STATE OF NEBRASKA

# Hazard Mitigation Plan

## 2026




NEBRASKA
EMERGENCY MANAGEMENT AGENCY

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# Executive Summary

Hazard mitigation aims to minimize or eliminate potential losses from future disasters. Effective hazard mitigation planning establishes a sustainable implementation process that enhances safety and resilience against hazards. The State of Nebraska is familiar with impacts of hazards on its residents, visitors, infrastructure, environment, and economy. This 2026 update to the State Hazard Mitigation Plan (State Plan, or SHMP) reaffirms the state's commitment to making continual improvements to its statewide mitigation strategy and program.

## NEBRASKA'S COMMITMENT

The State Plan shows Nebraska's commitment to pursue risk-reduction initiatives for assets exposed to natural and technological hazards. It also guides decision-makers in their efforts to prioritize mitigation actions and commit resources to reducing the effects of known hazards.

The SHMP plan update process began with a series of meetings to ensure input from stakeholders across the state. The meetings were followed by the launch of a committee to review and advise on initial draft content on a rolling review, as well as provide current data regarding recent hazard impacts, critical facilities, and resources available to Nebraskans.

Effective mitigation begins with identifying the threats and hazards a community faces and determining the associated impacts and vulnerabilities. Comprehensive assessment requires risk information based on credible science, technology, and intelligence validated by experience. No single threat or hazard exists in isolation. For example, a severe thunderstorm can lead to flooding, dam failures, and hazardous material spills. Understanding risks makes it possible to develop strategies and plans to manage them. Managing risks from threats and hazards requires decision-making to accept, avoid, reduce, or transfer those risks. Avoiding and reducing risks are ways to reduce a community's long-term vulnerability and build individual and community resilience.

Risk, not the occurrence of incidents, drives this plan. By fostering comprehensive risk considerations, this plan encourages behaviors and activities that will reduce people's future exposure and vulnerability. The risk assessment was a collaborative effort and relied on data provided by several collaborating agencies. The risk assessment offers detailed analyses of risks from across the state.

The next steps involved detailed analysis of hazard risk across the state and an assessment of vulnerabilities to these risks. A thorough evaluation of the state's current mitigation capabilities was conducted and resulted in an updated hazard mitigation strategy for Nebraska. The revised strategy identifies six overarching mitigation goals and related mitigation objectives. This is an increase of two from the prior plan. These goals frame Nebraska's path forward in implementing hazard mitigation:

- Promote a comprehensive state hazard mitigation policy framework to coordinate federal, state, and local hazard mitigation planning and program efforts.

- Reduce or eliminate long-term risk to property, including critical facilities and infrastructure, as well as historic and private property.
- Promote public awareness of hazards and how to reduce their impacts to all individuals, especially those with functional and access needs.
- Encourage the development and implementation of long-term, cost-effective, and resilient mitigation projects that preserve or restore the functions of natural systems.
- Build stronger by promoting mitigation actions emphasizing sustainable construction and design measures to reduce or eliminate the impacts of natural hazards.
- Identify opportunities for risk reduction by strategizing long-term actions designed to lessen the potential failure of medium and high hazard dams and the cascading consequences.

In summary, this plan aims to represent the most robust evaluation of Nebraska's hazard risks, the most thorough catalogue of resources available to local jurisdictions, and the most actionable and forward-looking hazard mitigation approach the state can use going forward to reduce the risk to their populace and structures.

# Preface

The 2026 State of Nebraska Hazard Mitigation Plan (HMP) outlines the foundational strategies, procedures, and frameworks guiding the state's Hazard Mitigation Program. It aligns with federal legislation, including the Stafford Act (Public Law 93-288, as amended) and the Disaster Mitigation Act of 2000, as well as the associated regulations derived from these statutes. The plan's Distribution List documents its implementation by listing the individuals and organizations that have received the plan.

**Table 1: Distribution List**

| Number | Agency | Name | Title |
|---|---|---|---|
| **1** | U.S. Army Corps of Engineers (USACE) | **Derek Schriner** | Engineer/Silver Jackets Coordinator |
| **2** | Nebraska Game and Parks Commission | **Amelia Baker** | Environmental Specialist II |
| **3** | Nebraska Department of Health and Human Services | **Russ Wren** | Emergency Response Coordinator/Emergency Support Function (ESF) 8 |
| **4** | Nebraska Department of Environment and Energy (NDEE) | **Jeffery Edwards** | Environmental Supervisor |
| **5** | Nebraska Department of Natural Resources (NeDNR) | **Adele Phillips** | Flood Mitigation Planner |
| **6** | Federal Emergency Management Agency (FEMA) | **Stephanie Drake** | Community Planner |
| **7** | Nebraska Emergency Management Agency (NEMA) | **Lexy Hindt** | Recovery Section Manager |
| **8** | NEMA | **Joel Beckman** | Public Assistance Unit Supervisor |
| **9** | NEMA | **Angelina Allen** | State Hazard Mitigation Program Specialist |
| **10** | Nebraska Department of Economic Development (DED) | **Joseph Lauber** | Deputy Director – Operations |
| **11** | NEMA | **Chelsea Harris** | State Hazard Mitigation Officer/ Hazard Mitigation Unit Supervisor |
| **12** | USACE | **Heaven McKinley** | Civil Engineer |
| **13** | State Fire Marshal's Office | **Scott Cordes** | State Fire Marshal Agency Director |

| Number | Agency | Name | Title |
|---|---|---|---|
| **14** | NEMA | **Donny Christensen** | Recovery Section Administrator |
| **15** | FEMA | **Penn Pennel** | Emergency Management Specialist Hazard Mitigation HMGP Grants Project Officer |
| **16** | NEMA | **Erv Portis** | Assistant Director |
| **17** | NEMA | **Marisa Alvares** | Hazard Mitigation Program Specialist I |
| **18** | Nebraska Forest Service | **Steven Jara** | Deputy Director |
| **19** | NEMA | **Kevin Cotter** | Program Specialist I |
| **20** | NEMA | **Logan Lueking** | Planner |
| **21** | FEMA | **Casey Hartline** | Supervisory Emergency Management Specialist |
| **22** | NEMA | **Erica Wertz** | Deputy State Hazard Mitigation Officer |
| **23** | Nebraska Department of Transportation (NDOT) | **Bobbi Brooks** | Highway Emergency Program Specialist |
| **24** | Nebraska Department of Agriculture | **Mike Gibson** | Emergency Response Coordinator |
| **25** | NEMA | **Josh Yox** | State VAL Long-Term Recovery Specialist |
| **26** | NeDNR | **Tim Gokie** | Chief Engineer |
| **27** | NDEE | **Doris Jansky** | ESF 12 |
| **28** | Nebraska Association of County Officials | **Luke Bonkiewicz** | Research Analyst |
| **29** | DED | **Jenny B. Mason** | Director of Community Development and Disaster Recovery |
| **30** | NDOT | **Jessica Sherwood** | Highway Operations Communications Manager |
| **31** | NDEE | **Bryce Puck** | Professional Engineer I |
| **32** | Nebraska State Patrol | **Jason Prante** | Emergency Preparedness Coordinator |
| **33** | Nebraska Rural Electric Association | **James Dukesherer** | Director of Government Relations |

# Record of Changes

This 2026 update is intended to be a living document, subject to ongoing evaluation and updates. Under authority delegated by the Governor, the Nebraska Emergency Management Agency (NEMA) can make administrative modifications as needed. Such updates may involve improvements to clarity and organization, integration of new or revised policies and procedures, inclusion of updated hazard and risk data, and revisions or additions to Mitigation Actions. Any other changes authorized by the Governor, or their appointed representative, may also be incorporated. Responsibility for documenting and managing these revisions throughout the planning cycle lies with the State Hazard Mitigation Officer (SHMO) or an appointed delegate.

**Table 2: Record of Changes**

| Section/Page | Description of Change | Authorized by | Date |
|---|---|---|---|
| **Entire plan** | Revision of goals and mitigation actions as well as update according to the 2023 federal guidance. | NEMA | 12/1/2024 |

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# 1.0 Introduction

## 1.1 Background

The Disaster Mitigation Act of 2000 requires the revision of the Nebraska State Hazard Mitigation Plan every five years. The 2014 State Hazard Mitigation Plan (SHMP) was updated in 2019, meeting the five-year update requirement. Concurrent with the 2019 update planning process, the state was experiencing catastrophic levels of flooding. Although the 2019 SHMP would not technically expire until 2024, catastrophic flooding and related issues that occurred during the 2019 planning process highlighted critical changes in risk and vulnerability as well as capabilities that were deemed important to capture and address in a more current plan. In March 2020, the State of Nebraska launched the collaborative planning effort to update the 2019 SHMP to capture new risk and vulnerability data from the flood response and recovery, as well as other current information from local hazard mitigation plans (LHMPs). The State of Nebraska Flood Hazard Mitigation Plan was adopted and approved on July 1, 2022. This 2026 SHMP will update the 2019 SHMP as well as integrate the information from the 2022 Flood Hazard Mitigation Plan.

Responsibility for the maintenance and revision of the plan is assigned to the Recovery Section of the Nebraska Emergency Management Agency (NEMA), with the State Hazard Mitigation Officer (SHMO) as the Plan Coordinator. As with previous versions, this plan has cultivated a rich planning environment involving local, state, and federal entities with differing perspectives.

## 1.2 Purpose

The purpose of the 2026 Nebraska State Hazard Mitigation Plan is to provide a comprehensive discussion of the natural, technological, and human-caused hazards that present risks to the residents, resources, and property of Nebraska, along with identifying the state's objectives and commitment in reducing the risks and vulnerability from these hazards. This plan also serves to break the cycle of repetitive damage by coordinating the implementation of mitigation activities that eliminate or reduce the long-term risk to human life and property from hazards and their effects.

The SHMP seeks to provide a framework to reduce the risk hazards pose to the lives and property of Nebraskans. It expands on Nebraska's commitment of over 30 years of programming to reduce risk and provide the tools and resources to encourage and engage in mitigation activities by:

- Creating a vision for a resilient future
- Setting goals and objectives to build toward Federal Emergency Management (FEMA) defined capabilities
- Promoting interagency coordination in the areas of hazard mitigation and resiliency
- Complying with state and federal requirements

- Identifying all hazards threatening the state
- Setting a framework for the effective creation and implementation of mitigation activities

Additionally, the purpose of the 2026 SHMP is to provide a comprehensive discussion identifying hazards that present potential risks to the residents, resources, and property within the State of Nebraska.

### 1.2.1 Applicability and Scope

Hazard mitigation planning is the process through which hazards are identified, likely impacts defined, mitigation goals set, and appropriate mitigation strategies determined, prioritized, and implemented. The outcome of this process is a comprehensive strategy to reduce or eliminate disaster damages and the long-term risks to human life and property, the environment, the economy and the state's resources.

The SHMP is a state-level, all-hazards plan that geographically covers the entire area within the state's boundaries (hereafter referred to as the "planning area"). For the purpose of this plan, each county and municipality within the state is considered to be a local jurisdiction.

The state of Nebraska includes four federally recognized tribes within the state's boundaries—the Santee Sioux Nation, Omaha Tribe of Nebraska, Ponca Tribe of Nebraska, and Winnebago Tribe of Nebraska. For the purpose of this plan, each tribal nation within the state is considered to be a tribal jurisdiction. Although each tribe typically assumes individual responsibility for its own mitigation program, some have participated in the planning process for LHMPs. The State of Nebraska stands ready to support and collaborate for these efforts, including serving as the administrative agency to implement federally funded mitigation projects, if requested.

### 1.2.2 Plan Adoption and Plan Expiration

The adoption of this plan completes a step of the planning process, in accordance with the requirements of the Disaster Mitigation Act of 2000. The purpose of formally adopting this plan is to secure buy-in from the State of Nebraska and its agencies and jurisdictions, raise awareness of the plan, and formalize the plan's implementation. The 2026 Nebraska SHMP was approved by FEMA Region 7 on *insert date here*, and confirmed plan expiration on *insert date here*.

The Governor's Authorized Representative (GAR), the Assistant Director of NEMA, has adopted the 2026 update of the Nebraska Hazard Mitigation Plan for implementation on [insert date here] and declared the document to be officially adopted by the state. A copy of the adoption is included at the beginning of this plan.

### 1.2.3 Compliance, Authorities, and Regulations

This plan was prepared in compliance with the requirements of the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (as amended by the Disaster Mitigation Act of 2000); all aspects of 44 Code of Federal Regulations (CFR); interim and final rules; presidential directives; Office of Management and Budget circulars; and other federal government guidelines that pertain to hazard mitigation planning

and activities. This plan also maintains Nebraska's eligibility for Public Assistance Categories C-G, Fire Management Assistance Grants (FMAG), Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), and Flood Mitigation Assistance (FMA), as well as the increased cost share for repetitive and severe repetitive loss structures.

The State of Nebraska pledges continued compliance with all applicable federal statutes and regulations during the periods for which it receives grant funding, pursuant to 44 CFR §13.11(c), and will amend its plans whenever necessary to reflect changes in state or federal laws and statutes as required in 44 CFR §13.11(d). The Disaster Mitigation Act of 2000 requires that the Nebraska State Hazard Mitigation Plan be revised every five years. This responsibility has been assigned to the Recovery Section of NEMA. NEMA acts as the lead agency in overall hazard mitigation planning for the State of Nebraska. Other state and federal agencies are engaged to provide input and guidance on mitigation planning and activities in the state.

#### 1.2.3.1 STATE AUTHORITIES

- Nebraska RRS 81-829.31 to 81-829.73 Emergency Management Act
- Title 67 – Nebraska Emergency Management Agency Chapter 7 – Standards and Requirements for Emergency Operations Plans
- Nebraska RRS 31-10 Floodplain Management Statute

#### 1.2.3.2 EMERGENCY MANAGEMENT ACCREDITATION PROGRAM

In addition to compliance with the associated federal/state hazard mitigation program, including the applicable sections of the Disaster Mitigation Act of 2000, this plan is in compliance with the mitigation standards for accreditation outlined in the Emergency Management Accreditation Program (EMAP).

### 1.2.4 Roles and Responsibilities

#### 1.2.4.1 FEDERAL

- 44 CFR, §201.3(b) – The key responsibilities of the Regional Administrator are to:
  - Oversee all FEMA related pre- and post-disaster hazard mitigation programs and activities.
  - Provide technical assistance and training to state, local, and Indian tribal governments regarding the mitigation planning process.
  - Review and approve all standard and enhanced state mitigation plans.
  - Review and approve all local mitigation plans, unless that authority has been delegated to the state in accordance with §201.6(d).
  - Conduct reviews, at least once every five years, of state mitigation activities, plans, and programs to ensure that mitigation commitments are fulfilled, and when necessary, take action, including recovery of funds or denial of future funds, if mitigation commitments are not fulfilled.

- 44 CFR, §201.4(d) and 201.6(d)(2) – The regional review will be completed within 45 days after receipt from the state, whenever possible.

#### 1.2.4.2 STATE

- 44 CFR, §201.3(c) – The key responsibilities of the state are to coordinate all state and local activities relating to hazard evaluation and mitigation and to:
  - Prepare and submit to FEMA a standard state mitigation plan following the criteria established in §201.4 as a condition of receiving non-emergency Stafford Act assistance and FEMA mitigation grants. In addition, a state may choose to address severe repetitive loss properties in their plan as identified in §201.4(c)(3)(v) to receive the reduced cost share for the Flood Mitigation Assistance (FMA) and Severe Repetitive Loss (SRL) Programs, pursuant to §79.44(c)(2) of this chapter.
  - In order to be considered for the 20% HMG funding, prepare and submit an enhanced state mitigation plan in accordance with §201.5, which must be reviewed and updated, if necessary, every 5 years from the date of the approval of the previous plan.
  - At a minimum, review and update the standard state mitigation plan every 5 years from the date of the approval of the previous plan in order to continue program eligibility.
  - Make available the use of up to the 7% of HMGP funding for planning in accordance with §206.434.
  - Provide technical assistance and training to local governments to assist them in applying for HMGP planning grants, and in developing local mitigation plans.
  - For managing states that have been approved under the criteria established by FEMA pursuant to 42 U.S.C. 5170c(c), review and approve local mitigation plans in accordance with §201.6(d).
- 44 CFR, §201.4(a) – Plan requirement. States must have an approved standard state mitigation plan meeting the requirements of this section as a condition of receiving non-emergency Stafford Act Assistance and FEMA mitigation grants. Emergency assistance provided under 42 U.S.C. 5170a, 5170b, 5173, 5174, 5177, 5179, 5180, 5182, 5183, 5184, 5192 will not be affected. Mitigation planning grants provided through the Pre-Disaster Mitigation (PDM) program, authorized under section 203 of the Stafford Act, 42 U.S.C. 5133, will also continue to be available. The mitigation plan is the demonstration of the state's commitment to reduce risks from natural hazards and serves as a guide for state decision makers as they commit resources to reducing the effects of natural hazards.
- 44 CFR, §201.4(c)(7) Assurances. The plan must include assurances that the state will comply with all applicable federal statutes and regulations in effect with respect to the periods for which it receives grant funding, including 2 CFR, parts 200 and 3002.
- 44 CFR, §201.4(d) Review and updates. The plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities and resubmitted for approval to the appropriate Regional Administrator every five years.

- 44 CFR, §201.6(d)(1) The state is responsible for the initial review and coordination of local mitigation plans prior to sending the plan to the appropriate FEMA Regional Office for formal review and approval.
- 44 CFR, §201.7(d)(1) Indian tribal governments interested in the option of being a subgrantee under the state must submit the tribal mitigation plan to the State Hazard Mitigation Officer for review and coordination. The state is responsible for the initial review and coordination prior to sending the plan to the appropriate FEMA Regional Office for formal review and approval.

## 1.3 Organization of the Plan

In addition to meeting the requirements of the 2022 State Mitigation Planning Policy Guide and DMA 2000, this plan is organized to clearly identify key components of the plan.

- Base Plan
  - Plan Adoption, Distribution, and Record of Changes
  - Executive Summary
  - Section 1: Introduction and State Profile
    - States the purpose of the plan; provides the state's assurances of compliance with all applicable state and federal statutes and regulations.
  - Section 2: Planning Process
    - Explains the planning process including how the plan was revised, who was involved and the integration of other planning efforts.
  - Section 3: Hazard Identification and Risk Assessment
    - Features the overall risk assessment along with the hazard profiles outlining the type and location of hazards that can affect Nebraska and their estimated impacts. This serves as the factual basis for the state's mitigation strategy and priorities.
  - Section 4: Mitigation Strategy
    - Identifies overall goals and specific actions to reduce long-term vulnerability from the hazards profiled in Section 3. It describes how actions are prioritized, potential funding sources, and how local mitigation strategies align with the state strategy. It also includes information regarding status of actions from the previous mitigation plan.
  - Section 5: Local Coordination and Mitigation Capabilities
    - Evaluates the state's laws, policies, programs, administrative and technical capabilities, and funding sources available to mitigate the hazard identified in the risk assessment. It identifies potential obstacles or challenges for implementing solutions and changes that have occurred since the prior plan was approved. Evaluates how the state's hazard management policies, programs, and capabilities support local and tribal governments through training, technical assistance and funding, where available. This section also

describes the state's roles in funding, developing, coordinating, and approving local mitigation plans.

- Section 6: Plan Maintenance
  - Outlines the method and schedule that NEMA and the Governor's Task Force for Disaster Recovery (GTFDR) use to monitor, evaluate, and update the plan. It also outlines how the state reviews progress on implementing the mitigation plan.
- Appendices
  - Planning Process Documentation
  - Local Mitigation Plan Evaluation
  - Public Power Districts Evaluation

# 1.4 Nebraska Overview

## 1.4.1 Introduction

Nebraska lies in the central Great Plains, bordering Wyoming and Colorado to the west, Iowa and Missouri to the east, South Dakota to the north, and Kansas to the south. It is the 16th largest state by area, with 76,816.5 square miles in land area and 530.8 square miles in water area, totaling 77,347.3 square miles.[1] With a population of just over 2 million, it is the 38th most population state and also the 8th least densely populated.

Nebraska became a territory in 1854 and was admitted as the 37th state on March 1, 1867, with nearly its present boundaries. The state includes 93 counties. Nebraska is nicknamed the Cornhusker State, because agriculture, particularly corn production, is such an integral importance to the state. Many historic routes passed through Nebraska, including the Oregon trail traveled by many emigrants on their way to Oregon territory, the route of the Lewis and Clark Expedition and the Transcontinental Railroad. The North and South Platte rivers traverse the center of the state, the Niobrara River runs across the northern part of the state, and the Missouri River along the eastern border.

[1] United States Census Bureau, "Nebraska."https://data.census.gov/profile/Octavia_village,_Nebraska?g=040XX00US31.

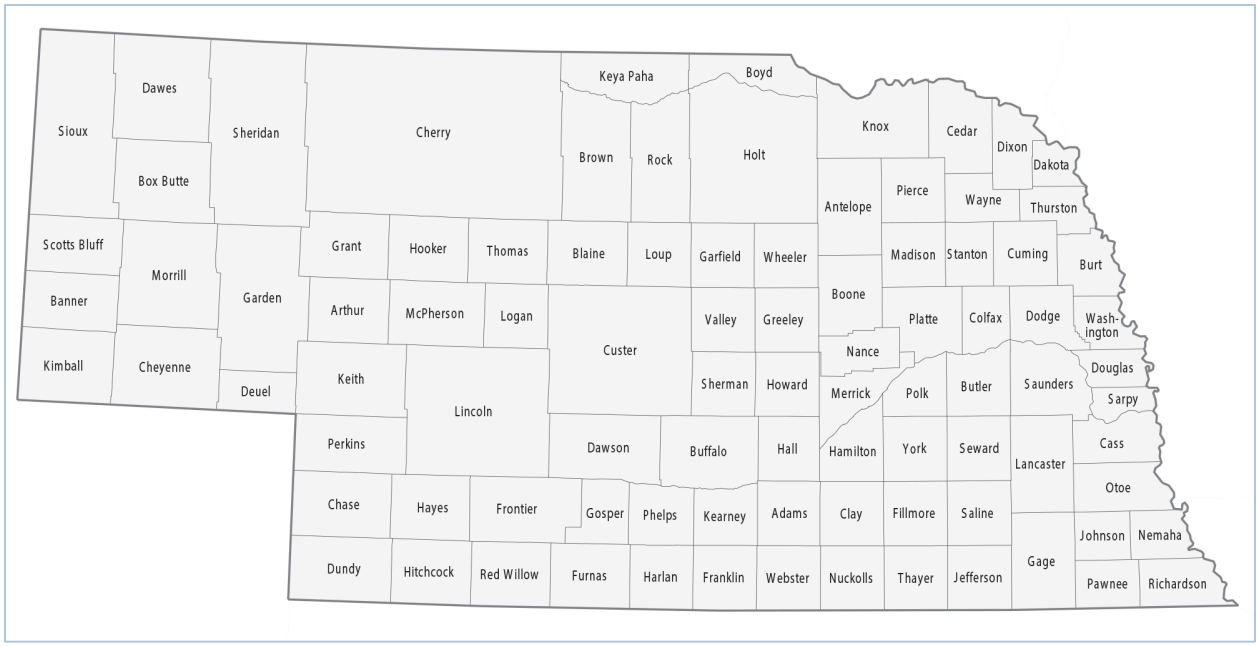



**Figure 1: Map of Nebraska County Boundaries**[2]

## 1.4.2 Topography

Nebraska covers approximately 76,816 square miles of land. The highest point at is 5,426 feet above sea level at Panorama Point near the Colorado and Wyoming Borders, and the lowest is 840 feet at the Missouri River. Much of the area in between is rolling prairie and relatively flat river valleys.

Nebraska is known for its rolling hills and prairies. The eastern portion of the state is part of the Dissected Till Plains land region, formed by glacial scouring and deposition from the Laurentide Ice Sheet, and left with gently rolling hills. The Great Plains make up most of western Nebraska, which includes several smaller regions including the Sand Hills and prairies.

[2] GISGeography, "Nebraska County Map." https://gisgeography.com/nebraska-county-map/.

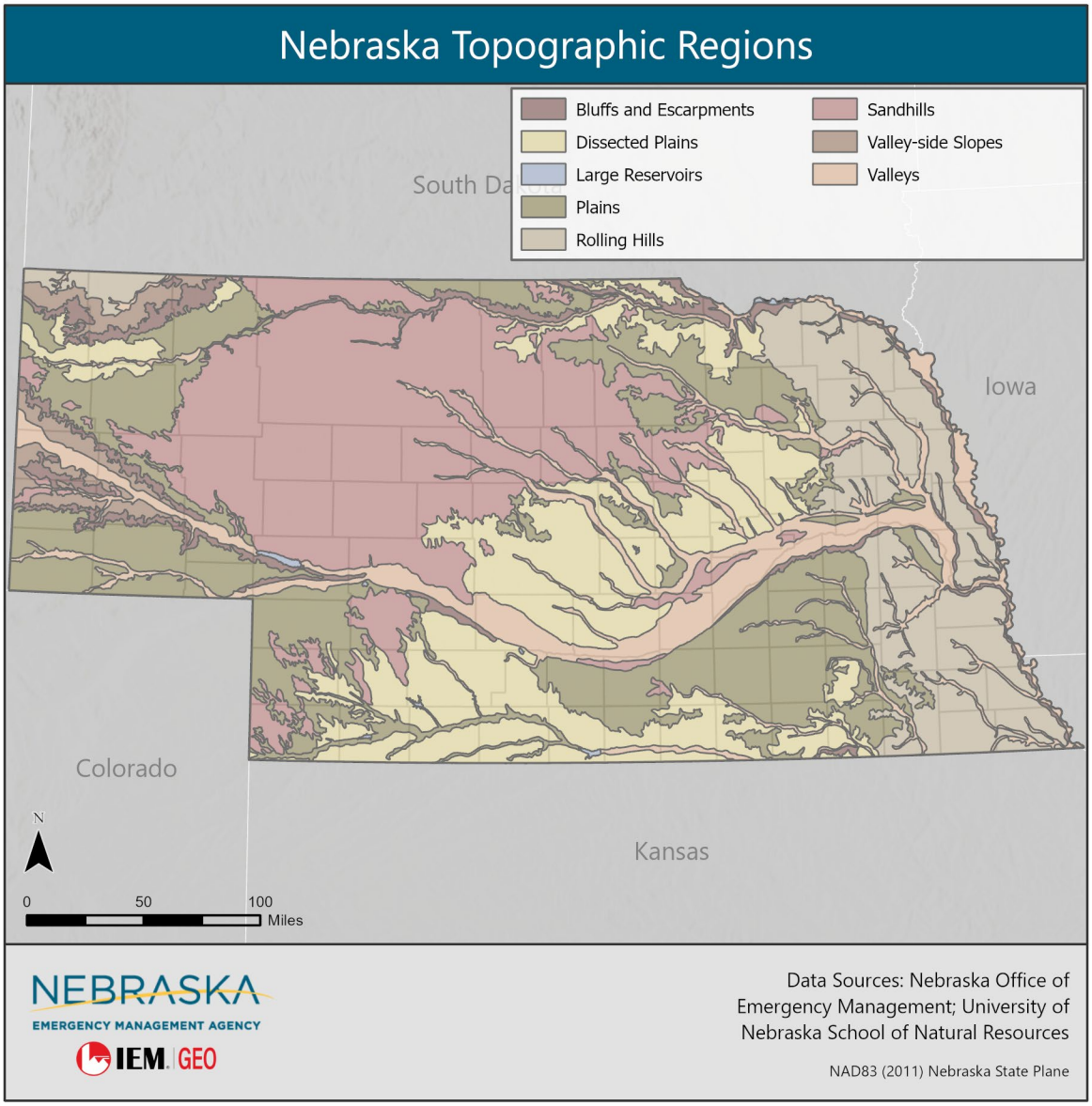



**Figure 2: Nebraska Topographic Regions**

## 1.4.3 Natural Environment

Nebraska is a crossroads of a variety of environmental factors. Prairies are a dominant landscape, with distinct ecological regions that support a variety of wildlife. Several significant rivers pass through Nebraska, including the Platte and Missouri Rivers and the Niobrara National Scenic River. These support natural ecosystems and also provide recreation opportunities. Nebraska also contains many wetlands that support a diverse wildlife population and improve water quality and reduce flooding to the

population. The eastern edge and other portions of the state contain woodlands, which also support wildlife and provide recreation opportunities.[3]

Thousands of miles of rivers flow through Nebraska, and the state is bordered by the Missouri River to the east. The Platte joins the Missouri river south of the city of Omaha. Cities and farmlands near these waterways are at risk to flooding from extreme precipitation events and snowmelt.

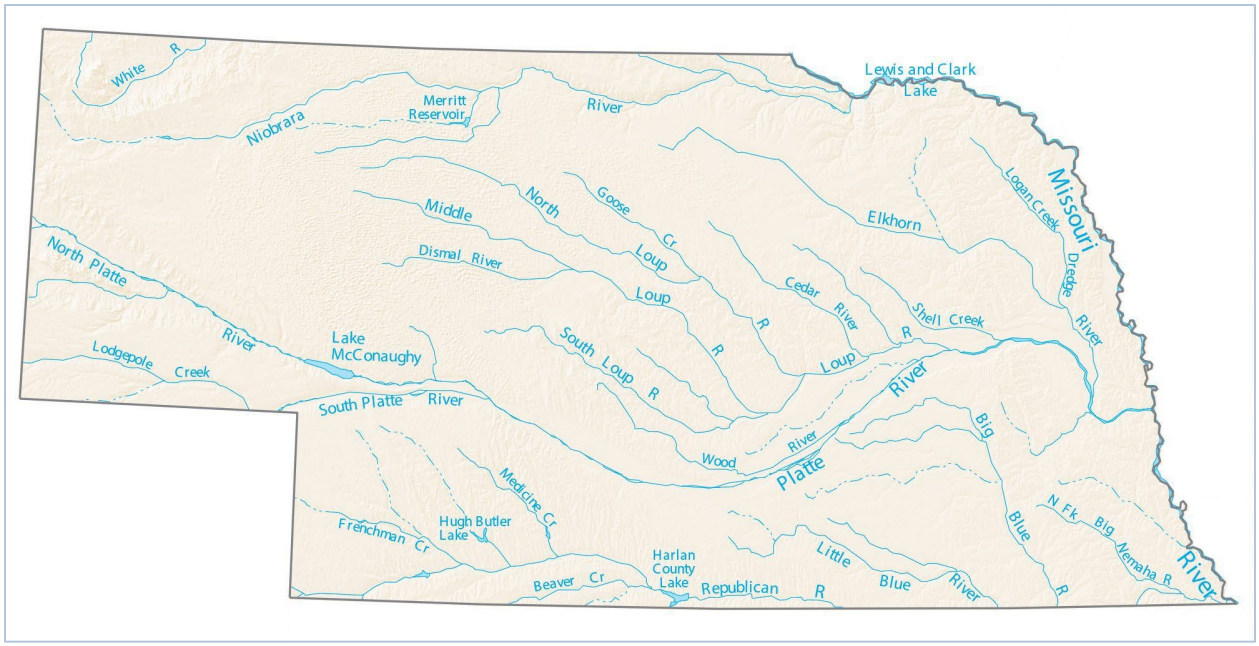



**Figure 3: Nebraska Lakes and Rivers**[4]

## 1.4.4 Ecosystems

Nebraska has four distinct ecological regions with unique landscapes, vegetation, birds, and other wildlife. Prairie landscapes have moderate temperatures, moderate rainfall, and few trees.

- **Mixed-grass prairie**: Located in central Nebraska, this is a transition zone between Tallgrass and Shortgrass Prairie ecoregions and contains both short and tall prairie grasses.
- **Sandhills**: One of the largest remaining intact native grassland ecosystems in the United States, overlaying extensive sand dunes. Extensive aquifer systems have formed below the dunes.
- **Shortgrass prairie**: This ecosystem features diverse topography and prairie grasses in western Nebraska.
- **Tallgrass prairie**: This ecosystem consists of rolling hills in eastern Nebraska and includes stretches of the Missouri and Platte Rivers.[5]

[3] https://outdoornebraska.gov/learn/nebraska-habitat/.
[4] GISGeography, "Nebraska Lakes and Rivers Map." https://gisgeography.com/nebraska-lakes-rivers-map/.
[5] https://outdoornebraska.gov/learn/nebraska-habitat/prairies/.

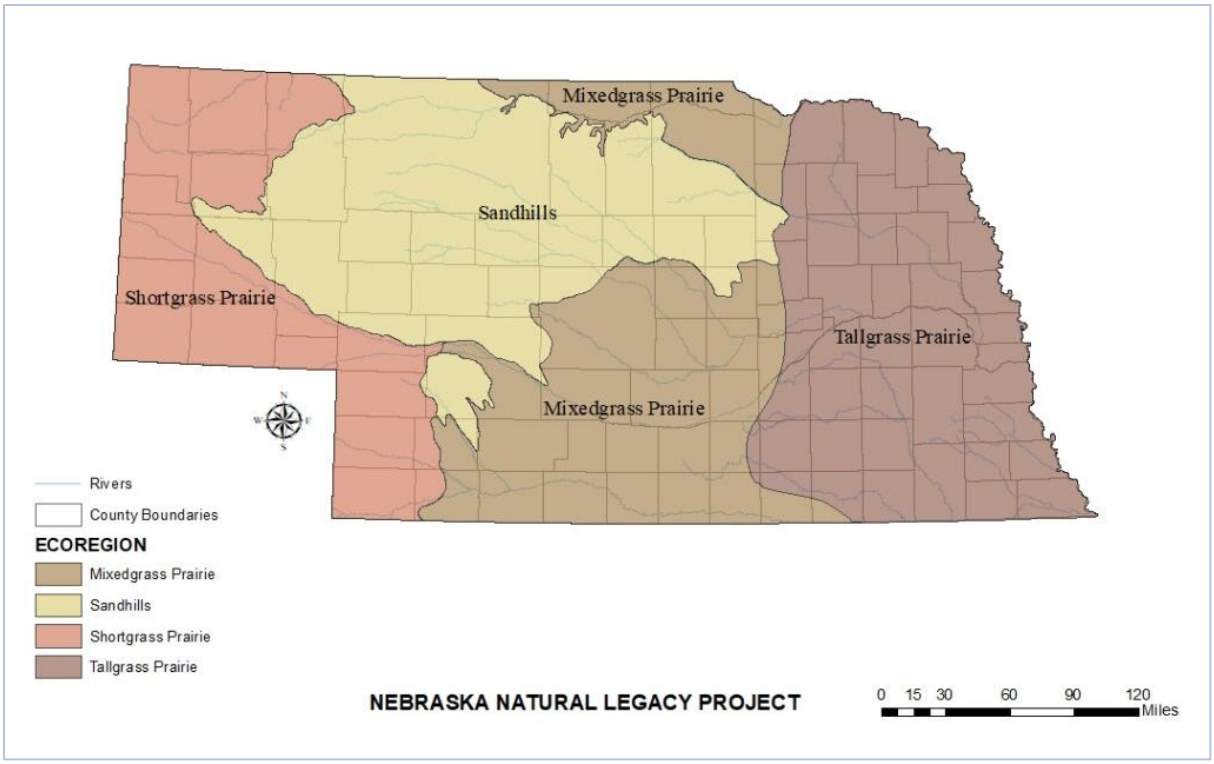



**Figure 4: Map of Nebraska Ecoregions**[6]

[6] Nebraska Game and Parks, "Ecological Regions." https://outdoornebraska.gov/learn/watch-wildlife/watchable-wildlife-guides/.

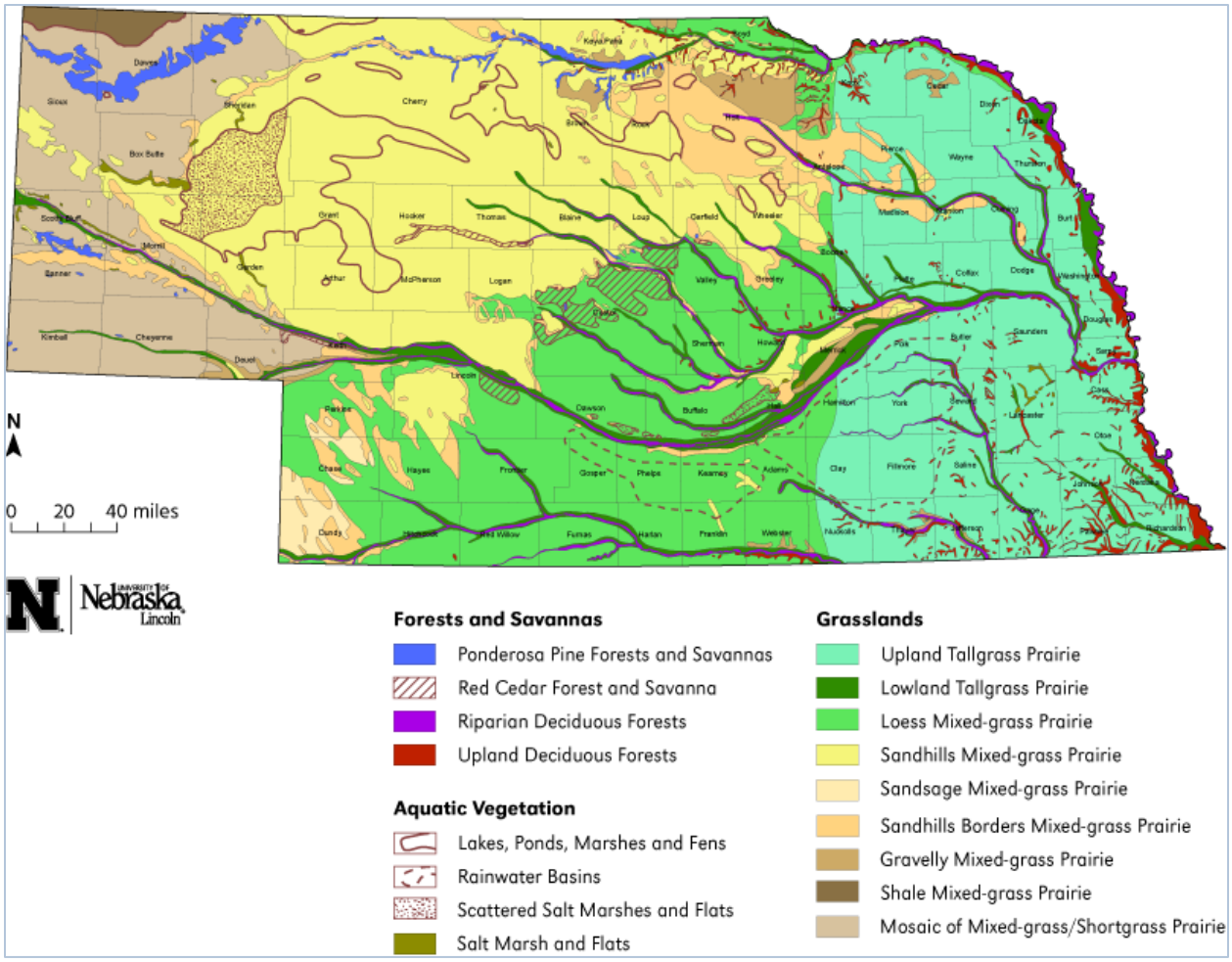



**Figure 5: Nebraska Native Vegetation**[7]

## 1.4.5 Climate

Based on the Köppen climate classification, Nebraska has a humid continental climate (Dfa) in the east and semi-arid climate (BSk) in the west (see Figure 6).[8] The eastern area averages more than 34 inches of precipitation annually, and the western panhandle averages just over 17 inches. Most of the precipitation falls in the spring and summer months. Precipitation can be highly variable from year to year ranging from a statewide average of low of 13.4 inches to a high of 35.5 inches. Nebraska experiences periodic droughts that can last for several years.

Its location in the interior of the country places it far from the moderating effects of oceans, so the temperatures vary widely between seasons. The average temperature is 25.1˚F in January and 74.4˚F in July. Snow and ice storms are common during the winter months. Western Nebraska has a greater than

[7] https://museum.unl.edu/collections/botany/nebraska_vegetation.html.
[8] https://koeppen-geiger.vu-wien.ac.at/usa.htm.

50% probability of a blizzard occurring in any given year. Convective storms in the summer months can produce flash flooding, severe thunderstorms, hail, damaging winds, and tornadoes.

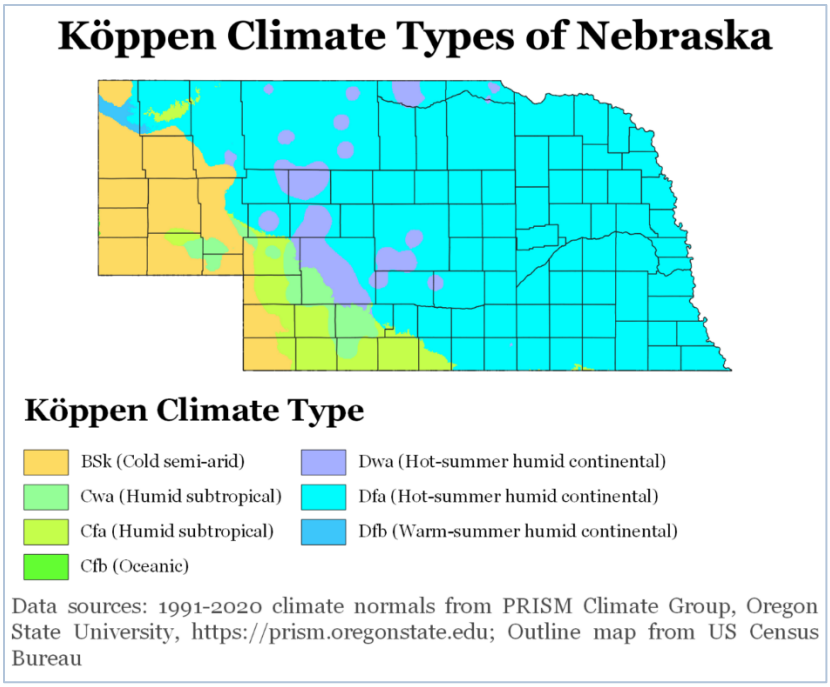



**Figure 6: Köppen Climate Types of Nebraska**[9]

## 1.4.6 Demographics

### 1.4.6.1 POPULATION

The population of Nebraska at the 2020 Census was 1,961,504. The 2024 ACS estimates the population has grown to 2,005,465, which indicates a growth rate of 2.2%.[10] Figure 7 shows areas that have experienced growth or decline since 2010.

[9] Wikipedia. https://en.wikipedia.org/wiki/Nebraska.
[10] https://www.census.gov/quickfacts/fact/table/NE,US#.

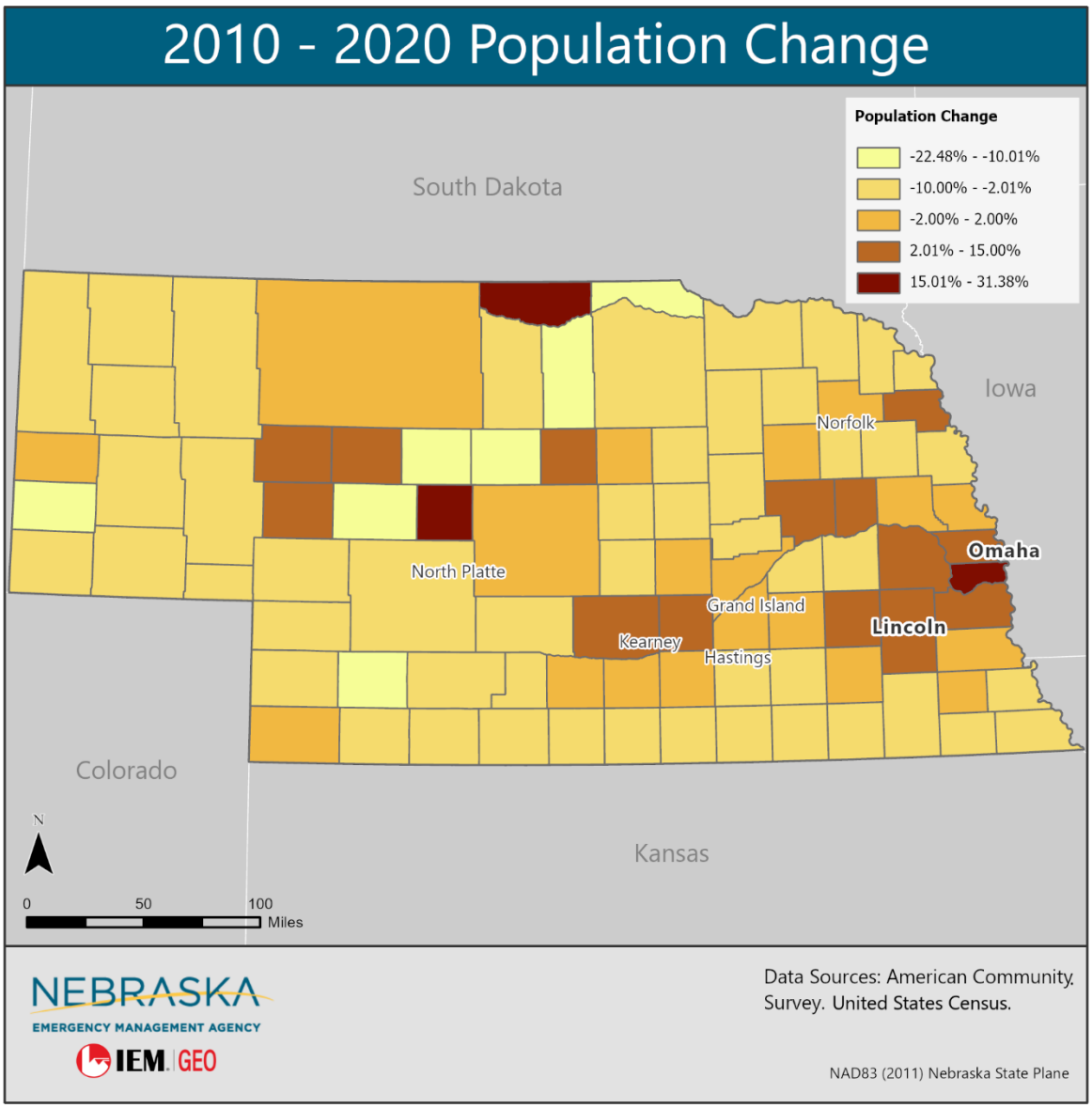



**Figure 7: Change in Population 2010–2020**

The two major cities, Omaha and Lincoln, account for almost 40% of the state's population, with 486,051 and 291,082 people, respectively, in 2020. The population density is an average of 25.5 people per square mile, which highlights the state's mostly rural distribution. As shown in Figure 8, many counties have an average density of less than 10 people per square mile.

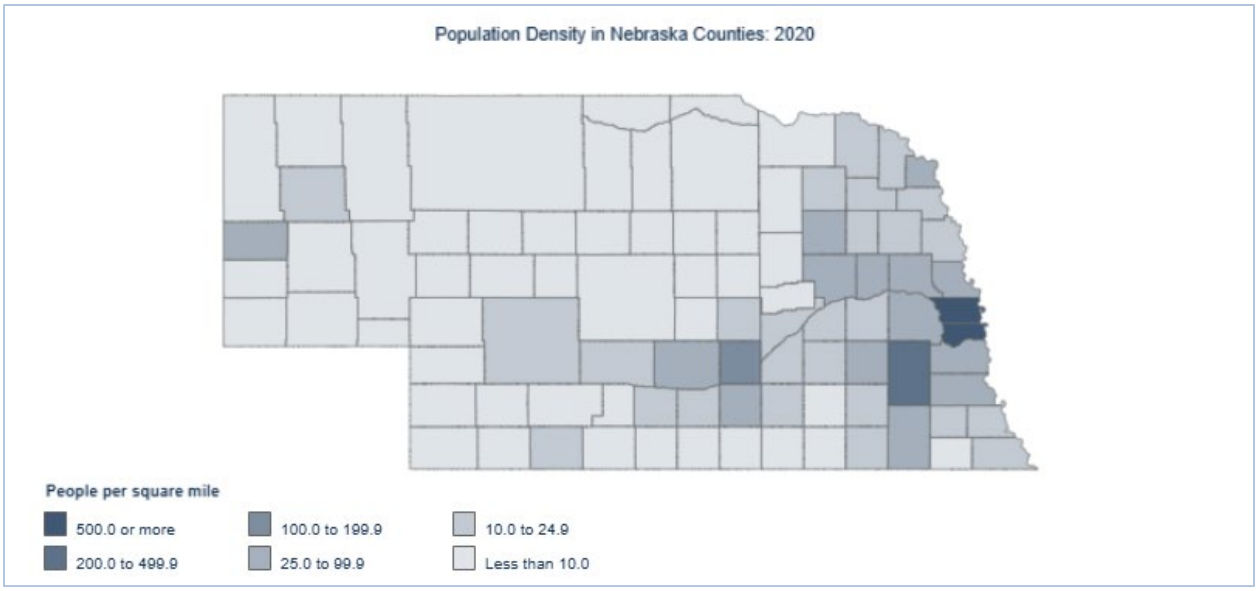



**Figure 8: Nebraska Population Density**[11]

### 1.4.6.2 AGE VULNERABILITY

Median age is 37.4, which can be compared to the median U.S. age of 39.2. Of the total population, 17.2% is over age 65, and 24.3% are under the age of 18. Figure 9 shows the distribution of the population between male and female for all age categories. Age is an important consideration when identifying potential impacts of hazards. Older individuals are often less mobile, are more likely to suffer from chronic illness, and are less able to adapt to disruptions to living environment. Young children depend on others to care for their needs and may not be able to communicate those needs adequately during a disaster.

[11] https://www.census.gov/library/stories/state-by-state/nebraska-population-change-between-census-decade.html.

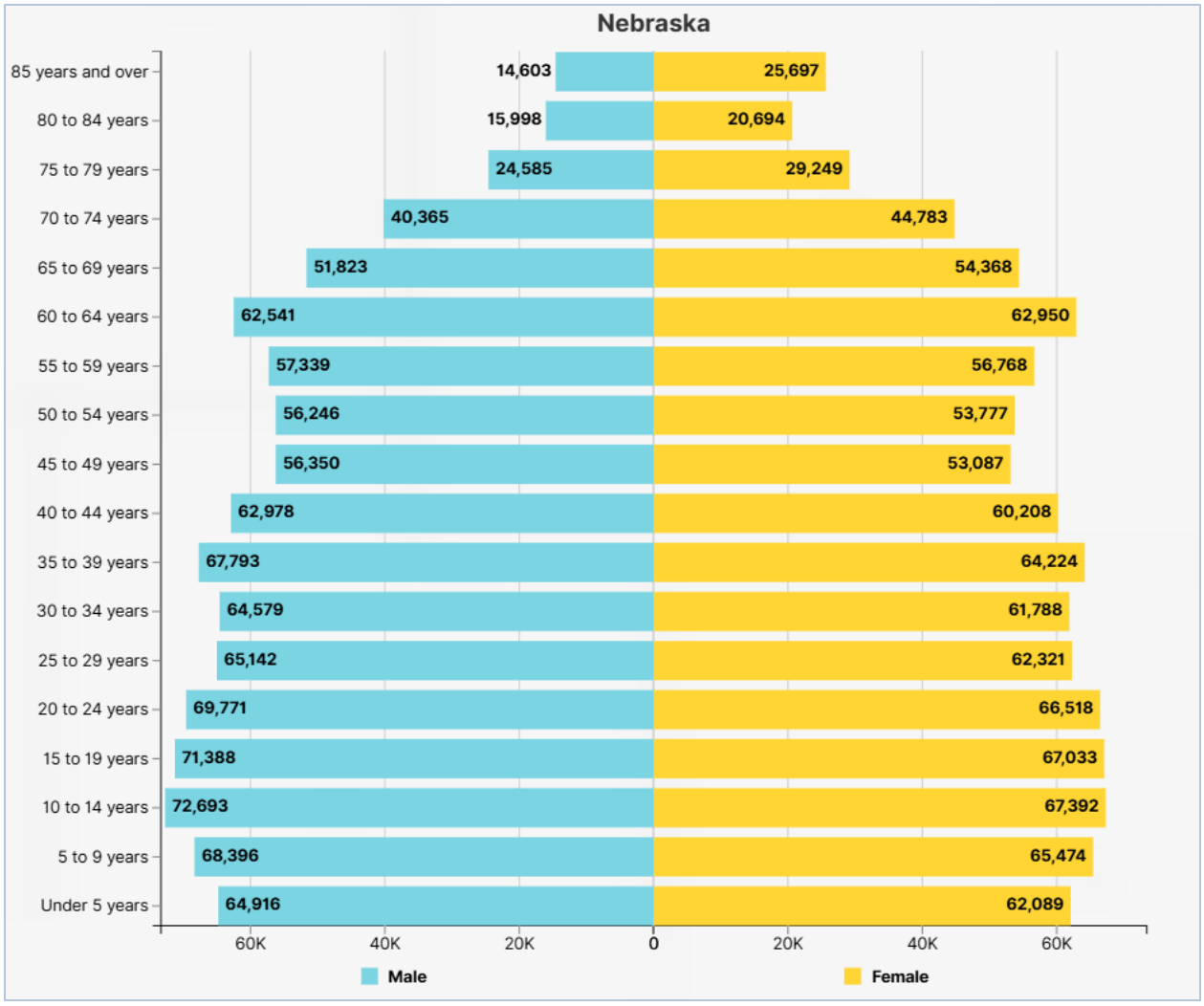



**Figure 9: Nebraska Population Pyramid 2024 (Census Version)**[12]

### 1.4.6.3 DISABILITY

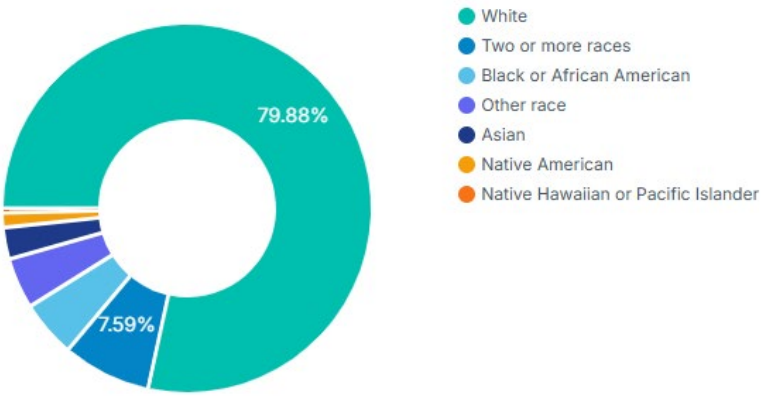
In Nebraska, 8.4% of the population under age 65 reports having a disability. This is slightly lower than the national average of 9.1%. Disability data comes from the American Community Survey and includes difficulty with vision, hearing, movement, cognitive function, self-care, and independent living. Any of these disabilities makes individuals more vulnerable to impacts from disasters.

### 1.4.6.4 RACE, LANGUAGE, AND CULTURAL CONSIDERATIONS

Language barriers may create unique challenges when a catastrophe occurs, especially if those in hazardous areas must evacuate. Such barriers may also limit the ability of those for whom English is not their native language to participate in the mitigation and planning processes. In Nebraska, 12.5% of the population speaks a language other than English at home. Spanish is the next most common, followed by

[12] https://data.census.gov/profile/Nebraska?g=040XX00US31#populations-and-people.

Asian and Pacific Islander, and other Indo-European languages. The portion of the population that is foreign born is 7.7%. Consideration should be given to address language and other cultural barriers that may impede some members of the community having access to information regarding hazards and mitigation. The racial composition of Nebraska is shown in Figure 10.




| RACE | POPULATION | PERCENTAGE (OF TOTAL) |
|---|---|---|
| White | 1,570,393 | 79.88% |
| Two or more races | 149,163 | 7.59% |
| Black or African American | 93,595 | 4.76% |
| Other race | 83,156 | 4.23% |
| Asian | 49,107 | 2.5% |
| Native American | 19,581 | 1% |
| Native Hawaiian or Pacific Islander | 933 | 0.05% |

**Figure 10: Population by Race**[13]

### 1.4.6.5 EDUCATION

In Nebraska, educational attainment showcases a commitment to learning among residents. Approximately 25.39% are high school graduates, highlighting the importance placed on foundational education. Additionally, 22.16% have some college education, indicating a proactive approach to enhancing skills in a competitive job market.

Higher education attainment is notable, with 21.83% holding a bachelor's degree, 11.64% achieving a graduate degree, and 10.85% obtaining an associate's degree. This demonstrates a strong pursuit of advanced education and its role in career advancement. Overall, Nebraska's educational landscape

[13] World Population Review, "Nebraska." https://worldpopulationreview.com/states/nebraska.

reflects a dedicated population that values education, contributing to workforce development and community growth, essential for adapting to economic changes.

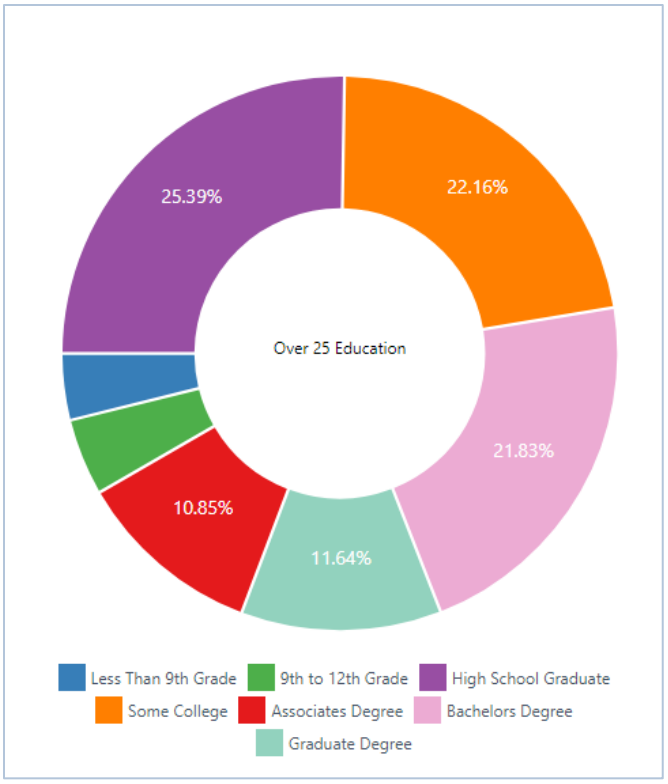



**Figure 11: Education Attainment in Nebraska**[14]

### 1.4.6.6 INCOME

The median household income for Nebraska is $74,985, compared with $78,538 nationally. The percentage of persons in poverty is 10.5% in Nebraska, slightly lower than the national percentage of 11.1%.[15]

### 1.4.6.7 SOCIAL VULNERABILITY

Data from the U.S. Census Bureau is used by the Centers for Disease Control and Prevention (CDC) to develop the Social Vulnerability Index, which measures 16 demographic indicators that may contribute to individual's resilience to stressors like disasters. The indicators measure four categories: socioeconomic status, household characteristics, racial and ethnic minority status, and housing type and transportation. These characteristics give insight to stakeholders to meet community needs. For example, older homes may be less resilient to severe weather, and areas with fewer transportation options may face difficulties if residents need to evacuate their homes and businesses. Figure 12 shows the social vulnerability for Nebraska by census tracts, while Figure 13 shows social vulnerability by County.

[14] https://worldpopulationreview.com/states/nebraska.
[15] U.S. Census Bureau Quick Facts. https://www.census.gov/quickfacts/fact/table/US,NE/PST045224.

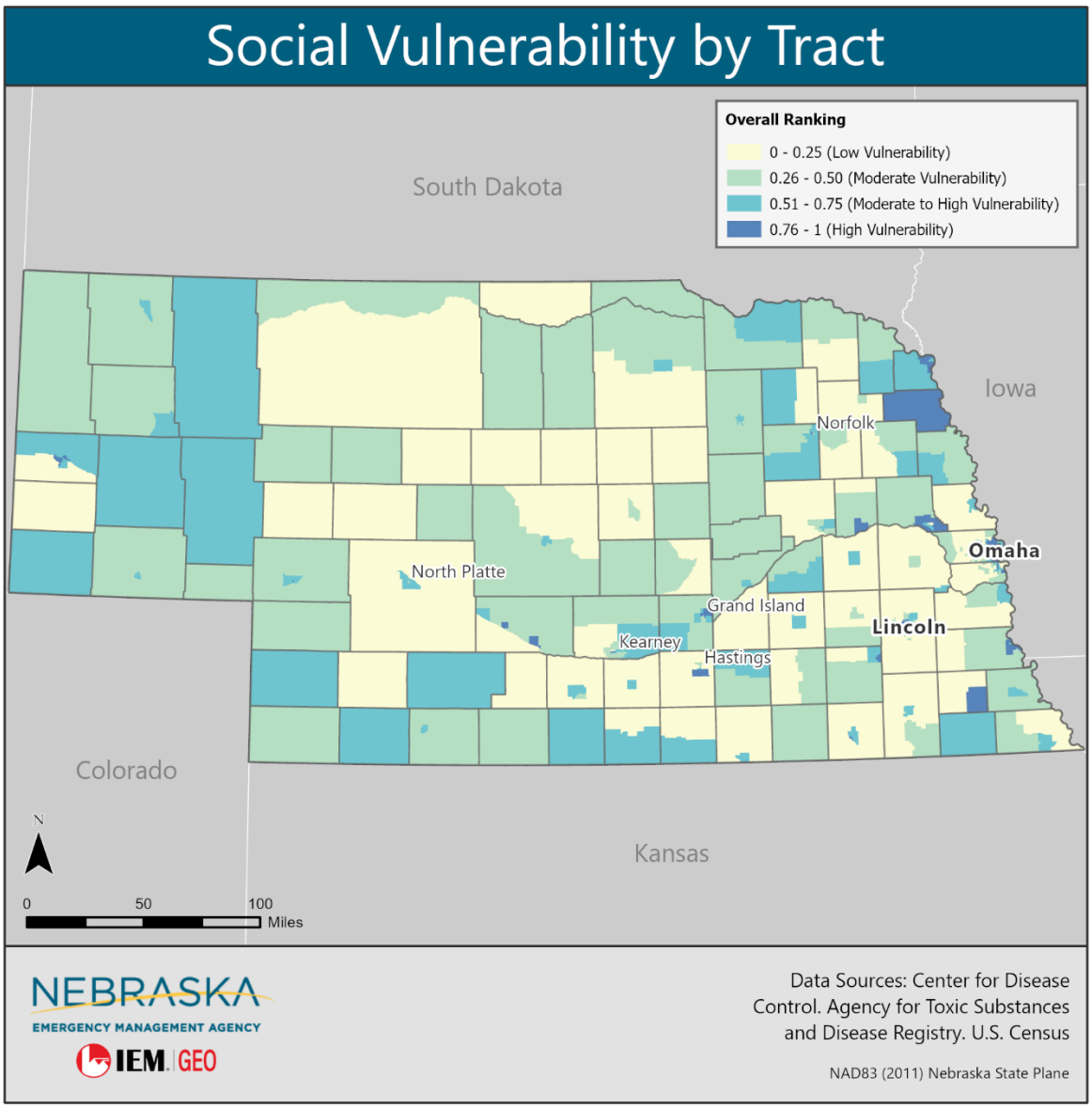



**Figure 12: Nebraska Overall Social Vulnerability**

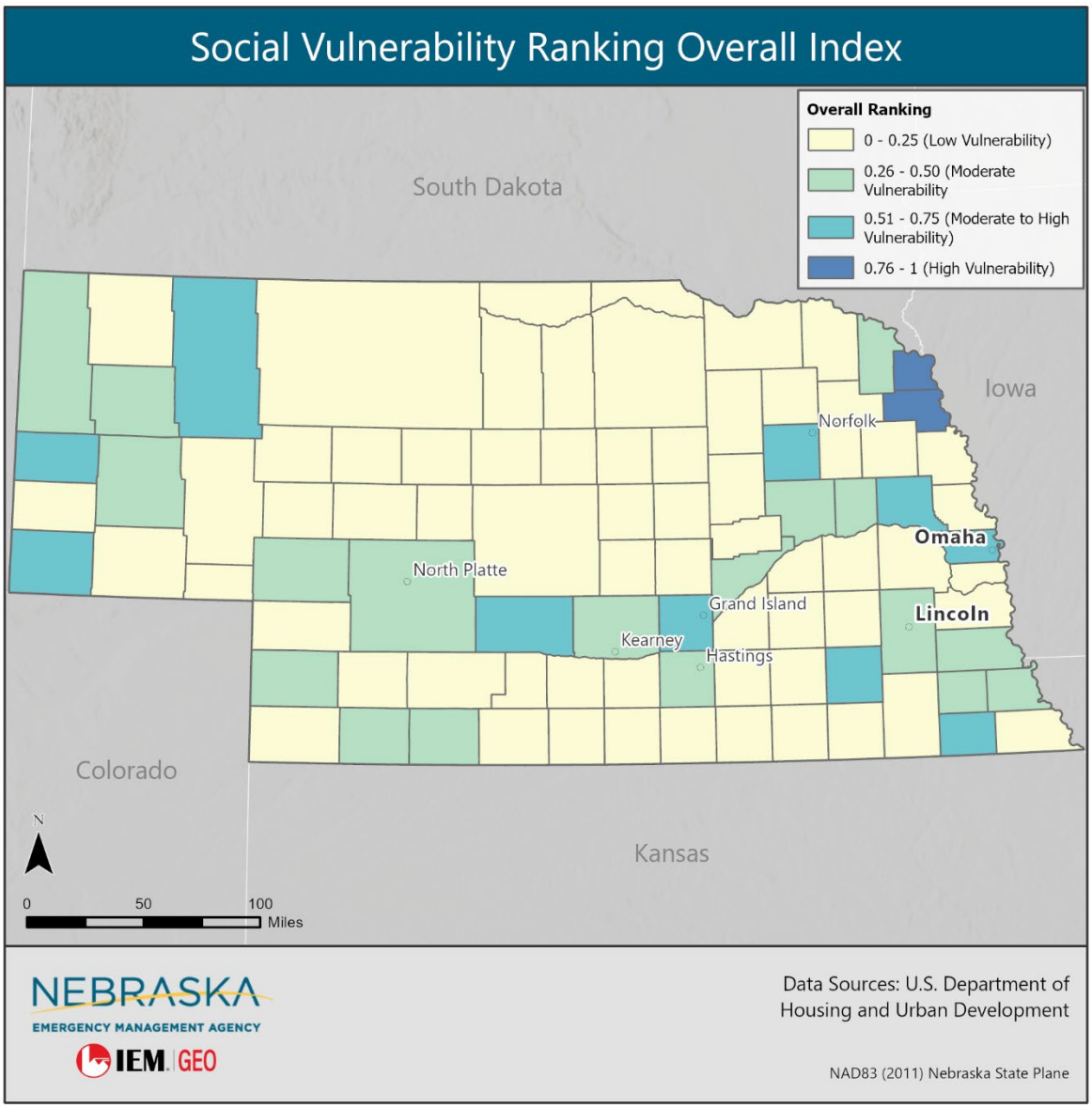



**Figure 13: Social Vulnerability Index Overall County Ranking**

### 1.4.6.8 COMMUNITY DISASTER RESILIENCE ZONES

In Nebraska, FEMA Community Disaster Resilience Zones (CDRZ) are designed to target disadvantaged communities most at risk to natural hazards. Designated zones provide a geographic focus for financial and technical assistance from public and private organizations to support entities as they plan and implement resilience and mitigation projects to help reduce risks associated with natural hazards. This initiative helps communities seeking to strengthen their resilience by working across all levels of government and with a wide range of public and private sector partners. These zones aim to enhance

resilience by directing public and private resources to these areas.[16] Figure 14 shows the location of three CDRZ designations in the Nebraska, in portions of Knox, Furnas, and Webster Counties.

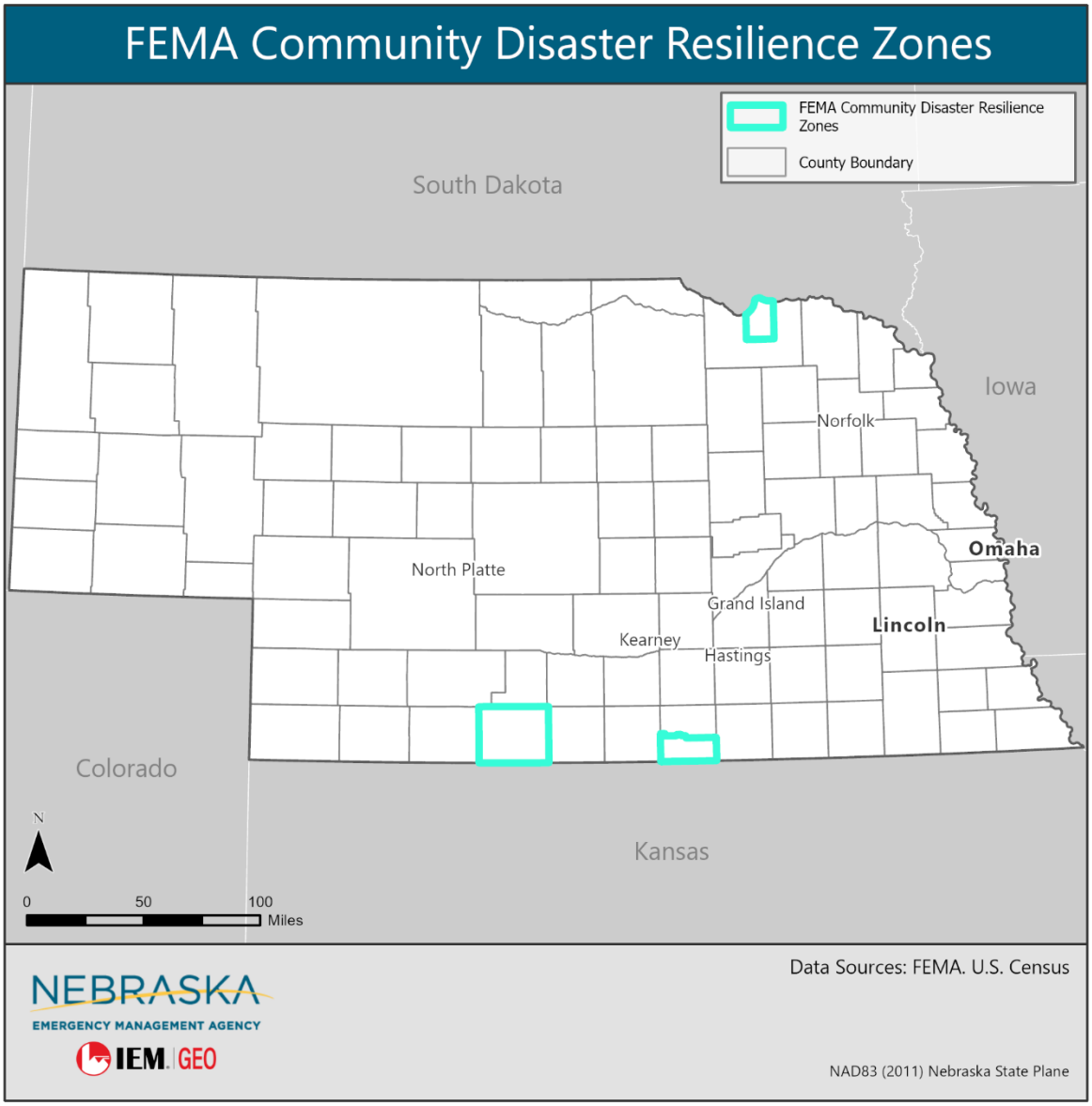



**Figure 14: Nebraska Community Disaster Resilience Zones**

[16] FEMA, "Community Disaster Resilience Zones Fact Sheet," January 2025. https://www.fema.gov/sites/default/files/documents/fema_cdrz_private-partnerships-fact-sheet.pdf.

## 1.4.7 Transportation Networks and Infrastructure

Nebraska's existing transportation system is the result of over 150 years of continuous effort to develop, improve, and maintain high quality, reliable infrastructure to support the movement of goods and people. The state's interdependent network of highways, streets, airports, rail lines, transit systems, and bicycle and pedestrian networks provide the means by which Nebraska's residents and visitors access the state's cities, towns, villages, recreational areas, and the markets beyond.[17]

### 1.4.7.1 NEBRASKA TRANSPORTATION SYSTEM

This transportation system is owned, operated, and maintained by a series of state and local governmental agencies as well as private enterprise. Generally, this is focused on the infrastructure under the control of the Nebraska Department of Transportation (NDOT). NDOT is responsible for the operations, maintenance, and improvements to the state's interstate and highway network. The highway network throughout the state can be classified into the following categories: interstate system, national highway system, U.S. routes, state highways, and local roads. The state highway system carries 63.5% of all vehicle miles traveled in the state. Municipal streets carry 25.6% and the county road network carries 10.9%. Also, about 83.7% of heavy truck travel in Nebraska is on the state highway system.[18]

The NE 511 site is mobile-responsive and includes features such as incident and roadwork info, winter road conditions, weather radar, favorite cameras, and searchable list views of road reports, cameras, and weather stations.[19]

There are 59 rural systems and nearly 90 organizations that provide specialized transportation for the elderly and disabled. In fiscal year 2017, the rural public transportation systems traveled nearly 3 million miles to transport passengers to medical appointments, employment, shopping, and other destinations.[20]

### 1.4.7.2 NEBRASKA'S NATIONAL HIGHWAY SYSTEM

The National Highway System (NHS) is a network of roadways providing critical access and mobility to support the nation's economy and defense. This network is designated by the U.S. Department of Transportation (USDOT) in cooperation with state departments of transportation, local officials, and metropolitan planning organizations (MPOs). The most recent composition of the NHS within Nebraska is shown in Figure 15. Insets of the Lincoln and Omaha metropolitan areas are shown in Figure 16.[21]

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[17] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Introduction," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.
[18] Ibid.
[19] Nebraska Department of Transportation, "Nebraska 511," 2025. https://dot.nebraska.gov/travel/511/.
[20] Nebraska Department of Transportation, "About Us," 2025. https://dot.nebraska.gov/about/.
[21] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Roadways-Transportation System Mileage," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.

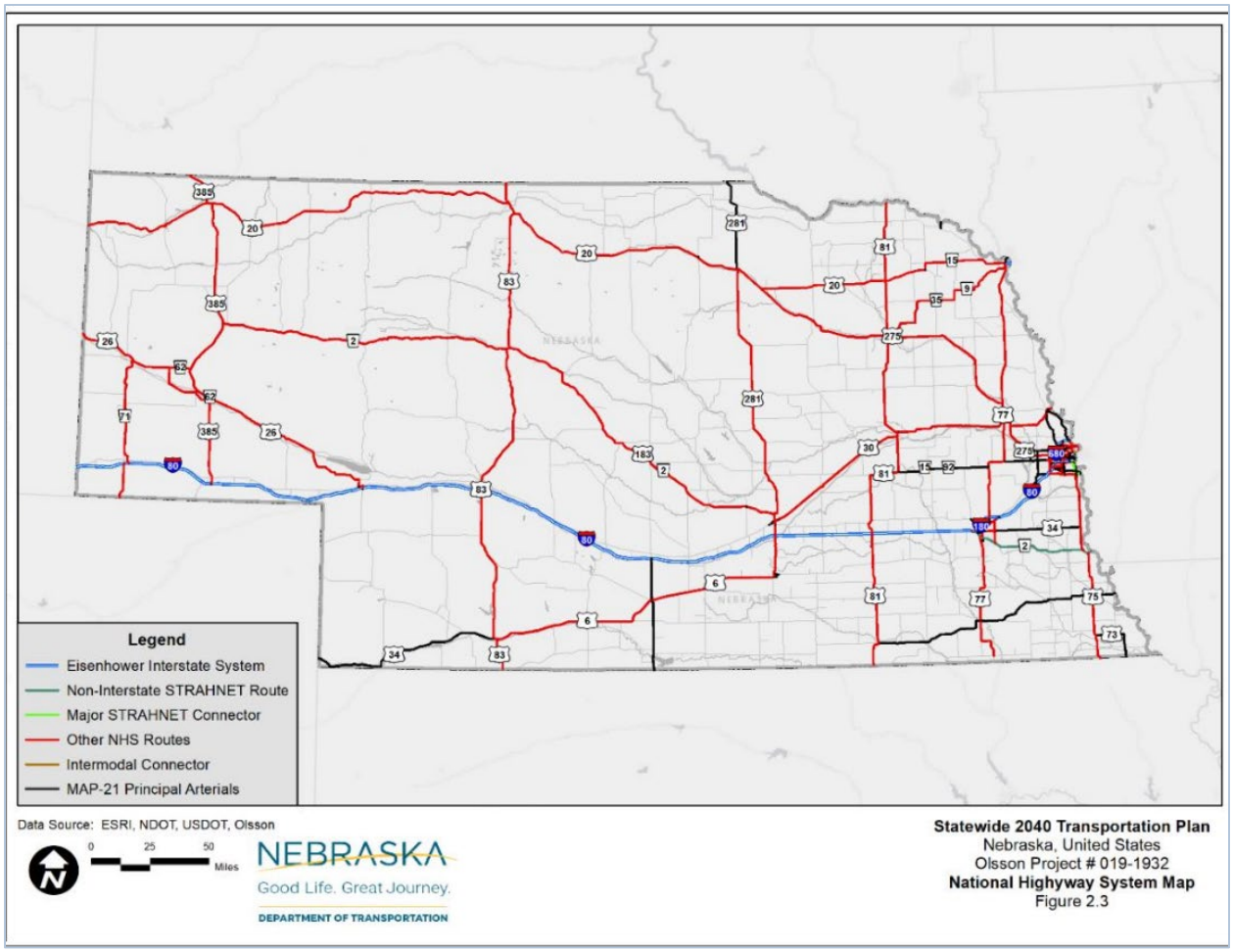



**Figure 15: National Highway System Map**[22]

[22] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Roadways-Transportation System Mileage-National Highway System Map," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.

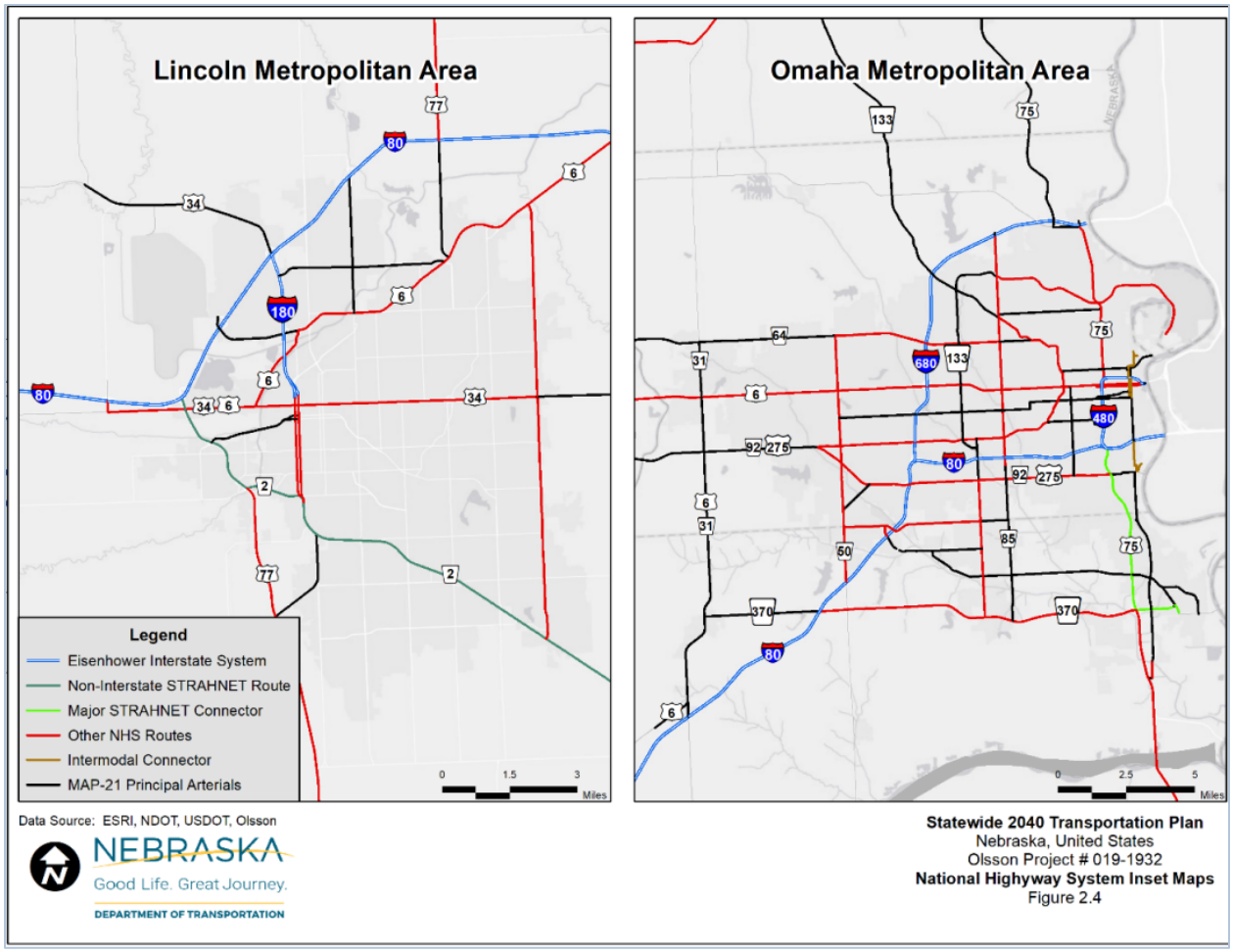



**Figure 16: National Highway System Inset Maps**[23]

Nebraska's NHS system is predominantly composed of interstate and state highway routes, though several urban principal arterials, owned by local jurisdictions (cities, counties, etc.), are included in the system. The NHS includes the following subsystems (specific routes may be designated to more than one subsystem):

- **Eisenhower Interstate System:** Originally designated by the Federal Aid Highway Act of 1956 and completed in 1992, this network of high speed, high-capacity roads serve long distance and freight uses throughout the United States.
- **Other Principal Arterials:** Roadways in urban and rural areas provide access to other arterials, major ports, airports, public transportation facilities, or other intermodal transportation facilities.
- **Strategic Highway Network (STRAHNET):** These highways are important to the strategic defense policy in providing access, continuity, and emergency capabilities for defense purposes.

[23] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Roadways-Transportation System Mileage-National Highway System Inset Maps," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.

- **Major Strategic Highway Network Connectors:** These highways provide access between major military installations and highways that compose the STRAHNET.
- **Intermodal Connectors:** These highways provide access between major intermodal facilities and the above four subsystems of the NHS.[24]

Nebraska's state highway system is composed of the Interstate System, U.S. Routes, Nebraska state highways, and Nebraska state links. The NDOT system (including the Interstate System, U.S. Route System, and state highway system) is shown in Figure 17.

[24] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Roadways-Transportation System Mileage," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.

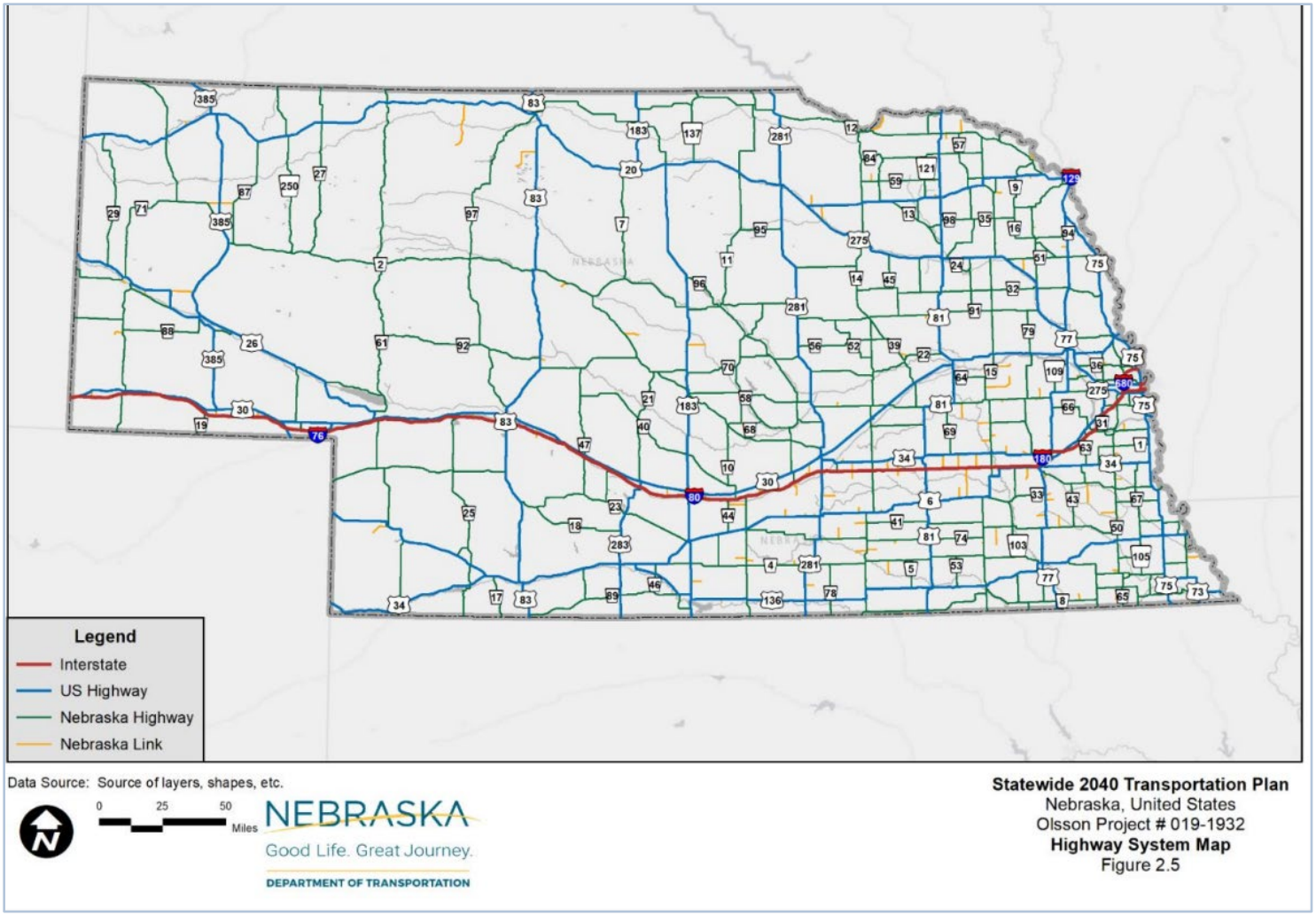



**Figure 17: Nebraska Highway System Map**[25]

[25] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Roadways-NHS Map," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.

Currently, 483 centerline miles of interstate highways traverse Nebraska. Most of this mileage is on I-80. I-80 connects New Jersey to California, traversing 11 states in all. Of these 11 states, Nebraska contains the largest portion of I-80's centerline miles. Nebraska was the first state in the nation to complete its mainline interstate in 1974.[26]

In all, two primary and three branch interstates exist in Nebraska:

- **Interstate 76:** Connects Denver, Colorado to I-80 near Brule, Nebraska
- **Interstate 80:** Traverses the length of Nebraska from Pine Bluffs, Wyoming, to Council Bluffs, Iowa
- **Interstate 180:** Connects downtown Lincoln, Nebraska, to I-80
- **Interstate 480:** Connects downtown Omaha, Nebraska, to Council Bluffs, Iowa; I-80 and I-29 (in Iowa)
- **Interstate 680:** Serves as a northern beltway connecting I-80 in Omaha, Nebraska, to I-29 near Crescent, Iowa

Nebraska is served by 10 primary U.S. Routes. These two-digit routes are numbered based upon the primary direction of travel. Odd-numbered routes predominantly move north–south while even-numbered routes travel east–west. Similar to the interstate system, several branch or spur routes also traverse the state. U.S. Routes in Nebraska are shown in Table 3.[27]

**Table 3: U.S. Routes in Nebraska[28]**

| Route | From | To | Details |
|---|---|---|---|
| **U.S. 6** | Holyoke, CO | Council Bluffs, IA | Generally paralleling I-80 (south of the interstate) |
| **U.S. 20** | WY border near Harrison, NE | IA border near South Sioux City, NE | Principal east–west route north of I-80 or U.S. 30 |
| **U.S. 26** | Torrington, WY | Ogallala, NE | Parallels the North Platte River |
| **U.S. 30** | Pine Bluffs, WY | IA border near Blair, NE | Generally paralleling I-80 (north of the interstate) |
| **U.S. 34** | Haigler, CO | I-29 east of La Platte, NE | Primary route |
| **U.S. 73** | KS border near Falls City, NE | U.S. 75 in Dawson, NE | Primary route |
| **U.S. 75** | KS border near Dawson, NE | I-129 near South Sioux City, NE | Primary route |

[26] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Roadways-Transportation System Mileage," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.
[27] Ibid.
[28] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Roadways-US Routes in Nebraska Table," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf

| Route | From | To | Details |
|---|---|---|---|
| **U.S. 77** | KS border near Wymore, NE | IA border near South Sioux City, NE | Primary route |
| **U.S. 81** | KS border in Chester, NE | SD border north of Valentine, NE | Primary route |
| **U.S. 136** | MO border near Brownville, NE | U.S. 6/34 near Edison, NE | Primary route |
| **U.S. 138** | CO border near Julesburg, CO | Big Springs, NE | Spur route |
| **U.S. 159** | KS border south of Falls City, NE | MO border near Rulo, NE | Spur route |
| **U.S. 275** | US 20/281 in O'Neil, NE | IA border in Omaha, NE | Branch route |
| **U.S. 281** | KS border south of Red Cloud, NE | SD border near Spencer, NE | Branch route |
| **U.S. 283** | KS border south of Bever City, NE | U.S. 30 in Lexington, NE | Spur route |
| **U.S. 385** | CO border near Julesburg, CO | SD border north of Chadron, NE | Branch route |

#### 1.4.7.3 HIGHWAY SAFETY

When it comes to improving safety, the NDOT uses a strategic approach that is based on available safety information for its Highway Safety Improvement Program (HSIP). In accordance with the Federal Highway Administration (FHWA) final safety performance measure (PM1), NDOT's HSIP established safety performance measure requirements for the purposes of carrying out the HSIP and also to assess fatalities and serious injuries on all public roads. Figure 18 illustrates Nebraska HSIP measures with 2023 baseline data and 2025 Projections.[29]

Safety performance measure targets:

1. Number of fatalities
2. Rate of fatalities per 100 million vehicle miles traveled
3. Number of serious injuries
4. Rate of serious injuries per 100 million vehicle miles traveled
5. Number of non-motorized fatalities and non-motorized serious injuries[30]

[29] Nebraska Department of Transportation, "Statewide Transportation Improvement Program Fiscal Years 2025–2028-Nebraska HSIP Performance Measures," 2025. https://dot.nebraska.gov/projects/publications/stip/.
[30] Ibid.

| NEBRASKA HSIP PERFORMANCE MEASURES - Baseline 2023 Target Year 2025 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| HSIP PERFORMANCE MEASURE | Projected 2021-2025 Actual Avg | Projected 2021-2025 Rolling Avg. | 2023 Yearend Actual Values | 2025 Yearend Actual Values | 5-Year Rolling Average | | | 2025 Target Achieved? | Better Than Baseline? | Met or Made Significant Progress? |
| | | | | | NDOT Target 2020-2025 (A) | Actual 2020-2025 (B) | Baseline 2018-2023 (C) | | | |
| Number of Fatalities | 222.2 | 235.4 | 227.0 | | 233.0 * | | 234.6 | | | |
| Fatality Rate | 1.006 | 1.122 | 1.054 | | 1.120 * | | 1.120 | | | |
| Number of Serious Injuries | 1,147.2 | 1,154.7 | 1,260.0 | | 1,155.0 | | 1,275.2 | | | |
| Serious Injury Rate | 5.178 | 5.482 | 5.850 | | 5.487 | | 6.084 | | | |
| Number of Non-motorized Fatalities and Serious Injuries | 106.0 | 96.0 | 128.0 | | 106.0 | | 111.6 | | | |

Figure 18: Nebraska Highway Safety Improvement Program Measures-Baseline 2023 and 2025 Projections[31]

*Selected targets based on a reduction of the current increasing trend by 1%.

[31] Nebraska Department of Transportation, "Statewide Transportation Improvement Program Fiscal Years 2025–2028-Nebraska HSIP Performance Measures," 2025. https://dot.nebraska.gov/media/a1vb31cv/amendment-2.pdf.

### 1.4.7.4 BRIDGES

There are over 15,000 bridges in Nebraska. Most of Nebraska's bridges are owned by counties (over 11,000). NDOT owns and maintains 3,523 of the bridges in Nebraska (23.4%).[32] Figure 19 is the NHS Bridges Inset Map of Lincoln Metropolitan and Omaha Metropolitan Area. Figure 20 is the NHS Bridges Map. The blue dots indicate the locations of NHS bridges across the state.

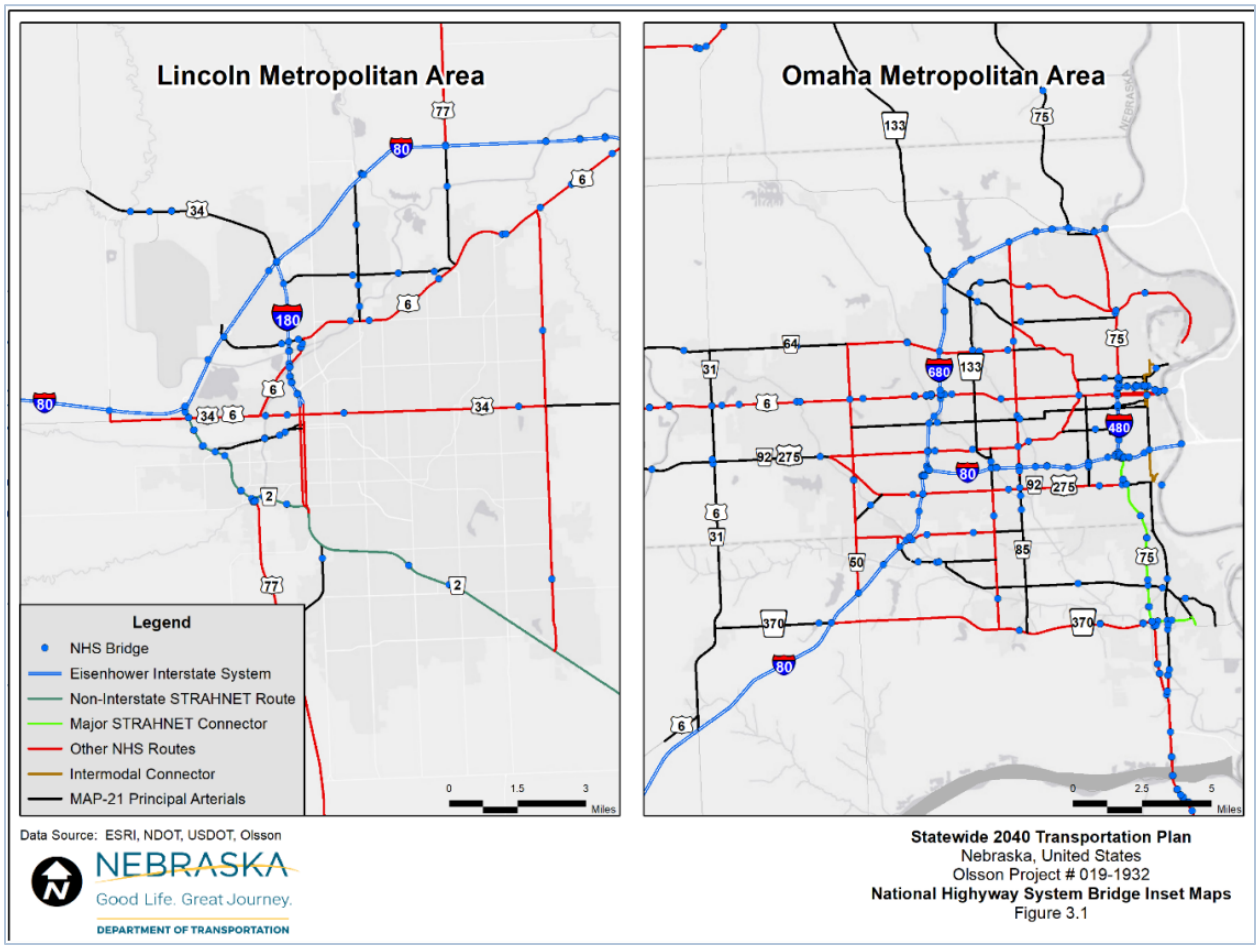



**Figure 19: Nebraska Highway Safety Bridges Inset Map[33]**

[32] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Bridges," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.
[33] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-NHS Bridges Inset Map," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.

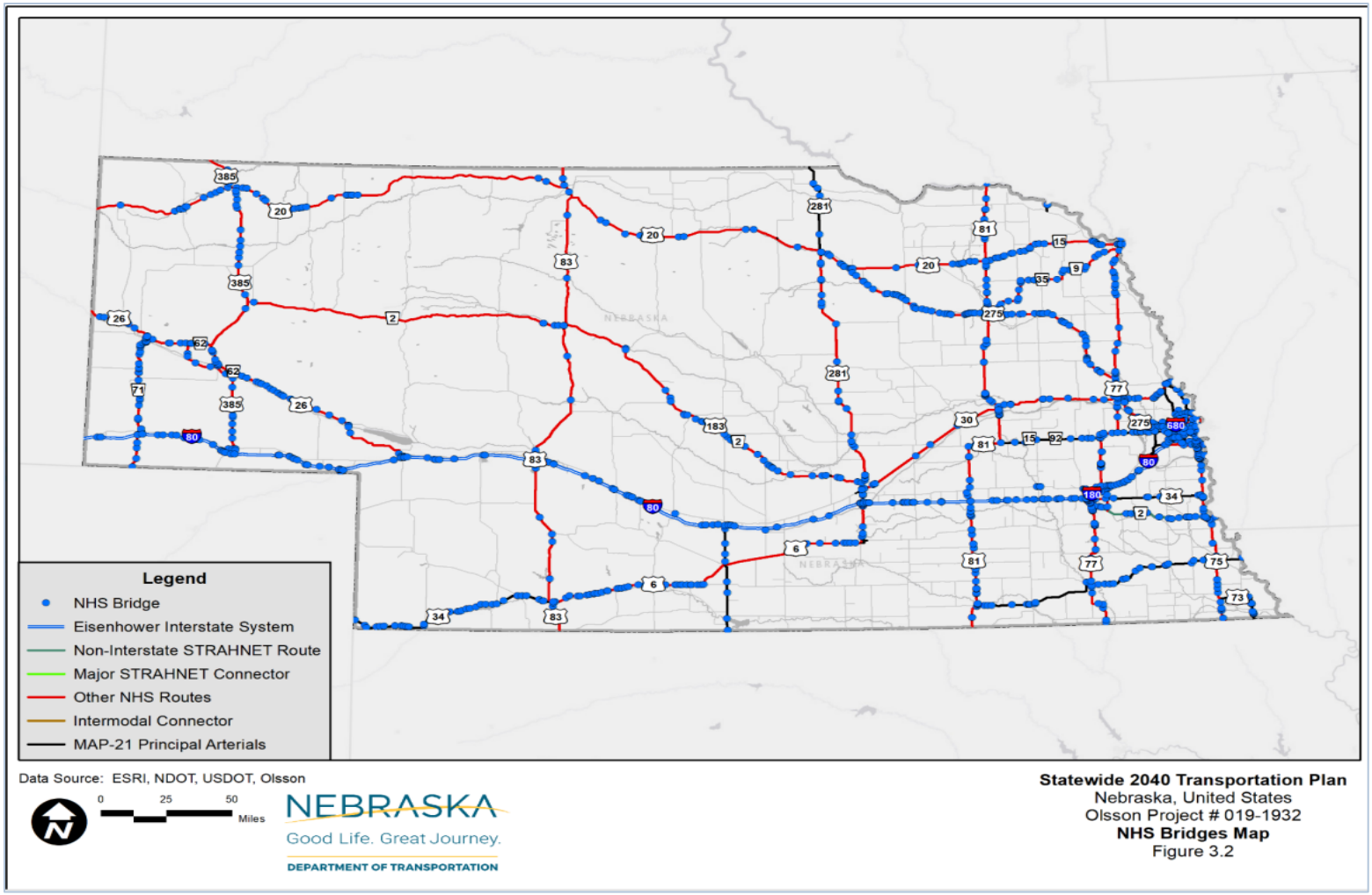



**Figure 20: Nebraska Highway Safety Bridge Map**[34]

[34] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Bridges," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.

### 1.4.7.5 FREIGHT NETWORKS

Nebraska's freight transportation system consists of the freight rail network, river ports along the Missouri River, intermodal transload facilities, and air freight facilities at the state's commercial airports.[35]

#### FREIGHT RAIL NETWORK

Nebraska's freight rail network is owned by a series of private companies. Of the seven Class I railroads, three have holdings in Nebraska: Burlington Northern Santa Fe (BNSF) and Union Pacific (UP) own the majority of the existing rail network and Kansas City Southern (KCS) holds trackage rights in the state, allowing its operation on track owned by other organizations. Additionally, UP is headquartered in Omaha, Nebraska.[36] Figure 21 is the NDOT Freight Rail Map.

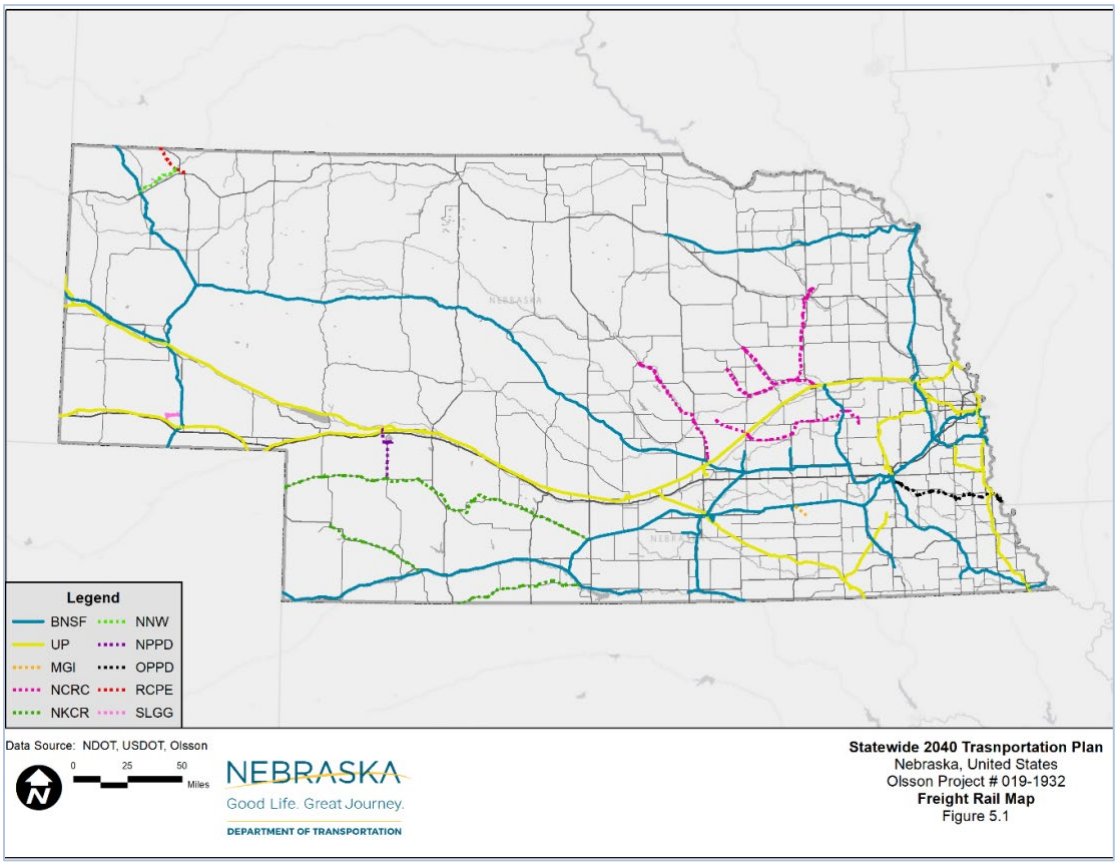



**Figure 21: Nebraska Department of Transportation Rail Map**[37]

[35] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Freight," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.
[36] Ibid.
[37] Ibid.

### 1.4.7.6 PORTS AND WATERWAYS

#### WATER FREIGHT

Riverine freight is typically transported in bulk through a system of barges and tugs. Suitable freight for river travel is bulky, heavy, and not time sensitive. Examples of freight cargo suitable for riverine transport include bulk grain, aggregate, and fertilizer.[38]

#### MISSOURI RIVER FREIGHT

Nebraska's only navigable waterway for freight traffic is the Missouri River, which serves as the eastern border of the state. The Missouri river was channelized during the middle of the 20th century, providing a 300-foot-wide channel at a depth of 9 feet from Kansas City, Missouri, to the Sioux City, Iowa. The Missouri is not channelized and is not navigable to barge traffic upstream of Sioux City, Iowa.[39]

In contrast to other navigable waterways in the United States, the Missouri River lacks weirs and locks to aid in navigation. The Missouri's flow is also regulated by the U.S. Army Corps of Engineers (USACE) using the dam at Gavin's Point and other facilities upstream.[40]

Freight volumes on the Missouri River are much lower than those seen on the Mississippi River. Typical annual freight transported on the Missouri River in recent years is comparable with daily freight volumes on the Mississippi. Challenges to the channel, a shortage of tugs, persistent flooding, and environmental concerns contribute to the low level of freight transported on the Missouri.[41] Figure 22 is the NDOT Water Freight Map. The blue line indicates the navigable waterways of the Missouri River in the state. The yellow triangle indicates the location of state port facilities along the Missouri River.

[38] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Ports and Waterways," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.
[39] Ibid.
[40] Ibid.
[41] Ibid.

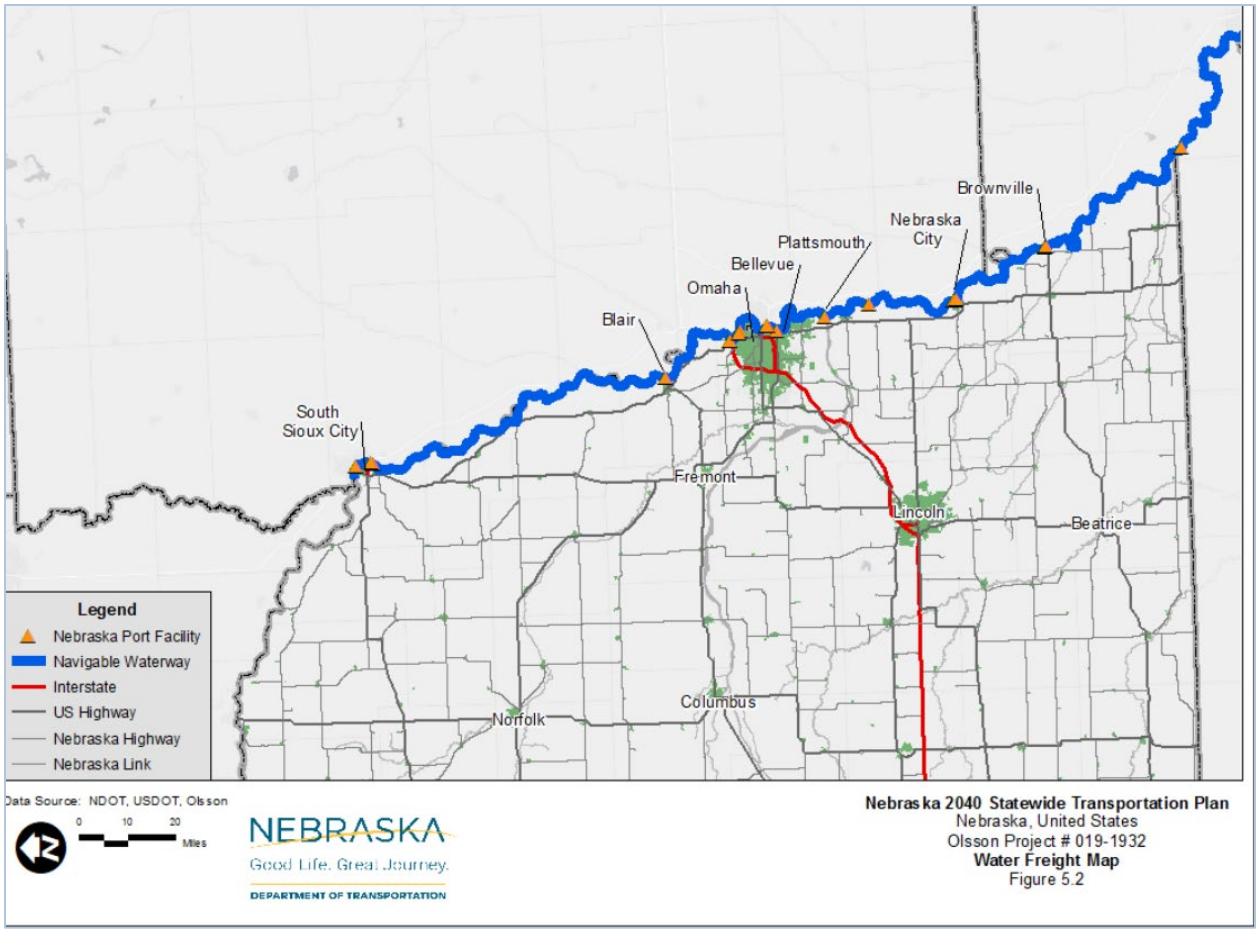



**Figure 22: Water Freight Map**[42]

### 1.4.7.7 AIR CARGO NETWORK

Air Cargo Network Nebraska's public airport network serves as a distribution point for air freight throughout the state. Detailed air cargo statistics are generally not publicly available for non-primary class airports. In Nebraska, the Federal Aviation Administration (FAA) reports annual air cargo statistics for Omaha's Eppley Field (the only qualifying airport).[43] Figure 23 is the NDOT Air Cargo Airport Map. The blue airplane logo indicates location of air cargo airports statewide.

