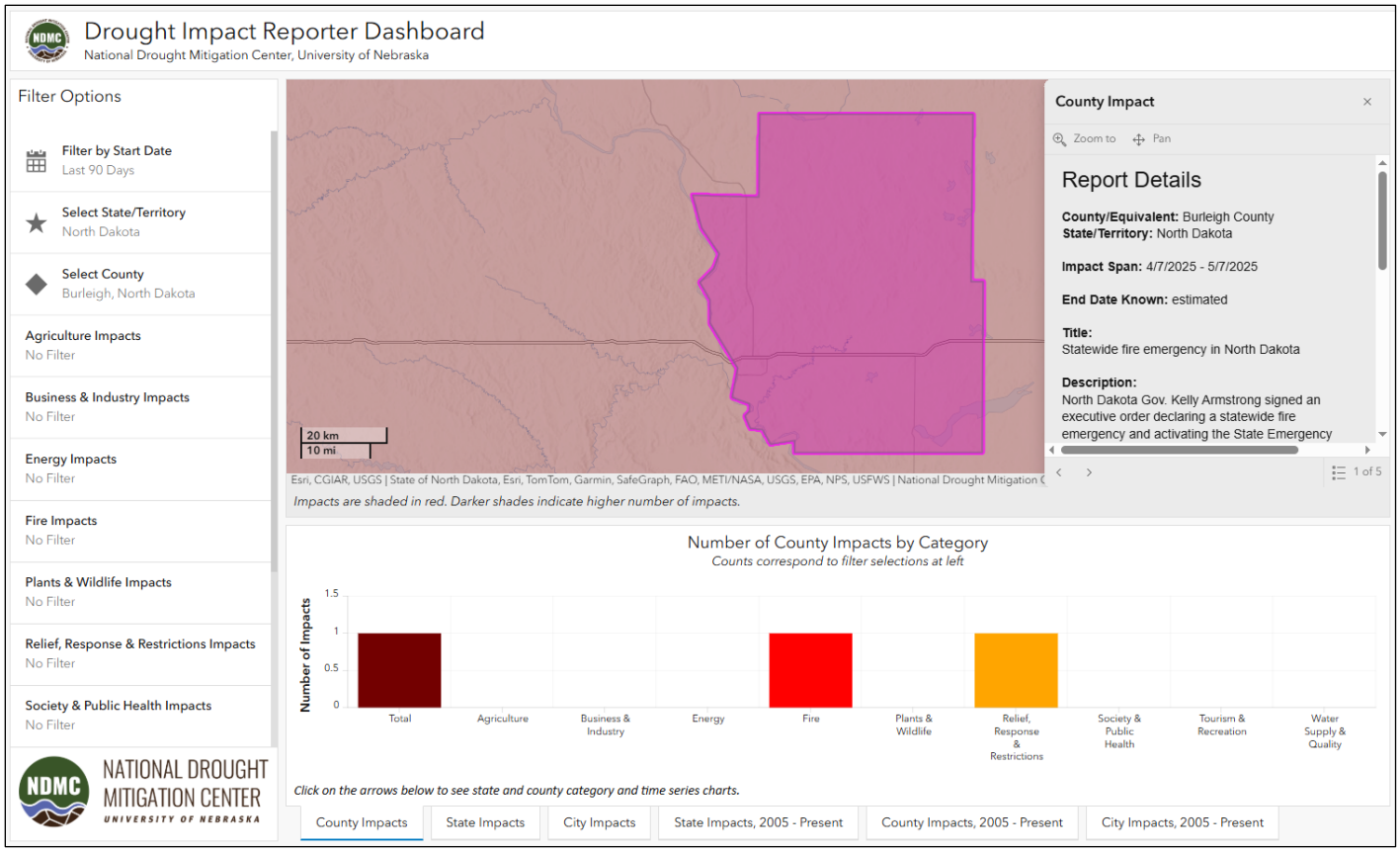
## Drought

| | |
|---|---|
| **Frequency** | Likely (10-100% probability in the next year, or at least 1 chance in next 100 years) |
| **Severity** | Limited (10-25% of jurisdiction affected) |
| **Risk Class** | C |
| **Seasonal Pattern** | Summer |
| **Duration** | Weeks/Months |
| **Speed of Onset** | Slow onset |
| **Location** | Countywide |

**Description**
In the most general sense, drought is defined as a deficiency of precipitation over an extended period of time(usually a season or more), resulting in a water shortage. (Source: National Drought Mitigation Center)

**Identified Impacts**
- Business Interruptions
- Increased Fire Potential
- Livestock Injury/Death
- Loss of Economy
- Loss of Potable Water
- Property Damage

The Drought Impact Reporter presents drought impacts recorded for states, counties, and cities with earliest impacts dated 1850.



**History**

May, 2017 – Voluntary water restrictions requested in City of Bismarck and City of Lincoln due to low water reservoirs as a result of a period of increased temperatures.

March-July, 2017 – A least 268 rural wildfires reported to the ND Department of Emergency Services, with more than 55% reported in July. (Source: The Bismarck Tribune, July 21, 2017)

June 1, 1988 – Excessive heat reported in Burleigh County with crop damages estimated over $20 million.

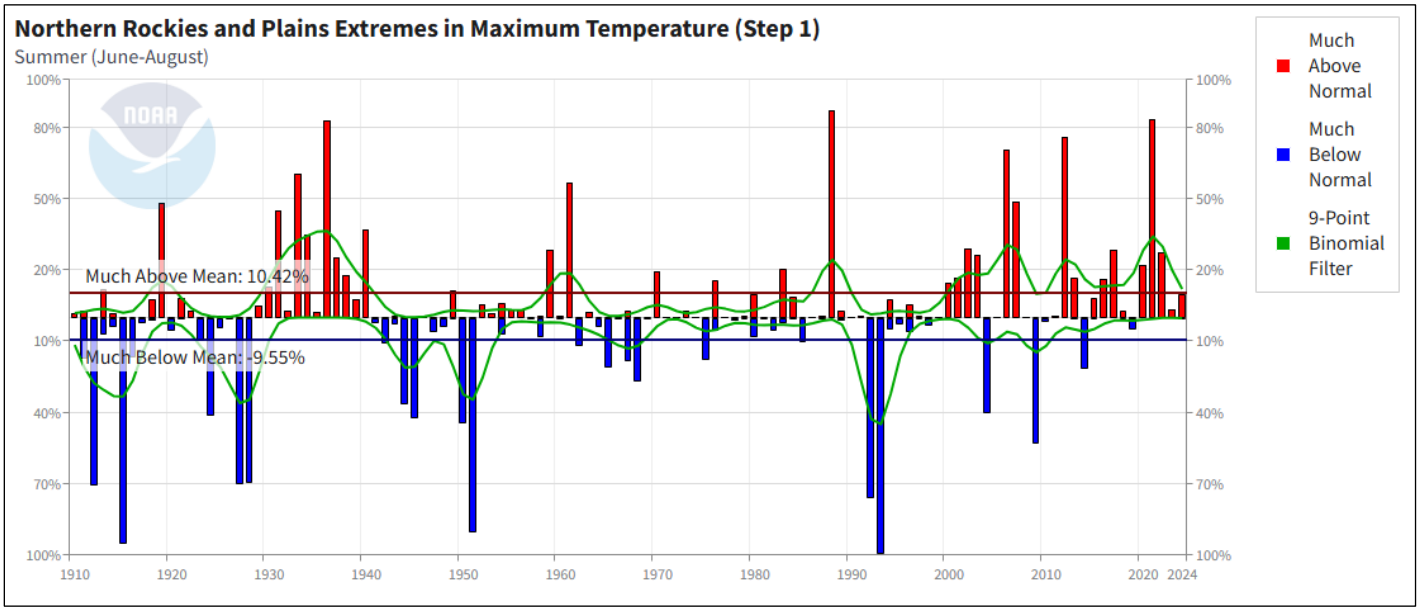
**Excessive Heat**

| Location | Date | Type | Dth | Inj | PrD | CrD |
|---|---|---|---|---|---|---|
| BURLEIGH (ZONE) | 07/16/2011 | Excessive Heat | 0 | 0 | 0.00K | 0.00K |
| **Totals:** | | | 0 | 0 | 0.00K | 0.00K |

Source: National Oceanic and Atmospheric Administration National Climatic Data Center (01/1950 to 2024)

**U.S. Climate Extremes Index (CEI)**

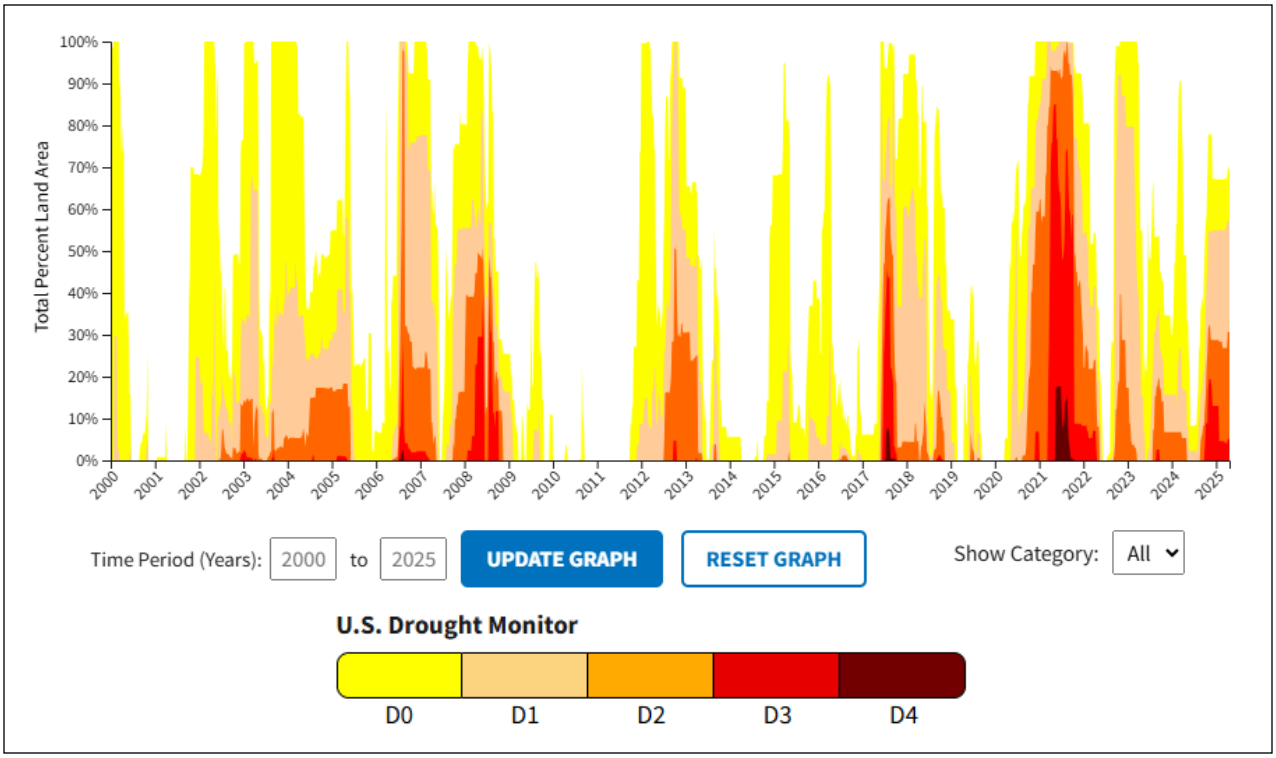
Extremes in maximum temperature for the period of Summer (June-August) from 1910-2024.




Source: National Centers for Environmental Information

**United States Drought Monitor**

The U.S. Drought Monitor started in 2000. Since 2000, the longest duration of drought (D1-D4) in North Dakota lasted 162 weeks beginning on June 4, 2002 and ending on July 5, 2005.




Source: [www.drought.gov](http://www.drought.gov)

## Fire
(Including urban fire or structure collapse and wildland fire)

| | |
|---|---|
| **Frequency** | Highly Likely (Nearly 100% probability in the next year) |
| **Severity** | Negligible (Less than 10 of jurisdiction affected) |
| **Risk Class** | C |
| **Seasonal Pattern** | None |
| **Duration** | Hours/Days |
| **Speed of Onset** | No warning |
| **Location** | Countywide |

### Descriptions
Source: National Fire Protection Association Glossary of Terms

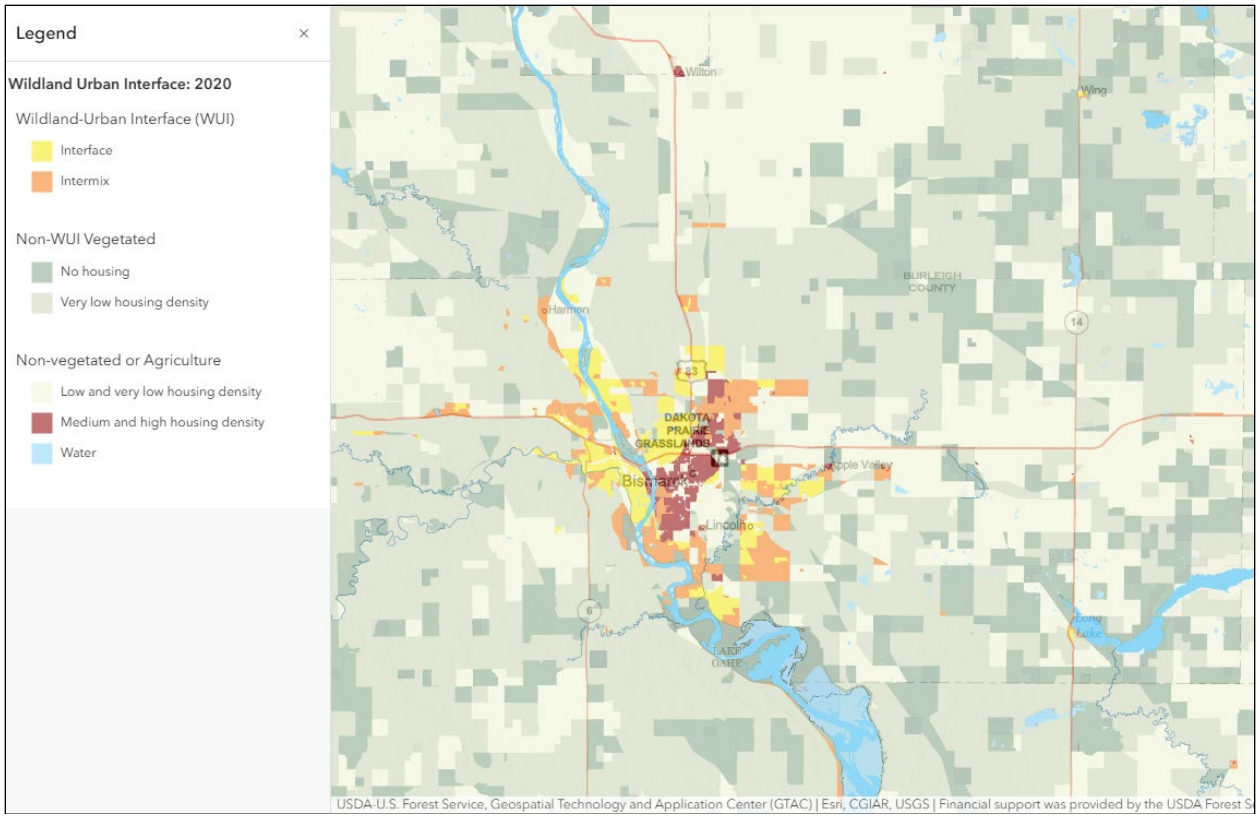
**Urban**
"An incorporated or unincorporated area with a population of over 30,000 people and/or a population density over 1,000 people per square mile but less than 2,999."

**Structure Collapse (Fire Fighting)**
"The activities of rescue, fire suppression, and property conservation in buildings or other structures, vehicles, rail cars, marine vessels, aircraft, or like properties."

**Wildland Fire (Wildfire)**
"An event dealing with a fire in the wildland; originating from an unplanned ignition, such as lightning, volcanos, unauthorized and accidental human-caused fires, and prescribed fires that are declared wildfires."

**Wildland/Urban Interface**
"A geographical area where structures and other human development meet or intermingle with wildland or vegetative fuels, resulting in the potential for ignition of the structures within the area from flames or firebrands of a wildland fire."

## Burleigh County Wildland Urban Interface




Source: [USDA US Forest Service]

**Identified Impacts**

- Blocked Roads
- Building Collapse
- Business Interruptions
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Localized)
- Explosion
- HAZMAT Release
- Increased Fire Potential
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Power
- Mass Casualties
- Property Damage
- School Closure

**History**

Urban fires are rare in occurrence and affect the more populated areas with the City of Bismarck having the highest population density.

Rural Burleigh County experiences wildland fires every year. Factors influencing the potential include amounts and conditions of fuel supply (vegetation), temperatures, wind conditions, precipitation patterns, humidity levels, topography, and levels of human activity on the land.

The main fire season normally begins when weather warms significantly, and precipitation is limited. This longer and more dangerous season extends until about October 30th or until the first significant snow cover.

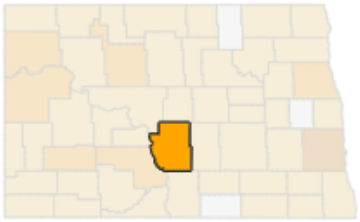
Most wildland fires result from activities such as: controlled burns of sloughs, ditches, and fields by landowners; recreational activity such as camping, hunting, and other off-road vehicle travel; and use of fireworks preceding and immediately following the 4th of July.

Bismarck Rural Fire Department extinguishing a scheduled burn which got out of control at Hawktree Golf Course northwest of Bismarck (Source: The Bismarck Tribune, March 10, 2016).

## National Fire Incident Reporting System (NFIRS)

North Dakota reported 12,842 fires to the National Fire Incident Reporting System (NFIRS) between 2015 and 2019.

**Now,** select a county on the map to learn more about the types of fires reported in North Dakota.

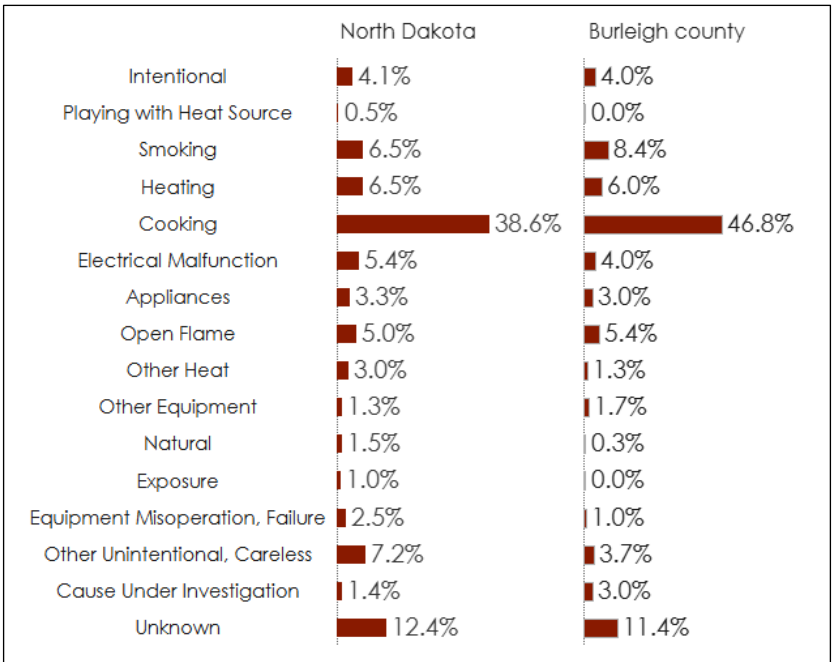


Number of Incidents Reported to NFIRS

- 10 or Fewer
- 11 - 500
- 501 - 1000
- 1001 - 2500

| General Property Use Type | Residential Fires | Non-Residential Fires | Vehicle Fires | Outside Fires | Other Fires |
|---|---|---|---|---|---|
| North Dakot | 20.2% | 11.6% | 14.3% | 46.5% | 7.4% |
| Burleigh county | 32.7% | 11.8% | 15.4% | 38.7% | 1.4% |

**Note**: only counties with more than 10 fires will display general property use type




Source: www.fema.gov

| Location | Date | Time | Type | Dth | Inj | PrD | CrD |
|---|---|---|---|---|---|---|---|
| BURLEIGH (ZONE) | 04/12/2015 | 17:00 | Wildfire | 0 | 0 | 200.00K | 0.00K |
| BURLEIGH (ZONE) | 07/18/2006 | 14:00 | Wildfire | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 04/08/2005 | 14:00 | Wildfire | 0 | 3 | 0.00K | 0.00K |
| BISMARCK | 04/09/2003 | 14:14 | Wildfire | 0 | 1 | 0.00K | 0.00K |
| MC KENZIE | 03/24/2003 | 13:35 | Wildfire | 0 | 0 | 0.00K | 0.00K |
| **Totals:** | | | | 0 | 4 | 200.00K | 0.00K |

Source: National Oceanic and Atmospheric Administration National Climatic Data Center (01/1950 to 12/2024)

Several wildland fires occur annually; some of the more significant incidents are listed below:

**October 12-13, 2024** – Recreational hunting cased a wildfire near Double Ditch involved 22 agencies including deployment of two ND National Guard Blackhawks and burned approximately 1,100 acres (no structures lost).

**April 12-15, 2015** – An abandoned campfire developed into a large wildfire in southwest Burleigh County, south of Bismarck, by the afternoon of April 13th, which led to the evacuation of approximately 20 residences. It is believed that the fire initially started on April 12th. The fire was assumed contained the evening of April 13th and work was done to extinguish hot spots. The fire re-intensified on April 14th as relative humidity values dropped to around 15%, and southerly winds gusted to nearly 40 mph. This led to the evacuation of multiple neighborhoods south of the City of Bismarck, along with the University of Mary campus. The North Dakota Department of Health urged residents of Bismarck to use caution as the smoke was pushing over parts of the city. The fire was re-contained the evening of the 14th. Thirty-four separate agencies were involved in the wildfire response, and approximately 2,000 acres were burned. No lives or homes were lost. ND National Guard air support for fire suppression was utilized.