[42] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Ports and Waterways-Water Freight Map," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.
[43] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Air Cargo Network," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.

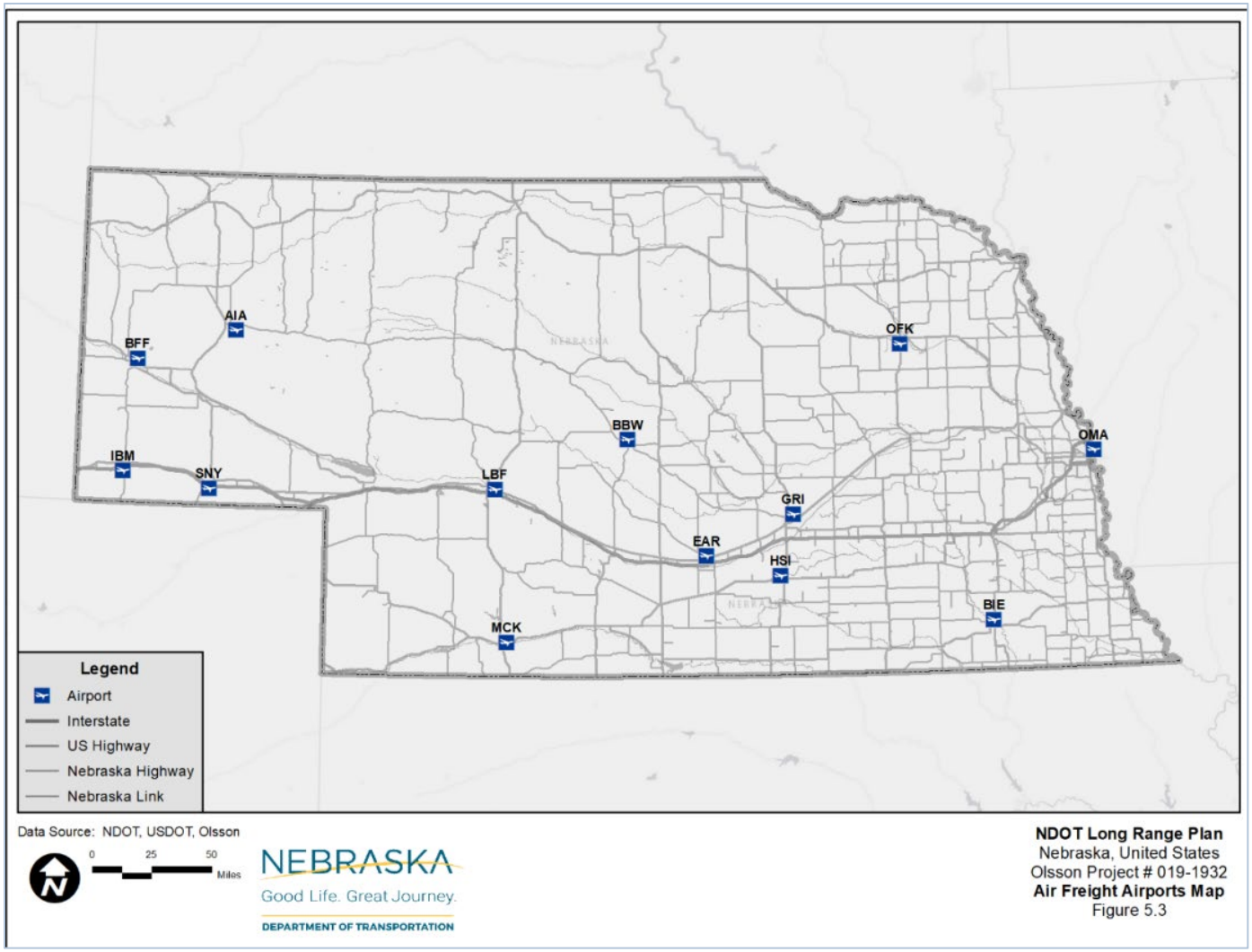



**Figure 23: Air Cargo Airport Map**[44]

[44] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Air Cargo Network-Air Cargo Airport Map," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.

### 1.4.7.8 PUBLIC TRANSPORTATION

Public transportation in Nebraska varies from urban fixed route transit services to small, rural accessible vans to national passenger rail service. In Greater Nebraska, much of the state-sponsored public transit is rural demand response service meeting needs across the state. The urbanized areas have fixed route transit services, along with complimentary paratransit services for those persons unable to use the fixed route network. Public transportation in the form of ridesharing and taxis has expanded into Transportation Network Companies. Additionally, long distance transportation is provided through existing intercity bus providers and the national passenger rail system operated by Amtrak.[45]

#### PASSENGER RAIL

Passenger Rail Nebraska has one passenger rail line operating in the state: the Amtrak California Zephyr. This line, originating in Chicago and terminating in San Francisco, has five stops in Nebraska: Omaha, Lincoln, Hastings, Holdrege, and McCook. It operates twice daily, once per direction. One (Omaha) of the five stations in Nebraska is owned and operated by Amtrak. The remaining four are privately owned or held by a freight operator (McCook-BNSF). Amtrak does not own any track in Nebraska but uses rail from UP and BNSF. [46]

#### PUBLIC TRANSIT

Nebraska public transportation agencies provided approximately 6.6 million trips to residents and visitors in the 2019 fiscal year according to NDOT. In 2022, rural and urban transit agencies collectively covered a total of 9,873,676 miles, an increase of 80% from 2021. Rural miles accounted for 43% of this total. The total number of passenger boardings, defined as anytime a passenger steps onto a transit vehicle, reached 4,734,215 in both rural and urban areas, reflecting an increase of 140% from 2021.[47]

According to the 2023 American Community Survey by the U.S. Census Bureau, less than 1% of all trips to work in Nebraska are made by public transportation.[48] The primary mode of travel in the state is the single occupant vehicle. However, for those residents who use public transportation by choice or do not have access to a vehicle, many transit systems across the state, both urban and rural, offer alternative transportation means for residents. Urban area transit agencies in Nebraska provide 90% of the total ridership for the state, with 8% of the ridership in rural areas. The remaining 1% of ridership are sponsored trips, where transit agencies coordinate with local organizations for specific trip requests under contract and financially supported by a designated program. Figure 24 illustrates the statewide ridership trends at the time of the 2020 reporting. Annual ridership is indicated in the millions for FY2017, FY2018, and

[45] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Public Transportation," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.
[46] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Passenger Rail," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.
[47] Nebraska Department of Transportation, "'Press Release – Faces of Transit in Nebraska' Creating Awareness of Vital Services Statewide," December 4, 2023. https://dot.nebraska.gov/media/bplhputr/12-4-2023-local-transit.pdf.
[48] U.S. Census Bureau, American Community Survey, "Nebraska-Work Transportation Demographics," 2023. https://data.census.gov/profile/Nebraska?g=040XX00US31#employment.

FY2019, indicating the larger majority of ridership was in urban areas of the state (blue bar graph) and lower ridership in rural areas of the state (orange bar graph).[49]

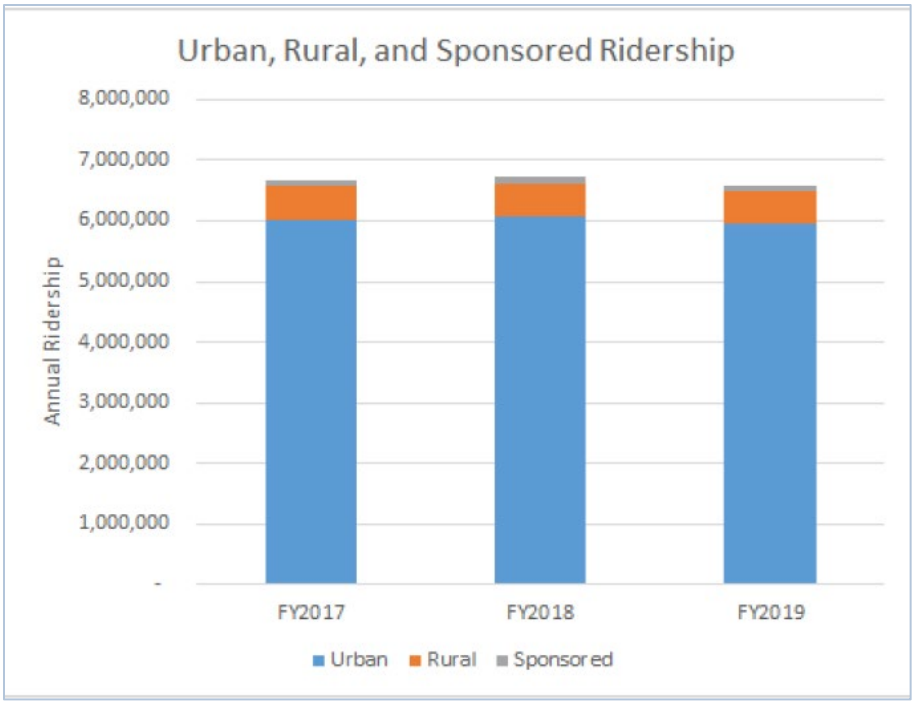



**Figure 24: Statewide Transit Ridership[50]**

Currently, public transit is available to residents in 82 of the 93 counties in Nebraska. Agencies provide a range of service options to residents, including four intercity providers, 56 demand response providers, a flexroute provider, four urban providers, and paratransit service. The following 11 counties were identified as not having any public transit service supported by any of the funding programs administered by NDOT: Blaine, Brown, Cherry, Greeley, Keya Paha, Logan, Sioux, McPherson, Polk, Rock, and Thomas. Figure 25 shows specific transit coverage across the state. Counties colored in red indicate countywide public transit. Counties in gray indicate no countywide public transit. The yellow dot indicates service within city limits for those counties.[51]

[49] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Public Transit," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.
[50] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Public Transit-Statewide Transit Ridership Graph," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.
[51] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Public Transit," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.

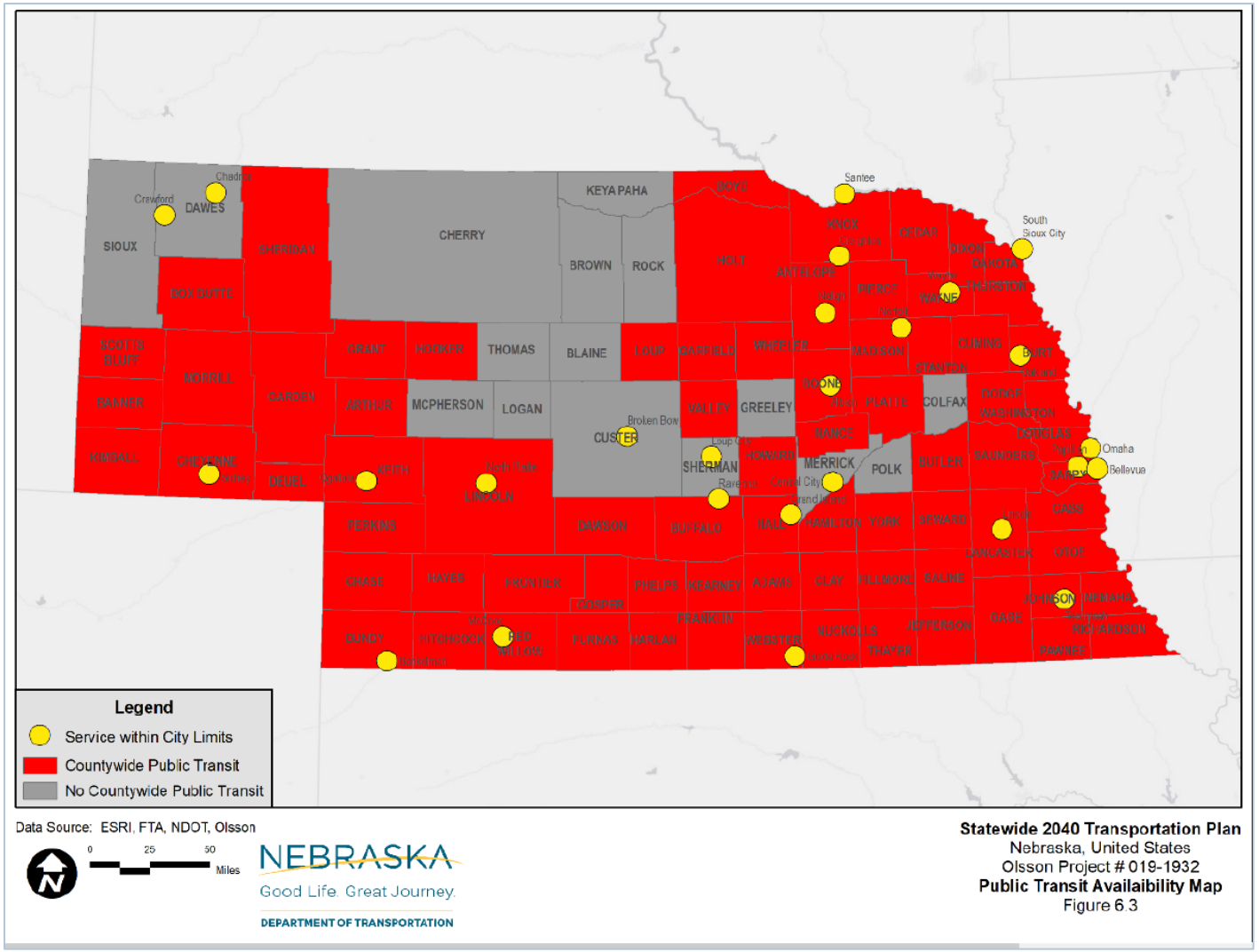



**Figure 25: Public Transit Availability in Nebraska Counties**[52]

[52] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Public Transit-Availability in Nebraska Counties Map," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.

## RURAL TRANSIT

Transit agencies in rural areas of Nebraska primarily operate demand response service, with one flexible route system in Scottsbluff and a transit line in Sidney. Funding for the agencies include federal, state, passenger fares, and local dollars, which may be from the local municipality or county general fund or other designated funding sources. In addition, many of the rural transit agencies receive local matching funds by partnering with local organizations recognizing the need for public transportation services.[53]

## ACCESS TO TRANSIT

Nebraska is relatively unique in the distribution of its population, with much of the population concentrated in a few cities, and many small towns with low population distributed across the state. Typically, intercity or regional bus services operating on a scheduled route will only be feasible if stops have a sufficient population. All of Nebraska's census designated places and urbanized areas with a population above 5,000 have intercity bus service, except the following eight that have a population over 5,000 and are not located within an urbanized area:[54]

- Blair (population 7,990)
- Crete (population 7,055)
- Gretna (population 5,416)
- Hastings (population 25,030)
- Holdrege (population 5,506)
- McCook (population 7.580)
- Seward (population 7,050)
- Wayne (population 5,578)

Hastings, Holdrege, and McCook are served twice a day by Amtrak's California Zephyr intercity rail passenger service, but not by intercity bus. In that sense they could be seen as having intercity access by Amtrak. However, the current schedule to those communities is in the middle of the night.[55]

## FLEXIBLE ROUTE SERVICES

Flexroute transit routes are scheduled routes through the community but are able to make deviations off the routes. The deviations are scheduled with the transit office dispatch and are made in advance.

- **Scotts Bluff County, NE** – The Tri-City Roadrunner operates two flexroutes through the three communities of Scottsbluff, Gering, and Terrytown.

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[53] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Public Transit-Rural Transit,"2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.
[54] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Public Transit-Access to Transit," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.
[55] Ibid.

- **Sidney, NE** – The Sidney Stage Line is a city-owned scheduled transit service operating six days a week with 12 designated stops.[56]

### URBAN TRANSIT

Four urban transit systems operate in Nebraska. Three of the cities, Lincoln, Omaha, and South Sioux City, have fixed route service and paratransit service for persons not able to access the fixed route network.

- **CRANE Transit:** The City of Grand Island operates CRANE Transit, which is a demand response service within the urbanized area.
- **StarTran** is managed by the City of Lincoln under the auspices of Lincoln Transportation and Utilities Department (LTU).
- **Omaha Rapid Bus Transit:** Omaha has the largest transit agency in Nebraska with 17 fixed routes and 10 express routes within the Omaha metro area. Metro also operates MOBY, the paratransit service. Additionally, in spring 2020, ORBT, the first bus rapid transit line in the state opened and runs primarily on Dodge Street from downtown Omaha near 10th Street to Westroads Mall. Metro's system map is available on their website: https://www.ometro.com/rider-guide/orbt/ (Omaha Rapid Bus Transit (ORBT) | Metro).[57]
- **Sioux City Transit System** serves three communities: Sioux City, South Sioux City, and North Sioux City. The agency operates 10 regular fixed routes and tripper routes on weekdays and Saturdays. Sioux City Transit's system map is available on their website: https://www.sioux-city.org/government/departments-q-to-z/transit (Transit | City of Sioux City).[58]

### INTERCITY BUS SERVICE

Five private intercity bus carriers operate in Nebraska:

- Express Arrow (formerly known as Black Hills Stage Lines) (orange dotted line on the map)
- Burlington Trailways (blue dotted line on the map)
- Jefferson Lines (purple dotted line on the map)
- Panhandle Trails (yellow, green, and red dotted lines on the map)
- Navigator Airport Express

---

[56] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Public Transit-Flexroute Transit Services," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.
[57] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Public Transit-Urban Transit," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.
[57] Ibid.
[58] Ibid.

The extent of the existing intercity transit network in Nebraska is shown in Figure 26.[59]

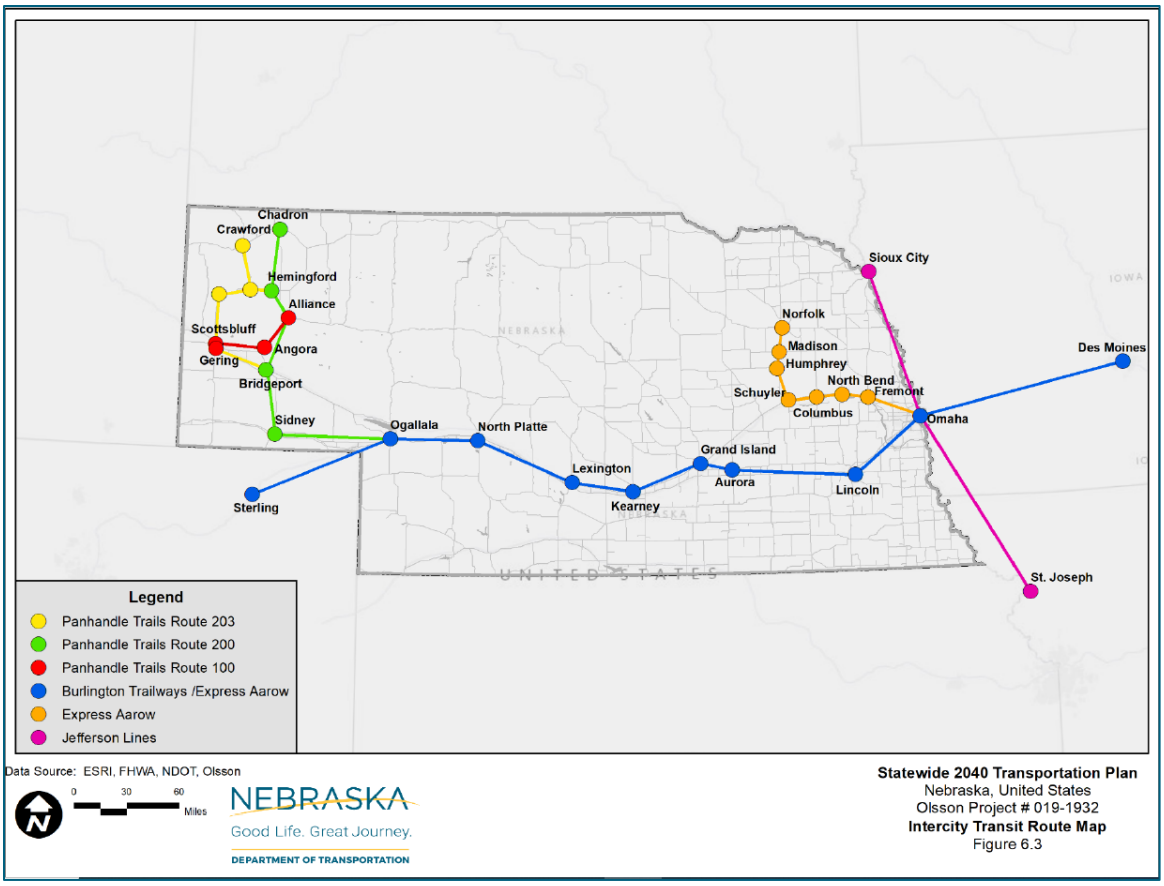



**Figure 26: Intercity Transit Route Map[60]**

[59] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Public Transit-Intercity Bus Service," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.
[59] Ibid.
[60] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Public Transit-Intercity Bus Route Map," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.

### 1.4.7.9 AVIATION

#### PUBLIC AVIATION

Nebraska's public aviation network includes 82 public airports. Most of these facilities are smaller, general aviation airports in rural areas, providing services to private pilots, air taxi services, and small businesses such as agricultural crop pesticide and fertilizer application. Supplementing the public airport network are 164 private airstrips, owned by corporations or residents. Offutt Air Force Base, in Bellevue, Nebraska, is the only military installation that is not collocated with a public use airport. The locations of Nebraska's public airports are shown Figure 27.[61] The blue airplane logo indicates the location of public airports statewide.

[61] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Public Transit-Public Aviation," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.

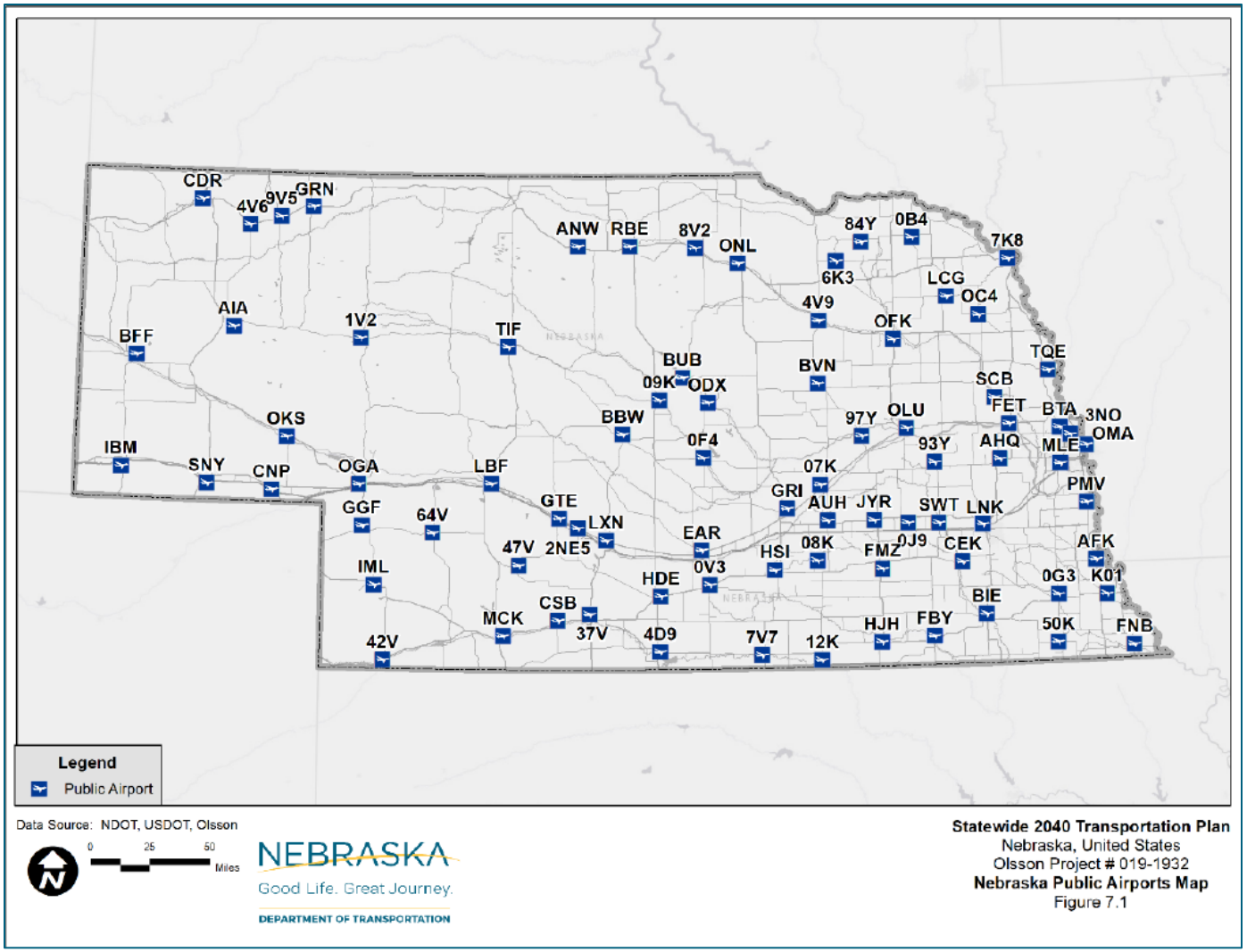



**Figure 27: Nebraska Public Airports Map**[62]

[62] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Nebraska Public Airports Map," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.

## COMMERCIAL AVIATION

Regularly scheduled commercial flights take place at eight of Nebraska's 82 public airports. The majority of commercial air service in terms of both total passengers and destinations served originate at Omaha's Eppley Airfield. The Lincoln Airport is the next greatest generator of commercial air traffic, followed by Central Nebraska Regional Airport (Grand Island), Western Nebraska Regional Airport (Scottsbluff), and Kearney Regional Airport. Fewer than 1,500 annual commercial operations occur at McCook's Ben Nelson Regional Airport, Lee Bird Field (North Platte), and Chadron Municipal Airport. On demand air taxi service is available throughout the state at various locations. The location of commercial airports in Nebraska is shown in Figure 28.[63] The blue airplane logo indicates the location of commercial airports. The green airplane logo indicates the location of airports with air taxi service.

[63] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Commercial Aviation," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.

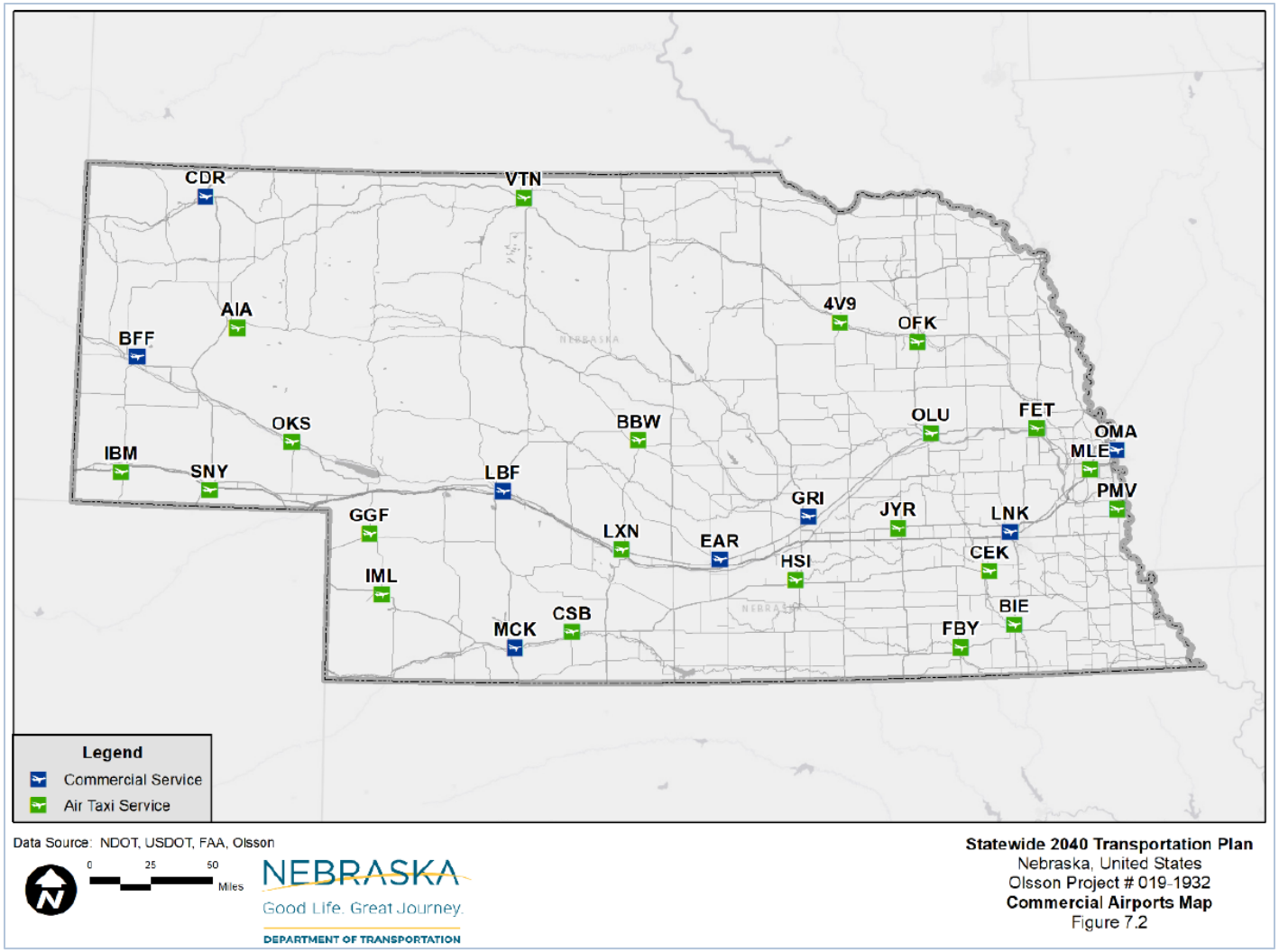



**Figure 28: Nebraska Commercial Airports Map**[64]

[64] Nebraska Department of Transportation, "2040 Nebraska-Existing Inventory and Conditions-Nebraska Commercial Airports Map," 2025. https://dot.nebraska.gov/media/idfeh1cg/task-3-existing-inventory-and-conditions-memo.pdf.

## 1.4.8 Dams and Levees

Dams and levees are commonly found throughout Nebraska. Dams and levees are artificial barriers constructed to hold back water, wastewater, or other liquid material. Dams forming reservoirs are constructed for a variety of purposes, such as recreation, power generation, water supply, fire protection, erosion control, and flood control. Levees are often constructed to increase areas of agricultural cultivation and to protect population and structures from floods.

According to the National Inventory of Dams, in March 2025 there were 2,961 total dams in Nebraska. Dams are categorized primarily by the potential for loss of life and damages to property if the dam were to fail. The hazard potential classification is not an assessment of the dam's condition or its likelihood of failure. Nebraska has 160 dams designated as high hazard potential, or those where dam failure or malfunction would likely result in loss of human life. The locations of these dams are shown in Figure 29. Nebraska has 215 dams designated as significant hazard potential from which failure or malfunction would not likely result in loss of human life, but could result in major economic loss, environmental damage, and disruption of critical facilities and lifelines.

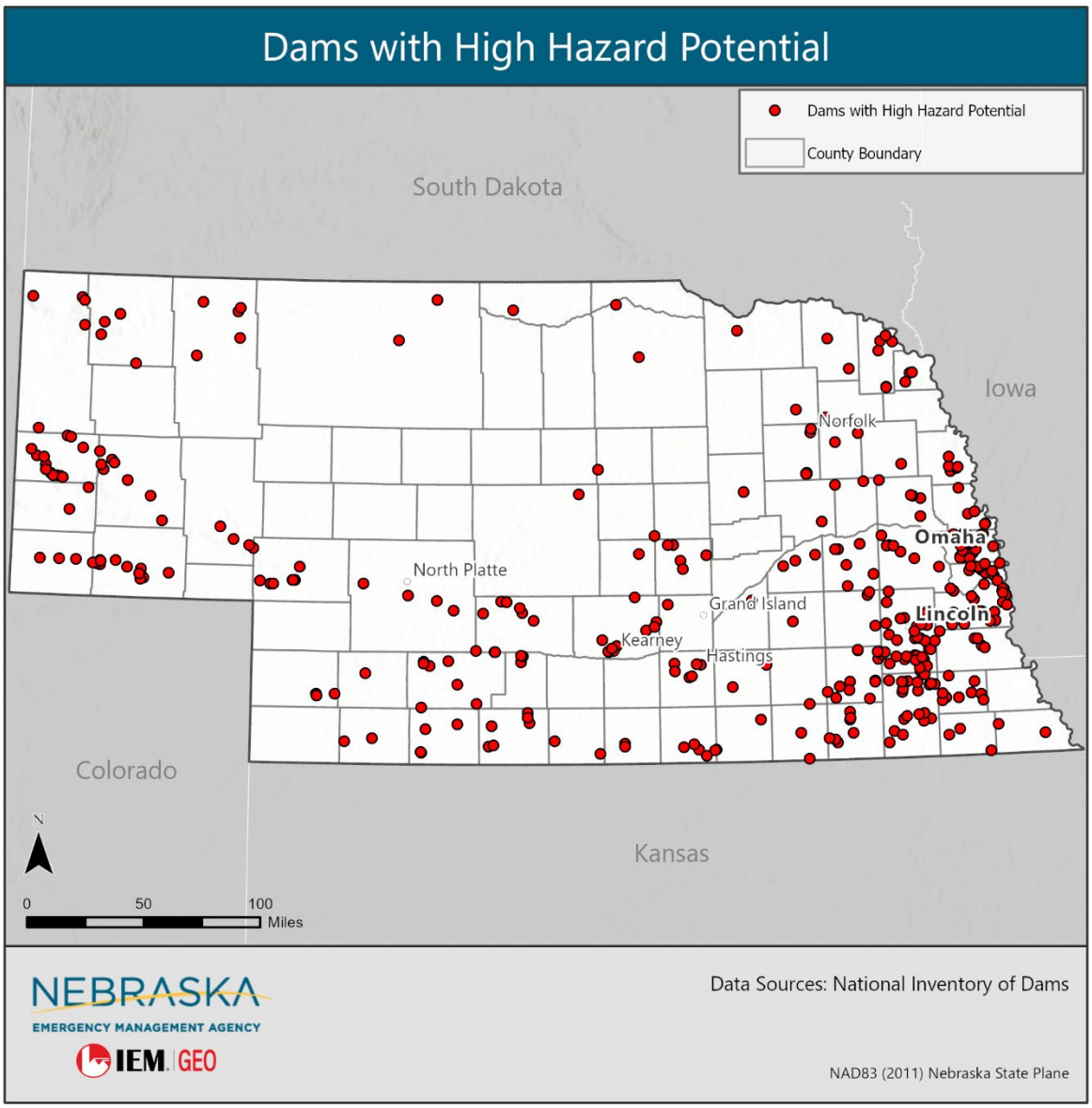



**Figure 29: Dams with High Hazard Potential**

Levees are found across the state, primarily along the Platte River, Elkhorn River, Missouri River, and their tributaries. To assess the areas at potential risk for levee failure, USACE's National Levee Database (NLD) was consulted. The congressionally authorized NLD is the primary source for comprehensive information about our nation's levees. According to the NLD, as of March 2022, Nebraska has 127 levee systems, comprising 338 miles of levees. These systems are 53 years of age on average.

Levee failure causes water to inundate normally dry areas. Even if levee systems are maintained and closely monitored during potential events that could result in breaches, levees can still fail. The failure of a levee can be attributed to the loss of structural integrity of a wall, dike, berm, or elevated soil by erosion,

piping, saturation, under seepage, or overtopping. In Nebraska, 377 miles of levees protect approximately 48,700 residents.[65]

Figure 30 illustrates NLD data showing where Nebraska's levees are located, and the areas that they protect from flooding. While the NLD provides a large amount of data, there is not a definitive list of all the numerous municipal, agricultural, and other small levees located throughout the state. For many levees in Nebraska, levee location, design specifications, condition, and the value of assets protected are unknown. However, the goal of the NLD is for it to include data about levees owned and operated by all federal agencies, tribes, states, municipalities, levee boards, and private entities. USACE adds information to the NLD as it becomes available.

[65] "2025 Report Card for America's Infrastructure: Nebraska Infrastructure Overview." https://infrastructurereportcard.org/state-item/nebraska/#site-state-fact-sheet.




**Figure 30: Nebraska Leveed Areas**

## 1.4.9 Energy

The Nebraska Department of Environment and Energy (NDEE) promotes the efficient, economic and environmentally responsible use of energy and seeks to maximize the benefits of energy efficiency and renewable energy through communication, outreach, technology, and partnerships.[66] The agency publishes quarterly and annual reports on trends in energy supply, demand, and conservation in across agricultural, commercial, residential, industrial, and transportation sectors. NDEE administers energy programs such as Weatherization Assistance Program, Dollar and Energy Saving Loans Program, and State Heating Oil and Propane Program.

[66] Nebraska Department of Environment and Energy. https://dee.nebraska.gov/state-energy-info-stats.

Emergency planning for energy security is critical to protecting and improving the resilience of the energy sector. NCEE participates in planning and providing support for Emergency Support Function (ESF) 12 along with NEMA to prepare for emergencies and enhance the resiliency of energy infrastructure to ensure energy supplies. These efforts help jurisdictions respond to energy supply disruptions and plan ahead to enhance the resiliency of their energy infrastructure[67] Nebraska's Energy Security Plan was updated in October 2024 in accordance with new federal requirements.

Nebraska produces about 13% of the nation's fuel ethanol and is the second largest ethanol producer in the United States after Iowa. Of Nebraska's in-state electricity net generation, 45% comes from coal, 30% from wind, 17% from nuclear power, 6% from natural gas, and 2% from hydropower. Nebraska ranks in the top 10 states in per capita total energy consumption because of its small population, energy-intensive industrial sector, and the state's hot summers and harsh winters. Nebraska ranks third in the nation in its number of industrial electricity customers. About 39% of electricity sales in the state go to the industrial sector, including electricity to run irrigation systems for agriculture.[68]

According to 2024 Annual State Energy Report statewide trends, Nebraska is the only state that generates electricity entirely by publicly owned power systems. Nebraska's electric utilities meet their customers' needs while continuing to export electricity to customers outside the state, and 16.8% of generation was exported in 2022. The statewide average electricity price is the fifth-lowest rate in the country. Total energy consumption by fuel type (Figure 31) is as follows:

- Coal: 25%
- Petroleum (and products): 27%
- Natural gas: 22%
- Renewable energy: 19%
- Nuclear power: 7%

[67] Nebraska Department of Environment and Energy, "March 2025 Quarterly Report." https://dee.nebraska.gov/sites/default/files/publications/March%202025%20Nebraska%20Energy%20Quarterly.pdf.
[68] U.S. Energy Information Administration, "Nebraska Quick Facts." https://www.eia.gov/state/print.php?sid=NE.

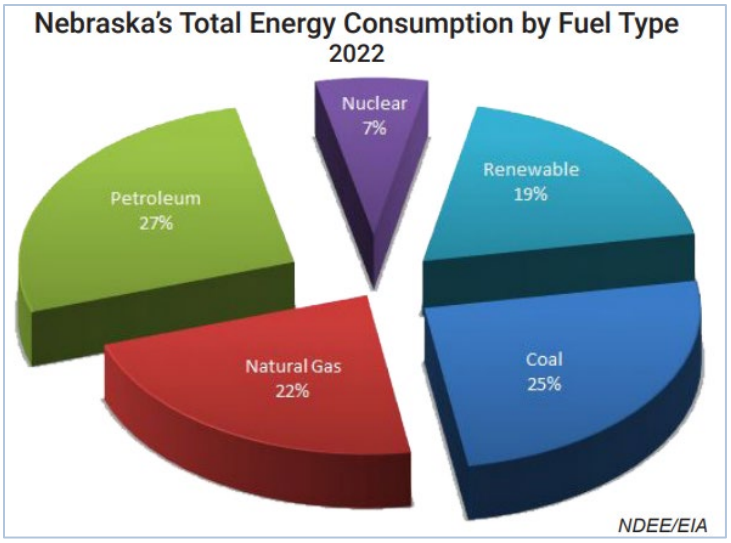



**Figure 31: Nebraska Energy Consumption by Fuel Type**

The amount of energy consumed by sector in 2022 (Figure 32) is as follows:

- Industrial: 45%
- Transportation: 24%
- Residential: 17%
- Commercial: 14%

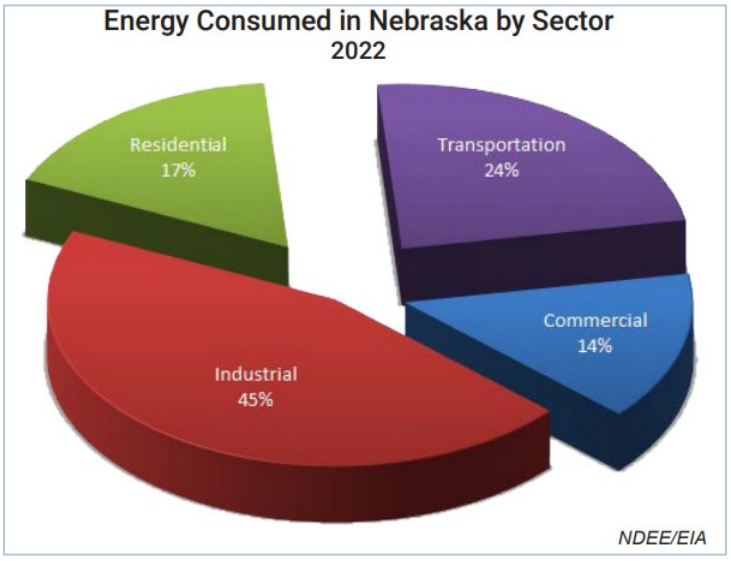



**Figure 32: Energy Consumed in Nebraska by Sector**

A list of public power districts (PPDs) and electric cooperatives that provide power within Nebraska is provided in Table 4. There are also numerous municipally owned and operated utilities.[69] Natural gas utilities include Black Hills Energy and NorthWestern Energy, as well as municipal gas utilities. Previously, PPDs created their own hazard mitigation plans, but now PPDs that are members of the Nebraska Rural Electric Association (NREA) are included in the State of Nebraska Hazard Mitigation Plan as Appendix C.

**Table 4: Retail and Wholesale Electric Power Providers**

| Public Power Districts and Electric Cooperatives That Provide Retail or Wholesale Electric Power | |
|---|---|
| Burt County Public Power District | Nebraska City Utilities |
| Butler Public Power District | Nebraska Public Power District |
| Cedar-Knox Public Power District | Niobrara Electric Association |
| Central Nebraska Public Power and Irrigation District | Niobrara Valley Electric Membership Corporation |
| Cherry-Todd Electric Co-Op | Norris Public Power District |
| Chimney Rock Public Power District | North Central Public Power District |
| Cornhusker Public Power District | Northeast Nebraska Public Power District |
| Cuming County Public Power District | Northwest Rural Public Power District |
| Custer Public Power District | Omaha Public Power District |
| Dawson Public Power District | Panhandle Rural Electric Membership Association |
| Elkhorn Rural Public Power District | Perennial Public Power District |
| High West Energy Co-Op | Polk County Rural Public Power District |
| Highline Electric Association | Roosevelt Public Power District |
| Howard Greeley Rural Public Power District | South Central Public Power District |
| KBR Rural Public Power District | Southern Public Power District |
| LaCreek Electric Association | Southwest Public Power District |
| Lincoln Electric System | Stanton County Public Power District |
| Loup Power District | Twin Valleys Public Power District |
| Loup Valleys Rural Public Power District | Western Area Power Administration |
| McCook Public Power District | Wheatbelt Public Power District |
| Midwest Electric Cooperative Corporation | WYRULEC Company |
| Municipal Energy Agency of Nebraska | Y-W Electric Association |

[69] NDEE, "Nebraska Utilities." https://dee.nebraska.gov/state-energy-information/nebraska-utilities.

## 1.4.10 Water Systems (Drinking, Stormwater, and Wastewater)

Nebraska's communities, agricultural industry, and business sector all require water. The NDEE Water Section in responsible for protecting the state's extensive water resources. In Nebraska, 85% of the population relies on groundwater from aquifers for drinking water. The Ogallala Aquifer that underlies much of Nebraska is one of the largest underground freshwater sources in the world. In addition, surface water resources in Nebraska include 18,000 miles of rivers and streams and 430 square miles of lakes that are important for wildlife habitat and other uses.

Runoff from rain and irrigation can carry chemicals and topsoil into waterways. Fertilizers and chemicals related to agriculture can contaminate surface and ground water. The state partners with water utilities, communities, and federal partners and also implements a variety of monitoring methods to ensure consumers have reliable and safe drinking water. Planning and permitting processes also protect groundwater and surface water systems.[70]

The Nebraska Water Science Center provides reliable, impartial, foundational data and scientific analysis to address water issues facing Nebraska today. This program of the U.S. Geological Survey conducts hydrologic monitoring and investigative studies in partnership with federal, state, and local agencies to assist them in understanding and managing Nebraska's water resources.

Continuing to provide the infrastructure to meet the state's needed water resources can be challenging. Stormwater utilities are responsible for conveying rain and snowmelt, but funding is not always sufficient for all their capital needs to address aging infrastructure. Wastewater and drinking systems also face capital needs. The American Society of Civil Engineers 2025 Report Card for America's Infrastructure indicates Nebraska needs $3.2 billion in drinking water and $2.1 billion in wastewater infrastructure investments.[71] Maintaining and ensuring the functionality of these networks is essential for public health and safety and supports the local economy.

## 1.4.11 Economy

The largest industries in Nebraska based on revenue are meat, beef, and poultry processing; corn, wheat, and soybean wholesaling; and life insurance and annuities. The top three sectors by total gross domestic product contributions are finance and insurance, manufacturing, and real estate and rental and leasing. Employment sectors with the largest workforces are healthcare and social assistance, retail trade, and administration, business support and waste management services. Nebraska's unemployment rate was 2.7% in 2024, which ranks fifth out of 50 states and has trended downward at a rate of -2.6% over the past five years, performing better than the United States as a whole.[72]

Nebraska monitors a variety of indicators to gauge economic strength in two major categories: workforce vitality and economic strength. The workforce vitality measures characteristics about the workforce,

[70] NDEE, "Water Section." https://dee.nebraska.gov/water.
[71] ASCE, "2025 Report Card for America's Infrastructure." https://infrastructurereportcard.org/state-item/nebraska/.
[72] IBISWorld, "Nebraska State Economic Profile." https://www.ibisworld.com/united-states/economic-profiles/nebraska/#EmploymentSection.

including productivity, work ethic, education and participation rates. Economic strength is reflected in economic diversity, entrepreneurship, and growth in jobs and income. Nebraska has a diverse economy that helps it weather economic downturns from periodic bust and boom cycles. Agriculture is a primary sector, but Nebraska also has successful businesses in information technology, finance, biotech, and transportation/logistics. Economic growth and the speed of that growth are important indicators of general economic health. Historically, Nebraska's economy has experienced steady growth and was less severely impacted by the Great Recession of the 2000s. Compared to states that were hit hard by the recession and showed quick growth during the return to normal, Nebraska's economy was stable throughout, experiencing typical growth. Recently, Nebraska has been making important gains in personal income and job growth.[73]

[73] Nebraska Department of Economic Development, "Bottomline: Nebraska Economic Indicators." https://nebottomline.nebraska.gov/economic-strength/.

# 2.0 Planning Process

| 44 Code of Federal Regulations (CFR) §201.4 Requirements |
|---|
| 1. S1. Does the plan describe the process used to develop the plan? [44 CFR §201.4(b) & (c)(1)]<br>2. S2. Does the plan describe how the state coordinated with other agencies and stakeholders? [44 CFR §201.4(b) and (c)(1)] |
| **Emergency Management Accreditation Program (EMAP) Standards (2019)** |
| *4.2.1: The Emergency Management Program has a plan to implement mitigation projects and sets priorities based upon loss reduction. The plan:*<br>1. Is based on the natural and human-caused hazards identified in Standard 4.1.1 and the risks and consequences of those hazards;<br>2. Is developed through formal planning processes involving Emergency Management Program stakeholders; and<br>3. Establishes short- and long-term strategies, actions, goals, and objectives. |
| **2026 State Hazard Mitigation Plan (SHMP) Update** |
| 1. Section reformatted for consistency with 44 CFR, §201.4.<br>2. Describes the development of the updated 2021 SHMP.<br>3. Incorporates data from the 2019 and 2021 SHMPs.<br>4. Describes program integration since the 2021 SHMP.<br>5. Describes the modified engagement methodology to accommodate social distancing measures required by the COVID-19 pandemic. |

This section outlines the process used to revise the 2021 SHMP for 2026, including the state's coordination with other agencies for statewide planning efforts.

## 2.1 Evolution of the State Hazard Mitigation Plan

### 2.1.1 Planning History

Hazard mitigation planning has a lengthy history in Nebraska. During the 1970s, Nebraska issued executive orders addressing hazard mitigation measures in response to disaster events. These actions were expanded upon as changes in the National Flood Insurance Program (NFIP) and other federal laws, such as the NFIP's Community Rating System (CRS) program, brought changes to the planning and funding of mitigation actions.

Nebraska's mitigation planning began after a series of devastating tornadoes, floods, and related severe storms resulted in federal disaster declarations DR-718 and DR-716 in 1984. The state set out to analyze the risks associated with the hazards that caused these disasters. The result was a 1985 Hazard Mitigation Plan outlining the risks, potential activities, and agencies to assist. This plan was revised and updated in 1991 and 1995 after additional severe storms.

At the same time as the initial mitigation plans, the Drought Assessment Response Team (DART) published a statewide strategy to address drought in 1990. The Nebraska Climate Assessment Response Committee (CARC), replacing DART, has built on this plan with revisions in 1998, 2000, and 2004. Information, objectives, and implementation measures have been incorporated into the SHMP.

The State of Nebraska Flood Mitigation Plan was initially developed by the Nebraska Department of Natural Resources (NeDNR) in 2002 and published in 2003. Since that time, elements of the plan have been used as the basis for the flooding risk assessment and mitigation strategy alternatives in the SHMP. In 2022, the Flood Mitigation Plan was updated and will be integrated into the 2026 SHMP.

## 2.1.2 Summary of Changes

The 2026 revision of the SHMP represents a comprehensive review and update of the 2021 plan.

**Table 5: Summary of Changes in the 2026 SHMP**

| Section | Change |
|---|---|
| **Overall** | Comprehensive review and updating data and information.<br>Increased readability and function.<br>Reformatted to be consistent with FEMA planning guidance.<br>Inclusion of EMAP requirements (2022 edition) in appropriate sections. |
| **Section 1: Introduction** | Streamlined to highlight key information locations in the plan.<br>Updated to reflect content location changes.<br>Brief profile provided for plan context. |
| **Section 2: Planning Process** | Participants and engagement information updated to reflect 2026 planning process. |
| **Section 3: Hazard Identification and Risk Assessment** | Latest hazard impact and disaster declaration data added.<br>Impact summary revised to reflect latest impacts and consequences.<br>Restored chemical, transportation, and power failure hazard profiles.<br>New hazard profiles for extreme temperature and human infectious disease added.<br>Stakeholder input incorporated in hazard profiles.<br>Detailed summary of 2019 flooding (DR-4420) impacts and discussion of changes in level of risk and vulnerability added to Section 3.4: Flood/Flash Flood. |
| **Section 4: Mitigation Strategy** | Adapted from the 2021 SHMP to include additional analysis on state and local capabilities.<br>Goals and Objectives revised from the 2021 SHMP to align more closely with FEMA mitigation categories.<br>Updated funding descriptions and requirements per latest FEMA guidance documents. |
| **Section 5: Local Coordination and Mitigation Capabilities** | New section added to emphasize the state's role in supporting local and tribal mitigation programs and capabilities. |

| Section | Change |
|---|---|
| **Section 6: Plan Maintenance** | Expanded detail on plan monitoring, evaluating, and updating to include roles and responsibilities, and a description of specific method and schedule. |

## 2.2 Coordination and Documentation of the Planning Process

The Nebraska statewide mitigation planning program is designed to coordinate the efforts of many state and local agencies and organizations in mitigation planning and programming on an ongoing basis. For the 2026 plan revision, the planning process was utilized to complement approved mitigation plans throughout the state, promoting continual local mitigation planning and emphasizing the implementation of the state mitigation strategy outlined in Section 4. It is also intended to actively promote and coordinate mitigation planning and programming with local jurisdictions by accomplishing the following activities:

I. Encourage and facilitate a multi-organizational, multi-jurisdictional approach to mitigation planning, aiming to develop interrelated and coordinated plans and programs at both the state and local levels.

II. Utilize a consistent and practical technical approach to develop mitigation plans, enabling information exchange statewide among all jurisdictions, levels of government, as well as volunteer and nongovernmental organizations throughout the state.

III. Promote a mitigation planning process that prioritizes available time and resources to address the highest-risk hazards confronting Nebraska communities and the mitigation goals established at both the state and local levels.

IV. Recognize that mitigation planning and programming must be an ongoing and continuous process, consistently updated to reflect changes in hazard conditions as well as the resources and capabilities available to mitigate vulnerabilities to those hazards.

### 2.2.1 Core Planning Team

The Core Planning Team for the 2026 SHMP update consisted of the Nebraska Emergency Management Agency (NEMA) Recovery Section staff, who contracted with IEM to assist with the plan update tasks. The Core Planning Team first met on September 12, 2024, and established a work plan and schedule that would ensure the plan's timely completion.

During the September meeting, it was determined that all aspects of the plan should be reviewed and revised to provide clarity and ensure that the plan met FEMA's planning requirements. The NEMA participants on the Core Planning Team were assembled to assist in reviewing and revising the SHMP and to serve as the primary point of contact for facilitating project phases and activities. Table 6 shows that this group was expanded to meet workload requirements and incorporate additional input as needed.

Table 6: Core Planning Team

| Name | NEMA Section/Agency | Title |
|---|---|---|
| **Lexy Hindt** | NEMA Recovery Section | Recovery Section Manager |
| **Chelsea Harris** | NEMA Hazard Mitigation Unit | State Hazard Mitigation Officer (SHMO)/ Hazard Mitigation Unit Supervisor |
| **Donny Christensen** | NEMA Recovery Section | Recovery Section Administrator |

## 2.2.2 Planning Committee

The planning committee for the 2026 SHMP update included invited representatives from key stakeholder agencies involved in the 2021 SHMP planning process, as well as other representatives from other agencies and organizations with a mitigation-related focus or involvement. Table 7 lists the 2026 SHMP planning committee members.

Table 7: 2026 Nebraska Planning Committee Members

| Name | Title | Agency/Jurisdiction |
|---|---|---|
| **Derek Schriner** | Engineer/Silver Jackets Coordinator | U.S. Army Corps of Engineers |
| **Amelia Baker** | Environmental Specialist II | Nebraska Game and Parks Commission |
| **Russ Wren** | Emergency Response Coordinator/ESF-8 | Nebraska Department of Health and Human Services |
| **Jeffery Edwards** | Environmental Supervisor | Nebraska Department of Environment and Energy |
| **Adele Phillips** | Flood Mitigation Planner | Nebraska Department of Natural Resources |
| **Stephanie Drake** | Community Planner | FEMA |
| **Lexy Hindt** | Recovery Section Manager | Nebraska Emergency Management Agency |
| **Joel Beckman** | Public Assistance Unit Supervisor | Nebraska Emergency Management Agency |
| **Angelina Allen** | Hazard Mitigation Program Specialist I | Nebraska Emergency Management Agency |
| **Alyssa Grosse** | Hazard Mitigation Program Specialist I | Nebraska Emergency Management Agency |
| **Joseph Lauber** | Deputy Director – Operations | Nebraska Department of Economic Development |
| **Chelsea Harris** | SHMO/Hazard Mitigation Unit Supervisor | Nebraska Emergency Management Agency |
| **Heaven McKinley** | Civil Engineer | U.S. Army Corps of Engineers |

| Name | Title | Agency/Jurisdiction |
|---|---|---|
| **Scott Cordes** | State Fire Marshal Agency Director | State Fire Marshal's Office |
| **Donny Christensen** | Recovery Section Administrator | Nebraska Emergency Management Agency |
| **Penn Pennel** | Emergency Management Specialist -Hazard Mitigation Hazard Mitigation Grant Program (HMGP) Grants Project Officer | Federal Emergency Management Agency |
| **Erv Portis** | Assistant Director | Nebraska Emergency Management Agency |
| **Marisa Alvares** | Hazard Mitigation Program Specialist I | Nebraska Emergency Management Agency |
| **Steven Jara** | Deputy Director | Nebraska Forest Service |
| **Kevin Cotter** | Program Specialist I | Nebraska Emergency Management Agency |
| **Logan Lueking** | Planner | Nebraska Emergency Management Agency |
| **Casey Hartline** | Supervisory Emergency Management Specialist | Federal Emergency Management Agency |
| **Erica Wertz** | Deputy State Hazard Mitigation Officer | Nebraska Emergency Management Agency |
| **James Dukesherer** | Director of Government Relations | Nebraska Rural Electric Association |
| **Jeanne Bunting** | Project Manager | IEM |
| **Kim Anthony** | Lead Planner | IEM |
| **Sabrina Lunsford** | Planner | IEM |

### 2.2.3 Planning Process

On September 18, 2024, IEM met with the Nebraska State point of contact to discuss the details of the ongoing project and clarify the expected deliverables. This initial meeting was crucial in aligning the objectives of all parties involved and establishing a clear path forward. The discussions centered on the project's scope, timelines, and key responsibilities, ensuring that everyone was aligned as they moved forward together.

Following this productive exchange, a kickoff meeting was held on September 24, 2024, bringing together stakeholders and participants to review expectations and outline the next steps for the project. This collaborative session allowed everyone to voice their insights and concerns, fostering a sense of ownership among the participants. The energy in the room was palpable as the team focused on building a solid foundation for successful project implementation.

In a continued effort to promote collaboration, IEM organized a workshop designed specifically to assess state capabilities. This workshop, held on December 10, 2024, was instrumental in identifying strengths and areas for improvement within the state. Building on this groundwork, IEM reconvened on February 11, 2025, with the Core Planning Team and stakeholders engaged in a crucial discussion about the mitigation strategy and the corresponding actions needed to move forward effectively. This meeting was pivotal in refining the project's objectives and ensuring that all efforts were strategically aligned for optimal impact.

### 2.2.4 Planning Committee Process

Coordination between state agencies and other organizations was achieved through planning committee meetings held from September 2024 to September 2025, as well as meetings of the Core Planning Team. Most meetings were conducted in person and included PowerPoint presentations and companion Word documents, which allowed planning committee members to provide feedback on the data and information presented. Table 8 describes the meeting schedule and topics during the planning process.

**Table 8: 2026 SHMP Planning Committee Meetings**

| Date | Topic |
|---|---|
| **September 24, 2024** | Kickoff |
| **December 10, 2024** | Capability Assessment |
| **February 11, 2025** | Mitigation Action Workshop |

### 2.2.5 Planning Committee Participation

Over a 12-month planning period, more than 30 individuals participated in the planning process, which included meetings, technical assistance, plan review and input, and other activities. The list of all participants in the 2026 plan update process is provided in Appendix A: Planning Process Documentation.

### 2.2.6 Stakeholder Participation

The participation of agencies and stakeholders was determined by the list of stakeholders involved in the 2021 plan revision. Coordination between state agencies and other organizations was achieved through stakeholder meetings conducted during the planning process and periodic phone meetings between the Core Planning Team and the contractor.

During these meetings, stakeholders provided insight into how their agencies/organizations engaged in mitigation and planning efforts and input and information on the state's hazards. Table 9 provides a list of stakeholders and their areas of input. Those not participating in the planning or individual meetings provided input via technical review, assistance, or data.

Table 9: Stakeholder Input – Hazard Data Review

| Agency | Contact | Assistance/Input | Date |
|---|---|---|---|
| **Technological Hazards** | Mark Johnson | Chemical and radiological hazards | 03/13/205 |
| **Department of Natural Resources** | Tim Goeke | Dam failure | 03/13/2025 |
| **Nebraska Department of Health and Human Services** | Russell Wren | Animal Disease and Infectious Disease | 03/13/2025 |
| **Nebraska Department of Environment and Energy** | Doris Jansky | Power and Infrastructure Failure | 03/13/2025 |
| **Nebraska State Patrol** | Jason Prante | Terrorism | 04/06/2025 |
| **Nebraska Game and Parks Commission** | Amelia Baker | Drought | 03/17/2025 |
| **National Weather Service** | Individual available at time of review | Severe weather | 03/30/2025 |

In addition to the planning entities described above, Public Power Districts (PPDs) were invited to participate as key stakeholders in the state's plan. The PPDs were represented by the Nebraska Rural Electric Association in developing PPD-specific mitigation actions that augment the base plan.

Throughout the planning process, between meetings and the final submission, stakeholders had the opportunity to review drafts of hazard profiles and provide feedback, including data on historical damages, the frequency of current and future events, and resource ideas.

## 2.3 Integration with Other Plans, Programs, and Initiatives

### 2.3.1 State, Federal, Local, and Tribal Plans

The Nebraska SHMP is part of an ongoing planning process in the State of Nebraska, involving numerous state and local agencies and organizations. Mitigation objectives and activities have been incorporated into the state's emergency operations plan, state and local recovery plans, local emergency operations plans, and local hazard mitigation plans. The plan update process included a comprehensive review and consideration of data and information from these plans, programs, and initiatives. Table 10 lists the plans reviewed during the planning process and provides a brief description of the information integrated into the 2026 SHMP update.

**Table 10: Review and Integration with Other Plans, Programs, and Initiatives**

| Plan/Program | How It Was integrated in the 2026 SHMP Update |
|---|---|
| ***2022 Flood Hazard Mitigation Plan, State of Nebraska*** | Technical information integrated as background. |
| **Local Hazard Mitigation Plans** | Reviewed and extracted data for hazard risk and vulnerability, capabilities, and projects. |
| **Nebraska Energy Security Plan** | Aligned with security actions to build resilience. |
| **Nebraska Hazard Mitigation Administrative Plan** | Reviewed for alignment with mitigation actions. |
| **Nebraska Climate Priority Plan** | Reviewed for data sources and vulnerabilities. |

Nebraska has actively participated in the Hazard Mitigation Grant Program (HMGP), the Pre-Disaster Mitigation (PDM) Grant, and the Flood Mitigation Assistance (FMA) grant for over three decades For fiscal year 2023, states and territories were allocated $1 billion. NEMA and NeDNR partner to coordinate the Governor's Task Force for Disaster Recovery, ensuring that funds are effectively managed and duplication is minimized. Additionally, NEMA and NeDNR have also been regular participants in workshops at both the national and local levels.

Federally recognized tribes in Nebraska generally develop and manage their own hazard mitigation programs, which are supported by the state. Should tribes request assistance, the state is willing and able to respond.

### 2.3.2 Challenges to Integration

Historically, staffing levels at the state level have posed challenges to effective planning and program integration efforts. As of this 2026 update, staffing levels have remained stable, and the integration of local plan information has been enhanced with this plan revision. Continued focus on staffing continuity will provide opportunities to increase engagement in local hazard mitigation planning and other local planning initiatives. The lack of funding remains challenging, as many projects have become too expensive to undertake at current funding levels. To address this issue, a priority is to target partnerships and additional funding streams.

## 2.4 Future Planning and Mitigation Efforts

The state remains committed to expanding the engagement of schools, not-for-profits, private businesses, and tribal partners in mitigation planning and activities. These efforts are achieved by encouraging partnerships during and after the local hazard mitigation planning process and promoting active engagement between entities and local emergency management.

# 3.0 Hazard Identification and Risk Assessment

## 3.1 Identifying Hazards

This section presents a comprehensive analysis and definition of hazards that may impact the state of Nebraska. A thorough understanding of these hazards enhances preparedness efforts for decision-makers, local agencies, and residents, enabling them to better assess causes, potential damages, and possible hazard scenarios. Table 11 outlines an overview of the hazards identified in the State Hazard Mitigation Plan (SHMP) update, providing a structured framework for risk assessment and mitigation planning.

**Table 11: Hazard Profile Summary**

| Hazard |
|---|
| Animal Disease |
| Dam Failure |
| Drought |
| Flood/Flash Flood |
| Human Infectious Disease |
| Levee Failure |
| Plant Disease and Pests |
| Severe Thunderstorm |
| Severe Winter Storm |
| Terrorism |
| Tornado |
| Wildfire |
| Chemical and Radiological Fixed Sites and Transportation |
| Extreme Temperatures |
| Power and Infrastructure Failure |

Table 12 summarizes the hazards identified across Nebraska along with the corresponding risk levels.

Table 12: State of Nebraska Hazard Assessment

| Hazard | Probability Past 5 Years | Impact | Spatial Extent | Warning Time | Duration | Vulnerability | Probability | Overall Risk |
|---|---|---|---|---|---|---|---|---|
| **Animal Disease (Domestic)** | 2.18 | 2.36 | 2.55 | 1.18 | 3.82 | 2.64 | 2.64 | 2.38 |
| **Animal Disease (Foreign)** | 2.91 | 2.00 | 2.64 | 1.09 | 3.72 | 2.09 | 2.91 | 2.48 |
| **Chemical and Radiological Fixed Sites and Transportation** | 2.27 | 2.55 | 2.55 | 3.82 | 3.64 | 2.00 | 2.36 | 2.74 |
| **Dam Failure** | 1.73 | 2.91 | 2.73 | 3.00 | 3.64 | 1.91 | 2.09 | 2.57 |
| **Drought** | 3.36 | 2.91 | 4.00 | 1.00 | 3.91 | 3.00 | 3.73 | 3.13 |
| **Extreme Temperatures** | 3.36 | 2.55 | 3.64 | 1.00 | 3.36 | 2.55 | 3.55 | 2.92 |
| **Flooding** | 3.09 | 2.55 | 2.82 | 3.45 | 3.09 | 2.36 | 3.09 | 2.92 |
| **Human Infectious Disease** | 2.27 | 2.64 | 3.00 | 1.09 | 3.91 | 2.55 | 2.55 | 2.57 |
| **Levee Failure** | 2.18 | 2.55 | 2.64 | 2.91 | 3.09 | 2.00 | 2.18 | 2.51 |
| **Plant Disease and Pests** | 2.55 | 1.91 | 2.45 | 1.55 | 3.82 | 1.55 | 2.55 | 2.34 |
| **Power and Infrastructure Failure** | 2.55 | 2.73 | 3.00 | 3.73 | 3.27 | 2.73 | 2.82 | 2.97 |
| **Severe Thunderstorms** | 3.91 | 2.64 | 2.91 | 2.91 | 1.55 | 3.27 | 3.91 | 3.01 |
| **Severe Winter Storms** | 3.64 | 2.64 | 3.36 | 1.82 | 2.64 | 3.09 | 3.73 | 2.99 |
| **Terrorism** | 2.36 | 2.91 | 2.82 | 3.73 | 3.36 | 2.36 | 2.91 | 2.92 |
| **Tornadoes** | 3.64 | 2.91 | 2.18 | 3.73 | 1.36 | 3.18 | 3.46 | 2.92 |
| **Wildfires** | 3.27 | 2.55 | 3.00 | 4.00 | 3.18 | 2.55 | 3.27 | 3.12 |

## 3.2 National Risk Index

The FEMA National Risk Index (NRI) offers a comprehensive composite score that quantifies the risk associated with 18 natural hazards at both the county and census tract levels in Nebraska. These hazards include avalanche, coastal flooding, cold wave, drought, earthquake, hail, heat wave, hurricane, ice storm, landslide, lightning, riverine flooding, strong wind, tornado, tsunami, volcanic activity, wildfire, and winter weather. The interactive NRI tool helps identify which Nebraska communities face the greatest threats by compiling data on expected annual losses for each hazard, along with measures of social vulnerability and community resilience.

The risk calculation behind the NRI is based on three key components. First, the natural hazards risk is represented by the expected annual loss (EAL), which estimates the yearly loss in building value, population, and agricultural assets due to natural events. Second, the consequence-enhancing component, or social vulnerability, evaluates demographic factors to gauge how susceptible various groups are to the impacts of natural hazards. Third, the consequence-reducing component, or community resilience, measures a community's capacity to prepare for, adapt to, withstand, and recover from these events. Together, social vulnerability and community resilience form the community risk factor (CRF), which is multiplied by the EAL to determine the overall risk.

Communities are then categorized into one of five qualitative risk levels ranging from "Very Low" to "Very High." Table 13 presents the overall risk for each county in Nebraska based on these calculations. The equations used are as follows:

#### EXPECTED ANNUAL LOSS

Expected Annual Loss = Exposure × Annualized Frequency × Historical Loss Ratio

#### RISK INDEX

Risk Index = Expected Annual Loss × Social Vulnerability / Community Resilience

**Table 13: National Risk Index for the Counties of Nebraska[74]**

| County | Expected Annual Loss | Social Vulnerability | Community Resilience | Overall Risk Rating |
|---|---|---|---|---|
| **Adams** | Relatively Low | Relatively Moderate | Relatively High | Relatively Low |
| **Antelope** | Very Low | Very Low | Relatively Moderate | Very Low |
| **Arthur** | Very Low | Very Low | Very Low | Very Low |
| **Banner** | Very Low | Very Low | Relatively Moderate | Very Low |
| **Blaine** | Very Low | Very Low | Very Low | Very Low |

[74] Federal Emergency Management Agency, "The National Risk Index." https://hazards.fema.gov/nri/.

| County | Expected Annual Loss | Social Vulnerability | Community Resilience | Overall Risk Rating |
|---|---|---|---|---|
| **Boone** | Very Low | Very Low | Very High | Very Low |
| **Box Butte** | Very Low | Relatively Moderate | Relatively Moderate | Very Low |
| **Boyd** | Very Low | Very Low | Relatively Moderate | Very Low |
| **Brown** | Very Low | Very Low | Relatively Moderate | Very Low |
| **Buffalo** | Relatively Low | Relatively Low | Relatively High | Relatively Low |
| **Burt** | Very Low | Relatively Low | Relatively Moderate | Very Low |
| **Butler** | Very Low | Very Low | Very High | Very Low |
| **Cass** | Very Low | Very Low | Very High | Very Low |
| **Cedar** | Very Low | Very Low | Relatively Moderate | Very Low |
| **Chase** | Very Low | Relatively Low | Very Low | Very Low |
| **Cherry** | Very Low | Very Low | Relatively Low | Very Low |
| **Cheyenne** | Very Low | Relatively Low | Relatively Moderate | Very Low |
| **Clay** | Relatively Low | Very Low | Relatively Moderate | Relatively Low |
| **Colfax** | Very Low | Relatively Low | Very Low | Very Low |
| **Cuming** | Very Low | Very Low | Relatively Moderate | Very Low |
| **Custer** | Very Low | Very Low | Relatively Low | Very Low |
| **Dakota** | Very Low | Relatively High | Very Low | Relatively Low |
| **Dawes** | Very Low | Relatively Low | Relatively Low | Very Low |
| **Dawson** | Relatively Low | Relatively High | Very Low | Relatively Low |
| **Deuel** | Very Low | Very Low | Relatively Moderate | Very Low |
| **Dixon** | Very Low | Relatively Low | Relatively Low | Very Low |
| **Dodge** | Relatively Low | Relatively High | Very High | Relatively Low |
| **Douglas** | Relatively High | Relatively High | Very High | Relatively High |
| **Dundy** | Very Low | Very Low | Very Low | Very Low |
| **Fillmore** | Relatively Low | Very Low | Relatively High | Relatively Low |
| **Franklin** | Very Low | Very Low | Relatively Moderate | Very Low |
| **Frontier** | Very Low | Very Low | Relatively Low | Very Low |
| **Furnas** | Relatively Low | Very Low | Relatively Moderate | Relatively Low |
| **Gage** | Relatively Low | Very Low | Relatively High | Relatively Low |
| **Garden** | Very Low | Very Low | Relatively Low | Very Low |
| **Garfield** | Very Low | Very Low | Relatively Moderate | Very Low |
| **Gosper** | Very Low | Very Low | Relatively Low | Very Low |
| **Grant** | Very Low | Relatively Low | Very Low | Very Low |

| County | Expected Annual Loss | Social Vulnerability | Community Resilience | Overall Risk Rating |
|---|---|---|---|---|
| **Greeley** | Very Low | Very Low | Relatively Moderate | Very Low |
| **Hall** | Relatively Low | Relatively High | Relatively High | Relatively Moderate |
| **Hamilton** | Relatively Low | Very Low | Very High | Relatively Low |
| **Harlan** | Very Low | Relatively Low | Relatively Low | Relatively Low |
| **Hayes** | Very Low | Very Low | Very Low | Very Low |
| **Hitchcock** | Very Low | Relatively Low | Very Low | Very Low |
| **Holt** | Very Low | Very Low | Relatively Moderate | Very Low |
| **Hooker** | Very Low | Very Low | Very Low | Very Low |
| **Howard** | Relatively Low | Very Low | Relatively Moderate | Relatively Low |
| **Jefferson** | Very Low | Relatively Low | Relatively Moderate | Very Low |
| **Johnson** | Very Low | Relatively Moderate | Relatively High | Very Low |
| **Kearney** | Relatively Low | Very Low | Relatively High | Relatively Low |
| **Keith** | Very Low | Relatively Low | Relatively Moderate | Very Low |
| **Keya Paha** | Very Low | Very Low | Relatively Low | Very Low |
| **Kimball** | Very Low | Relatively Moderate | Relatively Low | Very Low |
| **Knox** | Very Low | Relatively Low | Relatively Moderate | Very Low |
| **Lancaster** | Relatively Moderate | Relatively Low | Very High | Relatively Moderate |
| **Lincoln** | Relatively Low | Relatively Low | Relatively Moderate | Relatively Low |
| **Logan** | Very Low | Very Low | Very Low | Very Low |
| **Loup** | Very Low | Very Low | Relatively Moderate | Very Low |
| **Madison** | Relatively Low | Relatively Moderate | Relatively Moderate | Relatively Low |
| **McPherson** | Very Low | Very Low | Relatively High | Very Low |
| **Merrick** | Relatively Low | Relatively Low | Relatively High | Relatively Low |
| **Morrill** | Very Low | Relatively Low | Relatively Low | Very Low |
| **Nance** | Very Low | Very Low | Relatively High | Very Low |
| **Nemaha** | Very Low | Relatively Low | Relatively High | Very Low |
| **Nuckolls** | Very Low | Very Low | Relatively Moderate | Very Low |
| **Otoe** | Very Low | Relatively Low | Very High | Very Low |
| **Pawnee** | Very Low | Relatively Moderate | Relatively Moderate | Very Low |
| **Perkins** | Very Low | Very Low | Relatively Moderate | Very Low |
| **Phelps** | Relatively Low | Relatively Low | Relatively High | Relatively Low |
| **Pierce** | Very Low | Very Low | Relatively High | Very Low |

| County | Expected Annual Loss | Social Vulnerability | Community Resilience | Overall Risk Rating |
|---|---|---|---|---|
| **Platte** | Relatively Low | Relatively Low | Relatively High | Relatively Low |
| **Polk** | Relatively Low | Relatively Low | Relatively High | Relatively Low |
| **Red Willow** | Very Low | Relatively Low | Relatively Moderate | Very Low |
| **Richardson** | Very Low | Very Low | Relatively High | Very Low |
| **Rock** | Very Low | Very Low | Relatively Low | Very Low |
| **Saline** | Relatively Low | Relatively Moderate | Relatively Moderate | Relatively Low |
| **Sarpy** | Relatively Moderate | Very Low | Very High | Relatively Moderate |
| **Saunders** | Relatively Low | Very Low | Very High | Relatively Low |
| **Scotts Bluff** | Relatively Low | Relatively High | Relatively Moderate | Relatively Low |
| **Seward** | Relatively Low | Very Low | Very High | Relatively Low |
| **Sheridan** | Very Low | Relatively Moderate | Relatively Low | Very Low |
| **Sherman** | Very Low | Very Low | Relatively Moderate | Very Low |
| **Sioux** | Very Low | Relatively Low | Very Low | Very Low |
| **Stanton** | Very Low | Very Low | Relatively Moderate | Very Low |
| **Thayer** | Relatively Low | Very Low | Relatively Moderate | Relatively Low |
| **Thomas** | Very Low | Very Low | Relatively Moderate | Very Low |
| **Thurston** | Very Low | Relatively High | Relatively Low | Very Low |
| **Valley** | Very Low | Very Low | Relatively Moderate | Very Low |
| **Washington** | Relatively Low | Very Low | Very High | Relatively Low |
| **Wayne** | Very Low | Very Low | Very High | Very Low |
| **Webster** | Relatively Low | Very Low | Relatively High | Relatively Low |
| **Wheeler** | Very Low | Very Low | Relatively Low | Very Low |
| **York** | Relatively Low | Very Low | Very High | Relatively Low |

## 3.3 Disaster Declarations

Nebraska has experienced a wide range of natural disasters over the years, including floods, tornadoes, severe storms, wildfires, ice storms, droughts, snow events, and biological disasters. Historical records indicate that flooding has been one of the most recurring and impactful hazards, with major flood-related disaster declarations occurring throughout the 1960s, 1970s, 1990s, and 2000s. Notably, the 2019 floods resulted in nearly $100 million in public assistance funding, making it one of the costliest flood events in recent history. Severe storms, including tornadoes and high winds, have also posed significant threats, with multiple large-scale events requiring disaster declarations, such as the 2008, 2010, and 2022 storms, which each resulted in millions of dollars in recovery costs.

In addition to storms and flooding, Nebraska has faced other extreme weather events, including severe ice storms, major snowfalls, and prolonged droughts. Ice storms in 1976 and 2008, as well as blizzards in 1994 and 2018, caused significant disruptions and damage across multiple counties. Wildfires have also prompted emergency declarations, with fire-related disaster declarations occurring in 2006, 2012, 2022, and 2023, some requiring substantial public assistance funding. The COVID-19 pandemic in 2020 led to a biological disaster declaration covering all 93 counties, though it involved comparatively low federal assistance. Recent disaster declarations in 2024 continue to reflect the state's vulnerability to severe storms, underscoring the ongoing need for mitigation strategies, emergency preparedness, and resilient infrastructure investments to reduce the impact of future disasters. Table 14 displays the presidential disaster declarations for the state of Nebraska.

**Table 14: Presidential Disaster Declarations for the State of Nebraska [75]**

| Disaster | Year | Type | Disaster Type | Total Counties | Public Assistance Funds |
|---|---|---|---|---|---|
| **98** | 1960 | DR | Flood | 0 | N/A |
| **131** | 1962 | DR | Flood | 0 | N/A |
| **134** | 1962 | DR | Flood | 0 | N/A |
| **156** | 1963 | DR | Flood | 0 | N/A |
| **174** | 1964 | DR | Flood | 0 | N/A |
| **221** | 1966 | DR | Flood | 8 | N/A |
| **228** | 1967 | DR | Flood | 56 | N/A |
| **303** | 1971 | DR | Flood | 19 | N/A |
| **308** | 1971 | DR | Flood | 9 | N/A |
| **406** | 1973 | DR | Flood | 15 | N/A |
| **467** | 1975 | DR | Tornado | 2 | N/A |
| **500** | 1976 | DR | Severe Ice Storm | 20 | N/A |
| **3022** | 1977 | EM | Drought | 2 | N/A |
| **552** | 1978 | DR | Flood | 21 | N/A |
| **625** | 1980 | DR | Tornado | 3 | N/A |
| **716** | 1984 | DR | Tornado | 24 | N/A |
| **718** | 1984 | DR | Tornado | 1 | N/A |
| **873** | 1990 | DR | Severe Storm | 23 | N/A |
| **908** | 1991 | DR | Flood | 7 | N/A |
| **954** | 1992 | DR | Flood | 8 | N/A |
| **983** | 1993 | DR | Flood | 13 | N/A |

[75] Federal Emergency Management Agency, "Disaster Declarations for States and Counties." https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties.

| Disaster | Year | Type | Disaster Type | Total Counties | Public Assistance Funds |
|---|---|---|---|---|---|
| **998** | 1993 | DR | Flood | 52 | N/A |
| **1027** | 1994 | DR | Snow | 15 | N/A |
| **1123** | 1996 | DR | Severe Storm | 4 | N/A |
| **1190** | 1997 | DR | Severe Storm | 39 | N/A |
| **1286** | 1999 | DR | Severe Storm | 3 | $2,083,481.55 |
| **1373** | 2001 | DR | Severe Storm | 28 | $2,980,398.88 |
| **1394** | 2001 | DR | Severe Storm | 1 | $1,412,395.20 |
| **1480** | 2003 | DR | Severe Storm | 19 | $3,885,476.77 |
| **1517** | 2004 | DR | Severe Storm | 39 | $13,346,024.52 |
| **3245** | 2005 | EM | Hurricane | 93 | $393,813.27 |
| **1590** | 2005 | DR | Severe Storm | 11 | $1,688,473.78 |
| **1627** | 2006 | DR | Severe Storm | 29 | $5,444,137.27 |
| **2655** | 2006 | FM | Fire | 1 | N/A |
| **2660** | 2006 | FM | Fire | 1 | N/A |
| **2661** | 2006 | FM | Fire | 1 | N/A |
| **1674** | 2007 | DR | Severe Storm | 59 | $124,200,713.40 |
| **1706** | 2007 | DR | Severe Storm | 19 | $6,080,866.27 |
| **1714** | 2007 | DR | Severe Storm | 15 | $2,299,628.10 |
| **1721** | 2007 | DR | Severe Storm | 6 | $1,312,491.56 |
| **1739** | 2008 | DR | Severe Ice Storm | 8 | $2,891,172.04 |
| **1765** | 2008 | DR | Severe Storm | 5 | $492,125.86 |
| **1770** | 2008 | DR | Severe Storm | 62 | $36,096,137.77 |
| **1779** | 2008 | DR | Severe Storm | 4 | $12,046,925.54 |
| **1853** | 2009 | DR | Severe Storm | 17 | $4,457,575.56 |
| **1864** | 2010 | DR | Severe Storm | 7 | $5,106,763.94 |
| **1878** | 2010 | DR | Severe Storm | 58 | $6,473,921.01 |
| **1902** | 2010 | DR | Flood | 37 | $3,065,081.07 |
| **1924** | 2010 | DR | Severe Storm | 61 | $49,445,680.57 |
| **1945** | 2010 | DR | Severe Storm | 7 | $2,130,597.69 |
| **2900** | 2011 | FM | Fire | 1 | N/A |
| **3323** | 2011 | EM | Flood | 18 | N/A |
| **4013** | 2011 | DR | Flood | 16 | $62,444,842.87 |
| **4014** | 2011 | DR | Severe Storm | 12 | $3,344,622.68 |

| Disaster | Year | Type | Disaster Type | Total Counties | Public Assistance Funds |
|---|---|---|---|---|---|
| **5009** | 2012 | FM | Fire | 3 | $5,281,075.21 |
| **4156** | 2014 | DR | Severe Storm | 10 | $2,635,144.54 |
| **4179** | 2014 | DR | Tornado | 6 | $9,791,526.92 |
| **4183** | 2014 | DR | Severe Storm | 12 | $12,068,631.73 |
| **4185** | 2014 | DR | Severe Storm | 12 | $3,782,612.09 |
| **4225** | 2015 | DR | Severe Storm | 28 | $14,048,389.09 |
| **4321** | 2017 | DR | Severe Storm | 10 | $2,653,292.90 |
| **4325** | 2017 | DR | Severe Storm | 20 | $14,831,929.54 |
| **4375** | 2018 | DR | Snow | 30 | $4,207,723.46 |
| **4387** | 2018 | DR | Severe Storm | 11 | $393,627.19 |
| **4420** | 2019 | DR | Flood | | $99,774,858 |
| **4446** | 2019 | DR | Flood | | $995,061 |
| **4521** | 2020 | DR | Biological | 93 | $25,817 |
| **3488** | 2020 | EM | Biological | 93 | $8,685 |
| **4616** | 2021 | DR | Severe Storm | 14 | $28,507,974 |
| **4641** | 2022 | DR | Severe Storm | 25 | $8,952,643 |
| **4662** | 2022 | DR | Severe Storm | 20 | $10,031,362 |
| **5436** | 2022 | FM | Fire | 3 | $1,472,313 |
| **5462** | 2023 | FM | Fire | 1 | N/A |
| **4778** | 2024 | DR | Severe Storm | 6 | $960,254 |
| **4786** | 2024 | DR | Severe Storm | 8 | N/A |
| **4808** | 2024 | DR | Severe Storm | 19 | N/A |
| **4822** | 2024 | DR | Severe Storm | 17 | N/A |
| **4838** | 2024 | DR | Severe Storm | 5 | N/A |

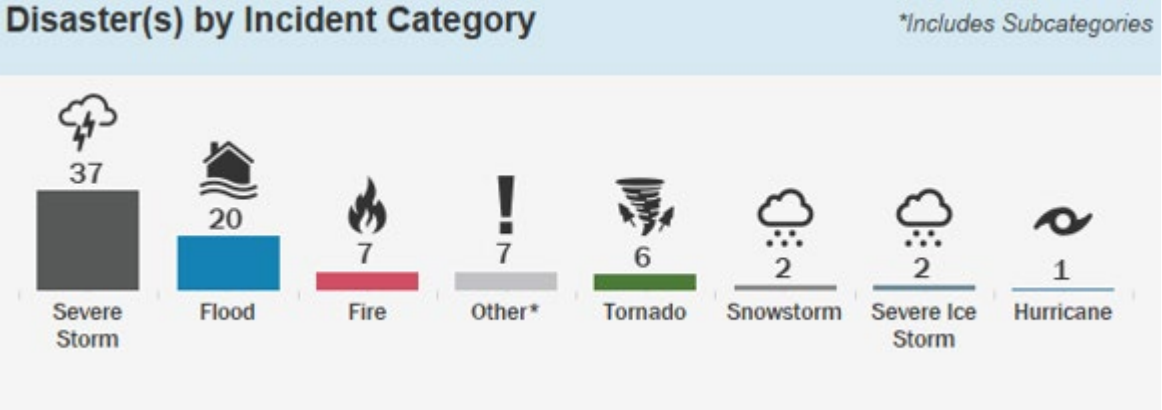



Figure 33: Presidential Disaster Declarations for the State of Nebraska by Disaster Type[76]

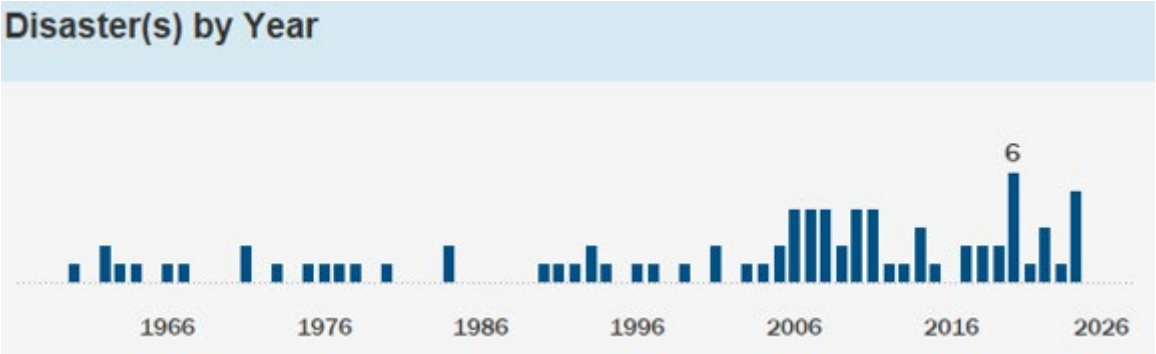



Figure 34: Total Presidential Disaster Declarations Yearly Totals for the State of Nebraska

[76] Federal Emergency Management Agency, "Disaster Declarations for States and Counties." https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties.

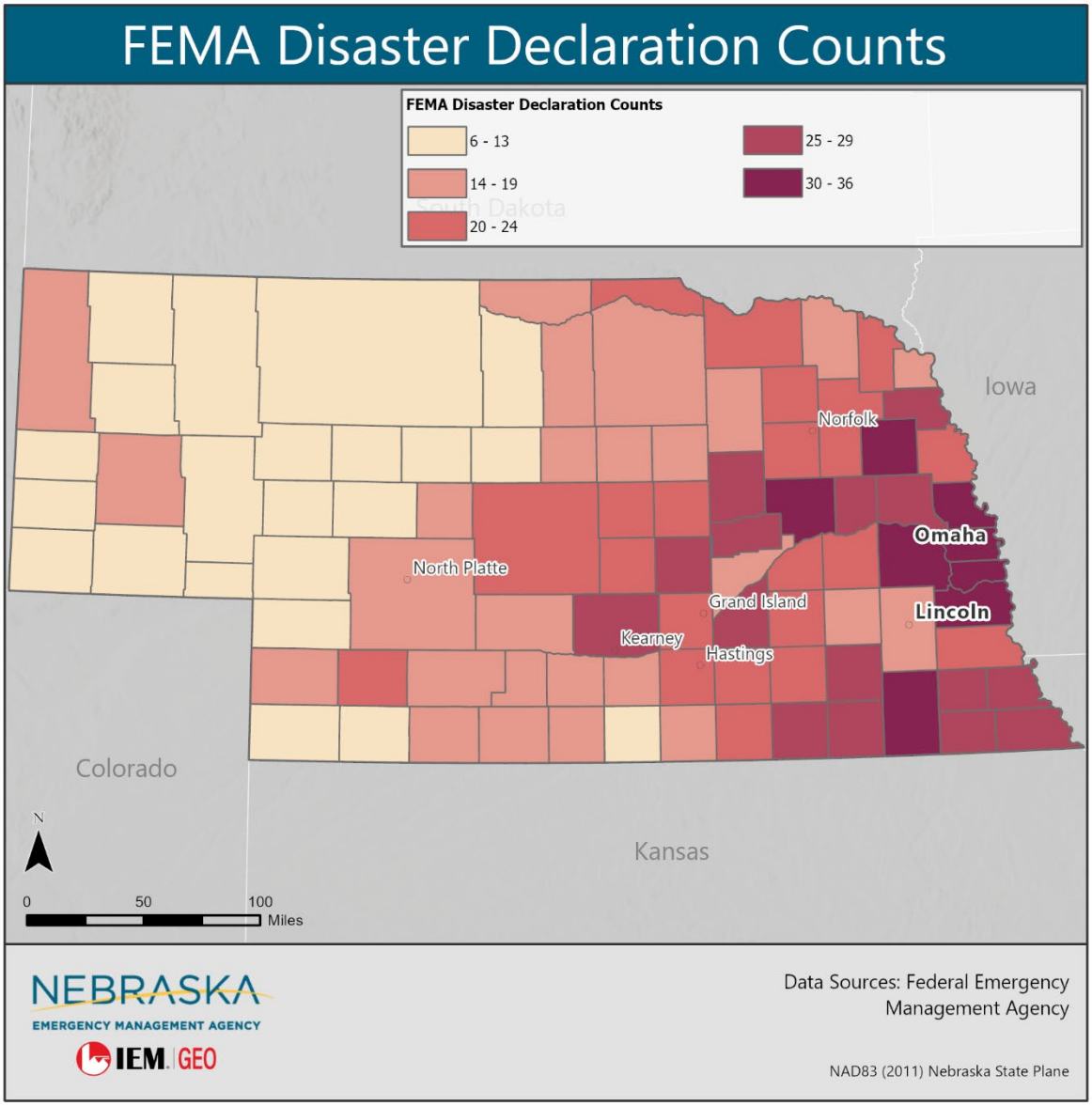



**Figure 35: FEMA Historical Declaration Count**

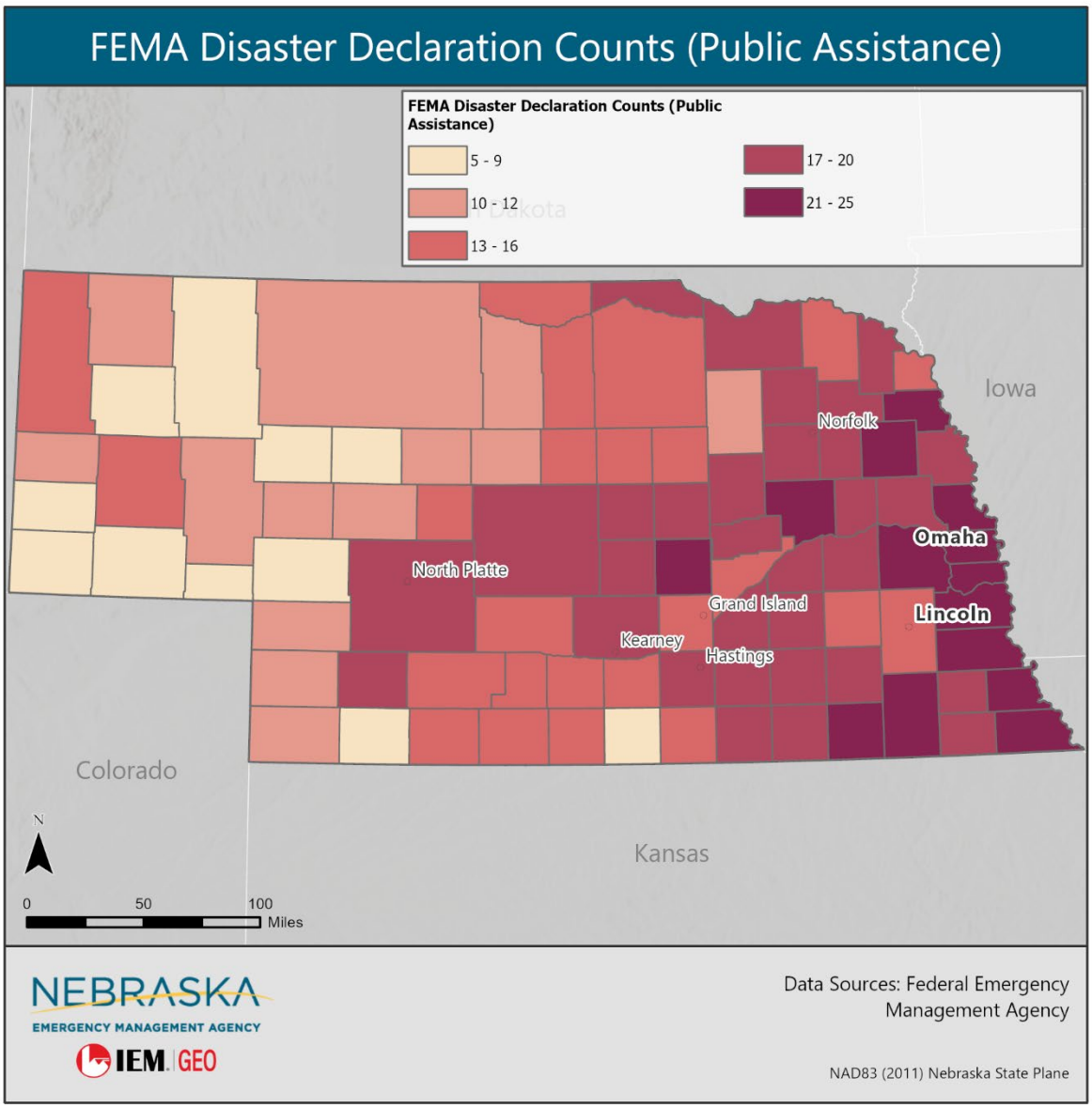



**Figure 36: FEMA Historical Declaration Count (Public Assistance)**

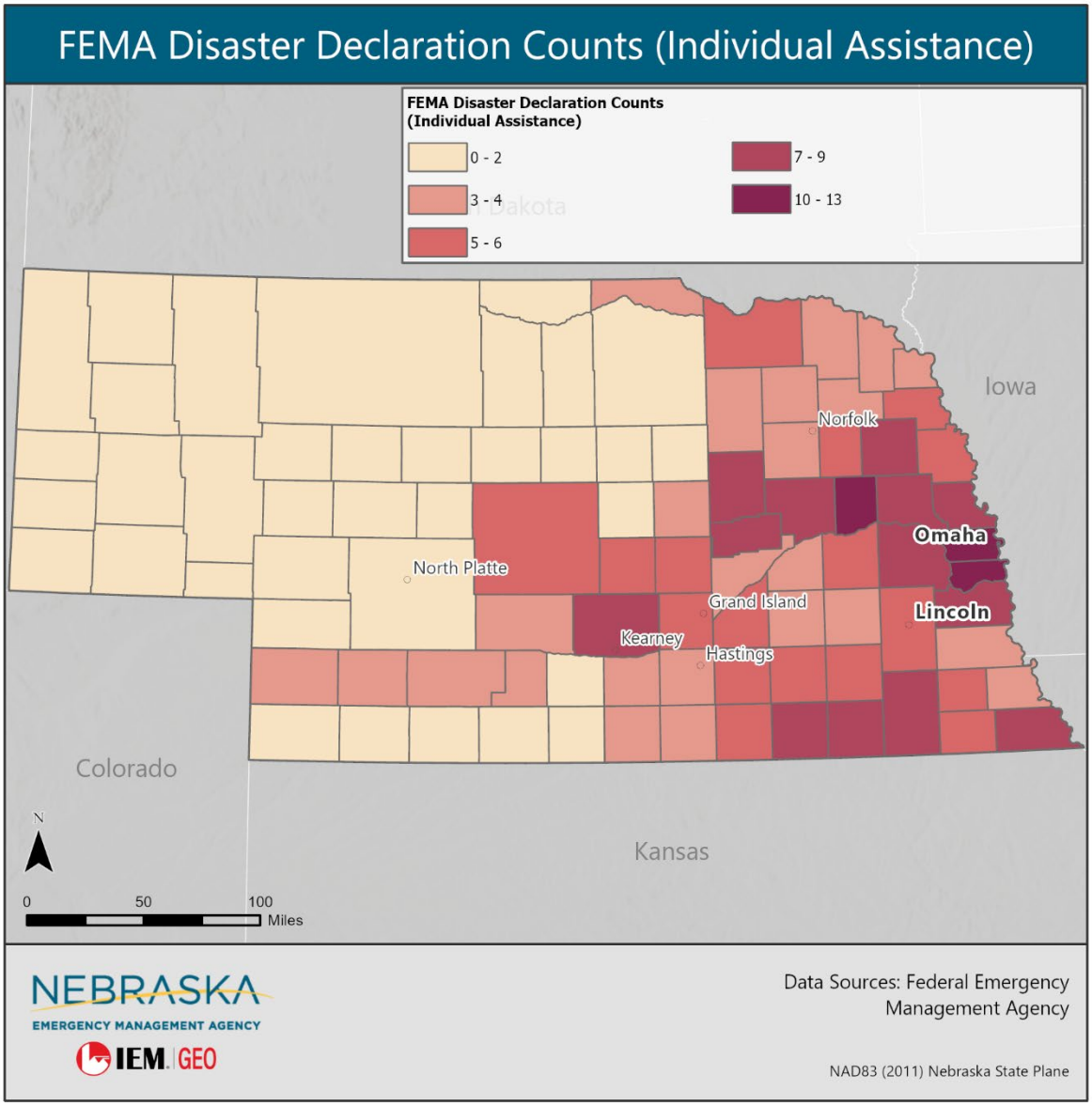



**Figure 37: FEMA Historical Declaration Count (Individual Assistance)**

## 3.4 Risk Assessment Overview

This section evaluates the various hazard risks that affect Nebraska, providing a framework for developing mitigation strategies for each hazard. By identifying and categorizing natural, technological, and human-caused hazards, this assessment examines their geographic extent, historical occurrences, probability of future events, and potential impacts influenced by future variability. The hazard risk assessment process involves the following steps:

I. Profiling and describing each hazard, including the following:
   A. Areas most at risk
   B. Historical occurrences with probability and frequency estimates at the state, regional, and county levels
   C. Influence of climate trends on hazard severity and frequency

II. Determining community exposure to hazards, which includes overlaying hazard maps with critical infrastructure, facilities, and essential systems to assess vulnerability.

# 3.5 Vulnerability Analysis Overview

A vulnerability analysis allows the planning team to both quantify and qualify the exposure of assets to specific hazards and to assess how diverse threats impact human life, property, built infrastructure, natural resources, and critical state operations in Nebraska. In this context, vulnerability is defined as the inherent characteristics of a system—encompassing physical, technical, organizational, and cultural dimensions—that increase its susceptibility to harm or damage. For instance, this analysis can identify geographic areas that incur disproportionate damage compared with other regions or evaluate the overall exposure of Nebraska to hazards such as terrorism. By systematically identifying and understanding vulnerabilities related to each threat, decision-makers can establish a robust foundation for the development and implementation of targeted mitigation strategies.

## 3.5.1 Consequence Analysis

A comprehensive consequence and vulnerability evaluation was undertaken in accordance with Emergency Management Standard 4.1.2 of the Emergency Management Accreditation Program (EMAP) to assign vulnerability scores to hazards. This analysis considered impacts across multiple dimensions, including effects on the public, emergency responders, continuity of operations, critical property, facilities and infrastructure, the natural environment, state economic conditions, and public confidence in governmental performance. Both qualitative and quantitative methods were employed to generate an overall consequence and vulnerability ranking—categorized as Low, Medium, High, or Very High—that was integrated into the vulnerability component of the enhanced priority risk index. The overall vulnerability for each sector was calculated using the weighted formula:

**OVERALL VULNERABILITY**

Vulnerability = [(Public × 0.15) + (Responders × 0.15) + (Continuity of Operations × 0.15) + (Property, Facilities, and Infrastructure × 0.15) + (Environment × 0.15) + (Economic Condition × 0.15) + (Public Confidence × 0.10)].

**Table 15: Summary of the Vulnerability Criteria for the Emergency Management Accreditation Program**

| Category | Description |
|---|---|
| **Very High (4)** | Catastrophic impact on the sector. Extremely high number of deaths and/or injuries possible. More than 50% of property impacted. Completed shutdown of critical operations for 30 days or more. Between 50% and 100% of the area possibly impacted. |
| **High (3)** | High impact on the sector. Multiple deaths and injuries possible. More than 25% of property impacted. Between 10% and 50% of the area possibly impacted. |
| **Medium (2)** | Minimal impact on the sector. Minor injuries only. More than 10% of property impacted. Between 1% and 10% of the area possibly impacted. |
| **Low (1)** | Little to no impact on the sector. Minor injuries, damage, and/or disruptions to services. Less than 1% of the area impacted. |

## 3.6 Community Lifelines

FEMA's community lifelines framework represents a critical component of Nebraska's hazard mitigation strategy, serving to identify and safeguard the essential services and infrastructure that underpin community resilience. These lifelines encompass sectors such as safety and security, food, water, shelter, health and medical services, energy, communications, transportation, and hazardous material response. By focusing on these fundamental areas, the framework guides local and state agencies in assessing vulnerabilities and prioritizing investments to ensure that communities can maintain core functions during and after a disaster.

Integrating community lifelines into the Nebraska hazard mitigation plan enables a systematic evaluation of critical infrastructure and services, facilitating the development of targeted mitigation measures. This approach not only supports rapid recovery and continuity of operations in the wake of disruptive events but also strengthens overall community resilience. By emphasizing the protection and rapid restoration of these vital lifelines, Nebraska's plan aims to minimize economic losses, enhance public safety, and preserve the quality of life for its residents.

## 3.7 State Assets

Table 16 and Figure 38 through Figure 41 provide a breakdown for the number of assets per county and values pertaining to the assets.

Table 16: Total State Assets by County

| County | Number of Properties | Insurance Value | Content Insurance | Total Value | Replacement Cost |
|---|---|---|---|---|---|
| Adams | 6 | $10,000.00 | $130,574.00 | $10,886,733.63 | $10,886,733.63 |
| Antelope | 8 | $0 | $109,998.08 | $7,311,848.77 | $7,311,848.77 |
| Arthur | 2 | $0 | $0 | $238,383.74 | $238,383.74 |
| Banner | 2 | $0 | $0 | $899,732.64 | $899,732.64 |
| Blaine | 0 | $0 | $26,250 | $0 | $0 |
| Boone | 7 | $0 | $1.00 | $1,267,516.84 | $1,267,516.84 |
| Box Butte | 4 | $15,000.00 | $940,887.60 | $4,977,452.77 | $4,977,452.77 |
| Boyd | 6 | $0 | $0 | $1,691,988.31 | $1,691,988.31 |
| Brown | 23 | $0 | $0 | $4,236,570.49 | $4,236,570.49 |
| Buffalo | 4 | $6,447,796.53 | $12,095,960.45 | $210,296,611.33 | $210,296,611.33 |
| Burt | 2 | $0 | $10,446.33 | $1,784,677.74 | $1,784,677.74 |
| Butler | 14 | $0 | $0 | $1,455,370.11 | $1,455,370.11 |
| Cass | 5 | $0 | $1,494,524.01 | $104,597,717.56 | $104,597,717.56 |
| Cedar | 3 | $0 | $0 | $3,082,534.41 | $3,082,534.41 |
| Chase | 15 | $0 | $12,811.60 | $2,957,361.57 | $2,957,361.57 |
| Cherry | 6 | $0 | $3,878,303.84 | $16,602,850.99 | $16,602,850.99 |
| Cheyenne | 4 | $1,548,753.30 | $394,034.00 | $4,937,256.31 | $4,937,256.31 |
| Clay | 4 | $0 | $335,010.01 | $7,741,188.58 | $7,741,188.58 |
| Colfax | 4 | $0 | $0 | $917,354.48 | $917,354.48 |
| Cuming | 10 | $0 | $236,175.00 | $1,572,637.78 | $1,572,637.78 |
| Custer | 2 | $1,586,748.38 | $96,224.24 | $7,596,351.08 | $7,596,351.08 |
| Dakota | 11 | $0 | $30,792.00 | $4,746,184.91 | $4,746,184.91 |
| Dawes | 7 | $1,279,930.92 | $1,127,495.94 | $97,713,763.12 | $97,713,763.12 |
| Dawson | 4 | $0 | $82,186.00 | $5,337,571.39 | $5,337,571.39 |
| Deuel | 7 | $0 | $0 | $3,746,981.93 | $3,746,981.93 |
| Dixon | 8 | $0.03 | $604,034.00 | $38,705,273.30 | $38,705,273.30 |
| Dodge | 23 | $0 | $691,471.01 | $10,360,884.31 | $10,360,884.31 |
| Douglas | 4 | $117,350,452.25 | $31,371,276.36 | $81,423,949.71 | $81,423,949.71 |
| Dundy | 5 | $0 | $94,781.79 | $6,170,027.10 | $6,170,027.10 |
| Fillmore | 1 | $0 | $1,151,515.01 | $9,535,636.51 | $9,535,636.51 |
| Franklin | 8 | $0 | $0 | $269,919.59 | $269,919.59 |

| County | Number of Properties | Insurance Value | Content Insurance | Total Value | Replacement Cost |
|---|---|---|---|---|---|
| **Frontier** | 2 | $0 | $20,000.00 | $5,407,771.40 | $5,407,771.40 |
| **Furnas** | 6 | $0 | $334,150.00 | $956,965.59 | $956,965.59 |
| **Gage** | 2 | $7,106,900.11 | $709,783.11 | $90,815,986.75 | $90,815,986.75 |
| **Garden** | 4 | $0 | $54,393.00 | $5,695,642.49 | $5,695,642.49 |
| **Garfield** | 3 | $0 | $4,814.00 | $10,883,934.65 | $10,883,934.65 |
| **Gosper** | 2 | $0 | $0 | $3,658,785.60 | $3,658,785.60 |
| **Grant** | 2 | $0 | $0 | $555,352.79 | $555,352.79 |
| **Greeley** | 16 | $0 | $0 | $708,767.77 | $708,767.77 |
| **Hall** | 2 | $7,321,520.12 | $2,719,927.05 | $10,634,654.02 | $10,634,654.02 |
| **Hamilton** | 1 | $0 | $3,817,995.64 | $8,084,098.34 | $8,084,098.34 |
| **Harlan** | 1 | $0 | $0 | $893,653.05 | $893,653.05 |
| **Hayes** | 4 | $0 | $0 | $3,439,751.06 | $3,439,751.06 |
| **Hitchcock** | 7 | $0 | $112,421.54 | $2,557,156.87 | $2,557,156.87 |
| **Holt** | 2 | $0.01 | $16,968.00 | $5,261,957.20 | $5,261,957.20 |
| **Hooker** | 3 | $0 | $0 | $2,048,793.32 | $2,048,793.32 |
| **Howard** | 5 | $0 | $0 | $3,773,559.85 | $3,773,559.85 |
| **Jefferson** | 5 | $0 | $315,000.00 | $5,170,816.38 | $5,170,816.38 |
| **Johnson** | 3 | $157,136,447.60 | $29,311,746.79 | $3,184,780.71 | $3,184,780.71 |
| **Kearney** | 9 | $0 | $162,500.00 | $4,682,184.28 | $4,682,184.28 |
| **Keith** | 2 | $0 | $546,985.00 | $12,627,962.53 | $12,627,962.53 |
| **Keya Paha** | 1 | $0 | $0 | $1,098,970.51 | $1,098,970.51 |
| **Kimball** | 11 | $0 | $0 | $1,399,428.81 | $1,399,428.81 |
| **Knox** | 66 | $0 | $72,578.74 | $16,516,470.10 | $16,516,470.10 |
| **Lancaster** | 30 | $327,401,528.89 | $419,606,538.12 | $867,395,761.25 | $867,395,761.25 |
| **Lincoln** | 2 | $2,663,151.16 | $5,678,855.10 | $50,290,292.43 | $50,290,292.43 |
| **Logan** | 4 | $0 | $0 | $2,789,145.01 | $2,789,145.01 |
| **Loup** | 9 | $0 | $0 | $3,277,795.89 | $3,277,795.89 |
| **Madison** | 1 | $1,513,417.05 | $7,697,868.38 | $90,281,538.19 | $90,281,538.19 |
| **McPherson** | 2 | $0 | $0 | $66,000.00 | $66,000.00 |
| **Merrick** | 7 | $0 | $0 | $1,304,280.75 | $1,304,280.75 |
| **Morrill** | 2 | $0 | $7,944,208.61 | $12,322,202.90 | $12,322,202.90 |
| **Nance** | 3 | $0 | $0 | $2,577,554.46 | $2,577,554.46 |
| **Nemaha** | 2 | $0 | $0 | $1,539,893.83 | $1,539,893.83 |

| County | Number of Properties | Insurance Value | Content Insurance | Total Value | Replacement Cost |
|---|---|---|---|---|---|
| **Nuckolls** | 9 | $0 | $0 | $3,113,667.35 | $3,113,667.35 |
| **Otoe** | 4 | $0 | $181,359.00 | $37,934,660.21 | $37,934,660.21 |
| **Pawnee** | 2 | $0 | $450,861.05 | $1,362,516.32 | $1,362,516.32 |
| **Perkins** | 3 | $0 | $0 | $1,564,795.80 | $1,564,795.80 |
| **Phelps** | 3 | $0 | $3,544,717.10 | $11,605,394.63 | $11,605,394.63 |
| **Pierce** | 5 | $0 | $0 | $1,920,929.23 | $1,920,929.23 |
| **Platte** | 2 | $3,931,727.22 | $328,996.01 | $2,665,396.29 | $2,665,396.29 |
| **Polk** | 7 | $0 | $0 | $1,009,358.05 | $1,009,358.05 |
| **Red Willow** | 6 | $16,627,008.84 | $4,492,327.43 | $4,143,570.80 | $4,143,570.80 |
| **Richardson** | 4 | $0 | $753,077.32 | $6,565,579.77 | $6,565,579.77 |
| **Rock** | 3 | $0 | $6,722,061.16 | $8,799,830.26 | $8,799,830.26 |
| **Saline** | 7 | $0 | $1.00 | $2,145,262.59 | $2,145,262.59 |
| **Sarpy** | 7 | $0 | $6,034,482.01 | $57,451,591.35 | $57,451,591.35 |
| **Saunders** | 13 | $1,452,945.83 | $3,285,932.60 | $10,857,986.31 | $10,857,986.31 |
| **Scotts Bluff** | 3 | $3,566,521.39 | $6,374,471.00 | $49,339,247.07 | $49,339,247.07 |
| **Seward** | 4 | $0 | $0 | $3,000,563.26 | $3,000,563.26 |
| **Sheridan** | 4 | $0 | $0 | $4,151,440.40 | $4,151,440.40 |
| **Sherman** | 3 | $0 | $27,000.00 | $2,781,102.61 | $2,781,102.61 |
| **Sioux** | 1 | $0 | $48,613.50 | $3,117,827.81 | $3,117,827.81 |
| **Stanton** | 5 | $0 | $0 | $15,602.42 | $15,602.42 |
| **Thayer** | 1 | $0 | $18,475.00 | $4,358,715.44 | $4,358,715.44 |
| **Thomas** | 3 | $0 | $0 | $924,122.58 | $924,122.58 |
| **Thurston** | 3 | $0 | $277,200.00 | $7,584,984.30 | $7,584,984.30 |
| **Valley** | 5 | $0 | $120,457.00 | $10,440,727.13 | $10,440,727.13 |
| **Washington** | 2 | $1,260,592.51 | $3,465,719.02 | $5,162,640.65 | $5,162,640.65 |
| **Wayne** | 2 | $0 | $0 | $663,989.11 | $663,989.11 |
| **Webster** | 6 | $0 | $0 | $697,760.32 | $697,760.32 |
| **Wheeler** | 7 | $44,001,334.93 | $10,724,046.94 | $2,583,521.44 | $2,583,521.44 |
| **York** | 4 | $0 | $1.00 | $1,267,516.84 | $1,267,516.84 |

Table 16 presents county-level data on property insurance metrics, including the number of insured properties, insurance values, content insurance, total property value, and replacement cost. Data vary considerably across counties, with some recording zero values for certain metrics while others exhibit substantial financial figures. For instance, while counties like Adams and Antelope report relatively

modest total values and replacement costs in the range of $7–$10 million, other counties such as Lancaster and Douglas show total values and replacement costs in excess of $80 million and $860 million, respectively. The table also highlights discrepancies in the number of properties insured, which, combined with varying insurance and content values, indicate diverse risk profiles and asset distributions across the region.

Notable outliers include counties with exceptionally high insurance values or replacement costs, suggesting significant exposure and asset concentration in those areas. For example, Douglas County exhibits high insurance and content insurance values relative to its total insured properties, while Lancaster County's replacement cost far exceeds that of many other counties, underscoring the economic importance and complexity of its insured assets.

Vulnerabilities to natural and technological hazards are multifaceted in these regions. Environmental hazards, including dam failure, levee failure, flood/flash flood events, and drought, pose a direct threat to counties with concentrated high-value assets. Similarly, meteorological hazards—severe thunderstorms, severe winter storms, tornadoes, and extreme temperatures—can disrupt critical infrastructure and lead to widespread property damage. Wildfires, which are influenced by climatic conditions, further exacerbate risks in areas where high replacement costs and dense asset clusters are present. In addition, hazards such as power and infrastructure failure and chemical and radiological incidents (both at fixed sites and during transportation) could significantly impair economic and social functions, particularly in counties with inadequate insurance penetration.

Agricultural and public health hazards also contribute to the overall vulnerability profile. Animal disease, plant disease, and pests, compounded by drought conditions, can severely affect agricultural productivity—a key economic component in many rural counties. Moreover, human infectious diseases and terrorism represent non-environmental threats that, while less directly linked to the property values captured in the dataset, have the potential to disrupt economic stability and public health services. Collectively, these hazards underscore the need for comprehensive risk management and mitigation strategies that integrate infrastructure resilience, enhanced insurance coverage, and targeted public health preparedness to protect communities from a diverse array of threats.

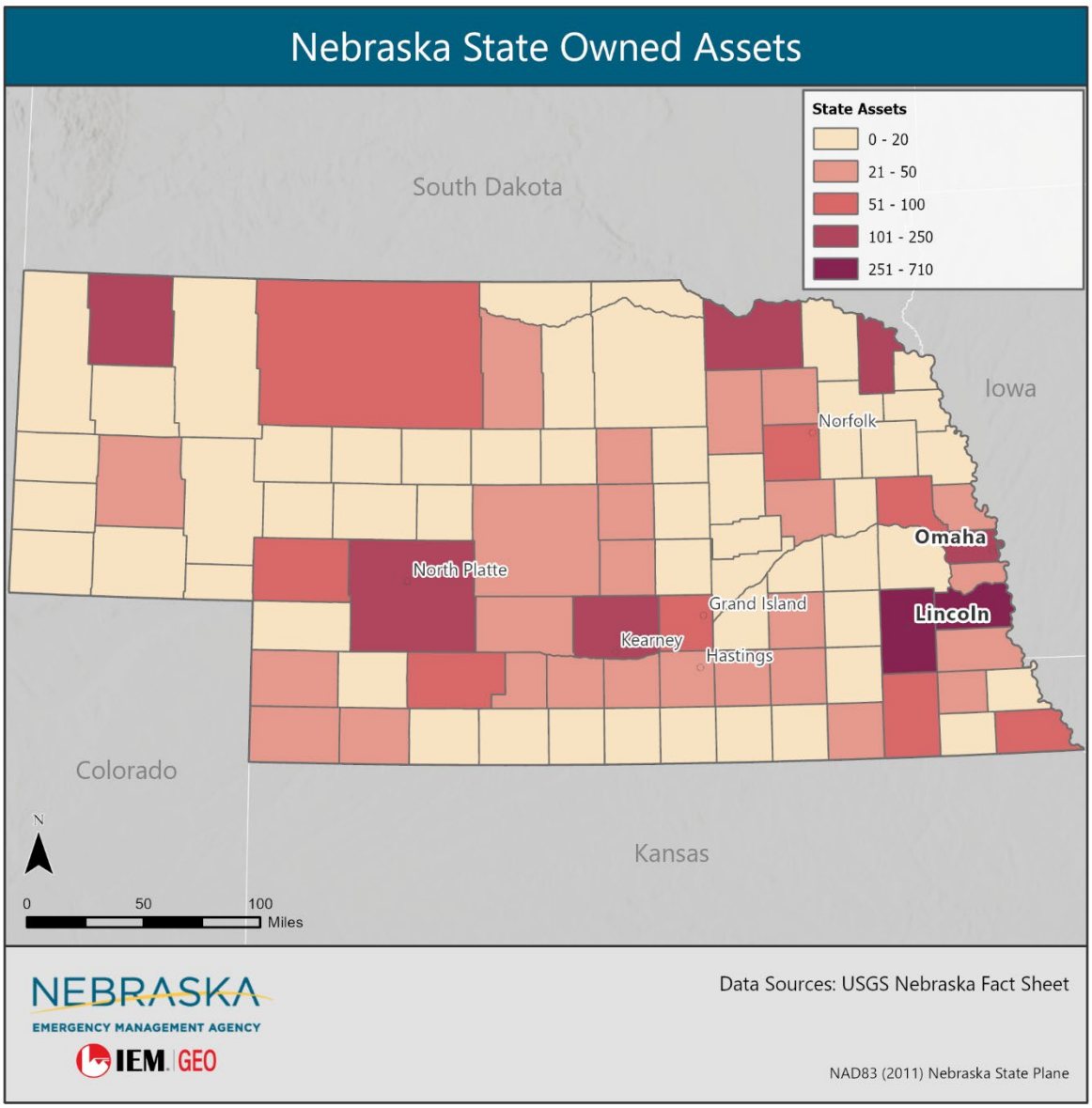



**Figure 38: Nebraska State-Owned Assets**

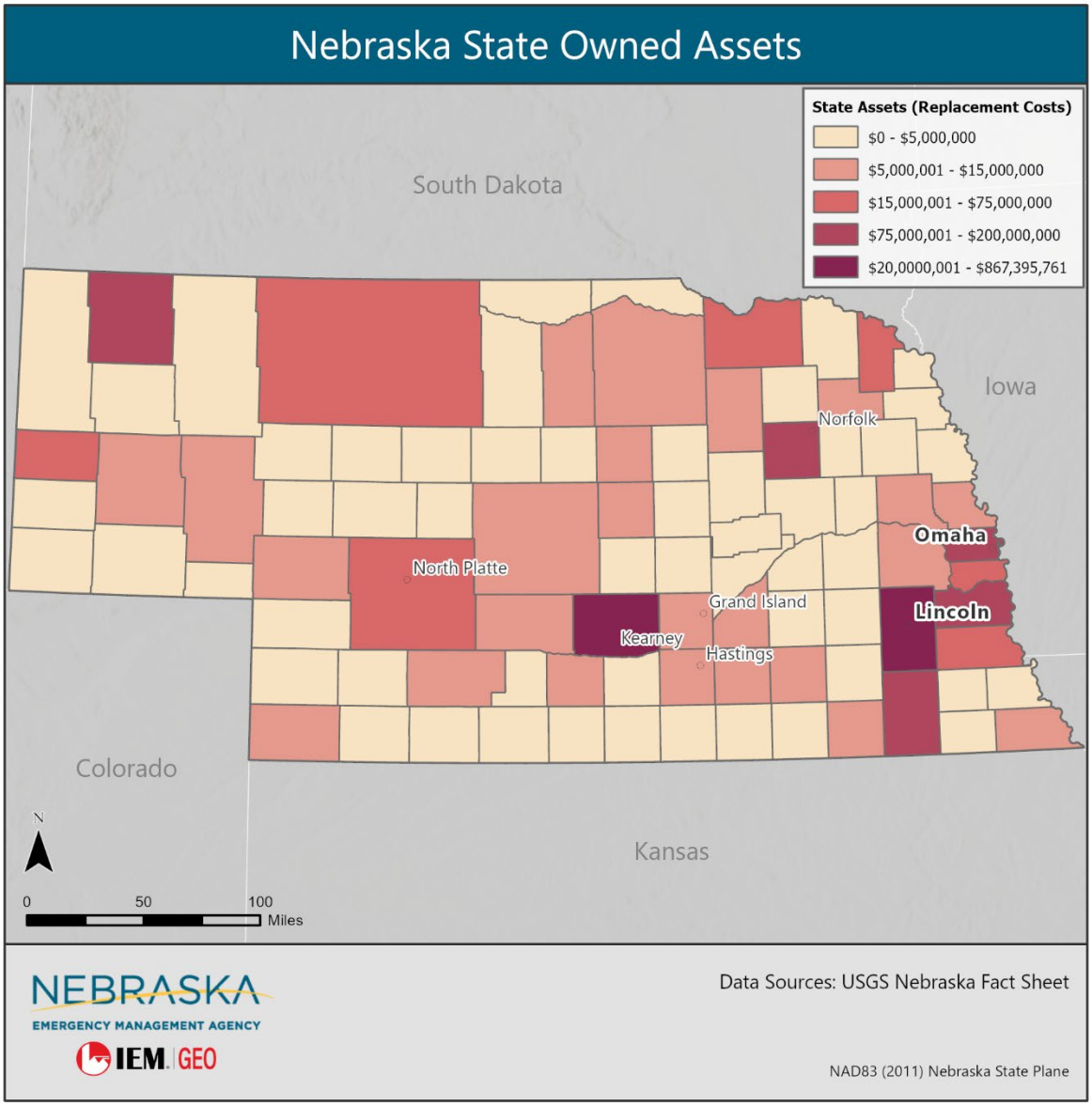



**Figure 39: Nebraska Counties by Replacement Cost**

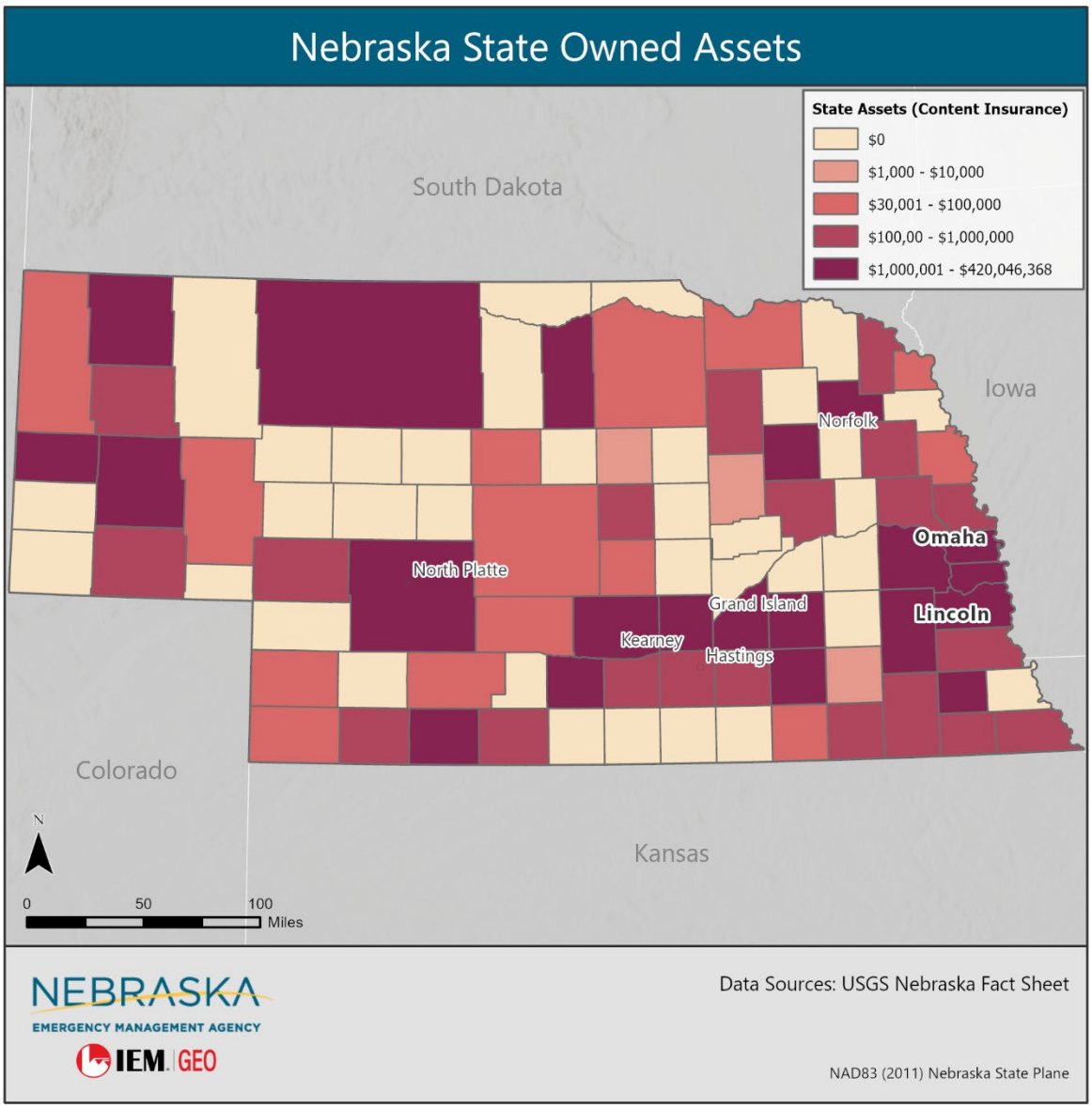



**Figure 40: Nebraska Counties by Content Insurance**

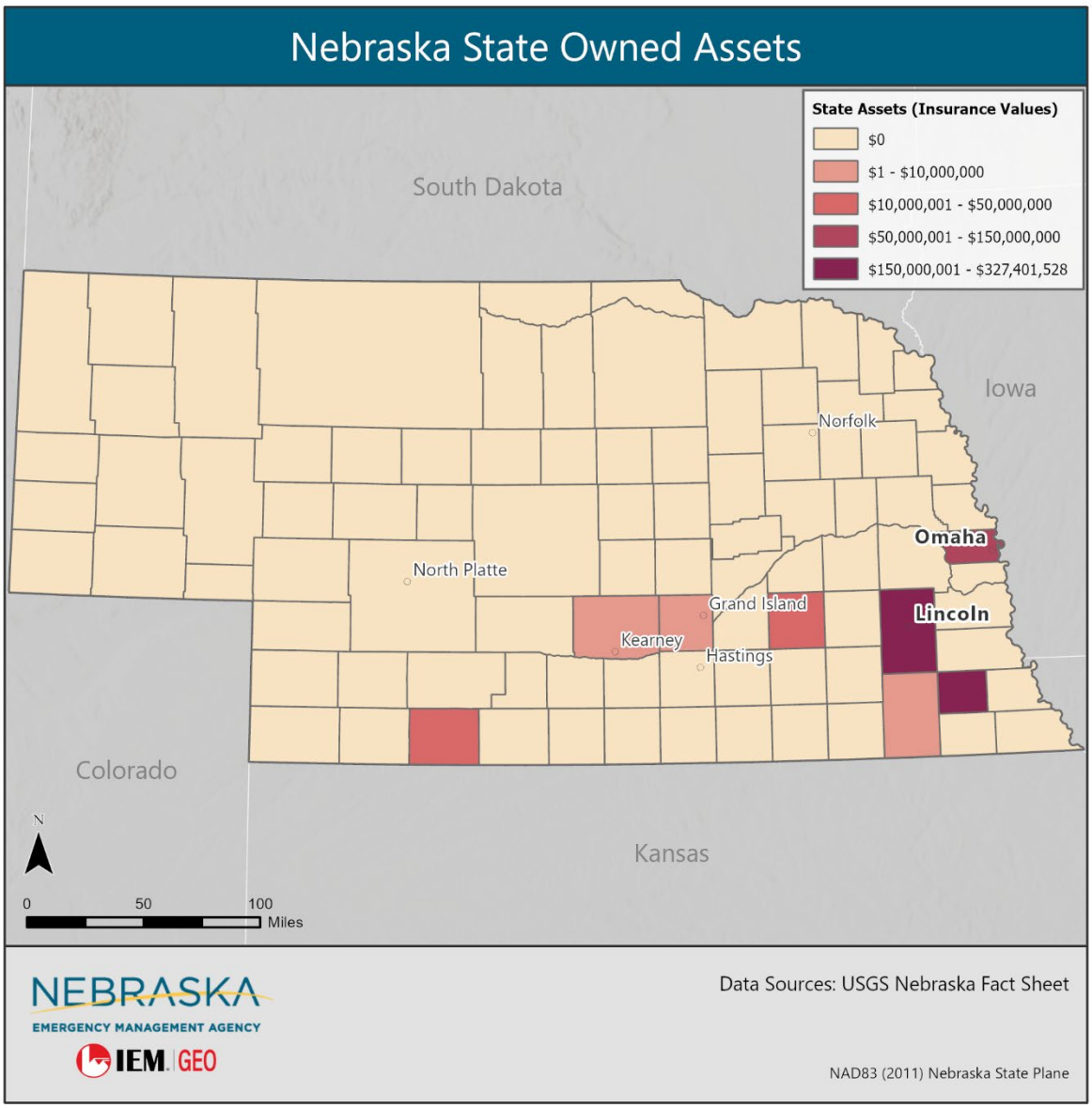



**Figure 41: Nebraska Counties by Insurance Value**

## 3.8 Changes in Development

Nebraska has undergone significant changes in land cover and development which has largely been driven by the expansion of agricultural practices and urban growth. Urban areas such as Omaha, Lincoln, and Grand Island have experienced steady growth which has transformed the landscape from predominantly wide-open agricultural land to more developed and urbanized areas. However, agriculture continues to be the cornerstone of Nebraska's land use with vast acres dedicated to corn, soybeans, and cattle ranching. Moreover, shifts in land use are becoming increasingly evident as developments continue to expand across the state. Residential growth has encroached upon prime agricultural land, especially in

suburban areas around Omaha and Lincoln. Urban sprawl has expanded infrastructure such as highways, commercial zones, and industrial parks. This has created more fragmented landscapes that disrupt traditional farming and ranching patterns.

These shifts in land use and development patterns present a number of challenges for Nebraska's resilience to natural hazards. The increase in urban development in flood-prone areas—especially along the Platter River and other waterways—increases the risk from flooding on infrastructure and the populace. Stormwater runoff from these developed areas exacerbates flooding and limits a the ability of a river's natural floodplain to absorb excess water during heavy rainfall or snowmelt events. The state's reliance on agriculture also makes it vulnerable to extreme weather events such as droughts, hailstorms, and tornadoes. The state's agricultural community relies heavily on rainfall patterns, but Nebraska has experienced increasingly more erratic weather patterns over the past decade. For instance, drought conditions can severely impact crop yields and strain water resources, especially as the Ogallala Aquifer continues to be depleted at unstainable rates. The combination of extreme weather events and continued development places Nebraska's agricultural industry at risk of natural hazards and creates a vulnerability that could have long-term economic consequences.

This expanding development also creates challenges for disaster preparedness and risk mitigation. As the population and infrastructure increases in disaster-vulnerable areas, government resources may be stretched to a breaking point and response may become more difficult. The demand for resources as the population grows can outpace the capacity of local governments and municipalities. Many of these areas do not have sufficient updated infrastructure to handle modern threats from natural hazards. As a result, communities may be exposed to greater risks without the resources necessary to respond to the impacts from natural hazards.

# 3.9 Animal Disease

## 3.9.1 Description

Animal disease is an impairment of the normal state of an animal that interrupts or modifies its vital functions. Animal diseases that are transmissible to humans are referred to as zoonotic diseases. Many diseases affecting humans can be traced to animals or animal products; however, because of the significant contribution to the state's people and economy from agricultural operations, this section focuses on diseases that impact farm animals and, to a limited extent, wild game.

## 3.9.2 Risk Assessment

### 3.9.2.1 LOCATION

All counties in Nebraska are home to potentially affected livestock operations or wild game that could transmit animal diseases. A sufficiently virulent disease strain could easily affect 50% or more of Nebraska's counties, making animal disease a wide-ranging hazard geographically and financially. [77]

From January 1, 2024, through December 31, 2024, animal disease impacted all Nebraska State counties except Grant, Hamilton, Harlan, McPherson, Perkins, Stanton, and Thayer Counties. [78]

### 3.9.2.2 EXTENT

The most widespread animal disease outbreak across the state noted during the reporting period was Bovine Paratuberculosis (see Table 17). This disease is mitigated at the herd level with individualized treatment programs at farms and ranches where outbreaks are identified.

[77] Nebraska Emergency Management Agency, "Hazard Mitigation Unit," 2021. https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.
[78] Nebraska Department of Agriculture, "Livestock Disease Reporting." https://nda.nebraska.gov/animal/reporting/index.html.

Table 17: Nebraska Reportable Animal Diseases and Numbers of Cases by County, January 2024–December 2024[79]

| County | Anaplasmosis (Bovine) | Bluetongue (Bovine) | Bovine Viral Diarrhea | Caprine Arthritis/Encephalitis | Echinococcosis/Hydatidosis | Enzootic Bovine Leukosis | Epizootic Hemorrhagic Disease (Cervid) | Equine Infectious Anemia | Equine Piroplasmosis | Infectious Bovine Rhinotracheitis/ Infectious. Pustular Vulvovaginitis | Infectious Bursal Disease (Avian) | Highly Pathogenic Avian Influenza | Leptospirosis (Bovine) | Mycoplasmosis (*M. Gallisepticum*) | Mycoplasmosis (*M. synoviae*) | Paratuberculosis (Bovine) | Porcine Circovirus & Circovirus 2 | Porcine Delta Coronavirus | Porcine Epidemic Diarrhea Virus | Porcine Reproductive & Respiratory Syndrome | Q Fever | Tuberculosis | Turkey Rhinotracheitis | West Nile Virus | County Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Adams** | 1 | 1 | 1 | | | | | | | | | | | | | 2 | | | | | | | | | 5 |
| **Antelope** | | | 1 | | | | | | | | | | | | | 3 | | | | | | | | | 4 |
| **Boone** | | | | | | | | | | | | | | | | 6 | | | | | | | | 1 | 7 |
| **Box Butte** | | | | | | | | | | | 1 | | | | | 2 | | | | | | | | | 3 |
| **Boyd** | 1 | | 1 | | | | | | | | 1 | | | | | 1 | | | | | | | | | 4 |
| **Brown** | | | | | | | | | | | | | | | | 1 | | | | | | | | | 1 |
| **Buffalo** | 1 | | | | | 2 | | | | | | | | | | 7 | | | | | | | | | 10 |
| **Burt** | 4 | | 1 | | | 2 | | | | | | | 1 | | | 2 | | | | | | | | | 10 |
| **Butler** | 1 | | | | | 1 | | | | | | | | | | 1 | | | | | | | | | 3 |
| **Cass** | | | | | | 2 | | | | | | | | | | 1 | | | | 1 | | | | | 4 |
| **Cedar** | | | | | | | | | | | | | | | | 4 | | 2 | 1 | | | | | | 7 |
| **Chase** | | | 2 | | | | | | | | | | | | | | | | | | | | | | 2 |
| **Cherry** | | | | | | | | | | | | | 1 | | | 5 | | | | | | | | | 6 |
| **Clay** | 1 | | | | | | | | | | | | | | | 3 | | | | 1 | | | | | 5 |

[79] Nebraska Department of Agriculture, "Livestock Disease Reporting." https://nda.nebraska.gov/animal/reporting/index.html

| County | Anaplasmosis (Bovine) | Bluetongue (Bovine) | Bovine Viral Diarrhea | Caprine Arthritis/Encephalitis | Echinococcosis/Hydatidosis | Enzootic Bovine Leukosis | Epizootic Hemorrhagic Disease (Cervid) | Equine Infectious Anemia | Equine Piroplasmosis | Infectious Bovine Rhinotracheitis/ Infectious. Pustular Vulvovaginitis | Infectious Bursal Disease (Avian) | Highly Pathogenic Avian Influenza | Leptospirosis (Bovine) | Mycoplasmosis (*M. Gallisepticum*) | Mycoplasmosis (*M. synoviae*) | Paratuberculosis (Bovine) | Porcine Circovirus & Circovirus 2 | Porcine Delta Coronavirus | Porcine Epidemic Diarrhea Virus | Porcine Reproductive & Respiratory Syndrome | Q Fever | Tuberculosis | Turkey Rhinotracheitis | West Nile Virus | County Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Colfax** | 1 | | | | | | | 1 | 1 | | | | | | | 1 | | | | | | | | | 4 |
| **Cuming** | | | | | | | | | | | | | | | | | | | | 1 | | | | | 1 |
| **Custer** | 1 | | | | | | | | | | | | | | | 7 | | | | | | | | | 8 |
| **Dawes** | | | | | | | | | | | | | | | | 7 | | | | | | | | | 7 |
| **Dawson** | | 1 | 2 | | 1 | 1 | | | | | | | | | | 4 | | | | | | | | | 9 |
| **Dixon** | | | | | | 1 | | | | | | | | | | 2 | | | | | | | | | 3 |
| **Dodge** | | | | | | 2 | | | | | | 1 | | | | 1 | | | | | 1 | | 1 | | 6 |
| **Douglas** | | 2 | | | | 1 | 2 | | | | | | | | 1 | | | | | | | | | 1 | 7 |
| **Dundy** | | | 1 | | | | | | | | | | | | | 1 | | | | | | | | | 2 |
| **Fillmore** | | | | | | | | | | | | | | | | | | | | 1 | | | | | 1 |
| **Franklin** | | | | | | | | | | | | | | | | 1 | | | | | | | | | 1 |
| **Furnas** | | | | | | | | | | | | | | | | 1 | 1 | | | | | | | | 2 |
| **Gage** | | | | | | 2 | | | | | | | | 1 | | 3 | | | | | | | 1 | | 7 |
| **Garden** | | | | | | | 1 | | | | | | 1 | | | | | | | | | | | | 2 |
| **Garfield** | | | | | | | | | | | | | | | | 2 | | | | | | | | | 2 |
| **Gosper** | | | | | | | | | | | | | | | | 1 | | | | | | | | | 1 |

| County | Anaplasmosis (Bovine) | Bluetongue (Bovine) | Bovine Viral Diarrhea | Caprine Arthritis/Encephalitis | Echinococcosis/Hydatidosis | Enzootic Bovine Leukosis | Epizootic Hemorrhagic Disease (Cervid) | Equine Infectious Anemia | Equine Piroplasmosis | Infectious Bovine Rhinotracheitis/ Infectious. Pustular Vulvovaginitis | Infectious Bursal Disease (Avian) | Highly Pathogenic Avian Influenza | Leptospirosis (Bovine) | Mycoplasmosis (*M. Gallisepticum*) | Mycoplasmosis (*M. synoviae*) | Paratuberculosis (Bovine) | Porcine Circovirus & Circovirus 2 | Porcine Delta Coronavirus | Porcine Epidemic Diarrhea Virus | Porcine Reproductive & Respiratory Syndrome | Q Fever | Tuberculosis | Turkey Rhinotracheitis | West Nile Virus | County Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Greeley** | | | | | | | | | | | | | | | | 1 | | | | | | | | | 1 |
| **Hall** | | | | | | | | | | | | | | | | 3 | | | | | | | | | 3 |
| **Hayes** | 1 | | | | | 1 | | | | | | | | | | | | | | | | | | | 2 |
| **Holt** | 1 | | | | | 1 | | | | | | | | | | 6 | | | | | | | | | 8 |
| **Hooker** | 1 | 1 | | | | | 1 | | | | | | | | | | | | | | | | | | 3 |
| **Howard** | | | | | | | | | | | | | | | | 2 | | | | | | | | | 2 |
| **Jefferson** | | | | | | 3 | | | | | | | | | | 1 | | | | | | | | | 4 |
| **Johnson** | | | 1 | | | 3 | | | | | | 1 | | | | 1 | | | | | | | | | 6 |
| **Kearney** | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | 2 |
| **Keith** | | | | | | | | | | | | | | | | 1 | | | | | | | | | 1 |
| **Keya Paha** | 1 | | | | | | | | | | | | | | | 1 | | | | | | | | | 2 |
| **Knox** | | | | | | | | | | | | | | | | 3 | | | | | | | | | 3 |
| **Lancaster** | 1 | | | | | 3 | 1 | | | | | 1 | | | | 9 | | | | | 1 | | | | 16 |
| **Lincoln** | 5 | | | | | 2 | | | | | | | | | | 4 | | | | | | | | | 11 |
| **Logan** | | | 1 | | | | | | | | | | | | | 1 | | | | | | | | | 2 |
| **Loup** | | | | | | | | | | | | | | | | 1 | | | | | | | | | 1 |

| County | Anaplasmosis (Bovine) | Bluetongue (Bovine) | Bovine Viral Diarrhea | Caprine Arthritis/Encephalitis | Echinococcosis/Hydatidosis | Enzootic Bovine Leukosis | Epizootic Hemorrhagic Disease (Cervid) | Equine Infectious Anemia | Equine Piroplasmosis | Infectious Bovine Rhinotracheitis/ Infectious. Pustular Vulvovaginitis | Infectious Bursal Disease (Avian) | Highly Pathogenic Avian Influenza | Leptospirosis (Bovine) | Mycoplasmosis (*M. Gallisepticum*) | Mycoplasmosis (*M. synoviae*) | Paratuberculosis (Bovine) | Porcine Circovirus & Circovirus 2 | Porcine Delta Coronavirus | Porcine Epidemic Diarrhea Virus | Porcine Reproductive & Respiratory Syndrome | Q Fever | Tuberculosis | Turkey Rhinotracheitis | West Nile Virus | County Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Madison** | | | | | | | | | | 1 | | | | | | 3 | | | | | | 1 | | | 5 |
| **Merrick** | | | | | | 2 | | | | | | | | | | 1 | | | | | | | | | 3 |
| **Morrill** | | | 1 | | | | | | | | | | | | | | | | | | | | | | 1 |
| **Nance** | 1 | 1 | | | | 3 | | | | | | | | | | 6 | | | | | | | | | 11 |
| **Nemaha** | | | 1 | | | 2 | | | | | | 1 | | | | | | | | 2 | | | | | 6 |
| **Otoe** | | | | | | 1 | | | | | | | | | | | | | | | | | | | 1 |
| **Pawnee** | | | | | | | | | | | | | | | | | | | | 1 | | | | | 1 |
| **Phelps** | | | 1 | | | | | | | | | | | | | | | | | | | | | | 1 |
| **Pierce** | | | 1 | | | | | | | | | | | | | 3 | | | | | | | | | 4 |
| **Platte** | 3 | | | | | 1 | | | | 1 | | | | | | 4 | | | | 1 | | | 1 | | 11 |
| **Polk** | | | | | | | | | | | | | | | | | | | | 1 | | | | | 1 |
| **Red Willow** | 1 | 2 | | | | 5 | | | | | | | | | | 4 | | | | | 1 | | | | 13 |
| **Richardson** | 3 | | | | | 1 | | | | | | | | | | 2 | | 1 | | 1 | | | | | 8 |
| **Rock** | | | | | | | | | | | | | 1 | | | | | | | | | | | | 1 |
| **Saline** | | | 2 | | | | | | | | | | | | | 1 | | | | | | | 1 | | 4 |
| **Sarpy** | | | | | | | | | | | | 1 | | 1 | 1 | | | | | | | | | | 3 |

| County | Anaplasmosis (Bovine) | Bluetongue (Bovine) | Bovine Viral Diarrhea | Caprine Arthritis/Encephalitis | Echinococcosis/Hydatidosis | Enzootic Bovine Leukosis | Epizootic Hemorrhagic Disease (Cervid) | Equine Infectious Anemia | Equine Piroplasmosis | Infectious Bovine Rhinotracheitis/ Infectious. Pustular Vulvovaginitis | Infectious Bursal Disease (Avian) | Highly Pathogenic Avian Influenza | Leptospirosis (Bovine) | Mycoplasmosis (*M. Gallisepticum*) | Mycoplasmosis (*M. synoviae*) | Paratuberculosis (Bovine) | Porcine Circovirus & Circovirus 2 | Porcine Delta Coronavirus | Porcine Epidemic Diarrhea Virus | Porcine Reproductive & Respiratory Syndrome | Q Fever | Tuberculosis | Turkey Rhinotracheitis | West Nile Virus | County Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Saunders** | | | | | | 1 | | | | | | | | | | 1 | | | | | | | | | 2 |
| **Scottsbluff** | | | | | | | | | | | | | | | | 2 | | | | | | | | | 2 |
| **Seward** | | | | 1 | | 1 | | | | | | | | | | 3 | | | | | | | | | 5 |
| **Sheridan** | 1 | 4 | | | | 3 | 3 | | | | | | 7 | | | 6 | | | | | | | | | 24 |
| **Sherman** | 1 | | 1 | | | | | | | | | | | | | 2 | | | | 1 | | | | | 5 |
| **Thurston** | | | | | | | | | | | | | | | | 1 | | | | | | | | | 1 |
| **Valley** | | | | | | | | | | 1 | | | | | | 2 | | | | | | | | | 3 |
| **Washington** | | | | | | | | | | | | | | | | 4 | | | | | | | | | 4 |
| **Wayne** | | | | | | | | | | | | | | | | 4 | | | | | | | | | 4 |
| **Webster** | 1 | | | | | | | | | | | | | | | 1 | | | | | | | | | 2 |
| **Wheeler** | | | | | | | | | | | | | | | | 1 | | | | | | | | | 1 |
| **York** | | | | | | | | | | | | | 1 | | | 1 | | | | | | | | | 2 |
| **TOTAL** | **33** | **12** | **19** | **1** | **1** | **47** | **8** | **1** | **1** | **3** | **2** | **5** | **12** | **2** | **2** | **155** | **1** | **3** | **1** | **11** | **3** | **1** | **4** | **2** | **325** |

The following animal diseases risk the state's agricultural industry and economy.

## CATTLE

**Anaplasmosis:** There were 33 cases statewide between January 2024 and December 2024, a significant decrease in the number of cases reported in the 2021 plan, with the largest number of cases (5) reported in Lincoln County. Anaplasmosis, also known as yellow bag or yellow fever, is an infectious blood disease that primarily affects cattle and leads to severe anemia. Parasites cause it, and ticks typically transmit it. Anaplasmosis has varying effects on different age groups of cattle. Research from Texas and California suggests that the costs of a clinical case of Anaplasmosis average over $400 per animal and that if Anaplasmosis infects a previously uninfected herd, the following effects are expected: calf crop reduced by 3.6%, a 30% increase in cull rate, and 30% of the adults showing signs will die.[80]

Cases of anaplasmosis typically increase in late summer and fall as insect vectors increase, so vector control is key to preventing the disease. Ranchers and farmers may take preventative steps, including various methods to control biting insects, sterilization of surgical instruments, medicated feed, and vaccination. While vaccination has been shown to reduce losses related to death in a herd and decrease the severity of symptoms of the disease, the use of the vaccine has a high potential for adverse side effects and death calves.[81]

The following animal disease descriptions were taken from the 2021 Nebraska State Hazard Mitigation Plan,[82] while statistics were gathered from Table 17.

**Bovine Viral Diarrhea (BVD):** There were 19 cases statewide in 2024. BVD is a widespread disease in cattle caused by the Bovine Viral Diarrhea Virus (BVDV), which poses a serious risk to most herds. Symptoms can vary by the animal's immune status and virus strain, with an incubation period of three to five days.

In non-vaccinated animals infected with a virulent strain, BVD can lead to acute illness with symptoms such as bloody diarrhea, high fever (105–107ºF), loss of appetite, mouth ulcers, and pneumonia. Some animals may die, while others typically recover within one to two weeks.

Pregnant animals that recover may experience abortions two to four weeks after exposure, especially in the second trimester. Infected cows may also have early embryonic death or difficulty conceiving. Notably, cows exposed between 60 and 120 days of pregnancy may deliver a persistently infected (PI) calf, which will continuously shed the virus and pose a risk to other animals.[83]

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[80] North Carolina Department of Agriculture & Consumer Services, "Veterinary-Anaplasmosis." https://www.ncagr.gov/divisions/veterinary/Anaplasmosis#:~:text=Anaplasmosis%20is%20an%20infectious%20disease,the%20whites%20of%20the%20eyes).
[81] Ibid.
[82] Nebraska Emergency Management Agency, "2021 Nebraska State Hazard Mitigation Plan." https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.
[83] College of Veterinary Medicine, "Bovine Viral Diarrhea: Background, Management and Control." https://www.vet.cornell.edu/animal-health-diagnostic-center/programs/nyschap/modules-documents/bovine-viral-diarrhea-background-management-and-control.

The economic loss per cow infected with BVD in the United States can vary significantly but is generally estimated to range from a few hundred dollars to several thousand dollars. Specific factors influencing these losses include the severity of the infection, herd management practices, and the individual circumstances of the farm.

**Bovine Tuberculosis:** Since the 2021 State Hazard Mitigation Plan (SHMP) update, there has been one recorded case of this animal disease in Madison County. Bovine tuberculosis (TB) is a type of TB that affects animals like cattle, deer, and some exotic species, caused by the bacterium *Mycobacterium bovis*. This strain is related to the one that causes human tuberculosis.

Humans can contract bovine TB mainly by consuming raw (unpasteurized) milk or dairy products from infected animals. It can also spread from prolonged exposure to infected cattle or their carcasses, and rarely through cuts in the skin.

Symptoms in humans are similar to those of human TB and can include a cough, fever, night sweats, chest pain, and loss of appetite.[84]

While many people infected with bovine TB remain healthy, those with weak immune systems, young children, and the elderly are at higher risk for developing the disease. Early intervention significantly decreases the risk of serious illness. On July 18, 2019, the National Veterinary Services Laboratories reported a likely case, based on histopathology, of a cow in a herd at the Tyson slaughter plant in Lexington. The herd was quickly placed under quarantine to reduce the risk of disease spread. The diagnosis was confirmed on August 12, 2019.[85]

**Paratuberculosis (Johne's Disease):** There were 155 cases statewide reported between January 2024 and December 2024, with the most significant number (9) in Lancaster County. Paratuberculosis (Johne's Disease) is an infectious disease affecting the small intestine of cattle, sheep, goats, and other ruminants. It is caused by *Mycobacterium avium subspecies paratuberculosis*, a bacteria related to tuberculosis and leprosy.[86]

This disease is contagious and commonly found worldwide, including in the United States. It causes chronic inflammatory bowel disease (granulomatous enteritis), leading to significant weight loss, debilitation, and eventual death. Economic losses include reduced milk production and early culling.

Symptoms often take years to appear after initial infection, which typically occurs shortly after birth. When noticeable, symptoms may include diarrhea and weight loss despite a normal appetite, soft swelling under the jaw, known as "bottle jaw," due to protein loss, and declining production in cows aged 3–6 years. Animals at this stage may survive only a few weeks.

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[84] California Department of Public Health Division of Communicable Disease Control, "Bovine Tuberculosis Fact Sheet." https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/Bovine-TB-Fact-Sheet.pdf.
[85] United States Animal Health Association, "Nebraska Tuberculosis Update-USAHA 2019." https://usaha.org/upload/Committee/CattleBison/Hughes_NE_TB_Update_2019.pdf.
[86] USDA, "Johne's Disease." https://www.aphis.usda.gov/livestock-poultry-disease/cattle/johnes

Newborns are most susceptible to the disease, often becoming infected through contaminated manure, milk, or during gestation.

There is no treatment for Johne's disease, but effective herd management practices can help reduce its prevalence and potentially eliminate it from affected herds.[87]

### POULTRY/FOWL

**Avian Influenza:** While there were no reported outbreaks of Avian Influenza in Nebraska in 2024, the state has been impacted by the disease in recent years. Avian influenza is a viral disease that primarily affects birds, particularly poultry, which are highly susceptible. Migratory birds can carry the virus without showing symptoms.

The disease is contagious and spreads through direct contact with infected birds, the air, and contaminated objects like clothing and equipment. While rare, humans and other mammals can also contract the virus.

In birds, signs include decreased water intake, respiratory issues like coughing and sneezing, reduced egg production, swelling in the head and neck, poor coordination, and sudden death. In humans, symptoms are flu-like, including fever, cough, sore throat, muscle aches, and, in severe cases, eye infections or pneumonia.[88]

On November 26, 2022, the Nebraska Department of Agriculture reported the state's 13th case of bird flu, found on an egg-laying farm in Dixon County, approximately 120 miles north of Omaha.

On November 27, 2022, Nebraska agriculture officials announced that another 1.8 million chickens would be slaughtered after bird flu was detected on a farm. That was the latest indication that the outbreak, which has already resulted in the death of more than 50 million birds nationwide, continued to spread.

As with other farms affected by the virus this year, this farm culled all the chickens to help prevent the further spread of the disease. According to the U.S. Department of Agriculture, over 52.3 million birds across 46 states—primarily chickens and turkeys on commercial farms—were slaughtered as part of the 2022 outbreak.[89]

There is currently no known treatment for Avian Influenza. Although poultry vaccines are available, no vaccine protects against all 16 HA (hemagglutinin) and 9 NA (neuraminidase) subtype strains of Avian Influenza.[90] Because there is no way of accurately predicting which strain may infect a flock, vaccines are not a practical method of prevention. The most effective prevention methods are by implementing strict

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[87] USDA Animal and Plant Health Inspection Service, "Johne's Disease." https://www.aphis.usda.gov/livestock-poultry-disease/cattle/johnes.
[88] Nebraska Department of Agriculture, "Information about Avian Influenza." https://nda.nebraska.gov/animal/avian/.
[89] Josh Funk, "Bird Flu Outbreak Prompts Slaughter of 1.8 Million Chickens in Nebraska," PBS, November 27, 2022. https://www.pbs.org/newshour/health/bird-flu-outbreak-prompts-slaughter-of-1-8-million-chickens-in-nebraska.
[90] Centers for Disease Control and Prevention (CDC), "Avian Influenza (Bird Flu)." https://www.cdc.gov/bird-flu/about/avian-influenza-type-a.html.

biosecurity measures, including avoidance of potentially infected birds, proper personal hygiene, isolation of any new animals before introduction into the flock, and ensuring footwear is cleaned and disinfected after leaving animal areas.

Avian Influenza infection in poultry can result in decreased egg production, soft-shelled or misshapen eggs, respiratory distress, unstable coordination, and sudden death. A single case of AI in Nebraska could quickly spread and affect the livelihood of all Nebraska poultry producers. Testing sick birds for AI will help identify if the disease is present and allow an immediate response to minimize the impact on human health and the economy. Avian Influenza can be transmitted from infected birds to humans through direct contact with infected animals or surfaces or by breathing in aerosolized fluids or dust from infected animals. Symptoms in humans include basic flu-like symptoms of fever, conjunctivitis, runny nose, cough, sore throat, and muscle aches. Severe infections in humans include respiratory failure, acute respiratory distress syndrome, acute kidney injury, multi-organ failure, and sepsis, and may lead to pneumonia.[91]

### SWINE

**Porcine Epidemic Diarrhea (PED):** One case statewide was reported between January 2024 and December 2024 in Cedar County. This disease is brought on by a coronavirus that that quickly spreads and causes severe diarrhea in pigs. It was first recognized in 1971 in the United Kingdom and spread throughout Europe and Asia by 2013. The first diagnosed cases in the United States appeared in May 2013 in Iowa.[92] Once the disease has entered a herd of swine, it will quickly spread to infect almost the entire herd. Death in infected piglets is 80%–100%.[93] Adult pigs may also be infected but generally do not die from it.

PED is caused by a virus, and no treatment is available to cure it. As the illness runs its course, survivability is improved by ensuring the animal consumes enough water and electrolytes to combat dehydration and meet nutritional needs. The disease is best controlled through biosecurity measures and sanitation procedures. The virus has been found in slaughter facilities, transport vehicles, and collection points.

**Porcine Reproductive and Respiratory Syndrome (PRRS):** There have been 11 cases reported statewide between January 2024 and December 2024. PRRS is a viral disease first reported in the United States in 1987. Since that initial report, the disease has been confirmed throughout North America and Europe.[94]

PRRS has been shown to have two phases. In the first, the reproductive phase, the disease leads to increased numbers of stillbirths, premature births, and weak-born pigs. Before weaning, infected pigs develop pneumonia, which may become chronic, drastically reducing daily weight gain and increasing

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[91] CDC, "Avian Influenza (Bird Flu)." https://www.cdc.gov/bird-flu/signs-symptoms/index.html.
[92] USDA, "Porcine Epidemic Diarrhea (PED)." https://www.aphis.usda.gov/sites/default/files/ped_tech_note.pdf
[93] Daesub Song, Hyoungjoon Moon, and Bokyu Kang, "Porcine Epidemic Diarrhea: A Review of Current Epidemiology and Available Vaccines," *Clinical and Experimental Vaccine Research* 4, no. 2 (July 29, 2015): 166–76. https://pmc.ncbi.nlm.nih.gov/articles/PMC4524901/.
[94] Iowa State University, "Porcine Reproductive and Respiratory Syndrome (PRRS)." https://vetmed.iastate.edu/vdpam/about/focus-areas/swine/swine-disease-manual/index-diseases/porcine-reproductive#:~:text=In%20the%20US%2C%20the%20clinical,in%20Europe%20and%20North%20America.

mortality by up to 25%. In addition to the problems caused by PRRS, secondary viral and bacterial infections are common and may lead to more potential losses in the herd. Because of the problems caused by PRRS compounded by the secondary infections, PRRS is considered by some to be "the most economically significant disease to affect US swine production since the eradication of classical swine fever (CSF)."[95]

While many herds are exposed to PRRS, not all will show signs of the disease. "As a guide, for every three herds exposed to PRRS for the first time, one will show no recognizable disease, the second would show mild disease, and the third moderate to severe disease."[96] This difference may be due to the initial health of the herds, or it may result from the virus mutating as it multiplies, occasionally creating strains that are less virulent than others.[97]

**Porcine Circovirus (PCV):** One PCV case was reported statewide between January 2024 and December 2024 in Furnas County. Porcine Circovirus type 1 (PCV1) has been present in swine since it was first identified in 1974 as a non-disease-causing agent frequently found in laboratory tissue cultures. In 1991, Canadian veterinarians began reporting cases of young pigs developing a previously unknown disease that caused wasting, enlarged lymph nodes, respiratory distress, and, in some cases, diarrhea, pale skin, and jaundice. This disease was called "postweaning multisystemic wasting syndrome" (PMWS).

While PCV1 is common worldwide, it has not been associated with any clinical disease. PCV2, however, is associated with PMWS, reproductive failure, respiratory disease in older pigs, and a skin and kidney disease known as porcine dermatitis and nephropathy syndrome (PDNS). Research has shown that PCV2 is seldom the only infecting agent that impacts diseased pigs.

**African Swine Fever (ASF):** ASF is a highly contagious hemorrhagic disease of all pigs, including domestic pigs, warthogs, and wild boars. Animals infected with ASF typically have a high fever, loss of appetite, and hemorrhages in the skin and internal organs, and they usually die 2–10 days after infection. ASF has not yet been detected in the United States, but outbreaks have been recently reported in China, Russia, Eastern Europe, and Africa. As the disease can be spread through direct physical contact, shared feed, and parasitic insects, prevention relies mainly on strict biosecurity measures. There are currently no treatments or vaccines available for ASF.

ASF can survive many months in processed meat and years in frozen carcasses. As a result, there are concerns that the disease may enter uninfected countries through meat products. In Japan, a traveler from China had a package of sausages confiscated that were shown to contain the virus, and similar discoveries have been made in South Korea. At least 19 countries have reported cases of ASF, with more than 360,000 wild and domestic animals infected. When considering the ramifications of the virus taking hold in major pork-producing countries in Western Europe and the United States, the potential disruption to the industry and profit losses because of the market shutdown could be staggering.

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[95] Ibid.
[96] CABI Digital Library, "Porcine Reproductive Respiratory Syndrome Virus (PRRSV)." https://www.cabidigitallibrary.org/doi/pdf/10.5555/20143355756.
[97] Ibid.

## DEER AND OTHER WILD GAME

**Chronic Wasting Disease (CWD):** CWD is a prion disease affecting the brains of infected cervids, including deer, elk, and moose. It was first discovered in Nebraska in 1999 Since 1997, nearly 58,000 deer and over 400 elk have been tested for CWD in Nebraska, with 1,347 deer and 23 elk testing positive.

In 2024, tests were conducted on 1,419 hunter-harvested deer samples, resulting in 60 deer and 4 elk testing positive for CWD. This led to adding 10 new counties—Antelope, Madison, Butler, York, Seward, Jefferson, Richardson, Merrick, Greeley, and Platte—to the areas where CWD has been detected.[98] Currently, CWD has been found in 68 counties across Nebraska; however, there have been no observed population declines in animals attributable to the disease.

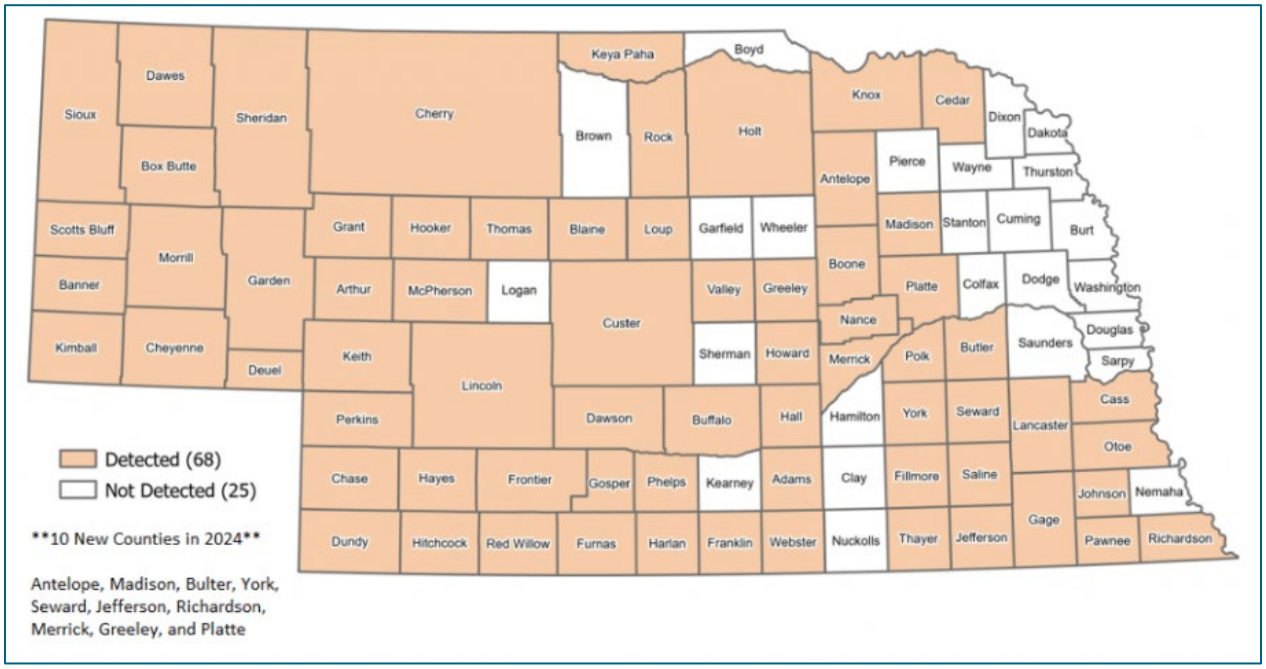



**Figure 42: 1999–2024 Deer Management Units Where CWD Has Been Found**[99]

The disease is generally thought to be transmitted from animal to animal, but the exact method of transmission is yet unknown. The long-term effects of CWD on the deer population are still being researched. Forward-looking computer modeling suggests that CWD could lead to decreased adult survival.[100] One of the most significant factors in the spread of this disease is the natural movements of infected animals throughout the regions they inhabit. CWD is spread by infectious proteins called prions. Those prions can remain viable for months or even years in the soil, making proper field dressing of animals and disposing of potentially contaminated carcasses key to limiting the spread of the disease.

[98] Nebraska Game and Parks, "Chronic Wasting Disease." https://outdoornebraska.gov/conservation/conservation-challenges/wildlife-diseases/chronic-wasting-disease/.
[99] Ibid.
[100] South Dakota Department of Game, Fish and Parks, "Chronic Wasting Disease Frequently Asked Questions." https://gfp.sd.gov/userdocs/docs/cwd_faq.pdf.

The disease causes many symptoms, including loss of bodily functions, abnormal behavior, emaciation, and eventually death.[101]

For those who consume the meat of harvested deer, no decisive evidence shows a risk of CWD to humans. Still, hunters and commercial deer processors are urged to exercise caution to ensure that spinal cord and brain tissue are not spread to the meat or the environment. Additionally, the U.S. Centers for Disease Control and Prevention (CDC) recommends avoiding consumption of meat from deer and elk that look sick or that test positive for CWD.[102]

#### 3.9.2.3 PREVIOUS EVENTS

Because of Nebraska's extensive agricultural industry and contribution to the food supply chain and economy, animal disease is an ongoing threat that the Nebraska Department of Agriculture continuously tracks. Between January 2024 and December 2024, 325 cases of animal disease were reported in the state. The most significant incidence of cases was linked to Paratuberculosis (Bovine) (155 cases), with Enzootic Bovine Leukosis (47) and Anaplasmosis (Bovine) (33) also appearing in significant numbers. Table 17 presents the total animal disease cases reported by county from January 1, 2024, to December 31, 2024.

Due to the absence of reported cases, the following were not included in the table: Avian Infectious Bronchitis, Bovine Genital Campylobacteriosis, Equine Herpesvirus and Herpesvirus 4, Equine Influenza, Equine Rhinopneumonitis, Salmonellosis (Bovine), Seneca Valley Virus, and Vesicular Stomatitis (Equine). Additionally, Grant, Hamilton, Harlan, McPherson, Perkins, Stanton, and Thayer Counties were excluded because there were no reported cases of animal disease in those areas.

#### 3.9.2.4 PROBABILITY

Animal disease is highly likely to persist in Nebraska. As farmers and ranchers face higher production demands, livestock population densities will likely increase. As a species' population density increases, the potential for epidemics also increases. Additionally, the perceived trend toward higher average temperatures and increased periods of severe drought increases the stress levels on animal populations, increasing the risk of disease taking hold. Uncommon diseases may return in higher numbers as environmental changes cause the release of previously contained diseases or promote disease mutation.

#### 3.9.2.5 EFFECTS OF FUTURE CONDITIONS

Changes in climate patterns can significantly affect animal diseases in Nebraska's livestock and poultry industries. As higher production demands are placed on farmers and ranchers, livestock population densities will likely increase. As a species' population density increases, the potential for an epidemic also rises.

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[101] Nebraska Game and Parks, "Chronic Wasting Disease Management Plan 2024." https://outdoornebraska.gov/wp-content/uploads/2024/07/DRAFT-Nebraska-CWD-Management-Plan.pdf.
[102] CWD-Info, "Recommendations for Hunters." https://cwd-info.org/recommendations-for-hunters/.

Also, the perceived trend toward higher average temperatures and increased periods of severe drought increases the stress levels on animal populations, increasing the risk of disease taking hold. Additionally, uncommon diseases may return at higher rates as changes in the environment cause the release of previously contained diseases or promote the mutation of diseases.

### 3.9.3 Vulnerability Analysis

Nebraska has a robust agricultural industry, particularly in livestock production, making it vulnerable to various animal diseases. As shown by the most recent Avian Flu outbreak, even if a disease is present in only a small geographic portion of the state, it could lead to long-lasting and costly consequences for the producers and the entire state.

All farms that raise animals are prone to the hazard of animal diseases. Modern farming and ranching practices help decrease the likelihood of disease spread through the active use of biosecurity measures, but the increased number of animals moving through individual operations from other places can raise the risk of introducing diseases that might not be defensible by those measures. Several diseases are known to be spread by insect bites or encounters with wild animals.

Figure 43 depicts the vulnerability and potential losses to the cattle industry across the state, noting the total numbers of all cattle and calves by county. Should a high-mortality animal disease outbreak occur in one or more counties with the highest cattle inventory – Cherry, Cuming, Custer, Dawson, Holt or Lincoln – the impact to the state's agricultural economy would be extensive.

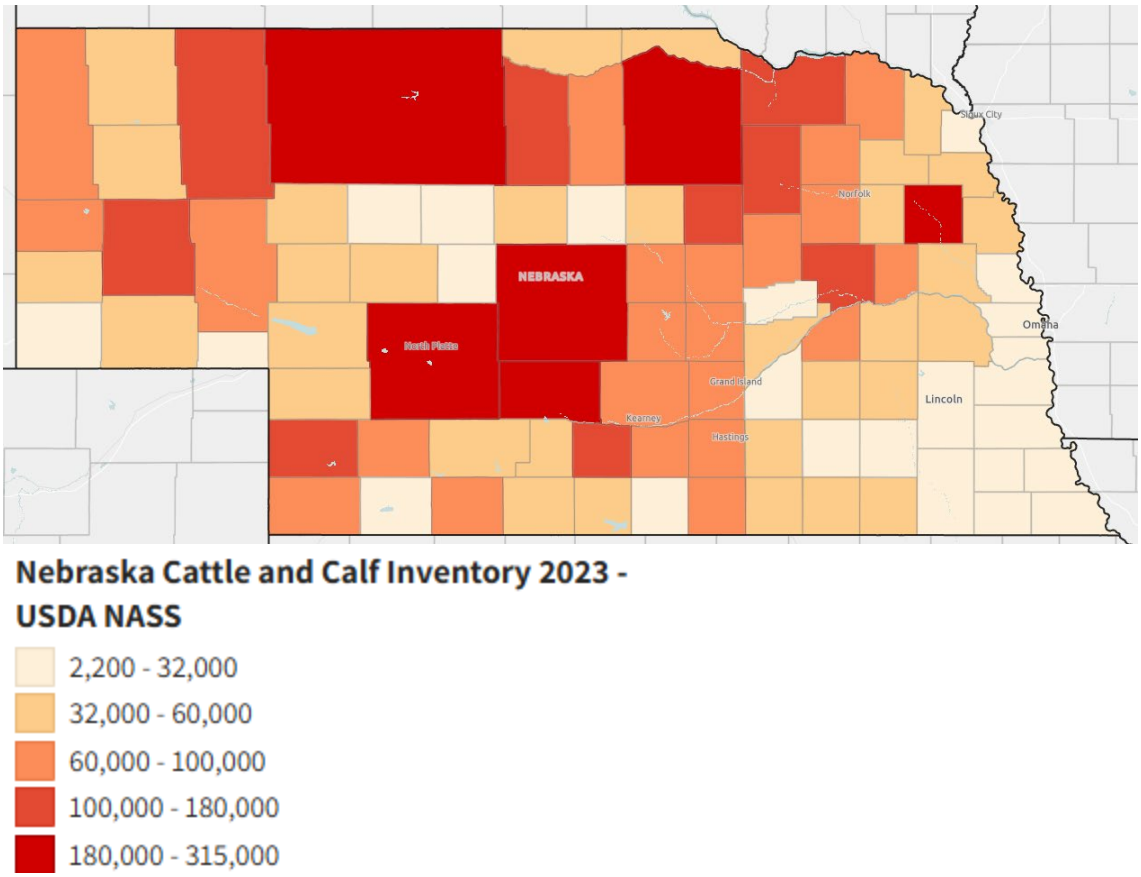



**Figure 43: Nebraska Cattle and Calf Inventory 2023 – USDA NASS**[103]

Animal diseases drastically threaten Nebraska's agricultural economy, public health, and ecosystem stability. By addressing vulnerabilities through preemptive measures, cooperation, and education, the state can better prepare to mitigate the effects of potential disease outbreaks.

### 3.9.3.1 ESTIMATED IMPACT AND POTENTIAL LOSSES

Animal diseases can considerably impact Nebraska's economy and communities, notably affecting the agricultural sector. The economic losses for farmers and ranchers can be considerable due to decreased productivity, livestock culling, and potential trade restrictions, which reduce income from livestock sales. Nebraska's reliance on agricultural exports means that outbreaks can destabilize markets, resulting in a loss of consumer confidence and reduced product demand. Farmers may also face heightened production costs by implementing biosecurity procedures, vaccinations, and improved farming practices to prevent the disease spread. The public health implications, particularly for zoonotic diseases, can strain community resources and necessitate robust monitoring and response strategies. The combination of economic, social, and environmental effects emphasizes the need for effective disease surveillance and management to safeguard Nebraska's agricultural vitality and community well-being.

[103] Institute of Agriculture and Natural Resources | Nebraska Extension, "Cattle and Calf Inventory." https://allthingsnebraska.unl.edu/category/program-areas/livestock-systems/.

Estimating exact economic impacts is complicated and varies depending on the type and severity of the disease, the affected animal species, and the response measures executed. Historical data and studies on previous outbreaks can provide some awareness, but each event can have exclusive consequences. Overall, the multifaceted nature of animal disease impacts highlights the importance of ongoing surveillance, prevention, and rapid response efforts to mitigate losses in Nebraska's agricultural sector.

#### 3.9.3.2 ACCESS AND FUNCTIONAL NEEDS

Animal diseases can significantly impact individuals with access and functional needs in Nebraska, affecting many aspects of their lives. Those depending on agriculture for their income may face financial uncertainty due to livestock disease outbreaks, reducing income and employment opportunities. Additionally, these outbreaks can strain local medical resources, making it more difficult for at risk populations to receive timely medical care, especially for zoonotic diseases that may affect individuals with existing health conditions.

Disruptions in food production can worsen food insecurity, particularly for those on a fixed income who may struggle to afford nutritious options. Likewise, transportation barriers during disease control measures can hinder access to essential services like medical appointments and grocery shopping.

Addressing these impacts requires coordinated efforts among public health officials, agricultural organizations, and community support services to ensure that the needs of all individuals, especially those with access and functional needs, are met during an animal disease outbreak.

#### 3.9.3.3 COMMUNITY LIFELINES

Animal disease impacts several Federal Emergency Management Agency (FEMA) community lifelines, primarily in these areas:

- **Health and Medical:** Outbreaks of animal diseases can threaten public health, especially if zoonotic diseases (those that can be transmitted from animals to humans) are involved. This can lead to increased demand for medical resources and veterinary services.
- **Food, Hydration, and Shelter**: Animal disease can disrupt food supply chains, particularly in agriculture-dependent areas. Livestock outbreaks can lead to the culling of affected animals, affecting farmers' livelihoods and food availability. Additionally, the disease can contaminate food and water supplies, leading to further public health concerns.
- **Safety and Security**: When animal diseases spread, quarantine measures and increased law enforcement presence may be needed to manage public fear and ensure compliance with health regulations. This can strain local law enforcement and public health resources.
- **Transportation:** The movement of animals and animal products may be restricted to control disease spread, impacting transportation lifelines. This can cause delays in getting necessary supplies to affected areas and disrupt local and regional economies.

### 3.9.3.4 ENHANCED PRIORITY RISK INDEX SCORE

The Enhanced Priority Risk Index (EPRI) provides the state of Nebraska with a methodology to measure the impact that each profiled hazard may have on the seven EMAP (Emergency Management Accreditation Program) Standard 4.1.2 sectors Table 18 provides the EPRI scores for the hazard with the appropriate risk factor.

**Table 18: Animal Disease Enhanced Priority Risk Index Score**

| | Probability Next 5 Years | Impact | Spatial Extent | Warning Time | Duration | Vulnerability | Probability | Overall Risk Factor |
|---|---|---|---|---|---|---|---|---|
| **Risk Level** | 2.1 | 2.3 | 2.5 | 1.1 | 3.8 | 1.9 | 2.6 | 2.4 |

Table 19 summarizes animal disease impacts—including those on the public, first responders, continuity of operations, property, infrastructure, environment, economic conditions, and public confidence—and the consequences of those impacts.

**Table 19: Animal Disease Impacts and Consequences**

| Sector | Impact |
|---|---|
| **Public** | **Housing**: Many rural homes and farms may be quarantined if the disease is widespread.<br>**Casualties/Fatalities**: Little to no impact. Most animal diseases are not readily spread to humans.<br>**Work**: If the disease is widespread, it will have a cascading effect on the meat and/or poultry supply chain from the farm to the market.<br>**Food/Water:** The meat/poultry supply could be interrupted if the disease spreads to multiple states. Crop transportation and prices would be affected due to restrictions on crop movement out of quarantined areas and changes in demand if livestock are culled, producers cannot sell healthy market animals, and producers instate a moratorium on feeding new livestock. |
| **First Responders** | **Emergency Services**: Some responders need to be specialized, but local responders and/or farmers and ranchers may be used for activities like animal movement, decontamination, and depopulation. Safety, through proper use of personal protective equipment (PPE) and decontamination, will draw on the resource pool.<br>**Medical:** The healthcare industry will experience increased demand due to the potential for illness to spread to humans and behavioral health issues following potentially significant livelihood losses. |
| **Continuity of Operations (COOP)** | State agencies involved in the response will divert staff from everyday activities and must prioritize operations per COOP plans. It may be necessary to dispose of perishable products. |

| Sector | Impact |
|---|---|
| **Property, Facilities, and Infrastructure** | **Buildings and Infrastructure:** Most of the property that will be destroyed by widespread animal disease is the animals through depopulation. Farms, ranches, and processors may be isolated by quarantine. Some properties (structures) that cannot be cleaned and disinfected may need to be destroyed, but that would be a very rare need.<br>Although minor physical/structural damage to infrastructure is anticipated, infrastructure systems will be impacted. The food supply chain and transportation system will be disrupted in and around quarantine areas. |
| **Environment** | Proper disposal and decontamination methods will be needed to mitigate the environmental impact. |
| **Economic Conditions** | An animal disease outbreak in Nebraska could have catastrophic economic consequences. For both the state and the nation, ripple effects will negatively affect mortgage payments, employment, banking institutions, markets, and international trade. A severe animal disease outbreak would negatively impact the stability of whole farming communities. |
| **Public Confidence** | Public perception will vary depending on the government's speed and efficiency of the response to the outbreak and whether it did enough to prevent or protect against it. If an animal disease spreads to workers, the public will look to the government for occupational safety and health guidance. |

# 3.10 Chemical and Radiological Fixed Sites and Transportation

## 3.10.1 Description

Incidents involving highly hazardous chemicals and radiological materials, either at fixed sites or during transportation, are typically referred to as hazardous material (Hazmat incidents. Chemicals used, stored, or transported mainly by industrial users vary in their compound or substance and have varying levels of combustion or flammability. Due to chemical composition variability, there is no universally accepted response protocol for Hazmat incidents. Each Hazmat incident demands a response proportional to the threat level and potential impact. Facilities that use, store, or transport extremely hazardous chemicals fall under federal regulatory requirements.

Chemical incidents involve releasing hazardous chemicals into the environment, either accidentally or intentionally. Examples include leaks from industrial facilities, spills during transportation, and the improper disposal of chemicals. Common hazardous chemicals might include toxic gases such as chlorine or ammonia, flammable substances, and corrosive materials. The consequences vary widely, from immediate health impacts like respiratory issues and chemical burns to long-term environmental contamination.[104]

Radiological incidents involve the release of radioactive materials, which can occur due to nuclear power plant accidents, transportation accidents involving radioactive materials, or the use of radioactive sources in medical or industrial applications. The effects of a radiological incident depend on the type and amount of radiation released. Exposure can lead to acute health effects, such as radiation sickness, or long-term impacts, like increased cancer risk, depending on the level of exposure and the radiological isotopes involved.[105]

## 3.10.2 Risk Assessment

### 3.10.2.1 LOCATION

Due to the prevalence of hazardous materials in transportation and industry, much of Nebraska is at risk. There are 2,934 facilities that house and use hazardous materials in Nebraska.[106] Areas that contain industrial parks and Tier II facilities are at a higher likelihood of incident, as are any roadways that see heavy and consistent interstate traffic.

[104] World Health Organization, “Chemical Incidents.” https://www.who.int/health-topics/chemical-incidents#tab=tab_1.
[105] Benton County Minnesota, “Radiological Incident.” https://www.co.benton.mn.us/270/Radiological-Incident.
[106] Nebraska DEE Tier 2 Data. Department of Environment and Energy. 2023. https://deq-iis.ne.gov/tier2/tier2Download.html.

### 3.10.2.2 EXTENT

Chemical and radiological incidents in Nebraska pose significant risks due to the various hazardous materials handled within the state. The presence of Tier II, a facility that stores hazardous chemicals and extremely hazardous substances (EHS) facilities, indicates that certain areas have a higher concentration of these materials, which increases the potential for incidents (See Figure 44). Facilities must comply with federal regulations to ensure the' safe handling and transportation of these substances.

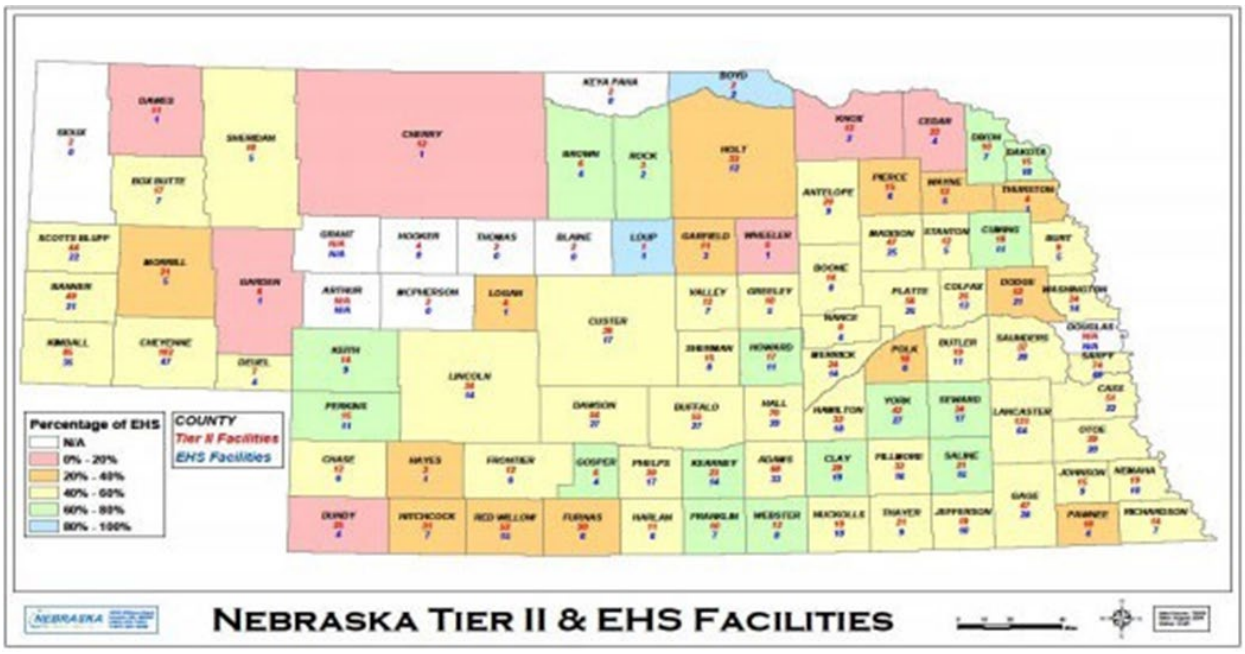



**Figure 44: Tier II & EHS Facilities, Nebraska** [107]

Historical data on Hazmat incidents is crucial for understanding the extent of chemical and radiological events in the state. This information can include the number of reported incidents, the types of hazardous materials involved, and the resulting damage, including property and agricultural losses due to leakages and spills from fixed sites and transportation incidents.

The Hazmat Warning System utilizes a series of levels to communicate the severity of a hazardous material incident and the appropriate response, as indicated in Table 20.

**Table 20: Hazmat Incident Levels** [108]

| Hazmat Incident Levels | Extent | Description |
|---|---|---|
| **1** | Minor | The hazardous material poses a minimal threat to human health and the environment. The local fire department or Hazmat team can usually manage it. |

[107] 2021 Nebraska State Hazard Mitigation Plan Update, https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.
[108] Lone Star Hazmat, "What Is Meant by the Different Hazmat Incident Levels?" https://lonestarhazmat.com/what-is-meant-by-the-different-hazmat-incident-levels/#:~:text=The%20first%20level%20of%20Hazmat,the%20need%20for%20additional%20support.

| Hazmat Incident Levels | Extent | Description |
|---|---|---|
| **2** | Moderate | The hazardous material poses a moderate threat to human health and the environment. Additional resources and specialized equipment may be needed to manage the situation. |
| **3** | Serious | The hazardous material poses a serious threat to human health and the environment. There is a need for a large-scale response involving multiple agencies and specialized equipment. |
| **4** | Severe | The hazardous material poses a severe threat to human health and the environment. There may be a need for a massive response involving multiple agencies, specialized equipment, and significant resources. |
| **5** | Catastrophic | The hazardous material poses an extreme threat to human health and the environment. |

Table 21 provides classification levels for radiological material spills.

**Table 21: Radioactive Material Spill Classification[109]**

| Radionuclide | Minor Spill Level | Major Spill Level |
|---|---|---|
| **Carbon-14** | ≤1 millicurie (mCi) | >1 mCi |
| **Hydrogen-3 (Tritium)** | ≤10 mCi | >10 mCi |
| **Phosphorus-32/33** | ≤0.1 mCi | > 0.1 mCi |
| **Sulfur-35** | ≤1 mCi | >1 mCi |
| **Iidone-125** | ≤0.1 mCi | >0.1 mCi |
| **Calcium-45** | ≤1 mCi | >1 mCi |
| **Chromium-51** | ≤10 mCi | >10 mCi |
| **Selenium-75** | ≤1 mCi | >1 mCi |
| **Other Radionuclides** | ≤0.1 mCi | >0.1 mCi |

### 3.10.2.3 PREVIOUS EVENTS

Thirty hazardous events occurred in Nebraska between 2021 and 2025. The Pipeline and Hazardous Materials Safety Administration (PHMSA) considers the events listed in Table 22 serious.

[109] University of Nebraska, "Radioactive Material Spills and Radiation Accidents." https://safety.unl.edu/sites/unl.edu.business-and-finance.police.safety/files/media/file/s-RAM_spills._radiation_accidents.pdf.

**Table 22: Serious Hazardous Events 2021–2025**[110]

| City | Date | Carrier | Commodity | Injuries | Fatalities | Hazardous Class | Cause of Failure |
|---|---|---|---|---|---|---|---|
| **Fairmont** | 7/18/2021 | BNSF RR | Alcohol, not otherwise specified (N.O.S.) | 0 | 0 | 3 | Rollover accident |
| **Omaha** | 2/4/2022 | SAIA Motor Freight Line | Corrosive liquid, basic, inorganic, N.O.S. | 0 | 0 | 8 | Vehicle rollover |
| **Shelton** | 11/29/2022 | Ranger Landstar | Organic peroxide type F, liquid | 0 | 0 | 5.2 | Single vehicle accident |
| **Omaha** | 7/24/2023 | Dohrn Transfer Co. | Sodium Hypochlorite solution | 0 | 0 | 8 | Forklift strike |
| **North Platte** | 9/14/2023 | Union Pacific RR | Perchloric acid with more than 50% but not more than 72% acid, by mass | Yes | 0 | 5.1 | Human Error |
| **Lincoln** | 7/23/2024 | BNSF RR | Alcohol, N.O.S. | 0 | 0 | 3 | Derailment |
| **North Platte** | 10/17/2024 | Union Pacific RR | Alcohol, N.O.S. | 0 | 0 | 3 | Derailment, rollover accident |

The following are miscellaneous radiological and chemical incidents that have occurred in Nebraska.

- On January 19, 2018, four tritium exit signs were reported lost during a renovation at Crete Cold Storage in Crete.[111]
- On March 11, 2008, the Nebraska Division of Public Health (DPH) informed the Nuclear Regulatory Commission (NRC) about a potential overexposure incident involving an industrial radiographer using an AEA 660B device with a 1.2 terabecquerel (33 curie) Iridium-192 sealed source.
  - On March 4, the radiographer noticed his pocket ion chamber was off-scale, which he attributed to being bumped. Regulatory requirements mandate that if an off-scale reading could indicate

[110] Pipeline and Hazardous Materials Safety Administration, "Hazmat Incident Report Search Tool." https://portal.phmsa.dot.gov/analytics/saw.dll?Portalpages&PortalPath=%2Fshared%2FPublic%20Website%20Pages%2F_portal%2FHazmat%20Incident%20Report%20Search.
[111] Nuclear Threat Initiative, "Overview of the CNS Global Incidents and Trafficking Database." https://www.nti.org/analysis/articles/overview-of-the-cns-global-incidents-and-trafficking-database/.

overexposure, the personal dosimeter must be processed within 24 hours. The radiographer reported the issue to his radiation safety officer on March 7, but the dosimeter was sent for processing that day, missing the 24-hour window.[112]

  - On March 10, the dosimetry provider confirmed that the radiographer received a whole-body dose of approximately 7.6 centisievert (cSv) (7.6 roentgen equivalent man [rem]), exceeding the regulatory limit of 5 cSv (5 rem).

- On November 5, 1975, a hydrogen explosion occurred at Cooper Nuclear Station, Brownsville, while maintenance was being performed on the Off-Gas System Sump, located under the elevated release point of the Off-Gas System. The accompanying health physics personnel activated the portable air pump sampler, causing the explosion. One injury was reported: burns from the explosion. The initial report indicated that the contamination levels did not exceed 300 counts per minute.[113]

#### 3.10.2.4 PROBABILITY

Predicting chemical spills or releases is an inexact process due to the volatility of specific chemicals, safety measures for the use, storage and transport of the chemical, and operational response conditions, timing and containment. Due to the fact that these chemical spills are unpredictable, we can assume that there is a small probability that a chemical spill will occur in the future.

#### 3.10.2.5 EFFECTS OF FUTURE CONDITIONS

Climate change increases the risks associated with hazardous chemical and radiological events due to rising temperatures, changing precipitation patterns, and more extreme weather. Higher temperatures can destabilize hazardous materials, causing leaks or spills, and droughts can concentrate chemicals and increase contamination risks. Expected Increased storm intensity levels can overwhelm containment systems, releasing hazardous substances into the environment where agricultural and chemical production operations are common.

Flooding can damage infrastructure, increasing the risk of failures at storage sites. Additionally, climate change can affect nuclear facilities. Changing weather patterns can compromise systems and disrupt energy supplies, increasing accident risks.

### 3.10.3 Vulnerability Analysis

Nebraska is at risk of chemical and radiological incidents due to its mix of industrial activities, agricultural operations, and transportation networks. Its vulnerability is influenced by geographic and demographic factors, with areas like Omaha and Lincoln being more susceptible to widespread impact. Risks arise from chemical production and storage, as well as from the presence of a nuclear power plant and several research facilities.

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[112] Laka, “Potential Industrial Radiographer Overexposure.” https://www.laka.org/docu/ines/event/858
[113] Nuclear Regulatory Commission, “Preliminary Notification of Event or Unusual Occurrence-PN-75-119.” https://www.nrc.gov/docs/ML2023/ML20236U935.pdf.

Environmental concerns further increase these risks, since chemical spills could severely affect agriculture, livestock, and water supplies, causing long-term health and economic challenges.

Based on the low potential for impact to state assets from this hazard, the potential vulnerability of state assets and dollar losses in relation to chemical and radiological fixed sites and transportation has not been calculated.

#### 3.10.3.1 ESTIMATED IMPACT AND POTENTIAL LOSSES

The estimated impacts of a chemical or radiological incident on the state of Nebraska could vary significantly depending on the incident's location, nature, and scale.

Overall, while the immediate effects of a chemical or radiological incident could be stark, the long-term implications would largely depend on how effectively the state and its communities respond and recover from the incident.

Given Nebraska's strong agricultural base, such an event could disrupt local farming, leading to crop failures and financial distress for farmers. Communities near the incident would face serious health risks from exposure to hazardous materials, requiring extensive health assessments and long-term monitoring.

Environmental consequences could be severe, with contamination affecting soil, water supplies, and local ecosystems. This contamination would harm wildlife and make agricultural lands unfit for growing crops or raising livestock, jeopardizing the state's economy. In addition, local businesses could suffer due to reduced populations from evacuations and fears of contamination, resulting in lower income for the community.

Table 23 lists state property replacement values in the top 10 most populated counties with increased concentrations of infrastructure and buildings.

**Table 23: State Asset Replacement Value Top 10 Counties as of 2024**

| County | Insurance Value | Contents Insurance | Total Value | Replacement Cost |
|---|---|---|---|---|
| **Brown** | Not Provided | Not Provided | $4,236,570 | $4,236,570 |
| **Lancaster** | $327,401,529 | $419,606,538 | $867,395,761 | $867,395,761 |
| **Douglas** | $117,350,452 | $31,371,276 | $81,423,950 | $81,423,950 |
| **Buffalo** | $6,447,796.53 | $12,095,960 | $210,296,611 | $210,296,611 |
| **Johnson** | $157,136,448 | $29,311,747 | $3,184,781 | $3,184,781 |
| **Hall** | $7,321,520 | $2,719,927 | $10,634,654 | $10,634,654 |
| **Cass** | Not Provided | $1,494,524 | $104,597,718 | $104,597,718 |
| **Dawes** | $1,279,930.92 | $1,127,496 | $97,713,764 | $97,713,763 |
| **Gage** | $7,106,900 | $709,783 | $90,815,987 | $90,815,987 |

| County | Insurance Value | Contents Insurance | Total Value | Replacement Cost |
|---|---|---|---|---|
| **Adams** | $10,000.00 | $130,574 | $10,886,734 | $10,886,734 |
| **TOTAL** | **$624,054,576** | **$498,567,826** | **$1,481,186,529** | **$1,481,186,529** |

### 3.10.3.2 ACCESS AND FUNCTIONAL NEEDS

Chemical or radiological incidents can significantly affect individuals with access and functional needs such as the elderly and those with disabilities. Vulnerable populations may face increased health risks if access to essential medications and medical equipment is disrupted during emergencies, and social isolation due to inadequate communication and evacuation. The financial strain from job losses and business closures can destabilize these populations, making recovery difficult.

### 3.10.3.3 COMMUNITY LIFELINES

In the event of a chemical or radiological incident, several of FEMA's community lifelines can be significantly impacted, affecting the overall response and recovery efforts. The Safety and Security lifeline may be strained as authorities work to protect the public from exposure and containment of hazardous materials. Meanwhile, the Health and Medical lifeline could become overwhelmed, as hospitals and medical facilities prepare for potential casualties requiring immediate care due to exposure or contamination. The Food, Water, and Energy lifelines may also be disrupted, particularly if the incident involves chemicals that contaminate local water supplies or if facilities producing critical resources are affected. Lastly, the Transportation lifeline may face challenges as roadways become restricted or closed for cleanup and safety measures, hampering emergency responders and the flow of supplies necessary for recovery efforts. The interconnected nature of these lifelines highlights the need for a coordinated response to minimize the impact of such incidents on the community.

### 3.10.3.4 ENHANCED PRIORITY RISK INDEX SCORE

The Enhanced Priority Risk Index (EPRI) provides the state of Nebraska with a methodology to measure the impact each profiled hazard may have on the seven Emergency Management Accreditation Program Standard 4.1.2 sectors. Table 24 provides the EPRI scores for the hazard with the appropriate risk factor.

**Table 24: Enhanced Priority Risk Index Score**

| | Probability Next 5 Years | Impact | Spatial Extent | Warning Time | Duration | Vulnerability | Probability | Risk Factor |
|---|---|---|---|---|---|---|---|---|
| **Risk Level** | 2.3 | 2.6 | 2.5 | 3.8 | 3.6 | 2 | 2.4 | 2.7 |

Table 25 provides a summary of chemical and radiological incident impacts, including impacts on the public, first responders, continuity of operations, property, infrastructure, environment, economic conditions, and public confidence, and the consequences of those impacts.

Table 25: Chemical and Transportation Impacts and Consequences

| Sector | Impacts |
|---|---|
| **Public** | **Housing:** If a chemical spill or release occurs in a populated area, the impact may cause property damage or destruction from fire or explosion.<br>**Casualties/Fatalities:** With sufficient warning and if citizens evacuate when asked, casualties and/or fatalities can be mitigated. Good adherence to safety and the proper use of personal protective equipment can also prevent or minimize responder casualties and deaths.<br>**Work:** If the incident occurs in a rural area, it should have little to no impact on work.<br>**Food/Water:** Depending on the type, characteristics, and location of a spill or release, food and water may become exposed or contaminated. If this occurs, additional resources should be considered. |
| **First Responders** | **Emergency Services**: Containing chemical spills and releases is dangerous, and extreme caution and strict adherence to safety measures, appropriate personal protective equipment, and incident management are important for responder safety and accountability.<br>Evacuation may require multiple agency support and resources for vulnerable populations. |
| **Continuity of Operations** | Continuity of operations should not be impacted if the incident is contained outside of municipalities. |
| **Property, Facilities, and Infrastructure** | **Buildings and Infrastructure:** Chemical spills and releases may be destructive if an explosion or fire occurs quickly. Homes and businesses adjacent to a spill or release are vulnerable to destruction from fire or explosion.<br>Infrastructure near a chemical spill or release is vulnerable to explosion, fire, or contamination, especially electrical structures, including transmission and distribution lines, poles, and towers. Runoff from suppression activities can pollute streams and rivers that provide drinking water. Roads and bridges may become isolated during the incident and could need to be repaired due to an explosion or fire or the large amounts of heavy equipment used to contain the incident.<br>**Agriculture**: Field crops and rangeland for livestock and other animals could be impacted in rural areas. |
| **Environment** | Significant federal and state regulations and processes address chemical use, storage, and transport. These controls provide for significant coordination between state and local responders, and chemical spills and releases are typically not expected to impact the environment in the long term. However, it is possible that streams and rivers can become temporarily polluted by chemicals, but the natural dilution factor helps clean the waterway over time. Wildlife may be temporarily displaced and lost but also return to the area as it returns to normal. |
| **Economic Conditions** | A short-term chemical spill or release is not expected to disrupt an area's economy. Tourism can be temporarily disrupted for the length of the incident or if any long-term property damage or environmental contamination is involved. |
| **Public Confidence** | Public confidence will depend on proper incident management, including safety measures for the public, timely and periodic updates, and activities taken to return the area to normal. |

# 3.11 Dam Failure

## 3.11.1 Description

A dam is an artificial, manmade barrier with the ability to impound water, wastewater, or liquid-borne materials.[114] Most dams in Nebraska are earthen embankment dams constructed across a river or stream. A dam failure is a catastrophic structural collapse that can lead to the sudden, rapid, and uncontrolled release of impounded water, potentially causing widespread flooding, damage and loss of life.[115] Overtopping is responsible for approximately 34% of all dam failures in the United States. It typically occurs due to inadequate spillway design or debris blocking the spillway, causing water to spill over the top of the dam leading to rapid erosion and, ultimately, and breaching of the dam embankment. The second most common cause of failure, accounting for around 30% of all incidents, is foundation defects. These defects can lead to excessive settlement or slope instability (slide), compromising the dam's integrity. Internal erosion caused by excessive seepage is another major contributor to dam failure, responsible for about 20% of all incidents. Over time, seepage gradually erodes the earthen structure from within, weakening the dam until it ultimately collapses. Other common causes of failure include embankment cracking, spillway failures, conduit deterioration, rodent burrows, and inadequate maintenance.

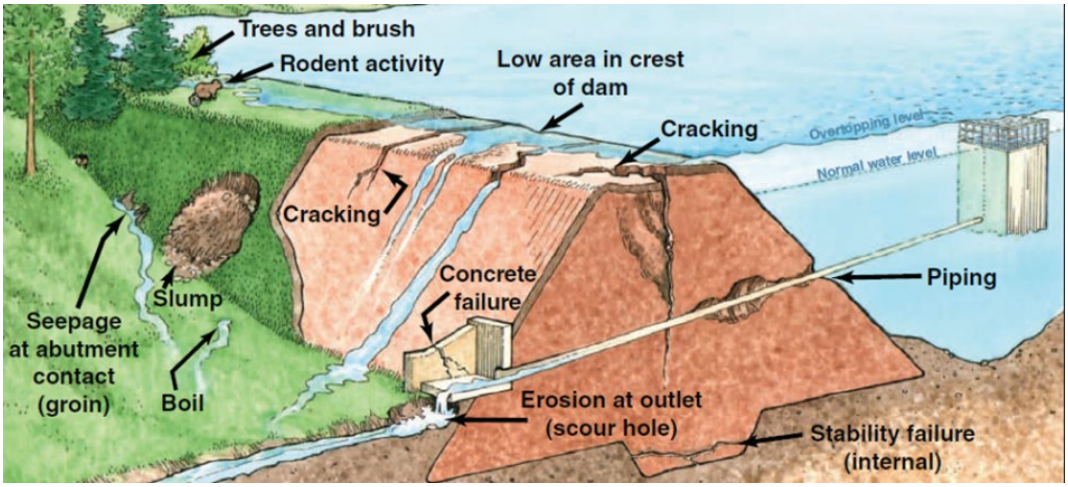



**Figure 45: Different Types of Dam Failure Modes**[116]

The implications of a dam failure can be severe, encompassing significant loss of life, economic ramifications, and extensive ecological damage. While many dams store relatively modest volumes of water, resulting in limited consequences in the event of a failure, those with larger storage capacities pose a risk of substantial downstream flooding.[117] In Nebraska, the average age of dams is 49 years,

[114] National Park Service, Dams and Reservoirs, 2014. https://www.nps.gov.
[115] S. H. Peterson and J. A. Harper, "Dam Safety: A Review of Failure Causes and Safety Guidelines." *Journal of Dam Safety,* 2015: 13(1), 15–23.
[116] Association of State Dam Safety Officials, "Lessons Learned from Dam Incidents and Failures." https://damfailures.org/lessons-learned/intervention-can-stop-or-minimize-consequences-of-a-dam-failure-warning-signs-should-not-be-ignored/#top.
[117] G. W. Brunner, *Hydraulic Modeling and Floodplain Management*. American Society of Civil Engineers, 2018.

which raises concerns regarding their structural integrity. Failures often occur suddenly, with early warning signs frequently going undetected. Effective design, ongoing maintenance, and thorough inspections offer critical opportunities to identify and rectify potential deficiencies, thereby mitigating the risk of failure.[118]

A dam failure can trigger cascading hazards, compounding the disaster's severity, and increasing risks to surrounding communities. The sudden release of water can lead to catastrophic flooding, destroying infrastructure, homes, and critical facilities such as hospitals and emergency response centers. This flooding can erode soil and destabilize roads, bridges, and utility lines, disrupting transportation and communication networks. The overwhelming water surge may also damage power plants, substations, and gas lines, leading to prolonged power outages and potential fires or hazardous material spills. Additionally, floodwater can contaminate drinking water sources and wastewater treatment facilities, increasing the risk of waterborne diseases and long-term environmental degradation. These cascading effects can overwhelm emergency management systems, delaying response efforts and prolonging community recovery.

The Nebraska Safety of Dams and Reservoirs Act of 2005 empowers the Nebraska Department of Natural Resources (NeDNR) to perform routine inspections, evaluate dam design and construction, and mandate that dam owners establish comprehensive emergency action plans.[119] Hazard mitigation efforts for High Hazard Potential Dams (HHPDs) are a coordinated effort involving multiple agencies, including the Nebraska Department of Natural Resources (NeDNR), the Nebraska Emergency Management Agency (NEMA), and local jurisdictions. These entities work closely with HHPD owners to ensure compliance with federal and state hazard mitigation requirements, particularly in alignment with the state's hazard mitigation plan (HMP).

NeDNR plays a crucial role in assessing the risks associated with HHPDs, conducting dam failure inundation studies, and identifying downstream vulnerabilities. These assessments inform Nebraska's SHMP, which outlines the necessary mitigation strategies to minimize potential impacts from dam-related failures. HHPD owners, including municipal authorities, private dam owners, and local water districts, are required to develop and maintain emergency action plans (EAPs) that align with state and federal hazard mitigation guidelines. NeDNR assists in the preparation and review of these EAPs, ensuring they include evacuation procedures, warning systems, and coordination strategies with first responders.

Nebraska leverages various funding sources, including FEMA's High Hazard Potential Dam Rehabilitation Grant Program (HHPD Grant) and the Hazard Mitigation Grant Program (HMGP), to support structural upgrades, emergency planning, and public awareness initiatives. NeDNR and NEMA work together to help HHPD owners apply for and administer these funds, ensuring that necessary upgrades—such as spillway

[118] U.S. Bureau of Reclamation, "Dam Safety: A Culture of Safety for Dams and Reservoirs," 2019. https://www.usbr.gov.
[119] Nebraska Legislature, *Nebraska Safety of Dams and Reservoirs Act*, 2005. https://nebraskalegislature.gov.

expansions, embankment reinforcements, and flood-routing improvements—are completed in accordance with hazard mitigation priorities.

To enhance safety and compliance, NeDNR conducts regular inspections and safety evaluations of HHPDs across the state. Owners are required to adhere to state dam safety regulations, which align with the mitigation objectives outlined in the HMP. NeDNR provides technical guidance, risk communication strategies, and training programs to ensure that HHPD owners and local emergency management officials understand best practices in dam safety and hazard mitigation.

## 3.11.2 Risk Assessment

### 3.11.2.1 LOCATION

Dam failures can affect anyone located within the inundation zone of a dam. Currently, there are 2,961 dams located in the state of Nebraska, with 160 of those identified as high hazard dams. Table 26 provides a list of all high hazard dams located within the state of Nebraska and Figure 46 is a map of their locations.