**May 24, 2008** – A prescribed burn at the Long Lake Wildlife Refuge escaped containment, burning over 650 acres of private and refuge land.

**July 18, 2006** - A fire, 15 miles north of Bismarck, quickly consumed 500 acres of vegetation after igniting in tall grass near a farmstead. The fire spread to the structures on the farm. Two barns, a granary, and corrals were lost to the fire before it was brought under control.

**April 8, 2005** - Strong southerly winds gusting to 45 mph combine with low relative humidities and dry pastures, created red flag conditions in North Dakota. A large grass fire developed east of Wilton. The fire became very large in size, creating its own weather conditions. Winds shifted entrapping 3 rural firefighters. One firefighter suffered a broken leg while two others suffered second and third-degree burns.

**April 9, 2003** – McLean Bottoms fire disaster (Burleigh and Emmons County). Wildland fire occurred on US Army Corps of Engineer land in Emmons County along the Missouri River. The fire continued to spread into Burleigh County on Corps land leased by North Dakota Game and Fish. Estimated 6,500 acres lost.

**March 24, 2003** - Grass fire one mile north and one mile east of McKenzie (5700 NE 249th St).

## Flood

(Including riverine, levee failure, closed basin, ice jam, and flash floods)

| | |
|---|---|
| **Frequency** | Likely (10-100% probability in the next year, or at least 1 chance in next 10 years) |
| **Severity** | Limited (10-25% of jurisdiction affected) |
| **Risk Class** | C |
| **Seasonal Pattern** | Spring and Summer |
| **Duration** | 1 to 10 days |
| **Speed of Onset** | More than 24 hours warning |
| **Location** | Countywide |

**Description**

In simple terms, a flood is an excess of water on land that normally is dry. For example, water damage to your home from a river that overflowed into nearby streets and yards would be a direct result of flooding. (Source: Federal Emergency Management Agency, National Flood Insurance Program

### What causes floods?

Flooding can happen anywhere, and at any time. Weather events commonly cause floods. Changes to the environment — like new buildings — and infrastructure failures — like a broken water main — can play a role, too.

Flood insurance covers many weather, environmental and infrastructure causes of floods, including:

- River, lake or coastal water overflows.
- Heavy or extensive rainfall.
- Melting snow and ice in spring.
- Changes to the land, such as new buildings and sidewalks or burned grass and trees after a wildfire.
- Water seeping through a dam, or levee or a broken water main.

Source: Federal Emergency Management Agency, National Flood Insurance Program

Floodplain Management in North Dakota

Flood control development had its beginning with the Flood Control Act of 1936. This Act provided a basic plan and an authorized program for the control of water resources. In the early 1940's the North Dakota State Water Commission cooperated with the Federal agencies to plan and engineer the overall program for North Dakota.

The U.S. Army Corps of Engineers occupies one of the major roles in flood control planning and construction. Two reservoirs built by the U.S. Soil Conservation Service have contributed materially to flood control by the construction of watershed projects in North Dakota. These watershed projects include channel work and flood retention structures. In such projects, the Soil Conservation District has the responsibility for assuring that 50 percent of the farms above a structure are under a basic conservation plan.

Floodplain Management in North Dakota: North Dakota has recognized that good floodplain management involves the utilization of a variety of tools to reduce the impact of flood disasters. It is also recognized that a balance must be reached between the three aspects of floodplain management which are: structural works designed to modify the flood itself, regulatory functions which may reduce susceptibility to flooding, and emergency preparedness actions which may reduce susceptibility to flooding, and emergency preparedness actions which minimize a flood's effect during a disaster.

The Federal Disaster Protection Act of 1973 requires state and local government to participate in the National Flood Insurance Program (NFIP) as a condition to the receipt of any federal loan or grant for construction projects in flood prone areas.

Participation in the NFIP requires communities to adopt floodplain regulations that meet NFIP objectives, which are: new buildings must be protected from flooding damages that occur as a result of the 100-year flood, and new development must not cause an increase in flood damages to other property.

Communities have been aided through passage, in 1981, of the state's first Floodplain Management Act which directs the State Engineer to aid local governments to reduce flood damages through sound floodplain management. As a start, the state legislature provided the State Engineer with an appropriation to be used in assisting communities to obtain base flood (100-year) elevation data. With appropriate planning, we will see continued reduction in flood damage susceptibility across the state, but it will likely take many years to achieve the established goals.

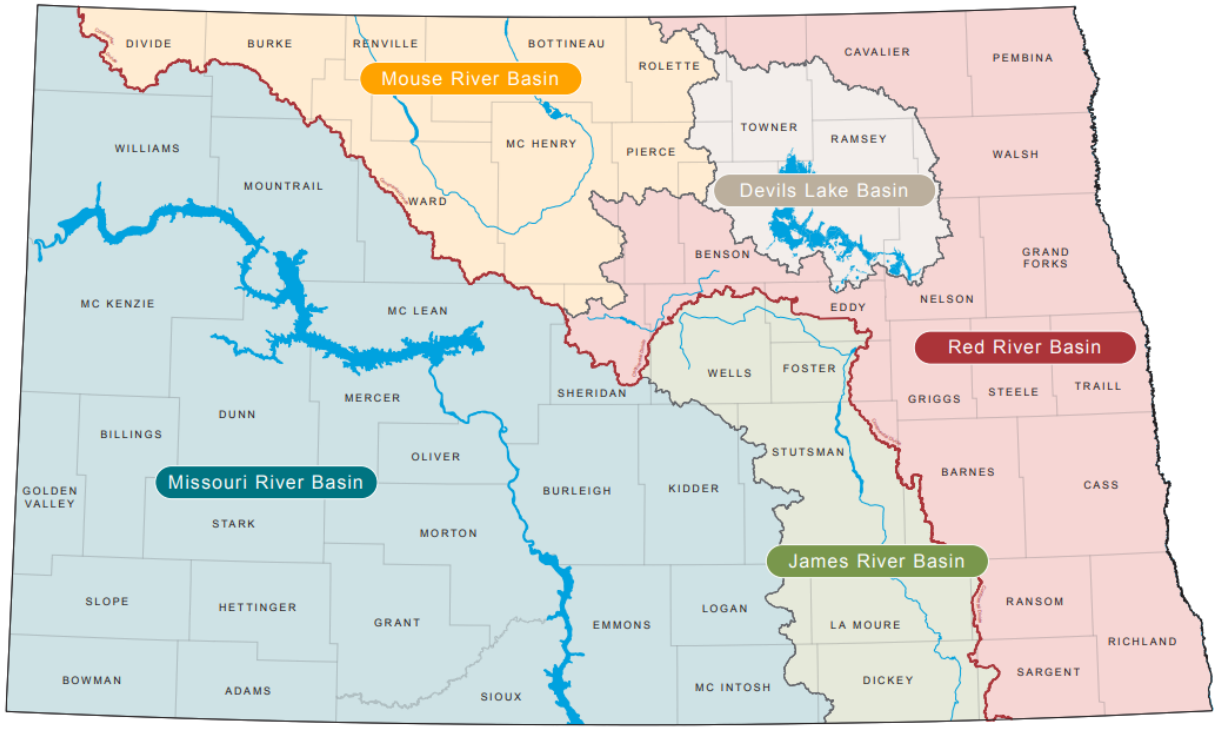
Missouri River Basin

The Missouri River was once free flowing with meandering braided channels, sand bars, and expansive tree-covered riparian areas. The river was free to make its own banks, which were ever changing, and seasonal flooding was a common occurrence.

Today, six dams and reservoir projects make up the Missouri River reservoir system. All of these dams were constructed by the federal government and are maintained and operated by the USACE for the following authorized purposes:

- Flood Control
- Water Supply
- Recreation
- Irrigation
- Hydropower
- Water Quality
- Fish and Wildlife
- Navigation

The first dam that was constructed was Fort Peck in Montana. Fort Peck was constructed under Congressional authorization from the Rivers and Harbors Act of 1935. The other five mainstem dams on the Missouri River were later built in cooperation between the USACE and the Bureau of Reclamation under the Pick-Sloan Plan. The Pick-Sloan Plan was part of the Flood Control Act of 1944. (Source: Missouri River Today Brochure)




Source: ND Department of Water Resources

Hydrologic Analyses

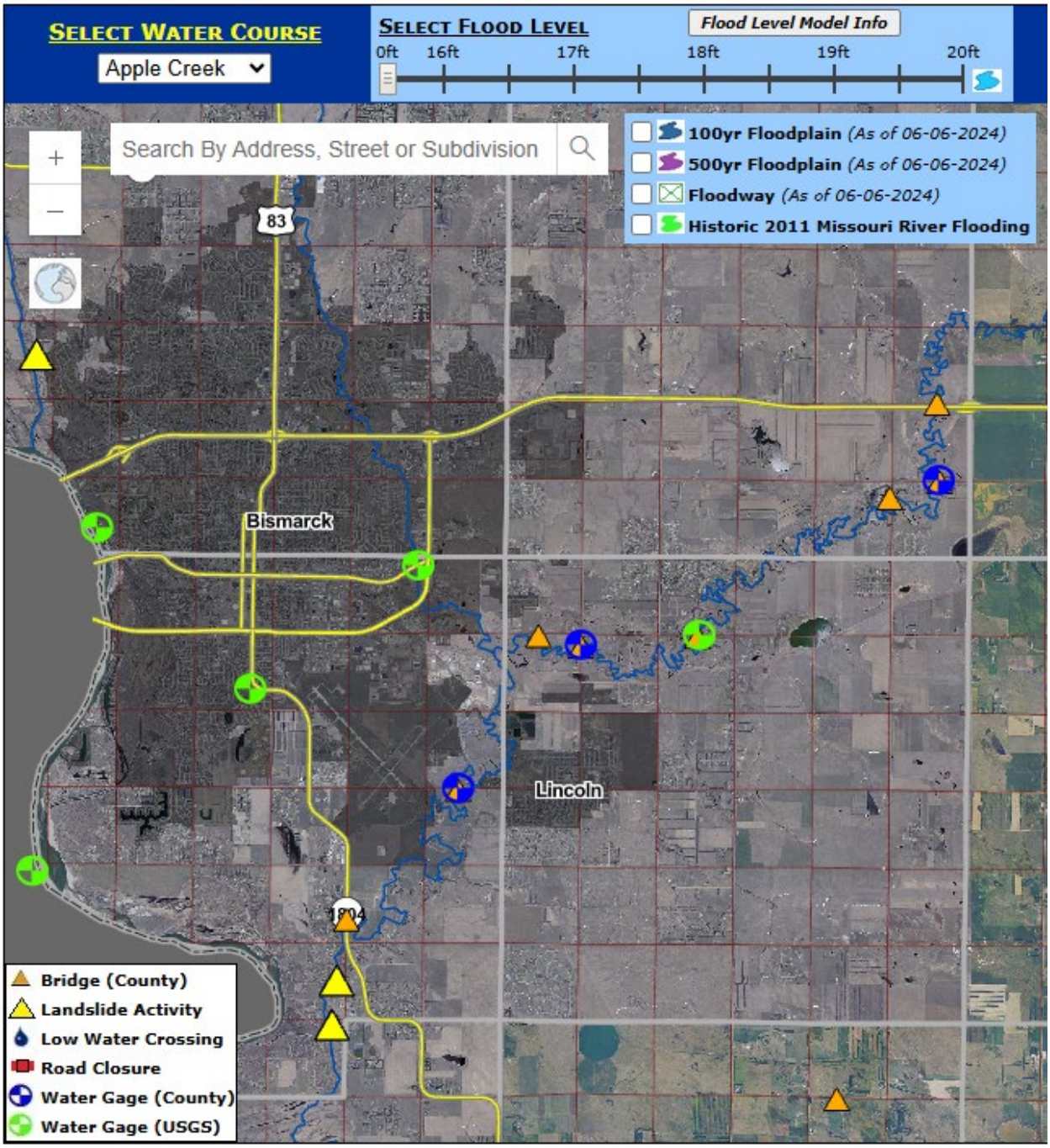
Hydrologic analyses were completed on the following areas as part of the Flood Insurance Study, Burleigh County, North Dakota, and Incorporated Areas, Revised: August 4, 2014 (available from the FEMA Map Service Center, Product 38015CV000B):

- Apple Creek
- Burnt Creek
- Grande Prairie Watersheds (Remmick, Grande Prairie Estates, Wachter)
- Hay Creek and North Valley Tributary
- Jackman Coulee
- Landfill Watershed
- Missouri River
- North 4th Street Watershed
- North Washington Street Watershed

### Mapping

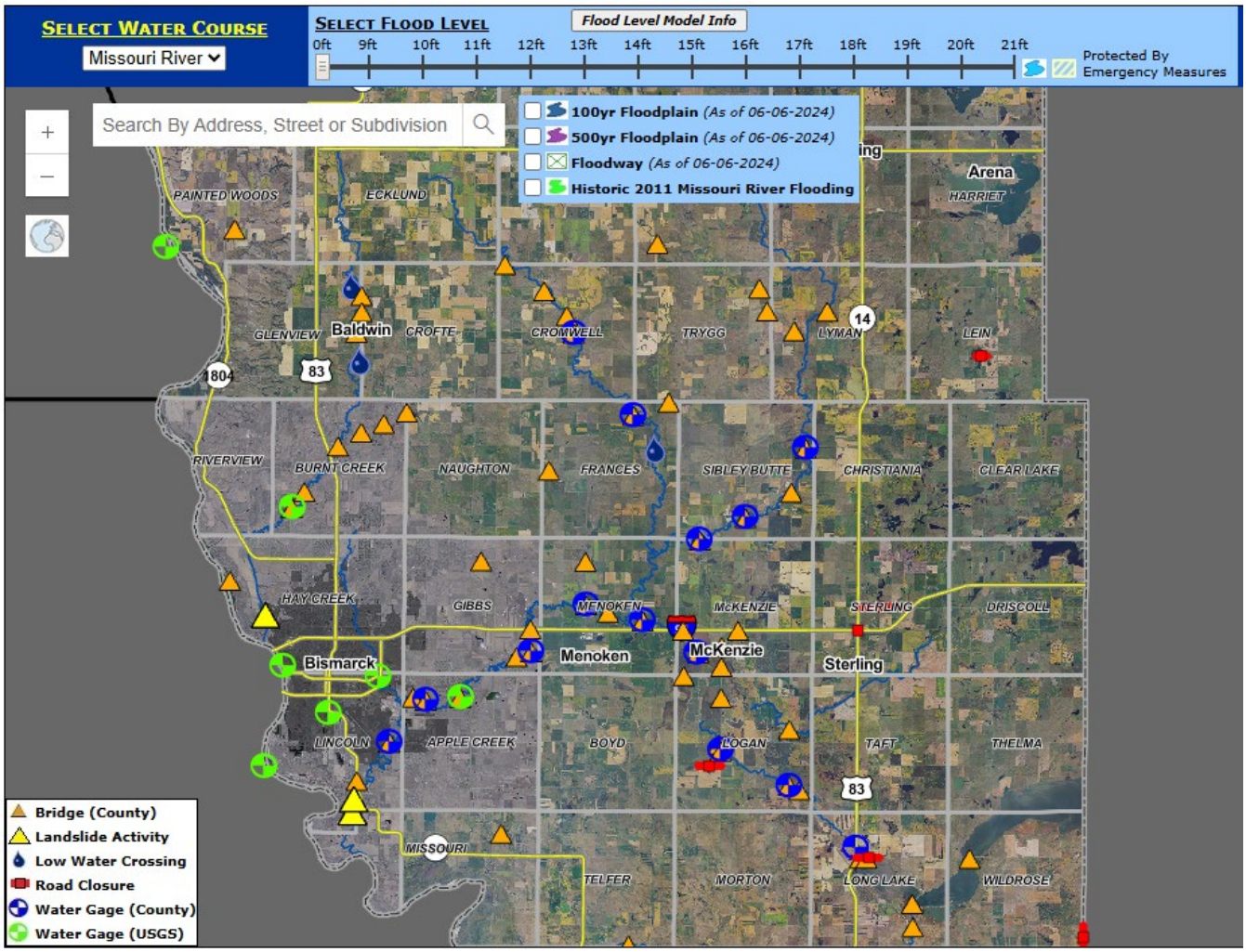
Burleigh County maintains a Flood & Elevation Tool for Apple Creek and the Missouri River which is intended to assist residents with data related to their location. An address can be entered in the search box, and they can toggle among different flood levels. In addition to flood stage levels, the following are also displayed: elevations, floodplains, tax parcels, road closures and water gages. https://www.burleighco.com/maps/apple-creek-flood-mapping/

**Apple Creek**




Source: Burleigh County Website

**Missouri River**




Source: [Burleigh County Website]

**Identified Impacts**
Short-duration, high-intensity spring rainstorms, in combination with snowmelt and ice jams, are a cause of flooding on the Missouri River and Burnt and Apple Creeks in Burleigh County. High-intensity summer rainstorms also cause minor flooding on Burnt and Apple Creeks.

Floodplains consist primarily of cropland and open rangeland with some brushy and wooded areas along the Missouri River bottoms. Some roads and residential and commercial facilities are in the Missouri River floodplain, particularly in the area south of the City of Bismarck.

(Source: Flood Insurance Study, Burleigh County, North Dakota, and Incorporated Areas, Revised: August 4, 2014 available from the FEMA Map Service Center, Product 38015CV000B)

- Blocked Roads
- Building Collapse
- Business Interruptions
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Localized)
- Flooding (Street)
- Flooding (Structure)
- HAZMAT Release
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Potable Water
- Loss of Power
- Mass Casualties
- Property Damage
- School Closure
- Sewer Backup

### History

**Flood**

| Location | Date | Time | Type | Dth | Inj | PrD | CrD |
|---|---|---|---|---|---|---|---|
| WILTON | 08/01/2011 | 00:00 | Flood | 0 | 0 | 0.00K | 0.00K |
| WILTON | 07/01/2011 | 00:00 | Flood | 0 | 0 | 0.00K | 0.00K |
| WILTON | 06/02/2011 | 00:00 | Flood | 0 | 0 | 20.000M | 0.00K |
| WILTON | 04/01/2009 | 00:00 | Flood | 0 | 0 | 558.00K | 0.00K |
| WILTON | 03/06/2009 | 00:00 | Flood | 0 | 0 | 530.00K | 0.00K |
| MENOKEN | 06/07/2007 | 00:00 | Flood | 0 | 0 | 50.00K | 100.00K |
| BISMARCK | 08/31/2002 | 19:05 | Flood | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/27/2001 | 02:00 | Flood | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/26/2001 | 22:00 | Flood | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 02/26/2000 | 11:58 | Flood | 0 | 0 | 0.00K | 0.00K |
| BISMARCK ARPT | 08/12/1999 | 00:00 | Flood | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 03/20/1999 | 09:00 | Flood | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 03/21/1997 | 08:00 | Flood | 0 | 0 | 150.00K | 0.00K |
| **Totals:** | | | | 0 | 0 | 21.288M | 100.00K |

Source: National Oceanic and Atmospheric Administration National Climatic Data Center (01/1950 to 12/2024)

Significant events include:

**March 30, 2019** – Apple Creek crested at 16.37' (Moderate Flood Stage is 16') after a period of rapid thaw. Self-fill sandbag sites were established, and several roads were closed to include Apple Creek Road (between 80th St SE and 93rd St SE). Apple Valley Subdivision experienced water encroachment, and the Apple Creek Golf Course was inundated.

Photo Credit: Burleigh County Sheriff's Department

**2011** - Since the construction of Garrison Dam, the 2011 flood event is the flood of record with a peak mean daily discharge of 154,000. This event occurred as a result of high mountain snow pack and a very significant and widely distributed system that brought extensive rain throughout eastern Montana. Prior to the 2011 event, the maximum peak discharge that has occurred since 1953 on the Missouri River was 68,900 cubic feet per second (cfs). This occurred on July 13, 1975. Prior to the 2011 event, the highest record of flooding at the Bismarck stream gage since the completion of Garrison Dam was 16.11 feet (1634.39 NGVD 29), which occurred in March of 2009, because of ice conditions and ice jams.

**June 26, 2009** - One to three inches of rain fell over the Bismarck area in 45 minutes. The heaviest rainfall occurred across northern sections of the city. This resulted in widespread street flooding and overturned manhole covers. A few homes suffered water damage to basements. Property damage estimated at $25K.

**February 25, 2009** - An ice jam on the Missouri River at Bismarck, and recent melting snow, caused a drainage canal to back up and overflow into south Bismarck. This occurred in the vicinity of University Drive and Wachter Avenue, and for several blocks around there. Damage was mostly confined to a mobile home park, which was lower in elevation than the surrounding terrain. The homes were elevated within the park and so damage was minimal. Bismarck city crews took action that resulted in the flood waters receding. Property damage estimated at $20K.

**June 12, 2007** - Very heavy rain of 2.50 inches fell in 30 minutes time 7 miles south of Driscoll. A total of 4.50 inches of rain was measured 2 miles northeast of Driscoll. Water was reportedly standing everywhere and water covered roads including in the city of Driscoll. Several roads were washed out. Water was up to 4 inches deep in some homes basements in Driscoll. In the early afternoon of Tuesday June 12th, Tornado Watch 389 was issued in anticipation of severe thunderstorms developing during the afternoon hours. Several severe thunderstorm and tornado warnings were issued. One report of a severe thunderstorm wind gust and two confirmed tornado reports were received during the mid-afternoon hours. In addition, very heavy rain fell over large portions of central North Dakota, prompting several flash flood warnings during the late afternoon and early evening hours. Began 2 Miles North East of Driscoll and ended 7 Miles South West of Driscoll. Property damage estimated at $250K, crop damage estimated at $50K.