**Table 26: High Hazard Dams Located in the State of Nebraska[120]**

| Name | NID | County | State Regulated | Federal Regulated | EAP Prepared | Population at Risk | Owner | Capacity (Acre-Ft) | Inspection Date | Condition |
|---|---|---|---|---|---|---|---|---|---|---|
| **Thirty-Two Mile Creek H** | NE01551 | Adams | Yes | No | Yes | 56 | Local Government | 4,938 | 9/10/2024 | Fair |
| **Hastings Northwest Dam** | NE01726 | Adams | Yes | No | Yes | 72 | Local Government | 1,155 | 9/10/2024 | Satisfactory |
| **Kohtz City of Albion Dam** | NE00153 | Boone | Yes | No | Yes | 400 | Local Government | 102 | 9/12/2024 | Satisfactory |
| **Hadwiger Dam** | NE01670 | Buffalo | Yes | No | Not Required | 50 | Local Government | 520 | 10/2/2024 | Poor |
| **Stoneridge Dam** | NE03239 | Buffalo | Yes | No | Yes | 33 | Private | 393 | 6/27/2024 | Satisfactory |
| **Kearney Dam** | NE00465 | Buffalo | Yes | No | Yes | 6,058 | Public Utility | 194 | 6/27/2024 | Satisfactory |
| **Ravenna Northwest Dam** | NE02492 | Buffalo | Yes | No | Yes | 450 | Local Government | 295 | 10/2/2024 | Satisfactory |
| **4th Avenue Storm Detention Dam** | NE02332 | Buffalo | Yes | No | Yes | 183 | Private | 93 | 6/27/2024 | Satisfactory |
| **Prairie Creek Upland Dam 2 (PCUL 2)** | NE09348 | Buffalo | Yes | No | Yes | 54 | Local Government | 4,465 | 4/17/2024 | Satisfactory |
| **Prairie Creek Upland Dam 1 (PCUL 1)** | NE09349 | Buffalo | Yes | No | Yes | 69 | Local Government | 5,776 | 4/17/2024 | Satisfactory |
| **Tekamah-Mud Creek 22-A** | NE01597 | Burt | Yes | No | Yes | 423 | Local Government | 499 | 5/9/2024 | Satisfactory |

[120] National Inventory of Dams. https://nid.sec.usace.army.mil/#/

| Name | NID | County | State Regulated | Federal Regulated | EAP Prepared | Population at Risk | Owner | Capacity (Acre-Ft) | Inspection Date | Condition |
|---|---|---|---|---|---|---|---|---|---|---|
| **Silver Creek 11** | NE03103 | Burt | Yes | No | Yes | 9 | Local Government | 1,317 | 5/9/2024 | Satisfactory |
| **Tekamah-Mud Creek 5-A** | NE01690 | Burt | Yes | No | Yes | 848 | Local Government | 6,861 | 5/9/2024 | Satisfactory |
| **Beaver Lake Dam** | NE00102 | Cass | Yes | No | Yes | 98 | Private | 12,760 | 7/16/2024 | Poor |
| **Plattsmouth 4-A** | NE01888 | Cass | Yes | No | Yes | 215 | Local Government | 16 | 5/1/2024 | Satisfactory |
| **Plattsmouth 10-A** | NE00097 | Cass | Yes | No | Yes | 297 | Local Government | 137 | 5/1/2024 | Satisfactory |
| **Plattsmouth 18-A** | NE00098 | Cass | Yes | No | Yes | 18 | Local Government | 117 | 5/1/2024 | Satisfactory |
| **Plattsmouth 12-A** | NE00099 | Cass | Yes | No | Yes | 186 | Local Government | 76 | 5/1/2024 | Satisfactory |
| **Centurylink Dam (Multi-Purpose Dam 1989-1)** | NE02322 | Cass | Yes | No | Yes | 59 | State | 173 | 8/27/2024 | Satisfactory |
| **Plattsmouth 7-C** | NE01889 | Cass | Yes | No | Yes | 335 | Local Government | 19 | 5/1/2024 | Satisfactory |
| **Mill Creek Road Dam 7** | NE02399 | Cass | Yes | No | Yes | 19 | Local Government | 213 | 5/1/2024 | Satisfactory |
| **Hartington Dam** | NE09968 | Cedar | Yes | No | Yes | 290 | Local Government | 112 | 8/21/2024 | Satisfactory |
| **Laurel Norris Dam** | NE02394 | Cedar | Yes | No | Yes | 45 | Local Government | 34 | 8/20/2024 | Satisfactory |

| Name | NID | County | State Regulated | Federal Regulated | EAP Prepared | Population at Risk | Owner | Capacity (Acre-Ft) | Inspection Date | Condition |
|---|---|---|---|---|---|---|---|---|---|---|
| **Enders Dike** | NE01070 | Chase | Yes | Yes | Yes | 1,608 | Federal | 79,161 | 7/8/2021 | Not Available |
| **Enders Dam** | NE01070 | Chase | Yes | Yes | Yes | 1,608 | Federal | 79,161 | 7/8/2021 | Not Available |
| **Merritt Dam** | NE01074 | Cherry | Yes | Yes | Yes | 87 | Federal | 78,375 | 4/26/2023 | Not Available |
| **Valentine Mill Pond Dam** | NE00600 | Cherry | Yes | No | No | 90 | Local Government | 391 | 6/6/2024 | Poor |
| **Verde Lane Dam** | NE00607 | Cheyenne | Yes | No | Yes | 381 | Local Government | 160 | 9/18/2024 | Satisfactory |
| **Potter Dam** | NE02293 | Cheyenne | Yes | No | Yes | 62 | Local Government | 50 | 9/19/2024 | Satisfactory |
| **Heimer Dam** | NE00601 | Cheyenne | Yes | No | Yes | 53 | Private | 76 | 9/18/2024 | Fair |
| **Sidney East Dam** | NE01146 | Cheyenne | Yes | No | Yes | 245 | Local Government | 126 | 9/18/2024 | Satisfactory |
| **Sidney West Dam** | NE01147 | Cheyenne | Yes | No | Yes | 24 | Local Government | 50 | 9/18/2024 | Satisfactory |
| **Dam 2-7-5W** | NE02407 | Clay | Yes | No | Yes | 83 | Local Government | 57 | 9/10/2024 | Satisfactory |
| **Big Sandy Creek 20-6-7** | NE00703 | Clay | Yes | No | Yes | 10 | Local Government | 11,524 | 6/15/2023 | Satisfactory |
| **Pokorny Dam** | NE02779 | Colfax | Yes | No | Yes | 83 | Local Government | 130 | 9/12/2024 | Satisfactory |

| Name | NID | County | State Regulated | Federal Regulated | EAP Prepared | Population at Risk | Owner | Capacity (Acre-Ft) | Inspection Date | Condition |
|---|---|---|---|---|---|---|---|---|---|---|
| **Maple Creek Recreation Area Dam** | NE03154 | Colfax | Yes | No | Yes | 19 | Local Government | 8,118 | 9/12/2024 | Satisfactory |
| **Hubbard Dam** | NE02700 | Dakota | Yes | No | Yes | 115 | Local Government | 86 | 8/21/2024 | Satisfactory |
| **Pigeon-Jones Creek 15** | NE03270 | Dakota | Yes | No | Yes | 20 | Local Government | 7,430 | 8/21/2024 | Satisfactory |
| **Pigeon-Jones Creek 12-A** | NE08466 | Dakota | Yes | No | Yes | 110 | Local Government | 2,402 | 8/21/2024 | Satisfactory |
| **Box Butte Dam** | NE01069 | Dawes | Yes | Yes | Yes | 33 | Federal | 45,901 | 9/10/2020 | Not Available |
| **Spring Creek 19-B** | NE01734 | Dawson | Yes | No | Yes | 4,000 | Local Government | 17,745 | 9/16/2024 | Poor |
| **Lake Helen Dam** | NE02393 | Dawson | Yes | No | Yes | 935 | Local Government | 566 | 9/16/2024 | Fair |
| **Hooper Dam** | NE01277 | Dodge | Yes | No | Yes | 63 | Local Government | 19 | 10/1/2024 | Satisfactory |
| **Dodge Dam** | NE02637 | Dodge | Yes | No | Yes | 42 | Local Government | 119 | 9/12/2024 | Satisfactory |
| **Candlewood Dam** | NE00138 | Douglas | Yes | No | Yes | 1,700 | Local Government | 1,256 | 5/16/2024 | Satisfactory |
| **Boys Town Dam 1** | NE00307 | Douglas | Yes | No | Yes | 74 | Local Government | 243 | 4/3/2024 | Satisfactory |
| **Glenn Cunningham Dam** | NE01518 | Douglas | Yes | Yes | Yes | 1,777 | Federal | 14,000 | 6/1/2021 | Satisfactory |

| Name | NID | County | State Regulated | Federal Regulated | EAP Prepared | Population at Risk | Owner | Capacity (Acre-Ft) | Inspection Date | Condition |
|---|---|---|---|---|---|---|---|---|---|---|
| **Adams Park Dam** | NE09714 | Douglas | Yes | No | Yes | 200 | Local Government | 86 | 7/10/2024 | Satisfactory |
| **Legacy Dam** | NE00032 | Douglas | Yes | No | Yes | 12 | Private | 121 | 4/3/2024 | Satisfactory |
| **Lonergan Dam** | NE00030 | Douglas | Yes | No | Yes | 2 | Private | 2,623 | 6/25/2024 | Satisfactory |
| **Zorinsky Basin 2** | NE08588 | Douglas | Yes | No | Yes | 146 | Local Government | 401 | 6/13/2024 | Satisfactory |
| **Newport Landing Dam** | NE02585 | Douglas | Yes | No | Yes | 4,967 | Local Government | 8,855 | 5/16/2024 | Satisfactory |
| **Zorinsky Basin 3 – Whitehawk** | NE02735 | Douglas | Yes | No | Yes | 53 | Local Government | 1,423 | 6/13/2023 | Satisfactory |
| **Boys Town Dam 2** | NE00031 | Douglas | Yes | No | Yes | 50 | Private | 79 | 4/3/2024 | Satisfactory |
| **Bennington Lake Basin 2** | NE02631 | Douglas | Yes | No | Yes | 2 | Private | 175 | 10/24/2023 | Satisfactory |
| **Papio Creek 13 – Youngman** | NE02784 | Douglas | Yes | No | Yes | 48 | Local Government | 1,770 | 5/16/2024 | Satisfactory |
| **Papio Creek 15-A** | NE03289 | Douglas | Yes | No | Yes | 2,755 | Local Government | 9,196 | 5/16/2024 | Satisfactory |
| **Sachs-Palmer Dam** | NE02638 | Douglas | Yes | No | Yes | 3 | Local Government | 352 | 10/24/2023 | Satisfactory |
| **Standing Bear Dam** | NE01065 | Douglas | Yes | Yes | Yes | 1,686 | Federal | 7,300 | 7/10/2020 | Fair |
| **Indian Creek Golf Course Dam 2** | NE02427 | Douglas | Yes | No | Yes | 2 | Private | 206 | 6/25/2024 | Not Available |
| **Indian Creek Golf Course Dam 1** | NE02426 | Douglas | Yes | No | Yes | 2 | Private | 125 | 6/25/2024 | Not Available |

| Name | NID | County | State Regulated | Federal Regulated | EAP Prepared | Population at Risk | Owner | Capacity (Acre-Ft) | Inspection Date | Condition |
|---|---|---|---|---|---|---|---|---|---|---|
| **Zorinsky Dam** | NE02185 | Douglas | Yes | Yes | Yes | 4,237 | Federal | 18,282 | 5/26/2022 | Not Available |
| **Big Sandy Creek 35-5-2 (Bruning Dam)** | NE02164 | Fillmore | Yes | No | Yes | 30 | Local Government | 10,538 | 9/10/2024 | Satisfactory |
| **Medicine Creek Dam** | NE01073 | Frontier | Yes | Yes | Yes | 1,951 | Federal | 193,020 | 5/3/2023 | Not Available |
| **Red Willow Dam** | NE01076 | Frontier | Yes | Yes | Yes | 2,371 | Federal | 161,899 | 5/2/2023 | Not Available |
| **Big Indian Creek 14-B** | NE01210 | Gage | Yes | No | Yes | 3 | Local Government | 5,585 | 11/12/2024 | Fair |
| **Mud Creek 2-A** | NE01000 | Gage | Yes | No | Yes | 3 | Local Government | 5,375 | 11/12/2024 | Satisfactory |
| **Upper Big Nemaha 25-C** | NE00914 | Gage | Yes | No | Yes | 3 | Local Government | 3,690 | 5/30/2024 | Satisfactory |
| **Upper Big Nemaha 7-A** | NE00993 | Gage | Yes | No | Yes | 22 | Local Government | 908 | 5/30/2024 | Fair |
| **Little Indian Creek 15-A** | NE00489 | Gage | Yes | No | Yes | 2 | Local Government | 698 | 9/28/2023 | Satisfactory |
| **Flowing Springs Dam** | NE04779 | Gage | Yes | No | Yes | 25 | Private | 53 | 9/28/2023 | Fair |
| **Wes Clark Cat Dam** | NE01204 | Garden | Yes | No | Yes | 15 | Local Government | 328 | 9/17/2024 | Satisfactory |
| **Virginia Smith Dam** | NE02287 | Garfield | Yes | Yes | Yes | 762 | Federal | 177,623 | 4/25/2023 | Not Available |
| **Elwood Dam** | NE01680 | Gosper | Yes | No | Yes | 75 | Public Utility | 45,950 | 7/2/2024 | Fair |

| Name | NID | County | State Regulated | Federal Regulated | EAP Prepared | Population at Risk | Owner | Capacity (Acre-Ft) | Inspection Date | Condition |
|---|---|---|---|---|---|---|---|---|---|---|
| **Johnson Lake Dam** | NE01025 | Gosper | Yes | Yes | Yes | 33 | Public Utility | 59,000 | 9/30/2020 | |
| **Johnson Lake West Dike** | NE01025 | Gosper | Yes | Yes | Yes | 33 | Public Utility | 59,000 | 9/27/2022 | Satisfactory |
| **Davis Creek Dam** | NE02342 | Greeley | Yes | Yes | Yes | 170 | Federal | 44,918 | 9/22/2020 | Not Available |
| **Harlan County Dam** | NE01066 | Harlan | Yes | Yes | Yes | 864 | Federal | 825,700 | 6/13/2025 | Not Available |
| **Blackwood Creek 11-A** | NE02369 | Hayes | Yes | No | Yes | 6 | Local Government | 6,050 | 7/1/2024 | Poor |
| **Trenton Dam** | NE01078 | Hitchcock | Yes | Yes | Yes | 3,388 | Federal | 352,018 | 7/7/2021 | Not Available |
| **Middle Big Nemaha 96** | NE02374 | Johnson | Yes | No | Yes | 215 | Local Government | 1,452 | 5/30/2024 | Satisfactory |
| **Brule Creek 1-A** | NE00211 | Keith | Yes | No | Yes | 33 | Local Government | 3,167 | 9/17/2024 | Satisfactory |
| **Ogallala 6 (West Dam)** | NE02331 | Keith | Yes | No | Yes | 848 | Local Government | 170 | 9/17/2024 | Satisfactory |
| **Cure Creek 1-A** | NE00210 | Keith | Yes | No | Yes | 387 | Local Government | 326 | 9/17/2024 | Satisfactory |
| **Ogallala 7 (East Dam)** | NE02334 | Keith | Yes | No | Yes | 335 | Local Government | 515 | 9/17/2024 | Satisfactory |
| **Kingsley** | NE01048 | Keith | Yes | Yes | Yes | 139,673 | Public Utility | 1,900,600 | 9/28/2022 | Fair |
| **Oliver Dam** | NE00749 | Kimball | Yes | No | Yes | 36 | Local Government | 8,428 | 9/19/2024 | Fair |

| Name | NID | County | State Regulated | Federal Regulated | EAP Prepared | Population at Risk | Owner | Capacity (Acre-Ft) | Inspection Date | Condition |
|---|---|---|---|---|---|---|---|---|---|---|
| **Janicek Dam** | NE00750 | Kimball | Yes | No | Yes | 276 | Local Government | 360 | 9/19/2024 | Satisfactory |
| **Upper Big Nemaha 11-A** | NE00550 | Lancaster | Yes | No | Yes | 78 | Local Government | 1,148 | 6/27/2023 | Fair |
| **North Oak Creek 1-A** | NE01665 | Lancaster | Yes | No | Yes | 40 | Local Government | 3,222 | 5/22/2024 | Satisfactory |
| **Wedgewood Lake Dam** | NE00527 | Lancaster | Yes | No | Yes | 400 | Private | 310 | 8/27/2024 | Satisfactory |
| **Korver Dam** | NE02652 | Lancaster | Yes | No | Yes | 3 | Private | 383 | 5/8/2024 | Satisfactory |
| **Upper Salt Creek 3-A** | NE00505 | Lancaster | Yes | No | Yes | 3 | Local Government | 1,767 | 3/28/2024 | Fair |
| **Village Gardens Dam** | NE02805 | Lancaster | Yes | No | Yes | 3 | Private | 51 | 5/7/2024 | Satisfactory |
| **Waterford Estates Dam** | NE02837 | Lancaster | Yes | No | Yes | 33 | Local Government | 2,081 | 5/22/2024 | Satisfactory |
| **Upper Salt Creek 10-A** | NE00533 | Lancaster | Yes | No | Yes | 9 | Local Government | 1,689 | 3/28/2024 | Satisfactory |
| **Upper Little Nemaha 21** | NE02518 | Lancaster | Yes | No | Yes | 10 | Local Government | 2,439 | 5/7/2024 | Satisfactory |
| **Stevens Creek A17-1** | NE02757 | Lancaster | Yes | No | Yes | 62 | Local Government | 1,127 | 5/22/2024 | Satisfactory |
| **Ash Hollow Dry Dam** | NE08364 | Lancaster | Yes | No | Yes | 2,342 | Local Government | 1,744 | 5/22/2024 | Satisfactory |
| **Stevens Creek A2-1** | NE02756 | Lancaster | Yes | No | Yes | 3 | Local Government | 256 | 4/12/2023 | Satisfactory |

| Name | NID | County | State Regulated | Federal Regulated | EAP Prepared | Population at Risk | Owner | Capacity (Acre-Ft) | Inspection Date | Condition |
|---|---|---|---|---|---|---|---|---|---|---|
| **Upper Salt Creek 35-A** | NE00523 | Lancaster | Yes | No | Yes | 106 | Local Government | 450 | 3/28/2024 | Satisfactory |
| **Bluestem Dam** | NE01064 | Lancaster | Yes | Yes | Yes | 12,995 | Federal | 17,550 | 6/17/2021 | Not Available |
| **Olive Creek Dam** | NE01062 | Lancaster | Yes | Yes | Yes | 8,142 | Federal | 8,590 | 5/1/2020 | Not Available |
| **Wagon Train Dam** | NE01056 | Lancaster | Yes | Yes | Yes | 10,476 | Federal | 15,050 | 5/5/2022 | Not Available |
| **Stagecoach Dam** | NE01059 | Lancaster | Yes | Yes | Yes | 8,217 | Federal | 10,200 | 6/16/2022 | Not Available |
| **Antelope Creek Dam** | NE01061 | Lancaster | Yes | Yes | Yes | 16,703 | Federal | 7,455 | 7/22/2021 | Not Available |
| **Conestoga Dam** | NE01055 | Lancaster | Yes | Yes | Yes | 14,382 | Federal | 15,000 | 7/17/2023 | Not Available |
| **Yankee Hill Dam** | NE01058 | Lancaster | Yes | Yes | Yes | 6,090 | Federal | 10,300 | 6/5/2023 | Not Available |
| **Pawnee Dam** | NE01057 | Lancaster | Yes | Yes | Yes | 16,450 | Federal | 38,300 | 6/28/2019 | Not Available |
| **Branched Oak Dam** | NE01063 | Lancaster | Yes | Yes | Yes | 22,331 | Federal | 122,283 | 9/1/2020 | Not Available |
| **Maloney** | NE01052 | Lincoln | Yes | Yes | Yes | 1,361 | Public Utility | 19,450 | 6/23/2022 | Satisfactory |
| **Jeffrey Dam** | NE01036 | Lincoln | Yes | Yes | Yes | 19 | Public Utility | 6,937 | 9/27/2022 | Satisfactory |
| **Sutherland** | NE01051 | Lincoln | Yes | Yes | Yes | 5 | Public Utility | 65,000 | 6/22/2022 | Satisfactory |

| Name | NID | County | State Regulated | Federal Regulated | EAP Prepared | Population at Risk | Owner | Capacity (Acre-Ft) | Inspection Date | Condition |
|---|---|---|---|---|---|---|---|---|---|---|
| **Skyview Lake Dam** | NE00326 | Madison | Yes | No | Yes | 4,248 | Local Government | 1,716 | 10/10/2024 | Satisfactory |
| **Raasch Dam** | NE01184 | Madison | Yes | No | Yes | 186 | Local Government | 384 | 8/20/2024 | Satisfactory |
| **Wildhorse 5-A** | NE00650 | Morrill | Yes | No | Yes | 134 | Local Government | 2,180 | 6/3/2024 | Fair |
| **Wildhorse 14-A** | NE00651 | Morrill | Yes | No | Yes | 114 | Local Government | 1,909 | 6/3/2024 | Satisfactory |
| **Wilson Creek 8-H** | NE00892 | Otoe | Yes | No | Yes | 2 | Local Government | 697 | 3/28/2024 | Satisfactory |
| **Wilson Creek 2-N** | NE00865 | Otoe | Yes | No | Yes | 18 | Local Government | 36 | 3/28/2024 | Satisfactory |
| **Plum Creek 4-F** | NE00775 | Pawnee | Yes | No | Yes | 9 | Local Government | 2,185 | 11/12/2024 | Poor |
| **Willow Creek Dam** | NE02134 | Pierce | Yes | No | Yes | 1,565 | Local Government | 30,300 | 10/10/2024 | Poor |
| **Columbus Powerhouse & Forebay** | NE01053 | Platte | Yes | Yes | Yes | 0 | Public Utility | 4,351 | 7/20/2022 | Satisfactory |
| **Kelley Creek West Dam** | NE01672 | Red Willow | Yes | No | Yes | 20 | Local Government | 1,183 | 7/1/2024 | Fair |
| **Long Branch 21** | NE02216 | Richard-son | Yes | No | Yes | 64 | Local Government | 5,841 | 10/16/2024 | Satisfactory |
| **Wilber Dam 1** | NE01519 | Saline | Yes | No | Yes | 152 | Local Government | 127 | 4/2/2024 | Satisfactory |

| Name | NID | County | State Regulated | Federal Regulated | EAP Prepared | Population at Risk | Owner | Capacity (Acre-Ft) | Inspection Date | Condition |
|---|---|---|---|---|---|---|---|---|---|---|
| **Swan Creek 31** | NE02450 | Saline | Yes | No | Not Required | 3 | Local Government | 1,641 | 12/6/2024 | Satisfactory |
| **Wilber Watershed Dam** | NE07975 | Saline | Yes | No | Yes | 445 | Local Government | 401 | 4/2/2024 | Poor |
| **Swan Creek 20** | NE02248 | Saline | Yes | No | Yes | 3 | Local Government | 3,978 | 4/2/2024 | Satisfactory |
| **Papio Creek S-27** | NE01818 | Sarpy | Yes | No | Yes | 3 | Local Government | 51 | 4/9/2024 | Satisfactory |
| **Papio Creek S-32** | NE00092 | Sarpy | Yes | No | Yes | 60 | Local Government | 163 | 4/9/2024 | Satisfactory |
| **Papio Creek S-31** | NE01751 | Sarpy | Yes | No | Yes | 2 | Local Government | 188 | 4/9/2024 | Satisfactory |
| **Shadow Lake Dam** | NE02830 | Sarpy | Yes | No | Yes | 274 | Local Government | 1,171 | 6/1/2023 | Satisfactory |
| **Midland Lake Dam** | NE02831 | Sarpy | Yes | No | Yes | 2 | Local Government | 401 | 6/1/2023 | Satisfactory |
| **Thompson Creek Dam** | NE02217 | Sarpy | Yes | No | Yes | 242 | Local Government | 122 | 4/3/2024 | Satisfactory |
| **Hanson Lake Dam** | NE02653 | Sarpy | Yes | No | Yes | 335 | Local Government | 56 | 4/9/2024 | Satisfactory |
| **Papio Creek Wp-6** | NE09746 | Sarpy | Yes | No | Yes | 4 | Local Government | 1,123 | 6/13/2024 | Satisfactory |
| **Papio Creek 21 – Walnut Creek** | NE02430 | Sarpy | Yes | No | Yes | 21 | Local Government | 3,347 | 10/30/2024 | Satisfactory |

| Name | NID | County | State Regulated | Federal Regulated | EAP Prepared | Population at Risk | Owner | Capacity (Acre-Ft) | Inspection Date | Condition |
|---|---|---|---|---|---|---|---|---|---|---|
| **Lakewood Villages Upper Dam** | NE02512 | Sarpy | Yes | No | Yes | 76 | Private | 140 | 10/30/2024 | Satisfactory |
| **Lakewood Villages Lower Dam** | NE02513 | Sarpy | Yes | No | Yes | 76 | Private | 143 | 10/30/2024 | Satisfactory |
| **Prairie Queen Main Dam** | NE05082 | Sarpy | Yes | No | Yes | 2,200 | Local Government | 5,060 | 6/13/2024 | Satisfactory |
| **Papio Creek Wp-7** | NE09785 | Sarpy | Yes | No | Yes | 4 | Local Government | 364 | 6/13/2024 | Satisfactory |
| **Wehrspann Dam** | NE01882 | Sarpy | Yes | Yes | Yes | 2,453 | Federal | 17,164 | 5/23/2023 | Not Available |
| **Cottonwood Creek 7-A** | NE02321 | Saunders | Yes | No | Yes | 50 | Local Government | 2,984 | 10/17/2024 | Satisfactory |
| **Lake Wanahoo Dam** | NE03108 | Saunders | Yes | No | Yes | 380 | Local Government | 27,356 | 8/22/2024 | Satisfactory |
| **Cottonwood Creek 21-A** | NE01887 | Saunders | Yes | No | Yes | 9 | Local Government | 1,043 | 10/17/2024 | Poor |
| **Gering Valley E** | NE00660 | Scotts Bluff | Yes | No | Yes | 38 | Local Government | 1,840 | 6/4/2024 | Satisfactory |
| **Gering Valley B** | NE00659 | Scotts Bluff | Yes | No | Yes | 50 | Local Government | 848 | 6/4/2024 | Not Available |
| **Gering Valley A** | NE00664 | Scotts Bluff | Yes | No | Yes | 20 | Local Government | 725 | 6/4/2024 | Poor |
| **Minatare Dam** | NE01075 | Scotts Bluff | Yes | Yes | Yes | 212 | Federal | 62,190 | 8/11/2020 | Poor |

| Name | NID | County | State Regulated | Federal Regulated | EAP Prepared | Population at Risk | Owner | Capacity (Acre-Ft) | Inspection Date | Condition |
|---|---|---|---|---|---|---|---|---|---|---|
| **Lake Alice Dam 1** | NE01072 | Scotts Bluff | Yes | Yes | Yes | 2,242 | Federal | 15,287 | 8/13/2020 | Not Available |
| **Lake Alice Dam 1-1/2** | NE01071 | Scotts Bluff | No | Yes | Yes | 3,407 | Federal | 15,287 | 8/13/2020 | Not Available |
| **Oak-Middle 82-B** | NE00068 | Seward | Yes | No | Yes | 3 | Local Government | 371 | 9/15/2023 | Satisfactory |
| **Twin Lakes Dam** | NE01060 | Seward | Yes | Yes | Yes | 10,126 | Federal | 11,750 | 7/29/2024 | Not Available |
| **Antelope Creek 20-A** | NE00793 | Sheridan | Yes | No | Yes | 500 | Local Government | 450 | 6/5/2024 | Satisfactory |
| **Antelope Creek 40-B** | NE00795 | Sheridan | Yes | No | Yes | 1,000 | Local Government | 8,655 | 6/5/2024 | Satisfactory |
| **Sherman Dam** | NE01077 | Sherman | Yes | No | Yes | 828 | Local Government | 125,477 | 4/17/2024 | Satisfactory |
| **Carter P Johnson Dam** | NE01124 | Sioux | Yes | No | Yes | 173 | State | 202 | 6/4/2024 | Poor |
| **Maskenthine Dam** | NE00682 | Stanton | Yes | No | Yes | 98 | Local Government | 3,862 | 10/10/2024 | Satisfactory |
| **Hebron Dam** | NE01576 | Thayer | Yes | No | Yes | 230 | Local Government | 685 | 4/2/2024 | Satisfactory |
| **Papio Creek W-3** | NE01883 | Washing-ton | Yes | No | Yes | 9 | Local Government | 270 | 5/9/2024 | Satisfactory |

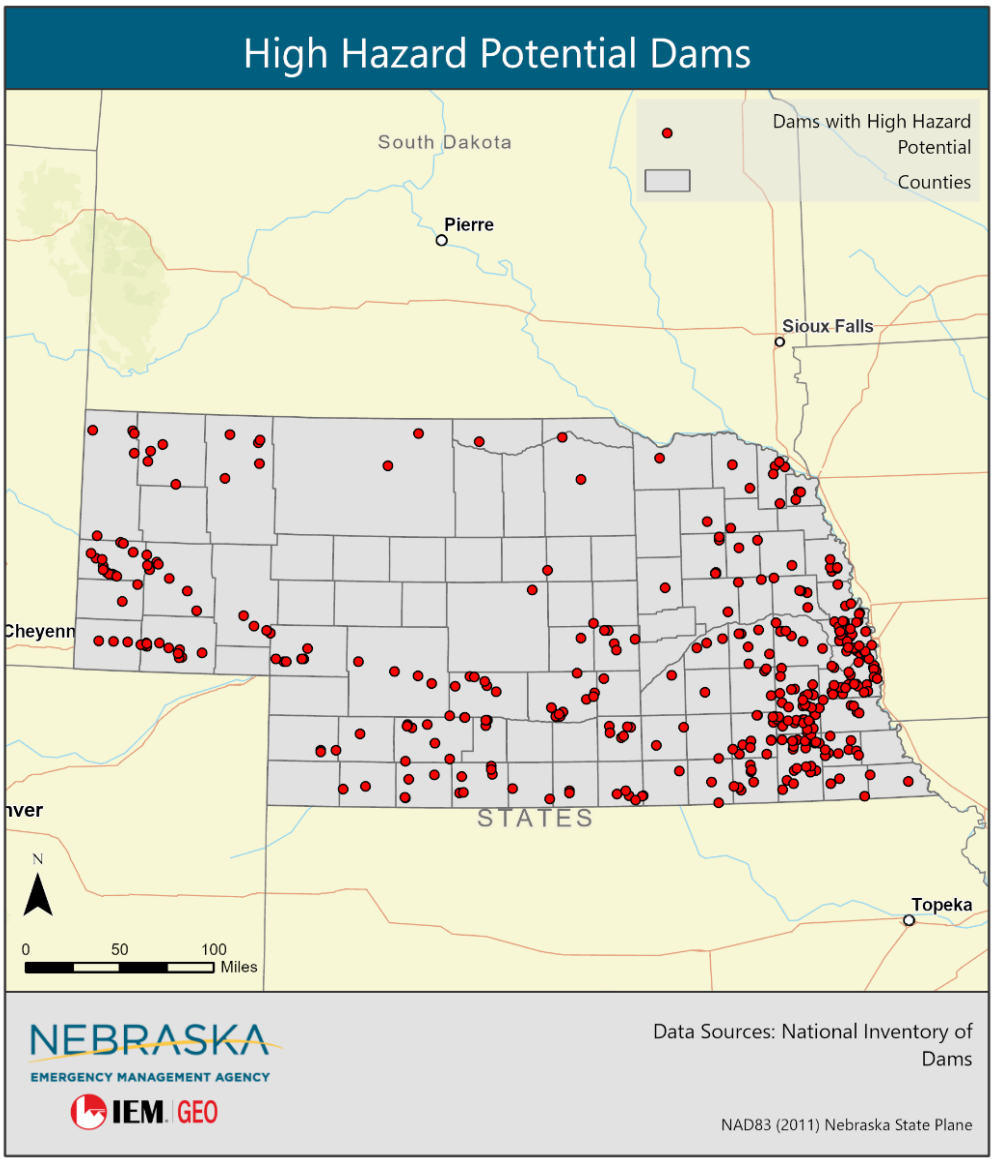



**Figure 46: High Hazard Potential Dam Locations**

### 3.11.2.2 EXTENT

Federal regulations establish a three-tier classification system to assess dam hazard potential, categorizing them as low, significant, or high hazard based on the projected consequences of failure. These classifications consider factors such as potential loss of life, economic impacts, and environmental damage (see Table 27).

Table 27: Dam Classification System

| Classification | Description |
|---|---|
| **High** | Likely to cause loss of life. |
| **Significant** | Could cause economic loss, environmental damage, or disruption of services. |
| **Low** | Unlikely to cause loss of life or significant economic or environmental damage. |

### 3.11.2.3 PREVIOUS EVENTS

The earliest recorded incident dates back to 1890, involving an embankment slide at County Dam. Several failures occurred in the early twentieth century, including at Nebraska City, Valentine Fish Hatchery, and Ainsworth, with causes largely undocumented. In 1936 and 1937, multiple incidents impacted Sutherland and Maloney Dams, with Maloney experiencing washouts on three separate occasions. Notably, Knapple Dams had repeat failures in 1942 and 1972, with issues such as embankment sliding and erosion contributing to their structural instability.

Hydrologic events have played a significant role in Nebraska's dam failures, with Ainsworth, Medicine Creek, and Hubl Road Structure experiencing failures due to inflow flooding between 1962 and 1993. The Lake North Dam breached twice, once in 1947 and again in 1966, while Atkinson Reservoir suffered a spillway failure in 1984. An unusual case occurred at Timperley Wildlife Dam in 1990, where an animal attack led to structural compromise. Table 28 provides an overview of these dam failures.

Table 28: Dam Failures in the State of Nebraska[121]

| Name | Incident Date | Incident Type | Dam Type |
|---|---|---|---|
| **County Dam** | 1/1/1890 | Embankment Slide | Earth |
| **Nebraska City (1)** | 4/10/1890 | Not Known | Not Known |
| **Nebraska City** | 4/10/1890 | Not Known | Earth |
| **Valentine Fish Hatchery Dam** | 1/1/1911 | Not Known | Earth |
| **Ainsworth** | 1/1/1913 | Not Known | Earth |
| **Minatare** | 1/1/1920 | Not Known | Earth |
| **Sutherland** | 12/1/1936 | Not Known | Gravity |
| **Maloney** | 12/1/1936 | Washout | Earth |
| **Sutherland** | 2/5/1937 | Not Known | Gravity |
| **Maloney** | 2/5/1937 | Washout | Earth |
| **Sutherland** | 3/30/1937 | Not Known | Gravity |
| **Maloney** | 3/30/1937 | Washout | Earth |

[121] National Performance of Dams Program, "NPDP Dam Incident Database." http://npdp.stanford.edu/dam_incidents.

| Name | Incident Date | Incident Type | Dam Type |
|---|---|---|---|
| **Knapple Dam** | 1/1/1942 | Sliding | Earth |
| **Johnson Dam** | 1/1/1945 | Not Known | Earth |
| **Columbus Powerhouse & Forebay** | 6/23/1947 | Not Known | Not Known |
| **Lake North** | 6/23/1947 | Breach | Earth |
| **Ainsworth** | 1/1/1962 | Inflow Flood – Hydrologic Event | Earth |
| **Medicine Creek** | 1/1/1964 | Inflow Flood – Hydrologic Event | Earth |
| **Diversion Dam** | 8/13/1966 | Not Known | Not Known |
| **Lake North** | 8/13/1966 | Breach | Earth |
| **Kingsley** | 5/1/1972 | Not Known | Earth |
| **Knapple Dam** | 5/1/1972 | Erosion | Earth |
| **Hubl Rd Str** | 5/11/1982 | Inflow Flood – Hydrologic Event | Earth |
| **Diversion Dam** | 6/7/1983 | Not Known | Not Known |
| **Knapple Dam** | 6/7/1983 | Erosion | Earth |
| **Atkinson Reservoir** | 4/8/1984 | Spillway Failure | Concrete; Earth |
| **Timperley Wildlife Dam** | 12/1/1990 | Animal Attack | Earth |
| **Helen Fehrs Trust Dam** | 12/20/1994 | Regulatory Action (Controlled Breach) | Not Known |
| **Hurt Dam** | 6/19/1995 | Seepage; Piping | Earth |
| **Timperley Wildlife Dam** | 6/1/1999 | Seepage | Earth |
| **Bear Creek 7d** | 6/11/1999 | Seepage | Earth |
| **Hurt Dam** | 5/17/2000 | Seepage: Piping | Earth |
| **Blue Springs Power Plant Dam** | 5/29/2004 | Inflow Flood – Hydrologic Event | Concrete |
| **Kingsley** | 7/19/2006 | Not Known | Earth |
| **Sutherland** | 6/7/2011 | Not Known | Gravity |
| **Diversion Dam** | 3/14/2019 | Ice | N/A |

#### 3.11.2.4 PROBABILITY

Dam failures in Nebraska have occurred across various locations and time periods, primarily affecting earth dams and resulting from a range of causes, including hydrologic events, erosion, structural failures, and unknown factors. Since 1890, there have been 38 recorded dam failures per the National

Performance of Dams Program.[122] Based on these historical records, the state of Nebraska has a 28% annual probability of impact by a dam failure or approximately one dam failure every 3 to 5 years.

#### 3.11.2.5 EFFECTS OF FUTURE CONDITIONS

Variations in environmental conditions pose significant challenges for the operation and reliability of dams across the globe. As temperatures increase and weather phenomena become more unpredictable, the effectiveness of these critical infrastructures is increasingly at risk. One of the primary concerns is the heightened frequency of intense precipitation events. Increased evaporation rates lead to greater atmospheric moisture, culminating in heavier rainfall and a greater likelihood of extreme precipitation, which can surpass the designed capacity of dams and compromise their ability to manage floodwaters effectively.[123]

Shifting precipitation patterns can also adversely affect the long-term functionality of dams and their storage capabilities. Certain regions may experience more frequent and severe droughts due to altered hydrological cycles resulting in diminished water resources available in reservoirs behind dams.[124] These reductions in water levels impact not only the supply for domestic and agricultural use but also hinder hydroelectric power generation, crucial for sustaining energy demands.[125]

Human population growth and urban development are also exerting unprecedented pressures on dam systems. As populations expand, the demand for water supply intensifies, often requiring increased water withdrawals from reservoirs. Concurrently, urbanization can lead to changes in land use patterns that may contribute to higher runoff rates and increase the frequency of flooding events, thereby challenging the existing infrastructure.[126] The structural integrity of dams may also be compromised as a result of these environmental dynamics and developmental pressures. Increased evaporation can cause soil beneath dams to shrink, which may lead to cracking and instability of the supporting base.[127]

## 3.11.3 Vulnerability Analysis

Nebraska faces significant vulnerability to dam failures due to its reliance on reservoirs for water management, irrigation, and flood control. The state's diverse landscape, including flood-prone areas along major rivers and tributaries, increases the potential for widespread devastation when a dam breach occurs. Failures can happen with little warning, particularly during periods of heavy rainfall, rapid snowmelt, or structural deterioration, leading to catastrophic flooding downstream. Vulnerable populations, including older adults, individuals with access and functional needs, and those living in

[122] National Performance of Dams Program. http://npdp.stanford.edu/.
[123] A. du Plessis, A. du Plessis, and Schmuhl, *Water as an Inescapable Risk.* (New York: Springer International Publishing, 2019), 147–172.
[124] A. M. Guiltner, A. S. North, and J. Dickinson, "Drought and Flood Variations and Their Effects on Reservoir Management, *Water Resources Research,* 2020:*56*(7). https://doi.org/10.1029/2019WR026029.
[125] E. F. Moran, M. C. Lopez, N. Moore, N. Müller, and D. W. Hyndman, "Sustainable Hydropower in the 21st Century," *Proceedings of the National Academy of Sciences,* 115, no. 47: 11891–11898.
[126] Z. Wang, Y. Chen, and B. Xu, "The Influence of Urbanization on Hydrology and Flood Risks in Dam Reservoirs," *Hydrology and Earth System Sciences* 22, no. 2 (2018): 727–741. https://doi.org/10.5194/hess-22-727-2018.
[127] P. Milanović, N. Maksimovich, O. Meshcheriakova, P. Milanović, N. Maksimovich, and O. Meshcheriakova,. "Overview of Dams and Reservoirs in Evaporites." Dams and Reservoirs in Evaporites, 2019, 115–157.

remote communities, face increased risks due to limited evacuation routes, emergency services, and communication resources. The state's reliance on dams for water storage and flood mitigation further heightens this vulnerability, as a failure could result in damage to critical infrastructure, including roads, power grids, and water treatment plants, delaying response efforts and complicating long-term recovery. Rural communities, which often have fewer emergency management resources than urban centers, are particularly at risk of extended disruptions and economic losses following a dam failure.

### 3.11.3.1 NATIONAL RISK INDEX

The National Risk Index (NRI) provides communities with an online tool to display potential risk to 18 natural hazards, but dams are not provided in the NRI.

### 3.11.3.2 ESTIMATED IMPACT AND POTENTIAL LOSSES

Dam failures pose significant risks to Nebraska, impacting multiple aspects of the state's communities. The sudden release of floodwater can cause extensive property damage, displace residents, and create serious public health concerns including water contamination and increased disease risk. Anxiety and uncertainty may rise among affected populations, reducing overall well-being. Economically, Nebraska's agricultural sector, a crucial component of the state's economy, faces devastating losses as floodwaters destroy crops, wash away topsoil, and threaten livestock operations. Businesses and tourism-related industries may suffer as damaged infrastructure, road closures, and safety concerns deter visitors. The strain on critical facilities, including hospitals, emergency services, and water treatment plants, can lead to prolonged disruptions and require significant financial resources for repairs and recovery.

Beyond immediate destruction, dam failures can cause long-term environmental damage by altering river ecosystems, eroding landscapes, and disrupting wildlife habitats. Floodwater may damage or destroy historic landmarks, parks, and recreational areas, limiting community gatherings and cultural events essential to Nebraska's heritage. These disasters can also redirect funding and resources from planned infrastructure improvements, economic development initiatives, and environmental conservation efforts. Without proactive flood management strategies and resilient infrastructure, the consequences of dam failures can undermine Nebraska's economic stability, environmental sustainability, and overall community resilience. The following table provides information on the vulnerable structures within each county that could be impacted by a dam failure.

**Table 29: Infrastructure Vulnerable to Dam Failure by County**

| County | State-Owned Structures | Local or Privately Owned Structures | Emergency Management | Emergency Response |
|---|---|---|---|---|
| **Adams** | * | 188 | * | * |
| **Antelope** | * | * | * | * |
| **Arthur** | * | * | * | * |
| **Banner** | * | * | * | * |
| **Blaine** | * | * | * | * |

| County | State-Owned Structures | Local or Privately Owned Structures | Emergency Management | Emergency Response |
|---|---|---|---|---|
| **Boone** | * | 298 | * | 1 |
| **Box Butte** | * | * | * | * |
| **Boyd** | * | * | * | * |
| **Brown** | * | * | * | * |
| **Buffalo** | 1 | 7,936 | 5 | 4 |
| **Burt** | * | 2,024 | 3 | 5 |
| **Butler** | * | 590 | * | * |
| **Cass** | * | 1,843 | 4 | 6 |
| **Cedar** | * | 898 | 10 | 3 |
| **Chase** | * | 333 | 2 | 3 |
| **Cherry** | * | 71 | * | * |
| **Cheyenne** | * | 1,024 | 1 | 5 |
| **Clay** | * | 83 | * | 1 |
| **Colfax** | * | 2,649 | 5 | 3 |
| **Cuming** | * | * | * | * |
| **Custer** | * | 2 | * | * |
| **Dakota** | * | 7,449 | 15 | 12 |
| **Dawes** | * | 25 | | |
| **Dawson** | * | 10,997 | 11 | 20 |
| **Deuel** | * | * | * | * |
| **Dixon** | * | 474 | 3 | 4 |
| **Dodge** | * | 14,482 | 14 | 8 |
| **Douglas** | * | 14,167 | 17 | 21 |
| **Dundy** | * | * | * | * |
| **Fillmore** | * | * | * | * |
| **Franklin** | * | 516 | * | 1 |
| **Frontier** | * | 9 | * | * |
| **Furnas** | * | 1,218 | * | * |
| **Gage** | * | 1,442 | 3 | 5 |
| **Garden** | * | 121 | 24 | 6 |
| **Garfield** | * | 63 | * | * |
| **Gosper** | * | * | * | * |
| **Grant** | * | 58 | * | * |

| County | State-Owned Structures | Local or Privately Owned Structures | Emergency Management | Emergency Response |
|---|---|---|---|---|
| Greeley | * | 7,824 | * | * |
| Hall | * | 278 | 4 | 5 |
| Hamilton | * | 85 | * | * |
| Harlan | * | 220 | * | * |
| Hayes | * | 833 | * | * |
| Hitchcock | * | * | * | * |
| Holt | * | * | * | * |
| Hooker | * | 986 | * | * |
| Howard | * | 16 | 2 | 2 |
| Jefferson | * | 43 | * | * |
| Johnson | * | 911 | * | 1 |
| Kearney | * | 1,776 | * | |
| Keith | * | 3 | * | 4 |
| Keya Paha | * | 891 | * | * |
| Kimball | * | * | 2 | 1 |
| Knox | 24 | 14,533 | * | * |
| Lancaster | 4 | 16,877 | 8 | 20 |
| Lincoln | * | * | 7 | 9 |
| Logan | * | 8 | * | * |
| Loup | * | 2,106 | * | * |
| Madison | * | * | * | * |
| McPherson | * | 5,566 | * | * |
| Merrick | * | 2,897 | 18 | 10 |
| Morrill | * | 150 | 18 | 18 |
| Nance | * | 285 | * | * |
| Nemaha | * | 334 | * | * |
| Nuckolls | * | 149 | 1 | 1 |
| Otoe | * | 4 | * | 1 |
| Pawnee | * | * | * | * |
| Perkins | * | 1,442 | * | * |
| Phelps | * | 309 | * | * |
| Pierce | * | 556 | 1 | * |
| Platte | * | 3,869 | * | 2 |

| County | State-Owned Structures | Local or Privately Owned Structures | Emergency Management | Emergency Response |
|---|---|---|---|---|
| **Polk** | * | 992 | * | * |
| **Red Willow** | * | 802 | * | * |
| **Richardson** | * | 92 | * | 1 |
| **Rock** | * | * | * | * |
| **Saline** | * | 305 | 3 | 2 |
| **Sarpy** | * | 4,513 | 1 | 6 |
| **Saunders** | * | 1,967 | | 1 |
| **Scotts Bluff** | * | 12,997 | 35 | 17 |
| **Seward** | * | 25 | * | * |
| **Sheridan** | * | 779 | 2 | 3 |
| **Sherman** | * | 233 | 2 | 1 |
| **Sioux** | * | 8 | * | * |
| **Stanton** | * | 88 | * | * |
| **Thayer** | * | 219 | * | * |
| **Thomas** | * | * | * | * |
| **Thurston** | * | 49 | * | * |
| **Valley** | * | 113 | * | * |
| **Washington** | * | 943 | 3 | 1 |
| **Wayne** | * | * | * | * |
| **Webster** | * | 581 | 1 | 1 |
| **Wheeler** | * | * | * | * |
| **York** | * | 188 | * | * |

* Specific numbers were not provided.

A data deficiency is declared for this analysis due to the absence of detailed information regarding critical infrastructure by type, location, and community lifeline function. While Table 29 provides a general inventory of state-owned and locally owned structures based upon best available data from the State of Nebraska, as well as emergency management and response capacities by county, it does not specify the exact types of infrastructure (e.g., transportation networks, utilities, healthcare facilities, or water systems) that may be exposed to dam failure impacts. Further studies and analysis to identify and classify critical infrastructure within areas of dam failure risk are prioritized for future hazard mitigation planning efforts and updates.

### 3.11.3.3 ACCESS AND FUNCTIONAL NEEDS

Dam failures pose significant risks to access and functional needs (AFN) populations, including individuals with disabilities, older adults, and those with limited mobility. These populations often face disproportionate challenges during emergency evacuations due to mobility impairments, communication barriers, and medical dependencies.[128] The sudden inundation caused by dam failure can restrict access to critical healthcare services, disrupt power supplies essential for medical equipment, and limit transportation options exacerbating vulnerabilities.[129] Emergency response efforts also may not always account for AFN-specific needs, further increasing the risk of injury or fatality in affected areas.

Mitigating the impact of dam failures on AFN populations requires inclusive disaster preparedness planning, early warning systems tailored for diverse communication needs, and accessible evacuation routes.[130] Community engagement and policy-driven strategies must prioritize the development of adaptive infrastructure and emergency response frameworks to ensure equitable safety measures.[131] Integrating AFN considerations into emergency management policies enhances resilience and reduces disparities in disaster outcomes, reinforcing the need for proactive risk reduction approaches.

### 3.11.3.4 COMMUNITY LIFELINES

Dam failures pose severe threats to FEMA's Community Lifelines, which are essential services that enable communities to function effectively during disasters. When a dam collapses, the water, power, and transportation lifelines are immediately disrupted. Flooding can contaminate potable water supplies, damage treatment facilities, and compromise wastewater management systems, leading to potential public health crises.[132] Additionally, the destruction of electrical grids and substations due to water inundation can result in prolonged power outages, affecting critical services such as hospitals, emergency shelters, and communication networks. Transportation infrastructure, including roads, bridges, and railways, may also suffer extensive damage, hampering emergency response operations and delaying aid distribution to affected areas.

Beyond immediate physical damage, dam failures can have cascading effects on safety and security, food and shelter, and health and medical lifelines. The rapid displacement of residents due to flooding increases demands for emergency shelters, while food supply chains may be disrupted as grocery stores, warehouses, and distribution centers become inaccessible.[133] Emergency response capabilities can be overwhelmed, particularly in regions with limited resources, making it difficult to evacuate vulnerable

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[128] Federal Emergency Management Agency, *Guide to Emergency Management Planning for Access and Functional Needs Populations*, U.S. Department of Homeland Security, 2021.
[129] R. Smith, M. Johnson, and P. Lee," Flood Risk and Vulnerable Populations: Examining the Effects of Dam Failures on Accessibility," *Natural Hazards Review* 21, no. 3 (2020): 45–59.
[130] National Institute of Standards and Technology, *Inclusive Infrastructure Planning for Disaster Resilience*, U.S. Department of Commerce, 2019.
[131] L. Jones and T. Brown, Disaster resilience and accessibility: Addressing Vulnerabilities in Emergency Planning," *Journal of Emergency Management* 40, no. 2 (2022): 112–126.
[132] Federal Emergency Management Agency, *Community Lifelines Implementation Toolkit*. U.S. Department of Homeland Security, 2020.
[133] R. Jones and T. Smith," Infrastructure Resilience and Disaster Preparedness: Addressing Cascading Failures in Emergency Response," *Journal of Emergency Management* 39, no. 4 (2021): 201–218.

populations and provide medical care to the community. Healthcare facilities may experience surges in patients suffering from injuries, waterborne diseases, or exposure-related illnesses, further straining the system.[134] Mitigating these impacts requires proactive dam safety measures, robust emergency response planning, and interagency coordination to ensure that FEMA's Community Lifelines remain operational in the wake of catastrophic dam failures. The following table provides more information on the transportation and utilities that could potentially be impacted by a dam failure.

**Table 30: Transportation and Utility Vulnerability to Dam Failures**

| County | State Roadways (miles) | Local Roadways (miles) | State Bridges | State Culverts | Local Bridges | Railroad (miles) | Electric Transmission Lines (miles) |
|---|---|---|---|---|---|---|---|
| **Adams** | 0.1 | 11.6 | 2 | | 20 | 4.3 | 2.1 |
| **Antelope** | * | * | * | * | * | * | * |
| **Arthur** | * | * | * | * | * | * | * |
| **Banner** | * | * | * | * | * | * | * |
| **Blaine** | * | * | * | * | * | * | * |
| **Boone** | 1.2 | 13.2 | * | * | 1 | 0.6 | 0.2 |
| **Box Butte** | * | * | * | * | * | * | * |
| **Boyd** | * | * | * | * | * | * | * |
| **Brown** | * | * | * | * | * | * | * |
| **Buffalo** | 64.4 | 389.3 | 39 | 14 | 75 | 26.7 | 69.8 |
| **Burt** | 15.9 | 212.2 | 7 | 2 | 26 | | 18.2 |
| **Butler** | 2.8 | 30.4 | 4 | 2 | 15 | 1.0 | 2.6 |
| **Cass** | 4.4 | 72.8 | 16 | 5 | 15 | 30.6 | 5.1 |
| **Cedar** | 6.3 | 61.2 | 2 | * | 11 | 0.0 | 0.4 |
| **Chase** | 2.4 | 13.6 | 1 | * | 9 | 7.3 | 1.1 |
| **Cherry** | 1.1 | 5.9 | 4 | * | 7 | | 0.2 |
| **Cheyenne** | 2.0 | 19.8 | 2 | 1 | 3 | 2.4 | 0.1 |
| **Clay** | 1.3 | 9.5 | 3 | * | 21 | 0.2 | 0.9 |
| **Colfax** | 5.2 | 125.6 | 5 | * | 29 | 17.2 | 0.9 |
| **Cuming** | * | * | * | * | * | * | * |
| **Custer** | * | 0.3 | * | * | * | * | * |
| **Dakota** | 33.3 | 304.8 | 17 | * | 14 | 31.0 | 75.8 |
| **Dawes** | 0.6 | 4.3 | 2 | * | 1 | * | 0.8 |

[134] National Institute of Standards and Technology, *Resilient Infrastructure and Emergency Response Planning*. U.S. Department of Commerce, 2019.

| County | State Roadways (miles) | Local Roadways (miles) | State Bridges | State Culverts | Local Bridges | Railroad (miles) | Electric Transmission Lines (miles) |
|---|---|---|---|---|---|---|---|
| **Dawson** | 114.7 | 658.8 | 41 | 26 | 84 | 70.2 | 100.4 |
| **Deuel** | * | * | * | * | * | * | * |
| **Dixon** | 1.7 | 32.0 | 1 | * | 5 | * | 1.4 |
| **Dodge** | 46.0 | 478.1 | 25 | 9 | 75 | 87.8 | 55.1 |
| **Douglas** | 45.8 | 430.6 | 65 | 12 | 126 | 71.3 | 69.9 |
| **Dundy** | * | * | * | * | * | * | * |
| **Fillmore** | * | * | * | * | * | * | * |
| **Franklin** | 2.1 | 52.8 | 2 | * | 18 | 12.6 | 1.3 |
| **Frontier** | * | 1.0 | * | * | 1 | * | 0.4 |
| **Furnas** | 13.2 | 62.3 | 12 | 6 | 13 | 17.5 | 7.3 |
| **Gage** | 2.0 | 12.7 | 7 | 4 | 27 | 2.8 | 0.2 |
| **Garden** | 31.4 | 101.5 | 5 | 8 | 4 | 28.3 | 7.2 |
| **Garfield** | 5.7 | 16.7 | 4 | * | * | * | * |
| **Gosper** | 0.3 | 11.8 | 1 | * | 12 | * | 4.7 |
| **Grant** | * | * | * | * | * | * | * |
| **Greeley** | 3.4 | 10.3 | 2 | 2 | 3 | 4.1 | 1.0 |
| **Hall** | 48.8 | 399.3 | 42 | 8 | 79 | 17.7 | 60.4 |
| **Hamilton** | 3.7 | 24.1 | 1 | 4 | 2 | 1.3 | 8.2 |
| **Harlan** | 5.2 | 40.0 | 11 |  | 8 | 4.5 | 1.8 |
| **Hayes** | 9.7 | 31.2 | 8 | 1 | 13 | 9.2 | 0.2 |
| **Hitchcock** | 11.6 | 78.4 | 12 | 4 | 6 | 14.6 | 6.6 |
| **Holt** | * | * | * | * | * | * | * |
| **Hooker** | * | * | * | * | * | * | * |
| **Howard** | 7.4 | 68.3 | 7 | 2 | 33 | 4.5 | 3.1 |
| **Jefferson** | * | 1.1 | * | * | 8 | * | * |
| **Johnson** | 0.3 | 1.8 | 5 | 1 | 5 | 0.4 | 0.1 |
| **Kearney** | 11.3 | 98.0 | * | 2 | 11 | * | 17.0 |
| **Keith** | 10.7 | 105.2 | 4 | 7 | 10 | 24.2 | 11.6 |
| **Keya Paha** | * | 3.0 | * | * | * | * | * |
| **Kimball** | 1.7 | 19.3 | 4 | * | 3 | 1.7 | * |
| **Knox** | * | * | * | * | * | * | * |
| **Lancaster** | 45.1 | 393.8 | 87 | 22 | 174 | 121.9 | 77.3 |

| County | State Roadways (miles) | Local Roadways (miles) | State Bridges | State Culverts | Local Bridges | Railroad (miles) | Electric Transmission Lines (miles) |
|---|---|---|---|---|---|---|---|
| **Lincoln** | 116.4 | 695.6 | 43 | 16 | 55 | 146.0 | 97.1 |
| **Logan** | * | * | * | * | * | * | * |
| **Loup** | 0.2 | 1.2 | * | 1 | * | * | 0.4 |
| **Madison** | 5.0 | 38.3 | 3 | 5 | 14 | 9.2 | 1.6 |
| **McPherson** | * | * | * | * | * | * | * |
| **Merrick** | 64.4 | 507.8 | 8 | 7 | 93 | 62.8 | 92.8 |
| **Morrill** | 58.4 | 201.6 | 12 | 14 | 8 | 88.3 | 5.2 |
| **Nance** | 5.3 | 19.7 | 6 | * | 6 | 6.4 | 1.9 |
| **Nemaha** | 2.1 | 44.2 | 2 | * | 15 | 13.7 | 13.5 |
| **Nuckolls** | 1.9 | 26.8 | 5 | 1 | 27 | 13.6 | 0.0 |
| **Otoe** | 0.3 | 13.6 | 3 | * | 15 | 22.2 | 20.3 |
| **Pawnee** | 0.0 | 0.1 | 1 | * | 1 | 0.1 | 0.0 |
| **Perkins** | 1.1 | 60.1 | * | * | 9 | * | 2.7 |
| **Phelps** | 3.0 | 19.7 | 3 | 1 | 8 | * | * |
| **Pierce** | 12.8 | 122.0 | 10 | 1 | 19 | 35.8 | 35.4 |
| **Platte** | 4.2 | 102.4 | 3 | 2 | 29 | * | 26.3 |
| **Polk** | 14.6 | 63.9 | 8 | 6 | 13 | 22.4 | 10.0 |
| **Red Willow** | 0.8 | 10.0 | 7 | * | 7 | 1.7 | 1.2 |
| **Richardson** | * | * | * | * | * | * | * |
| **Rock** | 1.1 | 8.1 | 1 | * | 17 | 1.1 | * |
| **Saline** | 20.1 | 169.8 | 32 | 7 | 59 | 39.8 | 54.6 |
| **Sarpy** | 9.7 | 146.7 | 13 | 1 | 68 | 31.8 | 21.8 |
| **Saunders** | 61.6 | 458.9 | 18 | 14 | 68 | 122.4 | 40.9 |
| **Scotts Bluff** | 1.1 | 2.4 | 2 | 2 | 2 | * | * |
| **Seward** | 4.3 | 23.4 | 4 | 1 | 6 | * | * |
| **Sheridan** | 2.6 | 18.7 | 1 | 1 | 10 | * | 0.6 |
| **Sherman** | 0.2 | 0.2 | * | * | * | 0.2 | * |
| **Sioux** | 0.1 | 1.1 | 1 | * | 2 | * | * |
| **Stanton** | 0.2 | 6.9 | 3 | * | 15 | * | 0.7 |
| **Thayer** | * | * | * | * | * | * | * |
| **Thomas** | * | 7.8 | * | * | * | * | * |
| **Thurston** | 2.6 | 15.6 | 1 | 2 | 7 | 1.2 | * |

| County | State Roadways (miles) | Local Roadways (miles) | State Bridges | State Culverts | Local Bridges | Railroad (miles) | Electric Transmission Lines (miles) |
|---|---|---|---|---|---|---|---|
| **Valley** | 6.8 | 79.1 | 6 | 1 | 14 | 9.8 | 21.5 |
| **Washington** | * | * | * | * | * | * | * |
| **Wayne** | 12.2 | 57.4 | 9 | 7 | 13 | 18.4 | * |
| **Webster** | * | * | * | * | * | * | * |
| **Wheeler** | * | * | * | * | * | * | * |
| **York** | 1.1 | 60.1 | * | * | 9 | * | 2.7 |

* Specific numbers were not provided.

### 3.11.3.5 ENHANCED PRIORITY RISK INDEX SCORE

The Enhanced Priority Risk Index (EPRI) provides the state of Nebraska with a methodology to measure the impact each profiled hazard may have on the seven Emergency Management Accreditation Program Standard 4.1.2 sectors. Table 31 provides the EPRI scores for the hazard with the appropriate risk factor.

**Table 31: Dam Enhanced Priority Risk Index Score**

| | Probability Next 5 Years | Impact | Spatial Extent | Warning Time | Duration | Vulnerability | Probability | Overall Risk Factor |
|---|---|---|---|---|---|---|---|---|
| **Risk Level** | 1.7 | 2.9 | 2.7 | 3 | 3.6 | 1.9 | 2.1 | 2.6 |

Table 32 provides a summary of dam failure impacts, including impact to the public, first responders, continuity of operations, property, infrastructure, environment, economic conditions and public confidence, and the consequences of those impacts.

**Table 32: Dam Impacts and Consequences**

| Sector | Impacts |
|---|---|
| **Public** | **Housing:** Structural damage in flood-prone areas depends on the volume of water released by the dam failure and the proximity of homes to the breach site. Entire neighborhoods could be inundated, leading to widespread displacement.<br>**Casualties/Fatalities:** The risk to human life is directly influenced by the available warning time and the population density downstream. Individuals in areas with less than 30 minutes of warning are at the highest risk.<br>**Work:** Business disruptions depend on proximity to the flood zone. Industries near major waterways, such as agriculture and manufacturing, may experience prolonged operational shutdowns.<br>**Food/Water:** Water supply contamination is a significant risk, potentially leading to shortages and public health concerns. Agricultural losses could disrupt food production, especially in farming-dependent regions. |

| Sector | Impacts |
|---|---|
| **First Responders** | **Emergency Services:** First responders will generally remain operational unless their facilities are directly impacted by floodwaters. However, response efforts must account for hazardous materials, debris, and potential disease outbreaks.<br>**Medical:** The capacity of healthcare facilities to provide treatment will depend on whether they are within the flood zone. If densely populated areas are affected, hospitals may see a surge in patients, necessitating emergency response activation. |
| **Continuity of Operations** | If essential government buildings, such as courthouses, emergency operation centers, or administrative offices, are within the inundation area, operations may be severely disrupted. The loss of electronic records, communications, and utilities can further hinder government response efforts. Effective continuity of operations planning is essential for minimizing disruption. |
| **Property, Facilities, and Infrastructure** | **Buildings and Infrastructure:** Structures within the flood path may suffer partial to complete destruction. Roads, bridges, and railways could be washed out, isolating communities and delaying recovery efforts. Power and water infrastructure may be significantly damaged, leading to prolonged outages.<br>**Agriculture:** Farmland could be devastated by prolonged flooding, resulting in soil degradation, crop destruction, and livestock losses. |
| **Environment** | Floodwater can introduce contaminants from industrial sites, sewage systems, and agricultural runoff. Soil erosion, habitat destruction, and long-term environmental degradation are likely consequences. The spread of debris and pollutants could impact ecosystems for years. |
| **Economic Conditions** | The economic impact of a dam failure in Nebraska could range from moderate to catastrophic, depending on the scale of the event. Damage to critical infrastructure, agricultural losses, and business interruptions could lead to long-term financial strain on affected communities. |
| **Public Confidence** | Public trust in government agencies may be influenced by perceptions of preparedness and response. If the failure is deemed preventable due to inadequate maintenance or oversight, public confidence may decline. Transparent communication and effective disaster management will be critical in maintaining public trust. |

## 3.11.4 Limitations and Approach to Address Deficiencies

The current HHPD program faces several documented limitations. For the purposes of risk analysis, inundation mapping is incomplete or dated for some dams, with studies that do not consistently reflect non-stationary hydrology, debris/ice conditions, or downstream development, and many products are not publicly available to authorized partners. In evaluating planning capabilities, it was found that EAP coverage and quality vary by owner, with inconsistent formats, notification trees, exercising, and annual updates. Structural integrity of dams is challenged by aging infrastructure, further complicating the ability to fully measure risk because inspection cycles, as-built records, and condition assessments—especially for older earthen embankments, spillways, and CMP outlets—are uneven and varying in detail. Measuring and understanding downstream exposure carry uncertainty because parcel-level data—such as population-at-risk, access and functional needs (AFN) populations, and critical facilities within failure

footprints—is not uniformly validated statewide. Real-time monitoring is limited, with few dams equipped with remote instrumentation for reservoir levels, seepage, piezometers, or weather data integrated into alerting systems. Interdependencies across community lifelines (power, telecom, transportation, water/wastewater) are not consistently mapped for cascading-failure analysis.

Finally, the ability to address deficiencies in high-hazard dams—and the impacts of those deficiencies—is limited by data governance gaps. These gaps exist because the National Inventory of Dams (NID) and state inventory fields, such as capacity updates, spillway rating curves, and last rehabilitation dates, are not routinely synchronized among owners, NeDNR, and NEMA, which can result in conflicting entries.

# 3.12 Drought

## 3.12.1 Description

Drought is a normal recurrent feature of climate, although at times it can be considered a random event. It occurs in virtually all climatic zones, but its characteristics vary significantly from one region to another. Drought is a temporary aberration; it differs from aridity, which is restricted to low rainfall regions and is a permanent feature of climate. It is a prolonged period with no rain, particularly during the planting and growing season in agricultural areas. Limited winter precipitation accompanied by moderately long periods during the spring and summer months can also lead to drought conditions. Drought is an insidious hazard of nature. Depending on its severity, drought can have widespread impacts on the environment and economy, potentially causing loss of life and property damage.

Drought should be considered relative to some long-term average conditions of balance between precipitation and evapotranspiration (evaporation + transpiration) in a particular area, a condition often perceived as "normal." It is also related to the timing (e.g., principal season of occurrence, delays in the start of the rainy season, occurrence of rains in relation to principal crop growth stages) and the effectiveness (rainfall intensity, number of rainfall events, antecedent moisture conditions, etc.) of the rains. Other climatic factors, such as high temperature, high wind, and low relative humidity, are often associated with drought in many regions of the world and can significantly affect its severity.

Drought should not be viewed as merely a physical phenomenon or natural event. Its impacts on society result from the interplay between a natural event (less precipitation than expected resulting from natural climatic variability) and the demand people place on water supply. Human activity often exacerbates the impact of drought. According to the National Weather Service, Climate Prediction Center, there are four identified drought types: meteorological/climatological, socioeconomic, agricultural, and hydrological, as illustrated in Figure 47.[135]

- **Meteorological/climatological drought** is defined in terms of the departure from a normal precipitation pattern and the duration of the drought hazard. It has a slow-onset that usually takes at least three months to develop and may last for several seasons or years.
- **Agricultural drought** links various characteristics of meteorological (or hydrological) drought to agricultural impacts, focusing on precipitation shortages, differences between actual and potential evapotranspiration, soil water deficits, and reduced groundwater or reservoir levels. Crop water demand depends on prevailing weather conditions, biological characteristics of the specific crops, its stage of growth, and the physical and biological properties of the soil.
- **Hydrological drought** is associated with the effects of substandard periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply (e.g., stream flow, reservoir and lake levels, groundwater). The frequency and severity of hydrological drought is often defined on a watershed or river basin scale. Although all droughts originate with a deficiency of precipitation,

[135] 2021 Nebraska State Hazard Mitigation Plan, "Section 3.3 Drought." https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.

hydrologists are more concerned with how this deficiency plays out through the hydrologic system. Hydrological droughts are usually out of phase with, or lag the occurrence of, meteorological and agricultural droughts. It takes longer for precipitation deficiencies to show up in components of the hydrological system such as soil moisture, stream flow, and groundwater and reservoir levels.

- **Socioeconomic drought** occurs when physical water shortage begins to affect the population, individually and collectively. Most socioeconomic definitions of drought associate it with supply, demand, and economic good.

Although climate is a primary contributor to hydrological drought, other factors—such as changes in land use (e.g., deforestation, increases in impervious area), land degradation, and the construction of dams—all affect the hydrological characteristics of the basin. Because regions are interconnected by hydrologic systems, the impact of meteorological drought may extend well beyond the borders of the precipitation-deficient area. For example, meteorological drought may severely affect western portions of the state; however, because a number of rivers and their tributaries drain this region to the east, there may be significant hydrologic impacts downstream. Similarly, changes in land use upstream may alter hydrologic characteristics such as infiltration and runoff rates, resulting in more variable streamflow and a higher incidence of hydrologic drought downstream. Land use change is one of the ways human actions alter the frequency of water shortage even when no change in the frequency of meteorological drought has been observed.

Land use has a significant impact on drought conditions through several key factors. Dense vegetation, such as forests and grasslands, helps retain soil moisture and reduce evaporation. In contrast, urbanization and agricultural clearing decrease plant cover, resulting in higher evaporation rates and reduced soil moisture, which can exacerbate drought conditions.

Soil health is another critical element; healthy soils retain water more effectively, while degradation from practices such as over-farming reduces this capacity and increases vulnerability to drought. Additionally, water management plays a vital role, as impervious urban surfaces prevent water infiltration and groundwater recharge, thereby exacerbating the impacts of drought when water resources are scarce.

Agricultural practices also contribute significantly; the choice of crops and irrigation methods can increase water consumption, putting further pressure on limited supplies during dry spells. Lastly, changes in land cover, such as deforestation, can disrupt local hydrology and alter precipitation patterns, intensifying drought challenges.

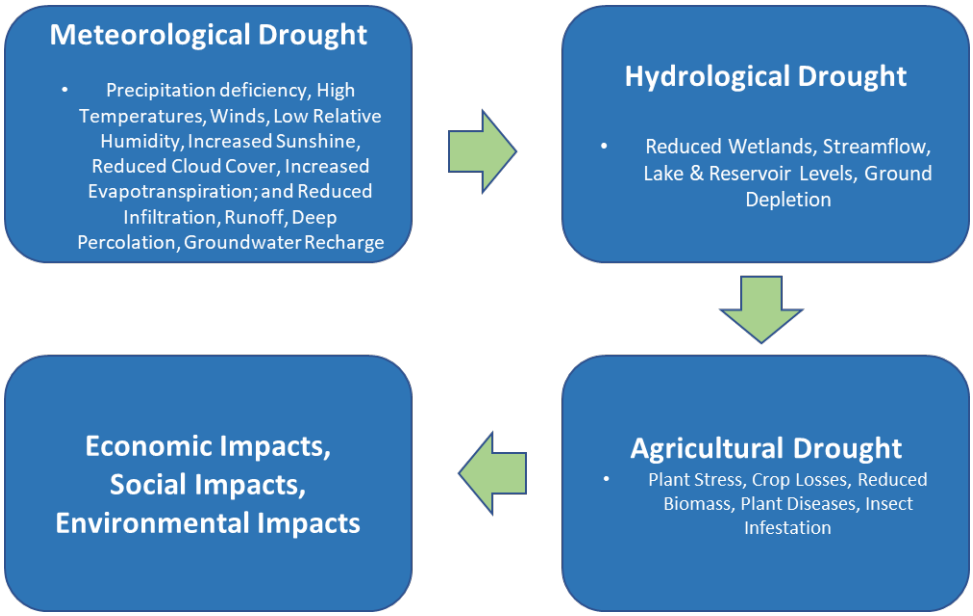



**Figure 47: Interrelationship of the Hydrological Cycle [136]**

## 3.12.2 Risk Assessment

### 3.12.2.1 LOCATION

Based on past occurrences, the entire state of Nebraska is susceptible to drought impacts. The precipitation rates in various locations are highly variable from year to year, with historic statewide annual averages ranging from a low of 13.36 inches in 2012 (Nebraska's driest year on record) to a high of 35.50 inches (1915). The most recent wettest five-year period was from 2015 to 2020; however, drought conditions continued from 2020 to 2024.[137] Because precipitation also varies in the state, with the eastern portion typically gaining almost twice as much rainfall annually, the western portion of the state is more likely to be impacted by drought. Figure 48 documents specific locations of significant drought by county. One data source for this is the National Drought Mitigation Center at the University of Nebraska. Its online impact reporter can map drought impacts by county, time period, and impact category. An example of this product, illustrating the widespread location of drought impacts between January 23, 2024, and January 23, 2025, is displayed in Figure 48.

[136] 2021 Nebraska State Hazard Mitigation Plan, "Section 3.3 Drought." https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.
[137] NOAA, NCEI, "State Climate Summaries 2022 – Nebraska," 2022. https://statesummaries.ncics.org/chapter/ne/.

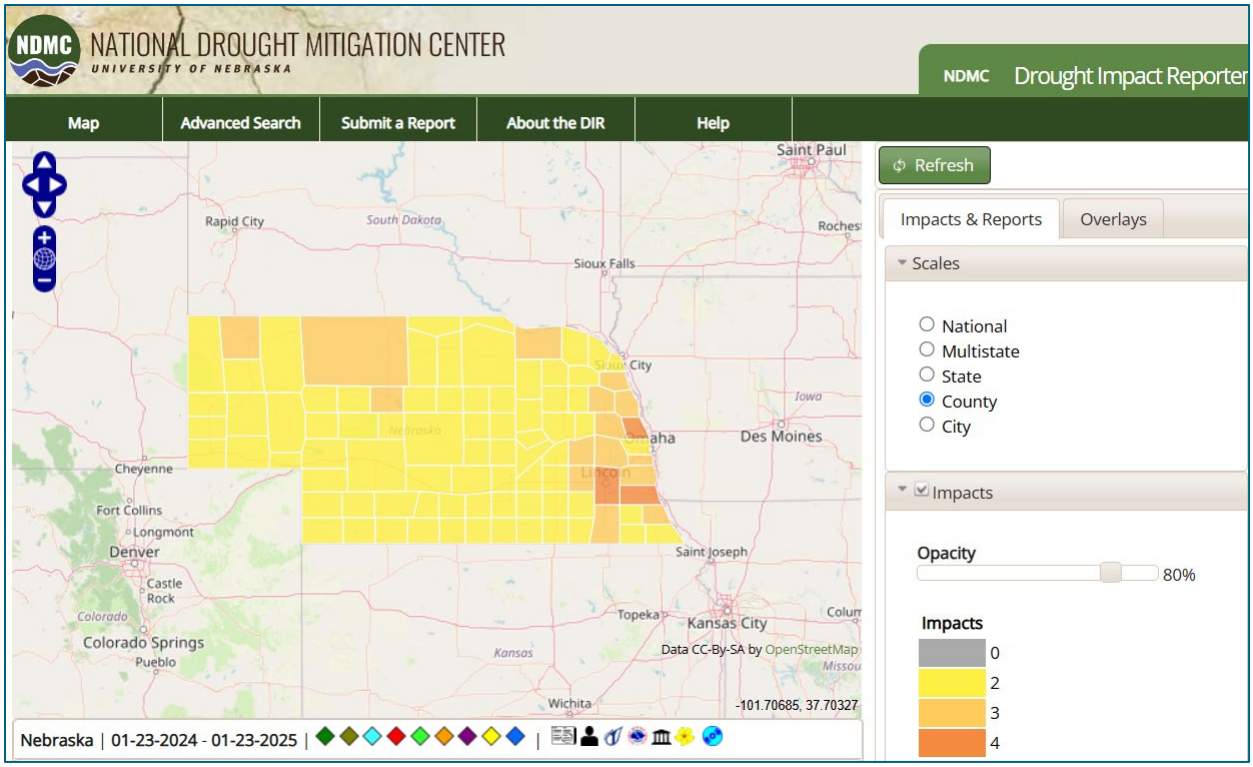



**Figure 48: Example of Drought Impact Reporter, 2024** [138]

### 3.12.2.2 EXTENT

The Keetch-Byram Drought Index (KBDI) is just one type of forecasting tool frequently used to monitor potential drought conditions. The KBDI, introduced in 2013, is generally used to determine potential drought hazard levels based on a scale that ranges from less than 200 to 800, with the lower number representing wetter conditions and the higher representing drier conditions. Areas showing a KBDI range between 600 and 800 represent the most severe drought conditions and are closely associated with increased wildfire occurrence. Many counties begin more intensive monitoring of potential wildfire areas, initiate public information, and issue burn bans when the KBDI is within this range. Figure 49 provides a graphic representation of the KBDI map for February 3, 2025. At that time, most of the state was in the KBDI range of 100–301, indicating moderate risk for drought. The soil moisture and large class fuel moistures were high and do not contribute much to fire intensity, typical of spring dormant season following winter precipitation.

[138] National Drought Mitigation Center, University of Nebraska. https://droughtreporter.unl.edu/map/.

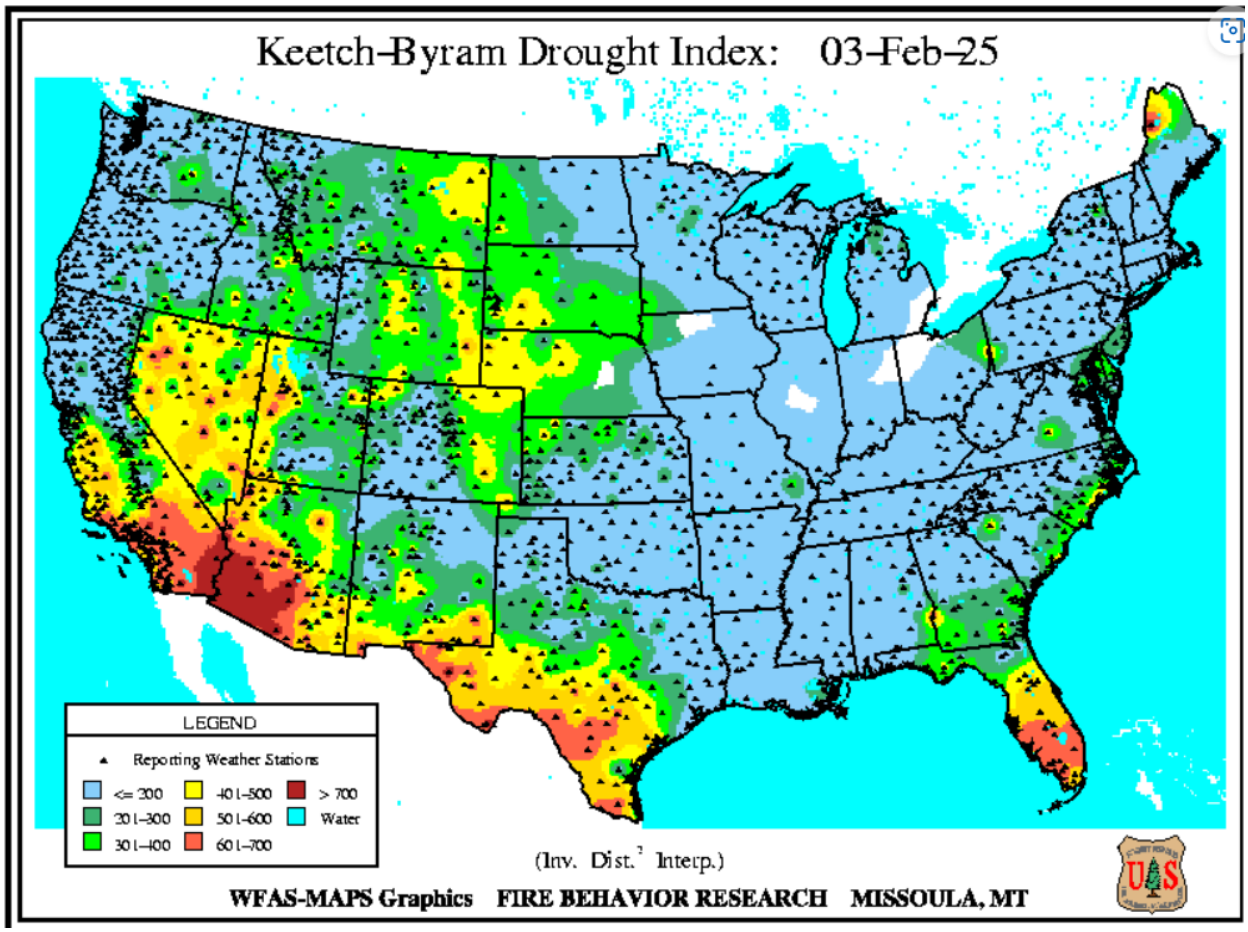



Figure 49: Keetch-Byram Drought Index Map of the United States, February 4, 2025[139]

The U.S. Drought Monitor also provides classification information that can assist in anticipating potential drought and wildfire conditions (Table 33).

Table 33: U.S. Drought Monitor Classifications[140]

| Category | Description | Possible Impacts in Nebraska |
|---|---|---|
| **D0** | Abnormally Dry | Going into drought: Short-term dryness slowing planting, growth of crops or pastures.<br>During drought condition: Rangeland conditions decline.<br>Coming out of drought: Some lingering water deficits and pastures or crops have not fully recovered. |
| **D1** | Moderate Drought | Pasture and crop growth are stunted.<br>Surface water levels in streams, reservoirs, or lakes decline, some water shortages developing or imminent.<br>Voluntary water-use restrictions requested. |

[139] Wildfire Assessment System, "Map of Keech-Byram Drought Index of the United States February 4, 2025," 2025. https://www.wfas.net/index.php?option=com_content&view=article&id=86&Itemid=487.
[140] U.S. Drought Monitor, "Drought Impacts by State." https://droughtmonitor.unl.edu/Data/StateImpacts.aspx.

| Category | Description | Possible Impacts in Nebraska |
|---|---|---|
| **D2** | Severe Drought | Crop yields are low; ethanol production decreases and plants begin to close.<br>Fires increase; firework restrictions are possible.<br>Well levels are dropping.<br>Mandatory surface water irrigation restrictions are implemented.<br>Water use is high. |
| **D3** | Extreme Drought | Hay is scarce and expensive; producers are selling cattle early and culling; horses are abandoned.<br>Pavement is cracking.<br>Fish kills claim thousands of fish; drought-tolerant trees are dying.<br>Water temperatures are high; Platte River is dry in sections; water recreation is limited.<br>Groundwater use increases; new irrigation wells are drilled. |
| **D4** | Exceptional Drought | Crop germination is stunted; high levels of nitrate are found in corn.<br>Auctions have record number cattle.<br>Wildfire season is destructive and costly.<br>Severe case of epizootic hemorrhagic disease (EHD) is observed in deer population; deer hunting is down.<br>Municipal water supplies are low; trade navigation is hindered on major rivers due to low flow and obstructions.<br>Exceptional and widespread crop/pasture losses.<br>Shortages of water in reservoirs, streams, and wells creating water emergencies. |

Table 33 summarizes categories of drought and potential drought, labeling them by intensity, with D1 as the least intense level and D4 the most intense. The D0 [zero] areas are not in drought but are experiencing abnormally dry conditions that could transition to drought conditions or are recovering from drought and are not yet back to normal.

Primary physical effects are further indicated in relation to short- or long-term drought:

- **S = Short-Term**, typically less than 6 months (e.g., agriculture, grasslands)
- **L = Long-Term**, typically more than 6 months (e.g., hydrology, ecology)

#### 3.12.2.3 PREVIOUS EVENTS

Drought, including multiple-year drought, is a normal part of the state's diverse climate. Severe drought hit this semi-arid region in the 1890s, 1950s, 1980s, 2012–2013, 2017, 2020, 2021, 2022, and 2023. Since the last plan update, many Nebraska counties suffered losses caused by drought conditions and were designated as primary natural disaster areas by the Secretary of the U.S. Department of Agriculture (USDA) (see Table 34). This designation made Farm Service Agency (FSA) emergency loans available to the counties. It is inferred from the lack of data available from October 2020 to April 2022 that the

restrictions imposed by the COVID-19 pandemic may have led to there being no approved declarations documented during that timeframe.

**Table 34: U.S. Department of Agriculture Drought Disaster Designations for Nebraska (2019–2024)** [141]

| Designation Number | Designated Counties | Date of Approval for Designations | Event Begin and End Date |
|---|---|---|---|
| **Crop Disaster Year 2020 Designations** | | | |
| **S4742** | Chase, Dundy | 8/25/2020 | 7/21/2020–ongoing |
| **S4764** | Sioux | 8/28/2020 | 1/1/2020 to–ongoing |
| **S4778** | Box Butte, Dawes, Scotts Bluff, Sioux | 9/4/2020 | 7/7/2020–ongoing |
| **S4782** | Dawes, Sioux | 9/4/2020 | 7/7/2020–ongoing |
| **S4787** | Chase, Cheyenne, Kimball, Perkins | 9/8/2020 | 7/14/2020–ongoing |
| **S4788** | Burt, Douglas, Sarpy, Thurston, Washington | 9/8/2020 | 7/14/2020–ongoing |
| **S4789** | Burt, Cuming, Dodge, Douglas, Sarpy, Saunders, Thurston, Washington | 9/8/2020 | 9/1/2020–ongoing |
| **S4798** | Cheyenne, Deuel, Perkins | 9/11/2020 | 7/21/2020–ongoing |
| **S4799** | Box Butte, Burt, Butler, Colfax, Cuming, Dakota, Dawes, Dixon, Dodge, Douglas, Madison, Pierce, Platte, Saunders, Sheridan, Sioux, Stanton, Thurston, Washington, Wayne | 9/11/2020 | 7/21/2020–ongoing |
| **S4802** | Banner, Scotts Bluff, Sioux | 9/11/2020 | 9/8/2020–ongoing |
| **S4807** | Arthur, Banner, Box Butte, Cherry, Cheyenne, Dawes, Deuel, Garden, Grant, Keith, Kimball, Morrill, Perkins, Sheridan | 10/14/2020 | 7/28/2020–ongoing |
| **S4809** | Cherry, Dakota, Dawes, Dixon, Sheridan | 10/14/2020 | 9/15/2020–ongoing |
| **S4816** | Antelope, Banner, Boone, Box Butte, Butler, Cedar, Cheyenne, Colfax, Cuming, Dawes, Dixon, Garden, Kimball, Knox, Madison, Merrick, Morrill, Nance, Pierce, Platte, Polk, Scotts Bluff, Sheridan, Sioux, Stanton, Thurston, Wayne | 10/14/2020 | 8/4/2020–ongoing |
| **S4826** | Dundy, Hitchcock, Red Willow | 10/15/2020 | 8/11/2020–ongoing |
| **S4829** | Arthur, Banner, Chase, Cheyenne, Deuel, Dundy, Frontier, Garden, Hayes, Hitchcock, Keith, Kimball, Lincoln, McPherson, Perkins, Red Willow | 10/15/2020 | 8/11/2020–ongoing |
| **S4842** | Cedar, Dixon | 10/16/2020 | 10/6/2020–ongoing |

[141] U.S. Department of Agriculture, Farm Service Agency, 2025, "Disaster Designation Information." https://www.fsa.usda.gov/resources/disaster-assistance-program/disaster-designation-information.

| Designation Number | Designated Counties | Date of Approval for Designations | Event Begin and End Date |
|---|---|---|---|
| **S4848** | Kimball | 10/16/2020 | 8/25/2020–ongoing |
| **S4852** | Banner, Kimball | 10/16/2020 | 8/25/2020–ongoing |
| **S4856** | Cherry, Sheridan | 10/26/2020 | 9/1/2020–ongoing |
| **Crop Disaster Year 2022 Designations** | | | |
| **S5147** | Chase, Cheyenne, Deuel, Dundy, Kimball, Perkins | 4/8/2022 | 11/1/2021–ongoing |
| **S5150** | Dundy, Furnas, Hitchcock, Red Willow | 4/8/2022 | 11/15/2021–ongoing |
| **S5153** | Antelope, Boone, Custer, Garfield, Greeley, Holt, Howard, Sherman, Valley, Wheeler, Blaine, Boyd, Buffalo, Dawson, Hall, Keya Paha, Knox, Lincoln, Logan, Loup, Madison, Merrick, Nance, Pierce, Platte, Rock | 4/8/2022 | 4/1/2022–ongoing |
| **S5160** | Furnas, Gage, Harlan, Jefferson, Nuckolls, Pawnee, Thayer | 4/18/2022 | 2/22/2022–ongoing |
| **S5163** | Blaine, Dundy, Hayes, Hitchcock, Knox, Loup, Madison, Merrick, Nance, Pierce, Platte, Red Willow, Antelope, Boone, Boyd, Brown, Butler, Cedar, Chase, Cherry, Colfax, Custer, Frontier, Furnas, Garfield, Greeley, Hall, Hamilton, Holt, Howard, Lincoln, Logan, Perkins, Polk, Rock, Stanton, Thomas, Wayne | 4/18/2022 | 4/12/2022–ongoing |
| **S5172** | Boyd, Brown, Buffalo, Dawson, Frontier, Furnas, Gosper, Keya Paha, Lincoln, Rock, Adams, Blaine, Cherry, Custer, Hall, Harlan, Hayes, Hitchcock, Holt, Howard, Kearney, Keith, Knox, Logan, Loup, McPherson, Perkins, Phelps, Red Willow, Sherman | 4/22/2022 | 4/19/2022–ongoing |
| **S5173** | Boyd, Cherry, Keya Paha, Knox | 4/22/2022 | 4/19/2022–ongoing |
| **S5179** | Franklin, Harlan, Webster | 5/2/2022 | 3/8/2022–ongoing |
| **S5195** | Cedar, Dixon, Knox, Pierce, Wayne | 5/13/2022 | 5/10/2022–ongoing |
| **S5199** | Chase, Perkins, Deuel, Dundy, Hayes, Keith, Lincoln | 5/23/2022 | 5/17/2022–ongoing |
| **S5207** | Burt, Dakota, Thurston, Burt, Cherry, Cheyenne, Colfax, Cuming, Dakota, Dixon, Garden, Hall, Hamilton, Harlan, Hooker, Kearney, Kimball, Logan, Morrill, Phelps, Stanton, Thomas, Thurston, Wayne, York, Adams, Arthur, Banner, Blaine, Box Butte, Brown, Buffalo, Butler, Cedar, Clay, Custer, Dawson, Deuel, Dodge, Fillmore, Franklin, Furnas, Gosper, Grant, Howard, Keith, Keya Paha, Lincoln, McPherson, Madison, | 5/31/2022 | 4/1/2022–ongoing |

| Designation Number | Designated Counties | Date of Approval for Designations | Event Begin and End Date |
|---|---|---|---|
| | Merrick, Pierce, Platte, Polk, Saline, Scotts Bluff, Seward, Sheridan, Washington, Webster | | |
| **S5217** | Adams, Clay, Deuel, Keith, Arthur, Buffalo, Cheyenne, Fillmore, Garden, Hall, Hamilton, Kearney, Lincoln, McPherson, Nuckolls, Perkins, Webster, York | 6/13/2022 | 4/19/2022–ongoing |
| **S5219** | Cedar, Dakota, Dixon, Knox | 6/13/2022 | 4/15/2022–ongoing |
| **S5223** | Banner, Scotts Bluff, Sioux | 6/27/2022 | 5/1/2022–ongoing |
| **S5228** | Banner, Kimball | 7/1/2022 | 6/28/2022–ongoing |
| **S5256** | Arthur, Banner, McPherson, Scotts Bluff, Sioux, Box Butte, Cheyenne, Dawes, Garden, Grant, Hooker, Keith, Kimball, Lincoln, Logan, Morrill, Thomas | 8/15/2022 | 6/21/2022–ongoing |
| **S5275** | Dodge, Burt, Butler, Colfax, Cuming, Douglas, Saunders, Washington | 8/26/2022 | 8/23/2022–ongoing |
| **S5293** | Burt, Washington | 9/26/2022 | 8/2/2022–ongoing |
| **S5297** | Washington, Burt, Dodge, Douglas | 9/26/2022 | 8/2/2022–ongoing |
| **S5304** | Butler, Dawes, Douglas, Saunders, Box Butte, Cass, Colfax, Dodge, Lancaster, Platte, Polk, Sarpy, Seward, Sheridan, Sioux, Washington, York | 10/3/2022 | 8/9/2022–ongoing |
| **S5307** | Cherry, Dawes, Sheridan, Sioux | 10/3/2022 | 8/9/2022–ongoing |
| **S5319** | Polk, Butler, Hamilton, Merrick, Platte, Seward, York | 10/15/2022 | 10/11/2022–ongoing |
| **S5320** | Cherry, Sheridan | 10/15/2022 | 10/11/2022–ongoing |
| **Crop Disaster Year 2023 Designations** | | | |
| **S5372** | Chase, Cheyenne, Deuel, Dundy, Kimball, Perkins | 3/17/2023 | 11/1/2022–ongoing |
| **S5376** | Dundy, Franklin, Furnas, Harlan, Hitchcock, Red Willow, Webster | 3/17/2023 | 11/15/2022–ongoing |
| **S5377** | Nemaha, Otoe | 3/17/2023 | 11/1/2022–ongoing |
| **S5391** | Burt, Dakota, Thurston, Washington | 3/31/2023 | 4/1/2023–ongoing |
| **S5392** | Antelope, Arthur, Banner, Blaine, Boone, Boyd, Brown, Burt, Butler, Cedar, Chase, Cherry, Cheyenne, Colfax, Cuming, Dakota, Deuel, Dixon, Dodge, Douglas, Dundy, Frontier, Furnas, Garden, Greeley, Hall, Hamilton, Hayes, Hitchcock, Holt, Hooker, | 3/31/2023 | 4/1/2023–ongoing |

| Designation Number | Designated Counties | Date of Approval for Designations | Event Begin and End Date |
|---|---|---|---|
| | Howard, Keith, Keya Paha, Kimball, Lincoln, Loup, Madison, Merrick, Morrill, Nance, Perkins, Pierce, Platte, Polk, Red Willow, Rock, Saunders, Scotts Bluff, Stanton, Thomas, Thurston, Washington, Wayne, Wheeler, Adams, Box Butte, Buffalo, Cass, Clay, Custer, Dawson, Garfield, Gosper, Grant, Harlan, Knox, Lancaster, Logan, McPherson, Phelps, Sarpy, Seward, Sheridan, Sherman, Sioux, Valley, York | | |
| **S5400** | Dakota, Dixon | 4/14/2022 | 4/15/2023–ongoing |
| **S5405** | Custer, Dawson, Gage, Garfield, Knox, Lancaster, Logan, McPherson, Saline, Seward, Sherman, Valley, York, Antelope, Arthur, Blaine, Boyd, Buffalo, Butler, Cass, Cedar, Clay, Fillmore, Frontier, Gosper, Greeley, Hamilton, Holt, Hooker, Howard, Jefferson, Johnson, Keith, Lincoln, Loup, Otoe, Pawnee, Phelps, Pierce, Polk, Saunders, Thayer, Thomas, Wheeler | 5/3/2023 | 4/25/2023–ongoing |
| **S5407** | Banner, Kimball, Scotts Bluff, Sioux | 5/3/2023 | 5/1/2023–ongoing |
| **S5408** | Nuckolls, Webster | 5/8/2023 | 5/2/2023–ongoing |
| **S5410** | Grant, Arthur, Cherry, Garden, Hooker, Sheridan | 5/8/2023 | 5/2/2023–ongoing |
| **S5414** | Jefferson, Nuckolls, Thayer | 5/15/2023 | 5/9/2023–ongoing |
| **S5416** | Adams, Clay, Fillmore, Franklin, Jefferson, Kearney, Nuckolls, Thayer, Webster, Buffalo, Gage, Hall, Hamilton, Harlan<br>Phelps, Saline, Seward, York | 5/15/2023 | 5/9/2023–ongoing |
| **S5422** | Box Butte, Buffalo, Gosper, Harlan, Phelps, Sioux, Adams, Custer, Dawes, Dawson, Franklin, Frontier, Furnas, Hall, Howard, Kearney, Morrill, Scotts Bluff, Sheridan, Sherman | 5/30/2023 | 4/1/2023–ongoing |
| **S5427** | Cass, Otoe, Sarpy, Douglas, Gage, Johnson, Lancaster, Nemaha, Saunders | 6/5/2023 | 5/30/2023–ongoing |
| **S5436** | Cass, Douglas, Sarpy, Washington | 6/26/2023 | 6/20/2023–ongoing |
| **S5439** | Boyd, Cedar, Keya Paha, Knox | 6/26/2023 | 6/20/2023–ongoing |
| **S5466** | Johnson, Gage, Lancaster, Nemaha, Otoe, Pawnee | 7/24/2023 | 5/30/2023–ongoing |
| **S5496** | Gage, Jefferson, Pawnee, Thayer | 8/21/2023 | 6/27/2023–ongoing |

| Designation Number | Designated Counties | Date of Approval for Designations | Event Begin and End Date |
|---|---|---|---|
| **Crop Disaster Year 2024 Designations** | | | |
| **S5673** | Franklin, Furnas, Gage, Harlan, Jefferson, Nuckolls, Pawnee, Red Willow, Thayer, Webster | 3/25/2024 | 11/15/2023–ongoing |
| **S5738** | Banner, Kimball | 8/19/2024 | 6/18/2024–ongoing |
| **S5754** | Sioux | 8/26/2024 | 8/20/2024–ongoing |
| **S5755** | Kimball | 9/3/2024 | 7/9/2024–ongoing |
| **S5771** | Box Butte, Dawes, Scotts Bluff, Sheridan, Sioux | 9/16/2024 | 7/23/2024–ongoing |
| **S5774** | Dawes, Sioux | 9/16/2024 | 7/23/2024–ongoing |
| **S5779** | Banner, Box Butte, Morrill, Scotts Bluff, Sioux | 9/23/2024 | 7/30/2024–ongoing |
| **S5784** | Banner, Scotts Bluff, Sioux | 9/23/2024 | 7/30/2024–ongoing |
| **S5801** | Cherry, Dawes, Sheridan | 9/30/2024 | 8/6/2024–ongoing |
| **S5823** | Banner, Box Butte, Cheyenne, Clay, Fillmore, Gage, Garden, Jefferson, Johnson, Lancaster, Morrill, Nuckolls, Otoe, Pawnee, Saline, Scotts Bluff, Sheridan, Thayer, Webster | 10/15/2024 | 8/20/2024–ongoing |
| **S5835** | Banner, Scotts Bluff, Sioux | 10/17/2024 | 6/11/2024–ongoing |

Based on a review of data from the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI) for the period between 2019 and 2024, 130 events were documented in five county reports—Cherry, Dixon, Dakota, Keya Paha, and Brown. There were no reported deaths, injuries, or property damage; however, there was $33.607 million in crop damage associated with this reported incident. While the NCEI data established a record of drought events since the last plan update, it does not provide a complete picture of the impacts felt in multiple regions of the state. Table 35 is an overview of drought occurrences in Nebraska from 2020 to December 2024.

**Table 35: NOAA NCEI Database Drought Events in Nebraska, 2020–2024**

| Dates | County/Area Affected | Types of Damage | Total Dollar Amount of Crop Damages (by year) |
|---|---|---|---|
| **July 2020 to October 2020** | Dakota | Moderate (D1) drought evolved to severe (D2) drought conditions by mid-month. Rainfall 25%–50% of normal during July and August with above normal temperatures leading to the development of severe short-term drought conditions over much of northeast Nebraska. Rainfall of less than 50% of normal along with above normal temperatures contributed to the worsening short-term agricultural drought. Crop damage is an estimate from insured losses. Information provided by the USDA. | $160,000 |
| **October 2020 to November 2020** | Dixon | Moderate (D1) drought evolved to severe (D2) drought conditions early in the month. Precipitation continued below normal across northeast Nebraska, varying from 50 to 75% of normal. Temperatures were well below normal. Rainfall around 50% of normal contributed to the worsening short-term agricultural drought, despite temperatures averaging more than 3˚ below normal at Concord. Crop damage is an estimate from insured losses. Information provided by the USDA. | $275,000 |
| **November 2020** | Dakota | Drought conditions remained severe (D2) through November. Crop damage is an estimate from insured losses. Information provided by the USDA. A lack of significant precipitation as the agricultural season ended maintained severe drought conditions. | $38,000 |
| **June 2021** | Dixon | Severe (D2) drought developed early in the month and was sustained by a continued lack of precipitation and extreme heat (0.57 inches/8 days of 10+˚ above normal at Concord). Crop damage is an estimate from insured losses. Information provided by the USDA. Temperatures averaged 5˚–6˚ above normal, and precipitation varied between 25% and 50% of normal across northeast Nebraska during June. | $100,000 |
| **July 2021** | Dixon, Dakota | Severe (D2) drought conditions continued through July. Precipitation was less than 50% of normal at Newcastle, Concord, and Emerson. Crop damage is an estimate from insured losses. Information provided by the USDA. Temperatures and precipitation averaged fairly close to normal during July. | $331,000 |

| Dates | County/Area Affected | Types of Damage | Total Dollar Amount of Crop Damages (by year) |
|---|---|---|---|
| **August 2021** | Dixon, Dakota | Severe (D2) drought continued through much of August, before briefly worsening late month to extreme (D3) conditions after a 12-day dry period. Conditions reverted to severe drought at the end of the month after 2–3 inches of rainfall from August 20 to August 29. Crop damage is an estimate from insured losses. Information provided by the USDA. Temperatures were slightly above normal during the month. The spatial and temporal distribution of rainfall, with more widespread heavier amounts toward the end of the month, defined drought trends. Overall, conditions improved somewhat by month's end. | $286,000 |
| **September 2021** | Dixon, Dakota | Around one-half inch of rainfall at Newcastle and Concord and one-half to 1 inch of rainfall at Emerson and 3 miles southwest of Hubbard at the beginning of September led to an improvement in drought conditions from severe (D2) to moderate (D1) at mid-month. Crop damage is an estimate from insured losses. Information provided by the USDA. Overall, precipitation near to a little above normal across northeast Nebraska led to the alleviation of severe drought. | $221,000 |
| **May 2022** | Dakota, Dixon | Precipitation 75%–100% of normal and near normal temperatures led to little change in overall severe (D2) drought conditions. Crop damage is an estimate from insured losses. Information provided by the USDA. A fairly average month for precipitation and temperature led to a status quo in drought conditions. | $392,000 |
| **June 2022** | Dakota, Dixon | Severe (D2) drought conditions worsened to extreme (D3) drought by the end of June, which featured temperatures of 2˚–3˚ above normal and 25%–50% of normal rainfall. Crop damage is an estimate from insured losses. Information provided by the USDA. Well-below-normal precipitation and above-normal temperatures contributed to worsening drought conditions. | $904,000 |
| **October 2023** | Dakota, Dixon | Extreme (D3) drought conditions improved to severe (D2) by mid-month. Crop damage is an estimate from insured losses. Information provided by the USDA. Precipitation was 175%–200% of normal across northeast Nebraska during October. | $6,670,000 |

#### 3.12.2.4 PROBABILITY

Based on historic occurrences of drought in Nebraska, it can be estimated that the recurrence interval for drought is 3.33 years,[142] indicating that, on average, a drought event will equal or be exceeded within that time period. The probability of future drought events is Nebraska is highly likely.

Predicting drought depends on the ability to forecast two fundamental meteorological surface parameters, precipitation and temperature. Based on the historical record, climate is inherently variable, making it difficult for climate scientists to predict drought for more than a few months in advance for most locations. In addition, precipitation and temperature anomalies may last from several months to several decades. The duration of drought-causing climate events depends on air-sea interactions, soil moisture and land surface processes, topography, internal dynamics, and the accumulated influence of dynamically unstable synoptic weather systems on a global scale.

The U.S. Drought Monitor provides a model of projected potential development of drought conditions over a short-term period. The Drought Monitor, produced by the National Integrated Drought Information System (NIDIS), is released weekly to show the location and intensity of drought across the country and its territories. The most current model, released on January 28, 2025 (Figure 49), indicates all counties in the state with abnormally dry to extreme drought conditions. Surveillance of this model over time can provide a trend-based indicator that aligns with the stages of drought conditions as they develop.

[142] Statistical calculation based on 20 years of record with six events during this time period.

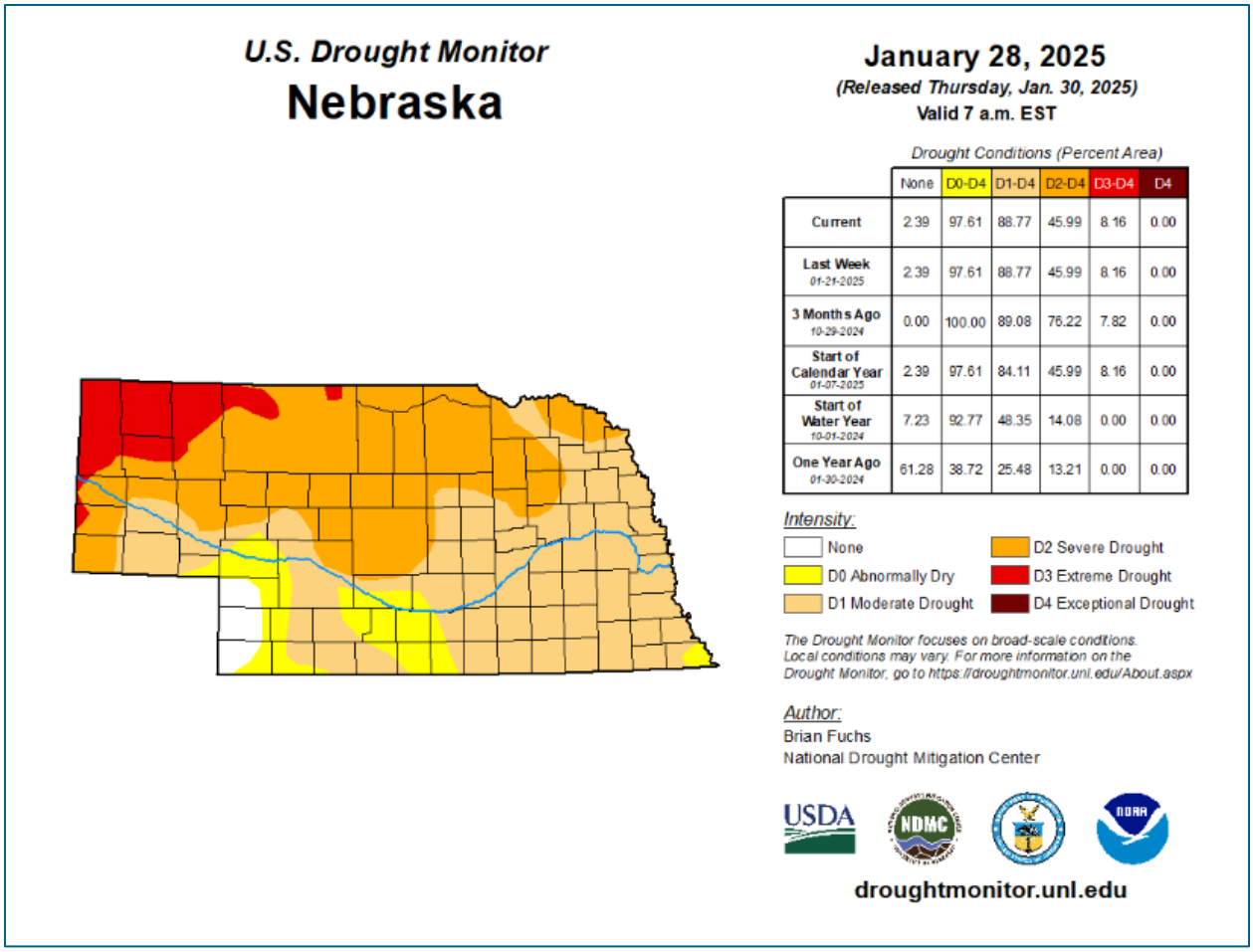



**Figure 50: U.S. Drought Monitor, State of Nebraska, January 28, 2025**[143]

According to the October 2013 Issue of *NebGuide* (a publication of the University of Nebraska–Lincoln Extension of the Institute of Agriculture and Natural Resources), a composite of the various climate models projects a warming in Nebraska of about 4˚F for the annual average by 2050—and 8˚F or higher by 2090. Each season shows a warming trend, with the greatest amount occurring in summer and the least amount in spring. There are expected to be changes in the frequency and severity of extreme events in a warmer climate, such as heat waves and heavy precipitation. Often, it is the extremes that have a significant influence on people, animals, and the environment. The number of days per year with daytime high temperatures greater than 95˚F are expected to increase by about 15 days by the middle of this century, along with more consecutive days with highs above this threshold. Conversely, the number of days with nighttime low temperatures lower than 10˚F is expected to decrease by about 10 days by 2050.[144]

[143] U.S. Drought Monitor, "State of Nebraska, January 28, 2025." https://droughtmonitor.unl.edu/Maps/MapArchive.aspx.
[144] 2021 Nebraska State Hazard Mitigation Plan, "Section 3.3 Drought." https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.

A large percentage of the land in Nebraska is used for agricultural or rangeland purposes. An increase in temperature, especially in the summer months, can lead to an increase in evapotranspiration that can impact soil moisture. Both of these result in an increase in irrigation demands, which could put a strain on the water resources in the region. Extreme warmth in summer is expected to increase, and this may cause more stress for human and animal comfort, as well as influence crop production with a higher frequency of hot days. However, with a decreased frequency of extremely low temperatures during winter, there will likely be less stress on humans and animals due to exposure to cold conditions.[145]

Model projections of changes in precipitation have less confidence than those of temperature. Precipitation can be highly variable from place to place and is generally more difficult to predict than temperature. Nebraska is situated around the dividing line in the North American continent: between wetter conditions that are predicted for the north and east, and drier conditions that are predicted for the south and west. There is thought to be seasonal variability in this dividing line, with a general drying in summer and wetter conditions in winter. The summer drying trend is compounded by increased evaporation rates due to the projected warming. River systems having source areas in the Rocky Mountains may experience changes in flow rates due to declining snowpack.[146]

#### 3.12.2.5 EFFECTS OF FUTURE CONDITIONS

Because drought is not limited to geographic boundaries or population groups, it is difficult to identify development and population trends that may be impacted by this hazard. Current land use and building codes incorporate standards that address and mitigate water supply and resources.

The potential impacts of future growth and development on drought will be monitored and evaluated in the next planning cycle to determine whether the level of risk has changed and whether there are opportunities for mitigation related to development that could reduce hazard impacts in the future.

Estimates by local plans vary widely due to the inherent challenges in predicting changing climate and weather patterns. Some estimates are upwards of a 14% chance of drought in any given year.[147] The uncertainty of climate patterns is projected to increase as the global average temperature rises. Local plans are inconsistent with mitigation efforts, varying between no planned actions to several analytical and preparatory actions that could reduce the negative consequences of a severe drought. Such actions include assessing drought vulnerability, establishing monitoring boards and reporting procedures, establishing conservation and agricultural policies, enhancing building codes, and participating in national programs such as Tree City USA, among other mitigation efforts.

Local plans have identified that their entire populations are vulnerable to droughts and may suffer directly due to heat concerns and water limitations, or indirectly. Losses from drought events are comprehensive and affect health, the environment, the economy, livestock, food stocks, and potable water stores as well as manufacturing and energy resources.

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[145] Ibid.
[146] Ibid.
[147] Ibid.

## 3.12.3 Vulnerability Analysis

Drought affects more people than any other natural hazard due to its large scale and long-lasting nature, and it differs from other natural hazards in several ways. It is a slow-onset natural hazard often referred to as a creeping phenomenon. Because of the creeping nature of drought, its effects accumulate slowly over a substantial period of time.

Drought conditions during certain parts of the crop growth cycles can be particularly impactful, as growth can be stunted or plants may die off, resulting in lower yields. Impacts on agriculture vary depending on the time of year, period of precipitation, amount of stored soil moisture, type of crop, stage of growth, and meteorological measures (i.e., temperature, humidity, and wind). Precipitation scarcities as little as 4–6 inches can be the foundation of an agricultural drought condition.

In Nebraska and across the Missouri River Basin (MRB), drought is a common climate event. Prolonged droughts in the 1930s and 1950s substantially affected water supplies, agriculture, energy, transportation of goods, and ecosystems. More recently, short duration droughts wreaked havoc on the MRB. The intense 2012 summertime drought surprised the region, as flooding was expected to continue into a second year following the devastating floods of 2011. Flash drought in the U.S. Northern Plains and Canadian Prairies in 2017 resulted in $2.6 billion of agricultural losses alone. Most recently, the 2020–2021 drought season affected the same area and was a multi-billion-dollar event that had wide-reaching impacts on the region's communities, ecosystems, water resources, and agricultural systems.

Nebraska's agricultural-based economy makes it especially vulnerable to drought. Losses in the agricultural sector are somewhat easier to determine than losses in other sectors because the direct agricultural losses are more obvious and are part of some statistics already being gathered. The most vulnerable portions of the state in terms of economic impact are cropland, pastureland for animals, recreational areas, and businesses that depend on agricultural industries for the bulk of their business. However, all areas of the state can be impacted by drought events.

Although agriculture is the main sector affected by drought in Nebraska, drought has a major impact on other sectors as well, including infrastructure. In 2012, Nebraska Public Power District set a new billable peak (with load management in effect) 7% higher than 2011 electrical loads and a new anytime peak (without load management) more than 16% higher than in 2011. This record energy use leads to increased costs for energy producers and consumers. The people of Nebraska are vulnerable economically, not only through higher costs in energy, but also due to job and income losses in the agricultural sector. Drought affects other sectors as well, as seen Table 36.[148]

[148] 2021 Nebraska State Hazard Mitigation Plan, "Section 3.3 Drought." https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.

Table 36: Nebraska Drought Impact Reporter Dashboard, January 2020–December 2024[149]

| Agriculture | Business and Industry | Energy | Fire | Plant and Wildlife | Relief, Response and Restrictions | Society and Public Health | Tourism and Recreation | Water Supply and Quality |
|---|---|---|---|---|---|---|---|---|
| **96** | 14 | 14 | 12 | 58 | 33 | 19 | 10 | 31 |

Table 37 provides a visualization of the frequency and cost of billion-dollar weather and climate events, using the interactive time series to identify drought costs between 2020 and 2024 in Nebraska, measured in millions of dollars. Drought incidents reported in the time series from 1980 to 2024 are ranked based on cost in the millions. Since the last plan updated, there have been four years with drought events that have ranked as the 2nd, 6th, 11th, and 13th most costly events. The year 2022 was the second most costly year for loss due to drought.

Table 37: Nebraska Drought Disaster Events (CPI-Adjusted), 2020–2024[150]

| Year | Drought Count | Drought Count Rank | Drought Cost (Millions) | Drought Costs Rank |
|---|---|---|---|---|
| **2024** | 1 | 1 | $100–$250 | 13th |
| **2023** | 1 | 1 | $1,000–$2,000 | 6th |
| **2022** | 1 | 1 | $2,000–$5,000 | 2nd |
| **2021** | 0 | 45 | $0 | 45th |
| **2020** | 1 | 1 | $500–$1,000 | 11th |

In a more direct way, people are vulnerable to shortages in the water system. In Nebraska, about 80% of the population consumes drinking water that is pumped from groundwater sources. The remaining 20% of the population, mostly in Omaha, obtains water from surface water sources such as rivers or lakes that have been properly treated for human consumption. As many as 81 municipal water systems in the state experienced drought-related water supply issues in 2012, according to the Department of Health and Human Services. The *Omaha World-Herald* also reported that the intense heat and drought caused Omaha and its surrounding areas to break a record for water use, reaching 224 million gallons on July 23, 2012.

### 3.12.3.1 VULNERABILITY OF STATE FACILITIES

There is little or no risk of substantial dollar loss to state buildings due to drought conditions. However, significant dollar losses to the government could occur in the event of a drought-induced economic failure. Public infrastructure is vulnerable to damage to underground water pipelines, stressed electrical

[149] National Drought Mitigation Center, University of Nebraska, 2025, "Drought Impact Reporter Dashboard, Number of State Impacts by Category, Nebraska-2020–2024." https://unldroughtcenter.maps.arcgis.com/apps/dashboards/46afe627bb60422f85944d70069c09cf.
[150] NOAA NCEI, "Time Series Nebraska-Drought 2020–2024 Disaster Costs," 2025 (visualization of the frequency and cost of billion-dollar weather and climate events using the interactive time series). https://www.ncei.noaa.gov/access/billions/time-series/NE/cost.

systems, and damaged roadways. Buildings are vulnerable to cracked foundations and other drought-related problems.

State property replacement values in the top ten most populated counties with increased concentrations of infrastructure and buildings are listed in Table 38.

**Table 38: State Asset Replacement Values – Top Ten Counties**

| County | # of Properties | Insurance Value | Contents Insurance | Total Value | Replacement Cost |
|---|---|---|---|---|---|
| **Brown** | 28 | $0 | $0 | $4,236,570 | $4,236,570 |
| **Lancaster** | 329 | $327,401,528 | $419,606,538 | $747,008,067 | $747,008,067 |
| **Douglas** | 107 | $117,350,452 | $31,371,276 | $148,721,729 | $81,423,950 |
| **Buffalo** | 76 | $6,447,797 | $12,095,960 | $18,543,757 | $210,296,611 |
| **Johnson** | 26 | $157,136,448 | $29,311,747 | $186,448,194 | $3,184,781 |
| **Hall** | 81 | $7,321,520 | $2,719,927 | $10,041,447 | $10,634,654 |
| **Cass** | 225 | $0 | $1,494,524 | $1,494,524 | $104,597,718 |
| **Dawes** | 146 | $1,279,931 | $1.127,496 | $2,407,427 | $97,713,763 |
| **Gage** | 63 | $7,106,900 | $709,783 | $7,816,683 | $90,815,987 |
| **Adams** | 29 | $10,000 | $130,574 | $140,574 | $10,886,734 |
| **TOTALS** | **1,110** | **$624,054,576** | **$498,567,826** | **$1,126,858,972** | **$1,360,798,834** |

### 3.12.3.2 NATIONAL RISK INDEX

Figure 51 illustrates the National Risk Index for Nebraska for drought. Most of the state shows relatively low or very low drought risk, with one-third of the state (indicated in yellow) showing a relatively moderate drought risk.

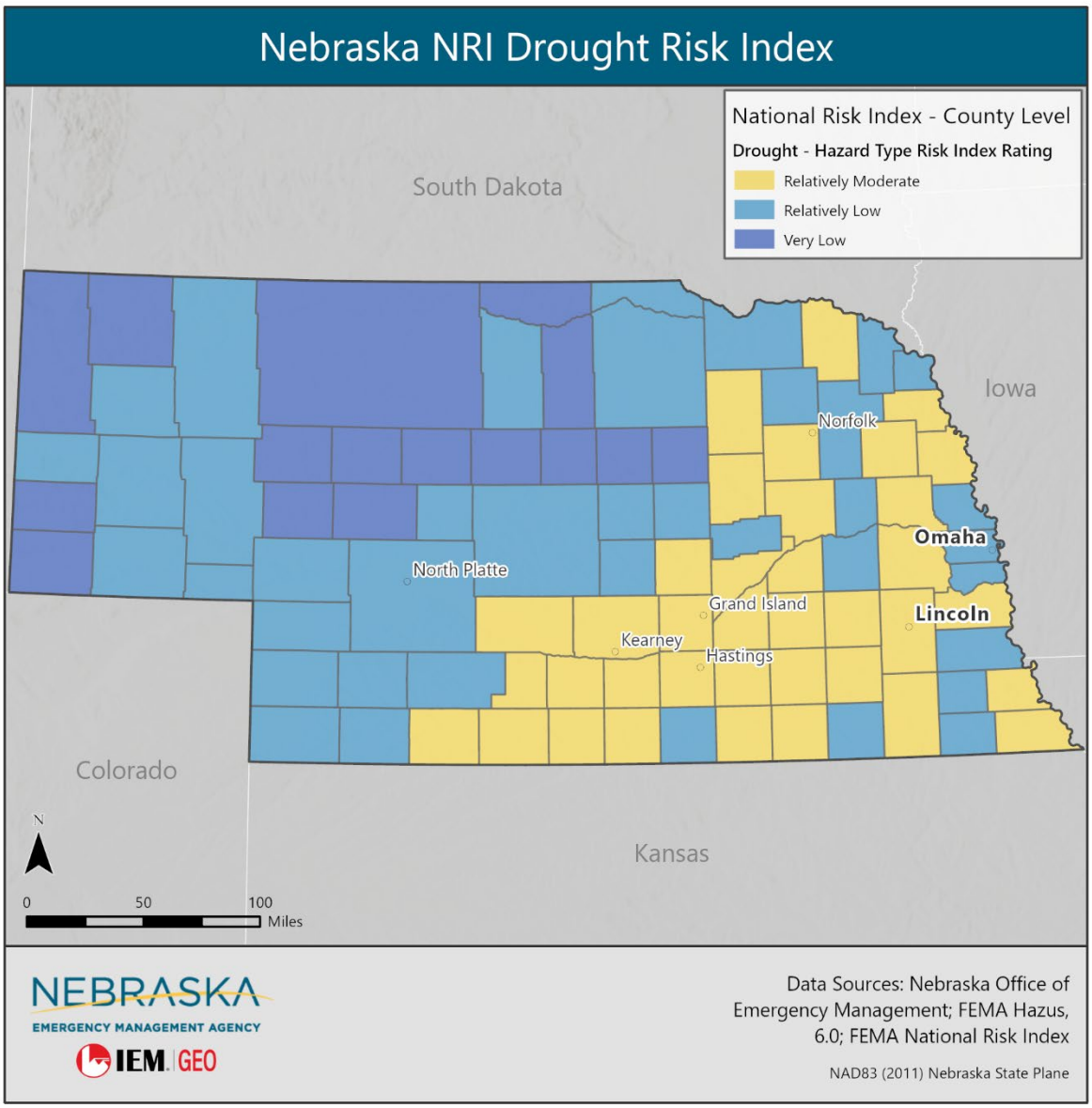



**Figure 51: Nebraska NRI Drought Risk Index**[151]

### 3.12.3.3 ESTIMATED IMPACT AND POTENTIAL LOSSES

Impacts from drought are spread over a larger geographical area compared to those from other natural hazards. Quantifying the impacts and providing disaster relief are far more difficult tasks for drought than for other natural hazards, as these impacts can filter through economies and the environment for months, years, and even decades. These characteristics of drought have hindered the development of accurate, reliable, and timely estimates of severity and impacts (e.g., drought early warning and information systems) and, ultimately, the formulation of drought preparedness plans and policies. It is difficult for

[151] Nebraska Office of Emergency Management, FEMA Hazus 6.0, FEMA National Risk Index.

emergency managers tasked with the assignment of responding to drought to deal with the impacts because droughts often have larger spatial coverage in comparison to floods, tropical storms, earthquakes, and other natural hazards. Additionally, impacts vary by type and magnitude within the drought-affected area because of different economic, social, and environmental system vulnerabilities.