**June 7, 2007** - Several county roads were closed due to water over them. Low lying areas north of Menoken were flooded with water standing in fields. Thunderstorms followed by showers and then areas of steady rain on June 6 and 7 resulted in flooding in parts of southern North Dakota. Five to six (5 to 6) inches of rain was common over the two day period, 10 Miles North of Menoken. Property damage estimated at $50K, crop damage estimated at $100K.

**August 23, 2004** - Streets and underpasses flooded causing several major arteries to be closed. Water flowed across yards and into several basements of homes.

**July 27, 2001** - Rainfall of 3 to 4 inches over Bismarck caused flooding of streets and underpasses. Many back roads near the Missouri River were water covered at times and a few washed out. Two mudslides on River Road covered the northbound lanes.

**July 26, 2001** - Around 2 inches of rain fell in a very short time causing street flooding and pooling of water in Bismarck.

**June 9, 2001** - Widespread street flooding throughout the City of Bismarck with a foot or more of water covered the roads. Travel not advised. Up to 12 feet of water accumulated in the railroad underpasses in town.

**February 26, 2000** – Rapid snowmelt and heavy rain resulted in extensive runoff throughout Burleigh County. Unseasonably warm temperatures, as well as frozen grounds and ice and snow plugged culverts, also factored into the extensive runoff. Fifteen roadways were overtopped by runoff resulting in closure of these roads. Apple Creek near Menoken rose 10 feet from February 25th through the 27th weekend, cresting 16.6 feet. The flood stage is 15 feet. The flood warning remained in effect until March 1st, 2000 when levels fell below flood stage.

**August 12, 1999** – Periods of heavy rainfall ranging from 4 to 7 inches saturated much of Morton and Burleigh counties. Hardest impact was felt in the cities of Bismarck and Mandan. Two hundred twenty one (221) homes and businesses received water damage. Twelve (12) road sites were damaged and a significant mudslide closed portions of Highway 1804 in north Bismarck.

**March 20, 1999** – Flooding along Apple Creek near the City of Menoken in Burleigh County due to snowmelt and ice jams resulted in washed out roads and flooded fields. Many roads near the river were closed and barricaded. The flood stage on Apple Creek is 15 feet. The river crested at 16.2 feet on the evening of the 24th.

**Source**: National Oceanic and Atmospheric Administration National Climatic Data Center Website (01/1950 to 10/31/2019)

Special Flood Hazard Areas (SFHA) are located within the County. Special Flood Hazard Areas (identified as 'A' or 'AE' zones) are defined as the area that will be inundated by the flood event having a 1% chance of being equaled or exceeded in any given year. Portions of unincorporated Burleigh County, City of Bismarck, City of Lincoln, and the City of Wing include SFHAs.

Burleigh County encourages property owners to purchase flood insurance through the National Flood Insurance Program (NFIP). Properties that sustained two or more flood insurance claims exceeding $1,000 within a ten-year period since 1978 are considered repetitive loss properties. Burleigh County has 32 repetitive loss properties. All properties are classified as single-family residences. There are no severe repetitive loss properties in Burleigh County.

Flood insurance is available to property owners whose jurisdiction participates in the NFIP.

| CID | Community | Status | Date of Entry | Date of Current Effective Map |
|---|---|---|---|---|
| 380149C | Bismarck, City of | Participating | 09/18/85 | 06/06/24 |
| 380017C | Burleigh County | Participating | 09/18/85 | 06/06/24 |
| 385396C | Lincoln, City of | Participating | 05/12/08 | 06/06/24 |
| 380065 | Wilton, City of | Participating | 04/25/97 | 06/06/24 |
| 380213 | Wing, City of | Participating | 08/19/80 | 06/06/24 |

Source: FEMA.gov

Burleigh County continues to foster participation from the City of Regan. Additional NFIP strategies are listed in the Appendices.

After the 2011 flood event, Burleigh County pursued acquisitions through FEMA and did not meet the required Benefit Cost Analysis to proceed. Numerous residents did not want to participate which would have resulted in a "patchwork" process.

Additionally, vulnerability is further addressed utilizing the Burleigh County Damage Estimator to determine estimate population, critical infrastructure, and structures impacted with assessed value for flood inundation.

## Geologic Hazards

(Including landslide, earthquake, abandoned land mines, expansive/unstable soils, environmental minerals, meteorite falls, volcanic hazards)

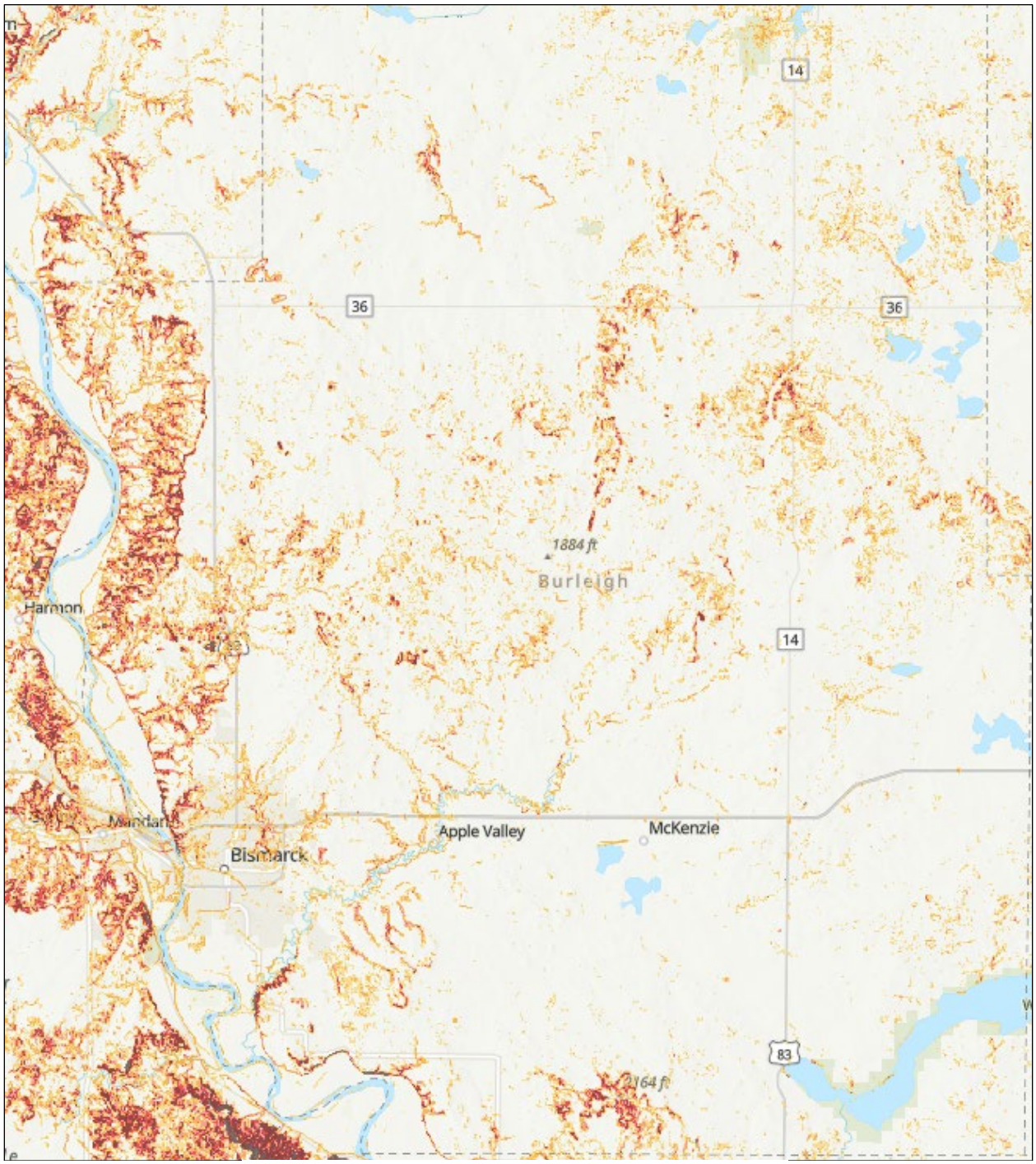
| | |
|---|---|
| **Frequency** | Likely (10-100% probability in the next year, or at least 1 chance in the next 10 years) |
| **Severity** | Negligible (Less than 10% of jurisdiction affected) |
| **Risk Class** | D |
| **Seasonal Pattern** | Spring and Summer |
| **Duration** | 1 to 10 days |
| **Speed of Onset** | Hours to days |
| **Location** | Countywide (areas along Missouri River and Creeks) |

**Description**

United States Geological Survey definition: "Landslides are the downslope movement of earth materials (rock, debris, and soil) at rates that range from inches per year to tens of miles per hour. Some landslides can move faster than a person can run. Landslides can happen with no notice or can take place over a period of days, weeks, or longer."

**Identified Impacts**

- Blocked Roads
- Building Collapse
- Business Interruptions
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Localized)
- Loss of Potable Water
- Loss of Power
- Property Damage




**Increasing Susceptibility**

Areas without colored shading represent very low landslide potential

Source: [USGS ArcGIS]

**History**

**March 4, 2020**: River Road closed between Wilderness Cove Road and Sandy River Drive due to debris and material on the roadway. Opened the next day.

**December 22, 2019, to present**: River Road closed between Burnt Boat Road and Sandy River Drive due to a landslide. Debris removed and road re-opened on December 30, 2019. The area continues to be monitored for movement.

**2018 to present**: The University of Mary campus sits upon a bluff and has experienced slumping and continues phases of bank stabilization through a series of mitigation grants.

The southern portion of Apple Creek has experienced some bank failures and slumping. The area above this portion of Apple Creek is home to the University of Mary Campus.

**2011** – Double Ditch is an earth lodge village that was home to thousands of Mandan people from 1490-1785. It has been owned by the State of ND since 1936 and began seriously eroding after the 2011 floods which caused the land to slump, crack, and erode at the site north of Bismarck (off of Hwy 1804) and exposed remains of 18 ancient inhabitants. The ND Legislature appropriated $3.5 million to stabilize the site, and pilons (some as deep as 95') were erected within the banks of the Missouri to hold up the village. The ND Historical Society monitors Double Ditch with a drone for biannual inspections.

Source: Forum News Service

**July 27, 2001** - Rainfall of 3-4" inches over Bismarck caused flooding of streets and underpasses. Many back roads near the Missouri River were water covered at times and a few washed out. Two mudslides on River Road covered the northbound lanes.

**August 12, 1999** – Heavy rainfall ranging from 4-7" saturated much of Burleigh County causing a significant mudslide which closed portions of Highway 1804 in north Bismarck.

## Hazardous Materials Release

| | |
|---|---|
| **Frequency** | Highly Likely (Nearly 100% probability in the next year) |
| **Severity** | Limited (10-25% of jurisdiction affected) |
| **Risk Class** | B |
| **Seasonal Pattern** | None |
| **Duration** | Hours/Days |
| **Speed of Onset** | No warning |
| **Location** | Countywide |

**Description**

Hazardous materials are any substances in any quantity or form which may pose an unreasonable risk to the safety, health, environment, and property of citizens. The term "hazardous materials" covers a wide array of products, from relatively innocuous ones such as hair spray in aerosol dispensers and wash preservatives such as creosote to highly toxic or poisonous materials such as anhydrous ammonia and phosgene gas. The potential severity of hazards of these materials is varied, but the primary reason for their designation is their risk to public safety. Tier II forms are available for viewing at the Burleigh County Emergency Management office.

The County is exposed to and is at risk from accidents and/or incidents involving hazardous materials. The economy is based upon agriculture, manufacturing, and industry. All of these rely on the production, use, storage, transportation, etc. of hazardous materials. Explosives, flammable liquids, flammable solids, gases, poisons, pesticides, oxidizing substances, miscellaneous dangerous substances, and radioactive materials are either used in or transported through Burleigh County.

Hazardous materials are transported via three modes into and within Burleigh County:

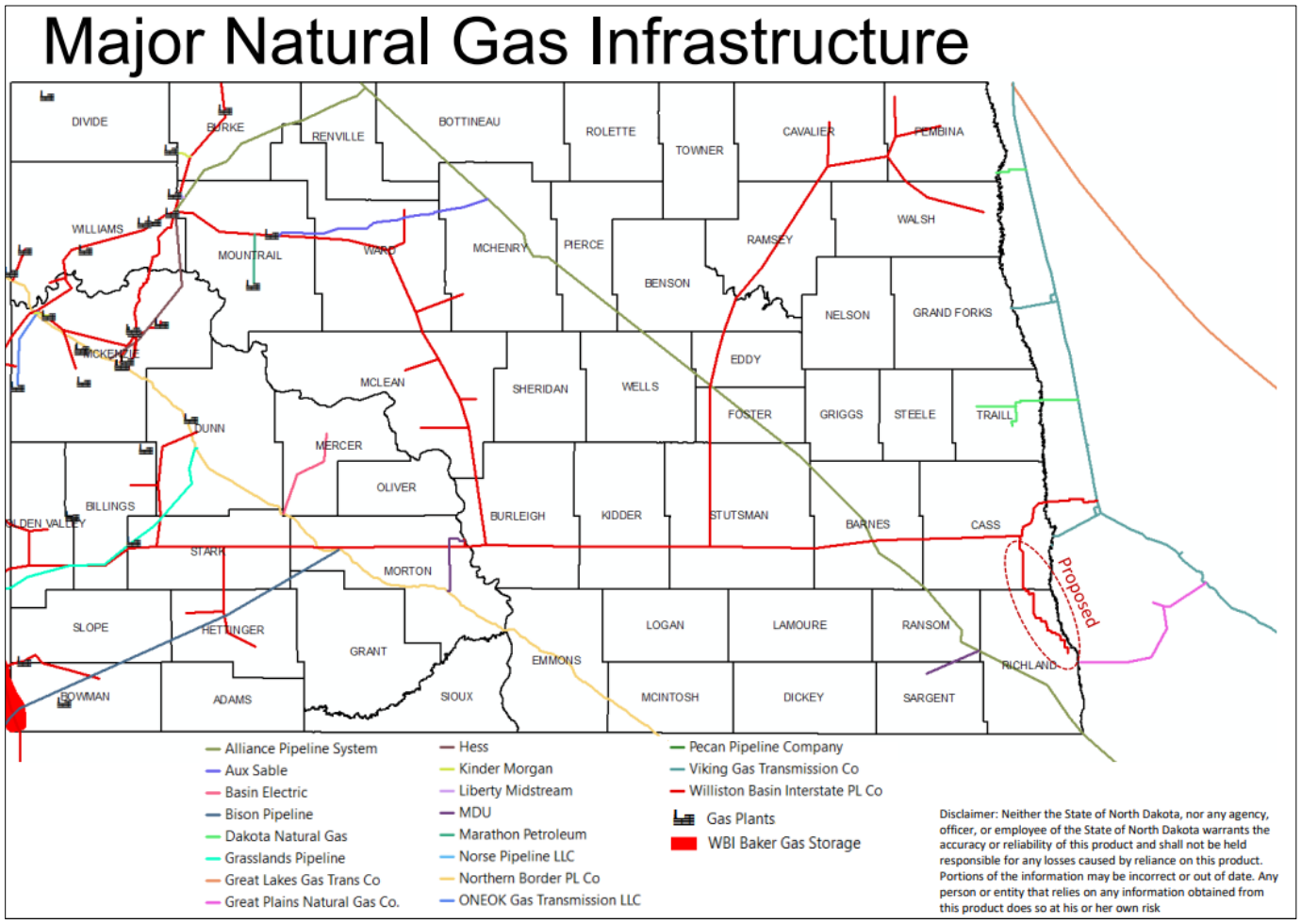
Highways: I-94 and ND 36 run east-west through the county. US-83, ND 1804, ND 41, and ND 14 run north-south through the county. (Attachment 3: Major Roadways in Burleigh County)

Rail: BNSF owns/operates all railways in the county.

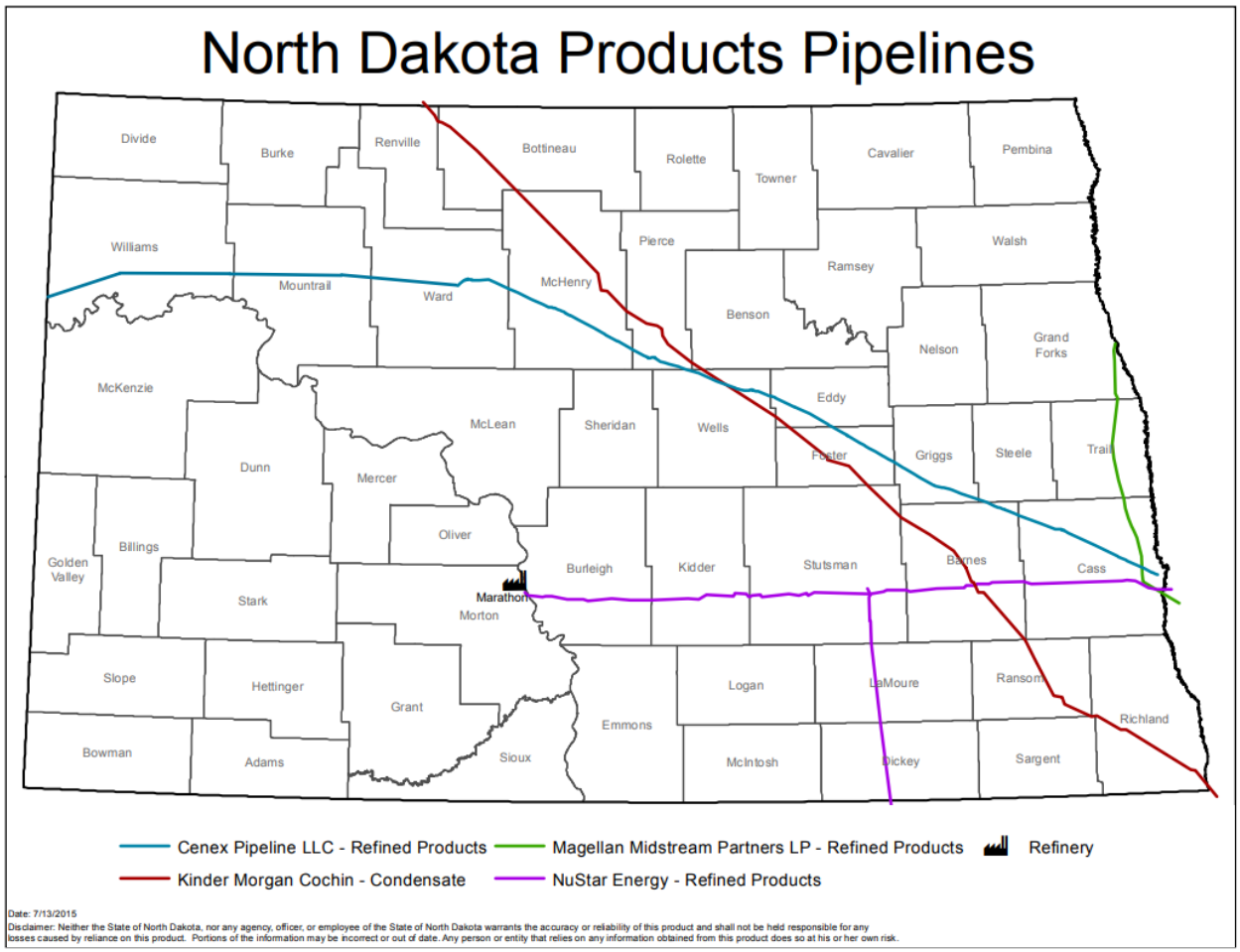
Air: The Bismarck Airport is the only airport in the area with significant air hazardous material transportation activity.

**Identified Impacts**

- Blocked Roads
- Building Collapse
- Business Interruptions
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Full)
- Evacuation (Localized)
- Explosion
- HAZMAT Release
- Increased Fire Potential
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Potable Water
- Loss of Power
- Mass Casualties
- Property Damage
- School Closure




Source: [ND Pipeline Authority]




Source: [ND Pipeline Authority]

**History**

The ND Department of Environmental Quality maintains a Spill Investigation Program for environmental incident reports. Burleigh County incident reports 2021 – Present:

| Incident ID | Incident Type | Incident Date | Contained | Date Reported | Chemicals | Section | Twp | Range |
|---|---|---|---|---|---|---|---|---|
| 4835 | Environmental Incident | 4/11/2025 | Yes | 4/11/2025 | Ethylene glycol - 60 gal | 25 | 139 N | 80 W |
| 4813 | Environmental Incident | 4/3/2025 | No | 4/3/2025 | Ethylene glycol - 1070 gal | 32 | 139 N | 80 W |
| 4800 | Oil/Gas Spill | 3/28/2025 | No | 3/28/2025 | Diesel - 25 gal | 25 | 139 N | 80 W |
| 4265 | Oil/Gas Spill | 10/24/2024 | Yes | 10/25/2024 | Glycol Ethers d - 3 gal | 34 | 140 N | 80 W |
| 4263 | Environmental Incident | 10/15/2024 | Yes | 10/24/2024 | Mineral Oil - 100 gal | 23 | 139 N | 80 W |
| 4125 | Environmental Incident | 9/14/2024 | No | 9/17/2024 | Diesel - 10 gal | 26 | 139 N | 80 W |
| 4020 | Environmental Incident | 7/29/2024 | Yes | 8/12/2024 | R-134a - 5 gal<br>Water - 50 gal<br>Propylene Glycol - 5 gal | 9 | 138 N | 80 W |
| 3894 | Oil/Gas Spill | 7/2/2024 | Yes | 7/2/2024 | unknown - 1 gal | 4 | 138 N | 80 W |
| 3697 | Environmental Incident | 4/22/2024 | Yes | 4/22/2024 | Diluted Magnesium Chloride - 160 gal | 30 | 139 N | 80 W |
| 3517 | Oil/Gas Spill | 2/16/2024 | Yes | 2/16/2024 | Fuel - 600 gal | 2 | 138 N | 80 W |
| 3480 | Environmental Incident | 1/29/2024 | Yes | 1/31/2024 | Mineral Oil - 28 gal | 8 | 138 N | 80 W |
| 3081 | Environmental Incident | 10/10/2023 | Yes | 10/13/2023 | Mineral Oil - 18 gal | 21 | 139 N | 80 W |
| 2591 | Environmental Incident | 4/10/2023 | No | 5/16/2023 | Diesel - 100 gal | 9 | 138 N | 80 W |
| 2587 | Environmental Incident | 4/27/2023 | No | 5/15/2023 | Produced Water - 200 gal | 4 | 139 N | 80 W |
| 2576 | Oil/Gas Spill | 5/5/2023 | Yes | 5/8/2023 | Diesel - 10 gal | 29 | 138 N | 80 W |
| 2512 | Environmental Incident | 4/18/2023 | No | 4/19/2023 | Phos-Chek WD8811 - 25 gal | 27 | 139 N | 80 W |
| 2448 | Oil/Gas Spill | 3/29/2023 | Yes | 3/30/2023 | Type 2 mineral oil - 25 gal | 4 | 139 N | 80 W |
| 2345 | Environmental Incident | 2/28/2023 | Yes | 2/28/2023 | lube oil - 50 gal | 32 | 139 N | 76 W |
| 1989 | Oil/Gas Spill | 11/16/2022 | Yes | 11/16/2022 | Fuel - 50 gal | 21 | 139 N | 80 W |
| 1935 | Environmental Incident | 11/1/2022 | Yes | 11/1/2022 | Diesel - 1 gal | 29 | 139 N | 76 W |
| 1848 | Oil/Gas Spill | 9/28/2022 | No | 9/28/2022 | Diesel - 10 mcf | 34 | 143 N | 80 W |
| 1669 | Environmental Incident | 7/24/2022 | Yes | 7/25/2022 | | 15 | 139 N | 80 W |
| 1597 | Oil/Gas Spill | 7/1/2022 | Yes | 7/1/2022 | Mineral oil - 2 gal | 25 | 139 N | 80 W |
| 1215 | Environmental Incident | 3/4/2022 | No | 3/4/2022 | Diesel - 200 gal | 35 | 139 N | 79 W |
| 910 | Environmental Incident | 11/27/2021 | Yes | 11/29/2021 | Mineral Oil - 20 gal | 4 | 138 N | 80 W |
| 626 | Environmental Incident | 8/8/2021 | No | 8/9/2021 | Coal - 4200000 lbs | 12 | 138 N | 80 W |
| 537 | Oil/Gas Spill | 10/28/2016 | No | 7/7/2021 | Benzene - 5 gal | 2 | 138 N | 80 W |
| 337 | Oil/Gas Spill | 4/21/2021 | Yes | 4/22/2021 | Benzene - 1 gal | 4 | 138 N | 80 W |
| 336 | Oil/Gas Spill | 4/21/2021 | Yes | 4/22/2021 | Benzene - 1 gal | 4 | 138 N | 80 W |
| 328 | Oil/Gas Spill | 4/20/2021 | Yes | 4/21/2021 | Benzene - 1 gal | 3 | 138 N | 80 W |
| 323 | Oil/Gas Spill | 4/19/2021 | Yes | 4/20/2021 | Benzene - 1 gal | 21 | 139 N | 80 W |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 321 | Oil/Gas Spill | 4/17/2021 | Yes | 4/19/2021 | Benzene - 1 gal | 25 | 139 N | 80 W |
| 320 | Oil/Gas Spill | 4/16/2021 | Yes | 4/19/2021 | Benzene - 1 gal | 24 | 139 N | 80 W |
| 227 | Environmental Incident | 3/14/2021 | Yes | 3/16/2021 | Milk - 7900 gal | 3 | 141 N | 76 W |
| 77 | Environmental Incident | 2/4/2021 | Yes | 2/4/2021 | Other - 25 gal | 12 | 138 N | 80 W |

Source: ND Department of Environmental Quality

## Infectious Disease and Pest Infestation

(Including human, animal, and plant diseases)

| | |
|---|---|
| **Frequency** | Likely (10-100% probability in the next year, or at least 1 chance in next 10 years) |
| **Severity** | Critical (25-50% of jurisdiction affected) |
| **Risk Class** | B |
| **Seasonal Pattern** | None |
| **Duration** | Hours/Days |
| **Speed of Onset** | No warning |
| **Location** | Countywide |

**Description**

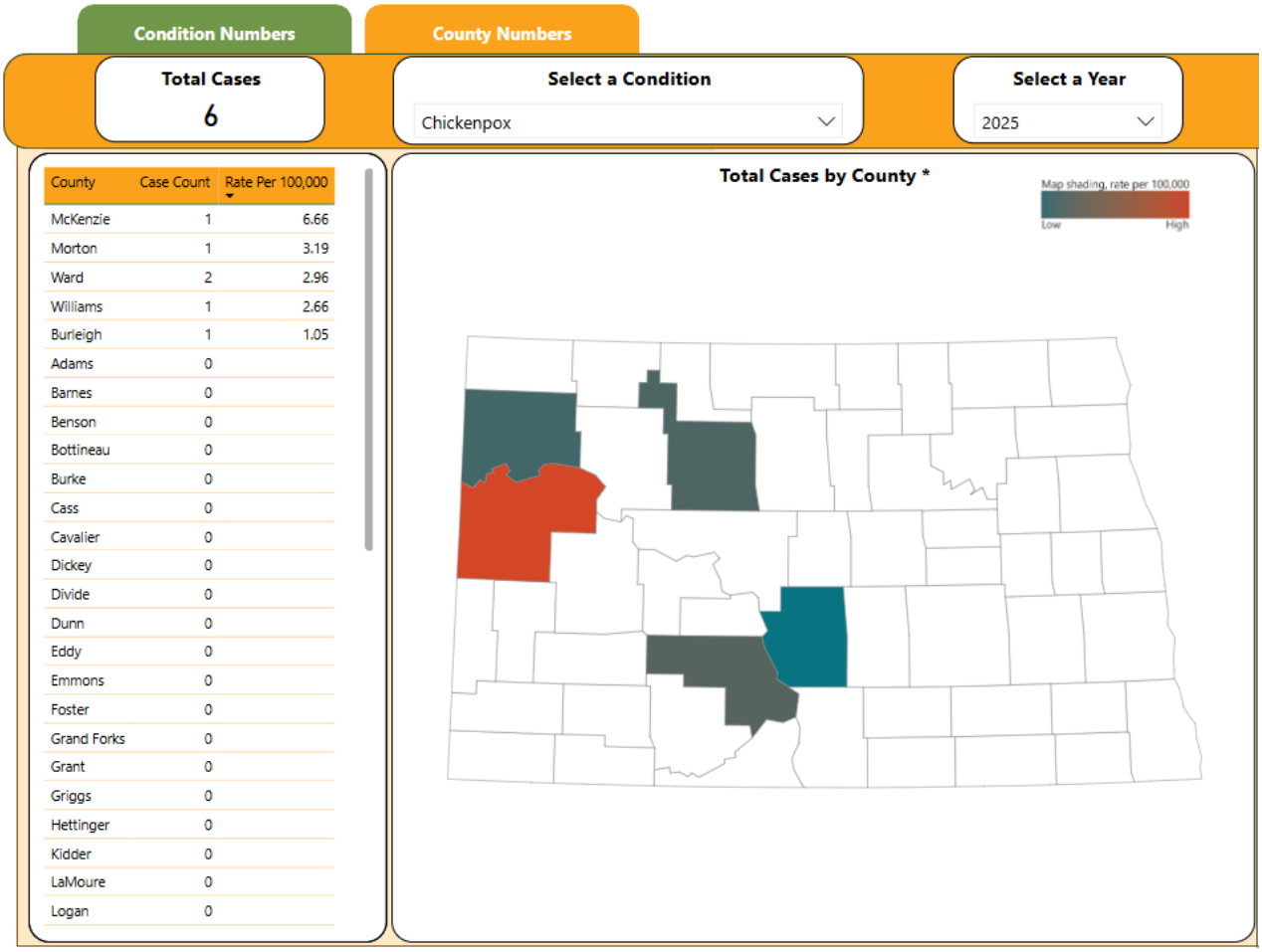
Naturally occurring biological diseases in humans as well as those biological agents found in the environment, or diagnosed in animals, that have the potential for transmission to humans.

The probability of communicable disease in Burleigh County presents challenges due to a limited history of outbreaks. Medical advances over the past 50 years prevent many disease outbreaks, yet the potential remains. Burleigh County is primarily a rural setting and somewhat isolated from the rapid spread of global diseases, however, international and domestic travel is so common that, like the Spanish Influenza Pandemic of 1918, North Dakotans would most likely be affected at some point. Urban areas could see rapid spread of such diseases through their populations.

**Identified Impacts**

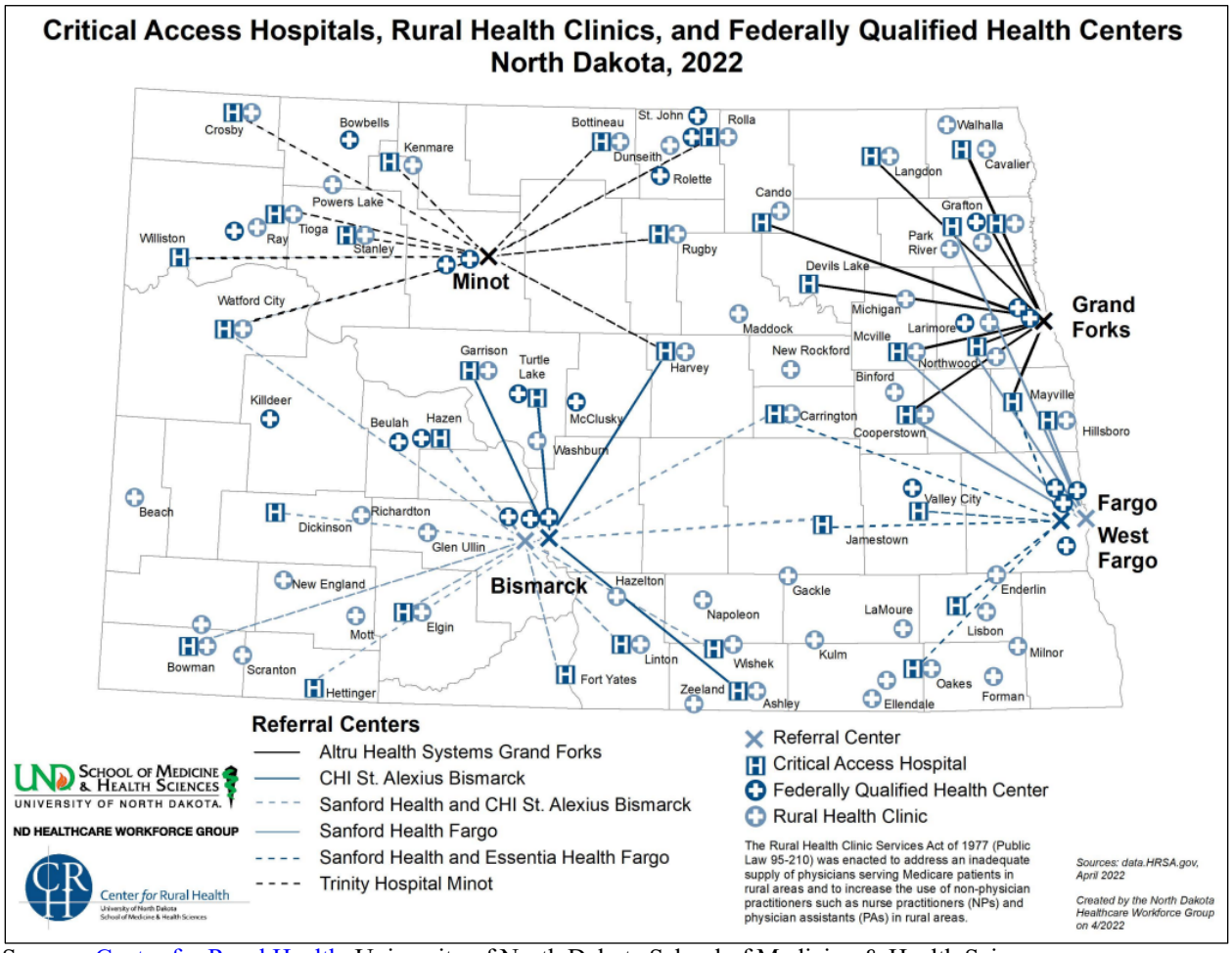
- Business Interruptions
- Delayed Emergency Response
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Potable Water
- Mass Casualties
- School Closure

The ND Department of Health and Human Services maintains a listing of "Diseases, Conditions and Immunization" as well as "Disease Report Dashboard".




| County | Case Count | Rate Per 100,000 |
|---|---|---|
| McKenzie | 1 | 6.66 |
| Morton | 1 | 3.19 |
| Ward | 2 | 2.96 |
| Williams | 1 | 2.66 |
| Burleigh | 1 | 1.05 |
| Adams | 0 | |
| Barnes | 0 | |
| Benson | 0 | |
| Bottineau | 0 | |
| Burke | 0 | |
| Cass | 0 | |
| Cavalier | 0 | |
| Dickey | 0 | |
| Divide | 0 | |
| Dunn | 0 | |
| Eddy | 0 | |
| Emmons | 0 | |
| Foster | 0 | |
| Grand Forks | 0 | |
| Grant | 0 | |
| Griggs | 0 | |
| Hettinger | 0 | |
| Kidder | 0 | |
| LaMoure | 0 | |
| Logan | 0 | |

ND is primarily rural with access to networked medical care:




Source: Center for Rural Health, University of North Dakota School of Medicine & Health Sciences.

**Most Significant Health Needs**

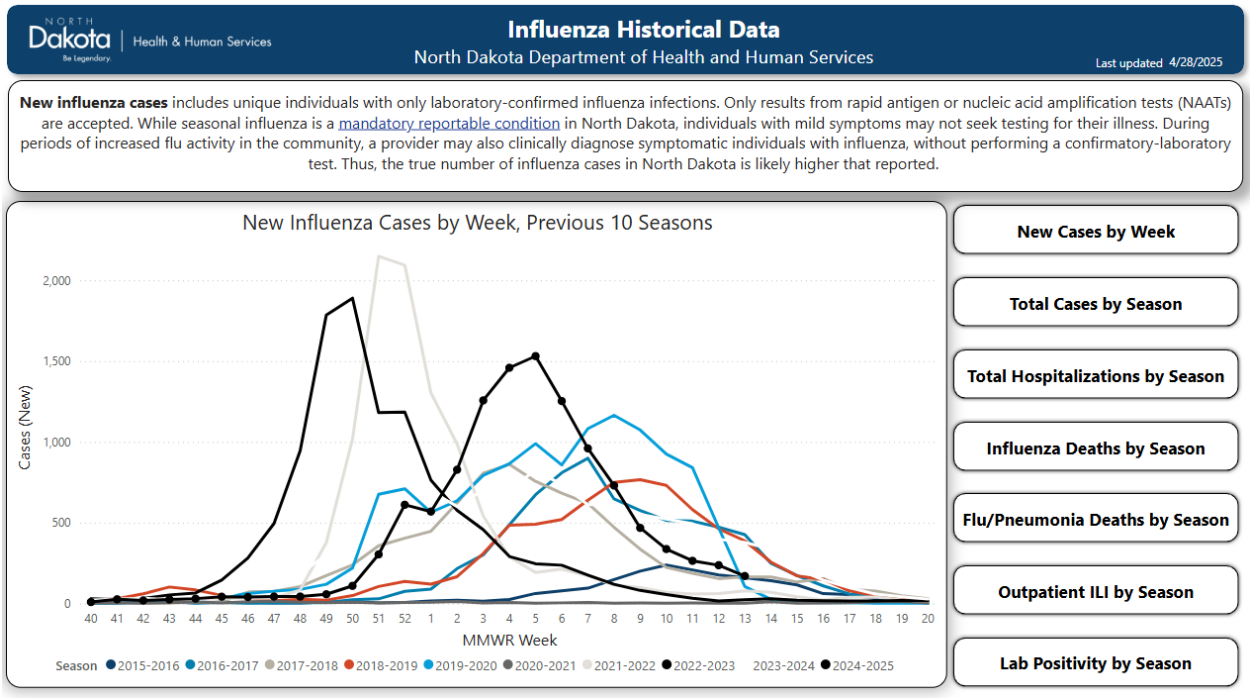
**Bismarck**
CHI St. Alexius Medical Center - 2022
Mental health
Healthy living (chronic health issues/access to healthy food)
Access to affordable healthcare
Affordable housing
Access to healthcare providers
Public transportation
Long-term care

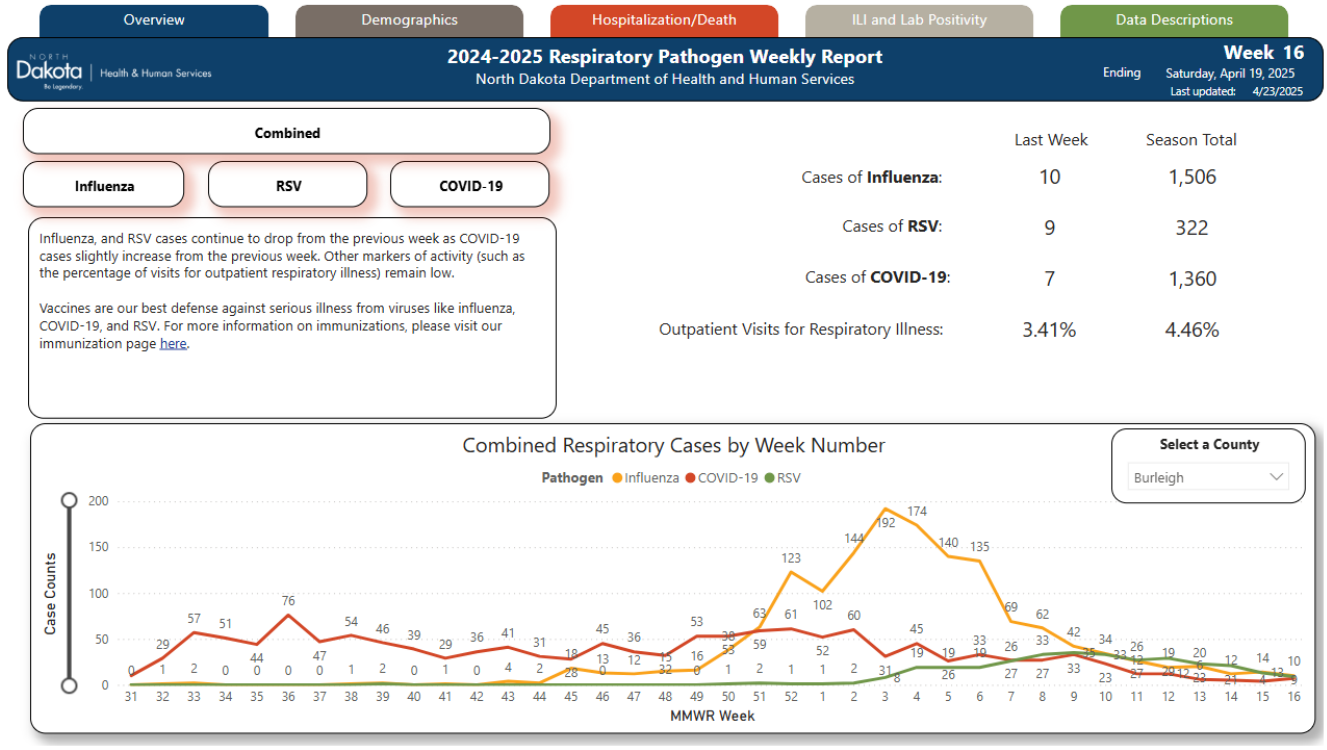
**Burleigh County (Rural)**
Burleigh County Board of Health - 2014
Elevated rate of excessive drinking
Cost/adequacy of health insurance
Concerns about availability of emergency services
Cost of healthcare services
Availability of resources to help elderly stay in their homes

Source: https://ruralhealth.und.edu/projects/community-health-needs-assessment/community-needs

**History**

Burleigh County has experienced one pandemic (COVID-19 in 2020) in recent years, and seasonal influenza outbreaks occur annually—both are tracked by the ND Department of Health and Human Services.