## DROUGHT OF 2012

The Drought of 2012 provides a well-documented example of the impacts that an exceptional drought can have in Nebraska. At the beginning of 2012, there was little indication that an extensive drought would develop and emerge as a significant natural disaster (see Figure 52).

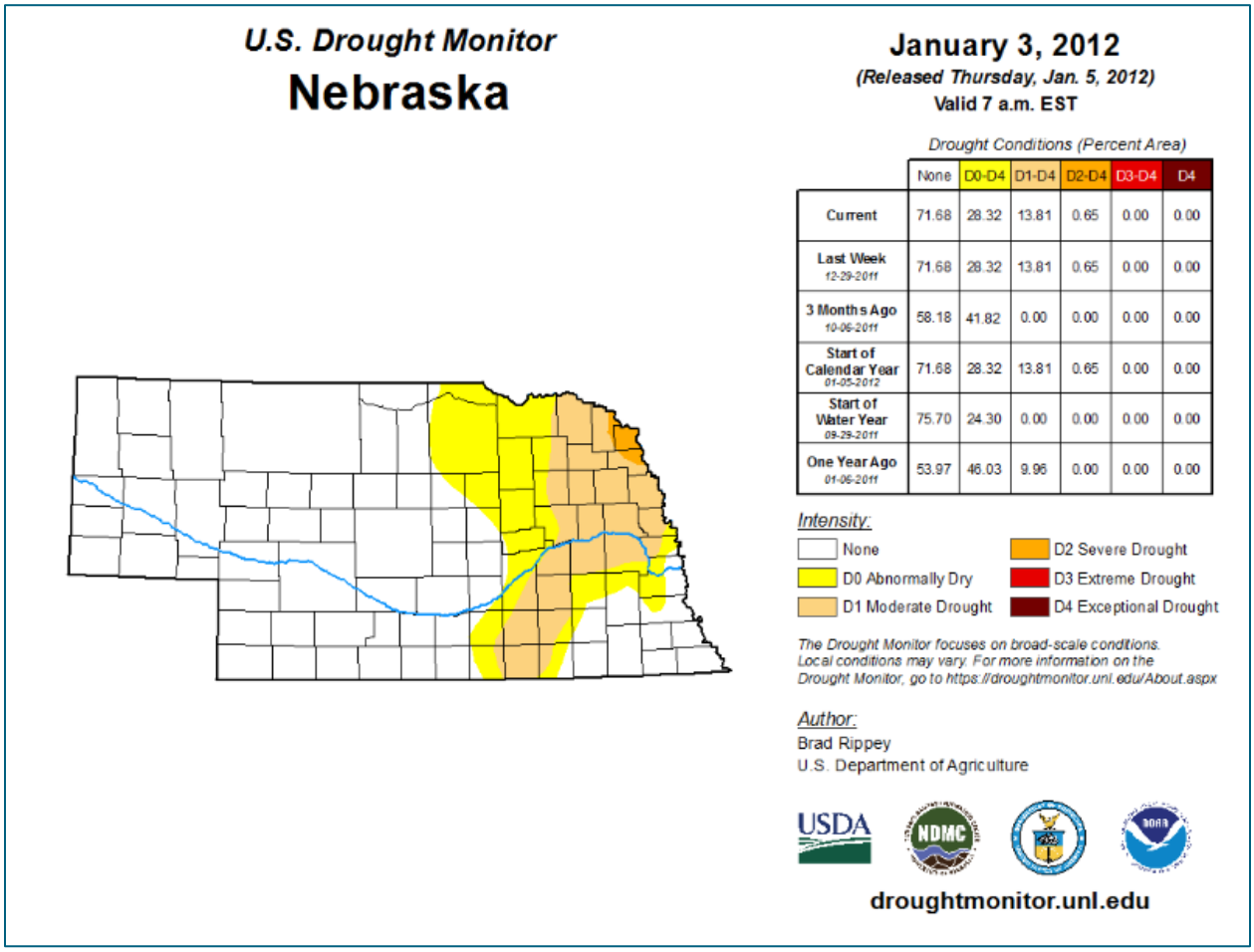



**Figure 52: U.S. Drought Monitor Nebraska, January 3, 2012**[152]

However, by the end of the year, Nebraska was impacted significantly by drought, with 100% of the state in drought and a little more than 96% in extreme drought or worse, according to the U.S. Drought Monitor, (Figure 53).

[152] U.S. Drought Monitor, "Drought Monitor Nebraska-January 3, 2012," 2012. https://droughtmonitor.unl.edu/maps/maparchive.aspx.

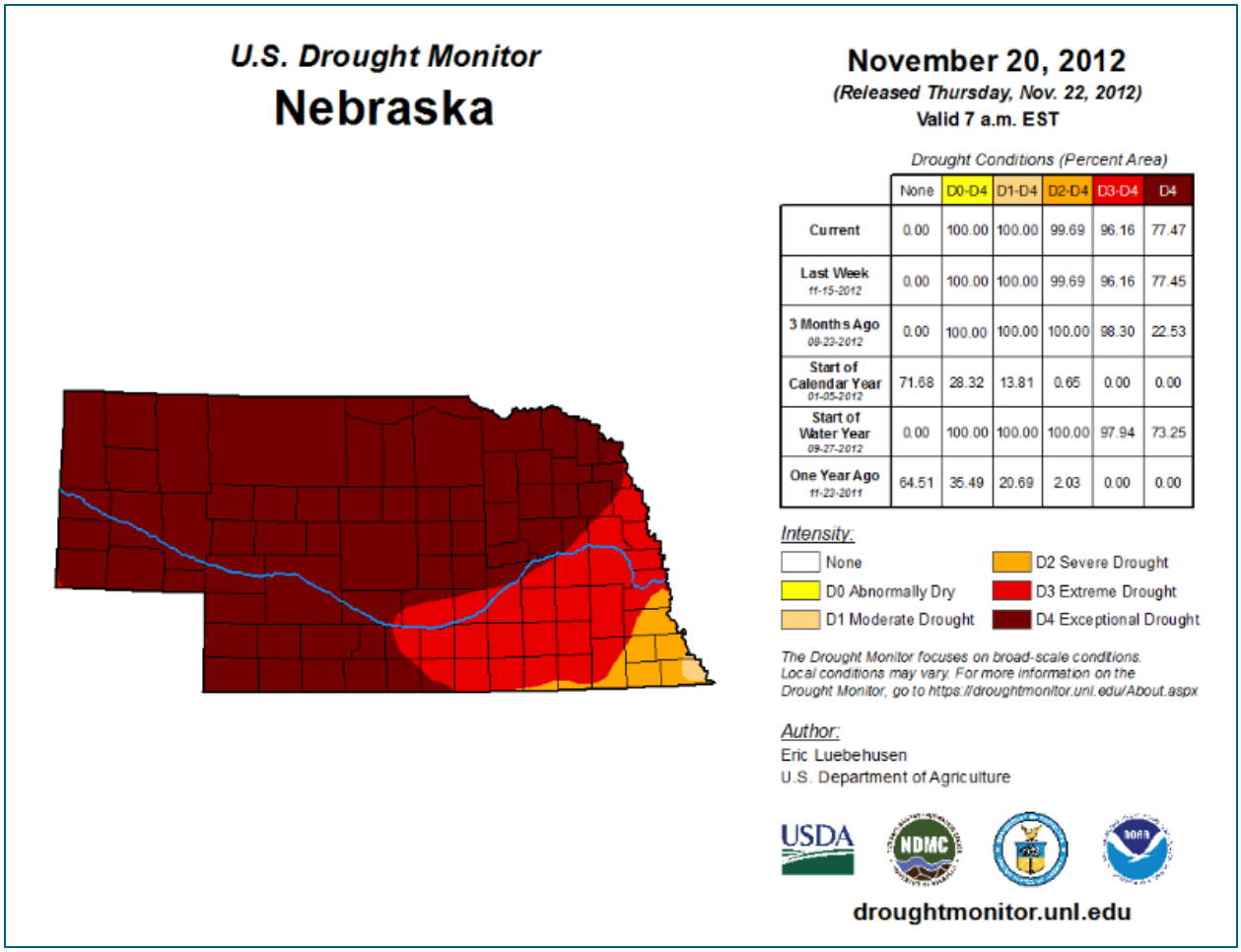



**Figure 53: U.S. Drought Monitor, November 20, 2012**[153]

## Development of Drought Conditions in 2012

The warmth of the 2011–2012 winter season in Nebraska was influenced by many climate factors, including strong southerly winds, a lack of snowpack to the north, a jet stream pattern that kept the cold Arctic air to the north of the state, and a positive Arctic Oscillation (AO). These dry conditions allowed drought to develop in the eastern part of the state in the fall of 2011. By early 2012, about 14% of the state was in drought, mainly the eastern third of the state. The majority of this area was in moderate drought (D1), and less than 1% was in the severe category (D2).

By the end of July, the entire state was in drought conditions, with 83% in extreme or exceptional drought (D3–D4), and southeast Nebraska was in severe drought (D2). By the end of August, drought conditions in Nebraska were rapidly deteriorating: 97% of the state was in extreme to exceptional drought (D3–D4), and almost a quarter of Nebraska (23.33%) was in exceptional drought (D4), which is considered a 1-in-50-year drought event.

[153] U.S. Drought Monitor, "November 20, 2012," 2012. https://droughtmonitor.unl.edu/Maps/MapArchive.aspx.

### Impacts on Agriculture

- Agriculture on all scales—from neighborhood plots and small organic farms to large-scale corn and soybean production and ranches—was impacted.
- Total indemnity payments in Nebraska totaled $1.49 billion.[154]
- Cattle ranchers were forced to cull herds by 25%–60%, as forage production was only about 28%–64% of normal in western Nebraska.[155]
- Increased costs for cattle feedlots due to the price of corn and forage, resulting in losses of $200 a head (or more) based on taking cattle to market earlier than normal and added finishing expenses.[156]
- With the corn crop being damaged, commodity prices increased and production of ethanol was not cost-effective, resulting in reduced production or even closure of several ethanol plants.
- Worst wildfire season since 1919, with more than $12 million in damages and more than 400,000 acres burned in more than 1,200 fire events.[157]
- Widespread tree loss, with evergreens particularly impacted, including white pines, arborvitae, spruces, red cedars, and junipers (700 pine trees removed in Pioneers Park[158]).
- Significant tree loss in windbreaks affected western Nebraska.
- Combination of drought and an outbreak of EHD was estimated to have killed about a third of the whitetail deer population in Nebraska.[159]
- The Lower Platte River experienced record low flows, with many areas running completely dry.[160] Low flows combined with high water temperatures ranging from 92˚F–97˚F led to considerable fish kills, including the endangered pallid sturgeon, catfish, carp, minnows, and others.
- Most water-based recreation was suspended.

### Impacts on Infrastructure

The 2012 drought caused significant damage to building foundations, private and municipal wells, water mains, and even trails.

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[154] 2021 Nebraska State Hazard Mitigation Plan, "Section 3.3 Drought" (Farm Credit Services of America, Inc. report, March 2013). https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.
[155] Ibid.
[156] Ibid.
[157] 2021 Nebraska State Hazard Mitigation Plan, "Section 3.3 Drought" (Nebraska Forest Service). https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.
[158] 2021 Nebraska State Hazard Mitigation Plan, "Section 3.3 Drought" (Lincoln – *Omaha World-Herald*). https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.
[159] 2021 Nebraska State Hazard Mitigation Plan, "Section 3.3 Drought" (*Norfolk Daily News*). https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.
[160] 2021 Nebraska State Hazard Mitigation Plan, "Section 3.3 Drought" (Lower Platte River Corridor Alliance). https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.

- As soils dry, they shift and sink, causing damage to a building's foundation. One estimate indicated the drought damage to houses would reach $1 billion or more .[161]
- Water main breaks are a factor during drought. From May to July 2012, 178 water main breaks were reported in Omaha.
- Metropolitan Utility District officials believed that the combination of extreme heat, drought, and increased water usage caused increased pressure on the city's water lines, causing some to crack.
- As many as 81 municipal water systems in the state experienced drought-related water supply issues in 2012, according to the Department of Health and Human Services.
- Omaha and its surrounding areas broke a record for water use, reaching 224 million gallons on July 23, 2012[162]

### Impacts from Other Natural Hazards

The combination of high winds and ongoing drought conditions caused a large dust storm to form across the panhandle and surrounding areas of Colorado, Wyoming, and Kansas in mid-October. The dust storm reduced visibility, and forcing many roads to close, including I-80 in western Nebraska. In addition, lightning caused a multi-state grassland fire that burned more than 48,000 acres in the northern part of the state.[163]

### Recent Impacts from Drought (2020–2023)

The U.S. Drought Monitor reports the following impacts from drought in Nebraska directly related to agriculture, fire, and water supply and quality.

#### AGRICULTURE

- **Grass growth slowed in western Nebraska**: In 2020, the *Omaha World Herald* reported that drought slowed grass growth in western Nebraska, causing a 15%–30% reduction in available grasses for livestock grazing, according to a range management specialist at the Panhandle Research and Extension Center. Consequently, some ranchers were weaning calves or selling animals earlier than planned.[164]
- **Nebraska's corn and soybeans damaged by drought and heat:** In 2022, the *Lincoln Journal Star* reported that drought conditions expanded in Nebraska, with the southwest part of the state experiencing exceptional drought for the first time since 2013. The worsening conditions hurt crops as drought and heat reduced Nebraska's corn and soybean yields. According to DTN, the average

[161] 2021 Nebraska State Hazard Mitigation Plan, "Section 3.3 Drought" (*U.S. News & World Report)*. https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.
[162] State Impacts Tool, Omaha World-Herald (Neb.), Sept. 13, 2020. https://droughtmonitor.unl.edu/DmData/StateImpacts.aspx.
[163] 2021 Nebraska State Hazard Mitigation Plan, "Section 3.3 Drought." https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.
[164] U.S. Drought Monitor, "Nebraska State Impacts-Agriculture," 2025, https://droughtmonitor.unl.edu/DmData/StateImpacts.aspx.

yield for corn was estimated at 158 bushels per acre (bpa) and 52.5 bpa for soybeans. The USDA's five-year average for corn is nearly 186 bpa and for soybeans is 59 bpa.[165]

- **Ongoing cattle sales in Nebraska:** In 2022, the *Tri-State Livestock News* reported that Nebraska auctions had a constant stream of weigh-up cows and bulls throughout the past year as ranchers culled deeper than usual to ease pressure on withered pastures.[166]
- **Corn without ears; pastures and ponds drying up in central Nebraska:** In 2022, KETVV-TV (Omaha, Neb.) reported that a Buffalo County farmer described the drought situation as being in "survival mode." The soil was very dry as no rain had fallen since mid-June. He swathed and baled his 100 acres of earless corn for cattle feed. His pastures and ponds were drying up. He culled nearly 300 cattle and sold his calves three months early because he simply did not have enough feed for all of them.[167]
- **Drought hurting Nebraska farmers and cattle herders:** In 2023, WOWT-TV NBC 6-Omaha reported that crops in eastern Nebraska were suffering from the lack of rain and nonexistent subsoil moisture. Grass that would normally be 3 feet tall was barely knee-high, making it hard for ranchers to feed their cattle.[168]
- **Major yield losses expected in eastern Nebraska:** In 2023, KLKN-TV (Lincoln, Neb.) reported that dryland farmers in eastern Nebraska anticipated major yield losses from drought, while farmers with irrigation capacity were watering nonstop. Low hay yields were another concern. Farmers who would usually have 200 to 225 large round bales toward the end of June had about 10. Farmers began moving cattle off pasture and sold spring and fall herds in July due to the lack of pasture hay.[169]

### FIRE

- **Unusual number of fires in Nebraska:** In 2020, the *Omaha World-Herald* reported that fire activity was high in Nebraska, with more than 625 wildfires in 2020, the most since the Cornhusker state's worst fire season in 2012, according to the director of the Nebraska State Forest Service. Nebraska experienced its driest August in 126 years of record keeping.[170]
- **Second worst fire season in Nebraska in 2022:** KNOP News2 reported that the second worst fire season in Nebraska's recorded history occurred in 2022, according to the Nebraska Forest Service. Record temperatures, drought, and all-time low soil moisture made firefighting difficult, as more than

[165] USDA Reports Summary, Progressive Farmer, 2025, https://www.dtnpf.com/agriculture/web/ag/news/article/2025/01/10/traders-prepare-busy-friday-usda.
[166] U.S. Drought Monitor, "Nebraska State Impacts-Agriculture," 2025, State Impacts Tool, T*ri-State Livestock News* (Belle Fourche, S.D.), Aug. 19, 2022. https://droughtmonitor.unl.edu/DmData/StateImpacts.aspx.
[167] U.S. Drought Monitor, "Nebraska State Impacts-Agriculture," 2025, State Impacts Tool, KETV-TV (Omaha, Neb.), Aug. 25, 2022. https://droughtmonitor.unl.edu/DmData/StateImpacts.aspx.
[168] U.S. Drought Monitor, "Nebraska State Impacts-Agriculture," 2025, State Impacts Tool, WOWT-TV NBC 6 Omaha (Neb.), May 24, 2023. https://droughtmonitor.unl.edu/DmData/StateImpacts.aspx.
[169] U.S. Drought Monitor, "Nebraska State Impacts-Agriculture," 2025, State Impacts Tool, KLKN-TV (Lincoln, Neb.), June 28, 2023. https://droughtmonitor.unl.edu/DmData/StateImpacts.aspx.
[170] U.S. Drought Monitor, "Nebraska State Impacts-Agriculture," 2025, State Impacts Tool, *Omaha World-Herald* (Neb.), Sept 13, 2020. https://droughtmonitor.unl.edu/DmData/StateImpacts.aspx.

25,000 acres burned, with a substantial area burning in rural parts of the state. In some cases, there was no water nearby.[171]

In 2022, The Nebraska *Examiner* (Lincoln) reported that intensifying drought and strong winds led to high fire activity in Nebraska, setting the state up to possibly see the second worst year on record for wildfires. Without more moisture this fall and winter, the fires are likely to continue into 2023. About 200,000 acres of grasslands, croplands, and forests have burned so far, compared with about 502,000 acres in 2012, another year of intense drought.[172]

### WATER SUPPLY AND QUALITY

- **Years of drought dropped water levels in the wells of Fairbury, Nebraska:** In 2023, the *Fairbury Journal* reported that water levels in Fairbury's wells had fallen in recent years due to drought.[173]
- **Groundwater levels are being closely monitored in northeast Nebraska: In 2023,** News Channel Nebraska (Grand Island, Neb.) reported that water users in the Lower Elkhorn Natural Resource District (LENRD) had a 15-inch allocation for the 2023 growing season while the area remained in extreme and exceptional drought. The concern was if drought conditions would improve to severe drought for 14 consecutive days, the restriction would be lifted for locations within the area. Spring well measurements showed that wells continued to decline.[174]

  WJAG-AM (Norfolk, Neb.) reported that LENRD closely watching groundwater levels in 2023 and imposed water restrictions on anyone with a well in a D3 or D4 area in late October of 2023.[175]
- **Voluntary water conservation in Lincoln, Nebraska:** In 2023, KLIN-AM (Lincoln, Neb.) reported extreme drought in Lancaster County, which prompted Lincoln officials to encourage residents to practice voluntary water conservation.[176]
- **Water emergency in Waverly, Nebraska:** In 2023, Waverly, Nebraska, was under a water emergency. A water warning took effect in Waverly on June 3. On June 28, a water emergency began as drought and high-water use continued, causing the level of the town's wells to fall. Waverly's mayor also proposed an emergency water rate to further lower water use because voluntary restrictions were not saving as much water as desired.[177]

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[171] U.S. Drought Monitor, 2025, State Impacts Tool, "Nebraska State Impacts-Fire", KNOP News2 (North Platte, Neb.), April 21, 2023, https://droughtmonitor.unl.edu/DmData/StateImpacts.aspx.
[172] U.S. Drought Monitor, "Nebraska State Impacts-Fire," 2025, State Impacts Tool, *Nebraska Examiner* (Lincoln), Nov. 7, 2022. https://droughtmonitor.unl.edu/DmData/StateImpacts.aspx.
[173] U.S. Drought Monitor, "Nebraska State Impacts-Water Supply and Quality," 2025, State Impacts Tool, *Fairbury Journal News*, Nov. 14, 2023. https://droughtmonitor.unl.edu/DmData/StateImpacts.aspx.
[174] U.S. Drought Monitor, "Nebraska State Impacts-Water Supply and Quality," 2025, State Impacts Tool, News Channel Nebraska (Grand Island, Neb.), Apr. 25, 2023. https://droughtmonitor.unl.edu/DmData/StateImpacts.aspx.
[175] U.S. Drought Monitor, "Nebraska State Impacts-Water Supply and Quality," 2025, State Impacts Tool, WJAG-AM (Norfolk, Neb.), Jan 24, 2023. https://droughtmonitor.unl.edu/DmData/StateImpacts.aspx.
[176] U.S. Drought Monitor, "Nebraska State Impacts-Water Supply and Quality," 2025, State Impacts Tool, KLIN-AM (Lincoln, Neb.), June 1, 2023. https://droughtmonitor.unl.edu/DmData/StateImpacts.aspx.
[177] U.S. Drought Monitor, "Nebraska State Impacts-Water Supply and Quality," 2025, State Impacts Tool, *Wahoo Newspaper* (Neb.), Aug. 2, 2023, and 1011 Now (Lincoln, Neb.), Aug. 9, 2023, June 27, 2023. https://droughtmonitor.unl.edu/DmData/StateImpacts.aspx.

### 3.12.3.4 ACCESS AND FUNCTIONAL NEEDS

Drought can impact both surface water and groundwater availability and can potentially have direct, disastrous effects on human populations. The indirect consequences of drought are not often fully known, but they include unemployment, reduced tax revenues, increased food prices, reduced outdoor recreation opportunities, higher energy costs as water levels in reservoirs decrease and consumption increases, and water rationing. This complex web of impacts causes drought to affect people and economies well beyond the area physically experiencing the drought.

### 3.12.3.5 COMMUNITY LIFELINES

Drought impacts Federal Emergency Management Agency (FEMA) community lifelines in the areas of food, hydration, shelter, and water systems. Most crops and animals require water to thrive and grow; without it, they stress and ultimately die. Shelter is also affected as drought can severely damage structural integrity when the soil pulls away from beams, buildings, bridges, and so forth. Mitigating drought moving forward will require conservation, thinking outside the box, and innovation to maintain the standard of living Nebraska has come to know.

### 3.12.3.6 ENHANCED PRIORITY RISK INDEX SCORE

The Enhanced Priority Risk Index (EPRI) provides the state of Nebraska with a methodology to measure the impact that each profiled hazard may have on the seven Emergency Management Accreditation Program (EMAP) Standard 4.1.2 sectors (public; responders; continuity of operations, including continued delivery of services; property, facilities, and infrastructure; the environment; the economic condition of the jurisdiction; and public confidence in the jurisdiction's governance). Table 39 provides the EPRI scores for the hazard with the appropriate risk factor.

**Table 39: Drought Enhanced Priority Risk Index Score**

| | Probability Next 5 Years | Impact | Spatial Extent | Warning Time | Duration | Vulnerability | Probability | Overall Risk Factor |
|---|---|---|---|---|---|---|---|---|
| **Risk Level** | 3.4 | 2.9 | 4 | 1 | 3.9 | 3 | 3.7 | 3.12 |

Table 40 provides a summary of drought impact, to include impact to the public, first responders, continuity of operations, property, infrastructure, environment, economic conditions and public confidence, and the consequences of those impacts.

**Table 40: Drought Impact/Consequence Summary**

| Sector | Impact |
|---|---|
| **Public** | **Housing:** In the event of severe drought, foundations of structures could be impacted by contracting soils.<br>**Casualties/Fatalities:** Could result if the drought is accompanied by severe and lingering heat.<br>**Food/Water:** As a result of extended drought, lower groundwater levels can lead to water supply impact. |
| **First Responders** | Due to dry conditions grasslands, CRP croplands and forested area are fire prone increasing demand on fire department resources. |
| **Continuity of Operations (COOP)** | No impact on COOP. |
| **Property, Facilities, and Infrastructure** | **Property:** May not be physically destroyed, but rural home water wells may go dry. This may cause long-term reduction of grazing for a year and replacement of fence posts. Well pumps may need to be lowered if groundwater levels decline drastically.<br>**Water systems:** May be strained by low levels of groundwater, potentially causing water shortages.<br>**Roads and bridges:** May experience cracking or foundation shifting due to extreme heat and drought conditions. |
| **Environment** | Animals are impacted by loss of food and nesting when grasses die. Streams, creeks, and river levels can lower to the point of fish kills and loss of habitat for waterfowl. |
| **Economic Conditions** | The loss of crops, hay, and animals due to high feed costs can significantly impact local and state economies. Animal and plant diseases would increase as animal and plant populations are stressed. Widespread disease would cut sales and hit the state's economy hard. Might need hay to feed cows. |
| **Public Confidence** | Depends on the efficiency of governments to handle the resulting impacts and the level of trust between the affected jurisdictions and the government. |

# 3.13 Extreme Temperatures

## 3.13.1 Description

Extreme temperatures, including both extreme heat and extreme cold, present significant challenges to the environment, economy, and public health. Heat waves occur when temperatures exceed historical norms for extended periods, and they are often accompanied by high humidity, which can intensify stress on people, animals, and infrastructure.[178] Prolonged exposure to extreme heat increases the likelihood of heat-related illnesses, such as heat exhaustion and heat stroke, especially for the elderly, children, individuals with underlying health conditions, and other at-risk populations.[179] Additionally, high temperatures place heavy demand on power grids; this increases the use of air conditioning, can lead to electrical outages and energy shortages, and can compound health risks.[180] In agricultural regions, excessive heat can contribute to drought conditions, reducing soil moisture, damaging crops, and threatening water availability, which, in turn, affects food security and economic stability.[181]

Extreme cold events occur when temperatures drop significantly below seasonal averages and are often accompanied by strong winds, heavy snowfall, and ice accumulation, all of which can disrupt daily life. Exposure to frigid temperatures can result in hypothermia, frostbite, and respiratory distress, particularly for low-income populations lacking access to reliable heating and shelter.[182] The effects of extreme cold extend beyond human health, as frozen water pipes, power failures, and hazardous road conditions can hinder emergency response efforts and delay aid to those in need. Additionally, livestock and winter crops can suffer significant losses, while transportation and supply chain disruptions can impact both urban and rural communities and lead to widespread economic consequences. As climate patterns continue to shift, the frequency and intensity of extreme heat and cold events are expected to rise. This highlights the need for proactive adaptation measures, enhanced infrastructure resilience, and improved disaster preparedness to mitigate societal and economic disruptions.

## 3.13.2 Risk Assessment

### 3.13.2.1 LOCATION

The entire Nebraska Planning Area is subject to extreme temperature variations, with northern regions typically experiencing slightly cooler averages than southern. According to 2023 data from the Nebraska Mesonet, a temperature range of 108 degrees Fahrenheit was observed between the highest and lowest recorded temperatures. Additionally, a single weather station documented a 48-degree fluctuation within

[178] Center for Climate and Energy Solutions, “Heat Waves and Climate Change.” https://www.c2es.org/content/heat-waves-and-climate-change/.
[179] U.S. Environmental Protection Agency, “Climate Change Impacts on Agriculture and Food Supply.” https://www.epa.gov/climateimpacts/climate-change-impacts-agriculture-and-food-supply.
[180] Intergovernmental Panel on Climate Change, “Climate Change 2022: Impacts, Adaptation and Vulnerability,” 2022. https://www.ipcc.ch/report/ar6/wg2/.
[181] U.S. Environmental Protection Agency, “Climate Change Impacts on Agriculture and Food Supply.” https://www.epa.gov/climateimpacts/climate-change-impacts-agriculture-and-food-supply.
[182] Centers for Disease Control and Prevention. “Cold Weather Safety and Health Risks,” 2021. www.cdc.gov.

a 24-hour period and a wind chill reaching -35°F.[183] Figure 54 shows an example of the state weather extremes in Nebraska.

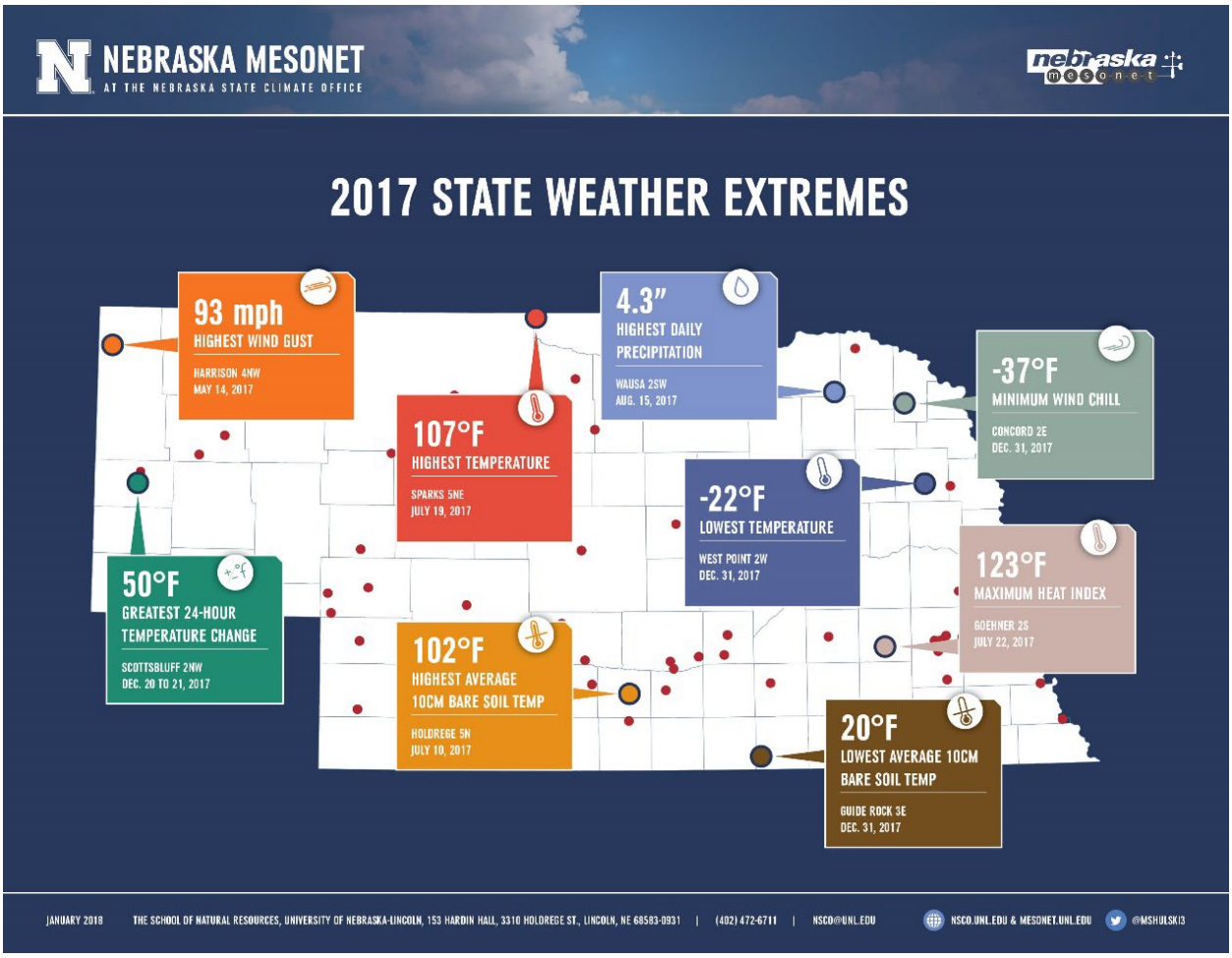



**Figure 54: Extreme Weather Extremes in the State of Nebraska[184]**

### 3.13.2.2 EXTENT

Atmospheric conditions play a crucial role in shaping the impacts of extreme heat. High humidity levels exacerbate human discomfort and can significantly increase the health risks associated with prolonged heat exposure. Excessive moisture in the air reduces the body's ability to cool itself through perspiration, increasing the likelihood of heat exhaustion, heat stroke, and other heat-related illnesses.[185] Additionally, in combination with insufficient rainfall, extended periods of high temperatures can lead to drought, severely affecting crop yields, livestock health, and overall agricultural productivity. These agricultural

[183] Nebraska Mesonet. https://nemesonet.unl.edu/.
[184] University of Nebraska-Lincoln, School of Natural Resources, "Extremes List Highlights Nebraska's Variable Climate," January 30, 2018. https://newsroom.unl.edu/announce/snr/7583/43184.
[185] University of Kentucky, "Expert explains how to use the heat index and other weather tools to stay safe and healthy this summer." https://ci.uky.edu/irj/rural-blog/expert-explains-how-use-heat-index-and-other-weather-tools-stay-safe-and-healthy.

disruptions can have cascading economic consequences, particularly in states where farming is a major industry, such as Nebraska.[186]

The heat index provides a scientific framework for assessing the combined effects of heat and humidity on the human body. Similarly, during winter months, extremely cold air masses can affect large regions and millions of people across the country. When cold Arctic air converges with strong winds, dangerously low wind chill values develop, increasing the risk of frostbite and hypothermia in a matter of minutes.[187] Exposed skin and extremities are especially vulnerable, making proper protective clothing essential in extreme cold conditions. Cold temperatures also pose a significant threat to agriculture, particularly during late spring and early fall, when unexpected freezes can damage or destroy crops and impact food supply chains and local economies. A freeze event, defined as temperatures dropping below 32°F, is particularly detrimental during the growing season, because different plant species have varying levels of tolerance to cold temperatures. Understanding and preparing for temperature extremes is essential to protecting human health, maintaining agricultural stability, and ensuring economic resilience in regions prone to these conditions.

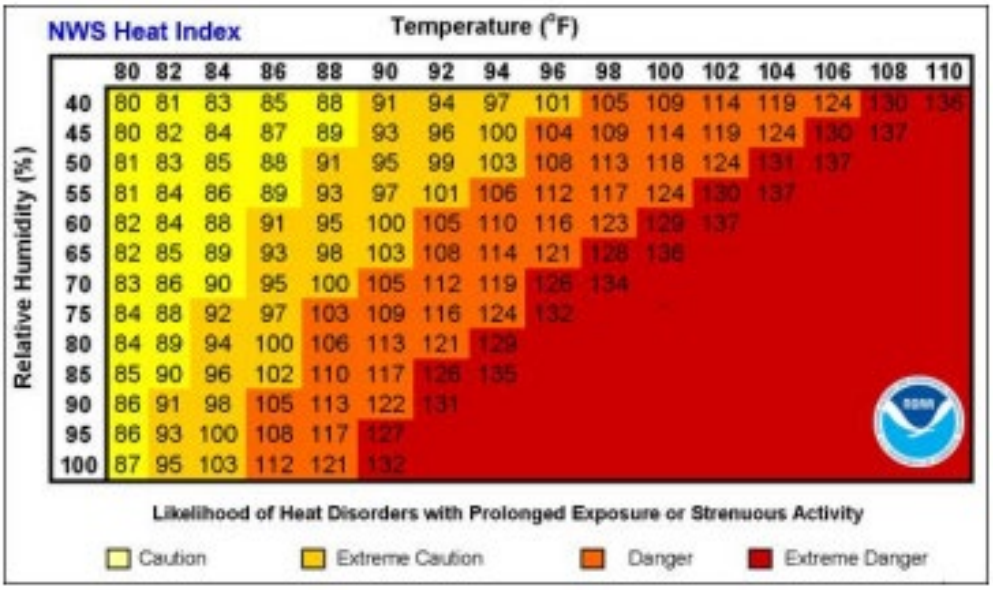



**Figure 55: National Weather Service Heat Index[188]**

[186] U.S. Environmental Protection Agency, "Climate Change Impacts on Agriculture and Food Supply." https://www.epa.gov/climateimpacts/climate-change-impacts-agriculture-and-food-supply.
[187] National Weather Servies, "Cold Weather Safety." https://www.weather.gov/safety/cold#:~:text=People%20exposed%20to%20extreme%20cold,weather%20can%20also%20affect%20crops.
[188] National Weather Service Heat Index Chart. https://www.weather.gov/media/unr/heatindex.pdf.

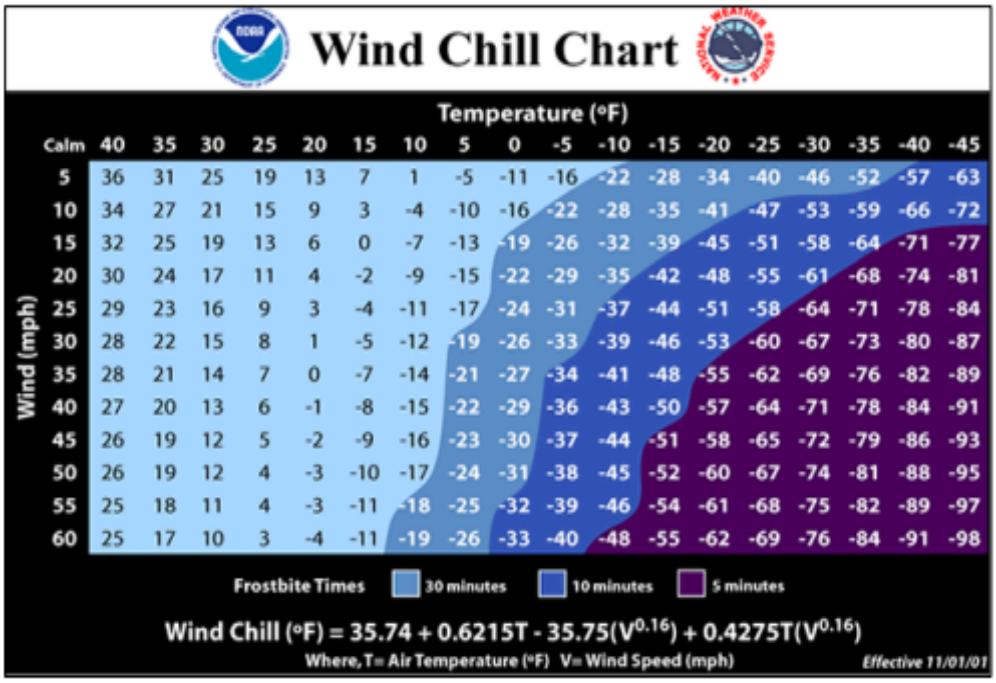



Figure 56: National Weather Service Heat Index[189]

### 3.13.2.3 PREVIOUS EVENTS

Data from the NCEI Storm Events Database over a 29-year period (1996 to 2024) was analyzed at the county level to determine the number of events, their impact, the chance of occurrence, and the return frequency of extreme heat and extreme cold. Table 41 and Table 42 summarize that data.

Table 41: Occurrences of Extreme Heat in the Counties of Nebraska[190]

| County | Total # of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Chance of Occurrence | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Adams** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Antelope** | 2 | $0 | $0 | 0 | 0 | 7% | 1 event every 14 to 15 years |
| **Arthur** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Banner** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Blaine** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |

[189] National Weather Service Wind Chill Chart. https://www.weather.gov/safety/cold-wind-chill-chart.
[190] National Centers for Environmental Information. Storm Events Database. https://www.ncdc.noaa.gov/stormevents/.

| County | Total # of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Chance of Occurrence | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Boone** | 2 | $0 | $0 | 0 | 0 | 7% | 1 event every 14 to 15 years |
| **Box Butte** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Boyd** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |
| **Brown** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |
| **Buffalo** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Burt** | 6 | $0 | $0 | 0 | 0 | 21% | 1 event every 4 to 5 years |
| **Butler** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Cass** | 9 | $0 | $0 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Cedar** | 3 | $0 | $0 | 0 | 0 | 10% | 1 event every 9 to 10 years |
| **Chase** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |
| **Cherry** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |
| **Cheyenne** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Clay** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Colfax** | 4 | $0 | $0 | 0 | 0 | 14% | 1 event every 7 to 8 years |
| **Cuming** | 4 | $0 | $0 | 0 | 0 | 14% | 1 event every 7 to 8 years |
| **Custer** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |
| **Dakota** | 13 | $0 | $0 | 0 | 0 | 45% | 1 event every 2 to 3 years |
| **Dawes** | 2 | $0 | $0 | 0 | 0 | 7% | 1 event every 14 to 15 years |
| **Dawson** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Deuel** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |

| County | Total # of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Chance of Occurrence | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Dixon** | 15 | $0 | $0 | 0 | 0 | 52% | 1 event every 1 to 2 years |
| **Dodge** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Douglas** | 9 | $0 | $0 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Dundy** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Fillmore** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |
| **Franklin** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Frontier** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |
| **Furnas** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Gage** | 8 | $0 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Garden** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Garfield** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |
| **Gosper** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Grant** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Greeley** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Hall** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Hamilton** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Harlan** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Hayes** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |
| **Hitchcock** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Holt** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |

| County | Total # of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Chance of Occurrence | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Hooker** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Howard** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Jefferson** | 7 | $0 | $0 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Johnson** | 8 | $0 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Kearney** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Keith** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Keya Paha** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |
| **Kimball** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Knox** | 2 | $0 | $0 | 0 | 0 | 7% | 1 event every 14 to 15 years |
| **Lancaster** | 8 | $0 | $0 | 8 | 0 | 28% | 1 event every 3 to 4 years |
| **Lincoln** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |
| **Logan** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |
| **Loup** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |
| **Madison** | 3 | $0 | $0 | 0 | 0 | 10% | 1 event every 9 to 10 years |
| **McPherson** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Merrick** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Morrill** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Nance** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Nemaha** | 9 | $0 | $0 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Nuckolls** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |

| County | Total # of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Chance of Occurrence | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Otoe** | 9 | $0 | $0 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Pawnee** | 9 | $0 | $0 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Perkins** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Phelps** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Pierce** | 3 | $0 | $0 | 0 | 0 | 10% | 1 event every 9 to 10 years |
| **Platte** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Polk** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Red Willow** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Richardson** | 9 | $0 | $0 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Rock** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |
| **Saline** | 7 | $0 | $0 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Sarpy** | 9 | $0 | $0 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Saunders** | 7 | $0 | $0 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Scotts Bluff** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Seward** | 6 | $0 | $0 | 0 | 0 | 21% | 1 event every 4 to 5 years |
| **Sheridan** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Sherman** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Sioux** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Stanton** | 3 | $0 | $0 | 0 | 0 | 10% | 1 event every 9 to 10 years |
| **Thayer** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |

| County | Total # of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Chance of Occurrence | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Thomas** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |
| **Thurston** | 4 | $0 | $0 | 0 | 0 | 14% | 1 event every 7 to 8 years |
| **Valley** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Washington** | 8 | $0 | $0 | 8 | 0 | 28% | 1 event every 3 to 4 years |
| **Wayne** | 2 | $0 | $0 | 0 | 0 | 7% | 1 event every 14 to 15 years |
| **Webster** | 0 | $0 | $0 | 0 | 0 | < 1% | < 1 event every 29 years |
| **Wheeler** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |
| **York** | 1 | $0 | $0 | 0 | 0 | 4% | 1 event every 29 years |

Extreme heat occurrences in Nebraska vary significantly across counties, with some regions experiencing frequent events and others reporting little to no extreme heat incidents. Notably, Dixon (15 events), Dakota (13 events), Cass (9 events), Douglas (9 events), and Gage (8 events) reported the highest frequency of extreme heat events between 1996 and 2024, with return intervals ranging from 1 to 4 years. Conversely, Adams, Arthur, Banner, Box Butte, Buffalo, Cheyenne, Clay, Dawson, Deuel, Franklin, and other counties reported no recorded extreme heat events; the probability of occurrence in these counties is less than 1%, and the return frequency is estimated to be less than one event every 29 years.

Despite the occurrences, no reported property or crop damage, injuries, or fatalities were attributed to extreme heat in Nebraska during this period. Counties with moderate event frequencies, such as Burt, Butler, Colfax, Cuming, and Dodge, experience heat waves approximately every 4 to 8 years, while counties with rare occurrences, including Blaine, Boyd, Brown, and Cherry, report one event every 29 years. The data suggests that extreme heat events in Nebraska are highly localized, with some counties facing recurrent heat waves while others remain largely unaffected.

Table 42: Occurrences of Extreme Cold in the Counties of Nebraska[191]

| County | Total # of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Chance of Occurrence | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Adams** | 6 | $0 | $0 | 0 | 0 | 21% | 1 event every 4 to 5 years |
| **Antelope** | 9 | $0 | $0 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Arthur** | 11 | $0 | $0 | 0 | 0 | 55% | 1 event every 2 to 3 years |
| **Banner** | 9 | $0 | $0 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Blaine** | 15 | $0 | $0 | 0 | 0 | 52% | 1 event every 1 to 2 years |
| **Boone** | 8 | $0 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Box Butte** | 19 | $0 | $0 | 0 | 0 | 66% | 1 event every 1 to 2 years |
| **Boyd** | 17 | $0 | $0 | 0 | 0 | 59% | 1 event every 1 to 2 years |
| **Brown** | 15 | $0 | $0 | 0 | 0 | 52% | 1 event every 1 to 2 years |
| **Buffalo** | 6 | $0 | $0 | 0 | 0 | 21% | 1 event every 4 to 5 years |
| **Burt** | 8 | $0 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Butler** | 8 | $0 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Cass** | 7 | $0 | $0 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Cedar** | 12 | $0 | $0 | 0 | 0 | 41% | 1 event every 2 to 3 years |
| **Chase** | 6 | $0 | $0 | 0 | 0 | 21% | 1 event every 4 to 5 years |
| **Cherry** | 45 | $0 | $0 | 0 | 0 | 100% | 1 to 2 events every year |
| **Cheyenne** | 15 | $0 | $0 | 0 | 0 | 52% | 1 event every 1 to 2 years |
| **Clay** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |

[191] Ibid.

| County | Total # of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Chance of Occurrence | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Colfax** | 8 | $0 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Cuming** | 8 | $0 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Custer** | 15 | $0 | $0 | 0 | 0 | 52% | 1 event every 1 to 2 years |
| **Dakota** | 8 | $0 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Dawes** | 18 | $0 | $0 | 0 | 0 | 62% | 1 event every 1 to 2 years |
| **Dawson** | 6 | $0 | $0 | 0 | 0 | 21% | 1 event every 4 to 5 years |
| **Deuel** | 11 | $0 | $0 | 0 | 0 | 38% | 1 event every 2 to 3 years |
| **Dixon** | 8 | $0 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Dodge** | 7 | $0 | $0 | 0 | 1 | 24% | 1 event every 4 to 5 years |
| **Douglas** | 7 | $0 | $0 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Dundy** | 8 | $0 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Fillmore** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Franklin** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Frontier** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Furnas** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Gage** | 7 | $0 | $0 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Garden** | 14 | $0 | $0 | 0 | 0 | 48% | 1 event every 2 to 3 years |
| **Garfield** | 13 | $0 | $0 | 0 | 0 | 45% | 1 event every 2 to 3 years |
| **Gosper** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Grant** | 12 | $0 | $0 | 0 | 0 | 41% | 1 event every 2 to 3 years |

| County | Total # of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Chance of Occurrence | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Greeley** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Hall** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Hamilton** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Harlan** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Hayes** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Hitchcock** | 7 | $0 | $0 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Holt** | 16 | $0 | $0 | 0 | 0 | 55% | 1 event every 1 to 2 years |
| **Hooker** | 12 | $0 | $0 | 0 | 0 | 41% | 1 event every 2 to 3 years |
| **Howard** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Jefferson** | 7 | $0 | $0 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Johnson** | 7 | $0 | $0 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Kearney** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Keith** | 9 | $0 | $0 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Keya Paha** | 9 | $0 | $0 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Kimball** | 9 | $0 | $0 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Knox** | 10 | $0 | $0 | 0 | 0 | 35% | 1 event every 2 to 3 years |
| **Lancaster** | 7 | $0 | $0 | 12 | 0 | 24% | 1 event every 4 to 5 years |
| **Lincoln** | 7 | $0 | $0 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Logan** | 11 | $0 | $0 | 0 | 0 | 38% | 1 event every 2 to 3 years |
| **Loup** | 13 | $0 | $0 | 0 | 0 | 45% | 1 event every 2 to 3 years |

| County | Total # of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Chance of Occurrence | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Madison** | 8 | $0 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **McPherson** | 10 | $0 | $0 | 0 | 0 | 35% | 1 event every 2 to 3 years |
| **Merrick** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Morrill** | 8 | $0 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Nance** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Nemaha** | 7 | $0 | $0 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Nuckolls** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Otoe** | 7 | $0 | $0 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Pawnee** | 7 | $0 | $0 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Perkins** | 9 | $0 | $0 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Phelps** | 6 | $0 | $0 | 0 | 0 | 21% | 1 event every 4 to 5 years |
| **Pierce** | 9 | $0 | $0 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Platte** | 8 | $0 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Polk** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Red Willow** | 9 | $0 | $0 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Richardson** | 7 | $0 | $0 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Rock** | 15 | $0 | $0 | 0 | 0 | 52% | 1 event every 1 to 2 years |
| **Saline** | 7 | $0 | $0 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Sarpy** | 7 | $0 | $0 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Saunders** | 8 | $0 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |

| County | Total # of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Chance of Occurrence | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Scotts Bluff** | 16 | $0 | $0 | 0 | 0 | 55% | 1 event every 1 to 2 years |
| **Seward** | 7 | $0 | $0 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Sheridan** | 23 | $0 | $0 | 0 | 0 | 79% | 1 event every 1 to 2 years |
| **Sherman** | 4 | $0 | $0 | 0 | 0 | 14% | 1 event every 7 to 8 years |
| **Sioux** | 19 | $0 | $0 | 0 | 0 | 66% | 1 event every 1 to 2 years |
| **Stanton** | 9 | $0 | $0 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Thayer** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Thomas** | 13 | $0 | $0 | 0 | 0 | 45% | 1 event every 2 to 3 years |
| **Thurston** | 10 | $0 | $0 | 0 | 0 | 35% | 1 event every 2 to 3 years |
| **Valley** | 6 | $0 | $0 | 0 | 0 | 21% | 1 event every 4 to 5 years |
| **Washington** | 7 | $0 | $0 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Wayne** | 11 | $0 | $0 | 0 | 0 | 38% | 1 event every 2 to 3 years |
| **Webster** | 5 | $0 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Wheeler** | 12 | $0 | $0 | 0 | 0 | 41% | 1 event every 2 to 3 years |
| **York** | 4 | $0 | $0 | 0 | 0 | 14% | 1 event every 7 to 8 years |

Extreme cold events have been widely recorded across Nebraska, with varying frequencies among counties. The most affected counties include Cherry (45 events), Sheridan (23 events), Sioux (19 events), Dawes (18 events), and Boyd (17 events), each experiencing one or more extreme cold events annually or biennially. Many counties, particularly in western and northern Nebraska, report frequent occurrences, with return intervals of every 1 to 2 years. In contrast, some counties, such as Sherman and York, experience extreme cold less frequently, approximately every 7 to 8 years.

Despite the prevalence of extreme cold, no recorded property or crop damage has been attributed to these events, and only one fatality has been reported in Dodge County. Counties with moderate event

frequencies, including Cedar, Grant, Hooker, and Logan, experience cold waves every 2 to 3 years, while others, such as Fillmore, Franklin, and Nance, report rarer occurrences approximately every 5 to 6 years.

#### 3.13.2.4 PROBABILITY

The NCEI Storm Events Database indicates that since 1996, Nebraska has experienced 26 days with extreme heat events, resulting in 21 injuries and one fatality. Additionally, 36 days of extreme cold have been reported since 1996, resulting in one fatality. Based on historical data, extreme heat has a 90% annual chance of occurrence, equating to one event every one to two years, and extreme cold has a 100% annual chance of occurrence, with one to two events each year.

#### 3.13.2.5 EFFECTS OF FUTURE CONDITIONS

Due to their widespread impact across diverse geographic regions, extreme temperatures in Nebraska present unique challenges for assessing development and population trends. Unlike localized hazards, extreme heat and cold affect both urban and rural areas and influence infrastructure, energy demand, and public health. Existing building codes and land-use regulations incorporate standards to improve insulation, ventilation, and energy efficiency, helping mitigate temperature-related stress on structures. Additionally, pre-engineered cooling and heating systems are available for residential and commercial buildings to enhance resilience. The potential effects of future growth and development on temperature-related risks will be evaluated in upcoming planning cycles to assess changes in exposure levels and identify opportunities for mitigation through sustainable development practices.

Shifts in global climate patterns and atmospheric conditions may intensify extreme temperature events. Rising global temperatures contribute to longer and more intense heat waves, increasing heat-related illnesses and energy consumption. Conversely, changing polar jet stream behavior can bring more frequent and severe cold outbreaks, affecting durability of agriculture, transportation, and infrastructure. Some studies suggest that as a result of these extremes, the climate would change such that seasons may manifest as prolonged periods of severe heat or cold rather than typical seasons with gradual transitions. These shifts pose challenges for emergency management, energy providers, and public health officials, and this emphasizes the need for updated forecasting models, improved urban planning strategies, and enhanced public preparedness efforts to address the evolving risks associated with extreme temperatures in Nebraska.

### 3.13.3 Vulnerability Analysis

Nebraska is particularly vulnerable to extreme temperatures due to its geographic location and climate patterns. The state experiences both intense summer heat waves and severe winter cold snaps, which often come with little warning but last for extended periods. Nebraska's flat terrain and open landscapes contribute to temperature extremes, as there are few natural barriers to moderate hot or cold air masses. During the summer, high temperatures, combined with humidity, can lead to dangerous heat indices, increasing the risk of heat exhaustion and heat stroke, particularly among vulnerable populations, such as the elderly, individuals with preexisting conditions, individuals with access and functional needs, and

those in rural or low-income communities who may lack adequate cooling resources. Conversely, extreme cold increases the risk of hypothermia and frostbite.

In the winter, rapid drops in temperature, strong winds, and blizzard conditions can create life-threatening cold exposure risks, especially for those without reliable heating, outdoor workers, and individuals in isolated areas with limited access to emergency services or shelter. The widespread nature of both extreme heat and cold in Nebraska further increases the vulnerability of rural communities, where emergency response systems, healthcare facilities, and infrastructure may be insufficient to handle prolonged temperature-related crises. As climate patterns continue to shift, the state may experience more frequent and intense temperature extremes, and this emphasizes the need for improved emergency preparedness, infrastructure resilience, and community support systems to protect at-risk populations.

#### 3.13.3.1 NATIONAL RISK INDEX

The National Risk Index (NRI) provides communities with an online tool that displays potential risk to 18 natural hazards. Table 43 and Table 44 provide an overview of historical losses, expected annual losses, and overall risk rating for extreme heat and cold at the county level.

**Table 43: The NRI for Extreme Heat for the Counties of Nebraska[192]**

| County | Historical Loss | Expected Annual Loss | Overall Risk Rating |
|---|---|---|---|
| **Adams** | Very Low | Relatively Low | Relatively Low |
| **Antelope** | Relatively Low | Relatively Low | Relatively Low |
| **Arthur** | No Rating | No Expected Annual Losses | No Rating |
| **Banner** | No Rating | No Expected Annual Losses | No Rating |
| **Blaine** | Relatively Low | Very Low | Very Low |
| **Boone** | Relatively Low | Relatively Low | Relatively Low |
| **Box Butte** | No Rating | No Expected Annual Losses | No Rating |
| **Boyd** | Very Low | Very Low | Very Low |
| **Brown** | Relatively Low | Relatively Low | Relatively Low |
| **Buffalo** | Very Low | Relatively Low | Relatively Low |
| **Burt** | Very Low | Relatively Low | Relatively Low |
| **Butler** | Very Low | Relatively Low | Relatively Low |
| **Cass** | Very Low | Relatively Low | Relatively Low |
| **Cedar** | Very Low | Relatively Low | Relatively Low |
| **Chase** | Relatively Low | Relatively Low | Very Low |
| **Cherry** | Relatively Low | Relatively Low | Relatively Low |
| **Cheyenne** | No Rating | No Expected Annual Losses | No Rating |

[192] The National Risk Index. https://hazards.fema.gov/nri/.

| County | Historical Loss | Expected Annual Loss | Overall Risk Rating |
|---|---|---|---|
| **Clay** | Very Low | Relatively Low | Very Low |
| **Colfax** | Very Low | Relatively Low | Relatively Low |
| **Cuming** | Very Low | Relatively Low | Relatively Low |
| **Custer** | Relatively Low | Relatively Low | Relatively Low |
| **Dakota** | Very Low | Relatively Low | Relatively Low |
| **Dawes** | No Rating | No Expected Annual Losses | No Rating |
| **Dawson** | Relatively Low | Relatively Low | Relatively Low |
| **Deuel** | No Rating | No Expected Annual Losses | No Rating |
| **Dixon** | Relatively Low | Relatively Low | Relatively Low |
| **Dodge** | Very Low | Relatively Moderate | Relatively Moderate |
| **Douglas** | Very Low | Relatively Moderate | Relatively Moderate |
| **Dundy** | No Rating | No Expected Annual Losses | No Rating |
| **Fillmore** | Very Low | Very Low | Very Low |
| **Franklin** | Very Low | Very Low | Very Low |
| **Frontier** | Relatively Low | Relatively Low | Relatively Low |
| **Furnas** | Relatively Low | Relatively Low | Relatively Low |
| **Gage** | Very Low | Relatively Low | Relatively Low |
| **Garden** | No Rating | No Expected Annual Losses | No Rating |
| **Garfield** | Relatively Low | Very Low | Very Low |
| **Gosper** | Relatively Low | Relatively Low | Very Low |
| **Grant** | Relatively Moderate | Very Low | Very Low |
| **Greeley** | Relatively Low | Relatively Low | Very Low |
| **Hall** | Very Low | Relatively Low | Relatively Low |
| **Hamilton** | Very Low | Very Low | Very Low |
| **Harlan** | Relatively Low | Relatively Low | Relatively Low |
| **Hayes** | Relatively Low | Very Low | Very Low |
| **Hitchcock** | Relatively Low | Very Low | Very Low |
| **Holt** | Very Low | Relatively Low | Very Low |
| **Hooker** | Relatively Low | Very Low | Very Low |
| **Howard** | Very Low | Very Low | Very Low |
| **Jefferson** | Very Low | Relatively Low | Relatively Low |
| **Johnson** | Very Low | Relatively Low | Relatively Low |
| **Kearney** | Very Low | Very Low | Very Low |

| County | Historical Loss | Expected Annual Loss | Overall Risk Rating |
|---|---|---|---|
| **Keith** | No Rating | No Expected Annual Losses | No Rating |
| **Keya Paha** | Relatively Low | Very Low | Very Low |
| **Kimball** | No Rating | No Expected Annual Losses | No Rating |
| **Knox** | Very Low | Relatively Low | Relatively Low |
| **Lancaster** | Very Low | Relatively Low | Relatively Low |
| **Lincoln** | Relatively Low | Relatively Low | Relatively Low |
| **Logan** | Relatively Low | Very Low | Very Low |
| **Loup** | Relatively Low | Very Low | Very Low |
| **Madison** | Relatively Low | Relatively Low | Relatively Low |
| **McPherson** | Very Low | Very Low | Very Low |
| **Merrick** | Very Low | Very Low | Very Low |
| **Morrill** | No Rating | No Expected Annual Losses | No Rating |
| **Nance** | Relatively Low | Relatively Low | Relatively Low |
| **Nemaha** | Very Low | Relatively Low | Relatively Low |
| **Nuckolls** | Very Low | Very Low | Very Low |
| **Otoe** | Very Low | Relatively Low | Relatively Low |
| **Pawnee** | Very Low | Relatively Low | Relatively Low |
| **Perkins** | No Rating | No Expected Annual Losses | No Rating |
| **Phelps** | Relatively Low | Relatively Low | Relatively Low |
| **Pierce** | Very Low | Relatively Low | Relatively Low |
| **Platte** | Very Low | Relatively Low | Relatively Low |
| **Polk** | Very Low | Very Low | Very Low |
| **Red Willow** | Relatively Low | Relatively Low | Relatively Low |
| **Richardson** | Very Low | Relatively Low | Relatively Low |
| **Rock** | Relatively Low | Very Low | Very Low |
| **Saline** | Very Low | Relatively Low | Relatively Low |
| **Sarpy** | Very Low | Relatively Low | Relatively Low |
| **Saunders** | Very Low | Relatively Low | Relatively Low |
| **Scotts Bluff** | No Rating | No Expected Annual Losses | No Rating |
| **Seward** | Very Low | Relatively Low | Relatively Low |
| **Sheridan** | Relatively Moderate | Very Low | Very Low |
| **Sherman** | Very Low | Very Low | Very Low |
| **Sioux** | No Rating | No Expected Annual Losses | No Rating |

| County | Historical Loss | Expected Annual Loss | Overall Risk Rating |
|---|---|---|---|
| **Stanton** | Very Low | Relatively Low | Relatively Low |
| **Thayer** | Very Low | Very Low | Very Low |
| **Thomas** | Relatively Low | Very Low | Very Low |
| **Thurston** | Relatively Low | Relatively Low | Relatively Low |
| **Valley** | Relatively Low | Relatively Low | Relatively Low |
| **Washington** | Very Low | Relatively Low | Relatively Low |
| **Wayne** | Very Low | Relatively Low | Relatively Low |
| **Webster** | Very Low | Very Low | Very Low |
| **Wheeler** | Relatively Low | Very Low | Very Low |
| **York** | Very Low | Relatively Low | Relatively Low |

**Table 44: Extreme Cold National Risk Index for the Counties of Nebraska [193]**

| County | Historical Loss | Expected Annual Loss | Overall Risk Rating |
|---|---|---|---|
| **Adams** | Very Low | Relatively Low | Relatively Low |
| **Antelope** | Very Low | Relatively Low | Relatively Low |
| **Arthur** | Relatively Low | Relatively Low | Relatively Low |
| **Banner** | Relatively Low | Relatively High | Relatively Moderate |
| **Blaine** | Very Low | Very Low | Very Low |
| **Boone** | Very Low | Relatively Low | Relatively Low |
| **Box Butte** | Relatively Low | Relatively High | Relatively High |
| **Boyd** | Very Low | Relatively Low | Relatively Low |
| **Brown** | Very Low | Relatively Low | Relatively Low |
| **Buffalo** | Very Low | Relatively Low | Relatively Low |
| **Burt** | Very Low | Relatively Low | Relatively Low |
| **Butler** | Very Low | Very Low | Very Low |
| **Cass** | Very Low | Relatively Low | Relatively Low |
| **Cedar** | Very Low | Relatively Low | Relatively Low |
| **Chase** | Relatively Low | Relatively High | Relatively High |
| **Cherry** | Very Low | Relatively Moderate | Relatively Moderate |
| **Cheyenne** | Relatively Low | Relatively High | Relatively High |

[193] The National Risk Index. https://hazards.fema.gov/nri/.

| County | Historical Loss | Expected Annual Loss | Overall Risk Rating |
|---|---|---|---|
| **Clay** | Very Low | Very Low | Very Low |
| **Colfax** | Very Low | Relatively Low | Relatively Low |
| **Cuming** | Very Low | Relatively Low | Relatively Low |
| **Custer** | Very Low | Relatively Low | Relatively Low |
| **Dakota** | Very Low | Relatively Moderate | Relatively Moderate |
| **Dawes** | Very Low | Relatively High | Relatively High |
| **Dawson** | Very Low | Relatively Moderate | Relatively Moderate |
| **Deuel** | Relatively Low | Relatively Moderate | Relatively Moderate |
| **Dixon** | Very Low | Relatively Low | Relatively Low |
| **Dodge** | Very Low | Relatively Moderate | Relatively Moderate |
| **Douglas** | Very Low | Relatively Moderate | Relatively Moderate |
| **Dundy** | Relatively Low | Relatively High | Relatively High |
| **Fillmore** | Very Low | Very Low | Very Low |
| **Franklin** | Very Low | Relatively Low | Relatively Low |
| **Frontier** | Very Low | Relatively Low | Relatively Low |
| **Furnas** | Very Low | Relatively Low | Relatively Low |
| **Gage** | Very Low | Relatively Low | Relatively Low |
| **Garden** | Relatively Low | Relatively Moderate | Relatively Moderate |
| **Garfield** | Very Low | Relatively Low | Relatively Low |
| **Gosper** | Very Low | Relatively Low | Relatively Low |
| **Grant** | Relatively Low | Relatively Low | Relatively Low |
| **Greeley** | Very Low | Relatively Low | Relatively Low |
| **Hall** | Very Low | Relatively Low | Relatively Low |
| **Hamilton** | Very Low | Relatively Low | Very Low |
| **Harlan** | Very Low | Relatively Low | Relatively Low |
| **Hayes** | Relatively Low | Relatively Low | Relatively Low |
| **Hitchcock** | Very Low | Relatively Low | Relatively Low |
| **Holt** | Very Low | Relatively Low | Relatively Low |
| **Hooker** | Very Low | Relatively Low | Relatively Low |
| **Howard** | Very Low | Very Low | Very Low |
| **Jefferson** | Very Low | Relatively Low | Relatively Low |
| **Johnson** | Very Low | Very Low | Very Low |
| **Kearney** | Very Low | Very Low | Very Low |

| County | Historical Loss | Expected Annual Loss | Overall Risk Rating |
|---|---|---|---|
| **Keith** | Very Low | Relatively Low | Relatively Low |
| **Keya Paha** | Very Low | Relatively Low | Relatively Low |
| **Kimball** | Relatively Low | Relatively Moderate | Relatively Moderate |
| **Knox** | Very Low | Relatively Low | Relatively Low |
| **Lancaster** | Very Low | Relatively Low | Relatively Low |
| **Lincoln** | Very Low | Relatively Moderate | Relatively Moderate |
| **Logan** | Very Low | Relatively Low | Relatively Low |
| **Loup** | Very Low | Relatively Low | Very Low |
| **Madison** | Very Low | Relatively Moderate | Relatively Moderate |
| **McPherson** | Very Low | Very Low | Very Low |
| **Merrick** | Very Low | Very Low | Very Low |
| **Morrill** | Relatively Low | Very High | Very High |
| **Nance** | Very Low | Relatively Low | Relatively Low |
| **Nemaha** | Relatively Low | Relatively Moderate | Relatively Moderate |
| **Nuckolls** | Very Low | Very Low | Very Low |
| **Otoe** | Very Low | Relatively Low | Relatively Low |
| **Pawnee** | Very Low | Very Low | Very Low |
| **Perkins** | Very Low | Relatively Low | Relatively Low |
| **Phelps** | Very Low | Relatively Low | Relatively Low |
| **Pierce** | Very Low | Relatively Low | Relatively Low |
| **Platte** | Very Low | Relatively Moderate | Relatively Moderate |
| **Polk** | Very Low | Very Low | Very Low |
| **Red Willow** | Very Low | Relatively Moderate | Relatively Moderate |
| **Richardson** | Relatively Low | Relatively Moderate | Relatively Moderate |
| **Rock** | Very Low | Relatively Low | Relatively Low |
| **Saline** | Very Low | Relatively Low | Relatively Low |
| **Sarpy** | Very Low | Relatively High | Relatively High |
| **Saunders** | Very Low | Very Low | Very Low |
| **Scotts Bluff** | Relatively Low | Very High | Very High |
| **Seward** | Very Low | Relatively Low | Relatively Low |
| **Sheridan** | Relatively Low | Relatively High | Relatively High |
| **Sherman** | Very Low | Very Low | Very Low |
| **Sioux** | Relatively Low | Relatively High | Relatively High |

| County | Historical Loss | Expected Annual Loss | Overall Risk Rating |
|---|---|---|---|
| **Stanton** | Very Low | Relatively Low | Relatively Low |
| **Thayer** | Very Low | Relatively Low | Relatively Low |
| **Thomas** | Very Low | Relatively Low | Very Low |
| **Thurston** | Very Low | Relatively Low | Relatively Low |
| **Valley** | Very Low | Relatively Low | Relatively Low |
| **Washington** | Very Low | Relatively Low | Relatively Low |
| **Wayne** | Very Low | Relatively Low | Relatively Low |
| **Webster** | Very Low | Relatively Low | Relatively Low |
| **Wheeler** | Very Low | Relatively Low | Relatively Low |
| **York** | Very Low | Relatively Low | Relatively Low |

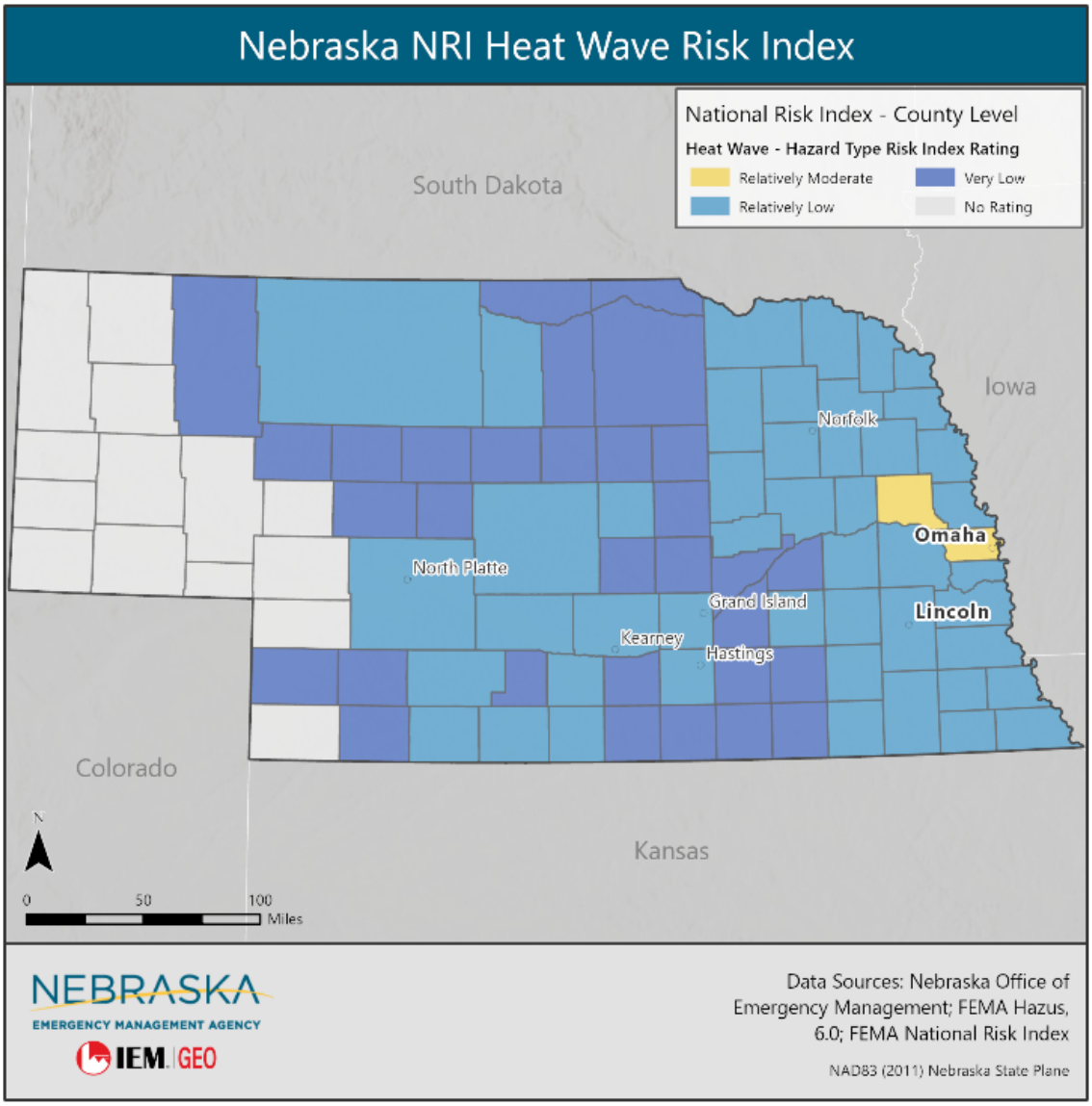



**Figure 57: National Risk Index for Heat Wave**

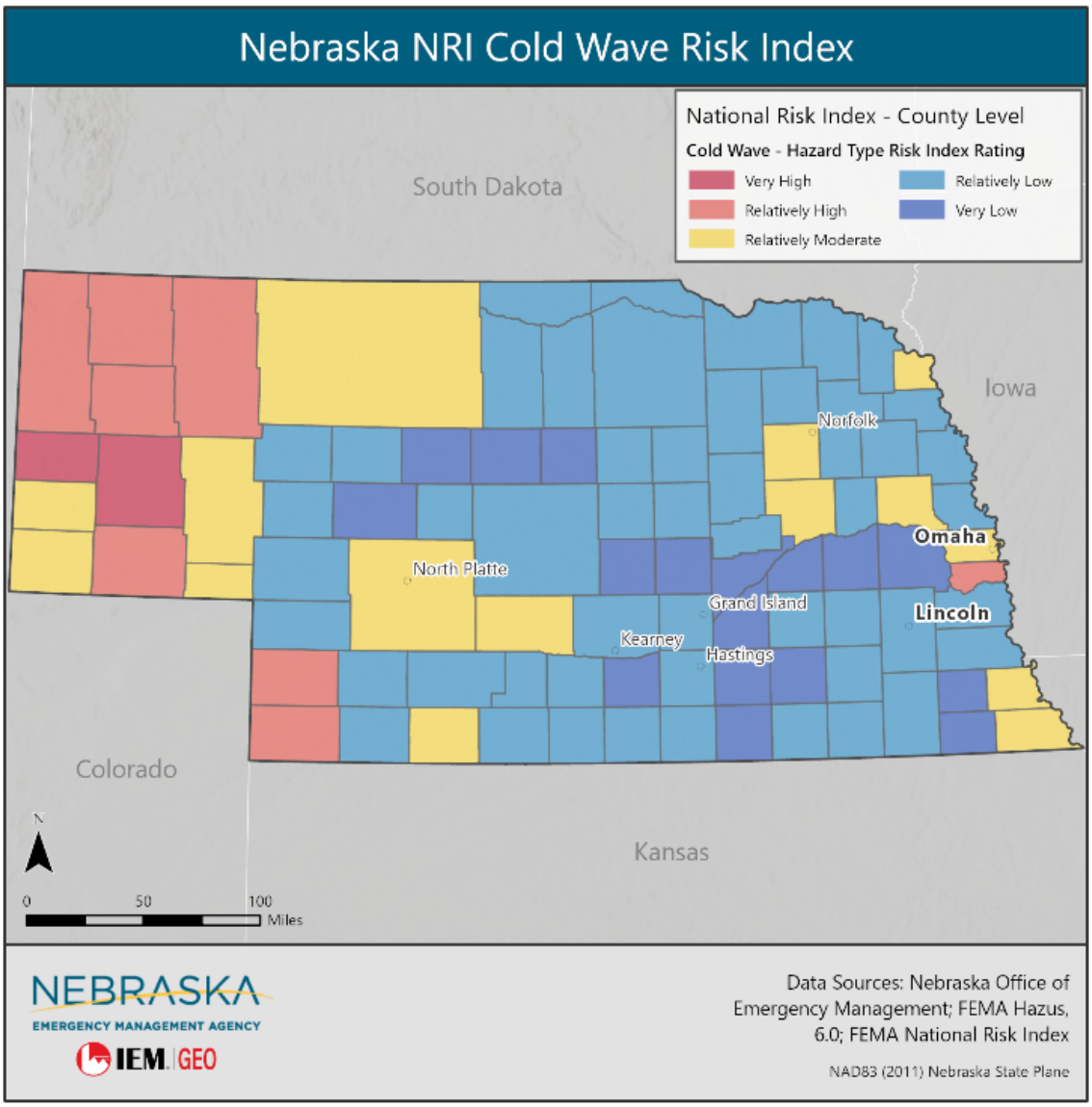



**Figure 58: National Risk Index for Cold Wave**

### 3.13.3.2 ESTIMATED IMPACT AND POTENTIAL LOSSES

Extreme temperatures pose significant risks to Nebraska and affect various aspects of the state's communities. Prolonged heat waves and severe cold spells can lead to health emergencies, economic strain, and infrastructure challenges, reducing the overall quality of life for residents. The agricultural sector, a cornerstone of Nebraska's economy, is particularly vulnerable, because extreme heat can stress crops and livestock, while harsh winter conditions can damage soil and disrupt farming operations. Extended periods of excessive heat increase energy demands, strain power grids, and raise costs for residents and businesses. Additionally, extreme cold events can freeze water lines, hinder transportation, and make roads hazardous, leading to economic losses and costly repairs. The tourism industry may also be affected, as weather extremes deter visitors from parks, historical sites, and outdoor attractions.

Hospitals, emergency services, and public utilities may face significant operational challenges due to increased demand for medical assistance and heating or cooling resources during extreme weather events.

Beyond the direct economic and structural impacts, extreme temperatures can also disrupt Nebraska's environment, alter ecosystems, stress wildlife populations, and increase the risk of wildfires and ice storms. Community traditions and cultural events, such as fairs, festivals, and outdoor gatherings, may be forced to cancel or relocate due to unsafe weather conditions. Additionally, disaster response and recovery efforts may redirect funding and resources away from long-term community development initiatives, delaying infrastructure improvements and economic growth. Without strong adaptation measures and emergency preparedness plans, extreme temperature fluctuations could significantly challenge Nebraska's resilience and affect public health, economic stability, and overall community well-being.

#### 3.13.3.3 ACCESS AND FUNCTIONAL NEEDS

Extreme temperatures in Nebraska can have severe consequences for individuals with access and functional needs, intensifying the challenges they face both during and after extreme heat or cold events. Elderly individuals; children; those with physical, sensory, intellectual, or mental health disabilities; and individuals with chronic medical conditions are particularly vulnerable to temperature extremes, due to their increased dependence on medical equipment, mobility aids, or specialized care. During extreme heat, power outages can disrupt air conditioning, refrigeration for medications, and life-sustaining devices such as oxygen concentrators and ventilators, significantly increasing health risks. Cold temperatures pose additional dangers, because frozen infrastructure and energy shortages can limit access to heating sources and make it difficult for at-risk individuals to maintain body temperature. Additionally, sensory or cognitive impairments may hinder an individual's ability to recognize the dangers of extreme temperatures or respond effectively to emergency warnings, further increasing their risk of heat-related illnesses or hypothermia.

Following an extreme temperature event, recovery can be particularly difficult for individuals with disabilities or health conditions, as damaged housing, inaccessible shelters, or the loss of medical supplies and assistive devices can hinder their ability to function independently. Essential support services, such as home healthcare, transportation, and personal care aides, may be disrupted or overwhelmed, leaving individuals without necessary assistance. The mental health impacts of extreme temperature events can also be profound, particularly for those with preexisting conditions, as the stress of displacement, service disruptions, and prolonged exposure to extreme temperatures can exacerbate anxiety, depression, or cognitive distress. To ensure an equitable response, it is imperative that emergency preparedness, response, and recovery efforts be designed to accommodate the specific needs of vulnerable populations and provide accessible cooling and warming centers, uninterrupted access to critical medical supplies, and targeted communication strategies that effectively reach all at-risk individuals.

### 3.13.3.4 COMMUNITY LIFELINES

Extreme temperatures in Nebraska can significantly disrupt community lifelines, which are essential services that support public safety, economic stability, and overall community resilience. Severe heat waves and extreme cold events place immense strain on the energy lifeline, leading to increased demand for electricity as communities rely on heating or cooling systems. This heightened demand can result in power outages, leaving residents, businesses, and critical infrastructure without essential energy sources. Water systems may also be affected, as extreme heat exacerbates evaporation and drought conditions, reducing water availability, while extreme cold can freeze water lines and damage treatment facilities, disrupting potable water supplies. Additionally, transportation networks may become hazardous due to icy roads, overheating vehicles, or railway malfunctions, limiting access to emergency services and delaying supply chains.

Beyond infrastructure, extreme temperatures pose severe public health risks, particularly for vulnerable populations, impacting the health and medical lifeline. Heat waves can lead to heat exhaustion and heat stroke, especially among the elderly and those with preexisting conditions, while extreme cold increases the risk of hypothermia and frostbite. Hospitals and emergency medical services may become overwhelmed as they respond to temperature-related illnesses, particularly if power failures or road closures limit accessibility. Emergency response operations may be further challenged by communication failures due to damaged infrastructure, reducing the ability to coordinate aid and issue timely warnings. The economic and safety impacts of extreme temperatures highlight the need for resilient infrastructure, adaptive emergency planning, and proactive mitigation efforts to sustain FEMA's Community Lifelines in the face of increasing climate variability.

### 3.13.3.5 ENHANCED PRIORITY RISK INDEX SCORE

The EPRI provides Nebraska with a methodology to measure the impact each profiled hazard may have on the seven EMAP Standard 4.1.2 sectors (i.e., public; responders; continuity of operations, including continued delivery of services; property, facilities, and infrastructure; the environment; the economic condition of the jurisdiction; and public confidence in the jurisdiction's governance). Table 45 provides the EPRI scores for the hazard with the appropriate risk factor.

**Table 45: Extreme Temperatures Enhanced Priority Risk Index Score**

| | Probability Next 5 Years | Impact | Spatial Extent | Warning Time | Duration | Vulnerability | Probability | Risk Factor |
|---|---|---|---|---|---|---|---|---|
| **Risk Level** | 3.4 | 2.6 | 3.6 | 1 | 3.4 | 2.6 | 3.6 | 2.9 |

Table 46 provides a summary of extreme temperature impacts, including impact to the public, first responders, continuity of operations, property, infrastructure, environment, economic conditions and public confidence, and the consequences of those impacts.

Table 46: Extreme Temperature Impacts and Consequences

| Sector | Impacts |
|---|---|
| **Public** | **Housing:** Residences exposed to prolonged extreme heat or cold may experience increased structural strain, particularly in older or inadequately insulated buildings. Heat waves can intensify the urban heat island effect, making indoor conditions dangerous, while extreme cold can lead to frozen pipes, roof damage, and heating system failures.<br>**Casualties/Fatalities:** While Nebraska has historically maintained low casualty rates from temperature extremes, risks remain high for elderly individuals, young children, and those with preexisting health conditions. Heat stroke, dehydration, hypothermia, and frostbite are serious concerns, especially for those without adequate heating or cooling options. Timely public warnings and emergency shelters play a critical role in reducing impact on health.<br>**Work:** Disruptions to workplaces depend on the severity of temperature extremes. Outdoor laborers, including agricultural workers and construction crews, face significant risks from heat exhaustion and frostbite. Prolonged extreme cold or heat can also strain energy grids, leading to power outages that disrupt business operations.<br>**Food/Water:** Extreme temperatures can damage crops and impact livestock health, leading to food supply challenges. Heat waves may accelerate food spoilage, while extreme cold can disrupt water infrastructure, increasing contamination risks and reducing availability of potable water. |
| **First Responders** | Nebraska emergency responders are trained to address temperature-related emergencies, but extreme conditions can strain resources. In rural areas, volunteer responders may be personally affected, reducing available personnel. Extended heat waves and deep freezes can overwhelm healthcare systems, requiring additional support from state and federal agencies. |
| **Continuity of Operations** | The extent of disruption depends on damage to essential government facilities. Extreme temperatures can compromise heating and cooling systems, disable power grids, and increase emergency service demands, affecting government response capabilities. Continuity of Operations (COOP) plans must account for prolonged power outages and increased utility strain. |
| **Property, Facilities, and Infrastructure** | **Building and Facilities:** Structures without adequate insulation, cooling, or heating systems may experience damage due to frozen pipes, excessive heat exposure, or fire hazards from overloaded electrical systems.<br>**Electricity:** Heat waves increase energy consumption, placing pressure on power grids and heightening the risk of blackouts or brownouts. Extreme cold can freeze power lines and disrupt energy distribution, leading to prolonged outages.<br>**Water:** Heat-related droughts reduce water availability, while freezing temperatures can damage pipes and treatment plants, leading to service disruptions and contamination risks.<br>**Roads and Bridges:** Extreme heat can cause pavement buckling, affecting road safety, while cold temperatures lead to ice accumulation and frost heaving, increasing maintenance costs and travel risks. |
| **Environment** | Extreme heat can dry out vegetation, increasing wildfire risk, while prolonged cold can impact local ecosystems and disrupt wildlife migration patterns. Drought conditions can deplete water sources, affecting rivers, lakes, and groundwater supplies essential for agriculture and wildlife sustainability. |

| Sector | Impacts |
|---|---|
| **Economic Conditions** | The economic impact of extreme temperatures can be severe, particularly for agriculture, which is a cornerstone of Nebraska's economy. Crop failures, livestock losses, and increased energy costs place financial strain on farmers, businesses, and residents. If major urban centers experience prolonged heat waves or cold spells, economic disruptions can extend statewide. |
| **Public Confidence** | The effectiveness of government response in providing cooling/warming shelters, energy reliability, and infrastructure resilience will influence public confidence in emergency preparedness efforts. Delays in restoring essential services, addressing power outages, or mitigating agricultural losses could erode trust in local and state leadership, emphasizing the need for proactive emergency planning. |

# 3.14 Flood and Flash Flood

## 3.14.1 Description

A flood is a general and temporary overflow of water onto normally dry land. Flooding typically results when a stream channel overflows due to excess runoff that exceeds channel capacity. These normally dry land areas adjacent to stream channels that have potential for flooding are floodplains. Every creek and river has a floodplain, which is the area inundated by water during a flooding event. The characteristics of the flooding, such as rate of rise, overall magnitude (peak flow), duration, and frequency, are a result of the climate and geographic characteristics of the area. Floods are typically measured in terms of magnitude and the probability that they will occur. FEMA floodplain maps and floodplain management regulations are currently based on the 1% annual chance flood, which is the flood that has a 1% chance of being equaled or exceeded in any year.

Nebraska has a diverse environment and a broad range of topography, geology, and weather variations from east to west. Nebraska experiences, on average, 34 inches of rain annually in the east and 16 inches of rain annually in the west. Due to the range of conditions, there are also different types of flooding along Nebraska's rivers. The type of flooding that takes place on a river is typically a function of watershed characteristics such as soils, slope, and level of development.

Types of floods and overall flooding characteristics vary depending on the type and the source of the runoff. Flooding characteristics are also impacted by the presence of dams or levees. Riverine floods, flash floods, ice jams, dam failure, and levee failure are all possible types of flooding in Nebraska.

**Riverine flooding** happens as a result of heavy precipitation or snowmelt runoff occurring over a watershed for a period of several days to even weeks. This type of flooding most commonly impacts medium to large channels, including but not limited to the Big Blue River, Elkhorn River, Loup River, Platte River, and Missouri River. The National Weather Service (NWS), U.S. Geological Service (USGS), and Nebraska Department of Natural Resources (NeDNR) work together to track stream gage heights to estimate future crests and stage heights. This allows for the timely dissemination of advance flood warnings.

Geology also has a unique impact on the nature of riverine flooding for some rivers in Nebraska. Sandhills rivers, located in certain areas of the central and western part of the state, are primarily fed through groundwater, and flooding, in general, is rare. In addition, the sandhills act as a reservoir by quickly absorbing rainfall and adding to groundwater supplies, which then release water to sandhills rivers and streams in controlled amounts.

**Flash flooding** develops quickly when intense rainfall falls over a brief time span—typically under six hours. These sudden floods may emerge within minutes or hours of the downpour. In addition to heavy rain, flash flooding can also result from the unexpected collapse of a dam or levee, or the rapid release of water trapped by debris or ice blockages.

Flash floods develop very quickly following an extreme precipitation event, such as heavy thunderstorms, rapid springtime snowmelt, or breaks in dams, levees, or ice jams. This type of flooding is commonly associated with smaller channels and watersheds that have steeper slopes. Urban areas are also more prone to flash flooding due to impervious surfaces that do not allow water to infiltrate the ground. Typically, flash flooding cannot be accurately tracked and anticipated with estimates of crests and stage heights. This limitation hinders the potential for the dissemination of advanced flood warnings. The National Weather Service (NWS) provides flash flood watches, advisories, and warnings as this specific information is gathered and modeled prior to and during an event.

**Ice jam flooding** occurs throughout the state, with the most significant events being on the Loup and Platte Rivers. Ice jam events occur during the shifting temperature periods between winter and spring, but can occur throughout the winter season, as the result of fluctuating above- and below-freezing air temperatures. It is during the below-freezing days that river ice sheets develop, and during the above-freezing days that ice starts to thaw, causing it to break up and begin flowing downstream. Ice jams are caused by the broken-up ice sheets getting caught on an obstacle, like a shallow river bend or bridge, where these floating ice sheets begin to pile up or stack upon each other, eventually creating an increase in water surface elevation upstream. Depending on the size of the blockage, the amount of additional floating ice sheets, and the amount of water flowing down the river, this can become a serious flooding issue for miles upstream. Additionally, depending on the amount of water being held back, a sudden breakup of the ice jam can create a serious flash flood issue downstream. Periods of rapid snowmelt and/or heavy rainfall can increase the severity of flooding if they accompany the formation of an ice jam.

Dam/levee failure flooding is covered in a separate hazard profile.

## 3.14.2 Risk Assessment

### 3.14.2.1 LOCATION

Nebraska has a number of major watersheds and rivers, including over 5,000 wetlands, 2,000 natural lakes, and over 1,000 reservoirs and sandpit lakes. Like most states, many flood problems in Nebraska have their roots in the initial development of communities along watercourses within the state. With its location on the Missouri River, Nebraska played a major role in the westward expansion of the nation. During this time, water was vital for transportation, running mills, and creating power; thus, development took place in close proximity to these water sources. As a result, historical infrastructure and new development near rivers are subject to flood risk. Flooding in Nebraska has the potential to affect both urban areas and rural agricultural areas.

### 3.14.2.2 EXTENT

A common measure of the extent of flooding is the 1% annual chance floodplain. This is the boundary that has a 1% chance of being equaled or exceeded in any given year, also sometimes referred to as the 100-year floodplain or base flood. This boundary is used by the National Flood Insurance Program (NFIP) as the standard for floodplain management and to determine the need for flood insurance. A structure located within this area has a 26% chance of experiencing flood damage during the term of a 30-year

mortgage. A 0.2% annual chance floodplain is one that has a 0.2% chance of being equaled or exceeded in any given year, also sometimes referred to as the 500-year floodplain. FEMA Flood Insurance Rate Maps (FIRMs) show the 1% annual chance and 0.2% annual chance flood zones but are not available at a statewide level in Nebraska. These areas are supplemented with DWEE Flood Awareness Areas.

From 2000 to 2023, the availability of the National Flood Hazard Layer (NFHL) in Nebraska has not experienced significant statewide expansion (see Figure 59). While select areas, particularly those with higher population densities or recent development, have seen more comprehensive analysis and updated mapping, a substantial portion of the state remains without detailed flood hazard data. This persistent gap, especially in rural and less populated regions, continues to limit the ability of local jurisdictions to fully understand their flood risks and develop targeted mitigation strategies. Enhancing the coverage and accuracy of the NFHL remains a critical priority for improving statewide resilience. DWEE estimates that around 4% of all homes in Nebraska are located within a 1% annual chance flood hazard area.

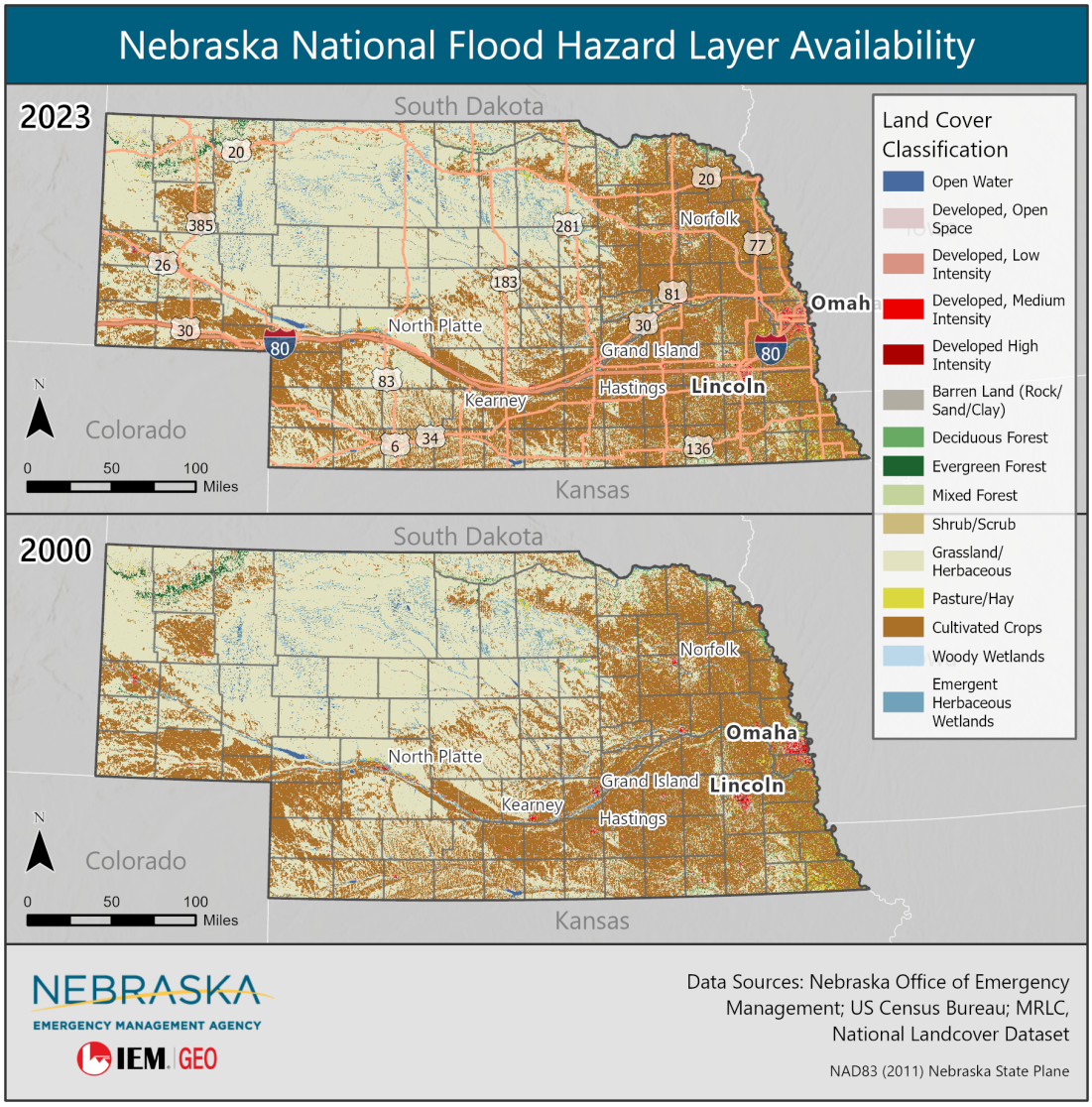



**Figure 59: 2000 and 2023 NFHL Comparison**

The availability of the National Flood Hazard Layer (NFHL) varies significantly across Nebraska. While some areas, particularly in the eastern and southern parts of the state, have detailed and updated flood mapping, large portions—especially in the north-central region—remain unmapped or lack current flood hazard data (See Figure 60). This gap in coverage presents a challenge for local jurisdictions attempting to assess flood risk and develop effective mitigation strategies. Improving the availability and accuracy of flood hazard data in these areas is critical. It empowers local governments with the necessary information to understand risk, prioritize projects, and implement targeted mitigation actions to better protect life, property, and infrastructure.

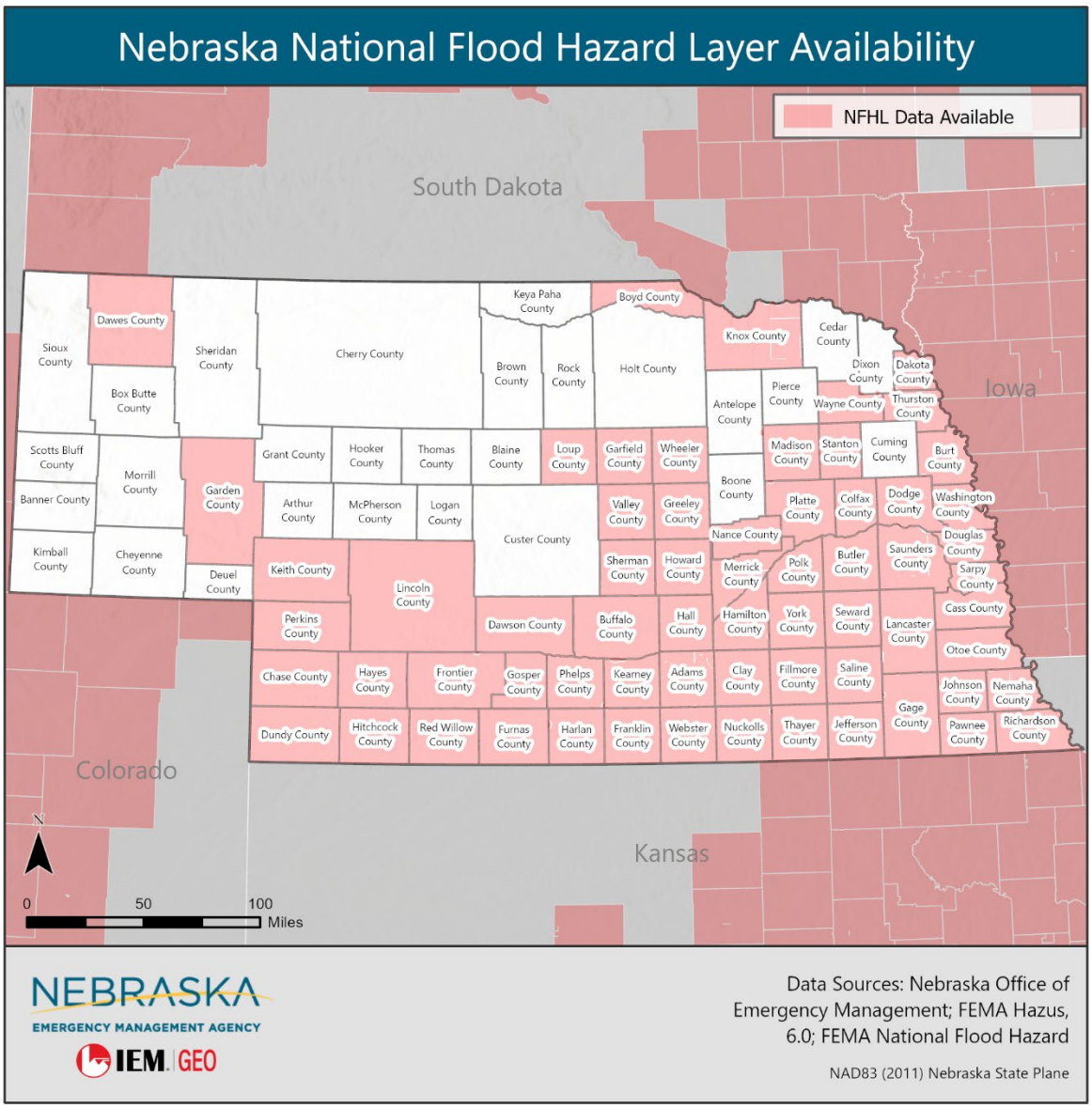



**Figure 60: Nebraska National Flood Hazard Layer Availability**

Accurate and comprehensive flood hazard data is foundational to effective hazard mitigation planning. When communities have access to detailed flood maps and NFHL data, they are better equipped to make informed decisions regarding land use, emergency preparedness, and infrastructure investments. In Nebraska, where a significant portion of the state remains without up-to-date flood information, especially in rural regions, prioritizing data collection and map modernization efforts is essential. These efforts support proactive mitigation, reduce vulnerability, and align with state and federal goals to enhance resilience in flood-prone areas.

#### 3.14.2.3 PREVIOUS EVENTS

This section provides a historical summary of major flooding events in Nebraska. It should be noted that this summary does not include all locations subject to potential flooding or all flood events. It is intended to show that the risk of flooding is present statewide and has occurred previously in a wide variety of watersheds and stream types.

The National Oceanic and Atmospheric Administration (NOAA), National Centers for Environmental Information (NCEI) database provides a summary of impacts from all flood events between 2019 and October 2024, summarized by county in Table 47.

Table 47: Flood Occurrences for the Counties of Nebraska, 2019–2024[194]

| County | Total Number of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Probability | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Adams** | 24 | $12,780,000 | $15,100,000 | 0 | 0 | 83% | 1 event every 1 to 2 years |
| **Antelope** | 26 | $4,300,000 | $195,000 | 0 | 0 | 90% | 1 event every 1 to 2 years |
| **Arthur** | 2 | $50,000 | $0 | 0 | 0 | 7% | 1 event every 14 to 15 years |
| **Banner** | 10 | $265,000 | $375,000 | 0 | 0 | 34% | 1 event every 2 to 3 years |
| **Blaine** | 2 | $130,000 | $10,000 | 0 | 0 | 7% | 1 event every 14 to 15 years |
| **Boone** | 29 | $367,000 | $0 | 0 | 0 | 100% | 1 event every year |
| **Box Butte** | 6 | $0 | $0 | 0 | 0 | 21% | 1 event every 4 to 5 years |
| **Boyd** | 16 | $21,876,000 | $50,000 | 0 | 1 | 55% | 1 event every 1 to 2 years |
| **Brown** | 12 | $760,000 | $10,000 | 0 | 0 | 41% | 1 event every 2 to 3 years |
| **Buffalo** | 29 | $39,535,000 | $14,510,000 | 0 | 0 | 100% | 1 event every 29 years |
| **Burt** | 20 | $705,000 | $17,000 | 0 | 0 | 69% | 1 event every 1 to 2 years |
| **Butler** | 31 | $250,000 | $223,000 | 0 | 0 | 100% | 1 to 2 events every year |
| **Cass** | 75 | $17,057,000 | $105,000 | 0 | 0 | 100% | 2 to 3 events every year |
| **Cedar** | 23 | $1,441,000 | $55,000 | 0 | 0 | 79% | 1 event every 1 to 2 years |
| **Chase** | 12 | $800,000 | $115,000 | 0 | 0 | 41% | 1 event every 2 to 3 years |
| **Cherry** | 16 | $214,000 | $30,000 | 0 | 0 | 55% | 1 event every 1 to 2 years |
| **Cheyenne** | 52 | $2,148,000 | $530,000 | 0 | 0 | 100% | 1 to 2 events every year |
| **Clay** | 13 | $978,000 | $6,630,000 | 0 | 0 | 45% | 1 event every 2 to 3 years |

[194] National Oceanic and Atmospheric Administration, National Centers for Environmental Information, "Storm Events Database." https://www.ncdc.noaa.gov/stormevents/

| County | Total Number of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Probability | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Colfax** | 27 | $3,300,000 | $630,000 | 0 | 0 | 93% | 1 event every 1 to 2 years |
| **Cuming** | 38 | $1,243,000 | $505,000 | 0 | 0 | 100% | 1 to 2 events every year |
| **Custer** | 59 | $4,759,000 | $77,000 | 1 | 0 | 100% | 2 to 3 events every year |
| **Dakota** | 34 | $3,690,000 | $350,000 | 0 | 0 | 100% | 1 to 2 events every year |
| **Dawes** | 8 | $1,000 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Dawson** | 21 | $5,883,000 | $13,850,000 | 1 | 1 | 72% | 1 event every 1 to 2 years |
| **Deuel** | 8 | $27,000 | $0 | 1 | 0 | 28% | 1 event every 3 to 4 years |
| **Dixon** | 34 | $5,040,000 | $230,000 | 0 | 0 | 100% | 1 to 2 events every year |
| **Dodge** | 83 | $3,525,000 | $8,870,000 | 0 | 0 | 100% | 2 to 3 events every year |
| **Douglas** | 92 | $24,394,000 | $35,000 | 0 | 2 | 100% | 3 to 4 events every year |
| **Dundy** | 18 | $341,000 | $60,010 | 0 | 0 | 62% | 1 event every 1 to 2 years |
| **Fillmore** | 13 | $3,470,000 | $11,780,000 | 0 | 0 | 45% | 1 event every 2 to 3 years |
| **Franklin** | 9 | $935,000 | $4,450,000 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Frontier** | 25 | $755,000 | $71,000 | 0 | 0 | 86% | 1 event every 1 to 2 years |
| **Furnas** | 13 | $443,000 | $75,000 | 0 | 0 | 45% | 1 event every 2 to 3 years |
| **Gage** | 43 | $1,958,000 | $350,000 | 0 | 0 | 100% | 1 to 2 events every year |
| **Garden** | 9 | $272,000 | $1,000 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Garfield** | 8 | $230,000 | $10,000 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Gosper** | 8 | $1,203,000 | $875,000 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Grant** | 2 | $35,000 | $5,000 | 0 | 0 | 7% | 1 event every 14 to 15 years |
| **Greeley** | 8 | $2,670,000 | $3,630,000 | 0 | 0 | 28% | 1 event every 3 to 4 years |

| County | Total Number of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Probability | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Hall** | 31 | $12,066,000 | $14,215,000 | 0 | 0 | 100% | 1 to 2 events every year |
| **Hamilton** | 17 | $2,600,000 | $6,170,000 | 0 | 0 | 59% | 1 event every 1 to 2 years |
| **Harlan** | 10 | $380,000 | $4,510,000 | 0 | 0 | 34% | 1 event evert 2 to 3 years |
| **Hayes** | 28 | $3,193,000 | $86,000 | 0 | 0 | 97% | 1 event every 1 to 2 years |
| **Hitchcock** | 19 | $1,462,000 | $101,100 | 0 | 0 | 66% | 1 event every 1 to 2 years |
| **Holt** | 23 | $1,672,000 | $83,000 | 0 | 0 | 79% | 1 event every 1 to 2 years |
| **Hooker** | 1 | $500,000 | $0 | 0 | 0 | 3% | 1 event every 29 years |
| **Howard** | 22 | $10,795,000 | $17,050,000 | 0 | 0 | 76% | 1 event every 1 to 2 years |
| **Jefferson** | 42 | $6,062,000 | $345,000 | 0 | 1 | 100% | 1 to 2 events every year |
| **Johnson** | 11 | $1,520,000 | $1,605,000 | 0 | 0 | 38% | 1 event every 2 to 3 years |
| **Kearney** | 11 | $3,425,000 | $4,600,000 | 0 | 0 | 38% | 1 event every 2 to 3 years |
| **Keith** | 16 | $1,288,000 | $40,000 | 0 | 1 | 55% | 1 event every 1 to 2 years |
| **Keya Paha** | 8 | $1,1000,000 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Kimball** | 33 | $1,049,000 | $520,000 | 0 | 0 | 100% | 1 to 2 events every year |
| **Knox** | 41 | $1,644,000 | $20,000 | 0 | 0 | 100% | 1 to 2 events every year |
| **Lancaster** | 60 | $105,259,000 | $286,000 | 0 | 0 | 100% | 2 to 3 events every year |
| **Lincoln** | 56 | $2,648,000 | $111,000 | 2 | 0 | 100% | 1 to 2 events every year |
| **Logan** | 7 | $300,000 | $10,000 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Loup** | 3 | $500,000 | $50,000 | 0 | 0 | 10% | 1 event every 9 to 10 years |
| **Madison** | 34 | $2,878,000 | $50,000 | 0 | 2 | 100% | 1 to 2 events every year |
| **McPherson** | 1 | $75,000 | $15,000 | 0 | 0 | 3% | 1 event every 29 years |

| County | Total Number of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Probability | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Merrick** | 18 | $5,795,000 | $5,530,000 | 0 | 0 | 62% | 1 event every 1 to 2 years |
| **Morrill** | 23 | $534,000 | $250,000 | 0 | 0 | 79% | 1 event every 1 to 2 years |
| **Nance** | 11 | $25,680,000 | $6,970,000 | 0 | 0 | 38% | 1 event every 2 to 3 years |
| **Nemaha** | 69 | $1,208,000 | $2,175,000 | 0 | 0 | 100% | 2 to 3 events every year |
| **Nuckolls** | 9 | $955,000 | $4,750,000 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Otoe** | 65 | $1,214,000 | $6,030,000 | 1 | 0 | 100% | 2 to 3 events every year |
| **Pawnee** | 12 | $101,000 | $0 | 0 | 0 | 41% | 1 event every 2 to 3 years |
| **Perkins** | 11 | $1,285,000 | $1,105,000 | 0 | 0 | 38% | 1 event every 2 to 3 years |
| **Phelps** | 13 | $1,408,000 | $3,450,000 | 0 | 0 | 45% | 1 event every 2 to 3 years |
| **Pierce** | 20 | $616,000 | $255,000 | 0 | 0 | 69% | 1 event every 1 to 2 years |
| **Platte** | 55 | $1,113,000 | $2,270,000 | 0 | 2 | 100% | 1 to 2 events every year |
| **Polk** | 19 | $865,000 | $6,560,000 | 0 | 0 | 66% | 1 event every 1 to 2 years |
| **Red Willow** | 16 | $228,500 | $1,000 | 0 | 0 | 55% | 1 event every 1 to 2 years |
| **Richardson** | 70 | $2,193,000 | $180,000 | 0 | 0 | 100% | 2 to 3 events every year |
| **Rock** | 7 | $745,000 | $120,000 | 0 | 0 | 24% | 1 event every 4 to 5 years |
| **Saline** | 76 | $106,312,000 | $760,000 | 0 | 0 | 100% | 2 to 3 events every year |
| **Sarpy** | 47 | $433,273,000 | $0 | 0 | 1 | 100% | 1 to 2 events every year |
| **Saunders** | 80 | $57,075,000 | $415,000 | 0 | 0 | 100% | 2 to 3 events every year |
| **Scotts Bluff** | 34 | $631,000 | $100,000 | 0 | 0 | 100% | 1 to 2 events every year |
| **Seward** | 28 | $467,000 | $120,000 | 0 | 0 | 97% | 1 event every 1 to 2 years |
| **Sheridan** | 10 | $571,000 | $0 | 0 | 0 | 34% | 1 event every 2 to 3 years |

| County | Total Number of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Probability | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Sherman** | 14 | $4,470,000 | $8,020,000 | 0 | 0 | 48% | 1 event every 2 to 3 years |
| **Sioux** | 6 | $0 | $0 | 0 | 0 | 21% | 1 event every 4 to 5 years |
| **Stanton** | 27 | $1,525,000 | $115,000 | 0 | 0 | 93% | 1 event every 1 to 2 years |
| **Thayer** | 21 | $5,461,000 | $19,285,000 | 0 | 0 | 72% | 1 event every 1 to 2 years |
| **Thomas** | 4 | $76,000 | $5,000 | 0 | 0 | 14% | 1 event every 7 to 8 years |
| **Thurston** | 23 | $499,000 | $0 | 0 | 0 | 79% | 1 event every 1 to 2 years |
| **Valley** | 9 | $5,240,000 | $2,100,000 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Washington** | 30 | $5,920,000 | $115,000 | 0 | 0 | 100% | 1 to 2 events every year |
| **Wayne** | 15 | $3,395,000 | $105,000 | 0 | 0 | 52% | 1 event every 1 to 2 years |
| **Webster** | 12 | $640,000 | $3,575,000 | 0 | 0 | 41% | 1 event every 2 to 3 years |
| **Wheeler** | 5 | 1,378,000 | $1,030,000 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **York** | 19 | $3,435,000 | $9,950,000 | 0 | 0 | 66% | 1 event every 1 to 2 years |

The dataset outlines county-level data regarding the frequency and impact of events from 1996 to 2024, encompassing total property damage, crop damage, injuries, fatalities, probabilities, and return frequencies. Counties such as Douglas, Dodge, and Saunders exhibit the highest event counts, while Sarpy records the most substantial property damage ($433,273,000). Conversely, Adams, Hall, and Dawson report significant crop damage, with totals exceeding $13 million each. Although fatalities are sparse, Douglas stands out with two recorded instances, and Lincoln accounts for the most injuries (two). Certain counties, such as Butler and Cass, demonstrate a 100% probability of events, with Butler experiencing one to two occurrences annually. This comprehensive data highlights the geographical variability and the multidimensional impacts of events across counties.