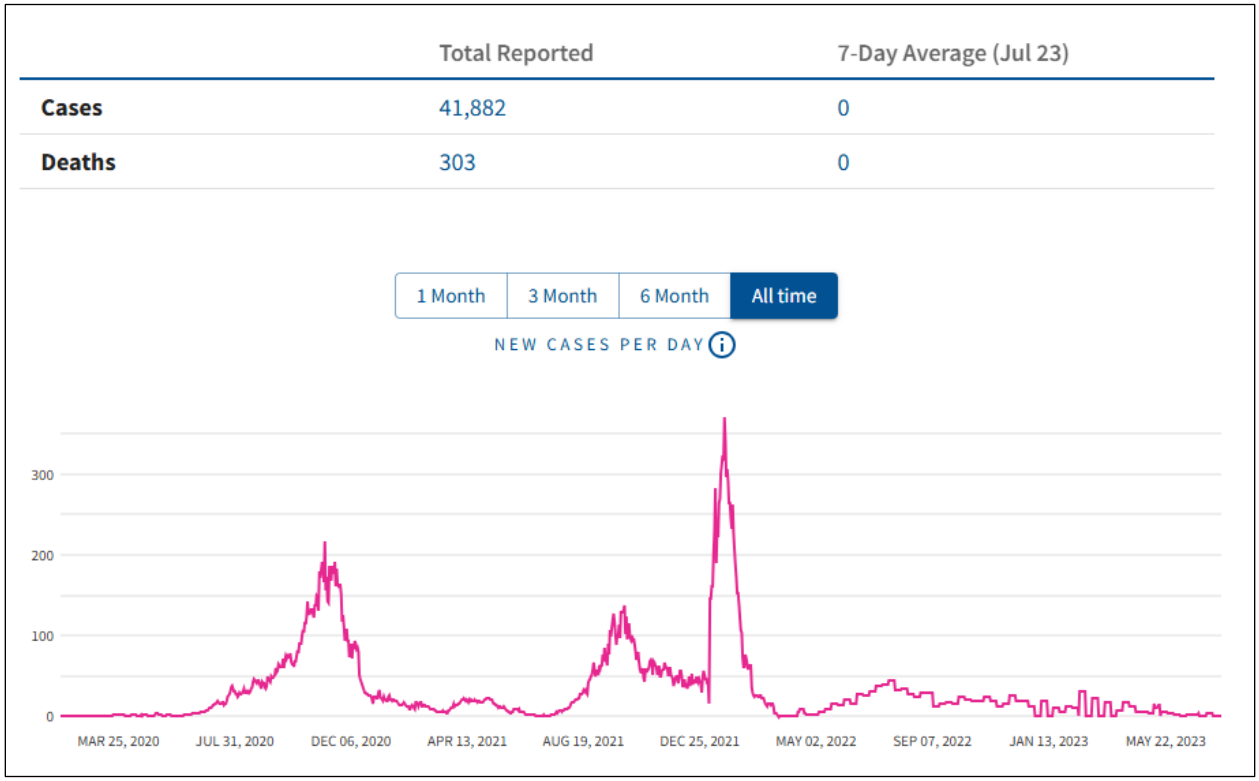



Source: [ND Department of Health and Human Services]

North Dakota has had three influenza pandemics in the 20th century: 1918 caused 5,100 deaths in North Dakota, 500,000 deaths in the United States; 1957 resulted in 70,000 deaths in the United States; and 1968 resulted in 34,000 deaths in the United States.

Burleigh County COVID-19 data:




Source: USA Facts

Spanish Influenza Pandemic of 1918

The magnitude of a communicable disease outbreak varies from everyday disease occurrences to widespread infection. During the 1918 Influenza Pandemic, infection rates approached 28% in the United States. (Billings, 1997). Other pandemics produced infections rates as high as 35% of the total population. (World Health Organization, 2007). Such a pandemic affecting North Dakota represents a severe magnitude event. Almost any highly contagious, incapacitating disease that enters the North Dakota population would quickly overwhelm local and state health resources. Similarly, any rapidly spreading bioterrorism event for which little vaccination or containment capability exists is a high magnitude event.

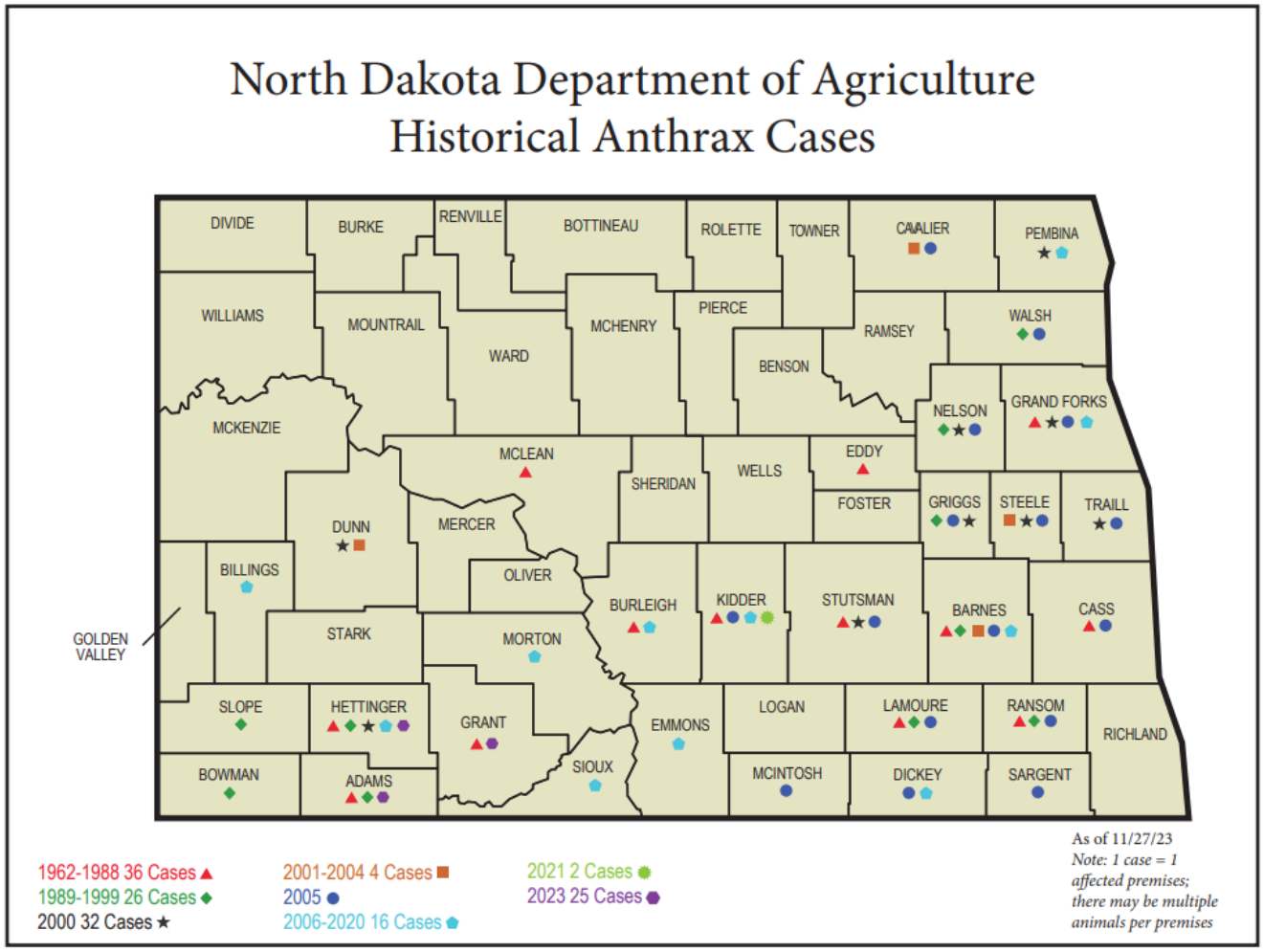
**Agricultural Diseases, Noxious Weeds, and Pests**

A comprehensive disease list (reportable disease, related pests diseases or noxious weeds, disease) maintained by the ND Department of Agriculture.

Anthrax

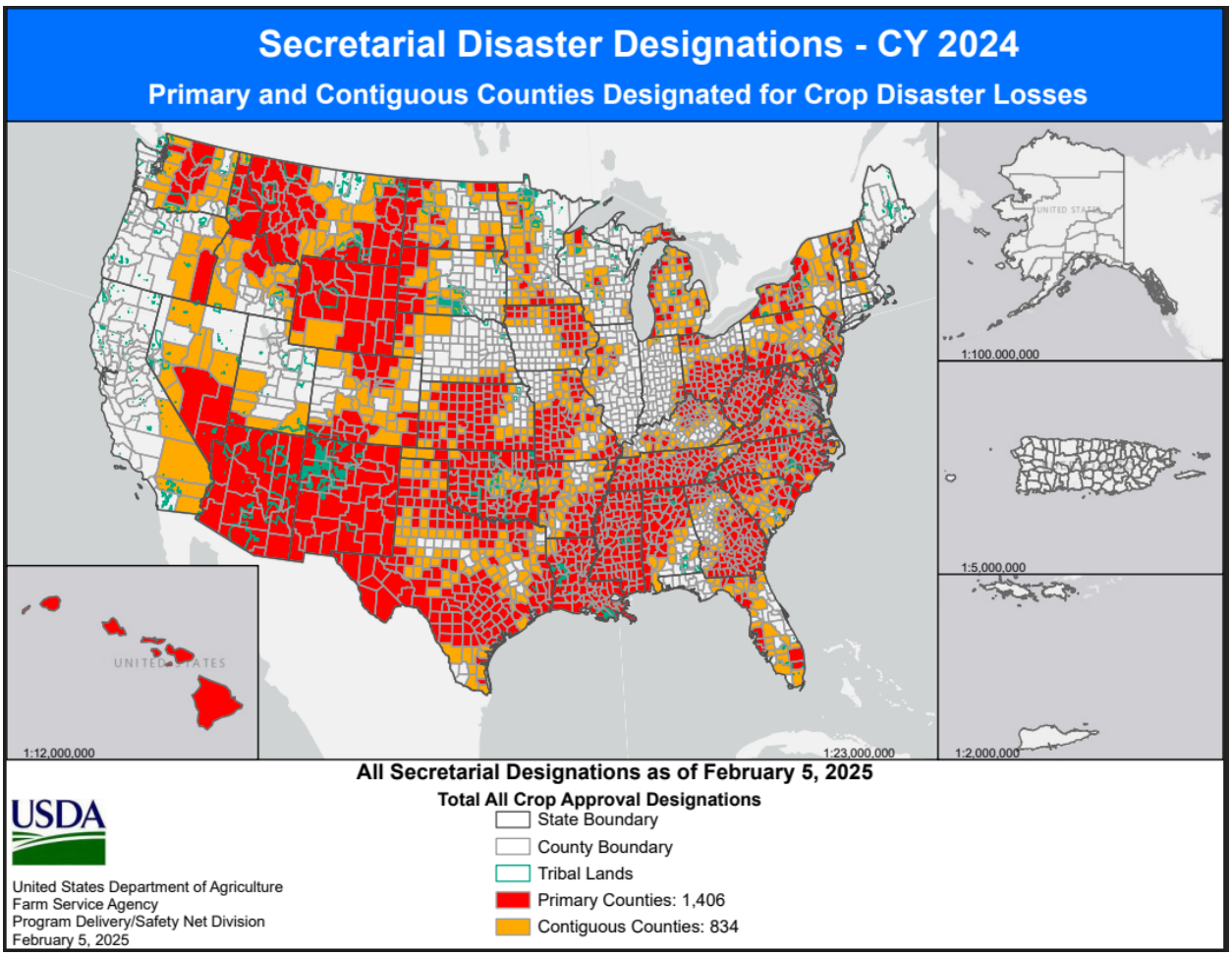
"Anthrax occurs worldwide and is associated with sudden death of cattle and sheep. Anthrax can infect all warm-blooded animals, including humans. The bacteria that causes anthrax (Bacillus anthracis) can form spores which are resistant to heat, cold, chemical disinfectants and drying. The anthrax spore may live indefinitely in the soil of a contaminated pasture or yard. Anthrax is more commonly seen in areas after periods of extended dryness or excessive rain. People may develop cutaneous anthrax after exposure to infected animals and animal products including hides, hair, and wool and may develop a more serious form of anthrax after eating contaminated undercooked meat or by inhaling the spores during a necropsy or disposal of opened carcasses. A vaccine is available for cattle and recommended for use annually in areas of historically high infection rates or when environmental factors increase the risk of anthrax in a new area." (Source: ND Department of Agriculture)

Burleigh County has a low case history:




Source: ND Department of Agriculture

Agriculture-related disasters and disaster designations are quite common. Disaster designation information and fact sheets are provided by the United Stated Department of Agriculture.




Source: [United States Department of Agriculture Farm Service Agency]

**Severe Summer Weather**
(Including downbursts, extreme heat, hail, lightning, high wind, and tornado)

| | |
|---|---|
| **Frequency** | Highly Likely (Nearly 100% probability in the next year) |
| **Severity** | Limited (10-25% of jurisdiction affected) |
| **Risk Class** | B |
| **Seasonal Pattern** | April to November |
| **Duration** | 2 to 5 hours |
| **Speed of Onset** | Little to no warning |
| **Location** | Countywide |

**Description**
Severe summer storms are generated by temperature imbalances in the atmosphere, and as warm, moist are rises, the thunderstorm develops. These conditions will produce updrafts and downdrafts which are the reason for gust fronts, heavy rain (flash flooding), lightning, hail, and high winds. Downburst or straight-line winds can be as deadly as tornadoes. If the thunderstorm continues to intensify, a tornado may develop.

Why Worry About Thunderstorms?
Lightning:
- Causes an average of 55-60 fatalities and 400 injuries each year
- Occurs with all thunderstorms
- Costs more than $1 billion in insured losses each year

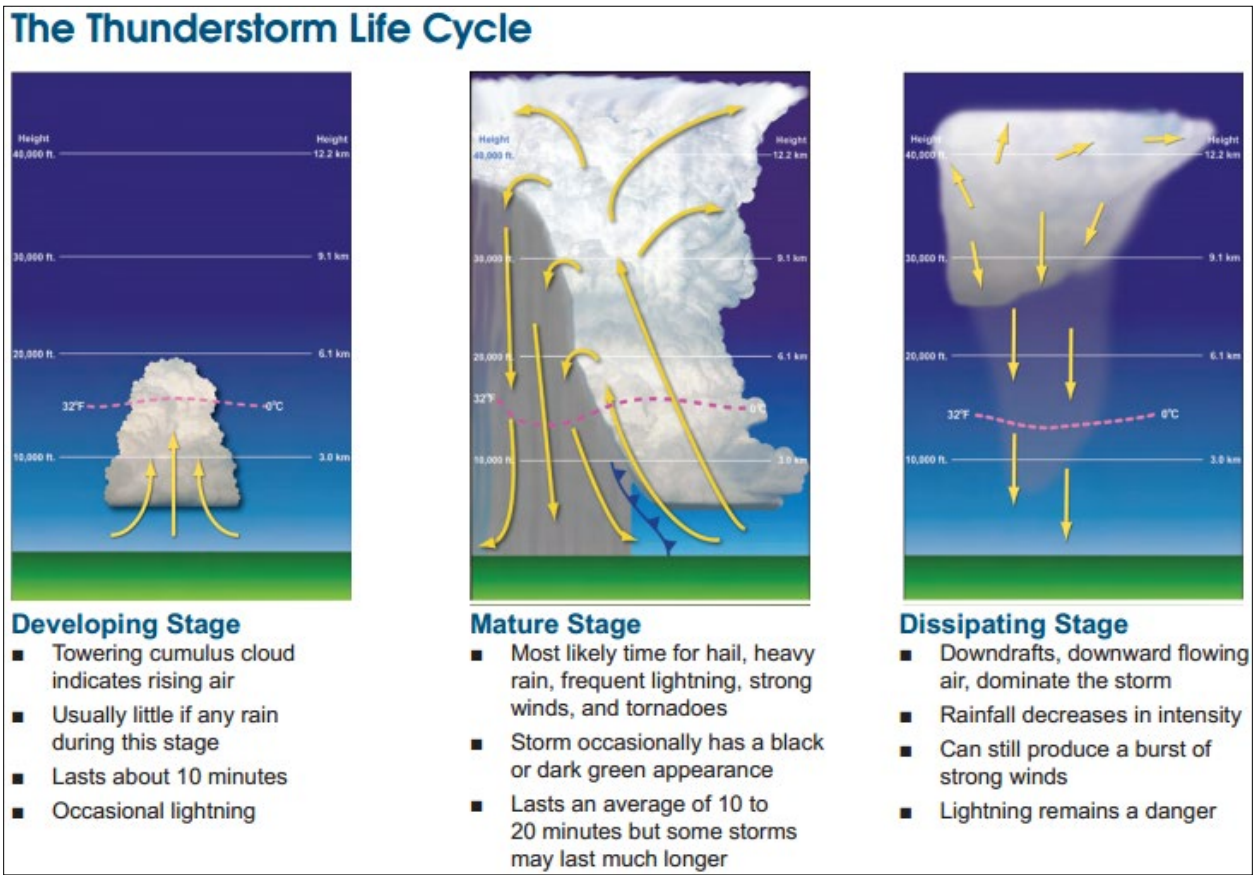
Tornadoes:
- Cause an average of 60-65 fatalities and 1,500 injuries each year
- Can produce wind speeds in excess of 200 mph
- Can be 1 mile wide and stay on the ground over 50 miles

Straight-line Winds:
- Can exceed 125 mph
- Can cause destruction equal to a tornado
- Are extremely dangerous to aviation

Hail:
- Can be larger than a softball (5 inches in diameter)
- Causes more than $1 billion in crop and property damage each year

A thunderstorm affects a relatively small area when compared to a winter storm. The typical thunderstorm is 15 miles in diameter and lasts an average of 30 minutes. Despite their small size, all thunderstorms are dangerous! Every thunderstorm needs:

- Moisture—to form clouds and rain
- Unstable air—warm air that can rise rapidly
- Lift—caused by cold or warm fronts, sea breezes, mountains, or the sun's heat.



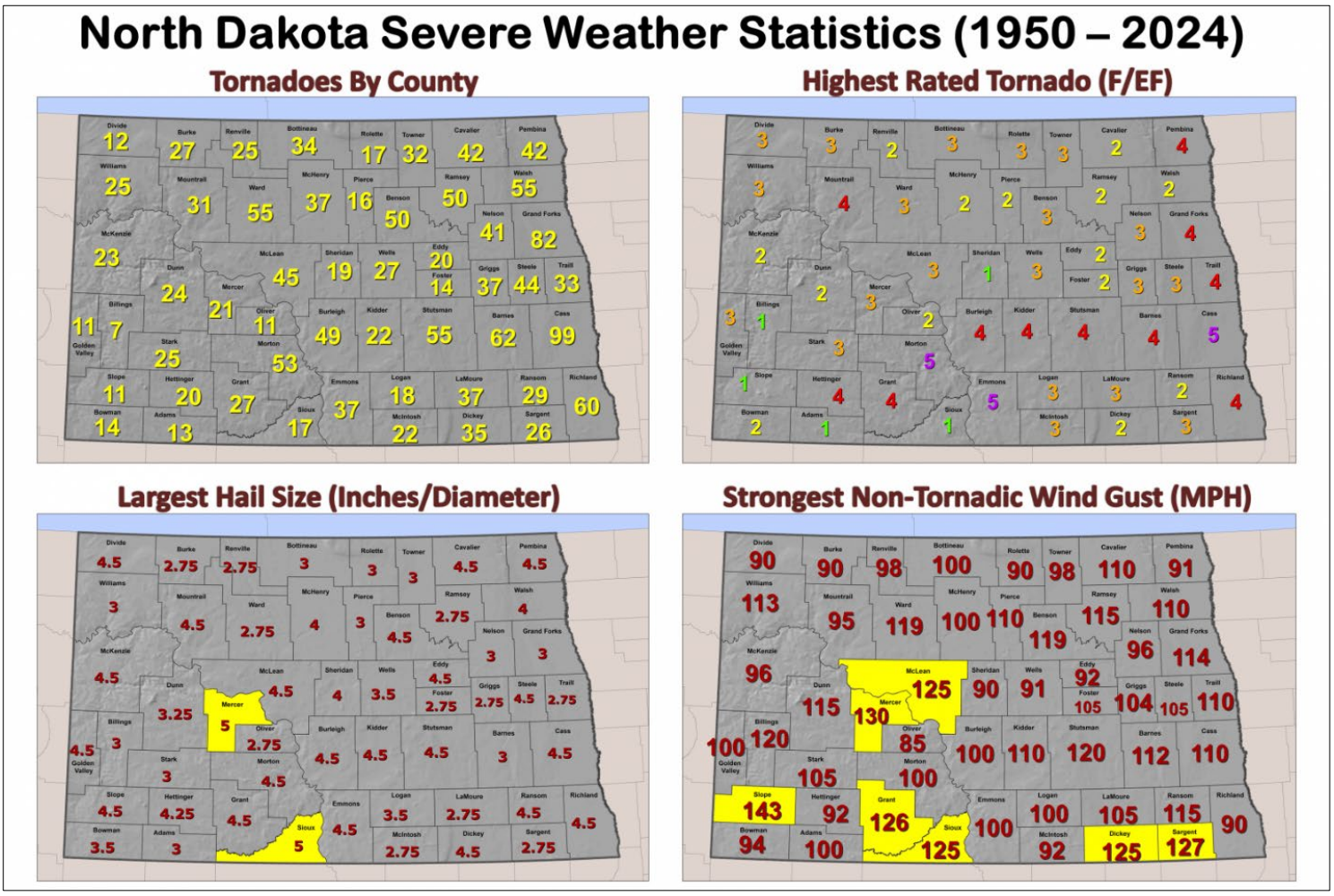

Source: Thunderstorms, Tornadoes, Lightning, A Preparedness Guide, US Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service

### Tornado

**The Enhanced Fujita Scale (EF Scale)**

| EF SCALE | |
|---|---|
| EF Rating | 3 Second Gust (mph) |
| 0 | 65-85 |
| 1 | 86-110 |
| 2 | 111-135 |
| 3 | 136-165 |
| 4 | 166-200 |
| 5 | Over 200 |

Source: National Weather Service




Source: National Weather Service Weather Forecast Office, Bismarck, ND

**Wind**

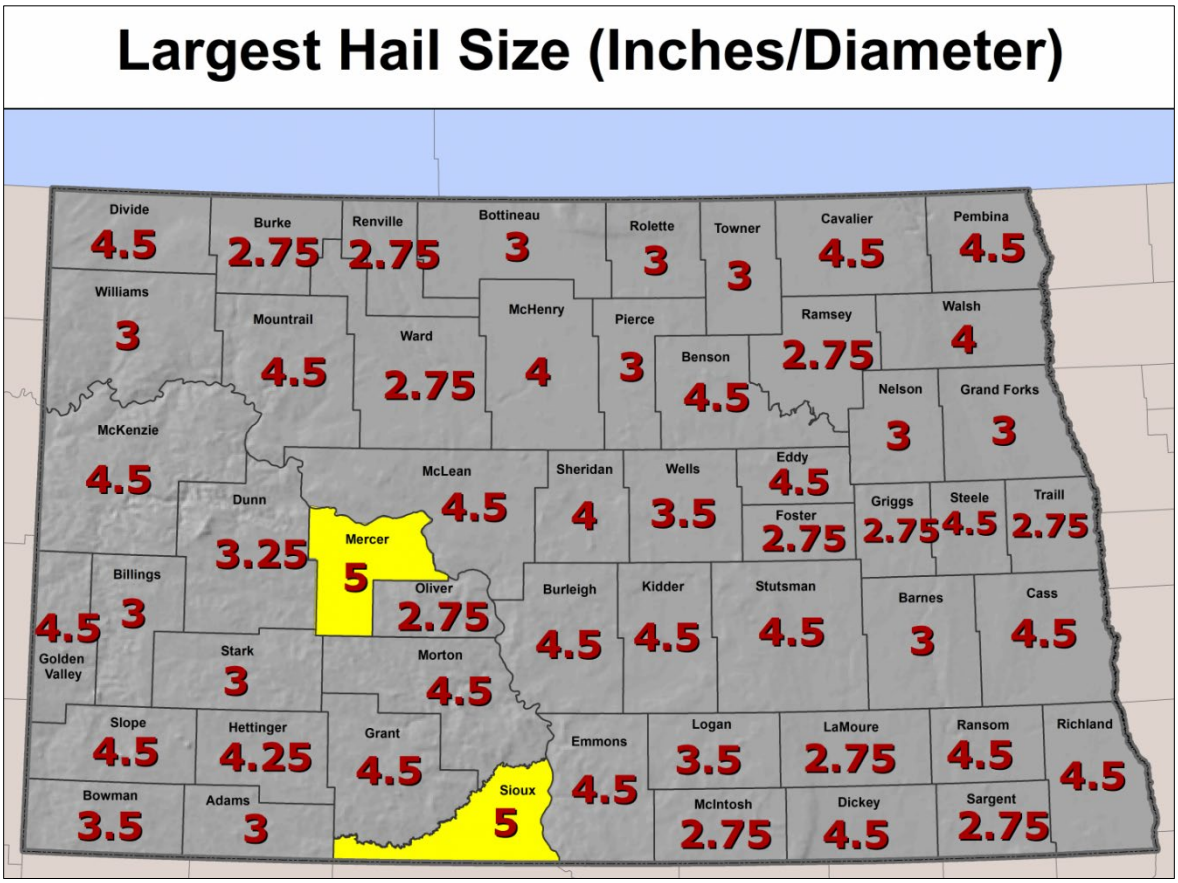

Source: National Weather Service

Straight-line winds are any winds not associated with the rotation of a tornado and are responsible for most thunderstorm damage. The winds can exceed 125 mph! A downburst is a small area of rapidly descending air beneath a thunderstorm and can cause damage equivalent to a strong tornado and can be extremely hazardous to aviation. The number one cause of wind damage in North Dakota is from downburst winds, not tornadoes.

**Hail**

Hail is larger than sleet and forms only in thunderstorms. Hail stones can range from pea size to the size of a grapefruit. Hail has the potential to be life-threatening due to falling from great heights; large hailstones can fall at speeds faster than 100 mph!

The major hazard is to crops, aircraft, automobiles, roofs, and windows, etc. The destructiveness of hailstorms is not due to the hailstones alone. Hail damage is difficult to determine, as hail, wind, and rain frequently occur at the same time.




Source: National Weather Service Weather Forecast Office, Bismarck, ND

**Identified Impacts**

- Blocked Roads
- Building Collapse
- Business Interruptions
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Localized)
- Explosion
- Flooding (Street)
- Flooding (Structure)
- HAZMAT Release
- Increased Fire Potential
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Potable Water
- Loss of Power
- Mass Casualties
- Property Damage
- School Closure
- Sewer Backup

## History

### Lightning

| Location | Date | Time | T.Z. | Type | Dth | Inj | PrD | CrD |
|---|---|---|---|---|---|---|---|---|
| STERLING | 08/28/2024 | 17:30 | CST-6 | Lightning | 0 | 3 | 1.00K | 0.00K |
| BISMARCK | 07/30/2011 | 02:00 | CST-6 | Lightning | 0 | 0 | 190.00K | 0.00K |
| WING | 07/27/2010 | 02:25 | CST-6 | Lightning | 0 | 0 | 8.00K | 0.00K |
| BALDWIN | 06/26/2010 | 07:28 | CST-6 | Lightning | 0 | 0 | 1.00K | 0.00K |
| MENOKEN | 07/16/2008 | 04:00 | CST-6 | Lightning | 0 | 0 | 5.00K | 0.00K |
| BISMARCK | 08/02/1996 | 21:00 | CST | Lightning | 0 | 0 | 2.00K | 0.00K |
| **Totals:** | | | | | 0 | 3 | 207.00K | 0.00K |

Source: National Oceanic and Atmospheric Administration National Climatic Data Center (01/1950 to 12/2024)

### Tornado (F1/EF1 and stronger)

| Location | Date | Time | T.Z. | Type | Mag | Dth | Inj | PrD | CrD |
|---|---|---|---|---|---|---|---|---|---|
| REGAN | 07/16/2011 | 16:35 | CST-6 | Tornado | EF1 | 0 | 0 | 10.00K | 0.00K |
| BISMARCK ARPT | 06/06/2005 | 23:02 | CST | Tornado | F1 | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 11/01/2000 | 14:33 | CST | Tornado | F2 | 0 | 0 | 55.00K | 0.00K |
| BISMARCK | 11/01/2000 | 13:55 | CST | Tornado | F1 | 0 | 2 | 0.00K | 0.00K |
| ARENA | 06/25/1999 | 21:24 | CST | Tornado | F1 | 0 | 0 | 0.00K | 0.00K |
| DRISCOLL | 06/03/1999 | 16:50 | CST | Tornado | F1 | 0 | 0 | 75.00K | 0.00K |
| BURLEIGH CO. | 05/30/1985 | 13:55 | CST | Tornado | F2 | 0 | 0 | 25.00K | 0.00K |
| BURLEIGH CO. | 05/10/1985 | 14:15 | CST | Tornado | F1 | 0 | 0 | 25.00K | 0.00K |
| BURLEIGH CO. | 05/10/1985 | 14:12 | CST | Tornado | F1 | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH CO. | 07/30/1981 | 18:00 | CST | Tornado | F3 | 0 | 0 | 250.00K | 0.00K |
| BURLEIGH CO. | 08/03/1980 | 17:00 | CST | Tornado | F1 | 0 | 0 | 2.50K | 0.00K |
| BURLEIGH CO. | 06/11/1976 | 20:32 | CST | Tornado | F1 | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH CO. | 06/11/1976 | 16:15 | CST | Tornado | F1 | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH CO. | 07/16/1957 | 20:00 | CST | Tornado | F2 | 0 | 0 | 2.50K | 0.00K |
| BURLEIGH CO. | 06/17/1956 | 18:30 | CST | Tornado | F2 | 0 | 0 | 250.00K | 0.00K |
| BURLEIGH CO. | 07/01/1952 | 18:36 | CST | Tornado | F4 | 0 | 1 | 250.00K | 0.00K |
| BURLEIGH CO. | 07/01/1952 | 18:00 | CST | Tornado | F4 | 1 | 25 | 250.00K | 0.00K |
| **Totals:** | | | | | | 1 | 28 | 1.195M | 0.00K |

Source: National Oceanic and Atmospheric Administration National Climatic Data Center (01/1950 to 12/2024)

**High Wind** (ten-year history plus previous events including death, injury, or damage)

| Location | Date | Time | T.Z. | Type | Mag | Dth | Inj | PrD | CrD |
|---|---|---|---|---|---|---|---|---|---|
| BURLEIGH (ZONE) | 10/05/2024 | 06:00 | CST-6 | High Wind | 53 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 11/06/2022 | 03:00 | CST-6 | High Wind | 56 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 10/13/2022 | 10:00 | CST-6 | High Wind | 54 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 06/15/2022 | 12:00 | CST-6 | High Wind | 56 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 05/13/2022 | 05:00 | CST-6 | High Wind | 54 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 04/06/2022 | 10:00 | CST-6 | High Wind | 50 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 02/01/2022 | 00:00 | CST-6 | High Wind | 53 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 01/31/2022 | 18:00 | CST-6 | High Wind | 53 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 11/17/2021 | 00:00 | CST-6 | High Wind | 50 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 11/13/2021 | 15:00 | CST-6 | High Wind | 54 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 02/22/2021 | 10:00 | CST-6 | High Wind | 53 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 01/14/2021 | 00:00 | CST-6 | High Wind | 62 kts. MG | 0 | 0 | 75.00K | 0.00K |
| BURLEIGH (ZONE) | 12/22/2020 | 22:00 | CST-6 | High Wind | 35 kts. MS | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 10/31/2020 | 11:00 | CST-6 | High Wind | 57 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 10/12/2020 | 18:00 | CST-6 | High Wind | 50 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 09/02/2020 | 18:00 | CST-6 | High Wind | 51 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 03/01/2020 | 08:00 | CST-6 | High Wind | 51 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 01/04/2020 | 22:00 | CST-6 | High Wind | 54 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 01/27/2019 | 17:00 | CST-6 | High Wind | 57 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 11/29/2017 | 11:00 | CST-6 | High Wind | 59 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 03/07/2017 | 06:00 | CST-6 | High Wind | 57 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 01/30/2017 | 09:00 | CST-6 | High Wind | 38 kts. MS | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 02/07/2016 | 00:00 | CST-6 | High Wind | 54 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 11/18/2015 | 13:00 | CST-6 | High Wind | 52 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 10/11/2015 | 12:00 | CST-6 | High Wind | 65 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 08/22/2015 | 15:00 | CST-6 | High Wind | 51 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 07/28/2015 | 14:00 | CST-6 | High Wind | 56 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 01/08/2015 | 07:30 | CST-6 | High Wind | 51 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 01/15/2014 | 20:00 | CST-6 | High Wind | 59 kts. MG | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 02/13/2011 | 09:00 | CST-6 | High Wind | 38 kts. MS | 0 | 0 | 20.00K | 0.00K |
| BURLEIGH (ZONE) | 05/25/2010 | 09:00 | CST-6 | High Wind | 52 kts. EG | 0 | 0 | 30.00K | 0.00K |
| BURLEIGH (ZONE) | 10/26/2008 | 12:47 | CST-6 | High Wind | 51 kts. MG | 0 | 0 | 50.00K | 0.00K |
| BURLEIGH (ZONE) | 05/01/2008 | 18:00 | CST-6 | High Wind | 52 kts. EG | 0 | 0 | 15.00K | 0.00K |
| BURLEIGH (ZONE) | 12/11/2004 | 18:00 | CST | High Wind | 42 kts. MS | 0 | 1 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 04/05/2000 | 08:30 | CST | High Wind | 62 kts. M | 0 | 10 | 0.00K | 0.00K |
| **Totals:** | | | | | | 0 | 11 | 190.00K | 0.00K |

Source: National Oceanic and Atmospheric Administration National Climatic Data Center (01/1950 to 12/2024)

**Hail**
(ten-year history plus previous events including death, injury, or damage)

| Location | Date | Time | T.Z. | Type | Mag | Dth | Inj | PrD | CrD |
|---|---|---|---|---|---|---|---|---|---|
| REGAN | 08/28/2024 | 18:10 | CST-6 | Hail | 1.25 in. | 0 | 0 | 0.00K | 0.00K |
| (BIS)BISMARCK MUNI A | 08/28/2024 | 17:40 | CST-6 | Hail | 1.75 in. | 0 | 0 | 0.00K | 0.00K |
| (BIS)BISMARCK MUNI A | 08/28/2024 | 17:35 | CST-6 | Hail | 1.75 in. | 0 | 0 | 0.00K | 0.00K |
| (BIS)BISMARCK MUNI A | 08/28/2024 | 17:33 | CST-6 | Hail | 1.75 in. | 0 | 0 | 0.00K | 0.00K |
| (BIS)BISMARCK MUNI A | 08/28/2024 | 17:32 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| (BIS)BISMARCK MUNI A | 08/28/2024 | 17:32 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/31/2024 | 07:45 | CST-6 | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/31/2024 | 07:25 | CST-6 | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| MC KENZIE | 07/29/2024 | 18:07 | CST-6 | Hail | 2.75 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/29/2024 | 17:48 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/29/2024 | 16:55 | CST-6 | Hail | 4.50 in. | 0 | 0 | 10.000M | 250.00K |
| BALDWIN | 07/29/2024 | 16:35 | CST-6 | Hail | 2.50 in. | 0 | 0 | 2.000M | 125.00K |
| BALDWIN | 07/27/2024 | 20:28 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/19/2024 | 05:43 | CST-6 | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 08/01/2023 | 17:05 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| MOFFIT | 07/26/2023 | 16:50 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 05/09/2023 | 20:20 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 05/09/2023 | 19:40 | CST-6 | Hail | 1.75 in. | 0 | 0 | 500.00K | 0.00K |
| MOFFIT | 07/21/2022 | 15:50 | CST-6 | Hail | 2.00 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/21/2022 | 15:33 | CST-6 | Hail | 1.75 in. | 0 | 0 | 400.00K | 0.00K |
| BISMARCK | 07/21/2022 | 15:05 | CST-6 | Hail | 2.50 in. | 0 | 0 | 1.200M | 0.00K |
| (BIS)BISMARCK MUNI A | 07/09/2022 | 10:05 | CST-6 | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| DRISCOLL | 06/24/2022 | 17:07 | CST-6 | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 06/20/2022 | 00:17 | CST-6 | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 06/20/2022 | 00:12 | CST-6 | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| BALDWIN | 07/17/2020 | 18:15 | CST-6 | Hail | 1.50 in. | 0 | 0 | 0.00K | 0.00K |
| BALDWIN | 07/17/2020 | 17:55 | CST-6 | Hail | 2.00 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/17/2020 | 17:48 | CST-6 | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/17/2020 | 17:40 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| (BIS)BISMARCK MUNI A | 09/20/2019 | 16:03 | CST-6 | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| REGAN | 08/25/2019 | 16:55 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 08/25/2019 | 15:19 | CST-6 | Hail | 2.00 in. | 0 | 0 | 400.00K | 0.00K |
| (BIS)BISMARCK MUNI A | 08/06/2019 | 15:41 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| STERLING | 08/06/2019 | 15:30 | CST-6 | Hail | 1.75 in. | 0 | 0 | 30.00K | 0.00K |
| (BIS)BISMARCK MUNI A | 08/06/2019 | 15:04 | CST-6 | Hail | 1.50 in. | 0 | 0 | 0.00K | 0.00K |
| (BIS)BISMARCK MUNI A | 08/06/2019 | 14:56 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| (BIS)BISMARCK MUNI A | 07/08/2019 | 16:46 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| (BIS)BISMARCK MUNI A | 07/08/2019 | 16:12 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| (BIS)BISMARCK MUNI A | 07/08/2019 | 16:00 | CST-6 | Hail | 1.50 in. | 0 | 0 | 0.00K | 0.00K |
| (BIS)BISMARCK MUNI A | 07/08/2019 | 16:00 | CST-6 | Hail | 1.75 in. | 0 | 0 | 0.00K | 0.00K |
| MENOKEN | 07/02/2019 | 18:45 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| BALDWIN | 06/11/2019 | 14:27 | CST-6 | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| FT LINCOLN | 09/09/2018 | 02:05 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/24/2018 | 23:10 | CST-6 | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/03/2018 | 23:14 | CST-6 | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/03/2018 | 23:12 | CST-6 | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/03/2018 | 23:10 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| FT LINCOLN | 06/28/2018 | 02:00 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 06/28/2018 | 01:50 | CST-6 | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/31/2017 | 17:35 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| FT LINCOLN | 07/31/2017 | 17:11 | CST-6 | Hail | 1.25 in. | 0 | 0 | 0.00K | 0.00K |
| (BIS)BISMARCK MUNI A | 07/21/2017 | 21:40 | CST-6 | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/21/2017 | 21:25 | CST-6 | Hail | 1.75 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/04/2017 | 17:10 | CST-6 | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/04/2017 | 16:42 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/04/2017 | 16:39 | CST-6 | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| FT LINCOLN | 06/27/2017 | 20:40 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| (BIS)BISMARCK MUNI A | 06/27/2017 | 20:32 | CST-6 | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| STERLING | 09/07/2016 | 13:45 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| DRISCOLL | 08/31/2016 | 04:27 | CST-6 | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| DRISCOLL | 08/31/2016 | 04:02 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| MOFFIT | 07/16/2016 | 15:51 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| MC KENZIE | 07/16/2016 | 15:12 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| ARENA | 07/16/2016 | 12:40 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| BALDWIN | 07/16/2016 | 12:19 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/10/2016 | 20:27 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/03/2016 | 20:00 | CST-6 | Hail | 0.75 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 07/03/2016 | 19:45 | CST-6 | Hail | 0.88 in. | 0 | 0 | 0.00K | 0.00K |
| DRISCOLL | 06/17/2016 | 04:10 | CST-6 | Hail | 2.50 in. | 0 | 0 | 15.00K | 20.00K |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| DRISCOLL | 06/17/2016 | 04:10 | CST-6 | Hail | 3.00 in. | 0 | 0 | 50.00K | 50.00K |
| BALDWIN | 06/17/2016 | 03:40 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| BISMARCK | 06/17/2016 | 03:30 | CST-6 | Hail | 3.25 in. | 0 | 0 | 50.000M | 250.00K |
| BISMARCK | 06/17/2016 | 03:25 | CST-6 | Hail | 1.50 in. | 0 | 0 | 0.00K | 0.00K |
| MOFFIT | 06/13/2015 | 16:08 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| REGAN | 09/04/2014 | 01:20 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| REGAN | 09/04/2014 | 01:15 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| BALDWIN | 09/04/2014 | 01:05 | CST-6 | Hail | 1.50 in. | 0 | 0 | 0.00K | 0.00K |
| BALDWIN | 08/20/2014 | 18:00 | CST-6 | Hail | 1.25 in. | 0 | 0 | 0.00K | 0.00K |
| MOFFIT | 07/05/2014 | 19:50 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| (BIS)BISMARCK MUNI A | 07/05/2014 | 19:30 | CST-6 | Hail | 1.00 in. | 0 | 0 | 0.00K | 0.00K |
| (BIS)BISMARCK MUNI A | 07/10/2011 | 12:50 | CST-6 | Hail | 1.25 in. | 0 | 0 | 150.00K | 0.00K |
| FT LINCOLN | 07/19/2008 | 18:45 | CST-6 | Hail | 2.75 in. | 0 | 0 | 10.00K | 0.00K |
| (BIS)BISMARCK MUNI A | 07/19/2008 | 18:20 | CST-6 | Hail | 2.75 in. | 0 | 0 | 800.00K | 0.00K |
| (BIS)BISMARCK MUNI A | 06/09/2001 | 16:55 | CST | Hail | 1.75 in. | 0 | 0 | 113.000M | 0.00K |
| NW Bismarck | 07/12/1994 | 19:06 | CST | Hail | 0.75 in. | 0 | 0 | 5.00K | 0.00K |
| Wilton | 06/21/1994 | 19:30 | CST | Hail | 0.75 in. | 0 | 0 | 0.00K | 50.00K |
| **Totals:** | | | | | | 0 | 0 | 271.575M | 845.00K |

Source: National Oceanic and Atmospheric Administration National Climatic Data Center (01/1950 to 12/2024)

## Severe Winter Weather

(Including blizzards, extreme cold/wind chill, heavy snow, ice storms, structure collapse)

| | |
|---|---|
| **Frequency** | Highly Likely (Nearly 100% probability in the next year) |
| **Severity** | Critical (25-50% of jurisdiction affected) |
| **Risk Class** | A |
| **Seasonal Pattern** | November to April |
| **Duration** | 2 to 5 days |
| **Speed of Onset** | 12 to 24 hours warning |
| **Location** | Countywide |

**Description**

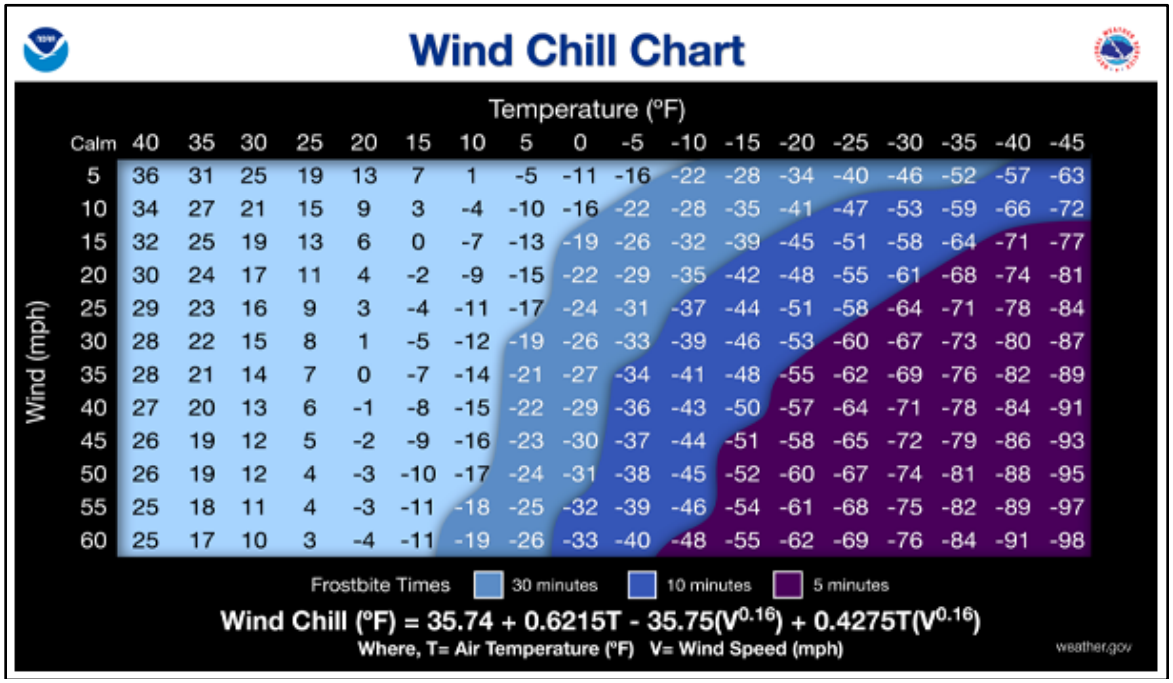
Winter storms occur in many forms and vary significantly in size, strength, intensity, duration, and impact. The winter season can begin as early as September and last into May. Generally, a period from mid-November through early April provides the bulk of winter storms.