### DISASTER 4420, MARCH 21, 2019

One of the most recent significant weather events that resulted in major flooding statewide occurred between March 9 and April 1, 2019, and resulted in two Federal Disaster Declarations, one for the State of Nebraska and one for the Ponca Tribe. Starting in March with a “bomb cyclone” event, rapid snowmelt as temperatures warmed and rain falling over a 48-hour period initiated the flood event. Due to the frozen ground and 1 to 2 feet of thick ice remaining in area rivers, catastrophic flooding occurred. The devastating floods caused numerous levee breaches over more than 350 miles of levees along the Missouri, Elkhorn, and Platte Rivers, and the failure of the Spencer Dam along with privately owned dams. The flood damage devastated communities. Four individuals lost their lives, several hundred people had to be rescued by air or boat, and tens of thousands were evacuated. Over the multi-day event, more than 50 record river crests were documented, along with more than 125 precipitation records.

Nebraska Governor Pete Ricketts presented $1.3 billion in preliminary damage estimates for the entire state, including specific sector losses as follows:[195]

- $439 million in infrastructure (including roads and bridges)
- $85 million in private homes and business losses
- $400 million in livestock losses
- $440 million in crop losses
- About 2,000 miles of state roads, including 15 Nebraska state highway bridges and numerous local bridges, were impacted, roughly 20% of the entire state road system.
- U.S. Interstate 29, extending north-south along the Missouri River, was inundated and partially destroyed, as was the Interstate 680 bypass around the Council Bluffs-Omaha metropolitan area.
- Also noteworthy was damage to Offutt Air Force Base located near Bellevue, Nebraska. One-third of the base’s main runway was inundated, along with one-third of Offutt’s buildings, with several hundred employees, and several families displaced. Preliminary damage estimates released by the Department of Defense are in the order of $450 million.

[195] National Public Radio, “Nebraska Faces Over $1.3 Billion in Flood Losses.” https://www.npr.org/2019/03/21/705408364/nebraska-faces-over-1-3-billion-in-flood-losses.

- Nebraska and Iowa severe flooding impacts culminated in Federal Disaster Declaration DR-4420.

Figure 61 depicts the statewide impact from the March 2019 flood event, including the types of assistance that were designated for selected areas within the state. All counties and tribes in the state were eligible to apply for assistance under the Hazard Mitigation Grant Program.

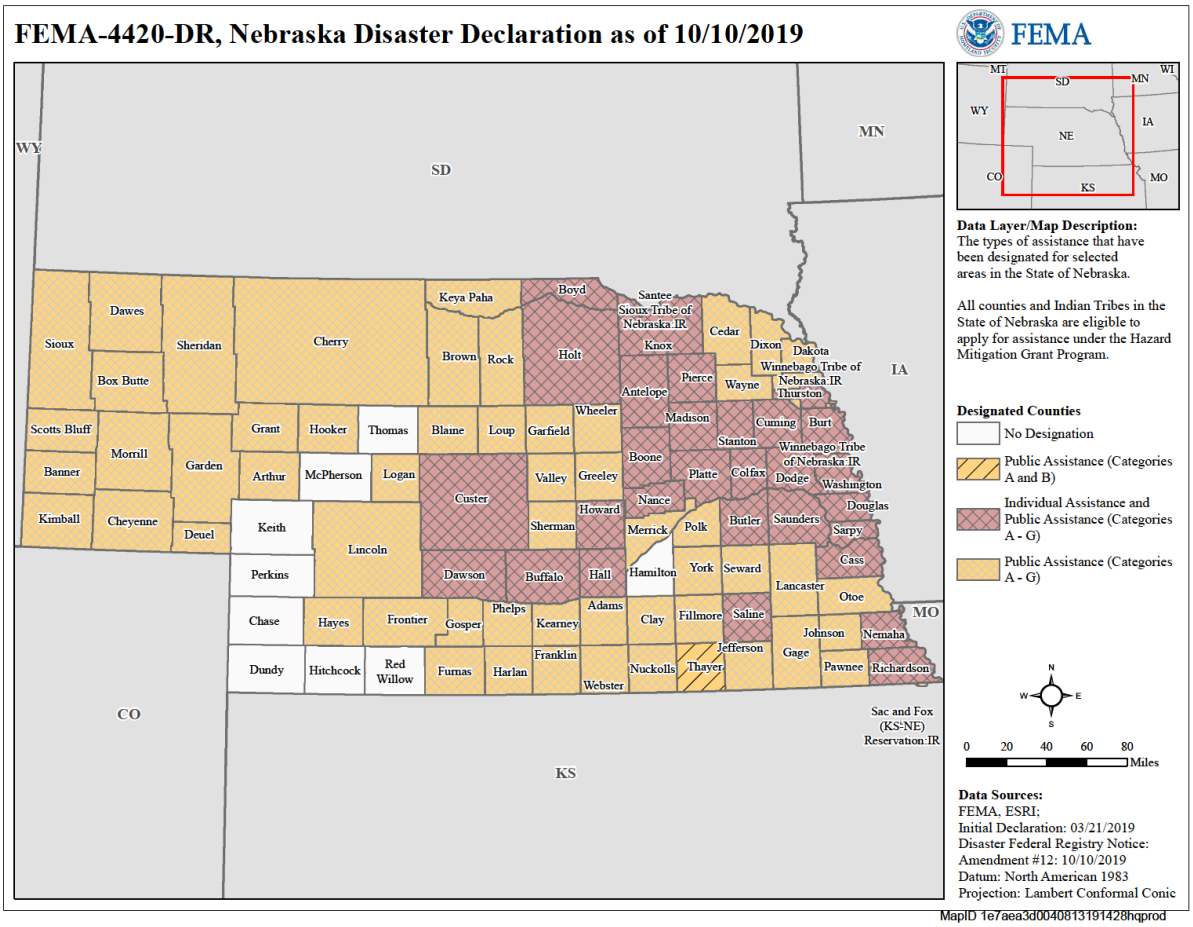



**Figure 61: Map of Nebraska Disaster Declarations from 2019 Flooding**[196]

**After-Action Summary:** On April 24, 2019, the Nebraska Emergency Management Agency (NEMA) and FEMA Region VII hosted a multi-jurisdictional and multi-agency conference to review preparedness, response, recovery, and mitigation actions related to the March 2019 flood event.[197] Additional meeting objectives included sharing information on how the disaster changed statewide risk and vulnerability; addressing and prioritizing identified issues; establishing a framework to align recovery and mitigation efforts; and identifying opportunities for inter-agency cooperation to support statewide mitigation efforts. More than 65 representatives from 23 federal, state, and local agencies and organizations participated in

[196] FEMA, "Designated Areas: Disaster 4420." https://www.fema.gov/disaster/4420/designated-areas.
[197] NEMA and FEMA, "2019 Nebraska State Hazard Mitigation Stakeholder Meeting: After Action Report (DRAFT)," undated.

the meeting. Key issues identified during the meeting have been evaluated as potential state-level mitigation actions in developing the mitigation strategy for this plan update. They include the following.

- Widespread and record levels of flooding have significantly altered river channels and floodplains, resulting in existing floodplain maps likely being incorrect and needing revision.
- Jurisdiction previously protected by levees that failed as a result of flooding may be unable to re-build and re-accredit levees, placing significant portions of cities and towns in floodplains.
- Many jurisdictions lack adequate flood control structures, or their flood risk has changed, resulting in the need for new flood control structures.
- Comprehensive information about dam failures, dams at risk of failure, and downstream impacts is not widely available.
- Flooding impacted existing natural, cultural, and historic (NCH) properties and archeological sites. Also, recovery activities that include ground disturbance could unearth or disturb other NCH sites.
- State law prohibits the repair/reconstruction of substantially damaged structures for human habitation in mapped floodways. Homeowners in this category will be significantly impacted as they will not be able to use Individual Assistance (IA) or insurance claims to repair their homes.
- A central repository or clearinghouse of risk assessment information is needed. Geocoding data, when possible, allows it to be shared and consumed by a variety of agencies and can achieve multiple benefits. This includes all information gathered to date for disaster response (e.g., Public and Individual Assistance Preliminary Damage Assessment [PDA] survey, IA inspections, NFIP Claims data, Public Assistance [PA] project locations, etc.).
- Opportunities exist to incorporate risk assessment information into PA projects to support benefit-cost analyses (BCAs) for 406 projects, maximizing mitigation and resilience for infrastructure restoration.
- The opportunity for the Nebraska Department of Economic Development to partner with other agencies to make the best use of existing Community Development Block Grant (CDBG) funds was noted as a means to position future funds to support recovery and mitigation.

Key themes include the following:

- The importance of public outreach to inform citizens of risk
- Collaboration and partnerships
- Data sharing
- Leveraging funding and resources
- Historical data related to the locations of past investments and expenditures

### 3.14.2.4 PROBABILITY

The probability of floods occurring in Nebraska on an annual basis is extremely high, and it is virtually guaranteed that at least some counties will experience flooding in a given year. Historically, Nebraska has experienced multiple flood events per year, as portrayed in the data from 2019–2024 presented in Table 47. However, it should be noted that flooding in Nebraska typically affects small geographic areas and is often associated with a particular body of water and low-lying lands. It is not typically widespread across large areas of land.

Based on the historic occurrence of flooding in Nebraska, it can be estimated that the recurrence interval for flood/flash flood events is annually, indicating a 100% chance that an event will be equaled or exceeded within that time period.

### 3.14.2.5 EFFECTS OF FUTURE CONDITIONS

Predicting flooding depends on the ability to forecast fundamental meteorological surface parameters. Based on the historical record, climate is inherently variable, making it difficult for climate scientists to predict long-term precipitation models. The article "Understanding and Assessing Climate Change: Implications for Nebraska" states that there is a large degree of uncertainty related to impacts of climate change to precipitation for regional and smaller scales; however, agreement among modeling studies, along with the understanding of the temperature-atmospheric moisture relationship, leads to the conclusion that there is virtual certainty that the global mean precipitation will increase in the long term. There have already been observed changes in precipitation, and projected changes are expected to vary considerably across the globe and by season. The general consensus is that wet areas will become wetter with some regional and seasonal deviations. In addition, the article provides the following statement related to the potential for more extreme events:

Scientists predict that it is likely that heavy precipitation events will increase in frequency, intensity, and amount in response to warmer temperatures. Additionally, El Niño is expected (with high confidence) to remain the dominant mode of climate variability, and associated precipitation variability is expected to intensify, though specific regional responses may vary.[198]

As storms become more frequent or severe, the risk of flooding also increases, depending on the location of storms.

As reported in the 2022 Nebraska Flood Hazard Mitigation Plan, the NOAA NCEI State Climate Summary notes the following trends for precipitation in Nebraska. Summer precipitation has been above the historical average since 2005. The frequency of extreme precipitation events has also increased in recent years. The state has experienced an above-average number of 2-inch precipitation events since 2005. Although most precipitation falls during spring and summer, winter and spring precipitation are also expected to increase. Extreme precipitation events contribute to an increased risk for flooding in the

[198], Deborah J. Bathke, Robert J. Oglesby, Clinton Rowe, and Donald A Wilhite, "Understanding and Assessing Climate Change: Implications for Nebraska, *Papers in the Earth and Atmospheric Sciences* (2014). https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1443&context=geosciencefacpub.

many cities and farmlands located along the many waterways in Nebraska. An overall increase in winter and spring precipitation, and the projected increase in extreme precipitation events, lead to increased runoff and flooding, which can reduce water quality and erode soils.[199]

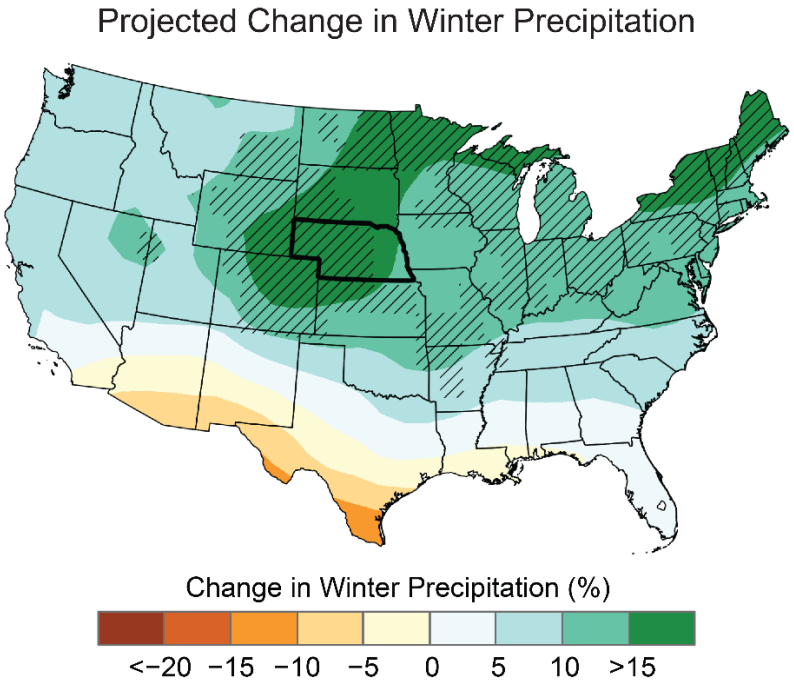



**Figure 62: Projected Change in Winter Precipitation**[200]

### 3.14.2.6 NATIONAL FLOOD INSURANCE PROGRAM

As of February 2025, 432 communities in Nebraska were participating in the National Flood Insurance Program (NFIP). Local jurisdictions (cities, villages, and counties) participate in the NFIP on a voluntary basis through an agreement with the federal government. The agreement is established when a community adopts minimum development standards within its identified flood hazard areas, typically through local ordinance, and resolves to cooperate with the federal and state government. Adopted development standards must meet or exceed the minimum standards set by the federal and state government. The federal government will then enable property owners in the participating community to purchase federally backed flood insurance either directly through the NFIP or through an accredited provider to financially protect themselves from flood damage.

Flood insurance is a prerequisite for receiving any type of direct or indirect federal financial assistance (any loan, grant, guaranty, insurance, payment, subsidy, or disaster assistance). Communities in the NFIP also qualify for many forms of federal grants to assist with recovery and mitigation from future flood damages. Individual property owners that purchase and maintain NFIP flood insurance qualify for Flood Mitigation Assistance (FMA) grant funding to help mitigate their at-risk structure. Additionally,

[199] NOAA National Centers for Environmental Information, "State Climate Summaries 2022: Nebraska." https://statesummaries.ncics.org/chapter/ne/.
[200] Ibid.

communities that participate in the NFIP qualify for federal disaster assistance for damage in the floodplain.

## PRE-DISASTER AND POST-DISASTER FLOODPLAIN MANAGEMENT

NFIP minimum standards apply for all development in the floodplain, including both new construction and improvements and repairs to existing structures. The State NFIP Coordinator's office within the Nebraska Department of Water, Energy and Environment (DWEE) Floodplain Management Division provides technical assistance and guidance to community floodplain administrators' offices to conduct both pre- and post-disaster floodplain management activities.

When repair work for damage to pre-existing structures occurs in the floodplain, the local participating community is responsible for determining the extent of damage and for providing an official determination of whether the damage is substantial. To be substantially damaged means that the cost of restoring a disaster-damaged structure to its pre-disaster condition would equal or exceed 50% of the structure's pre-disaster market value. Existing structures that are substantially damaged must be treated as new buildings and brought into compliance with the local floodplain management ordinance. In most cases, this means either elevating the structure to one foot above the base flood elevation (BFE) or removing it from the SFHA. The intent of this standard is to help reduce future losses due to flooding over time by mitigating at-risk structures.

The extent of damage is determined by an inspection of the exterior and, occasionally, interior of the damaged building, collecting estimated damage percentages for each structural element such as the foundation, exterior and interior finish, roof, superstructure, and doors and windows. Inspections can occur alongside other damage inspections such as preliminary damage assessments by FEMA and/or state and local emergency management but are considered a separate assessment. While it is the responsibility of the local community to complete such inspections, many of the designated enforcement offices of the floodplain ordinance are not experienced in post-disaster procedures or structural inspections. The DWEE Floodplain Management Division assists by providing technical assistance to communities after disasters and assisting with local substantial damage processes. Technical assistance may include helping communities create a database of at-risk structures, identifying the total number and location of damaged structures in the floodplain after a disaster, completing substantial damage inspections, and processing field data. The DWEE Floodplain Management Division has also released the Nebraska Substantial Damage Handbook: A Guide for Local Floodplain Administrators to help floodplain management programs prepare for and work through the substantial damage process.

## POST-DISASTER INCREASED COST OF COMPLIANCE SUPPORT

NFIP policyholders that meet this threshold will qualify for Increased Cost of Compliance (ICC) coverage. ICC coverage allows for up to an additional $30,000 on top of any flood insurance claim related to a substantially damaged structure. If the community chooses to include repetitive loss structures in its definition of substantial damage, the NFIP will help pay the added costs of bringing buildings into compliance with the community's floodplain management requirements for new construction through the ICC claims process. Unfortunately, the NFIP sets maximum coverage amounts for insurance policies of

$250,000 for residences and $500,000 for nonresidences. ICC funding cannot exceed these coverage limits, meaning structures with higher valuations may not be able to use this benefit and may require additional coverage from private insurance providers.

**Table 48: Flood Policies and Claims for the Counties of Nebraska, as of November 11, 2024**

| Nebraska NFIP Statistics | Total Policies in Force | Total Coverage | Total Claim Counts | Total Net Payments |
|---|---|---|---|---|
| **Nebraska** | 7,576 | $1,822,711,000 | 6,059 | $97,734,386 |

## REPETITIVE LOSS STRUCTURES

Structures in the floodplain that have incurred repeated flood losses and that have filed multiple flood insurance claims may be designated as Repetitive Loss (RL) or Severe Repetitive Loss (SRL). For NFIP purposes, RL structures are those that have experienced two flood insurance claims of more than $1,000 in any 10-year period since 1978. SRL structures are those that have had four claims of more than $5,000 or at least two claims that are greater than the structure's value. According to the 2022 Nebraska State Flood Hazard Mitigation Plan, Nebraska has approximately 542 RL properties and 41 SRL properties. Each year, outreach is conducted for communities with properties designated as RL or SRL, to encourage applications for Hazard Mitigation Assistance funding. The State Hazard Mitigation Officer and the DWEE Floodplain Management Division coordinate to prioritize applications for mitigation grant funding. SRL properties within disadvantaged communities may be eligible for reduced match requirements for FMA grants of 100% of the project cost. RL properties may receive 90% cost share. If a higher cost share is not available, a project will receive up to 75% federal funding. Much of the difficulty with interest in these grant programs involves local cost share, local ownership of the property, and voluntary buy-in from the property owner.

While the NFIP maintains the list of RL and SRL properties for insurance purposes, local participating communities may also define repetitive loss through local ordinance to deem repetitively damaged structures as substantially damaged. When communities enact this standard, pre-existing structures that experience at least two damaging flood events that cause an average of 25% damage compared to the market value are required to be brought into compliance, similar to a structure that experiences conventional substantial damage. The NFIP will recognize locally adopted repetitive loss thresholds, and NFIP policyholders that meet this threshold will qualify for ICC coverage.

Table 49 shows the counties that have verified repetitive loss properties within the jurisdiction.

**Table 49: Repetitive Loss Summary by County as of November 11, 2024**

| County | Repetitive Loss Properties | Total Losses | Total Building Payments | Total Contents Payments |
|---|---|---|---|---|
| **Boone** | 1 | 2 | $7,152.89 | $0.00 |
| **Boyd** | 1 | 3 | $68,695.40 | $21,612.85 |
| **Buffalo** | 8 | 17 | $227,935.65 | $0.00 |

| County | Repetitive Loss Properties | Total Losses | Total Building Payments | Total Contents Payments |
|---|---|---|---|---|
| **Burt** | 5 | 15 | $302,597.22 | $14,287.30 |
| **Butler** | 1 | 2 | $35,288.00 | $10,631.62 |
| **Cass** | 33 | 83 | $1,932,571.93 | $327,298.38 |
| **Cheyenne** | 1 | 2 | $21,743.76 | $0.00 |
| **Colfax** | 22 | 46 | $543,775.66 | $355,698.73 |
| **Cuming** | 1 | 2 | $45,636,42 | $0.00 |
| **Custer** | 1 | 2 | $6,334.19 | $0.00 |
| **Dakota** | 3 | 10 | $180,159.32 | $0.00 |
| **Dawson** | 8 | 18 | $108,510.64 | $421,129.57 |
| **Dodge** | 56 | 145 | $1,819,529.96 | $542,423.36 |
| **Douglas** | 76 | 195 | $3,145,738.67 | $408,915.35 |
| **Gage** | 13 | 30 | $437,726.95 | $127,095.18 |
| **Hall** | 3 | 8 | $104,233.90 | $0.00 |
| **Hamilton** | 1 | 3 | $43,120.05 | $5,063.35 |
| **Knox** | 1 | 2 | $49,924.31 | $12,619.80 |
| **Lancaster** | 10 | 27 | $227,138.97 | $4,674.37 |
| **Madison** | 3 | 6 | $25,903.51 | $6,636.00 |
| **Nemaha** | 1 | 2 | $9,332.00 | $23,893.72 |
| **Otoe** | 4 | 8 | $350,613.47 | $9,968.63 |
| **Platte** | 1 | 2 | $14,064.40 | $0.00 |
| **Richardson** | 17 | 61 | $1,509,575.71 | $431,483.01 |
| **Saline** | 5 | 12 | $84,220.00 | $16,379.72 |
| **Sarpy** | 91 | 235 | $3,813,986.29 | $1,006,397.54 |
| **Saunders** | 19 | 51 | $722,301.76 | $324,730.10 |
| **Seward** | 2 | 6 | $32,005.76 | $50,499.62 |
| **Thayer** | 3 | 7 | $79,473.63 | $8,043.34 |
| **Valley** | 1 | 2 | $34,645.26 | $0.00 |
| **Washington** | 19 | 45 | $766,548.15 | $140,515.00 |
| **Unknown** | 31 | 78 | $449,716.13 | $111,313.46 |
| **TOTAL** | **442** | **1,127** | **$17,200,202.96** | **$3,981,310.00** |

Figure 63 illustrates FIRM status by county.

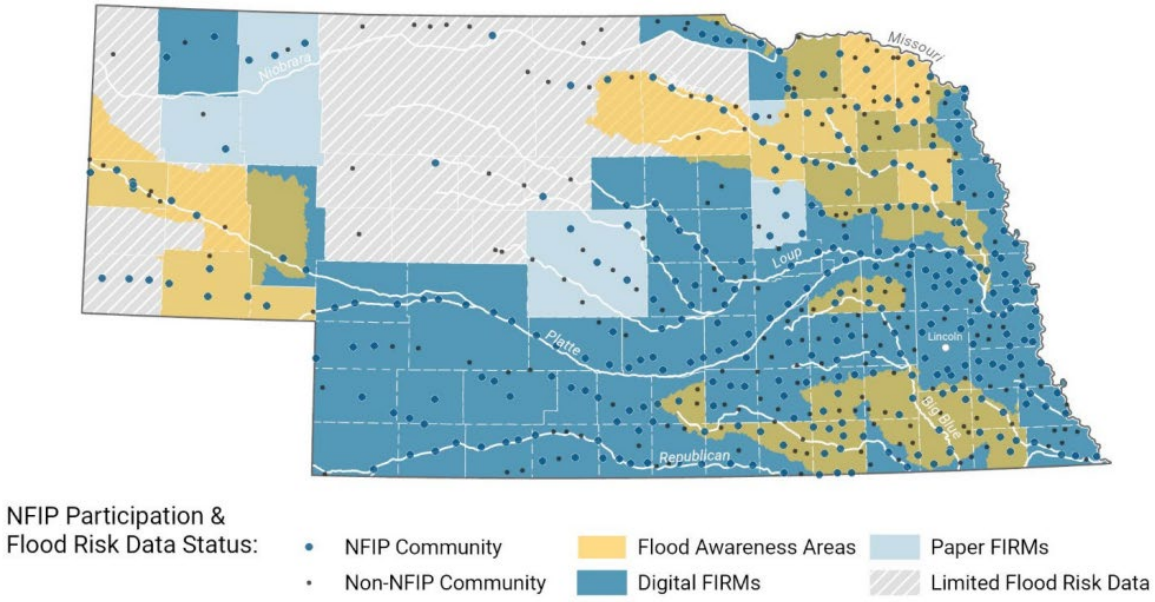



**Figure 63: Floodplain Mapping Status and NFIP Participation**[201]

## COMMUNITY RATING SYSTEM (CRS) COMMUNITIES

Several communities across Nebraska participate in FEMA's Community Rating System (CRS), a voluntary program that encourages floodplain management activities that exceed the minimum National Flood Insurance Program (NFIP) requirements. These CRS communities are distributed throughout the state and actively engage in risk-reduction strategies, earning discounted flood insurance premiums for their residents. However, even with insurance discounts, many smaller communities cannot financially justify or do not have the capacity to meet the administrative requirements to participate in CRS.

The City of Waverly and the City of Waterloo joined the program in October 2023 and are the two most recent communities to enroll in CRS.

### Technical Assistance for CRS Participation

Currently, the DWEE Floodplain Management Division is responsible for providing technical assistance to communities currently participating in or interested in CRS. The Floodplain Management Division coordinates with participating communities throughout the year, providing information and guidance through training, assisting with annual recertification or five-year cycle visits, and reviewing documentation for creditable activities. They assist communities that seek CRS enrollment by completing the prerequisite requirements on their behalf, which include verifying NFIP compliance through an audit, providing template application forms, and assisting with the determination of "green space" or areas reserved for development restrictions. This designation can yield significant credit toward the

[201] 2022 State of Nebraska Flood Hazard Mitigation Plan. https://dnr.nebraska.gov/floodplain/nebraska-flood-hazard-mitigation-plan.

community's class rating. Communities earn additional credit toward their CRS class rating by participating in the local or multi-jurisdictional hazard mitigation. Participating communities also receive significant credit toward their CRS class rating for participating in the local or multi-jurisdictional hazard mitigation plan. This represents an outreach opportunity for state and local hazard mitigation planners.

The spatial distribution of CRS participants can be seen in Figure 64, which illustrates how both urban and rural jurisdictions have made efforts to reduce flood risk through CRS participation.

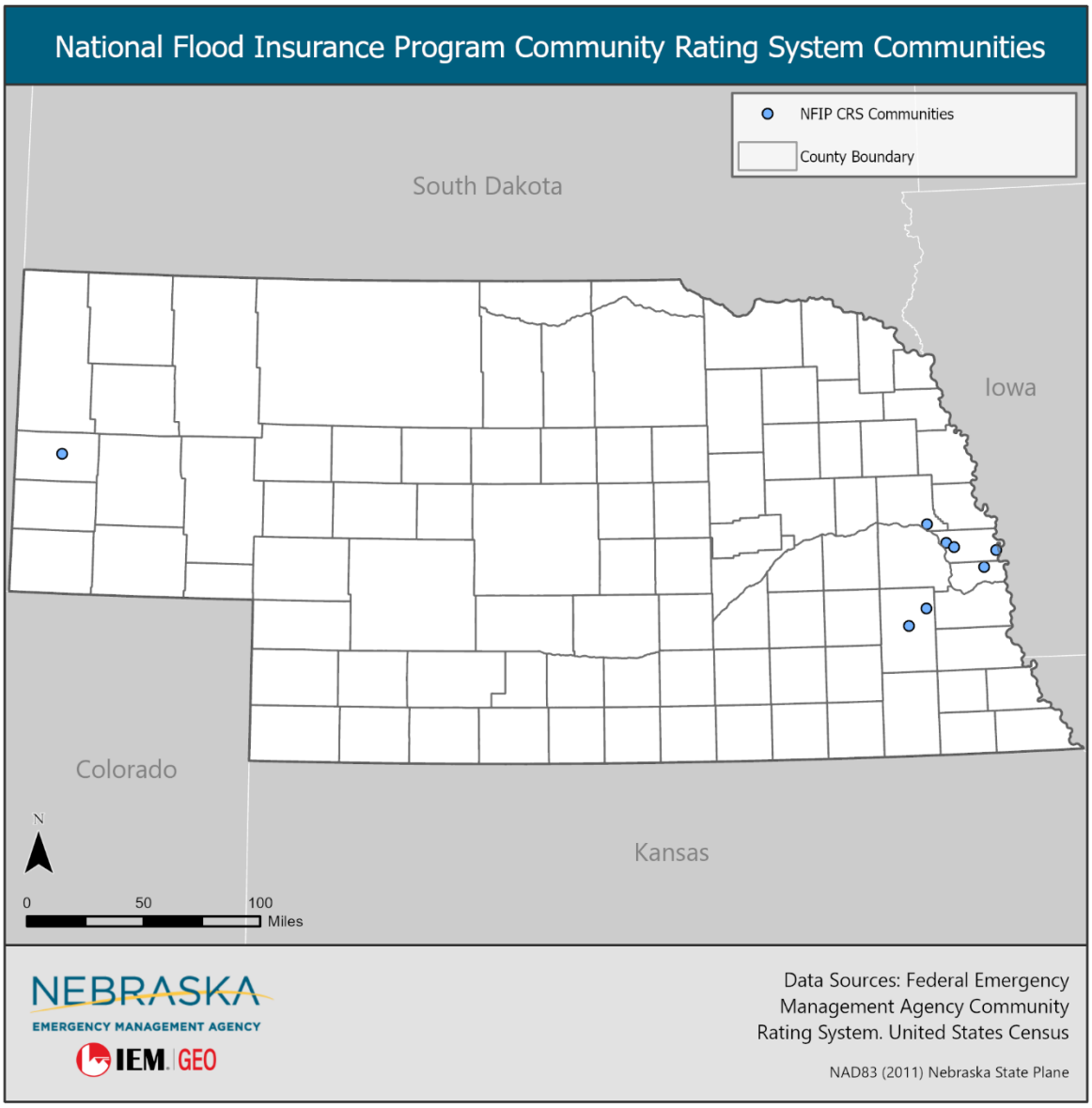



**Figure 64: Nebraska CRS Communities**

#### NFIP CHALLENGES

Multiple aspects of NFIP coordination are impacted by programmatic and local challenges that affect floodplain management at the local community level.

The ability to mitigate non-compliant NFIP-insured structures after substantial damage or improvement is limited by the parameters of the NFIP ICC program. The ICC sets maximum coverage amounts for insurance policies of $250,000 for residences and $500,000 for nonresidences. ICC funding cannot exceed these coverage limits, meaning structures with higher valuations may not be able to use this benefit and may require additional coverage from private insurance providers.

In cases where grant funding can be pursued, the State faces difficulty in garnering interest in these grant programs. Deterring factors include local cost share, local ownership of the property, and voluntary buy-in from the property owners. In addition, when considering the viability of buyout projects, locals must analyze whether the loss of revenue from residential taxes would be manageable when the project area becomes green space, while also factoring in new expenses to the jurisdiction introduced by the obligation to maintain the green space in perpetuity.

When seeking to consider participation in the CRS, many smaller communities cannot financially justify or meet the administrative requirements to participate in CRS. Participation and compliance with the NFIP and its associated programs, such as CRS, are challenging due to the funding necessary to hire or contract support for permitting, inspections, and record-keeping related to the program and the specific skill sets required to conduct these activities. The NFIP does not provide the performance grant funding needed to support program administration. The lack of funding for dedicated and qualified staffing creates challenges for NFIP administration at the local level, where program oversight is most critical.

## 3.14.3 Vulnerability Analysis

#### 3.14.3.1 NATIONAL RISK INDEX

The National Risk Index for Nebraska provides a comprehensive evaluation of risk factors across counties, considering metrics such as historic loss ratio, expected annual loss, and flood risk index. These assessments are categorized into scores and ratings, ranging from “Very Low” to “Relatively High,” and aim to quantify vulnerability and potential impacts (see Table 50 and Figure 65). Counties like Lancaster and Sarpy demonstrate higher risk profiles with elevated Expected Annual Loss and Flood Risk Index scores, while others, such as Burt and Box Butte, exhibit very low levels of risk. The data serves as a critical tool for identifying areas of concern and guiding mitigation strategies to address diverse risk factors statewide.

**Table 50: Repetitive Loss Summary by County as of November 11, 2024**

| County | Historic Loss Ratio | Expected Annual Loss Score | Expected Annual Loss Rating | Flood Risk Index Score | Flood Risk Index Rating |
|---|---|---|---|---|---|
| **Adams** | Relatively Low | 76.94 | Relatively Moderate | 72.16 | Relatively Low |
| **Antelope** | Relatively Low | 46.77 | Relatively Low | 43.05 | Relatively Low |
| **Arthur** | No Rating | 0.00 | No Expected Annual Losses | 0.00 | No Rating |
| **Banner** | No Rating | 0.00 | No Expected Annual Losses | 0.00 | No Rating |
| **Blaine** | No Rating | 0.00 | No Expected Annual Losses | 0.00 | No Rating |
| **Boone** | Relatively Low | 63.39 | Relatively Low | 58.42 | Relatively Low |
| **Box Butte** | Relatively Low | 7.43 | Very Low | 7.29 | Very Low |
| **Boyd** | Relatively Moderate | 41.97 | Relatively Low | 38.15 | Relatively Low |
| **Brown** | No Rating | 0.00 | No Expected Annual Losses | 0.00 | No Rating |
| **Buffalo** | Relatively Low | 84.87 | Relatively Moderate | 84.03 | Relatively Moderate |
| **Burt** | Very Low | 12.97 | Very Low | 11.84 | Very Low |
| **Butler** | Very Low | 27.67 | Very Low | 22.78 | Very Low |
| **Cass** | Very Low | 67.47 | Relatively Low | 62.65 | Relatively Low |
| **Cedar** | Very Low | 26.31 | Very Low | 22.18 | Very Low |
| **Chase** | Relatively Moderate | 11.95 | Very Low | 11.71 | Very Low |
| **Cherry** | Relatively Low | 9.63 | Very Low | 8.75 | Very Low |
| **Cheyenne** | Relatively Low | 49.37 | Relatively Low | 47.44 | Relatively Low |
| **Clay** | Relatively Low | 38.41 | Relatively Low | 37.16 | Relatively Low |
| **Colfax** | Very Low | 66.88 | Relatively Low | 70.98 | Relatively Low |
| **Cuming** | Relatively Low | 38.35 | Relatively Low | 36.02 | Relatively Low |
| **Custer** | Relatively Low | 52.31 | Relatively Low | 51.38 | Relatively Low |

| County | Historic Loss Ratio | Expected Annual Loss Score | Expected Annual Loss Rating | Flood Risk Index Score | Flood Risk Index Rating |
|---|---|---|---|---|---|
| **Dakota** | Very Low | 35.59 | Relatively Low | 39.90 | Relatively Low |
| **Dawes** | Very Low | 10.55 | Very Low | 9.23 | Very Low |
| **Dawson** | Relatively Low | 66.64 | Relatively Low | 66.37 | Relatively Low |
| **Deuel** | Relatively Low | 14.45 | Very Low | 13.43 | Very Low |
| **Dixon** | Relatively Low | 29.77 | Very Low | 29.21 | Very Low |
| **Dodge** | Very Low | 91.98 | Relatively Moderate | 92.97 | Relatively Moderate |
| **Douglas** | Very Low | 74.31 | Relatively Moderate | 71.75 | Relatively Low |
| **Dundy** | Relatively Low | 25.04 | Very Low | 23.35 | Very Low |
| **Fillmore** | Relatively Moderate | 45.03 | Relatively Low | 39.48 | Relatively Low |
| **Franklin** | Relatively Moderate | 47.08 | Relatively Low | 45.28 | Relatively Low |
| **Frontier** | Relatively Moderate | 19.96 | Very Low | 19.06 | Very Low |
| **Furnas** | Relatively Low | 25.53 | Very Low | 24.66 | Very Low |
| **Gage** | Very Low | 47.32 | Relatively Low | 41.74 | Relatively Low |
| **Garden** | Relatively Low | 17.02 | Very Low | 15.88 | Very Low |
| **Garfield** | Relatively Moderate | 11.64 | Very Low | 9.42 | Very Low |
| **Gosper** | Relatively Moderate | 21.79 | Very Low | 17.82 | Very Low |
| **Grant** | No Rating | 0.00 | No Expected Annual Losses | 0.00 | No Rating |
| **Greeley** | Relatively Moderate | 32.96 | Very Low | 30.10 | Very Low |
| **Hall** | Relatively Low | 67.29 | Relatively Low | 65.70 | Relatively Low |
| **Hamilton** | Relatively Low | 61.34 | Relatively Low | 52.69 | Relatively Low |
| **Harlan** | Relatively Moderate | 28.57 | Very Low | 27.71 | Very Low |

| County | Historic Loss Ratio | Expected Annual Loss Score | Expected Annual Loss Rating | Flood Risk Index Score | Flood Risk Index Rating |
|---|---|---|---|---|---|
| **Hayes** | Relatively Low | 11.92 | Very Low | 10.05 | Very Low |
| **Hitchcock** | Relatively Low | 17.55 | Very Low | 17.44 | Very Low |
| **Holt** | Relatively Low | 34.91 | Relatively Low | 33.60 | Very Low |
| **Hooker** | No Rating | 0.00 | No Expected Annual Losses | 0.00 | No Rating |
| **Howard** | Relatively Moderate | 70.84 | Relatively Low | 66.24 | Relatively Low |
| **Jefferson** | Relatively Moderate | 57.69 | Relatively Low | 51.51 | Relatively Low |
| **Johnson** | Relatively Low | 46.30 | Relatively Low | 42.22 | Relatively Low |
| **Kearney** | Relatively Moderate | 65.15 | Relatively Low | 57.68 | Relatively Low |
| **Keith** | Relatively Low | 44.69 | Relatively Low | 44.83 | Relatively Low |
| **Keya Paha** | Relatively High | 2.41 | Very Low | 2.39 | Very Low |
| **Kimball** | Relatively Moderate | 4.77 | Very Low | 4.90 | Very Low |
| **Knox** | Very Low | 35.75 | Relatively Low | 33.53 | Very Low |
| **Lancaster** | Relatively Low | 97.06 | Relatively High | 97.07 | Relatively High |
| **Lincoln** | Very Low | 40.98 | Relatively Low | 37.00 | Relatively Low |
| **Logan** | No Rating | 0.00 | No Expected Annual Losses | 0.00 | No Rating |
| **Loup** | Relatively Moderate | 9.56 | Very Low | 7.86 | Very Low |
| **Madison** | No Rating | 0.00 | No Expected Annual Losses | 0.00 | No Rating |
| **McPherson** | Relatively Low | 69.58 | Relatively Low | 69.23 | Relatively Low |
| **Merrick** | Relatively Low | 70.26 | Relatively Low | 67.26 | Relatively Low |
| **Morrill** | Relatively Moderate | 15.66 | Very Low | 15.75 | Very Low |

| County | Historic Loss Ratio | Expected Annual Loss Score | Expected Annual Loss Rating | Flood Risk Index Score | Flood Risk Index Rating |
|---|---|---|---|---|---|
| **Nance** | Relatively Moderate | 41.47 | Relatively Low | 39.52 | Relatively Low |
| **Nemaha** | Very Low | 30.05 | Very Low | 28.79 | Very Low |
| **Nuckolls** | Relatively Low | 34.14 | Relatively Low | 30.64 | Very Low |
| **Otoe** | Very Low | 35.69 | Relatively Low | 31.24 | Very Low |
| **Pawnee** | Relatively Low | 20.15 | Very Low | 20.84 | Very Low |
| **Perkins** | Relatively Moderate | 21.70 | Very Low | 19.19 | Very Low |
| **Phelps** | Relatively Moderate | 63.11 | Relatively Low | 56.54 | Relatively Low |
| **Pierce** | Relatively Low | 14.67 | Very Low | 13.74 | Very Low |
| **Platte** | Relatively Low | 75.05 | Relatively Moderate | 68.44 | Relatively Low |
| **Polk** | Relatively Low | 62.67 | Relatively Low | 58.07 | Relatively Low |
| **Red Willow** | Relatively Low | 29.46 | Very Low | 26.60 | Very Low |
| **Richardson** | Very Low | 28.32 | Very Low | 25.45 | Very Low |
| **Rock** | No Rating | 0.00 | No Expected Annual Losses | 0.00 | No Rating |
| **Saline** | Relatively Low | 93.22 | Relatively Moderate | 93.29 | Relatively Moderate |
| **Sarpy** | Relatively Low | 94.61 | Relatively High | 92.52 | Relatively Moderate |
| **Saunders** | Relatively Low | 88.89 | Relatively Moderate | 84.76 | Relatively Moderate |
| **Scotts Bluff** | Very Low | 45.28 | Relatively Low | 46.80 | Relatively Low |
| **Seward** | Very Low | 25.78 | Very Low | 22.62 | Very Low |
| **Sheridan** | Relatively Low | 24.64 | Very Low | 24.82 | Very Low |
| **Sherman** | Relatively Moderate | 43.89 | Relatively Low | 41.87 | Relatively Low |
| **Sioux** | No Rating | 0.00 | No Expected Annual Losses | 0.00 | No Rating |

| County | Historic Loss Ratio | Expected Annual Loss Score | Expected Annual Loss Rating | Flood Risk Index Score | Flood Risk Index Rating |
|---|---|---|---|---|---|
| **Stanton** | Relatively Low | 59.76 | Relatively Low | 53.67 | Relatively Low |
| **Thayer** | Relatively Moderate | 73.82 | Relatively Low | 70.35 | Relatively Low |
| **Thomas** | Relatively Moderate | 4.43 | Very Low | 4.07 | Very Low |
| **Thurston** | Relatively Low | 41.29 | Relatively Low | 47.76 | Relatively Low |
| **Valley** | Relatively Moderate | 34.23 | Relatively Low | 30.23 | Very Low |
| **Washington** | Very Low | 54.78 | Relatively Low | 51.54 | Relatively Low |
| **Wayne** | Relatively Low | 19.72 | Very Low | 16.54 | Very Low |
| **Webster** | Relatively Moderate | 57.88 | Relatively Low | 56.92 | Relatively Low |
| **Wheeler** | Relatively Moderate | 27.02 | Very Low | 20.55 | Very Low |
| **York** | Relatively Low | 58.71 | Relatively Low | 53.55 | Relatively Low |

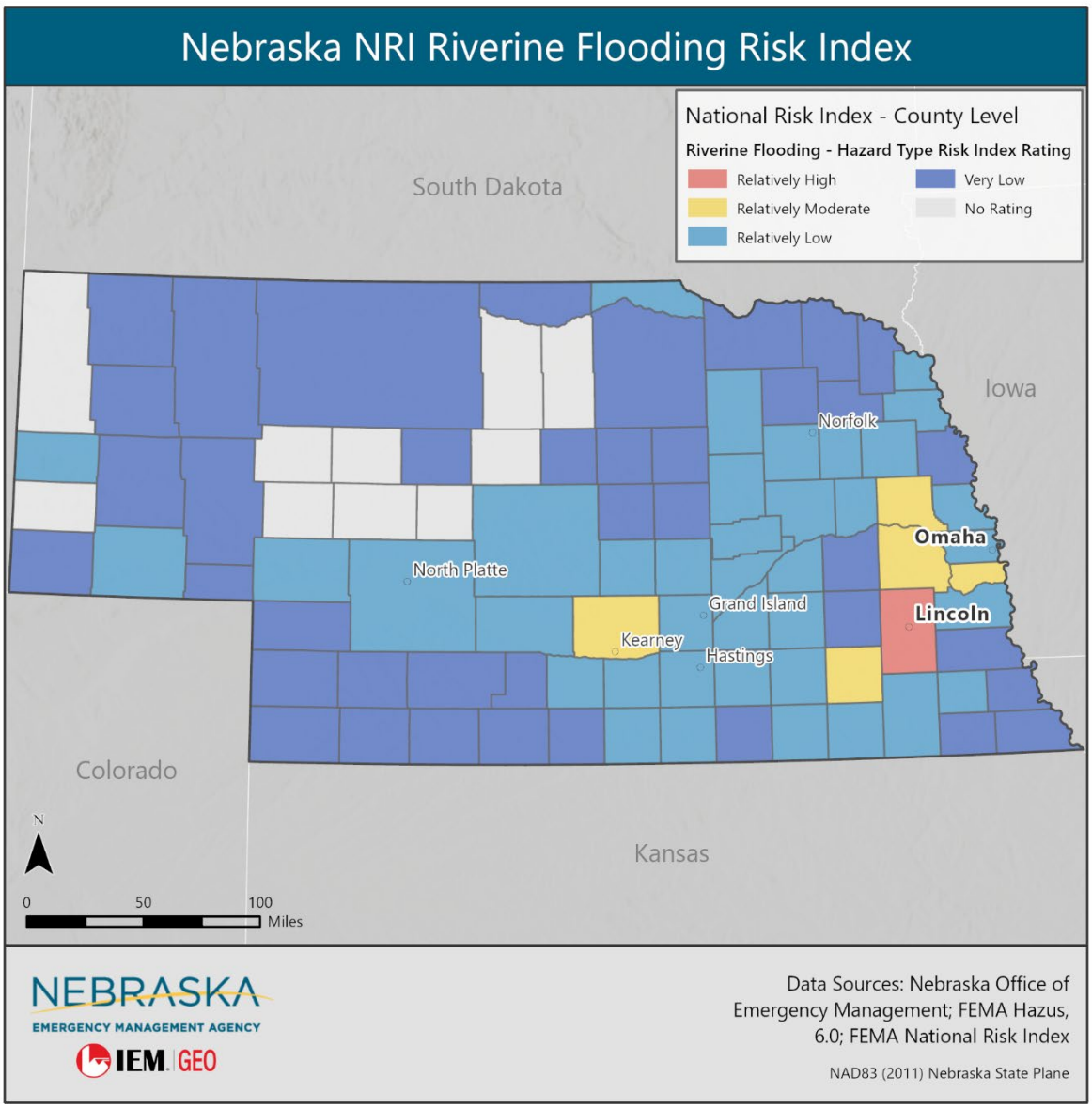



**Figure 65: National Risk Index – Riverine Flooding Risk Rating**

### 3.14.3.2 ESTIMATED IMPACT AND POTENTIAL LOSSES

This section describes the methodology uses to determine the potential impacts on critical facilities, structures, people, and other community assets caused by a 1% annual chance flood.

#### HAZUS

Estimated potential impacts from a 1% annual chance flood were generated using Hazus 6.1. Flood depth grids were developed based on the FIRM flood boundaries where available. Hazus models damage functions and general building stock data to estimate the level of damage to structures and other social

and economic impacts for each study region. For this plan, flood depth grids and modeled results were generated for 65 counties in four geographic zones with 14–18 counties each. The results were then totaled for all zones. The geographic zones used for the Hazus analyses are shown in Figure 66.

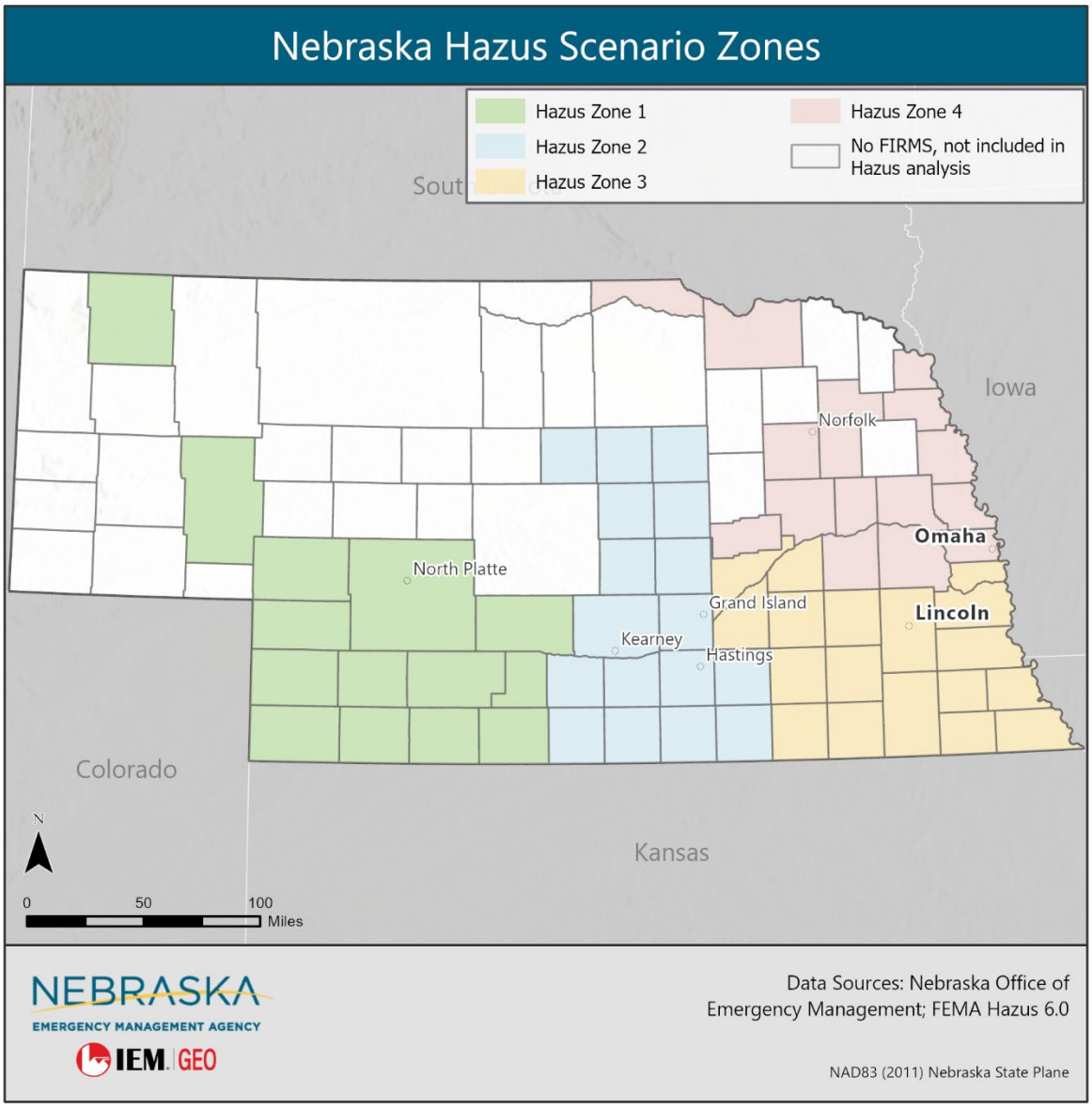



**Figure 66: Hazus Scenario Zones**

According to Hazus estimates, the modeled region spans more than 613 square miles and encompasses over 83,000 Census Blocks. Within this area, there are over 710,000 households, housing a population of approximately 1.81 million people. The region contains 810,833 structures, with a combined replacement value exceeding $366 billion.

## CRITICAL FACILITIES

Hazus utilizes the default inventory of critical facilities from HIFLD data to identify those located within the flood zone. This facility data was augmented with local data of state facilities to ensure accuracy. Hazus then estimates the potential physical damage to these facilities and categorizes them into damage states. It also assesses how this damage might impact their ability to continue operating after a disaster. Table 51 summarizes the potential impacts to critical facilities in terms of damage and loss of functionality immediately following the flood event.

**Table 51: Expected Damage to Critical Facilities from Flood Scenario**

| Facility Type | Facility Count | Facilities with At Least Moderate Damage | Facilities with At Least Substantial Damage | Facilities with Loss of Functionality on Day 1 |
|---|---|---|---|---|
| **EOCs** | 233 | 13 | 6 | 18 |
| **Fire Stations** | 430 | 17 | 5 | 17 |
| **Hospitals** | 97 | 0 | 0 | 0 |
| **Police Stations** | 187 | 5 | 2 | 6 |
| **Schools** | 1116 | 18 | 4 | 22 |
| **Total** | 2063 | 53 | 17 | 63 |

## BUILDING DAMAGE AND ECONOMIC LOSSES

Economic loss is measured by expected cost of damage to structures. These losses can be grouped into two categories: direct building loss and business interruption loss. Direct building losses are based on the estimated costs to repair or replace damage caused to a building and its contents by flooding. Business interruption losses are those associated with the inability to operate a business because of the damage sustained during the flood. This includes income and wage losses, rental income losses, and relocation losses which includes temporary living expenses for people displaced from homes because of the flood.

Of the 810,833 buildings in the flood study region, 13,720 are projected to experience at least moderate damage, and 6,890 to experience complete damage. The total economic loss from direct and business interruption losses from these structures is over $26.5 billion. This is 7.25% of the total replacement value of structures in the region. $14.5 billion (55%) of that value is from direct losses and 45 from business interruption losses. Table 52 summarizes these losses by geographic zones. Table 53 shows the losses for each zone by different direct and business interruption loss categories.

Flooding can result in a significant amount of debris from damaged buildings and other flood damage. An estimated 1,120,809 tons of debris will be generated in the study area by a 1% annual chance flood. This will require approximately 44,835 truckloads to remove.

Table 52: Building Damage Category and Economic Loss by Zone for Flood Scenario

| Zone | Total Building Count | Buildings with Moderate Damage | Buildings with Complete Damage | Total Building Losses | Total Economic Loss |
|---|---|---|---|---|---|
| **Zone 1** | 73,068 | 650 | 298 | $747,690,000 | $1,474,180,000 |
| **Zone 2** | 109,783 | 884 | 231 | $746,260,000 | $1,639,250,000 |
| **Zone 3** | 295,382 | 4,560 | 2,075 | $5,113,120,000 | $9,573,790,000 |
| **Zone 4** | 332,600 | 7,626 | 4,286 | $7,904,430,000 | $13,847,490,000 |
| **Total** | **810,833** | **13,720** | **6,890** | **$14,511,530,000** | **$26,544,710,000** |

Table 53: Total Building Related Losses by Zone for Flood Scenario

| Zone | Building Loss | Contents Loss | Inventory Loss | Income Loss | Relocation Loss | Rental Income Loss | Wage Loss | Total Loss |
|---|---|---|---|---|---|---|---|---|
| **Zone 1** | $352,880,000 | $366,954,000 | $27,852,000 | $259,559,000 | $122,124,000 | $75,347,000 | $269,459,000 | $1,474,175,000 |
| **Zone 2** | $343,518,000 | $374,314,000 | $28,431,000 | $287,979,000 | $152,873,000 | $110,758,000 | $341,374,000 | $1,639,247,000 |
| **Zone 3** | $2,104,832,000 | $2,710,556,000 | $297,727,000 | $1,660,465,000 | $643,462,000 | $394,960,000 | $1,761,789,000 | $9,573,791,000 |
| **Zone 4** | $3,369,821,000 | $4,043,472,000 | $491,162,000 | $1,622,161,000 | $848,418,000 | $491,366,000 | $2,991,085,000 | $13,857,485,000 |
| **Total** | **$6,171,051,000** | **$7,495,296,000** | **$845,172,000** | **$3,830,164,000** | **$1,766,877,000** | **$1,072,431,000** | **$5,363,707,000** | **$26,544,698,000** |

### POPULATION IMPACTS

Damage to residences from flooding will displace people from their homes. Hazus generates an estimated number of households and people who will be displaced based on estimated damage to residences. A percentage of people displaced is generated based on this number and housing occupancy types. A total of 19,653 households are anticipated to be displaced in this scenario, or an estimated 58,961 individuals. Approximately 5,089 of those are projected to seek public shelter. These values are summarized in by the different analysis zones in Table 54.

**Table 54: Sheltering Needs by Zone for Flood Scenario**

| Zone | Households Displaced | Individuals Displaced | Individuals Seeking Public Shelter |
|---|---|---|---|
| **Zone 1** | 1,280 | 3,840 | 315 |
| **Zone 2** | 29 | 87 | 13 |
| **Zone 3** | 8,215 | 24,646 | 2,569 |
| **Zone 4** | 10,129 | 30,388 | 2,192 |
| **Total** | **19,653** | **58,961** | **5,089** |

## 3.14.3.3 ACCESS AND FUNCTIONAL NEEDS

Floods pose significant risks to access and functional needs (AFN) populations, including individuals with disabilities, older adults, and those with limited mobility. These populations often face disproportionate challenges during emergency evacuations due to mobility impairments, communication barriers, and medical dependencies.[202] Individuals and families below the poverty line and those isolated from social interactions may lack resources or access to resources that could mitigate the impacts of floods.

Flooding can restrict access to critical healthcare services, disrupt power supplies essential for medical equipment, and limit transportation options.[203] Flooding may result in closed or impassable roadways, which increases the vulnerability among segments of the population that already have decreased mobility. Emergency response efforts also may not always account for AFN-specific needs, further increasing the risk of injury or fatality in affected areas. Hospitals, nursing homes, and other service facilities may require assistance if evacuation is necessary, or generator power and support for several hours or days during recovery operations.

Mitigating the impact of flooding on AFN populations requires inclusive disaster preparedness planning, early warning systems tailored for diverse communication needs, and accessible evacuation routes.[204] Community engagement and policy-driven strategies must prioritize the development of adaptive

[202] Federal Emergency Management Agency, *Guide to Emergency Management Planning for Access and Functional Needs Populations* (U.S. Department of Homeland Security, 2021).
[203] R. Smith, M. Johnson, & P. Lee, Flood Risk and Vulnerable Populations: Examining the Effects of Dam Failures on Accessibility," *Natural Hazards Review* 21, no. 2 (2020): 45–59.
[204] National Institute of Standards and Technology, *Inclusive Infrastructure Planning for Disaster Resilience* (U.S. Department of Commerce, 2019).

infrastructure and emergency response frameworks to ensure equitable safety measures.[205] Integrating AFN considerations into emergency management policies enhances resilience and reduces disparities in disaster outcomes, reinforcing the need for proactive risk reduction approaches.

### 3.14.3.4 COMMUNITY LIFELINES

Community Lifelines are the integrated network of assets, services, and capabilities that are used day-to-day to support the ongoing needs of our communities.

Flooding poses a severe threat to multiple Community Lifelines (Figure 67). In riverine flooding, disruption to services may be gradual, with some warning time to take action. During flash flooding, lifelines may be disrupted with no advance warning. Transportation routes may become impassable, which can isolate some residents and delay emergency response. Transportation infrastructure, including roads, bridges, railways, and airports, may suffer extensive damage. Public transit or other options may be limited. Emergency response capabilities may be overwhelmed. It may be difficult to evacuate vulnerable populations and provide for those with access and functional needs.

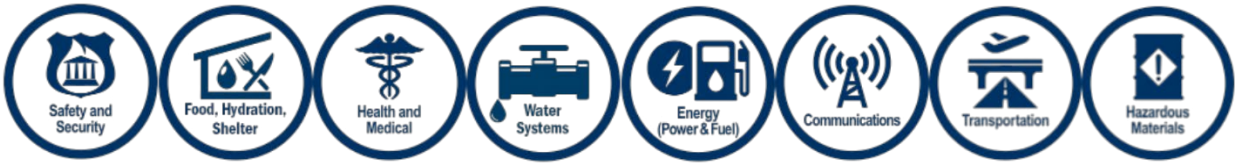



**Figure 67: Community Lifelines**

Flooding can also interrupt power and communication services, which affects the functionality of other critical services, such as emergency response, hospitals, emergency shelters, and other systems. Floodwaters can contaminate potable water supplies or damage treatment facilities as well as other water management systems, contributing to other public health risks.

Flooding may displace residents from their homes and create a demand for emergency shelter. Disruption to grocery stores and other distribution centers may limit food and hydration supplies. Healthcare facilities may experience a surge in patients with injuries, waterborne diseases, or exposure-related illnesses.

### 3.14.3.5 ENHANCED PRIORITY RISK INDEX SCORE

The Enhanced Priority Risk Index (EPRI) provides the state of Nebraska with a methodology to measure the impact each profiled hazard may have on the seven EMAP Standard 4.1.2 sectors (i.e., public; responders; continuity of operations including continued delivery of services; property, facilities, and infrastructure; the environment; the economic condition of the jurisdiction; and public confidence in the jurisdiction's governance). Table 55 provides the EPRI scores for the hazard with the appropriate risk factor.

[205] L. Jones & T. Brown, "Disaster Resilience and Accessibility: Addressing Vulnerabilities in Emergency Planning," *Journal of Emergency Management* 40, no. 2 (2022): 112–126.

Table 55: Enhanced Priority Risk Index Score

| | Probability Next 5 Years | Impact | Spatial Extent | Warning Time | Duration | Vulnerability | Probability | Risk Factor |
|---|---|---|---|---|---|---|---|---|
| **Risk Level** | 2 | 2.55 | 2.82 | 3.45 | 3.09 | 2.36 | 3.09 | 2.92 |

Table 56 provides a summary of flood impact, to include impact to the public, first responders, continuity of operations, property, infrastructure, environment, economic conditions and public confidence, and the consequences of those impacts.

Table 56: Impacts of Flooding on Sectors

| Sector | Impacts |
|---|---|
| **Public** | **Housing:** Structural damage in flood-prone areas depends on the extent of the flooding including the depth of flood waters as well as the velocity. Entire neighborhoods could be inundated, leading to widespread displacement.<br>**Casualties/Fatalities:** The risk to human life is directly influenced by the available warning time and the population density downstream. Riverine flooding may provide adequate warning time for those in potential flood areas to evacuate. Flash flooding can occur with little warning and may occur in unexpected areas.<br>**Work:** Business disruptions depend on proximity to the flood zone. Some businesses not directly affected by the flood may be disrupted by road closures, power outages, or communication disruptions caused by flooding. Industries near major waterways, such as agriculture and manufacturing, may experience prolonged operational shutdowns.<br>**Food/Water:** Water supply contamination is a significant risk, potentially leading to shortages and public health concerns. Agricultural losses could disrupt food production, especially in farming-dependent regions. |
| **First Responders** | **Emergency Services:** First responders will generally remain operational unless their facilities are directly impacted by floodwaters. However, damage to roadways or disruption to power and communication systems may delay response times. Response efforts must also account for hazardous materials, debris, and potential disease outbreaks.<br>**Medical:** The capacity of healthcare facilities to provide treatment will depend on whether they are within the flood zone. If densely populated areas are affected, hospitals may see a surge in patients, necessitating emergency response activation. |
| **Continuity of Operations** | If essential government buildings, such as courthouses, emergency operation centers, or administrative offices, are within the flooded area, operations may be severely disrupted. The loss of electronic records, communications, and utilities can further hinder government response efforts. Effective continuity of operations (COOP) planning is essential for minimizing disruption. |
| **Property, Facilities, and Infrastructure** | **Buildings and Infrastructure:** Structures within the flooded area may suffer partial to complete destruction. Roads, bridges, and railways could be washed out, isolating communities and delaying recovery efforts. Power and water infrastructure may be significantly damaged, leading to prolonged outages. |

| Sector | Impacts |
|---|---|
| | **Agriculture:** Farmland could be devastated by prolonged flooding, resulting in soil degradation, crop destruction, and livestock losses. |
| **Environment** | Floodwaters can introduce contaminants from industrial sites, sewage systems, and agricultural runoff. Soil erosion, habitat destruction, and long-term environmental degradation are likely consequences. The spread of debris and pollutants could impact ecosystems for years. |
| **Economic Conditions** | The economic impact of a flood in Nebraska could range from moderate to catastrophic, depending on the scale of the event. Damage to critical infrastructure, agricultural losses, and business interruptions could lead to long-term financial strain on affected communities. |
| **Public Confidence** | Public trust in government agencies may be influenced by perceptions of preparedness and response. If the failure is deemed preventable due to inadequate maintenance or oversight, public confidence may decline. Transparent communication and effective disaster management will be critical in maintaining public trust. |

# 3.15 Human Infectious Disease

## 3.15.1 Description

Human infectious disease is caused by a microorganism, such as a bacterium, virus, or protozoan, that is not typically found in the body but is capable of causing infection. Some, but not all, infectious diseases are contagious, meaning they can spread from person to person. Other infectious diseases can spread from animals or insects to humans, but not from person to person.[206]

## 3.15.2 Risk Assessment

### 3.15.2.1 LOCATION

All areas of the State of Nebraska are susceptible to infectious disease outbreaks. Variability in virus types, exposure levels, and social or environmental conditions make it challenging to predict specific disease occurrence locations. In the person-to-person transmission of infectious disease, places where humans are in close contact are more likely to be sites that lead to multiple cases, especially if airborne transmission is the primary means of exposure. Densely populated communities are typically more likely to have higher case numbers than rural areas. Some of the most significant outbreaks in Nebraska during the 2020 COVID-19 pandemic have been noted within residential healthcare facilities, such as long-term care and assisted living facilities, as well as meat processing facilities, where workers are in close proximity to each other.

### 3.15.2.2 EXTENT

The extent of a disease refers to its prevalence and incidence within a population, providing insight into how widespread it is. When acquiring this information, there are legal limitations on the accessibility of information related to cases of human infectious disease. The state and local public health and medical systems closely monitor and coordinate specific reportable diseases that indicate current cases. However, laws that protect private medical information, such as the Health Insurance Portability and Accountability Act (HIPAA), limit all disease-related data-sharing. During a public health emergency, HIPAA privacy rules are not suspended. However, the Secretary of the U.S. Department of Health and Human Services (HHS) may waive specific provisions, sanctions, or penalties during the emergency.

Local and state health officials who maintain records documenting outbreaks and the prevention and containment actions taken must continue to consider HIPAA provisions related to an individual patients' right to privacy during emergencies. Table 57 shows the disease levels and definitions monitored and tracked by the Centers for Disease Control and Prevention (CDC).

[206] "Infectious Diseases," National Institutes of Health. 2023. https://www.nih.gov/about-nih/what-we-do/nih-turning-discovery-into-health/our-biggest-health-challenges/infectious-diseases.

Table 57: Disease Levels[207]

| Disease Level | Definition |
|---|---|
| **Sporadic** | When a disease occurs infrequently and irregularly |
| **Endemic** | The baseline level of disease, marked by constant presence or usual prevalence of a disease or infectious agent in a population within a geographic area |
| **Hyperendemic** | Persistent, high levels of disease occurrence |
| **Epidemic (or outbreak, used for a more limited geographic area)** | An increase, often sudden, in the number of cases of a disease above what is normally expected in that population in that area |
| **Pandemic** | An epidemic that has spread over several countries or continents, usually affecting many people |

### 3.15.2.3 PREVIOUS EVENTS

The State of Nebraska has been issued two (2) federal disaster declarations related to human infectious disease since 1953, both related to the COVID-19 outbreak. This event is the only widespread human infectious disease outbreak since the 2021 plan.

### 3.15.2.4 PROBABILITY

Based on the historical occurrence of human infectious disease outbreaks of a pandemic level in Nebraska, the recurrence interval can be estimated at 34 years, indicating that, on average, a human infectious disease event is highly likely to occur within that period. Table 58 presents information about human diseases federally declared in Nebraska.

Table 58: Nebraska COVID-19 Pandemic Declarations[208]

| Number of Counties | Declaration Date | Disaster Number | Incident Subcategory |
|---|---|---|---|
| **All** | 04/04/2020 | 4521 | COVID-19 |
| **All** | 03/13/2020 | 3483 | COVID-19 |

Table 59 provides information about human diseases federally declared on Nebraska Indian reservations.

[207] CDC, "Lesson 1: Introduction to Epidemiology." https://archive.cdc.gov/www_cdc_gov/csels/dsepd/ss1978/lesson1/section11.html#:~:text=Level%20of%20disease,rather%20is%20the%20observed%20level.
[208] FEMA, "Disaster Declarations for States and Counties." https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties.

Table 59: Nebraska Indian Reservation COVID-19 Declarations[209]

| Reservations | Declaration Date | Disaster Number | Incident Subcategory |
|---|---|---|---|
| Iowa Indian Reservation, Also KS | 04/04/2020 | 4521 | COVID-19 |
| | 03/13/2020 | 3483 | COVID-19 |
| Omaha Indian Reservation | 04/04/2020 | 4521 | COVID-19 |
| | 03/13/2020 | 3483 | COVID-19 |
| Pine Ridge Indian Reservation Trust Lands | 04/04/2020 | 4521 | COVID-19 |
| | 03/13/2020 | 3483 | COVID-19 |
| Ponca TDSA | 04/04/2020 | 4521 | COVID-19 |
| | 03/13/2020 | 3483 | COVID-19 |
| Sac and Fox Indian Reservation, Also KS | 04/04/2020 | 4521 | COVID-19 |
| | 03/13/2020 | 3483 | COVID-19 |
| Santee Indian Reservation | 04/04/2020 | 4521 | COVID-19 |
| | 03/13/2020 | 3483 | COVID-19 |
| Winnebago Indian Reservation | 04/04/2020 | 4521 | COVID-19 |
| | 03/13/2020 | 3483 | COVID-19 |

Table 60: Miscellaneous Human Disease Outbreaks in Nebraska

| Disease | Dates | Cases | Website |
|---|---|---|---|
| 1918 Flu Pandemic (Spanish Flu) | October 2, 1918–December 31, 1918 | 50,000 | https://history.nebraska.gov/the-1918-flu-pandemic-in-nebraska/ |
| Poliomyelitis (Polio, Infantile Paralysis) | September 1952 | 857 | https://digitalcommons.unmc.edu/cgi/viewcontent.cgi?article=1001&context=coph_history_papers |
| Gonorrhea | 1975 | 5,000 | https://digitalcommons.unmc.edu/cgi/viewcontent.cgi?article=1001&context=coph_history_papers |
| Syphilis | 1969 | 398 | https://digitalcommons.unmc.edu/cgi/viewcontent.cgi?article=1001&context=coph_history_papers |
| HIV | 2022 | 149 per 100,000 | https://map.aidsvu.org/profiles/state/nebraska/overview |
| Mumps | 2019 | 30 | https://www.cdc.gov/mmwr/volumes/69/wr/mm6922a2.htm |

[209] Ibid.

| Disease | Dates | Cases | Website |
|---|---|---|---|
| **H1N1** | 2019 | 2404 | https://www.3newsnow.com/news/local-news/more-than-800-flu-cases-and-one-death-says-health-department |

#### 3.15.2.5 EFFECTS OF FUTURE CONDITIONS

Changes in climate patterns are expected to significantly impact human infectious diseases in Nebraska as it alters temperature, precipitation patterns, and ecosystems. Studies and reports on climate change reveal a relationship between changing climate conditions and the possibility of increased human disease activity. Scientific predictions signal an increase in several extreme events in response to a warming climate, such as heavy precipitation events, which could occur within increasingly severe thunderstorms, including tornadoes. Because models do not entirely agree on the type or amount of change, this is still an active area of research that should be monitored in the next planning cycle.[210]

This study notes that health effects, commonly divided into direct (such as deaths from heat waves and storms), indirect (mediated by culture, architecture, economics, etc.), and interactive (where climate change aggravates other environmental hazards) effects from climate and weather. The study references multiple articles by health professionals and scientists that link a wide range of health effects already resulting from climate change and likely to rise in future decades. Vector-borne and other infectious diseases are increasing in incidence. In addition, milder winters could allow contagious diseases and vectors not previously endemic to Nebraska to survive. If group sheltering from future severe weather events is required during the presence of an infectious disease, this type of operation could be impacted due to public health requirements for social distancing, isolation and other conditions requiring a higher level of resources such as personnel, equipment and supplies.

The effects of changes in climate patterns on human infectious diseases in Nebraska are multifaceted, presenting new challenges that require proactive public health strategies and interventions to mitigate potential risks.

### 3.15.3 Vulnerability Analysis

Like many states, Nebraska faces various human infectious diseases influenced by geography, climate, public health infrastructure, and population.. The state's rural and urban areas have distinct vulnerabilities and capacities for managing infectious diseases. However, due to a lack of local plans identifying specific human infectious diseases or pandemics as a hazard, there is insufficient jurisdictional vulnerability data to assess.

Nebraska faces significant vulnerabilities regarding human infectious diseases, particularly due to its varied geography, population density, and health infrastructure disparities. By addressing these

[210] University of Nebraska Lincoln, "Understanding and Assessing Climate Change: Implications for Nebraska." https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1443&context=geosciencefacpub.

vulnerabilities through strategic planning, community engagement, and resource allocation, Nebraska can improve its resilience against future outbreaks.

#### 3.15.3.1 NATIONAL RISK INDEX

The National Risk Index (NRI) provides communities with an online tool to display potential risk to 18 natural hazards, but human infectious diseases are not provided in the NRI.

#### 3.15.3.2 ESTIMATED IMPACT AND POTENTIAL LOSSES

Due to a lack of local plans that identify human infectious diseases or pandemics as a hazard, there is inadequate data available to evaluate jurisdictional vulnerability and potential loss.

As the COVID-19 pandemic progressed in the United States, it impacted individual states differently. Despite the disparity in impacts, the public health recommendations for social distancing and periodic closure of designated businesses caused widespread economic loss and hardships for individuals and families. Some assistance from the federal government provided intermittent relief; however, the longer the pandemic lasted, the more severe the economic losses became. In this situation, assistance for food, shelter, and other expenses was required to sustain vulnerable populations due to business closure, loss of jobs, and long-term medical care.

Although the entire population of Nebraska is potentially susceptible to human infectious disease, the hazard would unlikely impact state physical property or facilities.

#### 3.15.3.3 ACCESS AND FUNCTIONAL NEEDS

Human infectious diseases pose a challenge to public health, affecting individuals across diverse populations. However, specific populations, particularly those with access and functional needs, are more at risk to these diseases. Their increased susceptibility is often due to social, economic, and health factors that complicate their ability to prevent and respond to infections effectively.

People with disabilities face specific challenges. They may have limited mobility or other impairments that restrict their access to healthcare services. Some disabilities can compromise the immune system, making these individuals more susceptible to infections. Elderly individuals may experience age-related decline in immune function and chronic health conditions, increasing their vulnerability. Mobility issues or cognitive impairments can further hinder their access to healthcare and compliance with preventive measures.

Financially limited communities are also at heightened risk. Inadequate resources can lead to restricted access to healthcare, food, and safe living environments. Overcrowded environments can facilitate the rapid spread of diseases, and a lack of dependable transportation may prevent individuals from attending medical appointments. Homeless individuals face numerous barriers to healthcare access. Without stable housing, their hygiene and health are compromised, thereby increasing their risk of contracting communicable diseases.

Individuals with chronic health conditions, such as diabetes or heart disease, also face increased risks. Compromised immune systems make them more susceptible to severe outcomes from infections. Pregnant individuals are another at-risk group, as infections can pose severe risks to both mother and child.

Cross-cultural populations are also at greater risk. Language barriers and cultural differences can limit access to health information and services, leading to misinformation and a reluctance to seek medical help. To address these disparities, targeted public health initiatives focusing on accessibility, education, and resource allocation are needed. Community-based programs that provide transportation, healthcare services, and tailored education are fundamental for reducing vulnerability to infectious diseases.

#### 3.15.3.4 COMMUNITY LIFELINES

Human infectious diseases can significantly impact several of the Federal Emergency Management Agency (FEMA) community lifelines, primarily in the following areas:

- **Safety and Security:** Infectious disease outbreaks can strain public health resources and impact law enforcement and emergency services, leading to challenges in maintaining public safety and order.
- **Health and Medical:** This is perhaps the most directly impacted lifeline, as outbreaks of infectious diseases can overwhelm healthcare systems, lead to increased mortality, and disrupt routine health services.
- **Food, Hydration, and Shelter:** Disruptions in the supply chain due to quarantines or outbreaks can affect food distribution and access to clean water. There may also be increased demand for shelters for those needing isolation or care.
- **Energy:** Infectious disease outbreaks can affect the workforce responsible for maintaining energy supplies and infrastructure, leading to potential shortages or disruptions.
- **Communications:** Public health announcements and safety guidance become crucial in outbreaks. An effective communications strategy is essential for disseminating information, but misinformation can also lead to community panic.
- **Transportation:** Restrictions on movement due to quarantine measures or fear of contagion can disrupt transportation networks, impacting goods delivery and healthcare access.
- **Hazardous Materials:** In some cases, biohazard materials may need to be managed, such as in the transport of contaminated waste or the treatment of infected individuals, posing additional challenges.

Overall, infectious disease outbreaks create a ripple effect that can compromise these lifelines, necessitating a coordinated response to manage the impact on communities.

#### 3.15.3.5 ENHANCED PRIORITY RISK INDEX SCORE

The Enhanced Priority Risk Index (EPRI) provides the state of Nebraska with a methodology to measure the impact that each profiled hazard may have on the seven EMAP (Emergency Management

Accreditation Program) Standard 4.1.2 sectors. Table 61 provides the EPRI scores for the hazard with the appropriate risk factor.

**Table 61: Infectious Disease Enhanced Priority Risk Index Score**

| | Probability Next 5 Years | Impact | Spatial Extent | Warning Time | Duration | Vulnerability | Probability | Overall Risk Factor |
|---|---|---|---|---|---|---|---|---|
| **Risk Level** | 2.3 | 2.6 | 3 | 1.0 | 3.9 | 2.5 | 2.2 | 2.5 |

Table 62 provides a summary of human infectious disease impacts—including those on the public, first responders, continuity of operations, property, infrastructure, environment, economic conditions, and public confidence—and the consequences of those impacts.

**Table 62: Human Infectious Disease Impacts and Consequences**

| Sector | Impact |
|---|---|
| **Public: Housing, Casualties, Fatalities, Work, Food, Water** | **Housing:** Depending on the scale and magnitude of the outbreak conditions, residents could be quarantined within their homes, requiring support for food, medical care, and other essentials. Transient residents may require temporary housing for health and security.<br>**Casualties/Fatalities**: May be significant, especially with at-risk and vulnerable populations and healthcare workers. Additional resources for medical care and mortuary services may be required.<br>**Food/water**: Impact could be high if significant sectors of the economy are reduced or shut down temporarily. Support may be needed to produce or deliver commodities to the population. Those individuals experiencing food insecurity during a non-pandemic event may face increased challenges obtaining food/water. |
| **Responders: Fire, Police, Medical, Public Works** | Depending on the scale of the event, response agencies are highly likely to be severely impacted, requiring additional workforce, mutual aid, security, and other resources to continue essential services. High impacts on community health and medical systems, including residential medical facilities, can be expected along with increased demand for personal protective equipment (PPE). |
| **Continuity of Operations** | Impacts on operational continuity are likely to be related to insufficient personnel to carry out mission essential functions, resulting in the need for mutual aid, volunteers, or other personnel support. Operational continuity may be impacted for multiple short-term periods or may occur over an extended time. |
| **Property: Destroyed, Major, Isolated** | Residential and commercial properties are unlikely to be impacted by a human infectious disease outbreak. |
| **Infrastructure: Electricity, Water, Roads, Bridges** | Transportation may be indirectly impacted due to the limitation of personnel, restricted operations, or prioritization of other transportation missions. Electricity, water, roads, and bridges are less likely to be impacted unless personnel are unable to fulfill essential functions and services due to illness or other restrictions. |

| Sector | Impact |
|---|---|
| **Environment** | Limited to no impact expected. |
| **Economic Conditions** | Depending on the outbreak's scale and magnitude, there could be major impacts on the local, national, and global economies. The productivity of industrial and commercial entities may be limited to or redirected to support essential functions or services. Agricultural production may be reduced based on personnel impacts on operations and a decline in marketable goods. Restrictions on business operations may also create significant impacts on the economy, potentially resulting in permanent closure of many large and small businesses leading to high levels of unemployment. Every sector of the economy will most likely experience the negative effects of a pandemic. |
| **Public Confidence** | Confidence is likely to be highly impacted as citizens will expect the government to effectively conduct disaster operations and return the community to a normal state within a reasonable time. Failure to do so may lead to cascading events such as incidents of civil unrest. |

# 3.16 Levee Failure

## 3.16.1 Description

Levees and floodwalls serve as critical flood control structures, designed to mitigate the impacts of flooding by acting as protective barriers composed of materials such as earth, concrete, or other engineered substances.[211] For the purposes of flood risk management, levees are distinguished from smaller flood barriers, such as berms, based on their scale and function. While berms are typically constructed to protect a limited number of structures or, in some cases, a single property, levees and floodwalls provide defense for larger residential, commercial, or industrial areas, often encompassing entire neighborhoods or small communities.[212]

A levee failure occurs when the structure is overtopped, breached, or collapses, resulting in catastrophic consequences for surrounding areas during flood events.[213] The impact of a levee failure on property is comparable to that of a conventional flood; however, a key distinction lies in the increased velocity of water flow at the breach site, which exacerbates the extent of structural damage.[214] Levee failures predominantly transpire during periods of elevated water levels, allowing for advanced warning and risk mitigation measures. Continuous monitoring of levees during such events facilitates early detection of potential failures, thereby enabling emergency response teams to alert at-risk populations and implement necessary evacuations.[215]

## 3.16.2 Risk Assessment

### 3.16.2.1 LOCATION

Levees are found across the state, primarily along the Platte River, Elkhorn River, Missouri River, and their tributaries. Levees protect land with various uses from agriculture to large parts of major metro areas. The Missouri River, Platte River, Elkhorn River, and their tributaries make up the state's primary levee system (see Figure 68).

[211] Federal Emergency Management Agency," Levee System Design and Evaluation," U.S. Department of Homeland Security, 2020.
[212] U.S. Army Corps of Engineers," Levee Safety Program: Managing Flood Risk Through Responsible Levee Management," U.S. Department of Defense, 2019.
[213] Interagency Levee Policy Review Committee, "Interagency Performance Evaluation Task Force: Performance Evaluation of the New Orleans and Southeast Louisiana Hurricane Protection System," U.S. Army Corps of Engineers, 2006.
[214] S. N. Jonkman et al., "Costs of Adapting Coastal Defenses to Sea-Level Rise: New Estimates and Their Implications." *Journal of Coastal Research* (2008): 24(2), 511–517.
[215] National Research Council, *Levees and the National Flood Insurance Program: Improving Policies and Practices.* National Academies Press, 2012.




**Figure 68: Nebraska Leveed Areas**

Agricultural lands protected by levees are especially vulnerable to levee failure because many of the levees are privately constructed and maintained to provide water for crop irrigation and livestock. The widespread flooding of March 2019 pointed out how high-water levels caused overtopping, breaching, or erosion of some agricultural levees, leading to costly repairs that might not be within the means of private landowners to repair or replace. Aging levee infrastructure also presents concerns of failure in high water events.

Analysis of the National Levee Database provides a breakdown of the U.S. Army Corps of Engineers estimated people, structures, and property values protected by levees per county in Table 63.

Table 63: Levee Systems and Risk Associated with Each in the State of Nebraska[216]

| System | County | Length (Miles) | People at Risk | Structures at Risk | Property Value at Risk |
|---|---|---|---|---|---|
| **AMES** | Dodge | 1.03 | 44 | 25 | $9,758,106 |
| **Ames Diking – Platte River LB (NF)** | Dodge | 2.29 | 92 | 54 | $16,544,560 |
| **Bartley NE** | Red Willow | 1.31 | 433 | 273 | $99,076,485 |
| **Big Blue River Levee – Beatrice, NE** | Gage | 0.56 | 0 | 0 | $0 |
| **Big Papio LB – West Center to L St** | Douglas | 0.62 | 41 | 45 | $46,322,487 |
| **Big Papio RB – West Center to L St** | Douglas | 0.41 | 22 | 22 | $28,463,811 |
| **Blair WTP/WWTP Flood Protection System** | Washington | 0.51 | 0 | 0 | $0 |
| **Broken Bow – Mud Creek LB** | Custer | 0.17 | 25 | 18 | $3,812,524 |
| **Broken Bow – Mud Creek RB** | Custer | 0.83 | 95 | 77 | $26,067,418 |
| **Cedar Creek (Omaha F&W) – Platte RB (NF)** | Cass | 0.80 | 4 | 386 | $4,405,345 |
| **Clarkson – Maple Creek LB** | Colfax | 0.61 | 12 | 18 | $1,698,888 |
| **Clarkson – Maple Creek RB** | Colfax | 1.28 | 133 | 132 | $65,489,050 |
| **CLEAR CREEK** | Saunders | 0.36 | 2 | 6 | $17,157,848 |
| **Clear Creek – Platte River RB** | Saunders | 11.76 | 2,496 | 1,801 | $638,089,966 |
| **Columbus – Lost Creek RB** | Platte | 1.34 | 48 | 20 | $2,743,117 |
| **Columbus – Loup River LB** | Platte | 5.17 | 3,665 | 1,599 | $318,163,367 |
| **Corporation Gulch** | Madison | 0.61 | 648 | 381 | $282,358,975 |
| **Corporation Gulch 2** | Madison | 0.78 | 2,900 | 213 | $469,212,920 |
| **Elk Creek Levee** | Dakota | 3.12 | 240 | 91 | $62,635,847 |
| **Elk Creek Levee 2** | Dakota | 3.00 | 236 | 113 | $52,112,641 |
| **Fairbury NE** | Jefferson | 1.74 | 645 | 581 | $90,632,730 |
| **Grand Island – Wood River LB** | Hall | 8.79 | 11,316 | 3,859 | $2,217,277,190 |
| **Grand Island – Wood River RB** | Hall | 6.78 | 101 | 118 | $64,082,155 |
| **Hooper – Elkhorn RB** | Dodge | 2.05 | 495 | 268 | $68,122,988 |
| **Howells – Maple Creek RB** | Colfax | 1.14 | 149 | 69 | $138,857,830 |

[216] National Levee Database. https://levees.sec.usace.army.mil/.

| System | County | Length (Miles) | People at Risk | Structures at Risk | Property Value at Risk |
|---|---|---|---|---|---|
| **Indian Creek Levee – Beatrice, NE 1** | Gage | 0.17 | 0 | 0 | $0 |
| **Indian Creek Levee – Beatrice, NE 2** | Gage | 0.45 | 0 | 0 | $0 |
| **Indianola NE** | Red Willow | 0.86 | 409 | 304 | $139,085,266 |
| **Indianola South** | Red Willow | 0.36 | 32 | 13 | $3,357,247 |
| **L-575 (BW-McKissock-Buchanan-Atchison-Hamburg)** | Atchison, Fremont, Nemaha | 41.39 | 984 | 916 | $164,715,090 |
| **Lake Waconda – Missouri River RB (NF)** | Cass | 2.53 | 540 | 206 | $47,731,686 |
| **LB Jackson Adams, West Papillion Creek** | Sarpy | 0.07 | 30 | 6 | $10,224,426 |
| **Leshara Drainage District** | Saunders | 4.09 | 33 | 32 | $18,206,666 |
| **Lincoln – Salt Creek LB & Haines LB & Middle Cr RB** | Lancaster | 1.26 | 387 | 103 | $126,616,354 |
| **Lincoln – Salt Creek LB & Haines RB** | Lancaster | 1.25 | 32 | 7 | $4,505,712 |
| **Lincoln – Salt Creek LB & Middle Creek LB** | Lancaster | 1.50 | 701 | 76 | $224,535,407 |
| **Lincoln – Salt Creek LB & Oak Creek LB** | Lancaster | 1.72 | 827 | 123 | $149,880,151 |
| **Lincoln – Salt Creek RB** | Lancaster | 4.71 | 1,063 | 440 | $162,227,934 |
| **Lincoln – Salt Creek RB & Dead Man's Run RB** | Lancaster | 1.29 | 655 | 203 | $59,982,840 |
| **Lincoln – Salt Creek RB to Dead Man's Run** | Lancaster | 1.62 | 965 | 146 | $113,872,698 |
| **Little Papio RB & Big Papio LB** | Douglas | 1.25 | 179 | 27 | $65,258,391 |
| **LOUP RIVER – CUSTER** | Custer | 1.16 | 4 | 2 | $515,018 |
| **Macy – Blackbird Creek LB** | Thurston | 2.52 | 7 | 10 | $1,420,682 |
| **Macy – Blackbird Creek RB** | Thurston | 2.44 | 0 | 0 | $0 |
| **Madison – Union Creek LB** | Madison | 0.03 | 0 | 0 | $79,983 |
| **Madison – Union Creek RB** | Madison | 0.02 | 9 | 6 | $672,249 |
| **Meadow Grove – Buffalo Creek RB** | Madison | 0.08 | 46 | 25 | $1,470,180 |
| **Medicine Creek Levee** | Furnas | 0.76 | 401 | 164 | $124,320,266 |
| **Missouri River** | Nemaha, Otoe | 0.17 | 0 | 0 | $0 |

| System | County | Length (Miles) | People at Risk | Structures at Risk | Property Value at Risk |
|---|---|---|---|---|---|
| **Missouri River Washington Co 1** | Washington | 1.11 | 2 | 8 | $25,617,130 |
| **Morse Bluff Drainage District** | Saunders | 2.03 | 21 | 29 | $14,788,918 |
| **MRLS 512-513-R N** | Richardson | 11.65 | 12 | 18 | $2,886,493 |
| **MRLS 512-513-R SE** | Brown, Richardson | 5.76 | 2 | 2 | $205,100 |
| **MRLS 512-513-R SW** | Richardson | 2.01 | 1 | 0 | $52,557 |
| **MRLS R-520** | Richardson | 0.31 | 0 | 0 | $0 |
| **Mud Creek Levee – Burt Co, NE** | Burt | 2.64 | 541 | 191 | $81,860,090 |
| **NEDOUG16 – Big Papio LB – Betz Ditch to Capehart** | Sarpy | 1.89 | 1 | 4 | $14,437 |
| **NEDOUG16 – Big Papio LB – Big Elk Cr to Mud Cr** | Sarpy | 2.37 | 3 | 6 | $3,761,407 |
| **NEDOUG16 – Big Papio LB – Copper Cr to Big Elk Cr** | Sarpy | 2.96 | 3 | 10 | $2,712,861 |
| **NEDOUG16 – Big Papio LB – Mud Creek to Betz Ditch** | Sarpy | 1.81 | 1 | 6 | $3,361,293 |
| **NEDOUG16 – Big Papio RB – 36th St to Willow Lakes Golf Course** | Sarpy | 2.00 | 146 | 11 | $13,769,788 |
| **NEDOUG16 – Big Papio RB – L St to Thompson Cr** | Douglas, Sarpy | 3.28 | 254 | 73 | $95,835,984 |
| **NEDOUG16 – Big Papio RB – Willow Lakes Golf Course to Whitted Creek** | Sarpy | 1.82 | 450 | 36 | $24,731,224 |
| **NEDOUG16 LB & Little Papio LB – L St to Copper Cr** | Douglas, Sarpy | 3.03 | 126 | 105 | $41,823,196 |
| **NESARP84 – West Papio RB – 96th-Big Papio** | Sarpy | 5.01 | 866 | 112 | $77,399,121 |
| **No Name Dike** | Douglas | 3.36 | 103 | 67 | $60,465,170 |
| **Norfolk – Elkhorn LB** | Madison | 3.08 | 1,391 | 481 | $132,176,748 |
| **Norfolk – Elkhorn RB** | Madison | 4.22 | 11,400 | 5,385 | $1,423,201,670 |
| **Oak Creek Levee 1** | Lancaster | 3.32 | 261 | 6 | $46,337,676 |
| **Omaha – Missouri River RB** | Douglas | 12.67 | 8,375 | 3,320 | $1,600,123,581 |
| **Omaha Creek Ditch Levee 1** | Dakota | 1.54 | 5 | 2 | $222,393 |
| **Omaha Creek Ditch Levee 2** | Dakota | 2.49 | 29 | 20 | $8,620,079 |
| **Pender – Logan Creek RB** | Thurston | 2.44 | 1,546 | 568 | $216,594,250 |

| System | County | Length (Miles) | People at Risk | Structures at Risk | Property Value at Risk |
|---|---|---|---|---|---|
| **Pierce – North Branch Elkhorn LB** | Pierce | 0.33 | 2 | 3 | $109,209 |
| **Pierce – North Branch Elkhorn RB** | Pierce | 2.73 | 1,393 | 553 | $151,185,080 |
| **Pigeon Creek Ditch Levee 1** | Dakota | 8.70 | 81 | 52 | $23,480,186 |
| **Pigeon Creek Ditch Levee 2** | Dakota | 2.42 | 8 | 4 | $975,979 |
| **Pigeon Creek Ditch Levee 3** | Dakota | 4.49 | 21 | 13 | $4,826,545 |
| **Pigeon Creek Ditch Levee 4** | Dakota | 2.12 | 4 | 1 | $555,371 |
| **Platte River – Terrytown** | Scotts Bluff | 0.76 | 423 | 110 | $75,394,997 |
| **Platte River Levee 1** | Colfax, Dodge | 3.14 | 0 | 0 | $0 |
| **Platte River Levee 3** | Colfax, Dodge | 4.75 | 46 | 131 | $79,878,188 |
| **Platte Valley Drainage District** | Saunders | 6.36 | 34 | 36 | $29,546,407 |
| **Platte Valley Drainage District 2** | Saunders | 0.75 | 4 | 1 | $469,683 |
| **R-520 – Missouri River RB** | Richardson | 5.57 | 0 | 0 | $506,162 |
| **R-548 – Missouri River & Little Nemaha** | Nemaha | 7.19 | 216 | 27 | $6,991,750 |
| **R-548 LN – Little Nemaha LB & Happy Hollow RB** | Nemaha | 2.21 | 0 | 0 | $0 |
| **R-548 LN – Little Nemaha LB & Moores RB** | Nemaha | 2.94 | 0 | 0 | $0 |
| **R-548 LN – Little Nemaha RB & Jarvis Creek LB** | Nemaha | 3.25 | 0 | 0 | $0 |
| **R-548 LN – Little Nemaha RB & Whiskey Run LB** | Nemaha | 1.60 | 2 | 5 | $267,731 |
| **R-548 LN – Little Nemaha RB & Whiskey Run RB** | Nemaha | 1.66 | 0 | 0 | $0 |
| **R-562 – Peru – Missouri River RB** | Nemaha, Otoe | 7.54 | 30 | 14 | $1,078,361 |
| **R-573 – Missouri River RB** | Otoe | 5.88 | 124 | 4 | $1,401,397,524 |
| **R-613 – Platte LB & Papillion RB & MO River RB** | Sarpy | 9.03 | 593 | 136 | $47,368,251 |
| **R-616-613 – MO Riv RB & Papillion Cr LB** | Sarpy | 9.67 | 1,532 | 540 | $277,715,900 |
| **Richardson County Levee A** | Richardson | 0.93 | 0 | 0 | $0 |
| **Richardson County Levee B** | Richardson | 2.36 | 0 | 0 | $0 |
| **Schilling Refuge Levee 2** | Cass | 0.21 | 0 | 1 | $292,705 |

| System | County | Length (Miles) | People at Risk | Structures at Risk | Property Value at Risk |
|---|---|---|---|---|---|
| **Schilling Refuge Levee 3** | Cass | 2.31 | 0 | 0 | $0 |
| **Schuyler – Lost Creek & Platte River LB** | Colfax | 1.88 | 135 | 118 | $12,694,259 |
| **Schuyler – Shell Creek RB** | Colfax | 2.16 | 620 | 257 | $52,081,043 |
| **Scribner – Pebble Creek LB & Elkhorn River RB** | Dodge | 5.42 | 846 | 557 | $105,338,172 |
| **Seward NE** | Seward | 1.59 | 329 | 67 | $20,891,039 |
| **Sidney – Lodgepole Creek LB & Deadwood Draw LB** | Cheyenne | 2.34 | 2,855 | 1,709 | $494,628,474 |
| **Sidney – Lodgepole Creek LB & Deadwood Draw RB** | Cheyenne | 0.18 | 0 | 0 | $0 |
| **Sidney – Lodgepole Creek RB** | Cheyenne | 0.24 | 0 | 0 | $0 |
| **Silver Creek Levee** | Hall | 1.17 | 239 | 127 | $55,682,414 |
| **Skull Creek Levee 1** | Butler, Saunders | 1.79 | 10 | 8 | $4,313,910 |
| **Skull Creek Levee 2** | Butler, Saunders | 2.04 | 15 | 14 | $5,477,782 |
| **South Seward** | Seward | 0.64 | | | |
| **Tekamah Diversion Ditch Levee 1** | Burt | 1.66 | 10 | 13 | $7,010,219 |
| **Tekamah Diversion Ditch Levee 2** | Burt | 1.77 | 5 | 2 | $464,316 |
| **Upper Clear Creek** | Saunders | 0.05 | 7 | 1 | $496,895 |
| **Valley – Union and No Name Dikes System – Platte River LB (NF)** | Dodge, Douglas | 11.80 | 3,040 | 1,747 | $581,259,037 |
| **Vorhees Creek Levee** | Boone | 0.37 | 6 | 1 | $563,035 |
| **Wakefield – Logan River RB (NF)** | Dixon, Wayne | 1.98 | 1,665 | 776 | $158,828,809 |
| **Waterloo – Elkhorn River RB** | Douglas | 3.41 | 800 | 432 | $106,568,448 |
| **West Papio LB & Big Papio RB** | Sarpy | 7.49 | 134 | 108 | $39,468,885 |
| **West Point – Elkhorn LB** | Cuming | 1.94 | 727 | 510 | $116,632,128 |
| **Western Sarpy – Platte River LB** | Sarpy | 7.73 | 109 | 78 | $16,992,078 |
| **Western Sarpy Drainage District Levee 1** | Sarpy | 0.76 | 0 | 0 | $0 |
| **Western Sarpy Drainage District Levee 3** | Sarpy | 1.39 | 9 | 2 | $4,564,040 |

| System | County | Length (Miles) | People at Risk | Structures at Risk | Property Value at Risk |
|---|---|---|---|---|---|
| **White Tail Lake** | Platte | 1.28 | 164 | 80 | $37,823,931 |
| **Wood River FPP** | Hall | 0.31 | 0 | 0 | $0 |
| **Woodcliff** | Saunders | 1.87 | 2 | 1 | $387,363 |
| **YMCA Camp Kitaki Levee** | Cass | 0.40 | 0 | 0 | $0 |
| **YMCA Camp Kitaki – Platte River RB (NF)** | Cass | 0.22 | 0 | 2 | $49,750 |

### 3.16.2.2 EXTENT

Levee failures in Nebraska pose a substantial threat to landward areas, often resulting in widespread flooding and significant structural damage. The extent of inundation following a failure depends on multiple factors, including the volume of water, the breach location, and the surrounding topography. A levee failure occurring during a 1-percent annual chance flood event has the potential to submerge vast sections of land within the 100-year floodplain, which otherwise would have been protected by the levee system.[217] The structures positioned closest to the breach experience the most severe impact, as they bear the full force of the initial flood surge. The velocity of floodwaters at the breach site can result in rapid erosion and scouring, further weakening the levee and increasing downstream destruction. Additionally, strong water currents generated by the failure can dislodge debris, damaging critical infrastructure such as roads, bridges, and utility systems.[218]

Beyond the immediate impact at the breach site, flooding from a levee failure can have long-term consequences for inland areas. As water spreads across the floodplain, buildings, homes, and agricultural lands remain submerged for extended periods, increasing the risk of structural weakening, mold growth, and soil degradation.[219] The prolonged presence of floodwaters can also compromise underground infrastructure, including sewage and water treatment facilities, potentially resulting in contamination and public health risks. Economic losses from levee failures can be substantial, particularly for communities that rely on agriculture, where crop losses and soil erosion further contribute to financial hardship.[220] Displaced residents may face challenges in returning to their homes, as rebuilding efforts can be delayed due to infrastructure damage and resource constraints. Given these risks, ongoing levee maintenance, regular inspections, and improved flood mitigation strategies remain critical to reducing the likelihood of catastrophic levee failures and protecting vulnerable communities across Nebraska.

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[217] Federal Emergency Management Agency," Flood Hazard Mapping and Risk Analysis," U.S. Department of Homeland Security, 2004.
[218] National Research Council, *Levees and the National Flood Insurance Program: Improving Policies and Practices,* National Academies Press, 2012.
[219] U.S. Army Corps of Engineers, "Levee Safety Program: Managing Flood Risk Through Responsible Levee Management," U.S. Department of Defense, 2019.
[220] Interagency Levee Policy Review Committee, "Performance Evaluation of the New Orleans and Southeast Louisiana Hurricane Protection System," U.S. Army Corps of Engineers, 2006.

### 3.16.2.3 PREVIOUS EVENTS

Since the 2021 Nebraska State Hazard Mitigation Plan, there have been no recorded incidents of levee failure in the state of Nebraska. Based on historical records, the state of Nebraska has a 5% annual probability of impact by a levee failure or approximately one levee failure every 18 years. The following are levee failures that have impacted the state of Nebraska.

The levee systems along the Missouri River have faced repeated testing by major flood events, including those in 1952, 1993, 2010, 2011, and 2019. While Omaha avoided a levee breach during the 1952 flood, other areas experienced significant impacts. The U.S. Army Corps of Engineers (USACE) estimated damages from this event at $11.9 million in 1952 dollars, highlighting the financial toll of flooding on infrastructure and communities.[221]

In 1993, severe storms led to tornadoes and widespread flooding, prompting a federal disaster declaration (DR-993) for 52 counties. Precipitation levels in July reached 8.35 inches statewide, contributing to record flood crests along the Missouri River, particularly near Plattsmouth and Brownville. A levee breach near Brownville threatened the Cooper Nuclear Power Plant, though no direct damage was reported. During this event, 32 levees were overtopped, including 5 along the Missouri River. A Government Accountability Office (GAO) report identified three primary reasons for overtopping: (1) a reduction in levee design flow capacity, resulting in higher flood levels for the same flow rate, (2) inaccurate flood flow estimates due to the distance between levees and flood gauges, and (3) the specific location of overtopping relative to flood conditions.

The 2011 spring and summer flood season saw record rainfall combined with high water inflows into the Missouri River reservoir system from melting snow and previous precipitation. These conditions led to levee breaches and widespread flood damage. During this time, USACE allocated substantial resources for levee maintenance and operations, spending over $2 million on repair efforts in Omaha and nearly $1 million in Sarpy County. Additionally, extensive post-flood rehabilitation was necessary to restore levees to operational standards.

In 2015, heavy rainfall across south-central and southeastern Nebraska caused significant flooding throughout the region. Levees in Lincoln were at risk of overtopping and experienced substantial ponding on the interior side. These levees were designed to withstand a 50-year flood event, and none failed. However, following the flood, rehabilitation efforts were required to address subsurface soil loss and other structural concerns.

The March 2019 flooding, driven by rapid snowmelt, warm temperatures, and rainfall over a short, 48-hour period, resulted in catastrophic conditions. Frozen ground and thick ice layers in the Missouri, Elkhorn, and Platte Rivers exacerbated flooding, leading to extensive levee breaches across more than 350 miles. Among the 47 documented levee breaches across multiple states, at least six occurred in Nebraska, including the following:

[221] U.S. Army Corps of Engineers, “Annual Report of the Chief of Engineers, U.S. Army, 1952,” U.S. Government Printing Office, 1952.

- R-613 – Sarpy County
- R-562 – Nemaha County
- Western Sarpy – Ashland, Nebraska
- Clear Creek – Ashland, Nebraska
- Union Levee – Valley, Nebraska
- R-573 – Otoe County

These failures resulted in severe devastation, with four confirmed fatalities, hundreds of individuals requiring rescue by air or boat, and tens of thousands forced to evacuate. Beyond immediate impacts to communities, the levee breaches also contributed to extensive agricultural losses, further compounding the economic consequences of the disaster.

Since the 2019 flood, significant efforts have been made to repair and reinforce the state's levee systems. The status of these repairs is detailed in the following table, outlining the ongoing work to enhance flood protection and resilience across Nebraska.

**Table 64: Status of Active Levee System Repairs in Nebraska[222]**

| System | Stream | 2019 Impact | Contract Amount | Last Update | Status |
|---|---|---|---|---|---|
| **Ames Diking** | Platte River | Damaged – repair levee system to authorized level of flood risk management | $1,260,000 | 2/3/21 | Completed 8/14/2020 |
| **Broken Bow** | Mud Creek | Damaged – repair levee system to authorized level of flood risk management | $165,000 | 11/18/19 | Completed 10/17/2019 |
| **Cedar Creek** | Platte River | Damaged in 3 locations | $1,340,000 | 1/10/20 | Completed 12/12/2019 |
| **Clear Creek** | Platte River | 4 breaches and substantial damages | $9,200,000 | 2/3/21 | Completed 10/1/2020 |
| **Columbus** | Loup River | Damaged – repair gabion wall | $2,200,000 | 2/3/21 | Completed 1/9/2020 |
| **Lake Wa Con-Da** | Missouri River | Damaged – repair levee system to authorized level of flood risk management | Undetermined | 2/3/21 | The levee sponsor is working to secure the necessary real estate for the levee repair efforts. |

[222] US Army Corps of Engineers Omaha District. https://www.nwo.usace.army.mil/Omaha-District-System-Restoration-Team/.

| System | Stream | 2019 Impact | Contract Amount | Last Update | Status |
|---|---|---|---|---|---|
| **Norfolk** | Elkhorn River | Damaged – repair levee system to authorized level of flood risk management | $2,690,000 | 2/3/21 | 92% complete 2/3/2021 |
| **Omaha** | Missouri River | Damaged – repair levee system to authorized level of flood risk management | $1,255,879 | 2/3/21 | 82% complete 2/3/2021 |
| **Papillion Creek System** | Papillion Creek | Many of 13 levee systems damaged | $7,300,000 | 2/3/21 | Completed 10/20/2020 |
| **Pender** | Logan Creek | Damaged – repair levee system to authorized level of flood risk management | $7,000,000 | 2/3/21 | Completed 11/20/2020 |
| **Pierce** | North Branch Elkhorn | Damaged – repair levee system to authorized level of flood risk management | $183,000 | 11/8/19 | Completed 10/1/2019 |
| **R616-613** | Missouri River & Big Papillion Creek | Damaged – repair levee system to authorized level of flood risk management | $10.300,000 | 3/16/20 | Completed 3/16/2020 |
| **Salt Creek System** | Salt Creek | Channel bank erosion | $4,700,000 | 2/3/21 | Completed 9/13/2020 |
| **Scribner** | Pebble Creek & Elk Horn River | Debris & sedimentation damage – repair levee system to authorized level of flood risk management | $94,000 | 11/22/19 | Completed 11/7/2019 |
| **Union Dike & No Name Dike** | Platte River | Damaged – repair levee system to authorized level of flood risk management | $1,670,000 | 2/3/21 | Completed 9/13/2020 |
| **Wakefield** | Logan Creek | Damaged – significant erosion; repair levee system to authorized level of flood risk management | $3,100,000 | 2/3/21 | Completed 1/5/2021 |
| **Waterloo** | Elkhorn River | Damaged – sand boils; repair levee system to authorized level of flood risk management | Undetermined | 2/3/21 | 10% complete 2/3/2021 |
| **Western Sarpy** | Platte | Damaged – repair levee system to authorized level of flood risk management | $4,200,000 | 2/3/21 | Completed 5/8/2020 |
| **West Point** | Elkhorn River | Damaged – repair levee system to authorized level of flood risk management | Undetermined | 2/3/21 | The levee sponsor is working to secure the |

| System | Stream | 2019 Impact | Contract Amount | Last Update | Status |
|---|---|---|---|---|---|
| | | | | | necessary real estate for the levee repair efforts. |

#### 3.16.2.4 EFFECTS OF FUTURE CONDITIONS

Increasingly extreme weather patterns and shifting precipitation trends place greater stress on levee systems, which were often designed based on historical data that may no longer reflect current conditions. More frequent and intense storms can lead to higher floodwaters, increasing the likelihood of overtopping or erosion. Additionally, prolonged periods of heavy rainfall can weaken levee structures by saturating the surrounding soil, making them more vulnerable to failure. As water levels continue to fluctuate unpredictably, levees may require more frequent inspections, reinforcements, and upgrades to ensure they remain effective in protecting communities.

At the same time, growing populations and expanding urban development in flood-prone areas place additional pressure on levee infrastructure. As more people settle in regions dependent on levees for protection, the potential consequences of a failure become more severe, both in terms of human safety and economic loss. Increased development also alters natural drainage patterns, potentially overwhelming levee systems that were not designed to accommodate such rapid changes. As demand for land near rivers and coastlines continues to rise, maintaining and improving levees will become increasingly critical to ensuring long-term resilience against evolving environmental and societal pressures.

### 3.16.3 Vulnerability Analysis

Nebraska faces significant vulnerability to levee failures due to its reliance on these structures for flood protection along major rivers and tributaries. The state's landscape, consisting of extensive floodplains and low-lying areas, increases the risk of widespread flooding when levees are breached or overtopped. Failures can occur with little warning, especially during periods of heavy rainfall or rapid snowmelt, leading to catastrophic water inundation. The impact is particularly severe in rural and agricultural areas, where levees protect farmland, homes, and infrastructure from rising waters. Vulnerable populations, including older adults, individuals with access and functional needs, and those residing in remote communities, face heightened risks due to limited access to emergency services, evacuation routes, and reliable communication systems. The widespread presence of levees across Nebraska further amplifies this vulnerability, as damage to critical infrastructure, including roads, power supplies, and water treatment facilities, can delay response efforts and complicate recovery. Rural communities, which often lack the resources and emergency management capacity of urban centers, are especially at risk of prolonged disruptions and economic losses in the aftermath of a levee failure.

### 3.16.3.1 NATIONAL RISK INDEX

The National Risk Index (NRI) provides communities with an online tool to display potential risk to 18 natural hazards, but levees are not provided in the NRI.

### 3.16.3.2 ESTIMATED IMPACT AND POTENTIAL LOSSES

Levee failures pose significant threats to Nebraska, impacting various aspects of the state's communities. The sudden and uncontrolled release of floodwaters can result in widespread property damage, displacement of residents, and increased health risks due to waterborne illnesses and contaminated drinking water. Anxiety and stress levels may rise among affected populations, diminishing overall quality of life. Economically, Nebraska's agricultural sector, a fundamental pillar of the state's economy, faces severe losses as floodwaters destroy crops, drown livestock, and erode fertile soil. Businesses and tourism-dependent areas may experience economic downturns as damaged infrastructure, road closures, and safety concerns discourage visitors. The strain on critical facilities, such as hospitals, emergency services, and levee systems, can lead to prolonged closures and require costly repairs, stretching state and local resources.

Beyond immediate structural damage, levee failures also cause long-term environmental disruptions, altering river ecosystems, displacing wildlife, and increasing soil erosion. Flooding may permanently change landscapes, threatening historic sites, recreational areas, and cultural landmarks vital to Nebraska's identity. Community traditions and local events, particularly those centered around outdoor spaces and historic venues, may be disrupted if key locations suffer damage or become inaccessible.

### 3.16.3.3 ACCESS AND FUNCTIONAL NEEDS

Levee failures pose significant risks to individuals with access and functional needs, as these populations often face greater challenges in responding to emergencies. Those with mobility impairments may struggle to evacuate quickly, particularly if floodwaters rise rapidly or transportation infrastructure is damaged. Individuals with sensory disabilities, such as those who are visually or hearing impaired, may require specialized communication methods to receive timely warnings and instructions. Additionally, people who rely on medical devices or regular healthcare access, such as dialysis patients or individuals dependent on refrigerated medications, may face life-threatening consequences if power outages or facility closures occur due to widespread flooding.

Beyond physical limitations, social and economic factors also play a critical role in the impact of levee failures on these communities. Older adults, individuals with cognitive disabilities, and those with limited English proficiency may have difficulty understanding or acting on emergency guidance, increasing their vulnerability during a crisis. Disruptions to public transportation systems can leave many without the means to evacuate, particularly in lower-income communities where private vehicle ownership is less common. Furthermore, temporary shelters may not always be equipped to meet the specific needs of individuals requiring medical support, personal assistance, or specialized diets. Ensuring inclusive disaster planning and response strategies is essential to reducing the disproportionate risks faced by these populations in the event of a levee failure.

### 3.16.3.4 COMMUNITY LIFELINES

Levee failures can have profound and cascading effects on FEMA's community lifelines, which are critical systems essential for public health, safety, and economic security. One of the most immediate impacts is on safety and security, as flooding from a levee breach can endanger lives, displace residents, and overwhelm emergency response operations. Law enforcement, fire departments, and emergency medical services may struggle to navigate flooded areas, delaying rescue efforts and medical assistance. In severe cases, entire communities may require evacuation, placing additional strain on emergency shelters and logistical support. Furthermore, public confidence in disaster preparedness and response efforts can be diminished if levee systems fail unexpectedly, particularly in areas that depend on them for long-term flood protection.

Levee failures also disrupt food, water, and shelter lifelines, as floodwaters can contaminate drinking water supplies, damage wastewater treatment facilities, and render homes uninhabitable. Infrastructure supporting food distribution, including warehouses and transportation routes, may be compromised, leading to shortages in affected areas. Additionally, electrical and natural gas systems often sustain damage, further complicating recovery efforts and prolonging power outages, which can impact critical facilities such as hospitals, nursing homes, and emergency shelters. The transportation lifeline is particularly vulnerable, as roads, highways, railways, and bridges may be submerged or washed away, delaying emergency response and supply chain operations.

The economic repercussions of levee failures extend to energy, communications, and supply chain management, further straining community resilience. Damage to power grids and fuel supply infrastructure can disrupt energy distribution, making it difficult for first responders and residents to access essential services. Flooded areas may experience interruptions in communication networks, hampering coordination among emergency responders and limiting public access to timely information. Additionally, businesses, industries, and agricultural operations may suffer long-term financial losses due to property damage and prolonged operational disruptions. Given the interconnected nature of FEMA's community lifelines, a levee failure can have widespread consequences that necessitate comprehensive mitigation strategies and resilient infrastructure planning to safeguard vulnerable communities.

### 3.16.3.5 ENHANCED PRIORITY RISK INDEX SCORE

The Enhanced Priority Risk Index (EPRI) provides the state of Nebraska with a methodology to measure the impact each profiled hazard may have on the seven Emergency Management Accreditation Program Standard 4.1.2 sectors (i.e., public; responders; continuity of operations including continued delivery of services; property, facilities, and infrastructure; the environment; the economic condition of the jurisdiction; and public confidence in the jurisdiction's governance). The following table provides the EPRI scores for the hazard with the appropriate risk factor.

Table 65: Levee Enhanced Priority Risk Index Score

| | Probability Next 5 Years | Impact | Spatial Extent | Warning Time | Duration | Vulnerability | Probability | Overall Risk Factor |
|---|---|---|---|---|---|---|---|---|
| **Risk Level** | 2.2 | 2.6 | 2.6 | 2.9 | 3.1 | 2 | 2.2 | 2.5 |

Table 66 provides a summary of levee failure impacts, including impact to the public, first responders, continuity of operations, property, infrastructure, environment, economic conditions and public confidence, and the consequences of those impacts.

Table 66: Levee Impacts and Consequences

| Sector | Impacts |
|---|---|
| **Public** | **Housing** – The extent of structural damage within flood-prone areas depends on the volume of water contained by the levee and the proximity of the affected structures to the failure site.<br>**Casualties/Fatalities** – The level of risk to human life is influenced by the available warning time and the distance downstream from the breach. Individuals with less than 30 minutes of warning face the highest danger.<br>**Work** – The disruption of workplaces is contingent upon their location in relation to the levee failure zone.<br>**Food/Water** – Minimal anticipated impact on food and water availability. |
| **First Responders** | Emergency responders will generally remain unaffected unless they or their facilities are located within the flood zone. However, response efforts must account for potential contamination, disease outbreaks, and hazardous materials within floodwaters.<br>**Medical** – The ability of healthcare facilities to provide treatment depends on whether they are situated in the affected area. Hospitals and medical centers may experience a surge in patients if a densely populated area is impacted, necessitating the activation of emergency medical response plans. |
| **Continuity of Operations** | If key government buildings, such as courthouses or administrative offices, are within the flood zone, the damage could be severe. This includes potential loss of electronic and paper records. The level of disruption is directly related to the existence and effectiveness of continuity of operations (COOP) planning. |
| **Property, Facilities, and Infrastructure** | Structures within the inundation zone may suffer minor to complete destruction, depending on their distance from the levee breach and the volume of released water. Agricultural lands, including crops and livestock, will experience varying levels of impact. Infrastructure in the affected area may sustain substantial damage, including power outages, contaminated water supplies, and the destruction or isolation of roads and bridges. Restoration efforts could be delayed until floodwaters recede. |
| **Environment** | Floodwaters will introduce contaminants, accelerate soil erosion, and distribute debris across the affected region. Agricultural losses due to inundation and soil degradation are highly probable. |

| Sector | Impacts |
|---|---|
| **Economic Conditions** | The economic consequences of a levee failure in Nebraska can range from negligible to severe, depending on the critical infrastructure affected and the volume of water released. |
| **Public Confidence** | The public's perception of government accountability will be influenced by whether the failure is viewed as preventable. Actions taken or omitted by governmental agencies prior to the event may shape public sentiment. |

# 3.17 Plant Disease and Pests

## 3.17.1 Description

A diseased plant is one that has been continuously disturbed by a causal agent, resulting in an abnormal physiological process that disrupts its normal structure, growth, function, or other activities.

Plant diseases are broadly classified according to the nature of their primary causal agent, either infectious or noninfectious. Infectious plant diseases are caused by pathogenic organisms; noninfectious plant diseases are caused by unfavorable growing conditions, including extreme temperatures, imbalance of moisture and oxygen, toxic substances in the soil or atmosphere, and an excess or deficiency of an essential mineral.

## 3.17.2 Risk Assessment

### 3.17.2.1 LOCATION

In 2023, there were 44,000 farms with over $29,413,398[223] in market value agricultural product sales in 2022, covering more than 44 million acres.[224] Although the number of farms declined slightly in 2023, from 44,479 in 2022, farms are in every county. Some diseases and pests affect residential and community plants, trees, and agricultural products. One method of tracking crop diseases is coordinated by the University of Nebraska-Lincoln's (UNL) Plant and Pest Diagnostic Lab, which collects disease reports from geographic districts, depicted in the map in Figure 69.

[223] USDA, "Census of Agriculture." https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Nebraska/cp99031.pdf.
[224] USDA, "2023 State Agriculture Overview." https://www.nass.usda.gov/Quick_Stats/Ag_Overview/stateOverview.php?state=NEBRASKA.

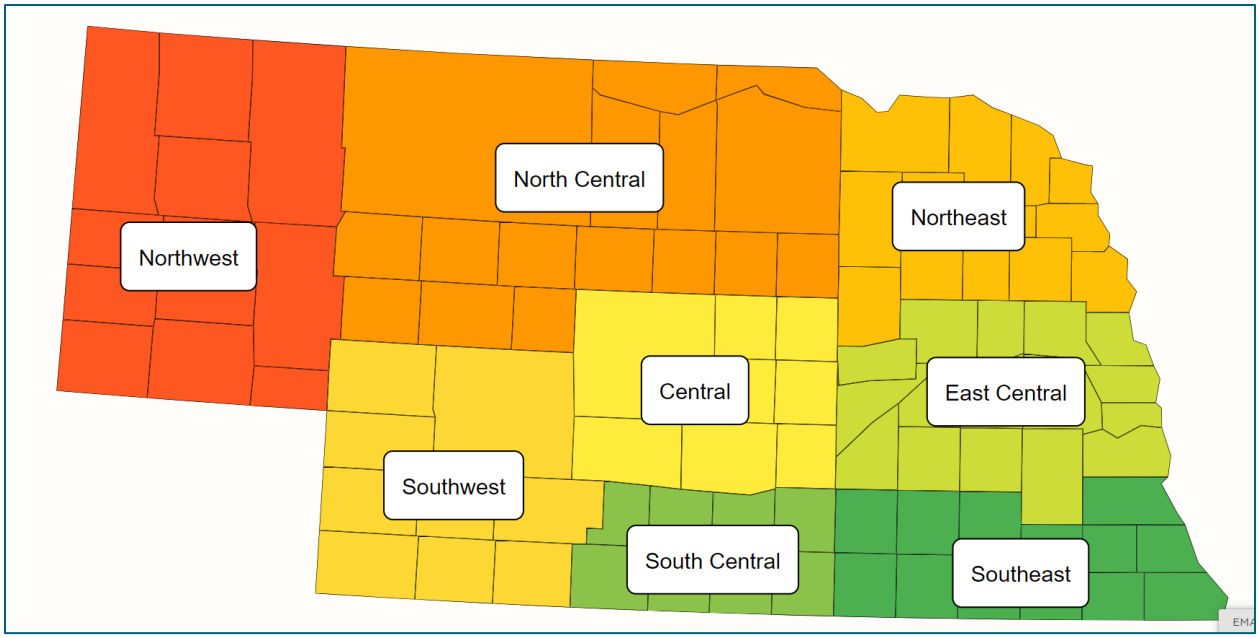



Figure 69: Nebraska Plant Disease Reporting Districts

Table 67 provides plant disease by district from July 1 through July 15, 2020, the latest disease report found.

Table 67: Disease Report per District 2020[225]

| District | Soybean | Corn | Wheat |
|---|---|---|---|
| **Northwest** | N/A | N/A | Wheat Streak Mosaic Virus |
| **Central** | Frogeye Leaf Spot, Phyllosticta Leaf Spot | Northern Corn Leaf Blight | N/A |
| **Northeast** | N/A | Fusarium Crown and Root Rot | N/A |
| **Southeast** | Phytophthora Root and Stem Rot | Fusarium Crown and Root Rot, Southern rust, common rust | N/A |
| **South District** | Frogeye Leaf Spot | Northern Corn Leaf Blight, Bacterial Leaf Streak | N/A |
| **North District** | Rhizoctonia Damping Off | N/A | N/A |
| **East District** | Phytophthora Root and Stem Rot | Anthracnose Leaf Blight, Common Rust | N/A |

[225] University of Nebraska-Lincoln, "July 2020 Disease Reports from the UNL Diagnostic Clinic." https://cropwatch.unl.edu/2020/july-2020-disease-reports-unl-diagnostic-clinic/.

### 3.17.2.2 EXTENT

Due to uncalculated variables and a lack of consistent reporting and data-gathering mechanisms, it is not possible to determine the total net losses caused by specific pests and other plant diseases within the state each year. Each farm has its history of damages, level of severity, duration of each event, and dates of occurrence for each agricultural disease or pest outbreak. However, the extent of Nebraska's plant disease and pest issues can be significant due to the state's diverse agricultural landscape. Nebraska's key crops, including corn, soybeans, and wheat, can be affected by various diseases and pests.

### 3.17.2.3 PREVIOUS EVENTS

The following tables display critical data on crop losses in Nebraska due to diseases and pests over a three-year period from 2021 to 2023.[226] This period has been particularly significant for agricultural stakeholders as they have navigated various challenges affecting crop yields. Understanding the extent of these losses is critical for assessing the economic impact on farmers and the larger agricultural community. The information highlights trends in crop health, identifies the most involved crops (corn, soybean, and wheat), and emphasizes the importance of successful pest management and disease control approaches.

**Table 68: Corn Disease Loss, 2021–2023[227]**

| Disease | % Loss | Bushels Lost | $(USD) Loss | $(USD)Loss per Acre |
|---|---|---|---|---|
| **Anthracnose stalk rot** | 0.18 | 3,109,709 | $15,522,032 | $1.58 |
| **Bacterial leaf stalk** | 1.08 | 18,819,044 | $109,003,685 | $11.10 |
| **Bacterial stalk rot** | 0 | 510 | $3,519 | $0 |
| **Charcoal rot** | 0.10 | 1,807,524 | $8,960,141 | $0.91 |
| **Crown rot** | 0.50 | 5,543,182 | $32,411,401 | $4.97 |
| **Diploid ear rot** | 0 | 5,100 | $35,191 | $0 |
| **Fusarium ear rot** | 0.07 | 1,254,804 | $6,313,685 | $0.64 |
| **Fusarium stalk rot** | 1.51 | 26,313,681 | $156,047,438 | $15.90 |
| **Gibberella ear rot** | 0 | 510 | $3,519 | $0 |
| **Gibberella stalk rot** | 0.24 | 4,159,135 | $21,877,453 | $2.23 |
| **Goss's wilt** | 0.08 | 1,467,762 | $9,402,082 | $0.96 |
| **Gray leaf spot** | 0.05 | 917,007 | $5,331,657 | $0.54 |
| **Nematodes** | 1.01 | 17,646,499 | $100,247,531 | $10.21 |
| **Northern corn leaf blight** | 0 | 11,742 | $68,635 | $0.01 |
| **Physoderma leaf spot** | 0 | 599 | $2963 | $0 |

[226] Crop Protection Network, "Field Crop Disease and Insect Loss Calculator." https://loss.cropprotectionnetwork.org/.
[227] Ibid.

| Disease | % Loss | Bushels Lost | $(USD) Loss | $(USD)Loss per Acre |
|---|---|---|---|---|
| Root rots | 0 | 11,086 | $64,823 | $0.01 |
| Seedling blights | 0 | 51,002 | $351,911 | $0.04 |
| Southern rust | 0.19 | 3,280,666 | $17,715,327 | $1.80 |
| Tar spot | 0.03 | 603,721 | $2,998,366 | $0.31 |

Table 69: Corn Crop Loss by Pest, 2021–2023[228]

| Pest | % Loss | Bushels Lost | $(USD) Loss | $(USD)Loss per Acre |
|---|---|---|---|---|
| Armyworm | 0.05 | 1,112,365 | $6,587,047 | $0.67 |
| Banks grass mite | 2.54 | 52,555,211 | $324,998,794 | $33.11 |
| Black cutworm | 0.54 | 11,123,646 | $65,870,466 | $6.71 |
| Corn earworm | 3.06 | 63,195,211 | $377,666,794 | $38.47 |
| Corn rootworms | 10.08 | 208,286,260 | $1,247,185,314 | $127.05 |
| European corn borer | 0.01 | 222,473 | $1,317,409 | $0.13 |
| Fall armyworm | 0.01 | 222,473 | $1,317,409 | $0.13 |
| Grasshopper (multiple species) | 1.08 | 22,247,293 | $131,740,931 | $13.42 |
| Grubs | 0.05 | 1,112,365 | $6,587,047 | $0.67 |
| Other cutworms | 0.01 | 222,473 | $1,317,409 | $0.13 |
| Sap beetle | 0.01 | 222,473 | $1,317,409 | $0.13 |
| Seedcorn maggot | 0.05 | 1,112,365 | $6,587,047 | $0.67 |
| Stink bugs | 0.01 | 222,473 | $1,317,409 | $0.13 |
| Twospotted spider mite | 3.53 | 73,076,918 | $452,766,573 | $46.12 |
| Western bean cutworm | 5.27 | 109,036,236 | $656,337,699 | $66.86 |
| Wireworm (multiple species) | 0.05 | 1,112,365 | $6,587,047 | $0.67 |

[228] Ibid.

Table 70: Soybean Disease Loss 2021–2023

| Disease | % Loss | Bushels Lost | $(USD) Loss | $(USD)Loss per Acre |
|---|---|---|---|---|
| Anthracnose stem blight | 0 | 314 | $4121 | $0 |
| Bacterial disease | 0.02 | 48,831 | $697282 | $0.13 |
| Brown stem rot | 0.05 | 145,105 | $1,836,519 | $0.33 |
| Charcoal rot | 0.43 | 1,335,828 | $16,913,438 | $3.06 |
| Diaporthe/Phomopsis complex | 0 | 1,900 | $25,580 | $0 |
| Frogeye leaf spot | 0.01 | 31,408 | $412,145 | $0.07 |
| Fusarium root rot | 0.01 | 31,408 | $412,145 | $0.07 |
| Phytophthora root and stem rot | 0.67 | 2,097,306 | $27,246,132 | $4.92 |
| Pod and stem blight | 0.22 | 696,710 | $8,860,550 | $1.60 |
| Purple seed stain or Cercospora leaf | 0 | 4,297 | $55,941 | $0.01 |
| Sclerotinia stem rot (white mold) | 0.80 | 2,507,792 | $31,844,201 | $5.75 |
| Seedling diseases | 0.10 | 314,083 | $4,121,455 | $0.74 |
| Septoria brown spot | 0 | 3,141 | $41,215 | $0.01 |
| Soybean cyst nematode | 2.30 | 7,231,649 | $95,219,147 | $17.21 |
| Stem canker | 0.01 | 31,408 | $412,145 | $0.07 |
| Sudden death syndrome | 0.30 | 930,842 | $12,384,667 | $2.24 |
| Viruses | 0 | 3,830 | $53,173 | $0.01 |

There were no losses of soybean crops due to pests from 2021 to 2023.

Table 71: Wheat Disease Crop Loss, 2021–2023[229]

| Disease | % Loss | Bushels Lost | $(USD) Loss | $(USD)Loss per Acre |
|---|---|---|---|---|
| Bacterial leaf streak and black chaff | 0 | 123 | $852 | $0.00 |
| Bacterial yellow dwarf virus | 0.04 | 13,278 | $112,196 | $0.11 |
| Common root and foot rot | 0.01 | 4,415 | $29,301 | $0.03 |
| Fusarium head blight | 0.12 | 43,563 | $287,881 | $0.29 |

[229] Ibid.

| Disease | % Loss | Bushels Lost | $(USD) Loss | $(USD)Loss per Acre |
|---|---|---|---|---|
| **Fusarium root, crown, and foot rot** | 0.10 | 36,141 | $238,692 | $0.24 |
| **High Plains disease, Triticum mosaic, and wheat streak mosaic** | 0.25 | 88,517 | $747,972 | $0.74 |
| **Leaf rust** | 0 | 1,654 | $11,118 | $0.01 |
| **Loose smut** | 0.01 | 2,973 | $19,783 | $0.02 |
| **Powdery mildew** | 0 | 1,531 | $10,266 | $0.01 |
| **Rhizoctonia root rot** | 0.01 | 2,884 | $19,036 | $0.02 |
| **Septoria leaf spot** | 0.50 | 174,944 | $1,157,943 | $1.15 |
| **Stripe rust** | 0.83 | 288,541 | $1,904,404 | $1.89 |
| **Take-all** | 0.01 | 2,884 | $19,036 | $0.02 |
| **Tan spot** | 0.49 | 169,784 | $1,129,621 | $1.12 |

There were no losses of wheat crops due to pests from 2021 to 2023.

#### 3.17.2.4 PROBABILITY

The probability of future plant disease in Nebraska is highly likely due to a combination of factors. Several diseases tend to change over time, allowing for the infection of previously resistant cultivars. If observed meteorological trends hold out, climatological conditions will lead to greater plant stress, leading to easier paths of infection and higher yield losses. Similarly, if the trend of rising temperatures continues, the number and appetite of insects is predicted to rise. Not only will the loss increase due to consumption by insects, but more pests will lead to more insect-borne plant diseases being spread to previously uninfected fields. Additionally, the migration of pests due to changing climates can introduce new diseases to crops, and increased global trade raises the risk of bringing in new pathogens. Together, these elements suggest that Nebraska's agricultural environment will continue to face challenges from plant diseases.

#### 3.17.2.5 EFFECTS OF FUTURE CONDITIONS

If observed meteorological trends hold out, climatological conditions will lead to greater plant stress, easier paths of infection, and higher yield losses. Similarly, if the trend of rising temperatures continues, the number and appetite of insects are predicted by some to rise. The loss will increase due to insect consumption, and more pests will lead to more insect-borne plant diseases being spread to previously uninfected fields.

With shifting climate zones, insects native to other climates may now be able to survive within the state of Nebraska, whereas previously, they could not. Many native plants do not have a defense against these insects.

## 3.17.3 Vulnerability Analysis

All jurisdictions in Nebraska would be impacted if a large-scale plant disease or pest infestation caused greatly reduced yield in Nebraska's bigger cash crops. A loss in production would lead to losses in farm revenue as well as state and local tax revenue. Rural communities could see further population losses as farmers, unable to meet financial demands, could lose their land to creditors. Prices of impacted commodities would rise at the markets, leading to increased costs being passed on to the consumers. Wherever a farm is located, that area is prone to the hazards of plant diseases. Most of the fungal diseases are carried on the wind for hundreds of miles, and many of the bacterial diseases are pest-borne and/or survive in debris from previous crop cycles.

Due to environmental, agricultural, and economic factors, Nebraska faces significant vulnerabilities related to pests and plant diseases. Increased awareness, proactive management, and sustainable practices will mitigate these risks and protect the state's agricultural assets.

### 3.17.3.1 ESTIMATED IMPACT AND POTENTIAL LOSSES

All jurisdictions within Nebraska would be impacted if a large-scale plant disease or pest infestation caused significantly reduced yield in Nebraska's bigger cash crops. Production loss would lead to farm, state, and local tax revenue losses. Rural communities could see population losses as farmers cannot meet financial demands and lose their land to creditors. The prices of impacted goods would rise in the markets, increasing costs being passed on to the consumers.

This hazard would not directly impact state assets. However, indirect economic consequences from a severe incident could impact state funding abilities and stress the state government. Nebraska's $9.98 billion in total agricultural exports in 2022 translates to $10.68 billion in additional economic activity. In 2021, every dollar of farm exports generated $1.07 in economic activities, including transportation, financing, warehousing, and production.[230] Plant disease outbreaks or pest infestations could negatively impact crop production and agriculturally dependent businesses. Nebraska's crop products are among the top five agricultural production rankings in the United States, as shown in Table 72.

**Table 72: Nebraska Top 5 Agricultural Rankings in the United States, 2023**[231]

| Rank | Crop/Product |
|---|---|
| **1st** | Beans, Dry Edible, Great Northern |
| **2nd** | Beans, Dry Edible, Pinto |
| | Millet, Proso |
| **3rd** | Beans, Dry Edible, Small Red |
| | Corn for Grain |

[230] Nebraska Department of Agriculture, "Nebraska Ag Facts." https://nda.nebraska.gov/facts.pdf.
[231] USDA National Agricultural Statistics Service, "Nebraska Rank in U.S. Agriculture." https://www.nass.usda.gov/Statistics_by_State/Nebraska/Publications/Economic_Releases/Rank/2024/NE-rank24.pdf.

| Rank | Crop/Product |
|---|---|
| | Sorghum for Silage |
| **4th** | Beans, Dry Edible, All |
| | Beans, Dry Edible, Light Red, Kidney |
| | Hay, All |
| | Peas, Dry Edible |
| | Sunflower, non-oil |
| **5th** | Hay, Alfalfa |
| | Sorghum for Grain |
| | Sugar Beets |
| | Sunflower, All |
| | Sunflower, Oil |

### 3.17.3.2 ACCESS AND FUNCTIONAL NEEDS

Plant diseases and pests can greatly affect people with access and functional needs in Nebraska, putting their food security and health at risk. Many depend on local farms for fresh produce, and when crops fail, their access to food decreases.

Farmers who lose crops also face financial issues, which can threaten their livelihoods and the jobs of those relying on them, affecting the whole community.

Health is another concern, as people with dietary needs, such as diabetes, may have limited food options.

People might struggle to find details on pest management and agricultural support, making it harder to choose the right foods. Community support is essential, but vulnerable individuals may have trouble relying on social networks.

Finally, the mental health impacts of food insecurity and financial stress can worsen anxiety and depression. This emphasizes the need for comprehensive support to address physical and emotional needs.

### 3.17.3.3 COMMUNITY LIFELINES

Plant diseases and pests impact several FEMA community lifelines that focus heavily on agriculture. One important lifelines is Safety and Security. Outbreaks can threaten food security, requiring local authorities to manage resources carefully for biosafety.

Another important lifeline is Food, Hydration and Shelter. When crop production suffers due to diseases or pests, the food supply chain is disrupted. This affects food availability and prices and may also change water needs, especially in irrigated areas.

Health and Medical also is affected. Pests and diseases can harm humans and livestock, increasing the need for medical support and monitoring to prevent health issues.

Finally, the Hazardous Materials lifeline is crucial, as managing plant health involves using pesticides and herbicides. Safe handling and disposal of these chemicals are essential to protect the environment and public health.

### 3.17.3.4 ENHANCED PRIORITY RISK INDEX SCORE

The Enhanced Priority Risk Index (EPRI) provides the state of Nebraska with a methodology to measure the impact each profiled hazard may have on the seven Emergency Management Accreditation Program Standard 4.1.2 sectors (i.e., public; responders; continuity of operations including continued delivery of services; property, facilities, and infrastructure; the environment; the economic condition of the jurisdiction; and public confidence in the jurisdiction's governance). Table 73 provides the EPRI scores for the hazard with the appropriate risk factor.

**Table 73: Plant Disease and Pests Enhanced Priority Risk Index Score**

| | Probability Next 5 Years | Impact | Spatial Extent | Warning Time | Duration | Vulnerability | Probability | Overall Risk Factor |
|---|---|---|---|---|---|---|---|---|
| **Risk Level** | 2.6 | 1.9 | 2.4 | 1.5 | 3.8 | 1.5 | 2.5 | 2.3 |

Table 74 summarizes plant and pest disease impacts, including those on the public, first responders, continuity of operations, property, infrastructure, environment, economic conditions, and public confidence, and the consequences of those impacts.

**Table 74: Plant and Pest Disease Impacts and Consequences**

| Sector | Impacts |
|---|---|
| **Public** | Low impact on the population in general until or unless the disease becomes long-term, and then the impacts will be mostly economic.<br>The widespread impact of plant diseases or pests that affect food or livestock feed crops could affect the availability of specific foods. If corn is impacted, it would greatly impact the beef industry because of the lack of foodstuffs. |
| **Responders** | Plants killed or weakened by disease or pests may provide additional fuel for fast-spreading wildfires that require fire response. |
| **Continuity of Operations** | No Impact |
| **Property** | The duration of infestation and the type of disease or pest may leave some farmland unusable for a considerable amount of time. |
| **Infrastructure** | Minimal Impact |

| Sector | Impacts |
|---|---|
| **Environment** | Infections and/or infestations may lead to widespread die-off of trees, shrubs, and other vegetation used as windbreaks and erosion control. These losses could allow for a considerable environmental impact. |
| **Economic Conditions** | If the disease is invasive and long-term, there will be severe impacts on the local and statewide economies. Although property may not be destroyed, it may be unavailable for tillage for some time, potentially quite a long time. As with animals, a large percentage of the state's economy is dependent on agriculture. The local rural economy depends on the income and purchasing power of farmers and ranchers. |
| **Public Confidence** | Depends on how effectively and efficiently governmental agencies respond to the situation. |

# 3.18 Power and Infrastructure Failure

## 3.18.1 Description

A power failure occurs when the electrical supply to a specific building, area, or system is interrupted. Power failures are especially critical when essential infrastructure, services, or public safety is jeopardized. For this plan, a power failure may result from a cascading effect of a natural or technological hazard and can be caused by either accidental or intentional means. For example, a lightning strike at a critical service area can lead to a temporary outage.

## 3.18.2 Risk Assessment

### 3.18.2.1 LOCATION

Power failures in Nebraska can occur in various locations due to multiple factors, including severe weather conditions, infrastructure challenges, and increased energy demand. Urban centers like Omaha and Lincoln frequently experience power outages during storms, mainly when high winds cause downed power lines or damage to equipment. These cities, with their dense populations and extensive electrical infrastructure, are particularly vulnerable during thunderstorms or winter weather events.

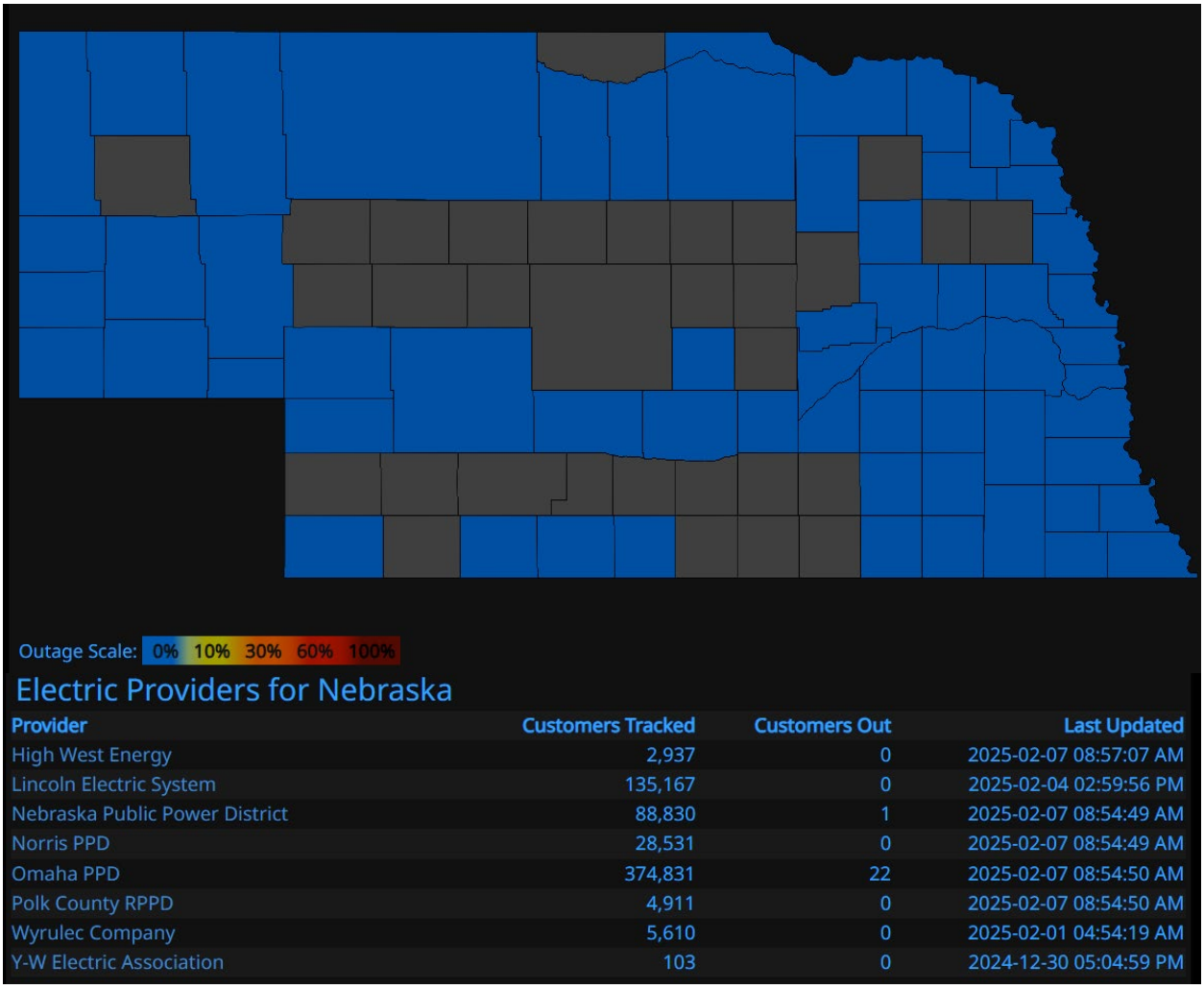
In contrast, rural areas throughout Nebraska can also experience outages, especially during extreme weather. Regions like the Nebraska Sandhills, where the landscape is more open and exposed, can be severely impacted by storms or tornadoes, resulting in significant disruptions to the power supply. The vastness of these areas can make restoration efforts more challenging, often resulting in prolonged outages.

Additionally, agricultural zones are particularly vulnerable to power failures, especially during peak farming seasons when electricity demand is at its highest. Equipment used in farming operations may rely heavily on a stable power supply, making outages particularly impactful in these regions. Locations in the northern and western parts of the state, such as Scottsbluff and McCook, may also see outages related to wind activity and other weather phenomena typical of the High Plains, further complicating the reliability of power in these areas.

Local utility companies actively monitor and respond to outages and often provide real-time updates, helping residents stay informed about service disruptions in their specific locations. These resources can be beneficial for understanding the extent of outages and the expected timeline for restoration.

### 3.18.2.2 EXTENT

Developing a comprehensive process to track and document power failure events by year, location, or individual power provider is challenging. While some online systems maintain current status updates, documentation of previous events is typically not maintained. Figure 70 illustrates one source of online data that reports current status. In this map, the counties in dark gray are untracked locations, and only a few providers are tracked in the system.




Electric Providers for Nebraska

| Provider | Customers Tracked | Customers Out | Last Updated |
|---|---|---|---|
| High West Energy | 2,937 | 0 | 2025-02-07 08:57:07 AM |
| Lincoln Electric System | 135,167 | 0 | 2025-02-04 02:59:56 PM |
| Nebraska Public Power District | 88,830 | 1 | 2025-02-07 08:54:49 AM |
| Norris PPD | 28,531 | 0 | 2025-02-07 08:54:49 AM |
| Omaha PPD | 374,831 | 22 | 2025-02-07 08:54:50 AM |
| Polk County RPPD | 4,911 | 0 | 2025-02-07 08:54:50 AM |
| Wyrulec Company | 5,610 | 0 | 2025-02-01 04:54:19 AM |
| Y-W Electric Association | 103 | 0 | 2024-12-30 05:04:59 PM |

**Figure 70: Current Power Outages and Electric Providers**[232]

### 3.18.2.3 PREVIOUS EVENTS

The following are previous historic power outages in Nebraska.

- On July 31, 2024, hurricane-force winds ripped eastern Nebraska and caused the largest power outage in the history of Omaha Public Power Districts (OPPD). At its peak, around 221,000 customers were without power.[233]
- On July 9, 2021, three storm cells converged to send 96 mph winds through nearly the entire OPPD service territory, resulting in the loss of power to 188,000 customers.
- On August 10, 2020, a Derecho windstorm caused 57,000 to lose power.

[232] US Power Outage, "Nebraska." https://poweroutage.us/area/state/nebraska.
[233] The Wire, "On the Front Lines of a Historic Outage." https://oppdthewire.com/stories-from-the-front-lines-a-historic-outage/.

- On June 16, 2017, a tornado caused the loss of power to 76,500 customers and destroyed dozens of transmission structures.
- June 27, 2008, wind gusts between 90 and 100 mph in Omaha caused 156,000 outages.
- On July 5–6, 2003, windstorms caused 60,000 outages, with winds reaching 90 mph. The restoration took almost 4.5 days.
- On October 26, 1997, a snowstorm that brought ice and 14” of snow to the area caused 150,000 outages, and it took 11 days for power to be fully restored.
- On October 31, 1991, an ice storm caused 80,000 customers to lose power. The electric system suffered major damage to utility poles and primary lines.
- On July 15, 1988, winds of 90 mph caused 75,000 customers to lose power. Because of its widespread nature, the damage was worse than that of the 1975 tornado.
- June 12–14, 1980, two windstorms with winds of 100 mph hit the Omaha area, taking out powerlines and knocking out power to 71,000 people. The first storm took out power to 36,000 customers, and as the repairs were winding down, the second storm hit, knocking out power to 35,000.

#### 3.18.2.4 PROBABILITY

Power outages are highly likely due to a combination of various factors. One primary reason is severe weather events, such as thunderstorms, tornadoes, and winter storms, which can cause significant damage to power lines and equipment. Additionally, the age and maintenance of the power infrastructure can contribute to outages; older systems may be more prone to failures or unable to handle high demand during peak usage times. Fluctuations in energy demand can also stress the grid, leading to outages if the infrastructure cannot cope with the increased load. Overall, the interplay between these factors can create a heightened risk of power interruptions.

#### 3.18.2.5 EFFECTS OF FUTURE CONDITIONS

Climate change is expected to significantly impact power and infrastructure in Nebraska, leading to a higher likelihood of failures and disruptions. One primary concern is the increase in heat waves. As temperatures rise, there may be a surge in electricity demand for cooling, which could strain the power grid. If the grid cannot meet this increased demand, it can lead to outages, impacting homes, businesses, and essential services across the state.

Severe storms are another climate-related challenge that Nebraska may face more frequently. With unpredictable weather patterns, the state could experience intense thunderstorms, tornadoes, and hailstorms, all of which threaten power lines, substations, and critical infrastructure. Damage from such storms can result in prolonged outages and complicate recovery efforts, affecting urban and rural areas.

Flooding is also a serious concern as increased precipitation and extreme rain events become more common. Floodwaters can undermine roads, bridges, and other key infrastructure, making transportation unsafe and challenging the accessibility of electricity and emergency services. Flooding may lead to

significant infrastructure failures, particularly in low-lying areas, creating vulnerabilities in the state's power distribution systems.

Conversely, Nebraska may grapple with drought conditions, which impact water supplies necessary for hydroelectric power generation and agricultural irrigation. Reduced water availability can pose a dual threat, hindering energy production while challenging agricultural productivity. These changes affect the economy and the state's ability to maintain stable energy supplies.

Additionally, extreme weather patterns can disrupt farming, a cornerstone of Nebraska's economy. Lower crop yields resulting from erratic weather can destabilize economic conditions, potentially decreasing funding available for infrastructure maintenance and improvements. As aging infrastructure may struggle to cope with the increased frequency and severity of climate events, the need for significant investments in resilience becomes even more pressing.

## 3.18.3 Vulnerability Analysis

Nebraska's infrastructure, particularly its power systems, is critical for its economy and public safety. A failure in this infrastructure could have widespread effects, including on agriculture, commerce, and daily life. This analysis identifies vulnerabilities and potential impacts in the case of power and infrastructure failures.

- Key Infrastructure Components
  - **Electric Generation and Distribution:** Nebraska's power generation primarily relies on a mix of renewable energy (such as wind), nuclear, and coal. The state has numerous transmission lines that distribute electricity across its rural landscape.
  - **Water Supply Systems:** Municipal water systems depend on electricity for pumping, treatment, and distribution.
  - **Transportation:** Roads, bridges, and rail lines are crucial for moving goods, especially given Nebraska's agricultural output.
  - **Telecommunications:** Internet and telecommunications infrastructure is essential for communication and emergency services.
- Vulnerabilities
  - **Natural Disasters:** Nebraska is susceptible to severe weather events, including tornadoes, flooding, and winter storms, which can damage power lines and infrastructure and lead to outages.
  - **Aging Infrastructure:** Much of Nebraska's energy infrastructure is aging, which raises concerns about reliability and resilience during high-demand periods or adverse weather events.
  - **Cybersecurity Threats:** Nebraska's increasing reliance on digital control systems exposes its power and water systems to cyberattacks that could disrupt services.

  - **Geographical Challenges:** Nebraska's vast rural areas mean that certain locations may face delayed restoration times due to the distance and potential lack of infrastructure redundancy.
- Potential Impacts
  - **Economic Disruption:** Power outages can halt agricultural operations, harming crop production and livestock care. This could result in significant economic losses for farmers and associated industries.
  - **Public Health Risks:** Prolonged outages can disrupt critical services like hospitals and emergency responders, potentially endangering lives, especially for vulnerable populations.
  - **Water Supply Issues:** Electric failure can compromise water treatment and delivery, leading to public health crises related to clean water access.
  - **Communication Breakdowns:** Loss of telecommunications can hinder emergency response efforts and disrupt public information dissemination during crises.

A power and infrastructure failure in Nebraska poses significant challenges that can disrupt daily life and the economy. By recognizing vulnerabilities and implementing targeted mitigation strategies, the state can enhance its resilience and ensure it can withstand and recover quickly from such incidents.

#### 3.18.3.1 ESTIMATED IMPACT AND POTENTIAL LOSSES

Power failure may result from many causes, including impacts from natural hazard events, technological failures, or human-caused intentional events. Looking beyond the cause, the result is a temporary loss of electrical power within a system or systems that cover a widespread area. A power failure may occur without warning and may last minutes, hours, or days.

Under current data collection criteria, there is no record of direct impacts or dollar losses to state assets from power failure.

Estimating the annual dollar amount loss from power and infrastructure failures in Nebraska can be complex due to the variability of events and impacts. While exact figures may not be readily available, larger power outages can cost millions of dollars in individual events. For example, assessments may show losses of around $10 million or more for significant outages in specific communities.

Given these factors, while an exact annual figure for the entire state is challenging to determine, regional studies and reports suggest that cumulative losses across Nebraska could potentially run into hundreds of millions of dollars annually when considering multiple outages throughout the year, infrastructure repair costs, and impacts on various economic sectors.

#### 3.18.3.2 ACCESS AND FUNCTIONAL NEEDS

Infrastructure and power failures can profoundly impact individuals with access and functional needs in Nebraska. For many of these individuals, especially those with disabilities or chronic health conditions, reliable access to power is crucial. They often depend on medical equipment such as oxygen concentrators, ventilators, or other assistive devices requiring electricity. A power outage can jeopardize

their health and create anxiety and uncertainty about their well-being, making backup power solutions essential.

Transportation is another critical area affected by infrastructure issues. Those with mobility challenges may struggle to access essential services when roads are damaged or public transportation is disrupted. Reliable transportation is necessary for medical appointments, grocery shopping, and other daily activities. Increased barriers can lead to isolation and diminished access to essential resources, further complicating their situation.

Effective communication during emergencies is crucial, especially for individuals who rely on specific technologies to stay informed. Power failures can disrupt communication networks, limiting access to crucial information about outages, emergency services, and available resources. This lack of communication can increase fear and confusion among individuals with access and functional needs, who might already feel vulnerable.

Furthermore, individuals in supportive or congregate housing can be particularly at risk during infrastructure failures. Power outages can disrupt essential services in these facilities, placing multiple residents at risk and potentially necessitating evacuation.

Emergency preparedness is another significant concern. Many individuals with access and functional needs may lack the necessary resources or knowledge to prepare effectively for emergencies. This can include a lack of access to emergency communication tools or an inadequate understanding of available resources.

Community resources are also heavily affected during such disruptions. During power outages, essential services such as food banks, shelters, and emergency medical services may become overwhelmed or cease functioning. While these disruptions impact the entire community, they disproportionately affect those already reliant on these services.

#### 3.18.3.3 COMMUNITY LIFELINES

Power and infrastructure failures can severely impact several FEMA Community Lifelines, essential for maintaining community stability and safety during emergencies.

The Safety and Security Lifeline is significantly impacted since power outages disrupt emergency response systems, slowing down police and fire services, and potentially putting lives at risk.

Health and Medical services also are affected. Hospitals depend on electricity for critical operations, and outages can delay emergency care, risking patient safety.

Energy Lifeline disruptions lead to widespread power outages that impact homes and businesses.

The Communications Lifeline also suffers, making it difficult for emergency services and residents to communicate during disasters.

Food, Hydration, and Shelter servers also are at risk. Power outages can spoil food and compromise water treatment, leading to shortages.

Finally, the Hazardous Materials Lifeline is critical during outages. If power failures occur, facilities handling hazardous materials may experience dangerous spills.

### 3.18.3.4 ENHANCED PRIORITY RISK INDEX SCORE

The Enhanced Priority Risk Index (EPRI) provides the state of Nebraska with a methodology to measure the impact each profiled hazard may have on the seven Emergency Management Accreditation Program Standard 4.1.2 sectors (i.e., public; responders; continuity of operations including continued delivery of services; property, facilities, and infrastructure; the environment; the economic condition of the jurisdiction; and public confidence in the jurisdiction's governance). Table 75 provides the EPRI scores for the hazard with the appropriate risk factor.

**Table 75: Power and Infrastructure Failure Enhanced Priority Risk Index Score**

| | Probability Next 5 Years | Impact | Spatial Extent | Warning Time | Duration | Vulnerability | Probability | Overall Risk Factor |
|---|---|---|---|---|---|---|---|---|
| **Risk Level** | 2.6 | 2.7 | 3 | 3.7 | 3.2 | 2.8 | 2.5 | 2.9 |

Table 76 provides a summary of the impacts of power and infrastructure failure, including the impact on the public, first responders, continuity of operations, property, infrastructure, environment, economic conditions, and public confidence, and the consequences of those impacts.

**Table 76: Power Failure Impact/Consequence Summary**

| Sector | Impacts |
|---|---|
| **Public** | **Housing** – Power failure may directly impact housing with short- or long-term failure. Temporary public shelters may need to be provided when individuals are without power for a significant period of time.<br>**Casualties/Fatalities** – Periodic preparedness and safety messages will allow citizens to identify personal and family needs before a power failure and make appropriate plans. If citizens depend on life-sustaining equipment, alternate or battery power arrangements should be made for backup. In extreme instances, citizens may rely on rescue transport to alternate facilities for power.<br>**Work** – A loss of power at work could result in the loss of critical resources or public safety issues.<br>**Food/Water** – Loss of power for extended periods will result in contaminated food, which could endanger public health. The public should receive preparedness messages to protect food from short-term power failure. In extreme events, food supplies for those affected may need to be brought in. |

| Sector | Impacts |
|---|---|
| **Responders** | Response operations may be affected by power failure and loss of functional infrastructure such as traffic signals, railroad crossing gates, and communications. Strict adherence to alternate protocols and the use of incident management are essential for responder safety and accountability.<br>Temporary sheltering may require multiple agency support and resources for vulnerable populations. |
| **Continuity of Operations** | In a long-term event, continuity of operations plans should be activated to identify mission essential functions, vital records, communication and computer networks, other resources, and potential alternate operating facilities. |
| **Property** | Although property loss and destruction are not anticipated with a power failure, long-term outages could impact operational systems within buildings and other facilities. |
| **Infrastructure** | Critical infrastructure may be susceptible to loss of function or services due to a temporary or long-term power failure. If a power failure results in a cascading impact from another incident, support for critical facilities such as hospitals, nursing homes, and residential care facilities may be required. |
| **Environment** | Power failure is unlikely to impact the environment, although long-term conditions could impact accessibility to agricultural systems and equipment dependent on electric power. |
| **Economic Conditions** | Depending on the cause of the power failure, economic impacts could affect residents, businesses, and public infrastructure. Indirect effects of long-term power failure could include the loss of specific industries and large employers. |
| **Public Confidence** | If the incident extends beyond a few hours, the public must be kept informed about the current status of the event, what the authorities are doing to correct the situation, and what personal or family measures will mitigate the event. Timely and frequent public messaging is required. |

## 3.18.3.5 SUPPLEMENTAL INFORMATION

U.S. DEPARTMENT OF ENERGY

# State of Nebraska
## ENERGY SECTOR RISK PROFILE




This State Energy Risk Profile examines the relative magnitude of the risks that the State of Nebraska's energy infrastructure routinely encounters in comparison with the probable impacts. Natural and man-made hazards with the potential to cause disruption of the energy infrastructure are identified.

The Risk Profile highlights risk considerations relating to the electric, petroleum and natural gas infrastructures to become more aware of risks to these energy systems and assets.

## NEBRASKA STATE FACTS

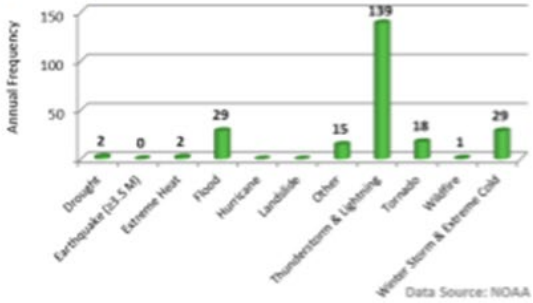
**State Overview**
- Population: 1.87 million (1% total U.S.)
- Housing Units: 0.81 million (1% total U.S.)
- Business Establishments: 0.05 million (1% total U.S.)

**Annual Energy Consumption**
- Electric Power: 30.8 TWh (1% total U.S.)
- Coal: 15,900 MSTN (2% total U.S.)
- Natural Gas: 72 Bcf (<1% total U.S.)
- Motor Gasoline: 18,500 Mbarrels (1% total U.S.)
- Distillate Fuel: 21,300 Mbarrels (2% total U.S.)

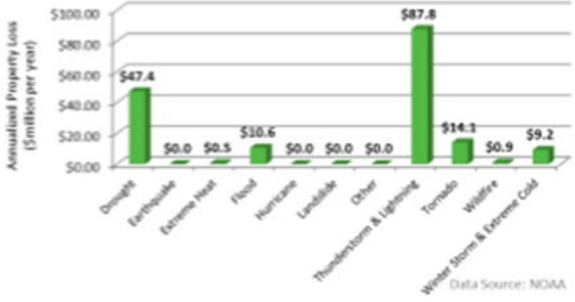
**Annual Energy Production**
- Electric Power Generation: 34.2 TWh (1% total U.S.)
  - Coal: 25.0 TWh, 73% [4.3 GW total capacity]
  - Petroleum: 0 TWh, <1% [0.4 GW total capacity]
  - Natural Gas: 0.8 TWh, 2% [2.1 GW total capacity]
  - Nuclear: 5.8 TWh, 17% [1.3 GW total capacity]
  - Hydro: 1.3 TWh, 4% [0.3 GW total capacity]
  - Other Renewable: 1.3 TWh, 4% [0.5 GW total capacity]
- Coal: 0 MSTN (0% total U.S.)
- Natural Gas: 0 Bcf (0% total U.S.)
- Crude Oil: 3,000 Mbarrels (<1% total U.S.)
- Ethanol: 43,400 Mbarrels (14% total U.S.)

## NATURAL HAZARDS OVERVIEW

**Annual Frequency of Occurrence of Natural Hazards in Nebraska (1996–2014)**




**Annualized Property Loss due to Natural Hazards in Nebraska (1996–2014)**




- According to NOAA, the most common natural hazard in Nebraska is Thunderstorm & Lightning, which occurs once every 2.6 day on the average during the months of March to October.
- The second-most common natural hazard in Nebraska is Flood, which occurs once every 12.6 days on the average.
- As reported by NOAA, the natural hazard in Nebraska that caused the greatest overall property loss during 1996 to 2014 is Thunderstorm & Lightning at $87.8 million per year.
- The natural hazard with the second-highest property loss in Nebraska is Drought at $47.4 million per year.

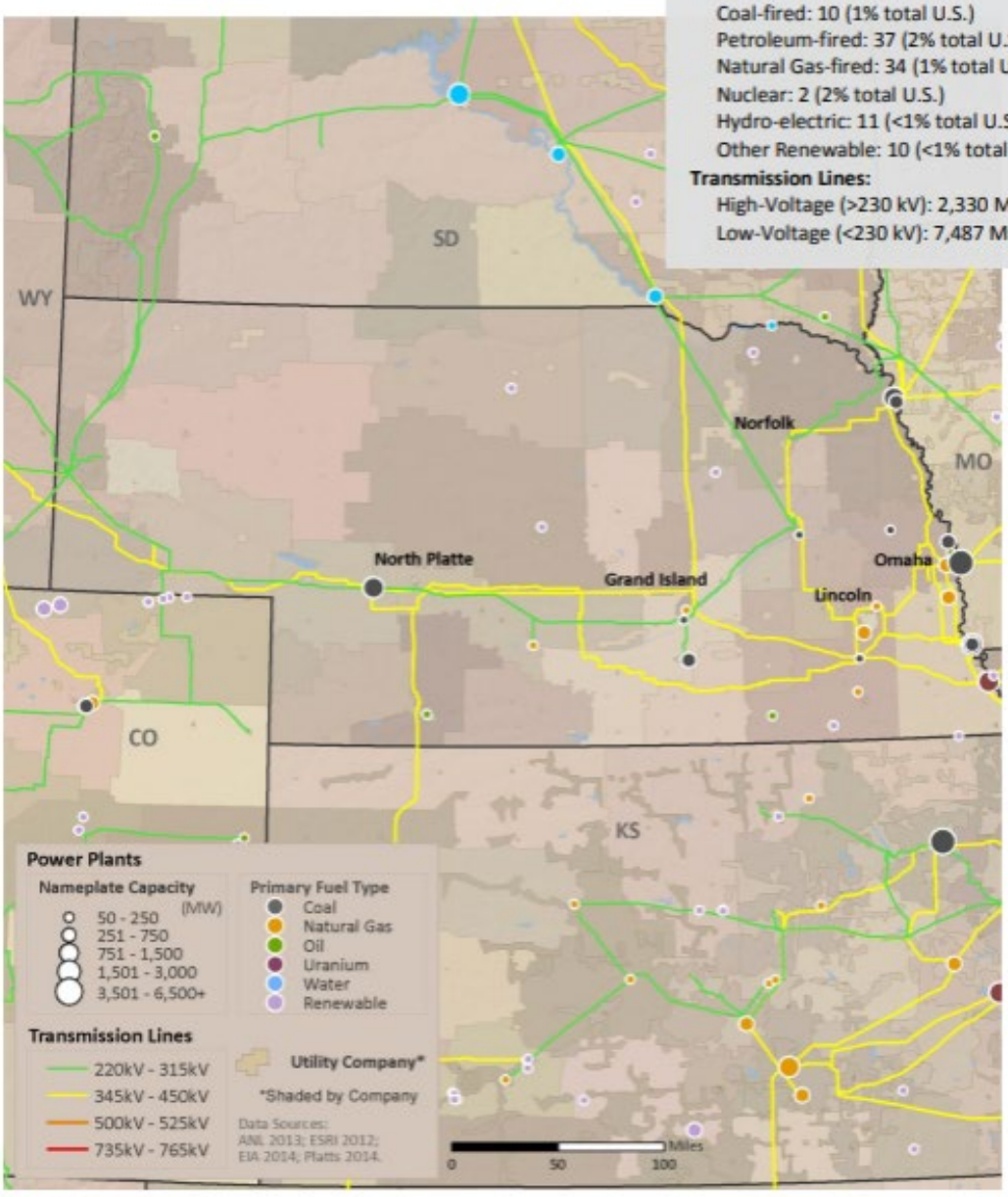
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ENERGY SECTOR RISK PROFILE State of Nebraska

# ELECTRIC

**Electric Power Plants: 104 (1% total U.S.)**
Coal-fired: 10 (1% total U.S.)
Petroleum-fired: 37 (2% total U.S.)
Natural Gas-fired: 34 (1% total U.S.)
Nuclear: 2 (2% total U.S.)
Hydro-electric: 11 (<1% total U.S.)
Other Renewable: 10 (<1% total U.S.)
**Transmission Lines:**
High-Voltage (>230 kV): 2,330 Miles
Low-Voltage (<230 kV): 7,487 Miles




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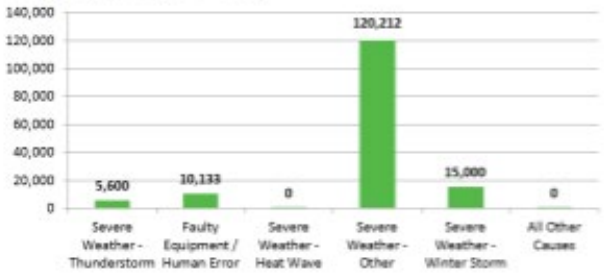
State of Nebraska

ENERGY SECTOR RISK PROFILE

# Electric Transmission

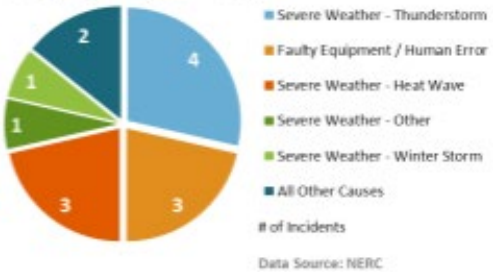
- According to NERC, the leading cause of electric transmission outages in Nebraska is Severe Weather - Thunderstorm.
- Nebraska experienced 14 electric transmission outages from 1992 to 2009, affecting a total of 150,945 electric customers.
- Severe Weather - Other affected the largest number of electric customers as a result of electric transmission outages.

**Electric Customers Disrupted by NERC-Reported Electric Transmission Outages by Cause (1992–2009)**




Data Source: NERC

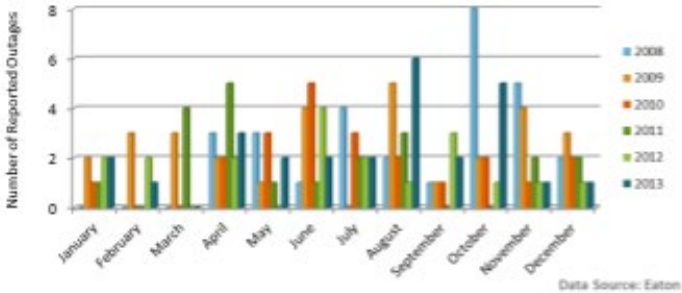
**Number of NERC-Reported Electric Transmission Outages by Cause (1992–2009)**




Data Source: NERC

# Electric Distribution

**Electric Utility Reported Power Outages by Month (2008–2013)**




Data Source: Eaton

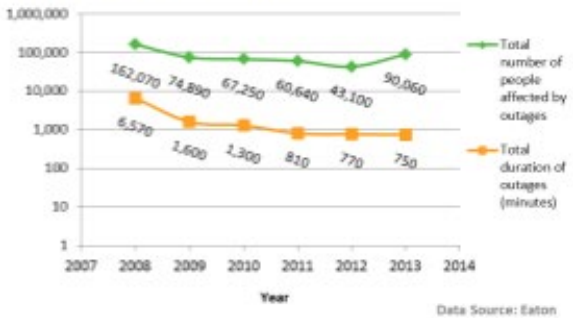
- Between 2008 and 2013, the greatest number of electric outages in Nebraska has occurred during the month of August.
- The leading cause of electric outages in Nebraska during 2008 to 2013 was Weather/Falling Trees.
- On average, the number of people affected annually by electric outages during 2008 to 2013 in Nebraska was 83,002.
- The average duration of electric outages in Nebraska during 2008 to 2013 was 1,967 minutes or 32.8 hours a year.

**Causes of Electric-Utility Reported Outages (2008–2013)**




Data Source: Eaton

**Utility Outage Data for 2008–2013**




Data Source: Eaton

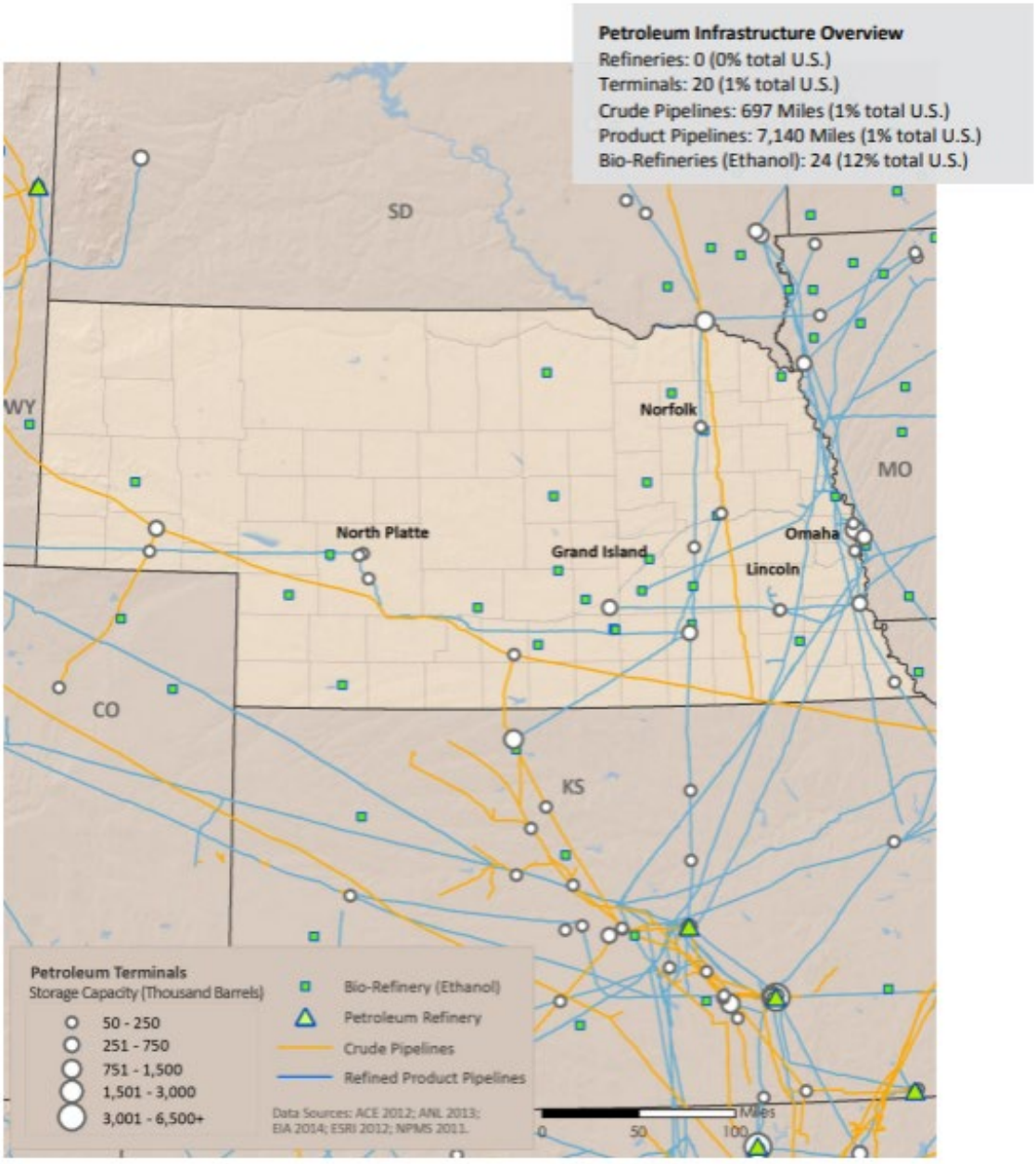
- NOTE: # of Incidents – The number within each pie slice is the number of event incidents attributable to each cause.



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ENERGY SECTOR RISK PROFILE State of Nebraska

# PETROLEUM




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State of Nebraska

ENERGY SECTOR RISK PROFILE

# Petroleum Transport

- The leading event type affecting the transport of petroleum product by rail and truck in Nebraska during 1986 to 2014 was Incorrect Operation for rail transport and Miscellaneous/Unknown for truck transport, with an average 1.4 and 1.8 incidents per year, respectively.

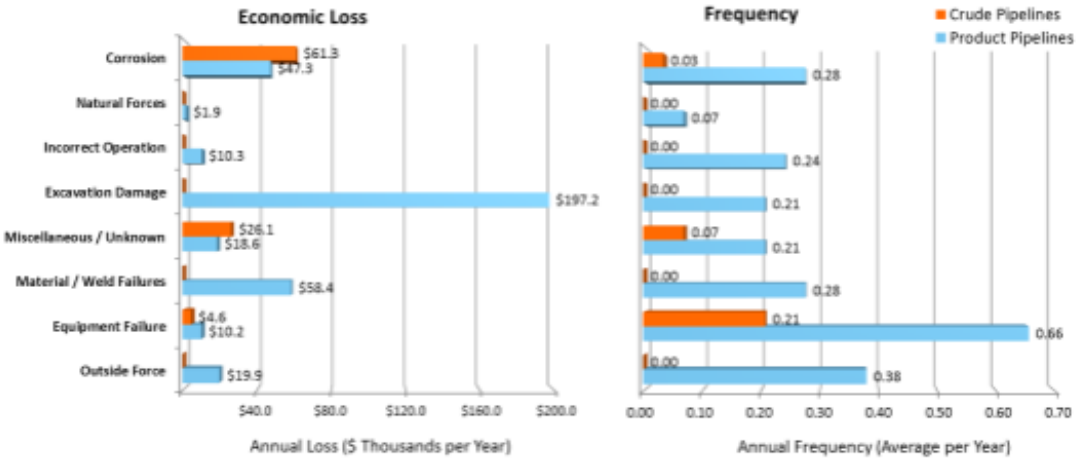
**Top Events Affecting Petroleum Transport by Truck and Rail (1986–2014)**




Data Source: DOT PHMSA

- The leading event type affecting crude oil pipeline and petroleum product pipelines in Nebraska during 1986 to 2014 was Equipment Failure for crude oil pipelines and Equipment Failure for product pipelines, with an average 0.21 and 0.66 incidents per year (or one incident every 4.8 and 1.5 years), respectively.

**Top Events Affecting Crude Oil and Refined Product Pipelines in Nebraska (1986–2014)**



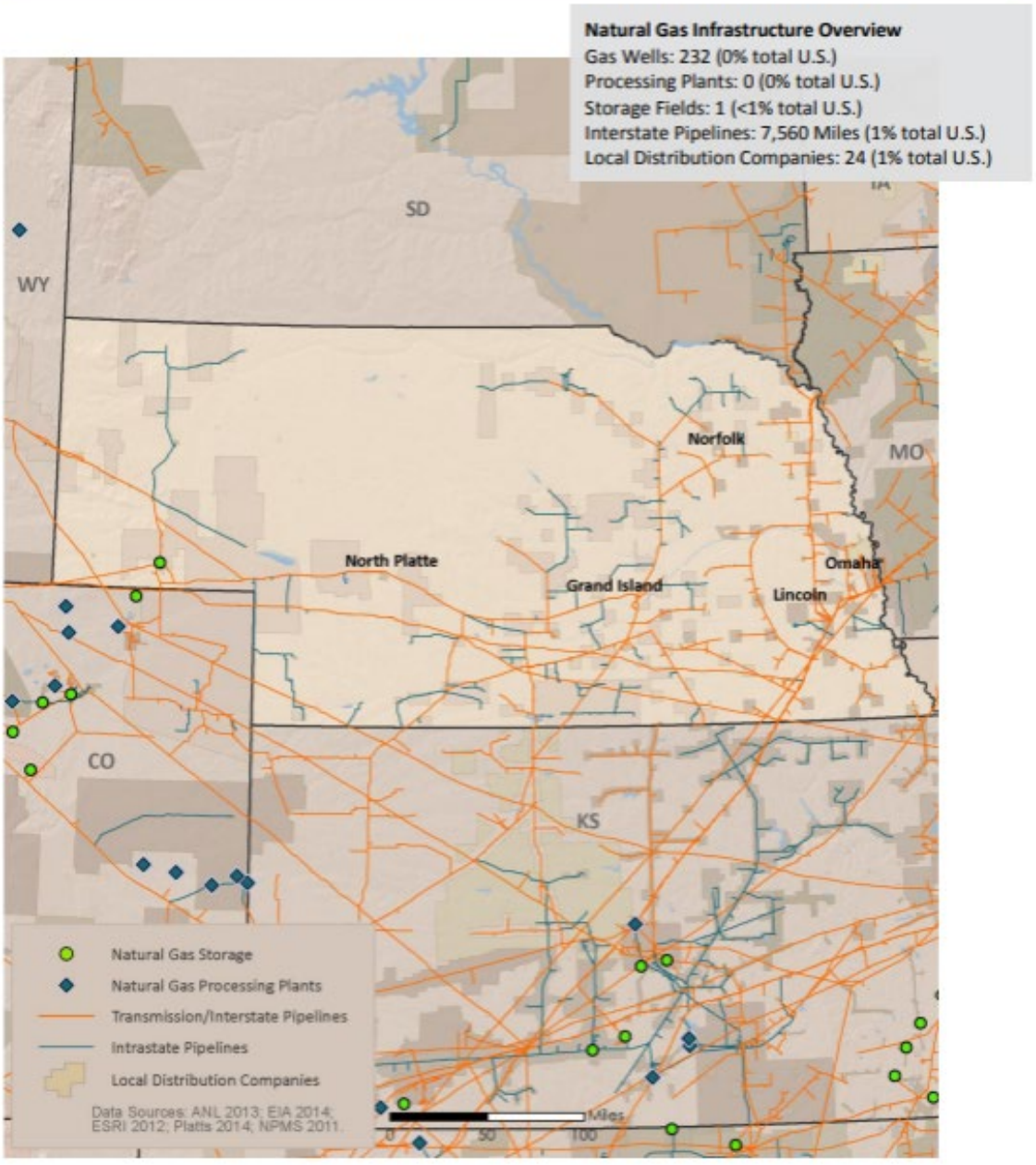

Data Source: DOT PHMSA



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# NATURAL GAS




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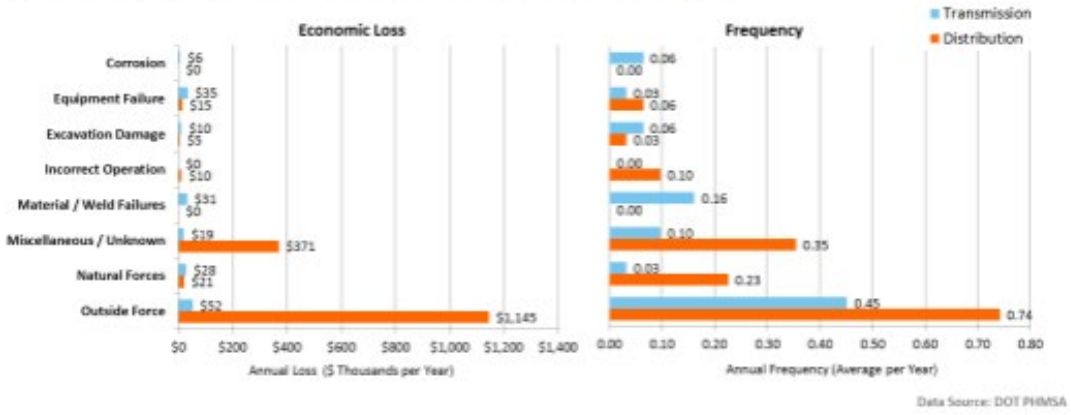
State of Nebraska

ENERGY SECTOR RISK PROFILE

# Natural Gas Transport

- The leading event type affecting natural gas transmission and distribution pipelines in Nebraska during 1986 to 2014 was Outside Force for Transmission Pipelines and Outside Force for Distribution Pipelines, with an average 0.45 and 0.74 incidents per year (or one incident every 2.2 and 1.3 years), respectively.

**Top Events Affecting Natural Gas Transmission and Distribution in Nebraska (1986–2014)**




Data Source: DOT PHMSA





Produced by Department of Energy (DOE), Office of Electricity Delivery & Energy Reliability (OE)

**Bcf** – Billion Cubic Feet
**GW** – Gigawatt
**kV** – Kilovolt
**Mbarrels** – Thousand Barrels
**Mbpd** – Thousand Barrels per Day
**MMcfd** – Million Cubic Feet per Day
**MSTN** – Thousand Short Tons
**TWh** – Terawatt hours

# DATA SOURCES

## Overview Information

- NOAA (2014) Storms Events Database [www.ncdc.noaa.gov/data-access/severe-weather]
- Census Bureau (2012) State and County QuickFacts [http://quickfacts.census.gov/qfd/ download_data.html]

## Production Numbers

- EIA (2012) Table P1 Energy Production Estimates in Physical Units [http://www.eia.gov/state/seds/sep_prod/pdf/P1.pdf]
- EIA (2013) Natural Gas Gross Withdrawals and Production [http://www.eia.gov/dnav/ng/ng_prod_sum_a_EPG0_VGM_mmcf_a.htm]
- EIA (2012) Electric Power Annual, Table 3.6. Net Generation by State, by Sector, 2012 and 2011 (Thousand Megawatt hours) [http://www.eia.gov/electricity/annual/pdf/epa.pdf]
- EIA (2012) Electric Power Annual, Existing Nameplate and Net Summer Capacity by Energy Source, Producer Type and State (EIA-860) [http://www.eia.gov/electricity/data/state/]

## Consumption Numbers

- EIA (2012) Electric Power Annual, Fossil Fuel Consumption for Electricity Generation by Year, Industry Type and State (EIA-906, EIA-920, and EIA-923) [http://www.eia.gov/electricity/data/state/]
- EIA (2013) Prime Supplier Sales Volumes [http://www.eia.gov/dnav/pet/pet_cons_prim_dcu_nus_m.htm]
- EIA (2012) Adjusted Sales of Fuel Oil and Kerosene [http://www.eia.gov/petroleum/data.cfm#consumption]
- EIA (2012) Annual Coal Consumption [http://www.eia.gov/coal/data.cfm]

## Electricity

- EIA (2013) Form-860 Power Plants [http://www.eia.gov/electricity/data/eia860/]
- Platts (2014 Q2) Transmission Lines (Miles by Voltage Level)
- Platts (2014 Q2) Power Plants (Production and Capacity by Type)

## Petroleum

- Argonne National Laboratory (2012) Petroleum Terminal Database
- Argonne National Laboratory (2014) Ethanol Plants
- EIA (2013) Petroleum Refinery Capacity Report [http://www.eia.gov/petroleum/refinerycapacity/]
- NPMS (2011) Petroleum Product Pipeline (Miles of Interstate Pipeline)
- NPMS (2011) Crude Pipeline (Miles of Interstate Pipeline)

## Natural Gas

- EIA (2013) Form-767 Natural Gas Processing Plants [http://www.eia.gov/cfapps/ngqs/ngqs.cfm?f_report=RP9]
- EIA (2013) Number of Producing Gas Wells [http://www.eia.gov/dnav/ng/ng_prod_wells_s1_a.htm]
- NPMS (2011) Natural Gas Pipeline (Miles of Interstate Pipeline)
- Platts (2014 Q2) Local Distribution Companies (LDCs)

## Event Related

- DOE OE (2014) Form 417 Electric Disturbance Events [http://www.oe.netl.doe.gov/OE417_annual_summary.aspx]
- DOE OE (2014) Energy Assurance Daily (EAD) [http://www.oe.netl.doe.gov/ead.aspx]
- Eaton (2014) Blackout and Power Outage Tracker [http://powerquality.eaton.com/blackouttracker/default.asp?id=&key=&Quest_user_id=&leadg_Q_QRequired=&site=&menu=&cx=3&x=16&y=11]
- DOT PHMSA (2013) Hazardous Material Incident System (HMIS) [https://hazmatonline.phmsa.dot/gov/IncidentReportsSearch/search.aspx]
- NERC (2009) Disturbance Analysis Working Group [http://www.nerc.com/pa/rrm/ea/Pages/EA-Program.aspx]*
  *The NERC disturbance reports are not published after 2009.

## Notes

- Natural Hazard, Other, includes extreme weather events such as astronomical low tide, dense smoke, frost/freeze, and rip currents.
- Each incident type is an assembly of similar causes reported in the data source. Explanations for the indescribable incident types are below.
  - Outside Force refers to pipeline failures due to vehicular accident, sabotage, or vandalism.
  - Natural Forces refers to damage that occurs as a result of naturally occurring events (e.g., earth movements, flooding, high winds, etc.)
  - Miscellaneous/Unknown includes releases or failures resulting from any other cause not listed or of an unknowable nature.
  - Overdemand refers to outages that occur when the demand for electricity is greater than the supply, causing forced curtailment.
- Number (#) of Incidents – The number within each pie chart piece is the number of outages attributable to each cause.

**FOR MORE INFORMATION CONTACT:**
**Office of Electricity Delivery and Energy Reliability**
U.S. Department of Energy
Phone: 202-586-2264
Email: energyresponsecenter@hq.doe.gov

# State of Nebraska
## ENERGY SECTOR RISK PROFILE

U.S. DEPARTMENT OF ENERGY
Cybersecurity, Energy Security, and Emergency Response




### Nebraska State Facts

| POPULATION | HOUSING UNITS | BUSINESS ESTABLISHMENTS |
|---|---|---|
| 1.93 M | 0.85 M | 0.05 M |

**ENERGY EMPLOYMENT:** 25,473 jobs
**PUBLIC UTILITY COMMISSION:** Nebraska Public Service Commission
**STATE ENERGY OFFICE:** Nebraska Department of Environment and Energy
**EMERGENCY MANAGEMENT AGENCY:** Nebraska Emergency Management Agency
**AVERAGE ELECTRICITY TARIFF:** 9.02 cents/kWh
**ENERGY EXPENDITURES:** $4,299/capita
**ENERGY CONSUMPTION PER CAPITA:** 457 MMBtu
*(7th highest out of 50 states and Washington, D.C.)*
**GDP:** $124.0 billion

*Data from 2020 or most recent year available.*
*For more information, see the Data Sources document.*

### ANNUAL ENERGY CONSUMPTION
**ELECTRIC POWER:** 30,940 GWh
**COAL:** 15,600 MSTN
**NATURAL GAS:** 178 Bcf
**MOTOR GASOLINE:** 20,200 Mbbl
**DISTILLATE FUEL:** 19,200 Mbbl

### ANNUAL ENERGY PRODUCTION
**ELECTRIC POWER GENERATION:** 131 plants, 37.3 TWh, *10.0 GW total capacity*
- **Coal:** 10 plants, 20.4 TWh, *4.0 GW total capacity*
- **Hydro:** 10 plants, 1.3 TWh, *0.3 GW total capacity*
- **Natural Gas:** 33 plants, 1.3 TWh, *2.3 GW total capacity*
- **Nuclear:** 1 plant, 7.0 TWh, *0.8 GW total capacity*
- **Petroleum:** 37 plants, 0.0 TWh, *0.4 GW total capacity*
- **Wind & Solar:** 36 plants, 7.2 TWh, *2.2 GW total capacity*
- **Other sources:** 4 plants, 0.1 TWh, *0.0 GW total capacity*

**COAL:** 0 MSTN
**NATURAL GAS:** 0 Bcf
**CRUDE OIL:** 1,800 Mbbl
**ETHANOL:** 52,100 Mbbl

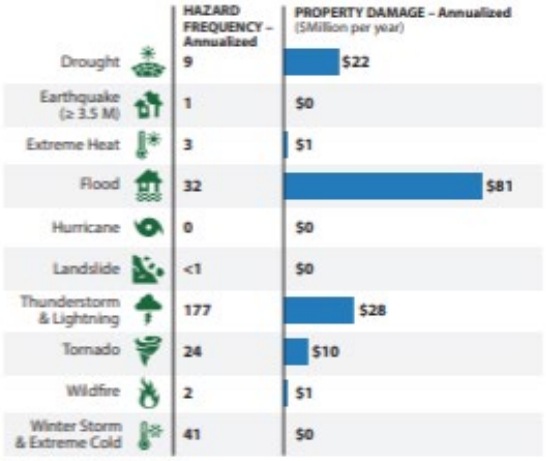
*Data from EIA (2018, 2019).*

This State Energy Risk Profile examines the relative magnitude of the risks that the state of Nebraska's energy infrastructure routinely encounters in comparison with the probable impacts. Natural and man-made hazards with the potential to cause disruption of the energy infrastructure are identified. Certain natural and adversarial threats, such as cybersecurity, electromagnetic pulse, geomagnetic disturbance, pandemics, or impacts caused by infrastructure interdependencies, are ill-suited to location-based probabilistic risk assessment as they may not adhere to geographic boundaries, have limited occurrence, or have limited historic data. Cybersecurity and other threats not included in these profiles are ever present and should be included in state energy security planning. A complete list of data sources and national level comparisons can be found in the Data Sources document.

### Nebraska Risks and Hazards Overview

- The natural hazard that caused the greatest overall property loss between 2009 and 2019 was **Flooding** at $81 million per year *(leading cause nationwide at $12 billion per year).*
- Nebraska had 230 Major Disaster Declarations, 0 Emergency Declarations, and 0 Fire Management Assistance Declarations for 11 events between 2013 and 2019.
- Nebraska registered 3% greater Heating Degree Days and 5% greater Cooling Degree Days than average in 2019.
- There is 1 Fusion Center located in Lincoln.

**Annualized Frequency of and Property Damage Due to Natural Hazards, 2009–2019**

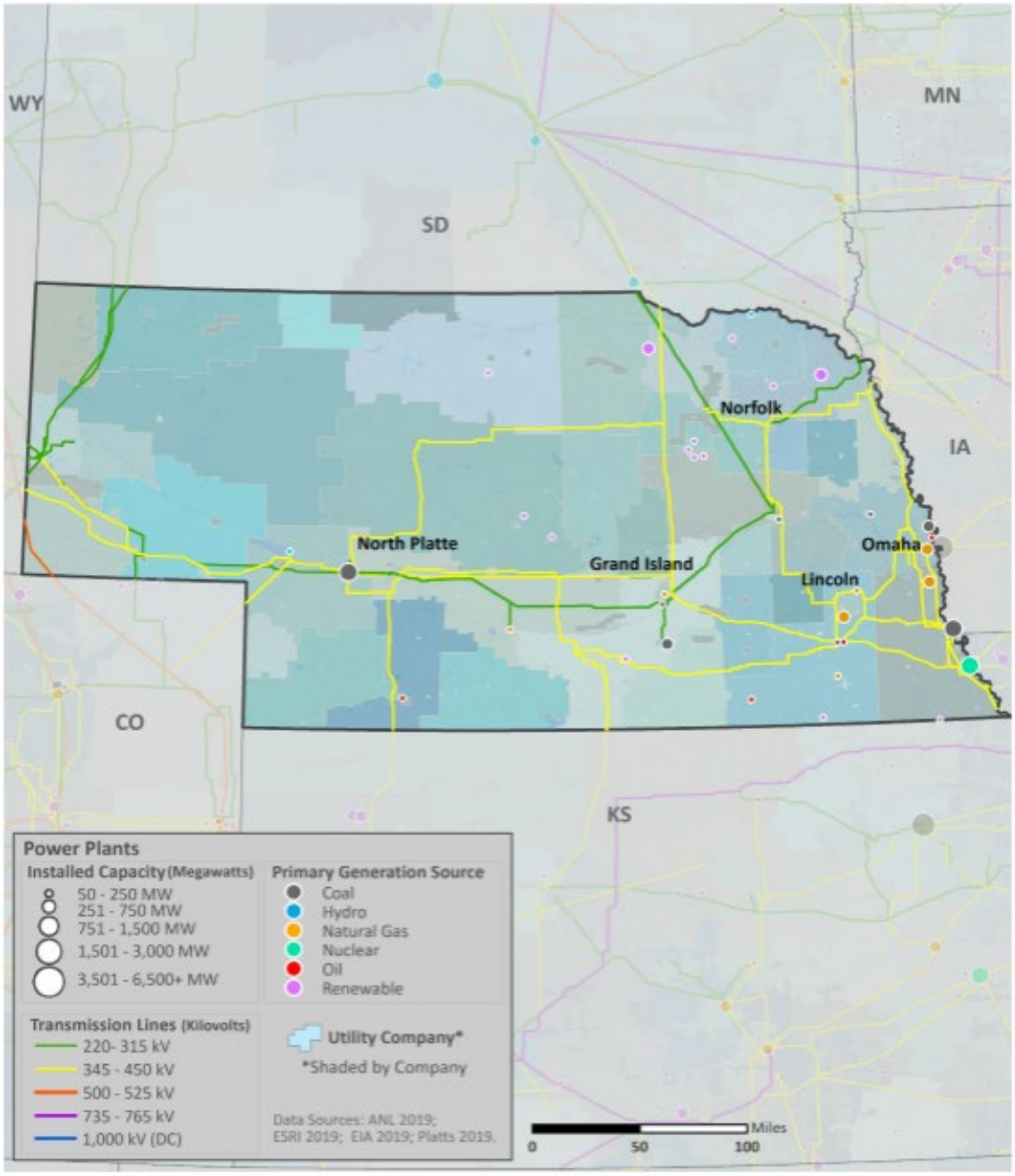



*Data Sources: NOAA and USGS*

State of Nebraska | ENERGY SECTOR RISK PROFILE



## ELECTRIC




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**State of Nebraska** | ENERGY SECTOR RISK PROFILE

## Electric Infrastructure

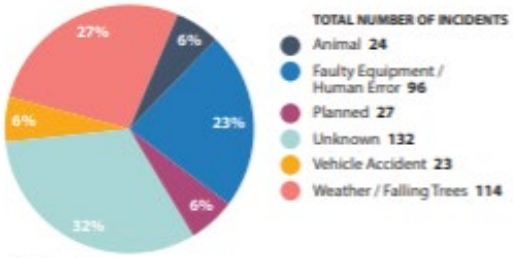
- Nebraska has 147 electric utilities:
  - *0 Investor owned*
  - *4 Cooperative*
  - *112 Municipal*
  - *31 Other utilities*
- Plant retirements scheduled by 2025: 3 electric generating units totaling 291 MW of installed capacity.
- In 2018, the average Nebraska electric customer experienced 1 service interruption that lasted an average of 3.1 hours.
- In Nebraska, between 2008 and 2017:
  - *The greatest number of electric outages occurred in **August** (3rd for outages nationwide)*
  - *The leading cause of electric outages was **Weather or Falling Trees** (leading cause nationwide)*
  - *Electric outages affected 92,381 customers on average*

### Electric Customers and Consumption by Sector, 2018

| | CUSTOMERS | CONSUMPTION |
|---|---|---|
| Residential | 80% | 34% |
| Commercial | 14% | 31% |
| Industrial | 6% | 35% |
| Transportation | <1% | <1% |

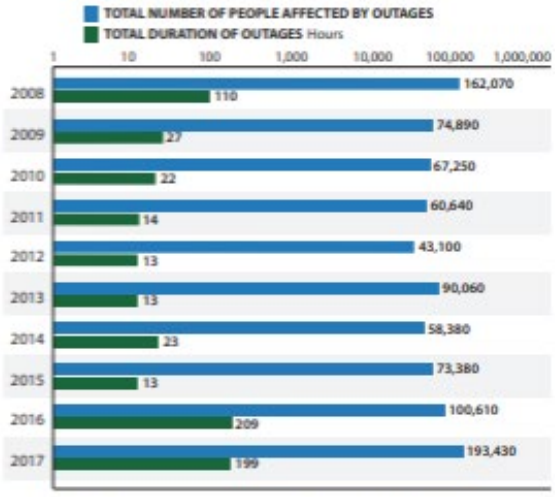
*Data Source: EIA*

### Electric Utility-Reported Outages by Cause, 2008–2017




*Data Source: Eaton*

### Electric Utility Outage Data, 2008–2017

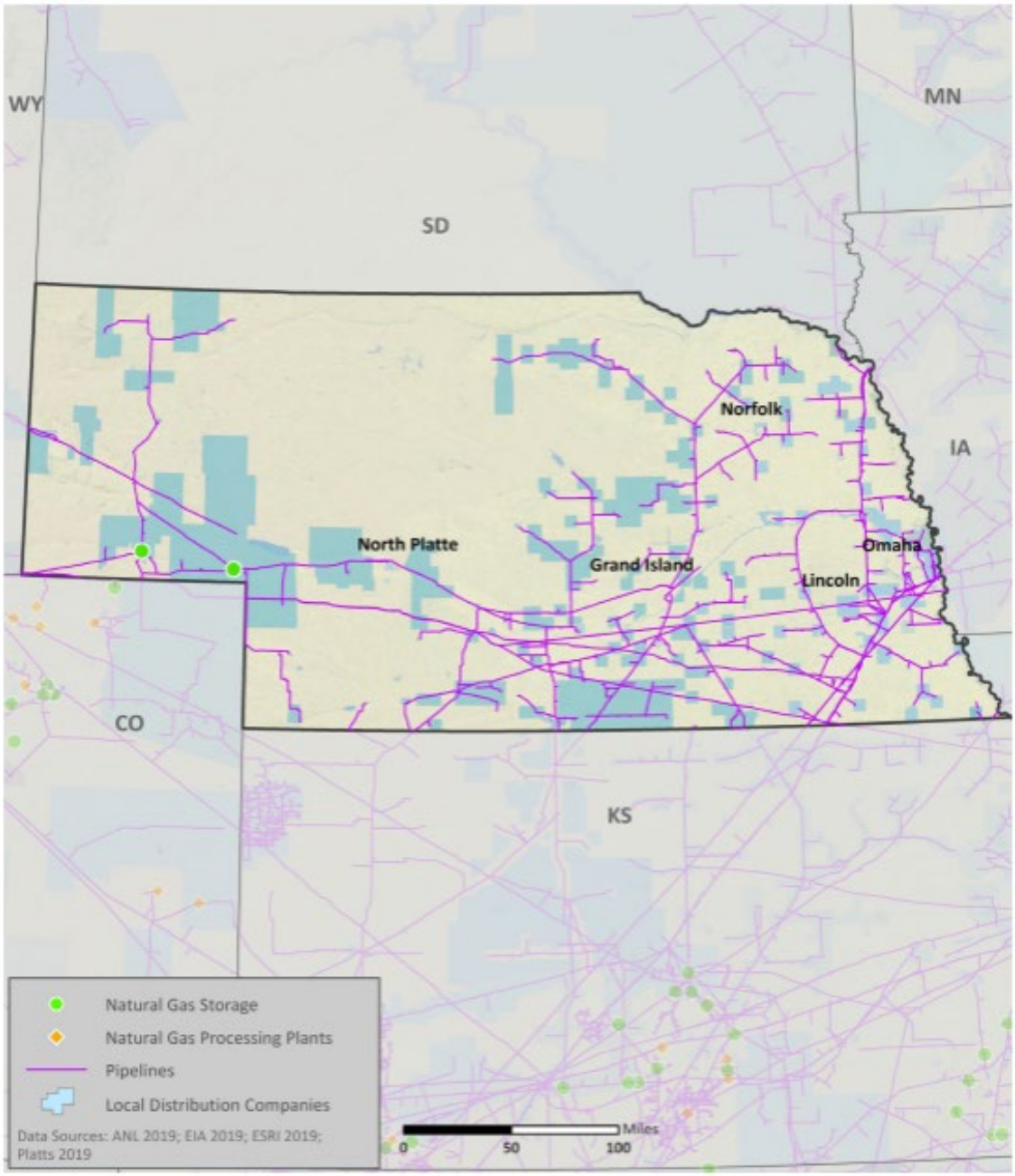



*Note: This chart uses a logarithmic scale to display a very wide range of values.*
*Data Source: Eaton*



State of Nebraska | ENERGY SECTOR RISK PROFILE

## NATURAL GAS

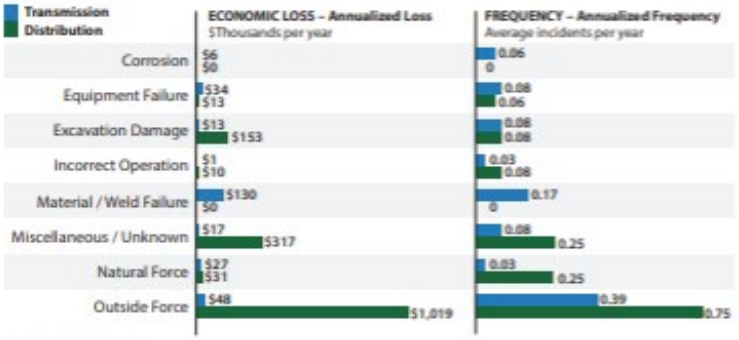



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State of Nebraska | ENERGY SECTOR RISK PROFILE

## Natural Gas Transport

**Top Events Affecting Natural Gas Transmission and Distribution, 1984–2019**




*Data Source: DOT PHMSA*

- As of 2018, Nebraska had:
  - *5,873 miles of natural gas transmission pipelines*
  - *13,209 miles of natural gas distribution pipelines*
- 61% of Nebraska's natural gas transmission system and 34% of the distribution system were constructed prior to 1970 or in an unknown year.
- Between 1984 and 2019, Nebraska's natural gas supply was most impacted by:
  - ***Material Failures** when transported by transmission pipelines (leading cause nationwide at $28.43M per year)*
  - ***Outside Forces** when transported by distribution pipelines (leading cause nationwide at $76.59M per year)*

## Natural Gas Processing and Liquefied Natural Gas

**Natural Gas Customers and Consumption by Sector, 2018**

| | CUSTOMERS | CONSUMPTION |
|---|---|---|
| Residential | 89% | 25% |
| Commercial | 10% | 21% |
| Industrial | <1% | 52% |
| Transportation | <1% | <1% |
| Electric Power | <1% | 3% |
| Other | <1% | <1% |

*Data Source: EIA*

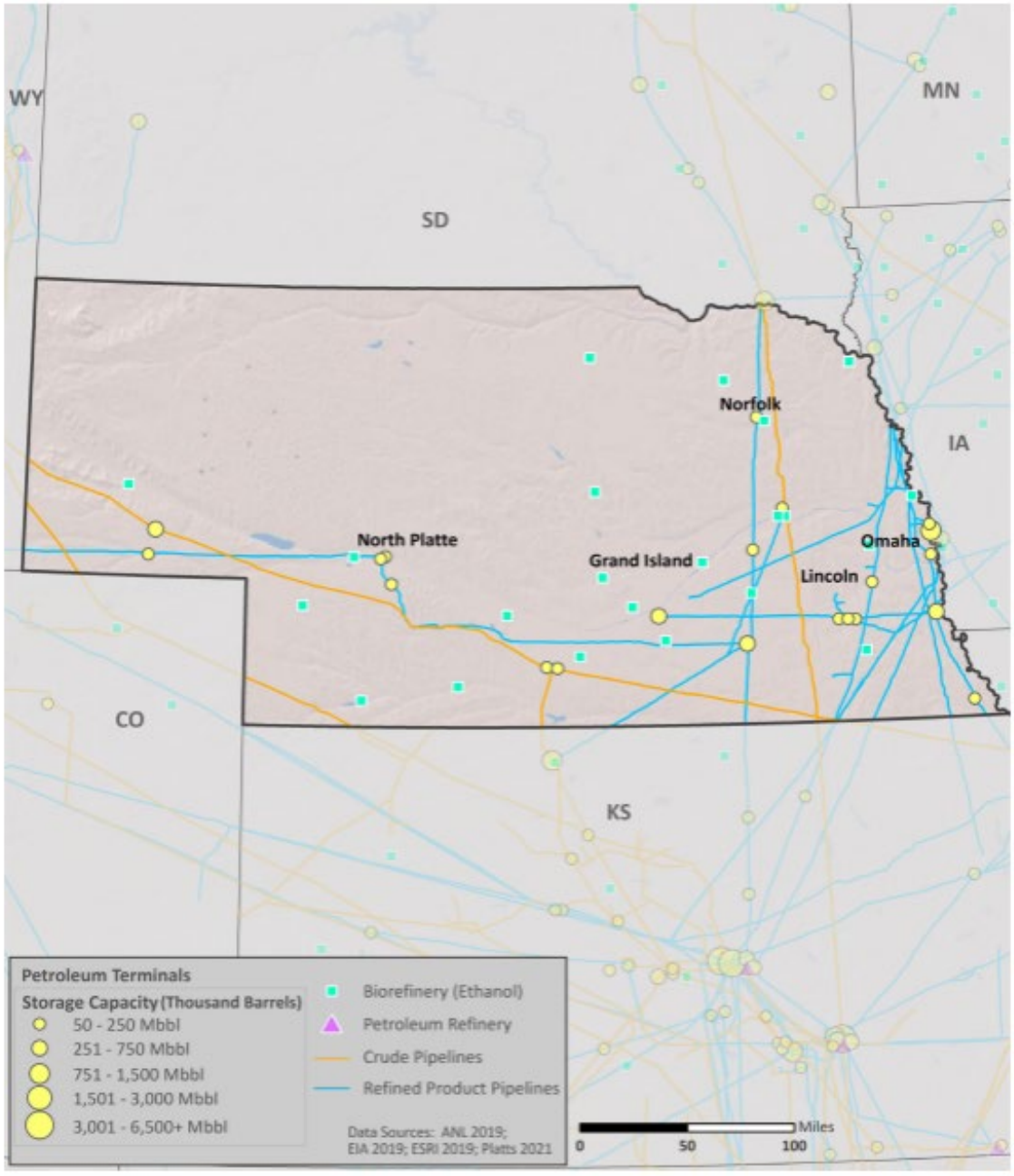
- Nebraska has 0 natural gas processing facilities.
- Nebraska has 1 liquefied natural gas (LNG) facility with a total storage capacity of 290,000 barrels.



State of Nebraska | ENERGY SECTOR RISK PROFILE



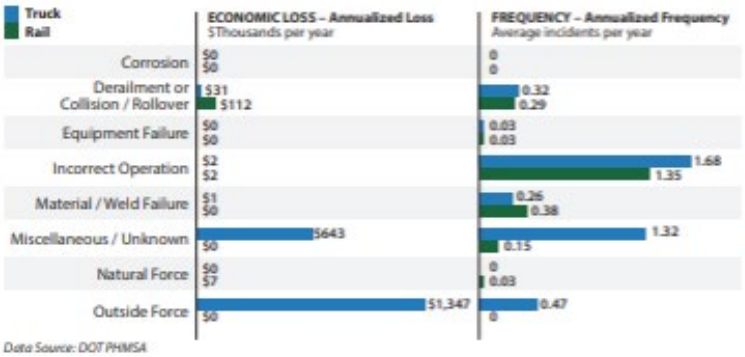
## PETROLEUM




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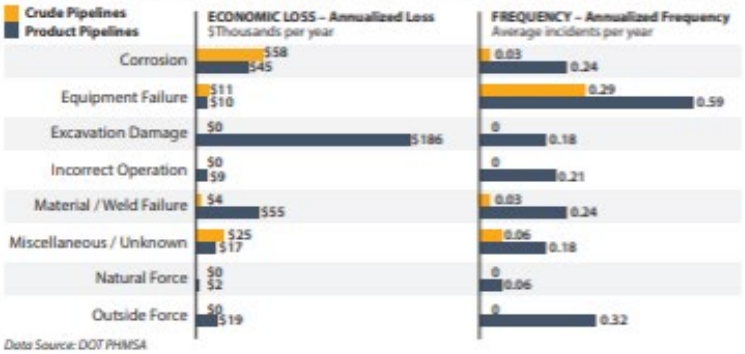
## Petroleum Transport

### Top Events Affecting Petroleum Transport by Truck and Rail, 1986–2019




Data Source: DOT PHMSA

### Top Events Affecting Crude Oil and Refined Product Pipelines, 1986–2019




Data Source: DOT PHMSA

- As of 2018, Nebraska had:
  - *754 miles of crude oil pipelines*
  - *1,320 miles of refined product pipelines*
  - *0 miles of biofuels pipelines*
- 73% of Nebraska's petroleum pipeline systems were constructed prior to 1970 or in an unknown year.
- Between 1986 and 2019, Nebraska's petroleum supply was most impacted by:
  - ***Outside Forces** when transported by truck (2nd leading cause nationwide at $60.45M per year)*
  - ***Derailments, Collisions, or Rollovers** when transported by rail (leading cause nationwide at $19.71M per year)*
  - ***Corrosion** when transported by crude pipelines (3rd leading cause nationwide at $14.51M per year)*
  - ***Excavation Damage** when transported by product pipelines (5th leading cause nationwide at $5.74M per year)*
- Disruptions in other states may impact supply.

## Petroleum Refineries

- There are no operating petroleum refineries in Nebraska.



# 3.19 Severe Thunderstorm

## 3.19.1 Description

Hazardous weather is defined as a dangerous meteorological event with the potential to cause damage, serious social disruption, or loss of life. The potential for hazardous weather exists at almost any time and in any place. The impacts of these events depend on latitude, altitude, topography, and atmospheric conditions.

Severe thunderstorms with high winds and hail are a hazard associated with severe weather conditions that can affect any region of the state at any time of the year; however, severe weather conditions are most prevalent in the early spring and throughout the summer.

### 3.19.1.1 STRONG WIND

The types of damaging winds defined in this section are straight-line wind, downdraft, downburst, microburst, gust front, and derecho. Windstorms in Nebraska are usually of short duration, very intense, and hard to predict. Straight-line winds often impact a wider area than tornadoes.

### 3.19.1.2 MULTI-CELL LINE (SQUALL LINE)

Thunderstorms can form in “squall lines” that extend for hundreds of miles. These lines can last for hours and cause damaging winds and hail. Squall lines produce straight-line wind damage. Long-lived, strong squall lines are called derechos**.** They can travel hundreds of miles and produce widespread damage. A low-hanging arc of cloudiness called a shelf cloud often forms along the front edge of the squall line due to rain-cooled air spreading out from underneath.

### 3.19.1.3 SUPERCELL THUNDERSTORMS

Supercell thunderstorms are long-lasting and organized storms that produce large hail, extreme winds, and flash flooding. They are responsible for most of the significant tornadoes and hailstones larger than golf ball size in the United States. Supercells thrive where the winds veer with height, producing storm-scale rotation.

Supercells are divided into three categories based on visual appearance: low precipitation, classic, and high precipitation. Low-precipitation supercells have sparse precipitation, classic supercells have heavy and adjacent precipitation, and high-precipitation supercells have precipitation that sometimes surrounds the updraft.

**Table 77: Damaging Wind Definitions**[234]

| Type of High Wind | Definition |
|---|---|
| **Straight-Line Winds** | Wind that comes out of a thunderstorm, but is not associated with rotation. |
| **Downdraft** | Small-scale column of air that rapidly sinks toward the ground. |
| **Downburst** | Strong downdraft with horizontal dimensions larger than 2.5 miles resulting in an outward burst of damaging winds on or near the ground. |
| **Microburst** | Small, short-lived, concentrated downburst that produces an outward burst of damaging winds at the surface. |
| **Gust Front** | A wind shift, temperature drop, and gusty winds out ahead of a thunderstorm. Sometimes the winds push up the air above them, forming a shelf cloud or detached roll cloud. |
| **Derecho** | Widespread windstorm that is associated with a band of rapidly moving showers or thunderstorms, it consists of numerous microbursts, downbursts, and downburst clusters. |

#### 3.19.1.4 HAIL

Hail is produced by a severe thunderstorm that forms small ice particles and supercooled water droplets when lifted into a thunderstorm by its updraft. These particles can combine, fall into the downdraft of the storm, and then, if the updraft is strong enough, be recycled back up above the freezing level in the storm.[235] Once this process repeats several times, the hail grows and becomes heavier, thus falling to earth.

#### 3.19.1.5 LIGHTNING

Lightning is the third possible product of a severe thunderstorm. According to the National Weather Service, lightning is the occurrence of a natural electrical discharge of very short duration and high voltage between a cloud and the ground or within a cloud, accompanied by a bright flash and typically also thunder. Although lightning is a product of a severe thunderstorm, it does not constitute a severe thunderstorm, because all thunderstorms have lightning.

## 3.19.2 Risk Assessment

#### 3.19.2.1 LOCATION

Thunderstorms can be isolated events covering a relatively small geographical area or they can develop into squall lines that traverse the entire state. The risk of thunderstorms is generally consistent across the state, but there are random variations in frequency from one county to another. The eastern and southeastern regions, including the cities of Omaha and Lincoln, as well as parts of Douglas, Sarpy, and

[234] 2021 Nebraska State Hazard Mitigation Plan. “Section 3.8 Severe Thunderstorm.” https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.
[235] National Oceanic and Atmospheric Administration, National Weather Service. 2025. “What Constitutes a Severe Thunderstorm.” https://www.weather.gov/bmx/outreach_svr.

Lancaster Counties, may experience slightly higher wind speeds. (See Figure 72.) These regions are located within Zone IV, indicating potential wind speeds of up to 250 miles per hour. The central and western regions of the state are located within Zone III, with the potential for wind speeds of up to 200 miles per hour. The whole state can be affected by severe thunderstorms, including all rural terrain as well as all urban areas.

### 3.19.2.2 EXTENT

The National Weather Service (NWS) considers a thunderstorm severe if at least one out of two events start to occur: hail that is one inch in diameter or larger or wind gusts of 58 miles per hour (mph) or greater. In addition, a tornado might be a component of a severe thunderstorm. Severe thunderstorms also produce lightning, which can cause a substantial amount of damage during an event but is not included in the NWS definition of a severe thunderstorm.

#### THUNDERSTORM

The strength or magnitude of severe thunderstorms varies greatly depending on multiple meteorological, environmental, and geological factors such as latitude, altitude, topography, and atmospheric conditions. In addition, there is seasonal variation in severe weather events, which influence a storm's characteristics, warning time, speed of onset, and duration. Most thunderstorms are preceded by a warning period of variable length, which allows for some level of preparedness. The duration can last for minutes, hours, or even multiple days in extreme weather events.

The National Weather Service provides the following criteria for severe thunderstorms watches and warnings.[236]

**SEVERE THUNDERSTORM or TORNADO WATCH:** Severe thunderstorms with large hail, damaging winds, and/or tornadoes are possible, but the exact time and location of storm development is still uncertain. A watch means be prepared for storms.

**SEVERE THUNDERSTORM WARNING:** A severe thunderstorm is imminent or occurring; it is either detected by weather radar or reported by storm spotters. A severe thunderstorm is one that produces winds 58 mph or stronger and/or hail 1 inch in diameter or larger. A warning means to take shelter.

Figure 71 provides a graphical representation of severe thunderstorm risk categories and their potential magnitude. All thunderstorm categories imply lightning and the potential for flooding. Categories are also tied to the probability of a severe weather event within 25 miles of an individual's location.

[236] National Oceanic and Atmospheric Administration, National Weather Service, "Thunderstorm Threats," 2024. https://www.weather.gov/ctp/wwaCriteria.

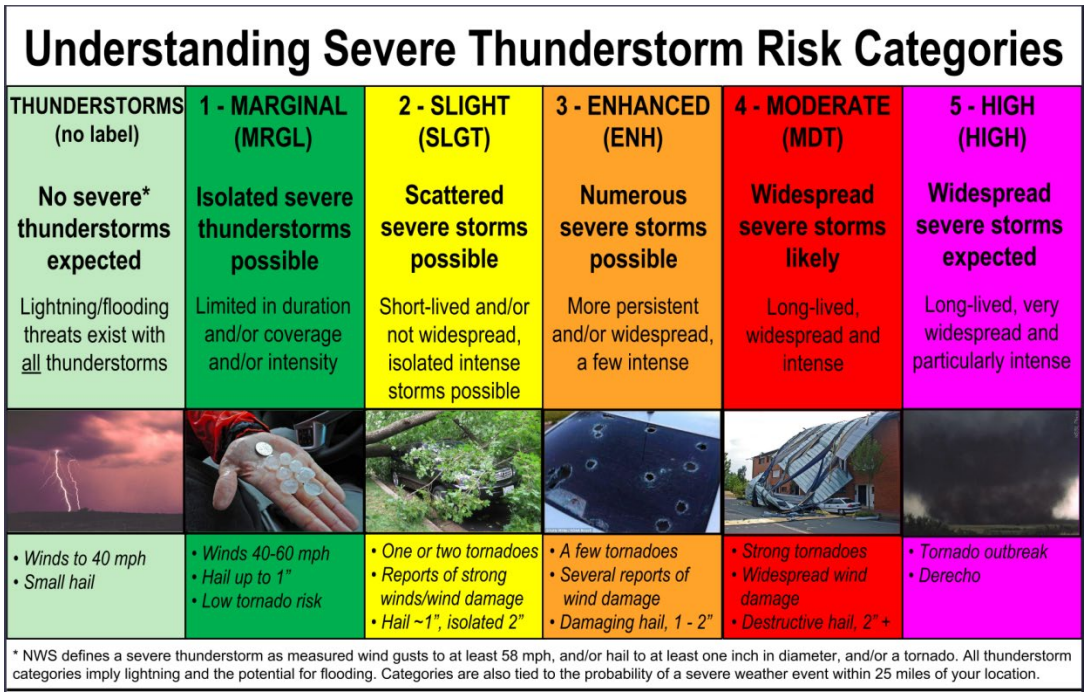



**Figure 71: Severe Thunderstorm Risk Categories**[237]

## HIGH WINDS

The Beaufort Wind Scale measures the extent or magnitude of a thunderstorm wind event. Table 78 describes the different intensities of wind in terms of speed and effects, from calm to violent and destructive.