Heavy snow can paralyze a community by stranding travelers, stopping the flow commodities, and disrupting emergency services. The weight of snow can cause roofs to collapse and knock down trees and utility lines. Homes and farms may be isolated for days, and unprotected livestock may die. The cost of snow removal, damage repair, and loss of business can have economic impacts on communities.

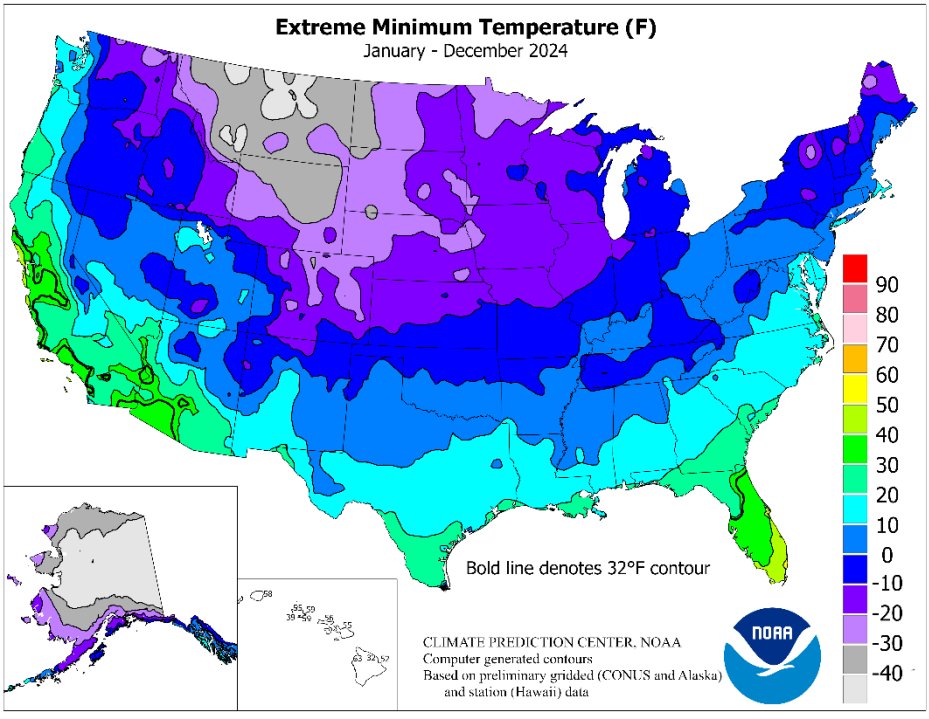
**Identified Impacts**

- Blocked Roads
- Building Collapse
- Business Interruptions
- Delayed Emergency Response
- Downed Power Lines
- Downed Trees
- Evacuation (Localized)
- HAZMAT Release
- Increased Fire Potential
- Increased Public Safety Runs
- Livestock Injury/Death
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Potable Water
- Loss of Power
- Property Damage
- School Closure
- Wind Chill

**Wind Chill**: The wind chill temperature is how cold people and animals feel when outside. Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature. Therefore, the wind makes it FEEL much colder. If the temperature is 0°F and the wind is blowing at 15 mph, the wind chill is -19°F. At this wind chill temperature, exposed skin can freeze in 30 minutes.




Source: National Weather Service, National Oceanic and Atmospheric Administration




Source: Climate Prediction Center

**History:**

**Severe Winter Weather Events**
**Blizzard, Cold/Wind Chill, Extreme Cold/Wind Chill, Heavy Snow, Ice Storm, Winter Storm, Winter Weather**
(ten-year history plus previous events including death, injury, or damage)

| Location | Date | Time | T.Z. | Type | Dth | Inj | PrD | CrD |
|---|---|---|---|---|---|---|---|---|
| BURLEIGH (ZONE) | 3/24/2024 | 3:00 | CST-6 | Heavy Snow | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 1/12/2024 | 19:00 | CST-6 | Cold/wind Chill | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 12/26/2023 | 0:00 | CST-6 | Ice Storm | 0 | 0 | 50.00K | 0.00K |
| BURLEIGH (ZONE) | 10/26/2023 | 1:00 | CST-6 | Heavy Snow | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 4/4/2023 | 14:00 | CST-6 | Blizzard | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 3/17/2023 | 12:00 | CST-6 | Winter Weather | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 3/11/2023 | 3:00 | CST-6 | Blizzard | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 3/5/2023 | 9:00 | CST-6 | Heavy Snow | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 3/1/2023 | 0:00 | CST-6 | Heavy Snow | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 2/28/2023 | 13:00 | CST-6 | Winter Weather | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 12/22/2022 | 11:00 | CST-6 | Blizzard | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 12/15/2022 | 12:00 | CST-6 | Blizzard | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 12/13/2022 | 8:00 | CST-6 | Heavy Snow | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 11/10/2022 | 6:00 | CST-6 | Blizzard | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 4/12/2022 | 6:00 | CST-6 | Blizzard | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 2/20/2022 | 21:00 | CST-6 | Heavy Snow | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 12/26/2021 | 12:00 | CST-6 | Heavy Snow | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 2/10/2021 | 20:00 | CST-6 | Extreme Cold/wind Chill | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 12/8/2019 | 13:00 | CST-6 | Heavy Snow | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 11/30/2019 | 4:00 | CST-6 | Heavy Snow | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 10/10/2019 | 21:00 | CST-6 | Heavy Snow | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 3/13/2019 | 22:00 | CST-6 | Blizzard | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 3/9/2019 | 1:00 | CST-6 | Heavy Snow | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 2/3/2019 | 12:00 | CST-6 | Heavy Snow | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 1/29/2019 | 0:00 | CST-6 | Extreme Cold/wind Chill | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 12/26/2018 | 9:00 | CST-6 | Heavy Snow | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 11/16/2018 | 5:00 | CST-6 | Heavy Snow | 0 | 0 | 250.00K | 0.00K |
| BURLEIGH (ZONE) | 3/5/2018 | 7:00 | CST-6 | Heavy Snow | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 1/2/2017 | 9:00 | CST-6 | Heavy Snow | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 12/25/2016 | 14:00 | CST-6 | Blizzard | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 12/5/2016 | 20:00 | CST-6 | Blizzard | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 11/27/2016 | 22:00 | CST-6 | Heavy Snow | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 3/31/2014 | 5:00 | CST-6 | Blizzard | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 3/1/2014 | 0:00 | CST-6 | Extreme Cold/wind Chill | 0 | 0 | 0.00K | 0.00K |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| BURLEIGH (ZONE) | 1/26/2014 | 7:00 | CST-6 | Blizzard | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 1/22/2014 | 21:00 | CST-6 | Extreme Cold/wind Chill | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 1/4/2014 | 4:00 | CST-6 | Extreme Cold/wind Chill | 0 | 0 | 0.00K | 0.00K |
| BURLEIGH (ZONE) | 4/2/2010 | 4:00 | CST-6 | Winter Storm | 0 | 0 | 2.000M | 0.00K |
| BURLEIGH (ZONE) | 3/30/2007 | 5:00 | CST-6 | Ice Storm | 0 | 0 | 25.00K | 0.00K |
| BURLEIGH (ZONE) | 12/30/2006 | 4:00 | CST-6 | Heavy Snow | 0 | 0 | 40.00K | 0.00K |
| BURLEIGH (ZONE) | 1/20/2006 | 7:00 | CST | Winter Weather | 0 | 0 | 15.00K | 0.00K |
| BURLEIGH (ZONE) | 12/29/2005 | 11:45 | CST | Winter Weather | 0 | 0 | 25.00K | 0.00K |
| MC KENZIE | 11/20/1997 | 18:00 | CST | Winter Weather | 1 | 12 | 20.00K | 0.00K |

Source: National Oceanic and Atmospheric Administration National Climatic Data Center (01/1950 to 12/2024)

## Space Weather

| | |
|---|---|
| **Frequency** | Possible (1-10% probability in next year, or at least 1 chance in next 100 years) |
| **Severity** | Critical (25-50% of jurisdiction affected) |
| **Risk Class** | B |
| **Seasonal Pattern** | None |
| **Duration** | Days/Weeks |
| **Speed of Onset** | Little to no warning |
| **Location** | Countywide |

### Description

Space Weather refers to variations in the space environment between the sun and Earth (and throughout the solar system) that can affect technologies in space and on Earth. Space weather is primarily driven by solar storm phenomenon that include coronal mass ejections, solar flares, solar particle events and solar wind. These phenomena can occur in various regions on the sun's surface, but only Earth directed solar storms are potential drivers of space weather events on Earth. An understanding of solar storm phenomena is an important component to developing accurate space weather forecasts (event onset, location, duration, and magnitude).

**Why does space weather matter?**

Space weather is a global issue. Unlike terrestrial weather events, like a hurricane, space weather has the potential to impact not only the United States, but wider geographic regions. These complex events can have significant economic consequences and have the potential to negatively affect numerous sectors, including communications, satellite and airline operations, manned space flights, navigation and surveying systems, as well as the electric power grid.

Source: NOAA Space Weather Prediction Center

NOAA Space Weather Scales

Source: NOAA National Weather Service Space Weather Prediction Center

The NOAA Space Weather Scales were introduced as a way to communicate to the general public the current and future space weather conditions and their possible effects on people and systems. Many of the SWPC products describe the space environment, but few have described the effects that can be experienced as the result of environmental disturbances. These scales are useful to users of our products and those who are interested in space weather effects. The scales describe the environmental disturbances for three event types: geomagnetic storms, solar radiation storms, and radio blackouts. The scales have numbered levels, analogous to hurricanes, tornadoes, and earthquakes that convey severity. They list possible effects at each level. They also show how often such events happen, and give a measure of the intensity of the physical causes.

## Geomagnetic Storm

| Scale | Description | Effect | Physical measure | Average Frequency (1 cycle = 11 years) |
|---|---|---|---|---|
| G 5 | Extreme | **Power systems:** Widespread voltage control problems and protective system problems can occur, some grid systems may experience complete collapse or blackouts. Transformers may experience damage. **Spacecraft operations:** May experience extensive surface charging, problems with orientation, uplink/downlink and tracking satellites. **Other systems:** Pipeline currents can reach hundreds of amps, HF (high frequency) radio propagation may be impossible in many areas for one to two days, satellite navigation may be degraded for days, low-frequency radio navigation can be out for hours, and aurora has been seen as low as Florida and southern Texas (typically 40° geomagnetic lat.). | Kp = 9 | 4 per cycle (4 days per cycle) |
| G 4 | Severe | **Power systems:** Possible widespread voltage control problems and some protective systems will mistakenly trip out key assets from the grid. **Spacecraft operations:** May experience surface charging and tracking problems, corrections may be needed for orientation problems. **Other systems:** Induced pipeline currents affect preventive measures, HF radio propagation sporadic, satellite navigation degraded for hours, low-frequency radio navigation disrupted, and aurora has been seen as low as Alabama and northern California (typically 45° geomagnetic lat.). | Kp = 8, including a 9- | 100 per cycle (60 days per cycle) |
| G 3 | Strong | **Power systems:** Voltage corrections may be required, false alarms triggered on some protection devices. **Spacecraft operations:** Surface charging may occur on satellite components, drag may increase on low-Earth-orbit satellites, and corrections may be needed for orientation problems. **Other systems:** Intermittent satellite navigation and low-frequency radio navigation problems may occur, HF radio may be intermittent, and aurora has been seen as low as Illinois and Oregon (typically 50° geomagnetic lat.). | Kp = 7 | 200 per cycle (130 days per cycle) |
| G 2 | Moderate | **Power systems:** High-latitude power systems may experience voltage alarms, long-duration storms may cause transformer damage. **Spacecraft operations:** Corrective actions to orientation may be required by ground control; possible changes in drag affect orbit predictions. **Other systems:** HF radio propagation can fade at higher latitudes, and aurora has been seen as low as New York and Idaho (typically 55° geomagnetic lat.). | Kp = 6 | 600 per cycle (360 days per cycle) |
| G 1 | Minor | **Power systems:** Weak power grid fluctuations can occur. **Spacecraft operations:** Minor impact on satellite operations possible. **Other systems:** Migratory animals are affected at this and higher levels; aurora is commonly visible at high latitudes (northern Michigan and Maine). | Kp = 5 | 1700 per cycle (900 days per cycle) |

## Solar Radiation Storms

| Scale | Description | Effect | Physical measure (Flux level of >= 10 MeV particles) | Average Frequency (1 cycle = 11 years) |
|---|---|---|---|---|
| S 5 | Extreme | **Biological:** Unavoidable high radiation hazard to astronauts on EVA (extra-vehicular activity); passengers and crew in high-flying aircraft at high latitudes may be exposed to radiation risk.<br>**Satellite operations:** Satellites may be rendered useless, memory impacts can cause loss of control, may cause serious noise in image data, star-trackers may be unable to locate sources; permanent damage to solar panels possible.<br>**Other systems:** Complete blackout of HF (high frequency) communications possible through the polar regions, and position errors make navigation operations extremely difficult. | $10^5$ | Fewer than 1 per cycle |
| S 4 | Severe | **Biological:** Unavoidable radiation hazard to astronauts on EVA; passengers and crew in high-flying aircraft at high latitudes may be exposed to radiation risk.<br>**Satellite operations:** May experience memory device problems and noise on imaging systems; star-tracker problems may cause orientation problems, and solar panel efficiency can be degraded.<br>**Other systems:** Blackout of HF radio communications through the polar regions and increased navigation errors over several days are likely. | $10^4$ | 3 per cycle |
| S 3 | Strong | **Biological:** Radiation hazard avoidance recommended for astronauts on EVA; passengers and crew in high-flying aircraft at high latitudes may be exposed to radiation risk.<br>**Satellite operations:** Single-event upsets, noise in imaging systems, and slight reduction of efficiency in solar panel are likely.<br>**Other systems:** Degraded HF radio propagation through the polar regions and navigation position errors likely. | $10^3$ | 10 per cycle |
| S 2 | Moderate | **Biological:** Passengers and crew in high-flying aircraft at high latitudes may be exposed to elevated radiation risk.<br>**Satellite operations:** Infrequent single-event upsets possible.<br>**Other systems:** Small effects on HF propagation through the polar regions and navigation at polar cap locations possibly affected. | $10^2$ | 25 per cycle |
| S 1 | Minor | **Biological:** None.<br>**Satellite operations:** None.<br>**Other systems:** Minor impacts on HF radio in the polar regions. | 10 | 50 per cycle |

## Radio Blackouts Scale

| Scale | Description | Effect | Physical measure | Average Frequency (1 cycle = 11 years) |
|---|---|---|---|---|
| R 5 | Extreme | **HF Radio:** Complete HF (high frequency) radio blackout on the entire sunlit side of the Earth lasting for a number of hours. This results in no HF radio contact with mariners and en route aviators in this sector.<br>**Navigation:** Low-frequency navigation signals used by maritime and general aviation systems experience outages on the sunlit side of the Earth for many hours, causing loss in positioning. Increased satellite navigation errors in positioning for several hours on the sunlit side of Earth, which may spread into the night side. | X20 ($2 \times 10^{-3}$) | Less than 1 per cycle |
| R 4 | Severe | **HF Radio:** HF radio communication blackout on most of the sunlit side of Earth for one to two hours. HF radio contact lost during this time.<br>**Navigation:** Outages of low-frequency navigation signals cause increased error in positioning for one to two hours. Minor disruptions of satellite navigation possible on the sunlit side of Earth. | X10 ($10^{-3}$) | 8 per cycle (8 days per cycle) |
| R 3 | Strong | **HF Radio:** Wide area blackout of HF radio communication, loss of radio contact for about an hour on sunlit side of Earth.<br>**Navigation:** Low-frequency navigation signals degraded for about an hour. | X1 ($10^{-4}$) | 175 per cycle (140 days per cycle) |
| R 2 | Moderate | **HF Radio:** Limited blackout of HF radio communication on sunlit side, loss of radio contact for tens of minutes.<br>**Navigation:** Degradation of low-frequency navigation signals for tens of minutes. | M5 ($5 \times 10^{-5}$) | 350 per cycle (300 days per cycle) |
| R 1 | Minor | **HF Radio:** Weak or minor degradation of HF radio communication on sunlit side, occasional loss of radio contact.<br>**Navigation:** Low-frequency navigation signals degraded for brief intervals. | M1 ($10^{-5}$) | 2000 per cycle (950 days per cycle) |

## Impacts

Source: NOAA National Weather Service Space Weather Prediction Center


Space Weather Impacts on Climate

All weather on Earth, from the surface of the planet out into space, begins with the Sun. Space weather and terrestrial weather (the weather we feel at the surface) are influenced by the small changes the Sun undergoes during its solar cycle.

The most important impact the Sun has on Earth is from the brightness or irradiance of the Sun itself. The Sun produces energy in the form of photons of light. The variability of the Sun's output is wavelength dependent; different wavelengths have higher variability than others. Most of the energy from the Sun is emitted in the visible wavelengths (approximately 400 – 800 nanometers (nm)). The output from the sun in these wavelengths is nearly constant and changes by only one part in a thousand (0.1%) over the course of the 11-year solar cycle.

Electric Power Transmission

The electric power grid, and consequently the power to your home and business, can be disrupted by space weather. One of the great discoveries of the 19th century was the realization that a time-varying magnetic field is able to produce an electrical current in a conducting wire. The basic idea is that the time rate of change of the magnetic flux (i.e. lines of magnetic force) passing through a current loop is proportional to the current that is generated around the loop. A slightly earlier but equally important discovery was that a current-carrying wire produces a magnetic field. The application of these principles is widely prevalent in modern society in electrical power generators, electrical power transformers, and electrical motors, for example.

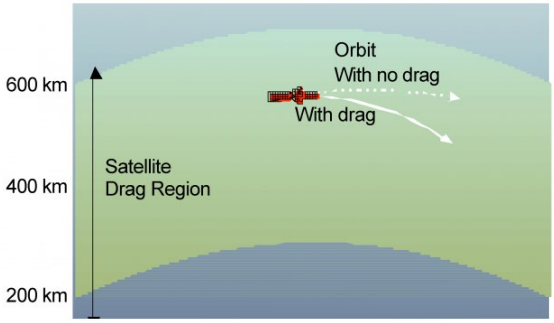
HF Radio Communications

Space weather impacts radio communication in a number of ways. At frequencies in the 1 to 30 mega Hertz range (known as "High Frequency" or HF radio), the changes in ionospheric density and structure modify the transmission path and even block transmission of HF radio signals completely. These frequencies are used by amateur (ham) radio operators and many industries such as commercial airlines. They are also used by a number of government agencies such as the Federal Emergency Management Agency and the Department of Defense.

Satellite Communications

Satellite communication refers to any communication link that involves the use of an artificial satellite in its propagation path. Satellite communications play a vital role in modern life. There are over 2000 artificial satellites in use. They can be found in geostationary, Molniya, elliptical, and low Earth orbits and are used for traditional point-to-point communications, mobile applications, and the distribution of TV and radio programs.

Satellite Drag




Drag is a force exerted on an object moving through a fluid, and it is oriented in the direction of relative fluid flow. Drag acts opposite to the direction of motion and tends to slow an object. As an example, think of running against a high wind and feeling the drag pushing you back in the direction of relative fluid flow. This same force acts on spacecraft and objects flying in the space enviro nment. Drag has a significant impact on spacecraft in low Earth orbit (LEO), generally defined as an orbit below an altitude of approximately 2,000 kilometers (1,200 mi). Although the air density is much lower than near the Earth's surface, the air resistance in those layers of the atmosphere where satellites in LEO travel is still strong enough to produce drag and pull them closer to the Earth. The International Space Station (ISS) and the Hubble Space Telescope are examples of spacecraft operating in LEO.

Space Weather and GPS Systems

The use of single and dual frequency satellite radio navigation systems, like the Global Positioning System (GPS), has grown dramatically in the last decade. GPS receivers are now in nearly every cell phone and in many automobiles, trucks, and any equipment that moves and needs precision location measurements. High precision dual frequency GPS systems are used for farming, construction, exploration, surveying, snow removal and many other applications critical to a functional society. Other satellite navigation systems in orbit include the European Galileo system and the Russian GLONASS system.

**Identified Impacts**

- Blocked Roads
- Business Interruptions
- Delayed Emergency Response
- Increased Fire Potential
- Increased Public Safety Runs
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Loss of Power
- Mass Casualties
- Property Damage
- School Closure

**History**

There is no significant history of space weather within the County.

## Transportation Accident

(Including vehicular, railway, and aircraft accidents)

| | |
|---|---|
| **Frequency** | Likely (10-100% probability in the next year, or at least 1 chance in next 100 years.) |
| **Severity** | Negligible (Less than 10% of jurisdiction affected) |
| **Risk Class** | C |
| **Seasonal Pattern** | None |
| **Duration** | Hours |
| **Speed of Onset** | No warning |
| **Location** | Countywide |

**Description**

A transportation accident is any large-scale aircraft, railroad, or vehicular accident involving mass casualties.

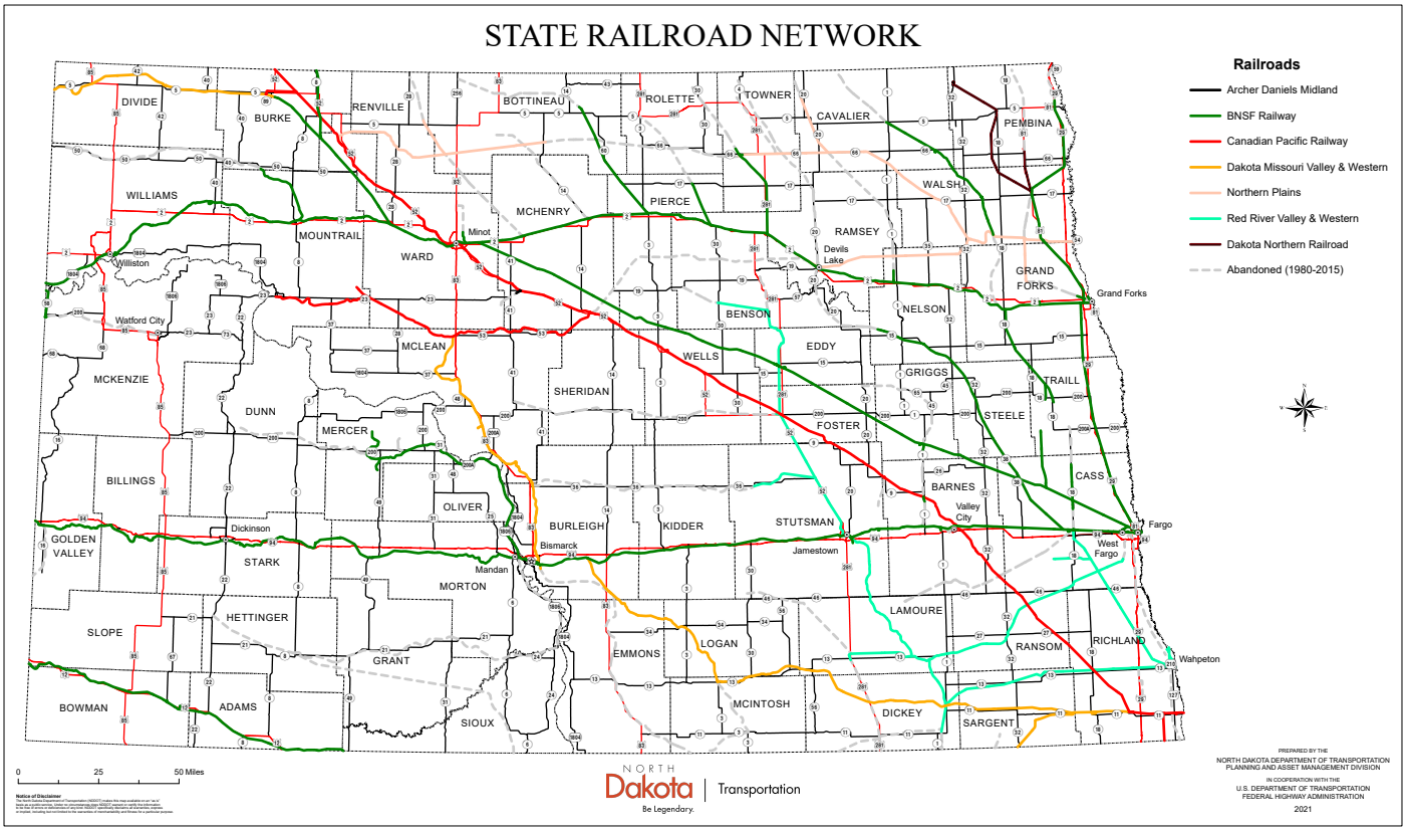
Burleigh County has one municipal airport, railroads, and several major highways.

### Vehicle

Interstate 94 is a primary, east/west transportation route intersecting Burleigh County and the City of Bismarck and is north of the City of Lincoln. U.S. Highway 83 is the second most utilized route and runs north/south, intersecting Burleigh County and the Cities of Bismarck and Wilton. The most predominant products observed in the study were anhydrous ammonia and gasolines. (See Attachment 3, Major Roadways in Burleigh County)

## Railroad

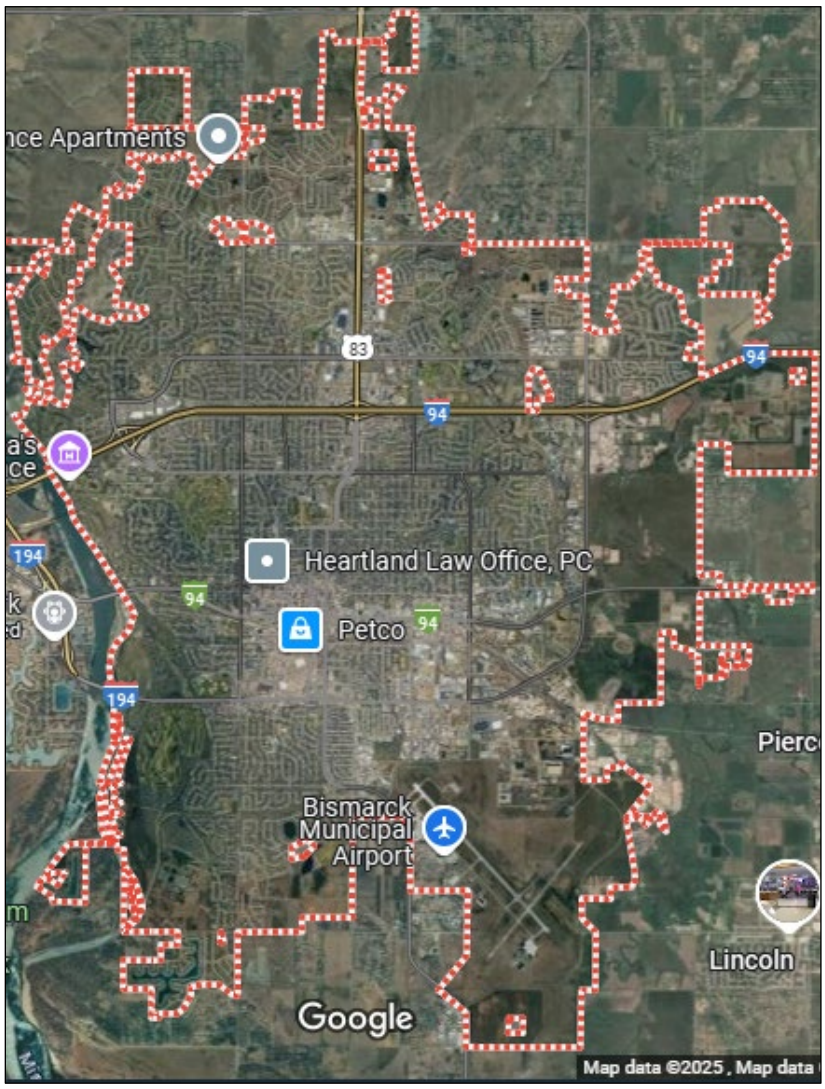
Two railroads traverse the county: Burleigh Northern Santa Fe (BNSF) and the Dakota, Missouri Valley Western Railroad (DMVW).




Source: [ND Department of Transportation]

**Airport**

The Bismarck Municipal Airport is in the southeast corner of the City of Bismarck.




Source: Google Map

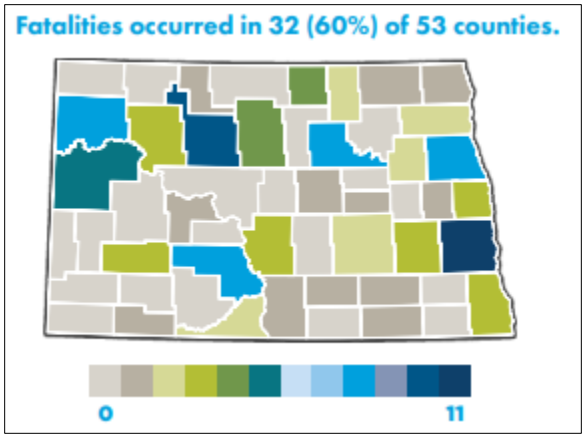
**Identified Impacts**

- Blocked Roads
- Business Interruptions
- Delayed Emergency Response
- Evacuation (Localized)
- Explosion
- HAZMAT Release
- Increased Public Safety Runs
- Loss of Economy
- Loss/Overcrowded Medical Facilities
- Mass Casualties
- Property Damage

**History**

**Vehicle**

Burleigh County had 2,173 crashes, 3 fatalities, and 70 injuries in 2023.



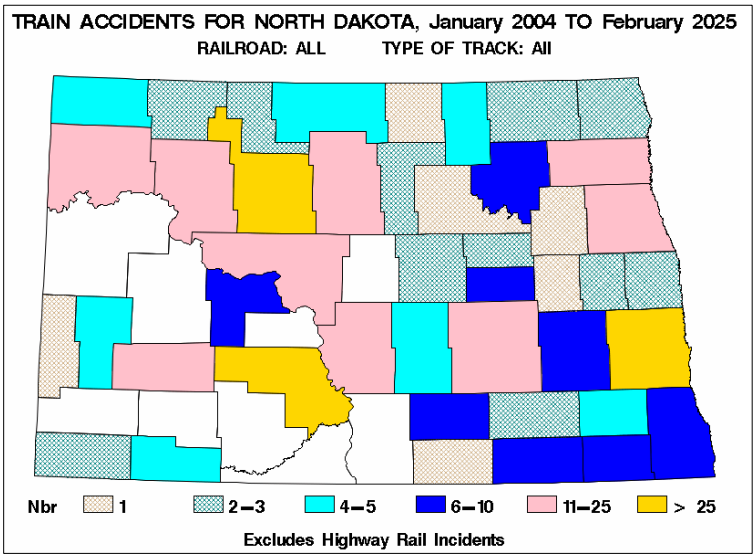

**North Dakota Motor Vehicle Crashes, Fatalities and Injuries 2014-2023**

| Year | Crashes | Fatalities | Injuries |
|---|---|---|---|
| 2014 | 16,134 | 135 | 5,278 |
| 2015 | 15,077 | 131 | 4,917 |
| 2016 | 15,017 | 113 | 4,614 |
| 2017 | 15,280 | 116 | 4,432 |
| 2018 | 15,242 | 105 | 4,230 |
| 2019 | 14,221 | 100 | 4,258 |
| 2020 | 8,820 | 100 | 3,426 |
| 2021 | 9,585 | 101 | 3,947 |
| 2022 | 10,734 | 98 | 3,763 |
| 2023 | 10,475 | 106 | 2,828 |

Source: 2023 North Dakota Crash Summary, North Dakota Department of Transportation

There is no history of mass casualty within Burleigh County.

## Railroad

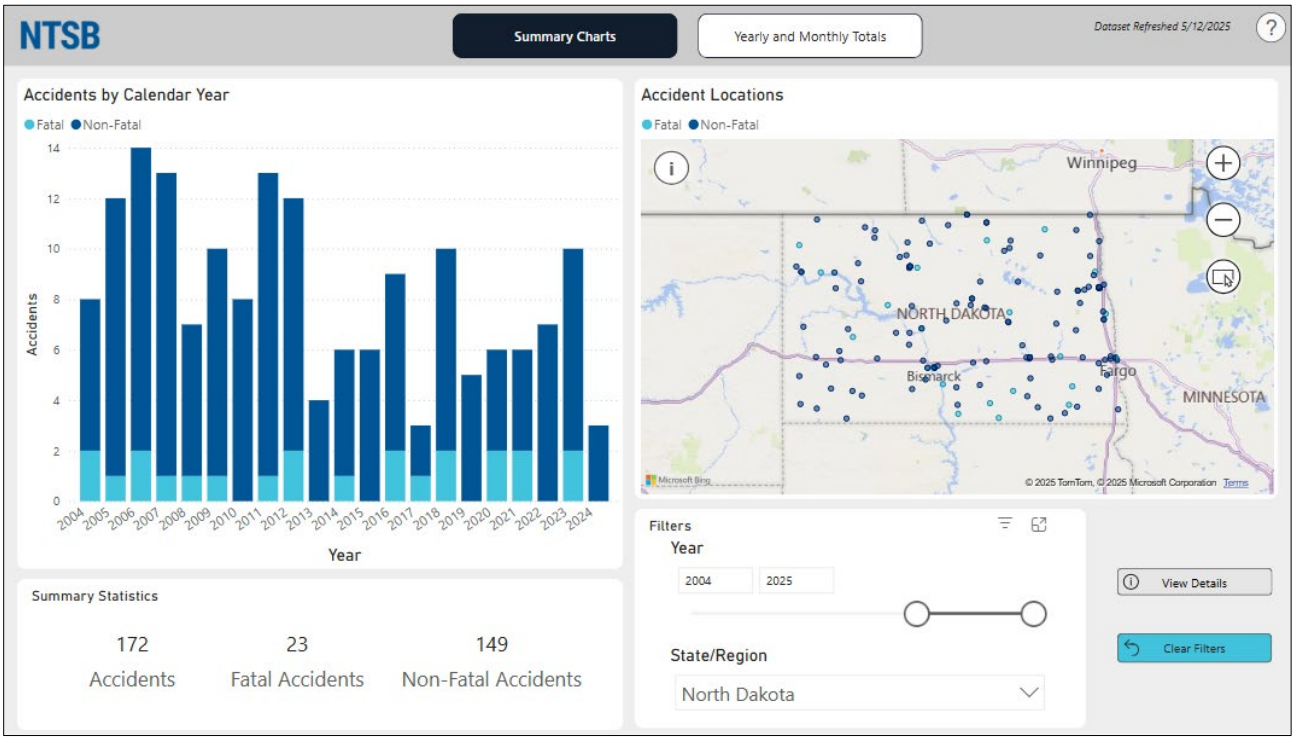



| County | Totals | | | | Type of Accident | | | Causes | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Accs | Kld | Inj | Reportable Damage | Coll | Der | Othr | Eqp | Hmn | Othr | Trk |
| ADAMS | 4 | 0 | 0 | 1,905,543 | - | 4 | - | 1 | 1 | 1 | 1 |
| BARNES | 6 | 0 | 0 | 1,009,060 | - | 6 | - | 3 | 1 | - | 2 |
| BENSON | 1 | 0 | 0 | 1,075,302 | - | 1 | - | - | - | - | 1 |
| BILLINGS | 4 | 0 | 0 | 3,204,620 | - | 4 | - | 2 | 1 | - | 1 |
| BOTTINEAU | 4 | 0 | 0 | 1,177,070 | - | 4 | - | - | - | 1 | 3 |
| BOWMAN | 2 | 0 | 0 | 357,226 | - | 2 | - | 1 | - | - | 1 |
| BURKE | 3 | 0 | 0 | 54,167 | - | 3 | - | 1 | 1 | - | 1 |
| BURLEIGH | 11 | 0 | 0 | 7,033,571 | - | 10 | 1 | 2 | 2 | 1 | 6 |
| CASS | 38 | 0 | 5 | 25,130,993 | 1 | 32 | 5 | 9 | 9 | 3 | 17 |
| CAVALIER | 3 | 0 | 0 | 162,732 | - | 3 | - | - | - | 1 | 2 |
| DICKEY | 6 | 0 | 0 | 1,276,088 | - | 6 | - | - | 2 | - | 4 |
| DIVIDE | 4 | 0 | 0 | 512,544 | - | 4 | - | - | 1 | - | 3 |
| EDDY | 2 | 0 | 0 | 270,508 | - | 1 | 1 | - | 1 | - | 1 |
| FOSTER | 9 | 0 | 2 | 10,217,044 | - | 8 | 1 | 1 | 3 | 1 | 4 |
| GOLDEN VALLEY | 1 | 0 | 0 | 36,928 | - | 1 | - | - | 1 | - | - |
| GRAND FORKS | 24 | 0 | 0 | 1,439,397 | 3 | 18 | 3 | 3 | 14 | - | 7 |
| GRIGGS | 1 | 0 | 0 | 4,557,879 | - | 1 | - | - | - | 1 | - |
| KIDDER | 4 | 0 | 0 | 3,361,700 | - | 4 | - | 2 | - | 1 | 1 |
| LA MOURE | 3 | 0 | 0 | 79,427 | - | 3 | - | - | - | - | 3 |
| LOGAN | 7 | 0 | 0 | 346,726 | - | 5 | 2 | - | 1 | 2 | 4 |
| MCHENRY | 11 | 0 | 0 | 2,859,260 | - | 8 | 3 | 3 | 2 | 2 | 4 |
| MCINTOSH | 1 | 0 | 0 | 131,750 | - | 1 | - | - | - | - | 1 |
| MCLEAN | 16 | 1 | 2 | 2,399,041 | - | 16 | - | 2 | 2 | 2 | 10 |
| MERCER | 9 | 0 | 0 | 647,139 | - | 9 | - | 1 | - | 2 | 6 |
| MORTON | 31 | 0 | 0 | 3,703,220 | 4 | 19 | 8 | 3 | 20 | 2 | 6 |
| MOUNTRAIL | 18 | 0 | 0 | 7,015,267 | - | 15 | 3 | 3 | 5 | 2 | 8 |
| NELSON | 1 | 0 | 0 | 130,000 | 1 | - | - | - | 1 | - | - |
| PEMBINA | 2 | 0 | 0 | 278,052 | - | 2 | - | - | - | - | 2 |
| PIERCE | 3 | 0 | 0 | 878,183 | - | 3 | - | - | - | - | 3 |
| RAMSEY | 7 | 0 | 1 | 420,203 | - | 6 | 1 | 1 | 2 | 1 | 3 |
| RANSOM | 4 | 0 | 0 | 179,048 | - | 2 | 2 | - | 2 | 1 | 1 |
| RENVILLE | 2 | 0 | 0 | 68,800 | - | 2 | - | - | - | 1 | 1 |
| RICHLAND | 9 | 0 | 0 | 3,505,454 | - | 9 | - | 1 | 4 | 1 | 3 |
| ROLETTE | 1 | 0 | 0 | 24,280 | - | 1 | - | - | - | 1 | - |
| SARGENT | 7 | 0 | 0 | 2,615,366 | - | 7 | - | - | - | 1 | 6 |
| STARK | 13 | 0 | 0 | 2,519,196 | - | 13 | - | 1 | 7 | 3 | 2 |
| STEELE | 2 | 0 | 0 | 305,052 | - | 2 | - | - | 1 | - | 1 |
| STUTSMAN | 23 | 0 | 0 | 4,027,990 | - | 21 | 2 | 6 | 2 | 6 | 9 |
| TOWNER | 4 | 0 | 0 | 1,179,669 | - | 4 | - | - | 1 | 1 | 2 |
| TRAILL | 3 | 0 | 0 | 759,955 | - | 3 | - | - | 1 | - | 2 |
| WALSH | 11 | 0 | 0 | 2,171,117 | - | 11 | - | 1 | - | - | 10 |
| WARD | 56 | 0 | 0 | 7,187,953 | 3 | 43 | 10 | 10 | 32 | - | 14 |
| WELLS | 3 | 0 | 0 | 3,579,352 | - | 2 | 1 | 2 | 1 | - | - |
| WILLIAMS | 21 | 1 | 0 | 14,747,938 | 1 | 16 | 4 | 2 | 9 | 3 | 7 |

*Causes: Eqp=Equipment Defect Hmn=Human factor Sig=Signal Defect Trk=Track Defect Othr=Other*
*Excludes Highway Rail Incidents*

Source: Federal Railroad Administration Office of Safety Analysis

## Aviation




Source: National Transportation Safety Board

There were six events in Burleigh County from 2004-2025 with no fatalities.

## Plan Maintenance

**Monitoring, Evaluating, and Updating the Plan**: The plan will be evaluated annually by the Burleigh County Emergency Manager with input from planning committee members. As a means of monitoring the plan and progress made on the projects, the Burleigh County Emergency Manager will collaborate with planning committee members and representatives identified as "lead agencies" to discuss progress of the projects, existing and potential grant opportunities, and changes in regulations. It will be the responsibility of the Emergency Manager to update the hazard history sections on an annual basis as events occur.

All disaster or emergency incidents will be evaluated for general/specific mitigation recommendations to be added to the plan as they occur. A comprehensive plan review by the planning committee will occur every five years unless the need arises earlier through aforementioned reviews and actions.

The approved plan is available on the Burleigh County website for review by stakeholders and the public along with the opportunity to submit mitigation ideas at any time. Burleigh County Emergency Management will continue to promote mitigation actions and seek projects through speaking engagements, booths, and especially after an actual event.

**Plan Integration:** The Burleigh County Multi-Hazard Mitigation Plan will be considered as building codes are developed and/or updated. The awareness of the hazards and vulnerability may affect future development in hazard-prone areas.

The Comprehensive Plan for Burleigh County (page 8) ties all other plans to the Burleigh County Multi-Hazard Mitigation Plan:

> "Objective 5: Ensure that the County is prepared to address Emergency Management incidents.
>
> Policy: #1 Review and update contingency plans for all hazards identified in the Burleigh County Multi-Hazard Mitigation Plan.
>
> #2 Review and address opportunities for mitigation of potential damage, such as, prohibiting developments in areas of high flood probability.
>
> #3 Encourage County Departments and Boards to review and update emergency policies and procedures.
>
> #4 Ensure that all developments are established with the safety of current and future users in mind."

(Page intentionally left blank)