**Table 78: Beaufort Wind Scale**[238]

| Force | Wind (mph) | WMO Classification | Appearance of Wind Effects |
|---|---|---|---|
| **0** | Less than 1 | Calm | Calm, smoke rises vertically |
| **1** | 1–3 | Light Air | Smoke drift indicates wind direction; still wind vanes |
| **2** | 4–8 | Light Breeze | Wind felt on face, leaves rustle, vanes begin to move |
| **3** | 9–14 | Gentle Breeze | Leaves and small twigs constantly moving, light flags extended |
| **4** | 15–21 | Moderate Breeze | Dust, leaves, and loose paper lifted, and small tree branches move |
| **5** | 22–28 | Fresh Breeze | Small trees and leaves begin to sway |

[237] National Oceanic and Atmospheric Administration, National Weather Service, "Severe Thunderstorm Risk Categories," 2024. https://www.spc.noaa.gov/misc/about.html.
[238] National Weather Service, "Beaufort Wind Scale." https://www.weather.gov/mfl/beaufort#:~:text=One%20of%20the%20first%20scales%20to%20estimate%20wind,is%20still%20used%20today%20to%20estimate%20wind%20strengths.

| Force | Wind (mph) | WMO Classification | Appearance of Wind Effects |
|---|---|---|---|
| **6** | 29–36 | Strong Breeze | Larger tree branches moving, whistling in wires |
| **7** | 37–44 | Near Gale | Whole trees moving, resistance felt walking against wind |
| **8** | 45–53 | Gale | Breaks twigs off trees; generally impedes progress |
| **9** | 54–62 | Strong Gale | Slight structural damage occurs; slate blows off roofs |
| **10** | 63–72 | Storm | Seldom experienced on land, trees broken or uprooted; considerable structural damage |
| **11** | 73–83 | Violent Storm | If experienced on land, widespread damage |
| **12** | 84+ | Hurricane | Violence and destruction |

While the frequency of occurrence is relatively equal across the state, the extent of wind speed based on scientific models indicates that the magnitude may be slightly higher in the east-southeast portions of the state. Figure 72 illustrates the wind zone in the southeast portion of the state as Zone IV, with a wind speed potential of 250 miles per hour, while the remainder of the state is in Zone III, which is 200 miles per hour.

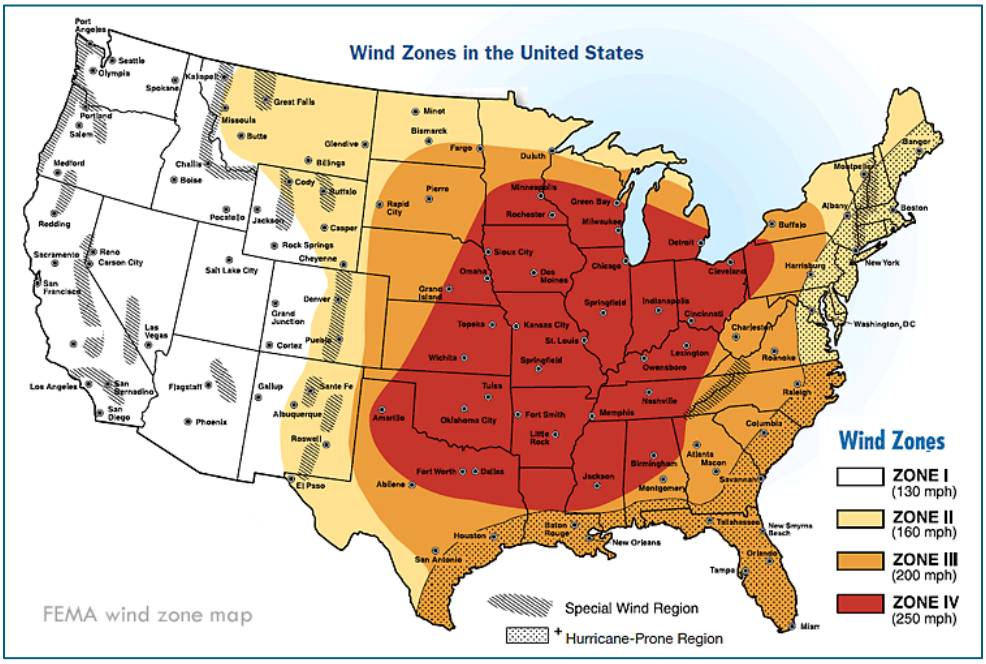



**Figure 72: FEMA Wind Zone Map of the United States**[239]

[239] Federal Emergency Management Agency, "Wind Zones in the United States," FEMA Wind Zone Map 2023. https://basc.pnnl.gov/images/wind-zones-us.

Although the wind map indicates this slight difference in potential wind speed across the state, actual damage costs from previous events reveal that there is similar potential for impacts and loss throughout the state.

### HAIL

By scientific agreement, an icy conglomeration is called a hailstone when it reaches a diameter of one-fifth of an inch (5 mm). Hailstones can grow as big as a grapefruit in diameter, which would cause heavy damage, but they only need to be an inch to be considered severe. In all its forms, hail usually occurs in relatively short episodes rather than as steady precipitation. In Nebraska, expected hail damage could affect people, homes, businesses, crops, and utility infrastructure.

**Table 79: Hail Intensity and Magnitude[240]**

| Size Code | Intensity Category | Size (Diameter in Inches) | Descriptive Term | Typical Damage |
|---|---|---|---|---|
| **H0** | Hard Hail | Up to 0.33 | Pea | No damage |
| **H1** | Potentially Damaging | 0.33–0.60 | Marble | Slight damage to plants and crops |
| **H2** | Potentially Damaging | 0.60–0.80 | Dime | Significant damage to plants and crops |
| **H3** | Severe | 0.80–1.20 | Nickel | Severe damage to plants and crops |
| **H4** | Severe | 1.2–1.6 | Quarter | Widespread glass and auto damage |
| **H5** | Destructive | 1.6–2.0 | Half Dollar | Widespread destruction of glass, roofs, and risk of injuries |
| **H6** | Destructive | 2.0–2.4 | Ping Pong Ball | Aircraft bodywork is dented, and brick walls pitted |
| **H7** | Very Destructive | 2.4–3.0 | Golf Ball | Severe roof damage and risk of serious injuries |
| **H8** | Very Destructive | 3.0–3.5 | Hen Egg | Severe damage to all structures |
| **H9** | Super Hailstorms | 3.5–4.0 | Tennis Ball | Extensive structural damage, could cause fatal injuries |
| **H10** | Super Hailstorms | 4.0 + | Baseball | Extensive structural damage, could cause fatal injuries |

[240] Tornado and Storm Research Organisation, "Hailstorm Intensity Scale." https://www.torro.org.uk/research/hail/hscale.

The intensity scale in Table 79 ranges from H0 to H10, with increments of intensity or damage potential in relation to hail size (distribution and maximum), texture, fall speed, speed of storm translation, and strength of the accompanying wind. Based on available data regarding the previous occurrences, Nebraska may experience hailstorms ranging from an H0 to an H7. Counties in the state can experience a storm from low-risk or hard hail to a very destructive hailstorm with golf-ball size hail that leads to severe roof damage and risk of serious injuries.

### LIGHTNING

According to the Federal Emergency Management Agency (FEMA), an average of 300 people are injured and 80 people are killed in the United States each year by lightning. Direct lightning strikes can also cause significant damage to buildings, critical facilities, and infrastructure. Lightning is responsible for igniting wildfires that can result in widespread damage to property before firefighters can contain and suppress the resultant fire.

Lightning is a discharge of electrical energy from the buildup of positive and negative charges within a thunderstorm, creating a "bolt" when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes, but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes thunder, often accompanying lightning strikes. While often affiliated with severe thunderstorms, lightning often strikes outside heavy rain and might occur as far as 10 miles from rainfall.

The extent of lightning can be expressed in terms of the number of strikes in an interval. National Oceanic and Atmospheric Administration (NOAA) utilizes lightning activity levels (LALs) on a scale from 1 to 6. LAL rankings reflect the cloud-to-ground lightning frequency, either forecast or observed (Table 80).[241]

**Table 80: NOAA Lightning Activity Levels (LALs)[242]**

| LAL | Cloud and Storm Development | Lightning Strikes/ 15 Minutes |
|---|---|---|
| **1** | No thunderstorms. | – |
| **2** | Cumulus clouds are common, but only a few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain occasionally reaches the ground. Lightning is very infrequent. | 1–8 |
| **3** | The towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent. | 9–15 |

[241] National Centers for Environmental Information, National Oceanic and Atmospheric Administration Severe Weather Data Inventory. "Lightning Strikes Data Set." https://www.ncei.noaa.gov/maps/swdi/.
[242] National Weather Service. 2025. "Lightning Activity Levels 1–6." https://www.weather.gov/media/rnk/fire/LAL.pdf.

| LAL | Cloud and Storm Development | Lightning Strikes/ 15 Minutes |
|---|---|---|
| **4** | The towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered, and more than three must occur within the observation area. Moderate rain is common, and lightning is frequent. | 16–25 |
| **5** | Towering cumulus and thunderstorms are numerous. They cover more than three-tenths of the sky and occasionally obscure the sky. Rain is moderate to heavy, and lightning is frequent and intense. | >25 |
| **6** | Similar to LAL 3, except thunderstorms are dry. | |

### 3.19.2.3 PREVIOUS EVENTS

In the past 16 years (2008–2024), there have been 1,976 event days of severe thunderstorms that include thunderstorm wind or hail. During that same period, Nebraska experienced 23 declared disasters related to severe thunderstorms, the most recently declared on September 24, 2024. Overall, these 23 disasters have affected 476 counties (multiple counties have been affected more than once). The total cost of Public Assistance (PA) from these disasters is more than $767,383,803 million when PA dollars obligated for each disaster are adjusted for inflation. PA obligations for active incidents in 2024 are not yet available.[243]

**Table 81: FEMA Disaster Declarations for Nebraska 2008–2024[244]**

| DR# | Type | Incident Period | Declaration Date | Public Assistance Obligated | Dollars Adjusted for Inflation (to February 2025) | # Counties Affected |
|---|---|---|---|---|---|---|
| **DR-4822** | Severe storms, tornadoes, straight-line winds, flooding | June 20, 2024–July 8, 2024 | September 24, 2024 | Not available | N/A | 17 |
| **DR-4808** | Severe storms, tornadoes, straight-line winds, flooding | May 20, 2024–June 3, 2024 | August 20, 2024 | Not available | N/A | 19 |

[243] Federal Emergency Management Agency. 2025. "Disasters and Declarations – Nebraska 2008–2024." https://www.fema.gov/disaster/declarations?field_dv2_declaration_date_value%5Bmin%5D=2008&field_dv2_declaration_date_value%5Bmax%5D=2025&field_dv2_declaration_type_value=DR&field_dv2_incident_type_target_id_selective=All&field_dv2_state_territory_tribal_value%5B%5D=NE.
[244] Ibid.

| DR# | Type | Incident Period | Declaration Date | Public Assistance Obligated | Dollars Adjusted for Inflation (to February 2025) | # Counties Affected |
|---|---|---|---|---|---|---|
| **DR-4786** | Severe storms, straight-line winds, | April 6, 2024–April 7, 2024 | May 4, 2024 | Not available | N/A | 8 |
| **DR-4778** | Severe storms, tornadoes, straight-line winds | April 25, 2024–April 27, 2024 | May 3, 2024 | Not available | N/A | 6 |
| **DR-4662** | Severe storms, straight-line winds, | May 12, 2022 | July 27, 2022 | $10,031,362.63 | N/A | 20 |
| **DR-4641** | Severe storms, tornadoes, straight-line winds | December 15, 2021 | February 23, 2022 | $8,952,643.85 | N/A | 25 |
| **DR-4616** | Severe storms, straight-line winds, | July 9, 2021–July 10, 2021 | September 6, 2021 | $28,507,974.57 | N/A | 14 |
| **DR-4420** | Severe storms, tornadoes, straight-line winds, flooding | March 9, 2019–July 14, 2019 | March 21, 2019 | $516,891,821.95 | N/A | 65 |
| **DR-4387** | Severe storms, tornadoes, straight-line winds, flooding | June 17–July 1, 2018 | August 27, 2018 | $713,719.21 | N/A | 11 |
| **DR-4325** | Severe storms, tornadoes, straight-line winds | June 12–17, 2017 | August 1, 2017 | $19,768,675.81 | $20,101,726.24 | 18 |

| DR# | Type | Incident Period | Declaration Date | Public Assistance Obligated | Dollars Adjusted for Inflation (to February 2025) | # Counties Affected |
|---|---|---|---|---|---|---|
| **DR-4225** | Severe storms, tornadoes, straight-line winds, flooding | May 6–June 17, 2015 | June 25, 2015 | $14,235,509.29 | $15,294,710.69 | 28 |
| **DR-4185** | Severe storms, tornadoes, straight-line winds, flooding | June 1–4, 2014 | July 28, 2014 | $3,937,963.86 | $4,525,180.92 | 12 |
| **DR-4183** | Severe storms, tornadoes, straight-line winds, flooding | June 14–21, 2014 | July 24, 2014 | $12,420,716.97 | $13,336,620.38 | 12 |
| **DR-4179** | Severe storms, tornadoes, straight-line winds, flooding | May 11–12, 2014 | June 17, 2014 | $10,125,817.92 | $10,892,700.69 | 6 |
| **DR-4156** | Severe storms, tornadoes, straight-line winds, flooding | October 2–6, 2013 | November 26, 2013 | $2,670,513.58 | $2,937,772.33 | 10 |
| **DR-4014** | Severe storms, tornadoes, straight-line winds | June 19–21, 2011 | August 12, 2011 | $3,362,468.45 | $3,805,498.84 | 12 |
| **DR-1945** | Severe storms, tornadoes, straight-line winds, flooding | September 13–14, 2010 | October 21, 2010 | $2,138,551.99 | $2,907,448.78 | 7 |

| DR# | Type | Incident Period | Declaration Date | Public Assistance Obligated | Dollars Adjusted for Inflation (to February 2025) | # Counties Affected |
|---|---|---|---|---|---|---|
| **DR-1924** | Severe storms, flooding, tornadoes | June 1–August 29, 2010 | July 15, 2010 | $49,926,354.50 | $58,716,384.67 | 61 |
| **DR-1902** | Severe storms, ice jams, flooding | March 6–April 3, 2010 | April 21, 2010 | $3,112,391.72 | $3,660,392.75 | 37 |
| **DR-1853** | Severe storms, tornadoes, flooding | June 5–June 26, 2009 | July 31, 2009 | $4,491,366.48 | $5,347,360.44 | 17 |
| **DR-1779** | Severe storms, straight-line winds, flooding | June 27, 2008 | July 18, 2008 | $12,058,393.64 | $14,055,480.80 | 4 |
| **DR-1770** | Severe storms, tornadoes, flooding | May 22–June 24, 2008 | June 20, 2008 | $36,258,650.19 | $42,485,663.02 | 62 |
| **DR-1765** | Severe storms, tornadoes, flooding | April 23–26, 2008 | May 30, 2008 | $499,319.42 | $590,967.65 | 5 |
| **Total public assistance dollars for declared disasters, 2008–2024 (adjusted for inflation to December 2024): $203,326,735.94** | | | | | | |

NOAA's National Centers for Environmental Information (NCEI) Storm Events Database, between 1950 and December 2024, documents in relation to thunderstorms wind $1.963 million in property damages, and $149,000 in crop damages for Custer County, located in the central part of Nebraska. In the same time period, Lancaster County, located in the southeast part of the state, incurred $1.505 million in property damages and no crop damages.

On May 3, 2024, Governor Jim Pillen, request for a major disaster declaration for the state was approved, triggering the release of federal funds to help Nebraska residents and communities in Douglas and

Washington Counties to recover from severe storms, straight line winds and tornadoes that occurred April 25, 2024, to April 27, 2024, called the Arbor Day Tornadoes.[245]

### 3.19.2.4 PROBABILITY

Due to the geographic location of the state within the continent and the event history, the probability of that multiple severe thunderstorm events will occur each year is highly likely. During 2011 and 2012, 25 severe storms, floods, droughts, heatwaves, and wildfires occurred, with a combined total loss of $188 billion. This study presents data that also supports a 16% increase in the annual amount of precipitation falling in very heavy events from 1901 to 2012.[246]

### 3.19.2.5 EFFECTS OF FUTURE CONDITIONS

#### SEVERE THUNDERSTORMS

Projected changes in the climate should be considered in relation to the probability of future severe thunderstorm events. Nebraska has experienced general warming of about 1 degree since 1895, with the majority of this warming occurring during the winter months. Minimum temperatures are rising 2.0 to 4.0 degrees Fahrenheit per century and maximum temperatures increase 1.0 to 2.5 degrees Fahrenheit per century. The precipitation trend shows an increase in the northern Great Plains, which is projected to become more pronounced. In addition, future changes in the climate also indicate a continued increasing trend in the number of heavy precipitation events, which could include hail and high winds, and could occur two to five times as often as they do currently depend on future greenhouse gas emissions.[247]

#### LIGHTNING

As carbon dioxide increases and the land surface warms, stronger updrafts are more likely to produce lightning. In a climate with double the amount of carbon dioxide, there may be fewer lightning storms due to less moisture but 25% stronger storms, with a 5% increase in lightning. Lightning damage is also likely to increase because of its role in igniting forest fires, where dry vegetation, also caused by rising temperatures, creates more fuel for fires. Implementing simple measures like lightning detection systems and installing grounding systems in buildings could go a long way in avoiding deaths and injuries.[248]

#### HAIL

Researchers assert hailstorms are dangerous and costly phenomena, with frequency and intensity expected to be impacted negatively in response to a warming climate. Current knowledge of climate change effects on hailstorms resulting from warm temperatures over time impacting the climate with

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[245] State of Nebraska, Office of the Governor. 2024. “Gov. Pillen Responds to Expedited Federal Disaster Declaration.” https://governor.nebraska.gov/press/gov-pillen-responds-expedited-federal-disaster-declaration.
[246] 2021 Nebraska State Hazard Mitigation Plan. “Section 3.8 Severe Thunderstorm.” https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.
[247] Ibid.
[248] Nathan Neal. January 11, 2021. “How Lightning Is Affected by Climate Change.” *Environment Journal*. https://environmentjournal.online/climate-change/the-future-is-not-forecast-how-lightning-is-affected-by-climate-change/.

low-level moisture that increases instability of air mass, raising the likelihood of hailstorms and potentially larger hailstones. Observations and modeling lead to the general expectation that hailstorm frequency will increase in Australia and Europe but decrease in East Asia and North America, while hail severity will increase in most regions. However, current, and future climate change effects on hailstorms remain highly uncertain.[249]

## 3.19.3 Vulnerability Analysis

### 3.19.3.1 SEVERE THUNDERSTORMS

Nebraska is particularly vulnerable to severe thunderstorms due to its flat topography, which makes it conducive to the collision of warm, moist air from the Gulf of Mexico and cooler air from the north. This interaction creates ideal conditions for severe storms, especially during the spring and summer months. Being part of "Tornado Alley," Nebraska frequently faces tornadoes that can cause significant destruction.

Severe thunderstorms can produce large hail, damaging winds, and heavy rainfall, all of which contribute to flash flooding. This can have dire consequences for the state's vital agricultural sector, as intense storms can damage crops and livestock, affecting the economy and food supply.

### 3.19.3.2 HAIL

Hail events can pose a significant risk to people and create dangerous situations. The economic and financial impacts of hail will depend entirely on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented.

### 3.19.3.3 LIGHTNING

Vulnerability is difficult to evaluate since lightning events can occur at different strength levels, in random locations, and create a broad range of damages depending on the strike location. Due to the randomness of these events, all existing and future structures and facilities in Nebraska could be impacted and remain vulnerable to possible injury and property loss from lightning strikes.

The main danger from a lightning storm is being struck by a lightning bolt. A bolt can cause severe electric burns and even fatally injure the victim. If a citizen can hear thunder but cannot see a flash of lightning, that does not mean someone cannot still be struck. Whenever thunder is present, it is recommended that shelter should be taken.[250]

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[249] T. H. Raupach, O. Martius, J. T.Allen, et al. "The Effects of Climate Change on Hailstorms. "*Nature Reviews Earth and Environment*2 (2021): 213–226. https://doi.org/10.1038/s43017-020-00133-9 https://doi.org/10.1038/s43017-020-00133-9.

[250] National Oceanic and Atmospheric Administration, National Weather Service, 2025. "What Constitutes a Severe Thunderstorm." https://www.weather.gov/bmx/outreach_svr.

Lightning can also strike trees or power lines, causing them to collapse, potentially starting wildfires that put nearby people at risk.

### 3.19.3.4 VULNERABILITY OF STATE FACILITIES

Due to the geographic location of the state, the probability of future events is very high. The number of thunderstorms expected to affect the state depends on yearly global weather patterns, making long-range prediction difficult. The entire state and all state assets are susceptible to thunderstorms, high winds, hail, and lightning and experience hazard impacts on a regular basis; consequently, all state assets are vulnerable to severe thunderstorms.

State property replacement values in the top ten most populated counties with increased concentrations of infrastructure and buildings are listed in Table 82.

**Table 82: State Asset Replacement Values – Top Ten Counties**

| County | # of Properties | Insurance Value | Contents Insurance | Total Value | Replacement Cost |
|---|---|---|---|---|---|
| Brown | 28 | $0 | $0 | $$4,236,570 | $4,236,570 |
| Lancaster | 329 | $327,401,529 | $419,606,538 | $747,008,067 | $747,008,067 |
| Douglas | 107 | $117,350,452 | $31,371,276 | $148,721,729 | $81,423,950 |
| Buffalo | 76 | $6,447,797 | $12,095,960 | $18,543,757 | $210,296,611 |
| Johnson | 26 | $157,136,448 | $29,311,747 | $186,448,194 | $3,184,781 |
| Hall | 81 | $7,321,5208 | $2,719,927 | $10,041,447 | $10,634,654 |
| Cass | 225 | $0 | $1,494,524 | $1,494,524 | $104,597,718 |
| Dawes | 146 | $1,279,931 | $1.127,496 | $2,407,427 | $97,713,763 |
| Gage | 63 | $7,106,900 | $709,783 | $7,816,683 | $90,815,987 |
| Adams | 29 | $10,000 | $130,574 | $140,574 | $10,886,734 |
| **TOTALS** | **1,110** | **$624,054,576** | **$498,567,826** | **$1,126,858,972** | **$1,360,798,834** |

### 3.19.3.5 NATIONAL RISK INDEX

Figure 73 illustrates the National Risk Index for Nebraska for hail. Various counties show an index rating of very high, relatively high, relatively moderate, relatively low, and very low hail risk. Notably, counties located in the southwestern and central portions of the state have index ratings of mostly very high and relatively high for hail.

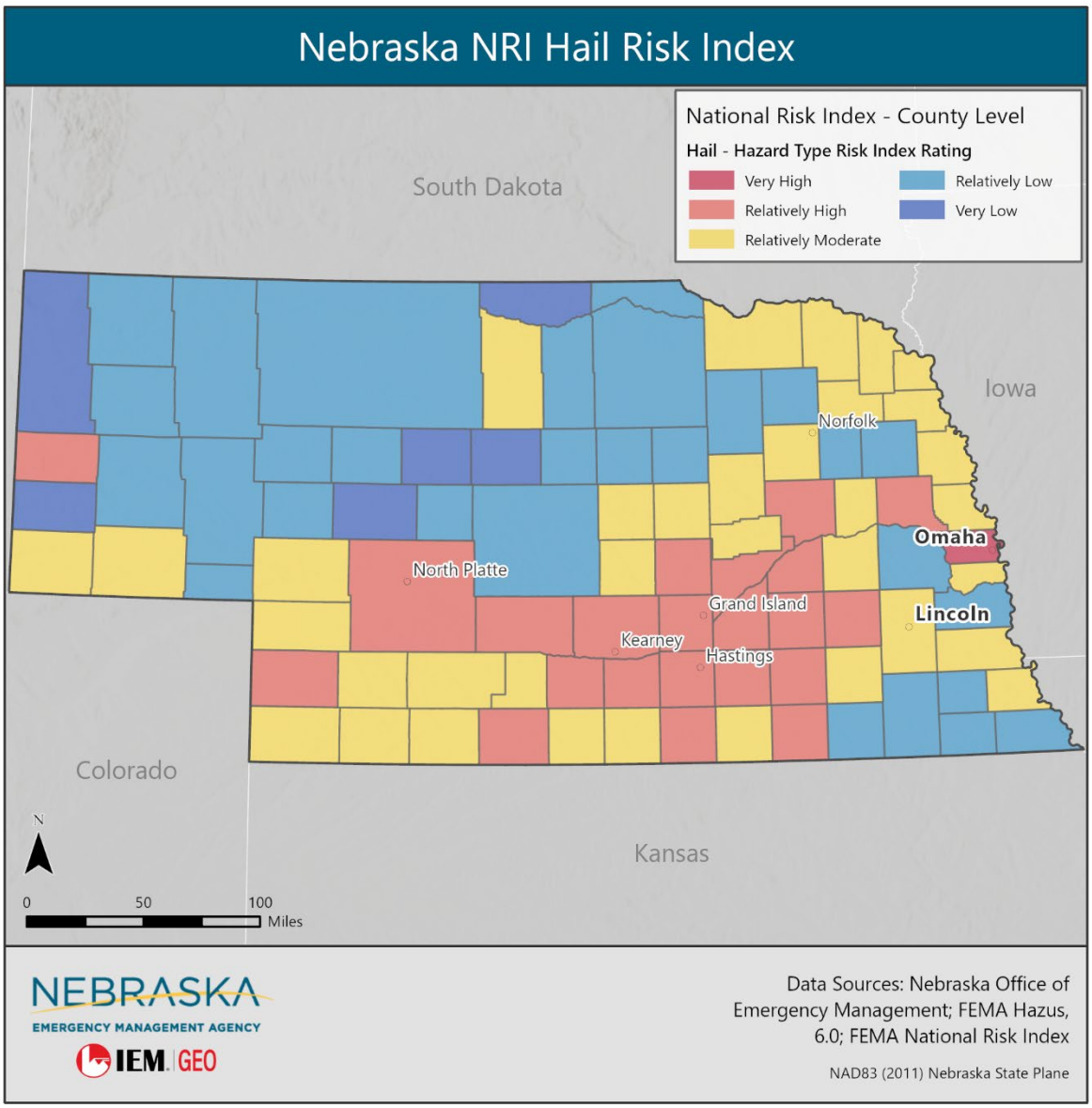



**Figure 73: Nebraska NRI Hail Risk Index**[251]

Figure 74 illustrates the National Risk Index rating for Nebraska for lightning. Most of the state has a relatively low or very low lightning risk rating. Notably, Omaha has a relatively high-risk index rating for lightning.

[251] Nebraska Office of Emergency Management, FEMA Hazus 6.0, FEMA National Risk Index.

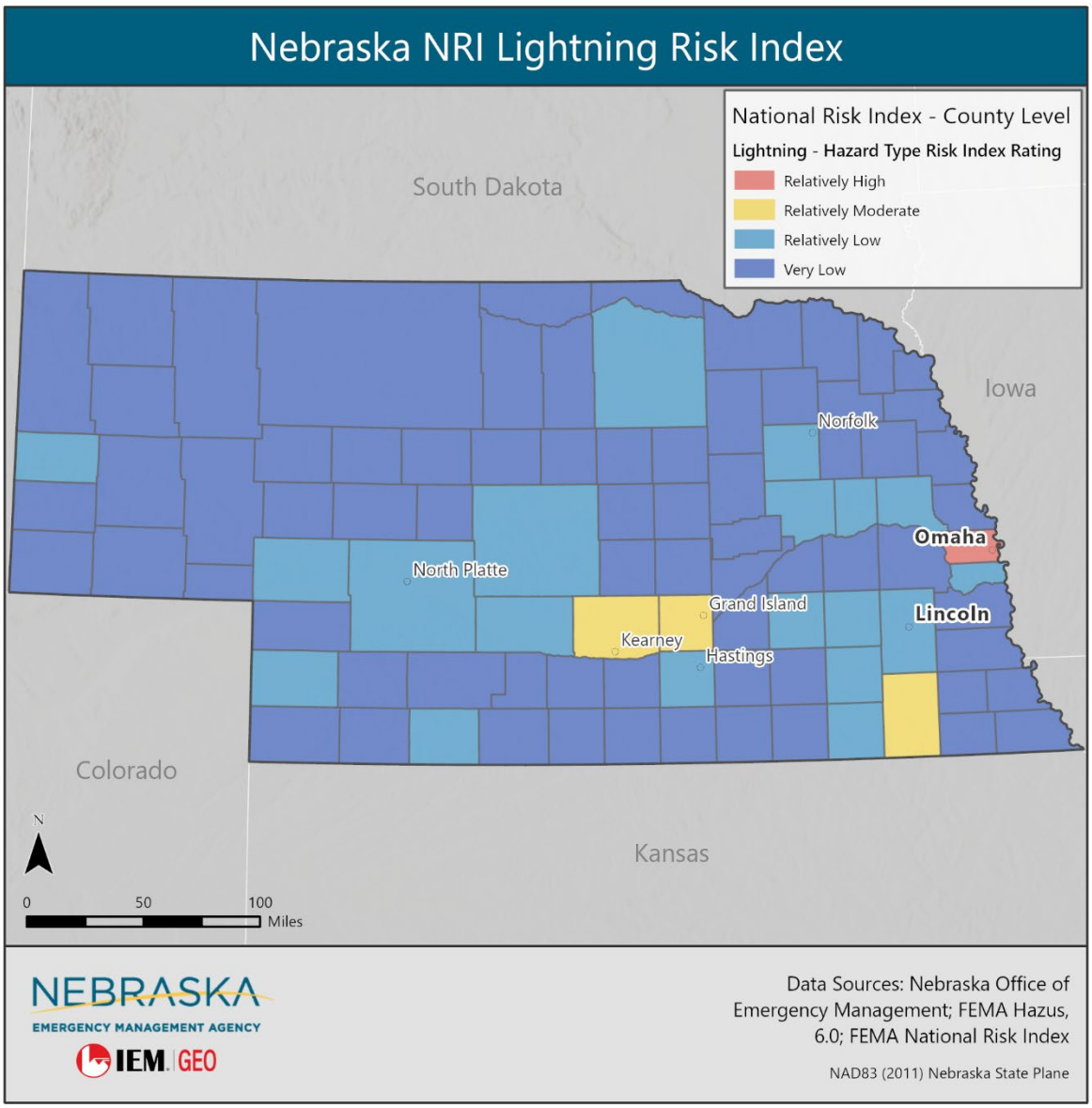



**Figure 74: Nebraska NRI Lightning Risk Index**[252]

## 3.19.3.6 ESTIMATED IMPACT AND POTENTIAL LOSSES

### HIGH WINDS

The primary effect on buildings is structural damage due to the lifting or suction force of the wind from the exterior, as well as the blowout force of the wind if it penetrates the interior. The results can be loss of roofs, walls, porches, lifting the building off the foundation, or complete destruction. Other sources of

[252] Nebraska Office of Emergency Management, FEMA Hazus 6.0, FEMA National Risk Index.

wind damage are from trees and wind-born objects and debris. Rain during or after a windstorm is also a threat due to the damaged buildings being left exposed and water infiltration causing additional damage.

### HAIL

According to NOAA, hail damage has approached $1 billion in damages annually in the United States since 2021. Much of the damage inflicted by hail is to crops.[253] Even relatively small hail can severely damage plants in minutes. Hail also damages vehicles, roofs of buildings and homes, and landscaping.

Utility systems on roofs in school districts and critical facilities would be vulnerable and could be damaged. Hail could cause a significant threat to people as they could be struck by hail and falling trees and branches. Outdoor activities and events may elevate the risk to residents and visitors when a hailstorm strikes with little warning. Portable buildings typically utilized by schools and commercial sites, such as construction areas, would be more vulnerable to hail events than the typical site-built structures.

### LIGHTNING

Lightning events can pose a significant risk to people and create dangerous and difficult situations for public health and safety officials. Individuals exposed to the storm can be directly struck, posing significant health risks and potential death. Structures can be damaged or crushed by falling trees damaged by lightning, resulting in physical harm to the occupants. Lightning strikes can result in widespread power outages, increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety. Extended power outages often increase structure fires and carbon monoxide poisoning as individuals attempt to cook or heat their homes with alternate, unsafe cooking or heating devices, such as grills. Lightning strikes can be associated with structure fires and wildfires, creating additional risk to residents and first responders. Emergency operations and services may be significantly impacted due to power outages and/or loss of communications. City and county critical facilities may be damaged, delaying response and recovery efforts for the entire community. Economic disruption due to power outages and fires negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue. Some businesses not directly damaged by lightning events may be negatively impacted while utilities are restored, further slowing economic recovery.

## 3.19.3.7 ACCESS AND FUNCTIONAL NEEDS

At-risk populations are the elderly, low-income, linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Power outages can be life-threatening to those dependent on electricity for life support. The whole population of the state is vulnerable since all of Nebraska is highly likely to be affected. “Vulnerable populations related to severe thunderstorms include the elderly, those living in mobile homes, and those caught outside during storm events. During severe thunderstorms, it is not uncommon for residents and towns to experience power outages for a temporary or prolonged period. These power outages may prove deadly for elderly citizens

[253] The Weather Channel, October 10, 2023, “Thunderstorm Safety and Preparedness: Hail Damage’s Extraordinary Costs.” https://weather.com/safety/thunderstorms/news/2023-04-28-hail-hailstorms-damage-cost.

that are reliant upon machines to remain alive. The elderly are generally less mobile than many other members of the community, making them more vulnerable to a wide range of threats. Unanchored or improperly anchored mobile homes are at high risk during thunderstorms because they can be turned over by winds of 60 to 70 mph."[254]

### 3.19.3.8 COMMUNITY LIFELINES

#### SEVERE THUNDERSTORMS

Severe thunderstorm events have the potential to pose a significant risk to people and can create dangerous and difficult situations for public health and safety officials. All community lifelines—safety and security; health and medical; communications; hazardous materials; food, hydration, and shelter; energy (power and fuel); water systems; and transportation—can be affected by severe thunderstorms. For example, downed power lines may make roadways unsafe for use, preventing first responders from answering calls for assistance or rescue. During exceptionally heavy wind events, first responders may be prevented from responding to calls, as the winds may reach a speed at which their vehicles and equipment are unsafe to operate. Thunderstorm winds often result in widespread power outages, increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.

#### HAIL

A bigger, stronger, longer-lasting hailstorm can result in roofs collapsing, power lines coming down, and other damage to buildings and infrastructure. In addition, hail can cause significant damage to nearby trees, which can collapse onto buildings and critical infrastructure, causing more damage than would otherwise be possible from just the hail. Hail can cause physical damage to HVAC equipment, impairing its performance and efficiency. Hailstorms can dent, fracture, or puncture asphalt and metal roofs, compromising the roof's integrity and requiring repairs or replacement. Hail impact can include damage to solar panels, reducing energy production and efficiency. Hailstones can damage transformers or utility poles, potentially causing power outages and suspending communication services. Hail can break plants and tree limbs, strip foliage from trees and plants, strip soft bark from trees, and damage wood under the bark if the storm is severe enough.

#### LIGHTNING

Depending on the duration and severity of an electrical storm, all community lifelines—safety and security, health and medical, communications, hazardous materials, food, hydration, and shelter, energy (power and fuel), water systems, and transportation—can be affected. Lightning can cause fires or explosions in buildings, electrical surges, damage to trees, and communication disruptions, as well as injuries and deaths. Compared to the severity and duration of other types of hazards, the effects of lightning strikes on community lifelines are relatively short-lived.

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[254] 2021 Nebraska State Hazard Mitigation Plan, "Section 3.8: Severe Thunderstorm." https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.

### 3.19.3.9 ENHANCED PRIORITY RISK INDEX SCORE

The Enhanced Priority Risk Index (EPRI) provides the state of Nebraska with a methodology to measure the impact each profiled hazard may have on the seven Emergency Management Accreditation Program Standard 4.1.2 sectors (i.e., public; responders; continuity of operations including continued delivery of services; property, facilities, and infrastructure; the environment; the economic condition of the jurisdiction; and public confidence in the jurisdiction's governance). Table 83 provides the EPRI scores for the hazard with the appropriate risk factor.

**Table 83: Severe Storms Enhanced Priority Risk Index Score**

| | Probability Next 5 Years | Impact | Spatial Extent | Warning Time | Duration | Vulnerability | Probability | Risk Factor |
|---|---|---|---|---|---|---|---|---|
| **Risk Level** | 3.9 | 2.6 | 2.9 | 2.9 | 1.6 | 3.3 | 3.9 | 3.01 |

Table 84 provides a summary of severe thunderstorm impacts, including impact to the public, first responders, continuity of operations, property, infrastructure, environment, economic conditions and public confidence, and the consequences of those impacts.

**Table 84: Severe Thunderstorm Impact and Consequences**

| Sector | Impacts |
|---|---|
| **Public** | **Housing** – Depending on the wind and the size of hail, most damages are roofs, siding, and windows from wind and hail. If there are extreme straight-line winds, homes and buildings may incur major damage or be destroyed.<br>**Casualties/Fatalities** – May occur with individuals lacking shelter during the storm.<br>**Work** – Business and industrial buildings can incur similar damages or can be shut down temporarily due to loss of electrical power.<br>**Food/water** – Little impact. |
| **First Responders** | Depending on the strength of the wind and size of hail, responders need to be aware of the possibility of downed electrical lines as they move debris from roadways. Some search and rescue may be needed but is unusual unless the storm spawns tornadoes. |
| **Continuity of Operations** | Unless governmental facilities are severely damaged, which is rare, or there is a prolonged loss of power where some electronic records are destroyed or damaged, there is little impact. |
| **Property, Facilities, and Infrastructure** | Homes and businesses may have minor damages similar to housing (above). There may be some properties isolated due to flash flooding.<br>Electricity can be the most impacted by a severe thunderstorm. High winds can affect structures and lines, causing outages. Water and wastewater systems can be impacted if an electrical outage is prolonged. |
| **Environment** | Limited impact except that due to flash flooding. |

| Sector | Impacts |
|---|---|
| **Economic Conditions** | Depending on the level and coverage of the storm, businesses may experience large amounts of damage. Farms may experience damage to crops, buildings, and livestock. |
| **Public Confidence** | The public will expect the government to effectively conduct disaster operations and return the community back to a normal state within a reasonable time. Failure to do so may lead to a lack of confidence in governance. |

# 3.20 Severe Winter Storm

## 3.20.1 Description

A severe winter storm is an event that occurs during the winter season and includes one or more of the following conditions: snow, ice, high winds, blizzard conditions, and other wintry conditions causing potential health and safety impacts as well as physical damage or loss to improved property. It can range from moderate snow over a few hours to a blizzard with blinding wind-driven snow that can last for multiple days.

A severe winter storm is the second most common event in the State of Nebraska behind severe thunderstorms. The National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI) Storm Events Database includes 456 individual reports of severe winter weather (reported as either blizzard, heavy snow, ice storm, winter storm, winter weather, or a combination of these) between January 1, 2019, and March 1, 2020. These events result from the collision of high-pressure systems with moderate temperatures and low-pressure systems having lower temperatures. The storms may contain freezing rain, sleet, significant snowfall, and high winds. The complex mixture of moisture, temperature, high pressure, and low-pressure systems creating winter storms is generally unique for each storm. Some severe winter storms can be defined as blizzards or ice storms.

From late October to mid-April, temperatures can range between 0 degrees Fahrenheit (°F) and 32°F, with February having the greatest average snowfall. The most extreme conditions related to severe winter weather are blizzards and ice storms.

- **Blizzard:** Blizzards are the most spectacular and vicious of all winter storms. A blizzard is a severe winter weather event, as defined by the National Oceanic and Atmospheric Administration (NOAA), characterized by a combination of high winds and low visibility due to snow. Blizzards occur most frequently in the northern Great Plains and upper Mississippi Valley. They can occur from the first of October to the end of April, but most often occur from early November to the end of March. According to the National Weather Service (NWS), a blizzard occurs when the following conditions last for three hours or longer:[255]
  - Wind speeds of 35 miles per hour (mph) or more
  - Considerable falling and/or blowing snow (reducing visibility frequently to less than 1/4 mile)
  - Generally, temperatures of 20°F or lower

According to the NWS, to be considered a severe blizzard, the system must meet these criteria:

- Wind speeds of 45 mph or more

[255] National Oceanic and Atmospheric Administration, National Weather Service, "Winter Storms and Blizzards," 2025. https://www.weather.gov/fgz/WinterStorms.

  - A great density of falling and/or blowing snow (reducing visibility frequently to near zero)
  - Temperatures of 10°F or lower
- **Ice Storm:** Ice storms occur when freezing rain falls through a layer of below-freezing air, causing raindrops to freeze on contact with surfaces like the ground, trees, and cars. The NWS defines an ice storm as a storm that results in the accumulation of at least 1/4 inch of ice on exposed surfaces.[256] Impacts from ice storms are most commonly vehicle accidents and damage to utility infrastructure. Ice accumulation can also collapse roofs on buildings.
  - Impacts can include hazardous driving and walking conditions and significant damage and/or injury from tree branches and power lines snapping under the weight of the ice.
  - Black ice presents a deadly driving hazard when ice on surfaces cannot be seen.
  - Ice jams can occur when bodies of water experience extended periods of freezing temperatures, causing the water level to rise. Alternatively, a thaw can break the ice into large chunks, which may become lodged at natural or human-made obstructions in the waterway. Though ice jams are commonly associated with rivers, they can also occur in streams, lakes, ponds, estuaries, and coastal waters.

## 3.20.2 Risk Assessment

### 3.20.2.1 LOCATION

Storms and blizzard conditions may impact anywhere from one or two counties to the entire state. Due to the geographic location and climate makeup of the state of Nebraska, the whole region is likely to experience severe winter storms including blizzards and ice storms. Large ice storms have historically caused major power outages across multiple counties.

### 3.20.2.2 EXTENT

The NWS follows a three-tiered methodology for issuing winter products utilizing the Ready-Set-Go approach. This includes Outlooks, Watches, and Advisories and Warnings.[257]

- **Outlook Phase (Ready):** The Hazardous Weather Outlook is a text product that will contain information pertaining to potential winter storms that may occur in the later days of the forecast, typically for periods beyond 48 hours.
- **Watch Phase (Set):** A Winter Storm Watch is issued when the risk of hazardous winter weather has increased significantly, when there is a strong possibility that weather conditions will reach warning criteria and typically falls in the 12- to-48-hour portion of the forecast. Winter storm watches are issued for snow, blowing snow, ice, sleet, and possible near-blizzard or blizzard conditions. An

[256] National Oceanic and Atmospheric Administration, National Weather Service, "Ice Storms," 2025. https://www.weather.gov/safety/winter-ice-frost.
[257] National Oceanic and Atmospheric Administration, National Weather Service, "Winter Products Issued by the National Weather Service of Omaha, Nebraska," 2025. https://www.weather.gov/oax/winter-products.

Extreme Cold Watch is issued when conditions are favorable for dangerously cold air, with or without wind.

- **Warnings and Advisories (Go):** The following advisories and warnings are issued when an event is occurring, is imminent, or has a high probability of occurrence. Warnings are issued for events that have a substantial impact and pose a significant threat to life and property. Advisories are issued for less serious events that still pose a hazard or inconvenience but typically do not pose an immediate threat of death or injury or significant property damage.
  - **Blizzard Warning:** Sustained wind or frequent gusts greater than or equal to 35 mph accompanied by falling and/or blowing snow, frequently reducing visibility to less than 1/4 mile for three hours or more. Note, there is no snowfall amount criteria when issuing a blizzard warning.[258]
  - **Ice Storm Warning:** Significant, potentially life-threatening icing on the ground, trees, power lines, vehicles, streets, and sidewalks. Generally, 1/4 inch or more of ice accumulations in 12 hours or less.[259]
  - **Winter Storm Warning:** Issued for snow events of 6 inches or more in 12 hours, 8 inches or more of snow in 24 hours, sleet accumulations of 1/2 inch or more, near-blizzard conditions, or any combination of winter precipitation and wind that will produce life threatening conditions.[260] Warnings may be issued for criteria lower than necessary if the combination of all-weather phenomena has a high societal impact.
  - **Extreme Cold Warning:** When wind chill or actual temperatures values of -30°F or colder are expected (previously Wind Chill Warning).[261] Conditions could lead to frostbite or hypothermia. Limit time outside, dress in layers, and cover up exposed skin.
  - **Winter Weather Advisory:** Typically issued for snowfall of 3 to 5 inches, for sleet accumulations of less than 1/2 inch, for freezing rain of freezing drizzle less than 1/4 inch, for areas of blowing snow reducing visibility, or any a combination of winter precipitation that will produce hazardous, but not necessarily life-threatening conditions.[262] Winter weather advisories may be issued for criteria lower than necessary if the event has a high societal impact, such as light snow affecting a morning or evening metro rush hour commute, or for an unusually early or late season event.
  - **Cold Weather Advisory:** When wind chill or actual temperature values of -20°F to -29°F are expected[263] (previously Wind Chill Advisory).

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[258] National Oceanic and Atmospheric Administration, National Weather Service, "Winter Storms and Blizzards," 2025. https://www.weather.gov/fgz/WinterStorms.
[259] National Oceanic and Atmospheric Administration, National Weather Service, "Ice Storms," 2025. https://www.weather.gov/safety/winter-ice-frost.
[260] National Oceanic and Atmospheric Administration, National Weather Service, "Winter Storms and Blizzards," 2025. https://www.weather.gov/fgz/WinterStorms.
[261] National Oceanic and Atmospheric Administration, National Weather Service, 2025, "Understanding Cold Weather Alerts, Extreme Cold Warning vs Watch and Cold Weather Advisory." https://www.weather.gov/safety/cold-ww.
[262] National Oceanic and Atmospheric Administration, National Weather Service, 2025, "Winter Products Issued by National Weather Service in Omaha." https://www.weather.gov/oax/winter-products.
[263] Ibid.

### 3.20.2.3 PREVIOUS EVENTS

Based on the FEMA Disaster Declarations Database, the State of Nebraska has received two major disaster declarations for severe winter storms disaster between January 2019 and December 2024.[264]

**Table 85: FEMA Disaster Declarations for Severe Winter Storms, Nebraska (2019–2024)[265]**

| Disaster Response # | Major Disaster Declaration Type | Declaration Date | Incident Period | Counties Designated for Assistance | Type of Assistance |
|---|---|---|---|---|---|
| **DR#4420-NE** | Severe Winter Storms, Straight-Line Winds, Flooding | 3/21/2019 | 3/9–4/14/2019 | Antelope, Boone, Boyd, Buffalo, Burt, Butler, Cass, Colfax, Cuming, Custer, Dodge, Douglas, Hall, Holt, Howard, Knox, Madison, Nance, Nemaha, Pierce, Platte, Richardson, Saline, Santee Indian Reservation, Sarpy, Saunders, Stanton, Thurston, Washington, | Individual Assistance |
| | | | | Adams, Antelope, Arthur, Banner, Blaine, Boone, Box Butte, Boyd, Brown, Buffalo, Burt, Butler, Cass, Cedar, Cherry, Cheyenne, Clay, Colfax, Cuming, Custer, Dakota, Dawes, Dawson, Deuel, Dixon, Dodge, Douglas, Fillmore, Franklin, Frontier, Furnas, Gage, Garden, Garfield, Gosper, Grant, Greeley, Hall, Harlan, Hayes, Holt, Hooker, Howard, Jefferson, Johnson, Kearney, Keya Paha, Kimball, Knox, Lancaster, Lincoln, Logan, Loup, Madison, Merrick, Morrill, Nance, Nemaha, Nuckolls, Omaha Indian Reservation, Otoe, Pawnee, Phelps, Pierce, Platte, Polk, Richardson, Rock, Sac and Fox Indian Reservation (Also KS), Saline, Santee Indian Reservation, Sarpy, Saunders, Scotts Bluff, Seward, Sheridan, Sherman, | Public Assistance (Category A to G) |

[264] Federal Emergency Management Agency, 2025, "Nebraska Disasters 2019–2024." Disasters and Other Declarations | FEMA.gov.
[265] Ibid.

| Disaster Response # | Major Disaster Declaration Type | Declaration Date | Incident Period | Counties Designated for Assistance | Type of Assistance |
|---|---|---|---|---|---|
| | | | | Sioux, Stanton, Thurston, Valley, Washington, Wayne, Webster, Wheeler, Winnebago Indian Reservation, York, | |
| **DR# 4786-NE** | Severe Winter Storms, Straight-Line Winds | 5/24/2024 | 4/6–7/2024 | Banner, Cheyenne, Dawes, Garden, Kimball, Morrill, Scotts Bluff, Sioux, | Public Assistance (Category A to G) |

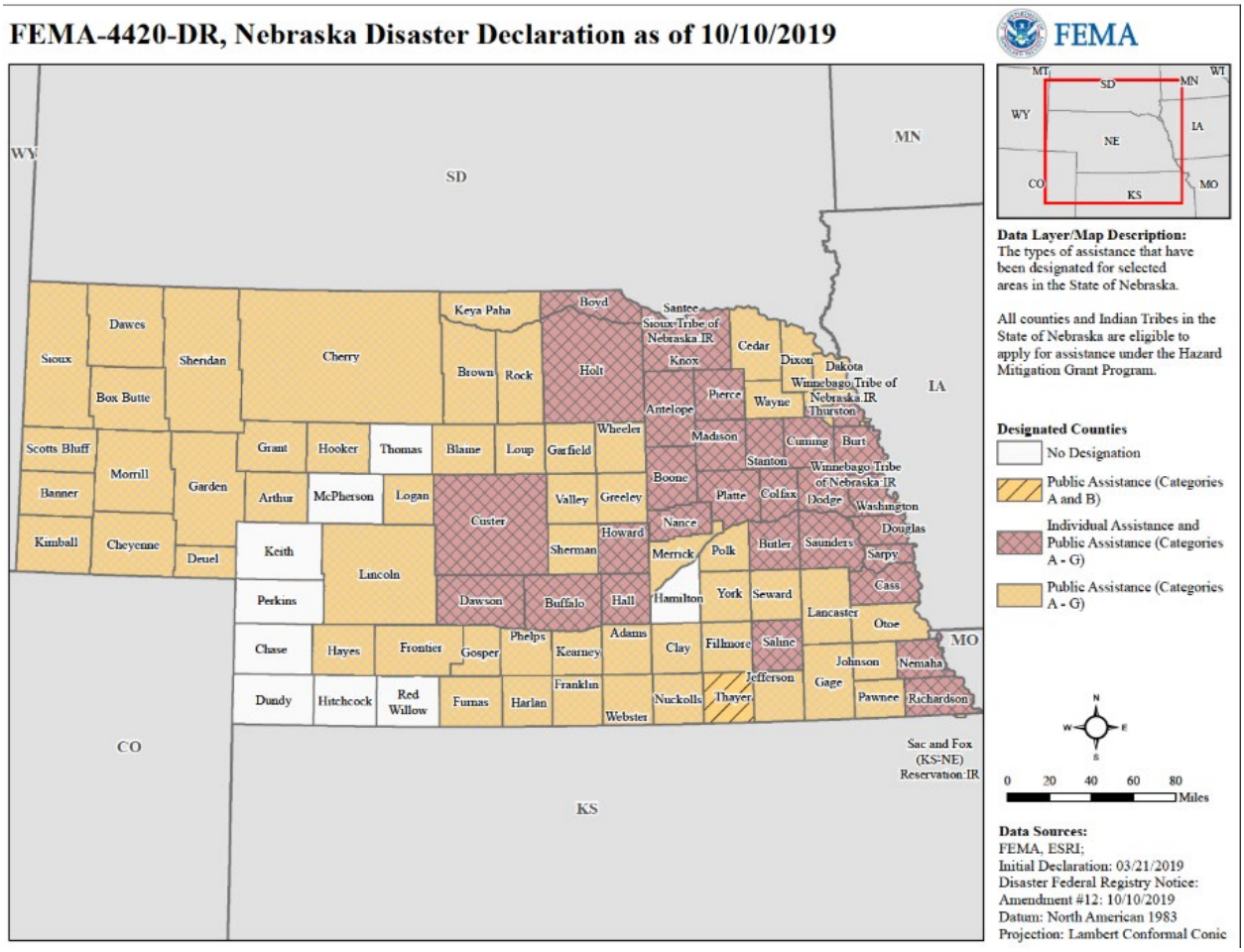



**Figure 75: FEMA-DR-4420, Nebraska Disaster Declaration Map of Designated Counties**[266]

[266] Federal Emergency Management Agency, "Nebraska Severe Winter Storms, Straight-Line Winds, and Flooding," 2025. https://www.fema.gov/disaster/4420.

Based on the review of the NOAA NCEI database for 2024 in Nebraska, there were a combined 267 events for Blizzard, Cold/Wind Chill, Frost/Freeze, Heavy Snow, Ice Storm, Sleet, Winter Storm, Winter Weather documented from various counties with statewide reports. There was one death, one injury, $7.5 million in property damage, and no dollar amount reported for crop damage in that time frame. While the NCEI data establishes a record of winter weather events during this time since the last plan update, it does not provide a complete picture of the weather as a result of each reported event or the impacts felt in multiple regions of the state.

**Table 86: NOAA NCEI Database Previous Events of Winter Storm in Nebraska, 2019–December 2024**[267]

| Dates | Type of Event | County/Area Affected | Types of Damage | Total Dollar Amount of Property and/or Crop Damages |
|---|---|---|---|---|
| **11/30–12/1/2019** | Blizzard | Grant, Thomas, Hooker | A strong storm system caused blizzard and winter storm conditions to develop across north central Nebraska during the morning hours on November 30 and continued during the afternoon through the evening hours. Snowfall amounts ranged from 3 to 10 inches, with the heaviest snowfall occurring across far northern Nebraska. Strong northwest winds of 30 to 40 mph with gusts around 50 mph developed during the late morning hours and continued during the afternoon and evening hours. This caused considerable blowing and drifting and visibilities as low as a 1/4 mile at times. Some road closures also occurred across north central Nebraska. A weather observer in Mullen reported 5 inches of snowfall. Freezing drizzle preceded the snow during the early morning hours, changing to snow after 6 a.m. CST. Snowfall amounts ranged from 3 to 5 inches across Hooker County. Strong northwest winds caused numerous downed power poles and power lines from ice covered power lines, and some road closures across Hooker County. | $110,000 in property damage |

[267] National Oceanic and Atmospheric Administration, National Centers for Environmental Information, 2025, "Winter Storms Previous Events Nebraska 2019 to 2024." https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+Winter+Storm&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=2019&endDate_mm=12&endDate_dd=30&endDate_yyyy=2024&county=ALL&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=31%2CNEBRASKA.

| Dates | Type of Event | County/Area Affected | Types of Damage | Total Dollar Amount of Property and/or Crop Damages |
|---|---|---|---|---|
| **4/12–4/17/2020** | Winter Weather | Phelps, Polk, Merrick, Hall, Hamilton, Buffalo, Adams, Kearney, Franklin, Harlan | While the entire area had relentless north winds gusting 40–50+ mph and very cold temperatures, many places also experienced several hours of freezing drizzle and at least brief snow. In addition to (and resulting from) this combination of weather elements, several counties also endured widespread power outages, both brief and multiple hours in duration. These power-related issues mainly focused within a southwest-northeast swath through the heart of the area (including counties such as Franklin, Adams, Hall, and Polk) as the nasty combination of strong winds and steady freezing drizzle coated power lines in ice, promoting pronounced line galloping and resultant outages and infrastructure damage. The Polk County Rural Power District reported at least 25 broken poles. As for snow, the vast majority of the area only accumulated a light dusting of no more than 1/4–1/2 inch, although much of it fell in a short but intense burst as a narrow band swung through from west to east, briefly reducing visibility to as low as 1/4 mile. The main concentration of slightly higher snow amounts in the 1–2-inch range targeted Valley County in the far northern local area, as any truly significant snow totals remained north through northwest of south-central Nebraska. Temperature-wise, April 12 was impressively cold by mid-April standards, featuring daytime highs of only 31°F–35°F across most of the area (roughly 30 degrees below normal) and wind chill values only in the teens. In fact, this event ushered in a markedly cold, six-day stretch centered from April 12–17. | $140,000 property damage |

| Dates | Type of Event | County/Area Affected | Types of Damage | Total Dollar Amount of Property and/or Crop Damages |
|---|---|---|---|---|
| **12/10/2021** | Winter Weather | Dawson | A fairly quick-hitting system deposited anywhere from a dusting up to 4 inches of modestly wind-blown snow across South Central Nebraska, slickening area roads for the evening commute and touching off a handful of accidents. Storm totals averaged around 1–3 inches across most of the county, including 3.0 inches reported in the Sumner area. The highest accumulations of 2–4 inches concentrated within the northwest half of the local area (mainly NW of a line from Beaver City-Grand Island-Genoa), highlighted by weather observers and NWS cooperative observer totals including: 4.0 inches east of Scotia and southeast of Ord, 3.3 west of Genoa, 3.1 west of Arcadia, and 3.0 in Holdrege, Loup City, and also near Sumner. In the Nebraska Tri Cities, Kearney officially led the way with 2.8 inches. Meanwhile, within the southeast half of the local domain most places received less than 1 inch, including only around 1/2 inch in the Hastings area. Although not overly strong, north-northwest winds through most of the event averaged 15–25 mph with gusts up to around 35 mph, promoting at least modest blowing and drifting, although temperatures averaging in the upper 20s to around 30°F mitigated this somewhat by keeping snow a little on the wetter side. Fortunately, there were no known reports of serious injury accidents, but Interstate 80 was shut down for around three hours during the late evening near Elm. | $200,000 in property damage |

| Dates | Type of Event | County/Area Affected | Types of Damage | Total Dollar Amount of Property and/or Crop Damages |
|---|---|---|---|---|
| **12/24/2023** | Winter Weather | Dawson | A long duration, light snow event impacted Thanksgiving holiday travel for portions of south-central Nebraska. Areas of light snow developed over areas along and west of Highway 183 during the early morning hours of Friday, November 24. The snow struggled to shift eastward during the morning due to persistent dry air. However, by the afternoon, snow did shift east past the Highway 283 corridor, then to the Highway 281 corridor Friday evening and overnight. Snow intensities remained light, thus despite the long duration, total snow accumulations generally ranged from around 1 to 3 inches. An exception to this was western Dawson County where amounts reached as high as 5 inches. Impacts were largely travel related, and mostly of the nuisance level, given aforementioned light snow rates, along with relatively weak winds around 10–15 mph. A more serious incident, however, occurred on Interstate 80 near Gothenburg in the form of a single fatality motor vehicle accident. | $40,000 in property damage |
| **1/13/2024** | Cold/Wind Chill | Dundy | On the evening of the 12, a strong cold front moved southward over the area. Behind it came an arctic airmass that caused -25°F wind chills early in the morning of January 13. This airmass remained until January 16, as did cold temperatures and wind chills. The coldest wind chill recorded in southwestern Nebraska during the event was -36°F in Red Willow County. One death was reported from frostbite and hypothermia. | $0 property damage |
| **4/6/2024** | Blizzard | Cheyenne, Dawes, Scotts Bluff, Sioux, Morrill, Banner, Kimball | Blizzard conditions were observed across the southern Nebraska Panhandle from the evening of April 6 through the morning of April 7. Widespread power outages from blown down and ice-laden power lines reported across the southern Nebraska | $7,500,000 in property damage<br>Preliminary Damage Assessment totals $10,667,298 |

| Dates | Type of Event | County/Area Affected | Types of Damage | Total Dollar Amount of Property and/or Crop Damages |
|---|---|---|---|---|
| | | | Panhandle with over 2000 power poles blown down. Emergency managers reported blizzard conditions during the event. The total estimated cost of the combination of strong winds and blizzard conditions was $7.6 million. Scotts Bluff suffered severe damage to the power infrastructure, 8,000 residents in the City of Gering lost power, and 12,000 were without power in the Nebraska panhandle region. | |

#### 3.20.2.4 PROBABILITY

The average winter season lasts from November through March in eastern Nebraska and from October through April in western Nebraska. In a typical winter, average seasonal snowfall ranges from 20 to 40 inches, with the heaviest amounts over the northern Nebraska panhandle. In addition to snow, bitterly cold temperatures and strong winds will contribute to blowing and drifting of snow as well as dangerous wind chills. If conditions are favorable, a blizzard may develop making travel extremely difficult or impossible. Early springtime snowstorms may produce heavy wet snow, leading to power outages. Though more common in eastern and central Nebraska, freezing rain can lead to tree damage and downed power lines.[268] The probability of future severe winter storms in Nebraska is highly likely.

#### 3.20.2.5 EFFECTS OF FUTURE CONDITIONS

The entire state of Nebraska is vulnerable to winter storms, with the nature of vulnerability varying across the state. In populated areas, travel difficulties and power outages can be significant. Rural areas also experience travel difficulties along with drifting snow. Power outages can range from several hours to several days, depending on the location and ability of responders to conduct repairs. Livestock experience increases in stress along with shortages of water and feed that can lead to increased death rates. All development in the state is vulnerable to these types of storms.

### 3.20.3 Vulnerability Analysis

Power outages, which occur almost on an annual basis with severe winter storms in Nebraska, in combination with cold temperatures and below zero wind-chill, can pose a significant threat to human life. Highly vulnerable populations include residents of nursing homes, young children, the elderly, and those living in less than adequate environments. Critical facilities and infrastructure including emergency response and recovery operations, warning and communication systems, wells and water treatment, and

[268] National Oceanic and Atmospheric Administration, National Weather Service, "Nebraska Winter Weather Preparedness," 2025. https://www.weather.gov/lbf/wwad.

many other services vital for returning the jurisdiction's functions to normal, are at risk during severe winter storm events due to potential power outages and other damages

### 3.20.3.1 VULNERABILITY OF STATE FACILITIES

State assets have a high vulnerability to severe winter storms. Buildings can experience damage from heavy snow, power failure, and wind. Additionally, winter storms require large numbers of state staff to respond when clearing state highways. Given the wide range of vulnerability, determining estimates of potential loss cannot be accurately determined. State property replacement values in the top 10 most populated counties with increased concentrations of infrastructure and buildings are listed in Table 87.

**Table 87: State Asset Replacement Values – Top 10 Counties**

| County | # of Properties | Insurance Value | Contents Insurance | Total Value | Replacement Cost |
|---|---|---|---|---|---|
| **Brown** | 28 | $0.00 | $0.00 | $4,236,570.49 | $4,236,570.49 |
| **Lancaster** | 329 | $327,401,528.89 | $419,606,538.12 | $747,008,067.00 | $747,008,067.00 |
| **Douglas** | 107 | $117,350,452.25 | $31,371,276.36 | $148,721,729.00 | $81,423,949.71 |
| **Buffalo** | 76 | $6,447,796.53 | $12,095,960.45 | $18,543,757.00 | $210,296,611.33 |
| **Johnson** | 26 | $157,136,447.60 | $29,311,746.79 | $186,448,194.00 | $3,184,780.71 |
| **Hall** | 81 | $7,321,520.12 | $2,719,927.05 | $10,041,447.20 | $10,634,654.02 |
| **Cass** | 225 | $0.00 | $1,494,524.01 | $1,494,524.01 | $104,597,717.56 |
| **Dawes** | 146 | $1,279,930.92 | $1.127,495.94 | $2,407,426.86 | $97,713,763.12 |
| **Gage** | 63 | $7,106,900.11 | $709,783.11 | $7,816,683.22 | $90,815,986.75 |
| **Adams** | 29 | $10,000.00 | $130,574.00 | $140,574.00 | $10,886,733.63 |
| **TOTALS** | 1,110 | $624,054,576.00 | $498,567,826.00 | $1,126,858,972.00 | $1,360,798,834.32 |

### 3.20.3.2 NATIONAL RISK INDEX

Table 88 presents the Winter Weather National Risk Index for Nebraska by county, listing historical loss, expected annual loss, and overall risk rating.

**Table 88: Winter Weather National Risk Index for the Counties of Nebraska**

| County | Historical Loss | Expected Annual Loss | Overall Risk Rating |
|---|---|---|---|
| **Adams** | Relatively Moderate | Relatively Moderate | Relatively Moderate |
| **Antelope** | Very High | Relatively High | Relatively High |
| **Arthur** | Relatively High | Relatively Low | Very Low |
| **Banner** | Relatively Moderate | Relatively Low | Very Low |
| **Blaine** | Relatively High | Relatively Low | Very Low |
| **Boone** | Very High | Relatively High | Relatively Moderate |

| County | Historical Loss | Expected Annual Loss | Overall Risk Rating |
|---|---|---|---|
| **Box Butte** | Relatively High | Relatively High | Relatively Moderate |
| **Boyd** | Relatively High | Relatively Moderate | Relatively Low |
| **Brown** | Relatively High | Relatively Moderate | Relatively Low |
| **Buffalo** | Relatively Moderate | Relatively High | Relatively High |
| **Burt** | Relatively Moderate | Relatively Low | Relatively Low |
| **Butler** | Relatively Moderate | Relatively Low | Relatively Low |
| **Cass** | Relatively Low | Relatively Moderate | Relatively Low |
| **Cedar** | Relatively High | Relatively High | Relatively High |
| **Chase** | Relatively High | Relatively Moderate | Relatively Low |
| **Cherry** | Relatively High | Relatively High | Relatively High |
| **Cheyenne** | Relatively High | Relatively High | Relatively Moderate |
| **Clay** | Very High | Relatively High | Relatively Moderate |
| **Colfax** | Relatively Moderate | Relatively Moderate | Relatively Moderate |
| **Cuming** | Relatively Moderate | Relatively Moderate | Relatively Low |
| **Custer** | Relatively High | Relatively High | Relatively High |
| **Dakota** | Relatively Moderate | Relatively Moderate | Relatively Moderate |
| **Dawes** | Relatively Moderate | Relatively Moderate | Relatively Low |
| **Dawson** | Relatively Moderate | Relatively High | Relatively High |
| **Deuel** | Relatively Moderate | Relatively Low | Very Low |
| **Dixon** | Relatively Moderate | Relatively Moderate | Relatively Low |
| **Dodge** | Relatively Moderate | Relatively High | Relatively Moderate |
| **Douglas** | Relatively Low | Relatively High | Relatively High |
| **Dundy** | Relatively High | Relatively Low | Relatively Low |
| **Fillmore** | Very High | Relatively Moderate | Relatively Moderate |
| **Franklin** | Very High | Relatively Moderate | Relatively Moderate |
| **Frontier** | Relatively Moderate | Relatively Low | Relatively Low |
| **Furnas** | Very High | Relatively High | Relatively Moderate |
| **Gage** | Relatively High | Relatively High | Relatively Moderate |
| **Garden** | Relatively Low | Relatively Low | Very Low |
| **Garfield** | Relatively High | Relatively Low | Relatively Low |
| **Gosper** | Very High | Relatively Moderate | Relatively Moderate |
| **Grant** | Relatively High | Relatively Low | Very Low |
| **Greeley** | Very High | Relatively Moderate | Relatively Moderate |

| County | Historical Loss | Expected Annual Loss | Overall Risk Rating |
|---|---|---|---|
| **Hall** | Relatively High | Very High | Very High |
| **Hamilton** | Relatively High | Relatively High | Relatively Moderate |
| **Harlan** | Very High | Relatively High | Relatively Moderate |
| **Hayes** | Relatively Moderate | Relatively Low | Very Low |
| **Hitchcock** | Relatively High | Relatively Low | Relatively Low |
| **Holt** | Relatively High | Relatively High | Relatively High |
| **Hooker** | Relatively High | Relatively Low | Very Low |
| **Howard** | Relatively High | Relatively High | Relatively Moderate |
| **Jefferson** | Relatively Moderate | Relatively Moderate | Relatively Low |
| **Johnson** | Relatively High | Relatively Low | Relatively Low |
| **Kearney** | Very High | Relatively High | Relatively Moderate |
| **Keith** | Very Low | Very Low | Very Low |
| **Keya Paha** | Relatively High | Relatively Low | Relatively Low |
| **Kimball** | Relatively Moderate | Relatively Low | Relatively Low |
| **Knox** | Very High | Relatively High | Relatively High |
| **Lancaster** | Relatively Moderate | Very High | Very High |
| **Lincoln** | Relatively High | Very High | Very High |
| **Logan** | Relatively High | Relatively Low | Very Low |
| **Loup** | Relatively High | Relatively Low | Relatively Low |
| **Madison** | Relatively High | Relatively Low | Very Low |
| **McPherson** | Relatively Moderate | Relatively High | Relatively High |
| **Merrick** | Relatively High | Relatively Moderate | Relatively Moderate |
| **Morrill** | Relatively High | Relatively Moderate | Relatively Moderate |
| **Nance** | Very High | Relatively Moderate | Relatively Moderate |
| **Nemaha** | Relatively High | Relatively Moderate | Relatively Low |
| **Nuckolls** | Very High | Relatively Moderate | Relatively Moderate |
| **Otoe** | Relatively Moderate | Relatively Moderate | Relatively Moderate |
| **Pawnee** | Relatively High | Relatively Low | Relatively Low |
| **Perkins** | Relatively Low | Relatively Low | Very Low |
| **Phelps** | Relatively High | Relatively High | Relatively Moderate |
| **Pierce** | Relatively High | Relatively Moderate | Relatively Moderate |
| **Platte** | Relatively High | Relatively High | Relatively High |
| **Polk** | Relatively High | Relatively Moderate | Relatively Moderate |

| County | Historical Loss | Expected Annual Loss | Overall Risk Rating |
|---|---|---|---|
| **Red Willow** | Relatively High | Relatively Moderate | Relatively Moderate |
| **Richardson** | Relatively High | Relatively Moderate | Relatively Low |
| **Rock** | Relatively High | Relatively Low | Relatively Low |
| **Saline** | Relatively Moderate | Relatively Moderate | Relatively Moderate |
| **Sarpy** | Relatively Moderate | Very High | Relatively High |
| **Saunders** | Relatively Low | Relatively Moderate | Relatively Low |
| **Scotts Bluff** | Relatively Low | Relatively Moderate | Relatively Moderate |
| **Seward** | Relatively Moderate | Relatively Moderate | Relatively Moderate |
| **Sheridan** | Relatively Low | Relatively Low | Very Low |
| **Sherman** | Very High | Relatively Moderate | Relatively Moderate |
| **Sioux** | Relatively High | Relatively Low | Relatively Low |
| **Stanton** | Relatively Moderate | Relatively Low | Relatively Low |
| **Thayer** | Very High | Relatively Moderate | Relatively Moderate |
| **Thomas** | Relatively High | Relatively Low | Very Low |
| **Thurston** | Relatively Moderate | Relatively Low | Relatively Low |
| **Valley** | Very High | Relatively High | Relatively Moderate |
| **Washington** | Relatively Moderate | Relatively Moderate | Relatively Moderate |
| **Wayne** | Relatively Moderate | Relatively Moderate | Relatively Low |
| **Webster** | Very High | Relatively Moderate | Relatively Moderate |
| **Wheeler** | Relatively High | Relatively Low | Very Low |
| **York** | Very High | Relatively High | Relatively High |

Figure 76 illustrates the National Risk Index for Nebraska for Winter Weather. The northwestern, central and southwestern portions of the state show an index rating of relatively low and very low winter weather risk. Sections of the southeastern and eastern central portions of the state, such as Omaha, Lincoln and Kearny, have index ratings of very high, relatively high and relatively moderate for winter weather.

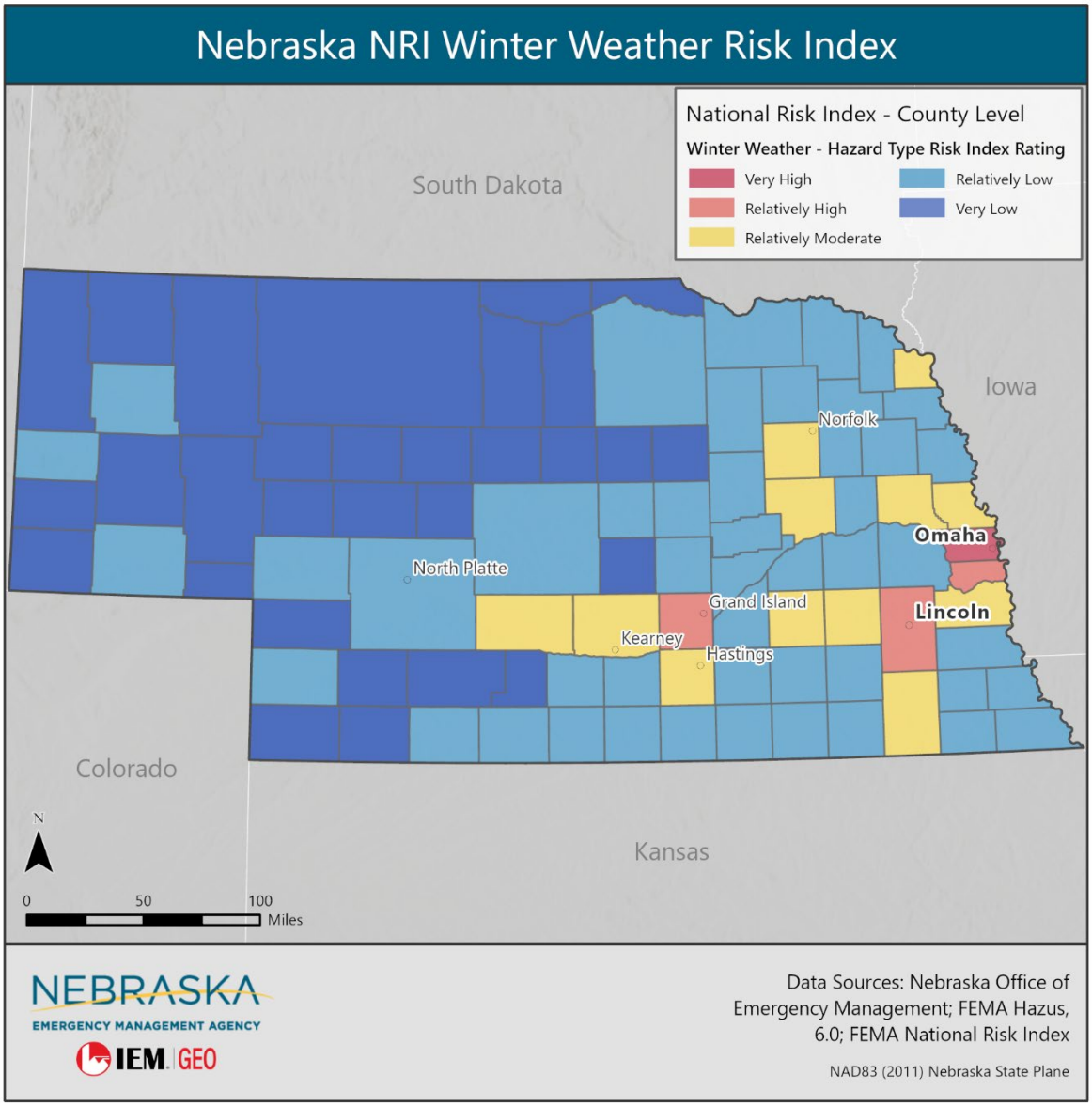



**Figure 76: Nebraska NRI Winter Weather Risk Index**[269]

[269] Nebraska Office of Emergency Management, "FEMA National Risk Index," FEMA Hazus 6.0.

### 3.20.3.3 ESTIMATED IMPACT AND POTENTIAL LOSSES

Severe winter storms are of significant concern in Nebraska because of their direct and indirect impacts, which include delays, accidents, health problems, cascading effects such as utility failure, and stress on community resources. Heavy snow can immobilize a region and paralyze communities by stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse buildings and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of removing snow and repairing damage and loss of business can have large economic impacts on cities and towns. Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communications towers. Communications and power can be disrupted for days while utility companies work to repair the extensive damage. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians. Bridges and overpasses are particularly dangerous because they freeze before other surfaces.

### 3.20.3.4 ACCESS AND FUNCTIONAL NEEDS

"Individuals and families below the poverty line and those isolated from social interactions may lack resources or access to resources that could mitigate the impacts of severe winter storms. Needed resources include sufficient food supplies when snowed in, and alternative heating sources during prolonged power outages. Severe winter storms often result in closed or impassable roadways. This increases the vulnerability among segments of the population that already have decreased mobility, making it important that they have a social network that can check on them and ensure they have access to heat and food. Finally, people who are new to the area may not know what to expect from a severe winter storm and what actions are appropriate in preparing for the event. Threat communication is imperative for informing and educating this portion of the population."[270]

Functional needs populations may be at risk of being snowed in, which limits access and emergency response. Hospitals, nursing homes, and other critical facilities may require generator power and support for several hours or days during recovery operations.

### 3.20.3.5 COMMUNITY LIFELINES

All eight FEMA community lifelines are applicable for winter storms. Heavy snowfall and ice accumulation can have disastrous consequences, such as collapsing roofs, falling trees, and power outages resulting in frozen and burst pipes and a lack of life-saving heat sources. This can result in homes and farms being cut off for several days. In rural regions, livestock that are not properly shielded may be at risk. The economic impact of snow removal expenses, repair work, and lost business can be severe in urban areas. Road conditions may be severe enough to impede emergency service vehicles, causing delayed medical care. In addition, transportation closures or delays can bring a halt to the supply chain, impacting the distribution of goods and services for businesses and government agencies.

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[270] 2021 Nebraska State Hazard Mitigation Plan, "Section 3.9: Severe Winter Storms." https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.

### 3.20.3.6 ENHANCED PRIORITY RISK INDEX SCORE

The Enhanced Priority Risk Index (EPRI) provides the state of Nebraska with a methodology to measure the impact each profiled hazard may have on the seven Emergency Management Accreditation Program Standard 4.1.2 sectors (i.e., public; responders; continuity of operations including continued delivery of services; property, facilities, and infrastructure; the environment; the economic condition of the jurisdiction; and public confidence in the jurisdiction's governance). Table 89 provides the EPRI scores for the hazard with the appropriate risk factor.

**Table 89: Winter Storm Enhanced Priority Risk Index Score**

| | Probability Next 5 Years | Impact | Spatial Extent | Warning Time | Duration | Vulnerability | Probability | Overall Risk Factor |
|---|---|---|---|---|---|---|---|---|
| **Risk Level** | 3.6 | 2.6 | 3.4 | 1.8 | 2.6 | 3.1 | 3.7 | 2.99 |

Table 90 provides a summary of winter storm impact, including impact to the public, first responders, continuity of operations, property, infrastructure, environment, economic conditions and public confidence, and the consequences of those impacts.

**Table 90: Winter Storm Impacts and Consequences**

| Sector | Impacts |
|---|---|
| **Public** | **Housing**: Roofs can collapse from heavy wet snow. Pipes can break from cold if there is a prolonged electrical outage causing water damage.<br>**Casualties/Fatalities**: There are chances for frostbite on exposed skin, hypothermia for people caught outdoors, which can cause death, and heart attacks for people shoveling snow.<br>**Work**: Employees will likely have a difficult time traveling to and from their places of employment. Buildings can also have roof damage or fail due to heavy snow, and there can be prolonged power outages that stop work.<br>**Food/Water**: On an individual basis, an individual or family can be caught with low or no food and unable to leave the house or travel to a store due to winter storm conditions. |
| **First Responders** | Conditions are very hard and dangerous for rescuers in severe winter storms. Low temperatures, strong winds, and heavy snow make traveling dangerous for the general public and responders. Loss of power may hinder the ability for facilities without generators or limited generator capacity to operate as needed. |
| **Continuity of Operations** | Government can struggle for a few days with limited staff able to get to work. Plans for working from home may not be feasible if electrical power is also affected by the storm. |
| **Property, Facilities and Infrastructure** | Property damage is usually limited to some roof damage or failure. There can be isolation of large areas due to the inability to maneuver on snow packed or icy roads.<br>All infrastructure is impacted in a severe winter storm: electrical systems are brought down by winds and ice; water systems and wastewater systems can be |

| Sector | Impacts |
|---|---|
| | affected by the temperatures; operators cannot reach the facilities and there can be prolonged electrical outages; roads and bridges become impassable and require large amounts of effort, time, and money to clear. |
| **Environment** | Limited impact, there may be larger than normal loss of wildlife due to a lack of food during prolonged winter storms. |
| **Economic Conditions** | Plowing snow and repairing major electrical systems can greatly exceed current budgets, causing stress on local and state government finances. The ability for businesses to return to normal operations may experience short-term delays. |
| **Public Confidence** | Confidence depends on the existing relationship between affected communities and the government, and how quickly and efficiently governments open roads, restore power, and bring things back to normal. |

# 3.21 Terrorism

## 3.21.1 Description

The definition of terrorism changes slightly according to its source and purpose. As of 2025, the Federal Bureau of Investigation (FBI) uses two definitions of terrorism: international and domestic:[271]

- **International Terrorism:** Violent, criminal acts committed by individuals and/or groups inspired by, or associated with, designated foreign state-sponsored terrorist organizations or nations.
- **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.

Acts and threats of terrorism can be classified into these potential threat categories:[272]

- Racially or Ethnically Motivated Violent Extremism
- Anti-Government or Anti-Authority Violent Extremism
- Animal Rights/Environmental Violent Extremism
- Abortion-Related Violent Extremism
- All Other Domestic Terrorism Threats

Acts of terrorism may be carried out through a wide range of methods:[273]

- Chemical, Biological, Radiological, or Nuclear (CBRN)
- Improvised Explosive Device (IED)
- Vehicle-borne Improvised Explosive Device (VBIED)
- Mail Bomb
- Active Shooter
- Hostage Situation
- Kidnapping
- Theft
- Vandalism
- Espionage
- Sabotage
- Identity Theft
- Unmanned Aircraft Systems (UAS)/Unmanned Aerial Vehicle (UAV)
- Cyberterrorism

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[271] Federal Bureau of Investigations, "What We Investigate." https://www.fbi.gov/investigate/terrorism.
[272] Department of Homeland Security, "Strategic Intelligence Assessment and Data on Domestic Terrorism." https://www.dhs.gov/sites/default/files/2022-10/22_1025_strategic-intelligence-assessment-data-domestic-terrorism.pdf.
[273] Nebraska Emergency Management Agency, "2021 Nebraska State Hazard Mitigation Plan." https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.

## 3.21.2 Risk Assessment

### 3.21.2.1 LOCATION

Due to the inherently unpredictable nature of terrorism, virtually all areas of the state are potential targets of terrorism and vulnerable to casualties and property damage. Of particular concern, however, are heavily populated areas with known racial, ethnic, or other demographic factions and those important to daily economic or governmental activity. Figure 77 depicts multiple locations in Nebraska where terrorist events took place between 1975 and 2017; no major events have occurred since the previous 2021 SHMP.




**Figure 77: Terrorist Events in Nebraska, 1975–2025**[274]

### 3.21.2.2 EXTENT

Nebraska has experienced 25 targets from 15 incidents since 1970. Most recently, Neo-Nazis were the perpetrator group. These types of perpetrators are consistent with national trends that point out the radicalization of violence leading to homegrown violent extremists and those associated with foreign terrorist organizations.[275] Although there have been cases of cyberattacks on local governments in Nebraska, these have not been reported in the FBI's 2018 Hate Crime Statistics.

[274] Ibid.
[275] Department of Homeland Security, "Summary of Terrorism-Related Threat to the United States." https://www.dhs.gov/ntas/advisory/national-terrorism-advisory-system-bulletin-may-24-2023.

### 3.21.2.3 PREVIOUS EVENTS

Table 91 shows details of terrorism events that have occurred in Nebraska or targeted a Nebraska institution since 1970.

**Table 91: Nebraska Terrorist Events, 1970–2025**[276]

| Date | City | Fatalities | Injuries | Hostages | Ransom | Property Damage | Type of Attack | Target |
|---|---|---|---|---|---|---|---|---|
| 10/22/2017 | Oxford | 0 | 0 | 0 | 0 | 0 | Armed assault | Transportation |
| 10/03/2016 | Lincoln | 0 | 0 | 0 | 0 | Yes | Facility/Infrastructure | Religious figures or institutions<br>This was one of two arson attacks targeting the same church on this date. No group claimed responsibility for the incidents. |
| 04/18/2013 | McCrook | 0 | 0 | 0 | 0 | 0 | Bombing/Explosion | Airports and aircraft |
| 05/04/2002 | Albion | 0 | 0 | 0 | 0 | 0 | Bombing/Explosion | Private citizens and property, government (general) |
| 05/04/2002 | Seward | 0 | 0 | 0 | 0 | 0 | Bombing/Explosion | Private citizens and property, government (general) |
| 05/04/2002 | Ohiowa | 0 | 0 | 0 | 0 | 0 | Bombing/Explosion | Private citizens and property, government (general) |
| 05/04/2002 | Davenport | 0 | 0 | 0 | 0 | 0 | Bombing/Explosion | Private citizens and property, government (general) |
| 05/04/2002 | Columbus | 0 | 0 | 0 | 0 | 0 | Bombing/Explosion | Private citizens and property, government (general) |
| 05/04/2002 | Cairo | 0 | 0 | 0 | 0 | 0 | Bombing/Explosion | Private citizens and property, government (general) |

[276] University of Maryland, "National Consortium for the Study of Terrorism and Responses to Terrorism." http://apps.start.umd.edu/gtd/search/Results.aspx?country=217.

| Date | City | Fatalities | Injuries | Hostages | Ransom | Property Damage | Type of Attack | Target |
|---|---|---|---|---|---|---|---|---|
| 05/04/2002 | Scotia | 0 | 0 | 0 | 0 | 0 | Bombing/Explosion | Private citizens and property, government (general) |
| 09/06/1991 | Bellevue | 0 | 0 | 0 | 0 | Yes | Facility/Infrastructure | Abortion related |
| 08/13/1991 | Peshawar, Pakistan | 0 | 1 | 0 | 0 | 0 | Assassination | Educational institution<br>USAID contractor Moqim Rahmanzai was shot and wounded while on his way to work at the University of Nebraska (Omaha) Educational Sector Support Project. A pickup truck with at least two individuals blocked Rahmanzai's vehicle on a narrow road near his residence. When Rahmanzai's driver attempted to pass the vehicle, a shooter in the pickup opened fire with an AK-47. Rahmanzai was hit in the right hand and left arm. His driver was not hurt. |
| 06/06/1979 | Lincoln | 0 | 0 | 0 | 0 | 0 | Bombing/Explosion | Private citizens and property, government (general) |
| 08/18/1977 | Omaha | 0 | 0 | 0 | 0 | Yes | Facility/Infrastructure Attack | Abortion related |
| 10/13/1975 | Pine Ridge | 0 | 0 | 0 | 0 | Yes | Bombing/Explosion | Utilities |
| 08/17/1970 | Omaha | 1 | 7 | 0 | 0 | Yes | Bombing/Explosion | Private citizens and property |
| 07/02/1970 | Omaha | 0 | 0 | 0 | 0 | Yes | Bombing/Explosion | Business |
| 06/11/1970 | Omaha | 0 | 0 | 0 | 0 | Yes | Bombing/Explosion | Police |
| 02/23/1970 | South Sioux City | 0 | 0 | 0 | 0 | 0 | Bombing/Explosion | Utilities<br>One of four on the same day |

| Date | City | Fatalities | Injuries | Hostages | Ransom | Property Damage | Type of Attack | Target |
|---|---|---|---|---|---|---|---|---|
| 02/23/1970 | South Sioux City | 0 | 0 | 0 | 0 | 0 | Bombing/Explosion | Utilities |
| 02/23/1970 | South Sioux City | 0 | 0 | 0 | 0 | 0 | Bombing/Explosion | Utilities |
| 02/23/1970 | South Sioux City | 0 | 0 | 0 | 0 | 0 | Bombing/Explosion | Utilities |
| 01/30/1970 | South Sioux City | 0 | 0 | 0 | 0 | Yes | Bombing/Explosion | Business |
| 01/30/1970 | South Sioux City | 0 | 0 | 0 | 0 | Yes | Bombing/Explosion | Unknown |
| 01/22/1970 | South Sioux City | 0 | 0 | 0 | 0 | Yes | Bombing/Explosion | Private citizens and property |

### 3.21.2.4 PROBABILITY

Due to the subjective nature of human behavior, a quantitative probability of a terrorist attack occurring is nearly impossible to predict accurately; however, it is considered significantly low. Based on current predictive models, all areas of Nebraska have an annual chance of terrorist attack far below 1%—and an even lower chance of attacks being successful. According to the most current research, the odds (i.e., percent chance) of an American citizen dying at the hands of a refugee terrorist are 1 in 3.3 billion, at the hands of an undocumented immigrant terrorist are zero, and at the hands of a Visa Waiver Program entrant are 0 in 1 (~ 0.00). From 1975 to 2022, 3,046 or 0.32% of U.S. murders were committed by foreign-born terrorists.[277] Currently, figures representative or estimative of the life and property value saved by mitigation efforts are unavailable.

Focusing on sound scientific data and consistent messaging across multiple government agencies could identify not only the potential for violent and/or criminal acts related to climate change but also appropriate measures to prevent or mitigate them.

### 3.21.2.5 EFFECTS OF FUTURE CONDITIONS

Although incidents of terrorism related to climate change have not been felt in the United States or Nebraska, the potential for incidents of this type does exist and has occurred in other countries. One study theorizes that, "detrimental climate change implications that particularly affect natural resources, such as floods and droughts, create civil unrest and eventually a vacuum for terrorist events to occur. This would most likely occur in conjunction with poor governance and/or political terror, resulting in a poor distribution of resources for the population."[278] This specific study found a relationship between climate trends and agriculture in Nigeria as a threat multiplier for conflict. For example, severe droughts caused by climatic weather shifts raise the vulnerability of water systems by restricting water supplies. In this situation, extremist groups have stepped up attacks as a strategic tactic of coercion to manipulate water supply, especially in countries experiencing extreme, long-term drought conditions.

As climate and weather patterns shift in the future, resulting environmental issues may be leveraged as a tool for terror and political violence, especially in nations with weak governance. Although this emerging threat is not related to eco-terrorism, it relates somewhat to a growing potential for vulnerable ecosystems to be exploited or destroyed to "intimidate or provoke a state of terror in the public for a political, ideological, or philosophical agenda."[279]

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[277] Cato, "Terrorism and Immigration A Risk Analysis, 1975–2022." https://www.cato.org/policy-analysis/terrorism-immigration.
[278] University of South Carolina, "Climate Change as a Contributor to Terrorism: A Case Study in Nigeria and Pakistan." https://scholarcommons.sc.edu/cgi/viewcontent.cgi?article=1182&context=senior_theses.
[279] UN Office for Disaster Risk Reduction, "How Terrorists Leverage Climate Change." https://www.preventionweb.net/news/how-terrorists-leverage-climate-change.

## 3.21.3 Vulnerability Analysis

Like many states, Nebraska faces a range of vulnerabilities related to terrorism. Understanding these vulnerabilities is critical for developing effective strategies to mitigate risks and enhance public safety.

- **Geographic Distribution:** Nebraska is mainly rural, with significant population concentrations in urban areas, such as Omaha and Lincoln. This distribution may make rural areas less prepared and more vulnerable to terrorist incidents due to a lack of resources and rapid response capabilities.
- **Critical Infrastructure:**
  - Agriculture: Nebraska is a major agricultural state, and attacks on food production facilities or supply chains could have widespread impacts.
  - Water Supply: The state's reliance on specific water sources makes it vulnerable to contamination or disruption.
  - Transportation Networks: Highways and railroads are vital for commerce and could be targeted to disrupt movement and supply chains.
- **Public Gathering Places:** Events such as state fairs, concerts, and sports events in urban centers can be soft targets for terrorist attacks. Security at these events may not always be comprehensive, making them vulnerable.
- **Cybersecurity Risks:** Increasing reliance on technology in various sectors, including government, healthcare, and agriculture, presents vulnerabilities to cyber-attacks that terrorist actors could execute.
- **Ideological Extremism:** While Nebraska is generally considered safe, isolated extremist groups or individuals could pose risks. Vigilance regarding radicalization and extremist sentiments is vital.
- **Economic Factors:** Economic disparities and social issues can contribute to an environment where individuals might feel disenfranchised, making them susceptible to extremist ideology.
- **Emergency Response Capabilities:** Although many urban centers have robust emergency services, rural areas may lack the same level of preparedness and resources to respond to a terrorist attack efficiently.
- **Communication Infrastructure:** Disruptions to communication systems during an incident can hinder response efforts, making the state vulnerable during a crisis. Although Nebraska is not considered a primary target for terrorism, it is essential to address its vulnerabilities comprehensively. A proactive approach to community engagement, resource allocation, and preparedness can significantly enhance the state's resilience against potential terrorist threats. Continuous evaluation and adaptation of strategies will be necessary to address the evolving nature of terrorism.

### 3.21.3.1 ESTIMATED IMPACT AND POTENTIAL LOSSES

The estimated impacts of a terrorist attack on the state of Nebraska could vary significantly depending on the nature and scale of the attack, but several key areas could be affected:

- **Omaha:** As the largest city in Nebraska, Omaha has a dense population and significant infrastructure, including the strategic Offutt Air Force Base and key business districts. The potential impact of an attack here could be considerable.
- **Lincoln:** The state capital and home to the University of Nebraska, Lincoln has a large population and various government buildings, making it a significant target.
- **Council Bluffs (Iowa):** While technically in Iowa, its proximity to Omaha and interconnected infrastructure (like bridges and highways) could mean an incident in this area affects both states.
- **Strategic Transportation Hubs:** Major highways and railroads that traverse the state, such as I-80 and I-76, could be potential targets since they facilitate the movement of goods and people.
- **Federal and Military Installations:** Given their significance, sites like the Army National Guard facilities or any federal buildings could also be vulnerable.
- **Public Events and Gathering Spaces:** Large venues such as stadiums, convention centers, and festivals could be potential targets during major public gatherings.

Overall, although the immediate effects of a terrorist attack would be stark, the long-term implications would largely depend on how effectively the state and its communities respond to and recover from the incident. This emphasizes the importance of resilience strategies and community support.

Large concentrations of infrastructure in communities across the state could result in a sizable loss of state assets if it were to be a direct target of a terrorist attack. State property replacement values in the top ten most populated counties with increased concentrations of infrastructure and buildings are listed in Table 92.

**Table 92: State Asset Replacement Value in Top 10 Counties, as of 2024**

| County | Insurance Value | Contents Insurance | Total Value | Replacement Cost |
|---|---|---|---|---|
| **Brown** | Not Provided | Not Provided | $4,236,570 | $4,236,570 |
| **Lancaster** | $327,401,529 | $419,606,538 | $867,395,761 | $867,395,761 |
| **Douglas** | $117,350,452 | $31,371,276 | $81,423,950 | $81,423,950 |
| **Buffalo** | $6,447,797 | $12,095,960 | $210,296,611 | $210,296,611 |
| **Johnson** | $157,136,448 | $29,311,747 | $3,184,781 | $3,184,781 |
| **Hall** | $7,321,520 | $2,719,927 | $10,634,654 | $10,634,654 |
| **Cass** | Not Provided | $1,494,524 | $104,597,718 | $104,597,718 |
| **Dawes** | $1,279,931 | $1,127,496 | $97,713,763 | $97,713,763 |
| **Gage** | $7,106,900 | $709,783 | $90,815,987 | $90,815,987 |
| **Adams** | $10,000 | $130,574 | $10,886,734 | $10,886,734 |
| **TOTAL** | **$624,054,577** | **$498,567,825** | **$1,481,186,529** | **$1,481,186,529** |

### 3.21.3.2 ACCESS AND FUNCTIONAL NEEDS

Individuals with disabilities or other functional needs face significant challenges during emergencies, particularly in the context of a terrorist attack. Their increased vulnerability can make self-protection and access to assistance more difficult. When emergencies overwhelm response services, those with access needs may experience delays in receiving support, because first responders often prioritize the most visibly distressed individuals.

Moreover, the psychological impact of a terrorist incident can be profound, exacerbating feelings of anxiety, insecurity, and isolation among these individuals. Effective communication is critical during crises, yet those with hearing, vision, or cognitive impairments may struggle to receive critical information, further complicating their ability to respond. The disruption of support networks, transportation barriers, and shifts in resource allocation can leave individuals without essential assistance. Additionally, the aftermath of a terrorist attack may lead to increased stigmatization and discrimination against those with functional needs.

### 3.21.3.3 COMMUNITY LIFELINES

A terrorist attack could impact all FEMA community lifelines. The foremost concern in the wake of a terrorist attack is ensuring the safety and security of the public. Law enforcement agencies are tasked with responding swiftly to restore order and implement protective measures. The chaos that often ensues during and after an incident places immense pressure on resources, making it essential for authorities to act decisively to mitigate threats and reassure the public.

The health and medical response following such incidents is equally critical. Terrorist attacks can lead to numerous injuries and profound psychological trauma, necessitating an immediate and comprehensive medical response. Hospitals must be prepared to handle an influx of patients and equipped with sufficient medical supplies and personnel. Equally important is the provision of mental health services to help individuals cope with the lasting emotional and psychological impact of the attack.

Moreover, the disruption of essential services, such as food, hydration, and shelter, can significantly impact those affected by the attack. Supply chain interruptions may limit access to necessities, making it imperative to set up emergency shelters and provide food and water to displaced individuals.

Energy infrastructure such as communication hubs and server farms often becomes a target in terrorist incidents, leading to power outages that complicate emergency response efforts. Rapid restoration of energy services is crucial because it enables hospitals and emergency responders to function effectively. Without reliable energy sources, the overall response and recovery efforts can be severely hindered, impacting the safety and well-being of the affected population.

Transportation networks also face disruptions during such crises, affecting the movement of emergency responders and critical supplies. Promptly addressing these transportation challenges ensures that aid reaches those in need. Restoring access to roads, airports, and public transit systems is vital to recovery, allowing for efficient logistical support and coordination.

Effective communication is another key component of crisis management. The aftermath of a terrorist attack can compromise communication infrastructure, making it difficult for agencies to coordinate their efforts and keep the public informed. Maintaining reliable channels for information dissemination is vital because it helps manage panic, directs emergency responses, and ensures that community members receive accurate updates regarding safety measures and available resources.

Terrorism can profoundly impact water systems. Direct attacks on water infrastructure, such as treatment facilities and pipelines, may lead to significant disruptions in the supply of potable water. Additionally, attempts to contaminate water sources can pose serious health risks and erode public trust. Such incidents can trigger panic and hoarding and, ultimately, overwhelm existing systems. Effective coordination between water services and emergency responders is crucial but can be hampered by infrastructure damage.

Lastly, managing and mitigating threats in scenarios involving hazardous materials is crucial for protecting public health and safety. Proper containment and response strategies must be employed to address any risks associated with the release of hazardous substances, ensuring that additional harm is avoided and that the community can safely proceed with recovery efforts. Overall, a comprehensive and coordinated approach addressing these interconnected areas is essential for effectively responding to the challenges presented by terrorist attacks.

#### 3.21.3.4 ENHANCED PRIORITY RISK INDEX SCORE

The Enhanced Priority Risk Index Score (EPRI) provides the state of Nebraska with a methodology to measure the impact each profiled hazard may have on the seven EMAP Standard 4.1.2 sectors (i.e., public; responders; continuity of operations including continued delivery of services; property, facilities, and infrastructure; the environment; the economic condition of the jurisdiction; and public confidence in the jurisdiction's governance). Table 93 provides the EPRI scores for the hazard with the appropriate overall risk factor.

**Table 93: Terrorism EPRI Score**

| | Probability Next 5 Years | Impact | Spatial Extent | Warning Time | Duration | Vulnerability | Probability | Overall Risk Factor |
|---|---|---|---|---|---|---|---|---|
| **Risk Level** | 2.4 | 2.9 | 2.8 | 3.7 | 3.3 | 2.3 | 2.9 | 2.9 |

Table 94 summarizes terrorism's impacts and consequences, including those on the public, first responders, continuity of operations, property, infrastructure, environment, economic conditions, and public confidence.

Table 94: Terrorism Impacts and Consequences

| Sector | Impacts |
|---|---|
| **Public** | **Housing:** The impact on housing should be small to non-existent because residential areas are not highly rated as targets. Housing adjacent to more probable targets is more likely to suffer damage.<br>**Casualties/Fatalities:** This depends on the target and whether the facility affected has been warned. The perpetrator could aim for a high number of fatalities.<br>**Work:** This depends on the target and medium of the attack.<br>**Food and Water:** The impact on food and water should be limited unless they are the intended targets of the attack.<br>**Identify Theft:** Terrorists may exploit individuals for espionage, sabotage, and other purposes. |
| **First Responders** | Emergency Services: Responders should be aware and vigilant while on the scene. Secondary devices may be present and intended to cause more harm to the public and the responders. All precautionary measures should be heeded during a terrorist event to prevent additional casualties. If a scene is deemed a potential terrorist event, it must be treated with the care of a crime scene. |
| **Continuity of Operations** | If the target is government property, a strong Continuity of Operations (COOP) plan will hasten the recovery of essential services. |
| **Property, Facilities, and Infrastructure** | Buildings and Infrastructure: The target of the attack may suffer significant damage or be destroyed. Other properties in the vicinity of the target may also suffer damage.<br>If targeted, infrastructure could be destroyed. If not targeted, the services outside the immediate targeted area should have little to no impact. |
| **Environment** | Environmental impact is dependent on the size, target, and surroundings of a terrorist attack. |
| **Economic Conditions** | The impact on the economy can vary greatly in both extent and severity. Depending on the target and severity of the attack, the damage may affect anything between the local economy and the global economy. |
| **Public Confidence** | The ability of the government to return life to normal conditions quickly and efficiently will play a significant role in public confidence. Thorough investigations will be conducted, and the following questions will need to be answered: Was enough done to prevent the attack? How quickly were the offenders identified and captured? Did the government adequately orchestrate the recovery of the disaster? |

# 3.22 Tornado

## 3.22.1 Description

Tornadoes can be defined as rapidly rotating funnels of wind extending between storm clouds and the ground. Tornadoes are considered one of the most severe storms for their size, making them one of the most significant hazards Nebraska faces. Severe storms, such as hurricanes and thunderstorms, create an environment suitable for the formation of tornadoes when cold air overrides a layer of warm air causing the warm air to rise rapidly. This rapid ascent of warm air coupled with wind shear can lead to the creating of a rotating funnel. This rotation is critical in the formation of a tornado and is sustained by the conditions of the weather system until other atmospheric conditions cause the rotation to dissipate. The powerful updraft and wind shear necessary for tornado formation make it one of the most dangerous natural hazards.

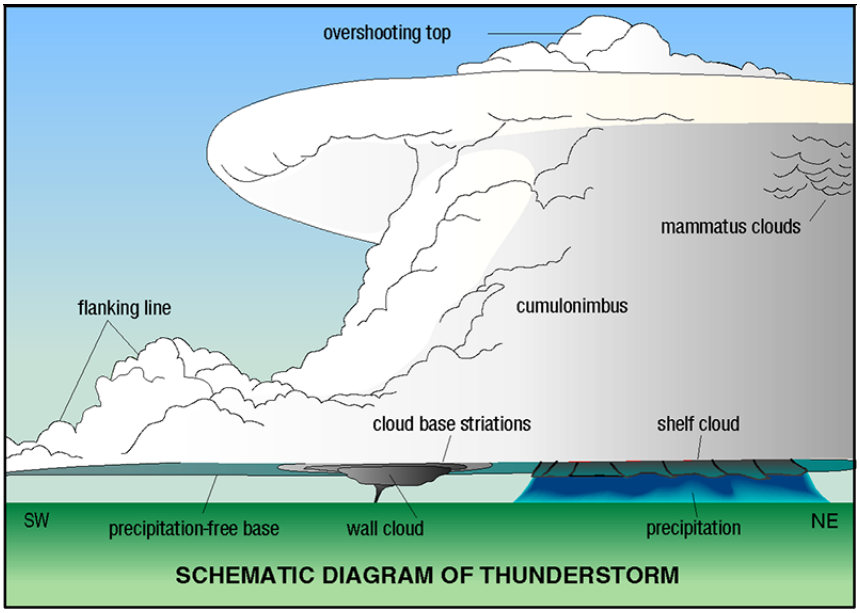



**Figure 78: Schematic Diagram of a Thunderstorm**[280]

The National Weather Service (NWS) issues advisory messages based on forecasts and observations. The following are advisory messages that may be issued for a tornado with definitions of each.[281]

- Tornado Watch
  - Issued to alert people to the possibility of a tornado developing in the area. A tornado has not been spotted but the conditions are favorable for tornadoes to occur.

[280] NOAA National Severe Storms Laboratory. "Severe Weather 101 – Tornadoes." https://www.nssl.noaa.gov/education/svrwx101/tornadoes/.
[281] National Weather Service. "Understand Tornado Alerts." https://www.weather.gov/safety/tornado-ww.

- Tornado Warning
  - Issued when a tornado has been spotted or when Doppler radar identifies a distinctive "hook-shaped" area within a thunderstorm line.

Tornado damage can be significant and devastating, with structures in the direct path of a tornado often reduced to rubble. A structure's survivability adjacent to the path of the tornado is highly dependent on the building type and construction technique, as these structures will be significantly impacted by the winds flowing into the tornado vortex, known as the inflow winds. Tornadoes are sporadic, making all buildings within a tornado-prone area vulnerable to damage. However, certain types of buildings, such as mobile homes, homes with crawl spaces, and those with large spans, are more susceptible to tornado damage due to their design.

One of the major health concerns associated with tornadoes is physical injury from flying debris or the collapse of a building. After a tornado, damaged buildings are also a potential threat due to instability, potential gas leaks, or electrical system damage. Sewage and water lines may also be damaged, potentially leading to contamination of potable water. Figure 79 displays the number of tornado watches in the United States for the year 2024.

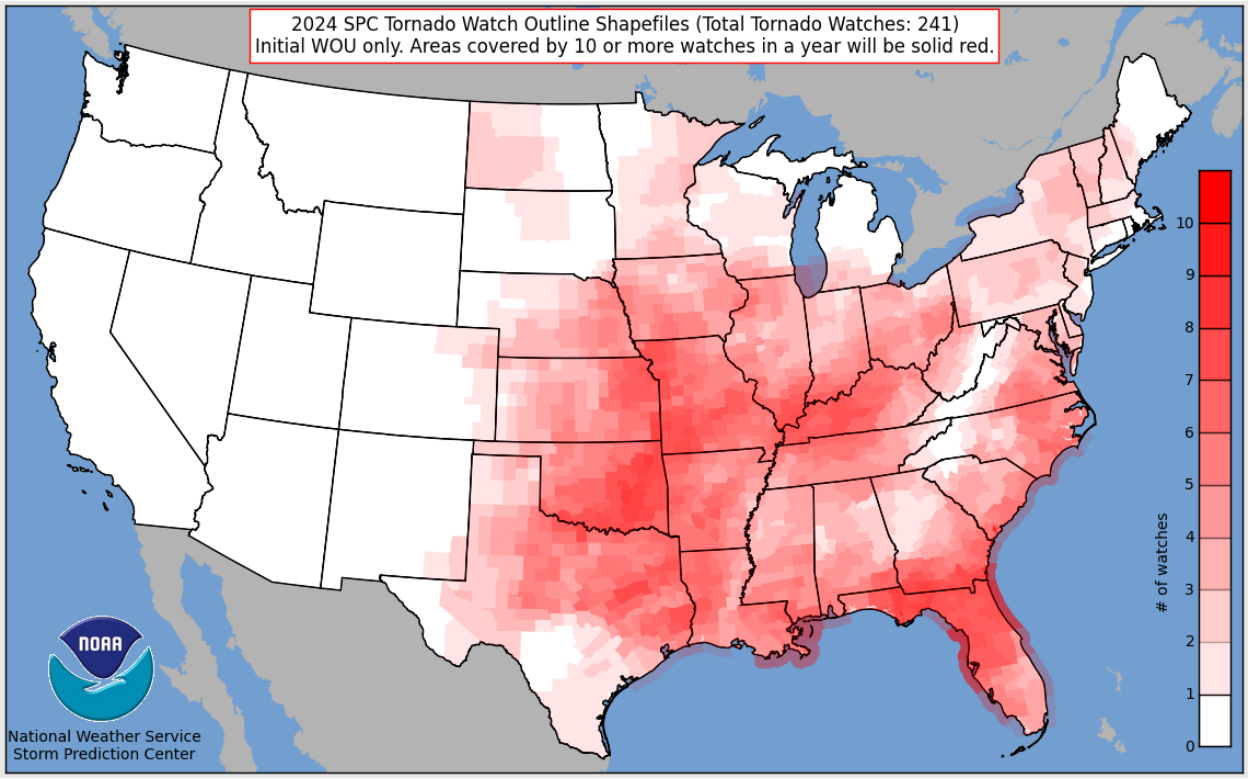



**Figure 79: Tornado Watch Density for the Continental United States in 2024**[282]

[282] NOAA Storm Prediction Center. https://www.spc.noaa.gov/wcm/2024_torww_to_date.png.

## 3.22.2 Risk Assessment

### 3.22.2.1 LOCATION

Tornadoes are possible anywhere in the United States but occur mainly east of the Rocky Mountains in the central plains and west of the Appalachian Mountains (Figure 80). Tornadoes typically form in the late afternoon and evening hours during the spring and summer months, but they have the potential to form throughout the entire year at any time. The United States experiences tornadoes more than any other country, but states such as Texas, Oklahoma, Kansas, and Nebraska are highly vulnerable to tornadoes due to their geographic location. The warm, moist air from the Gulf of Mexico clashing with the cool, dry air from Canada and the Rocky Mountains make it a prime hotspot for tornadic activity. The lack of significant topographical barriers such as mountains in these states allows storms to build and sustain themselves over long geographical distances.

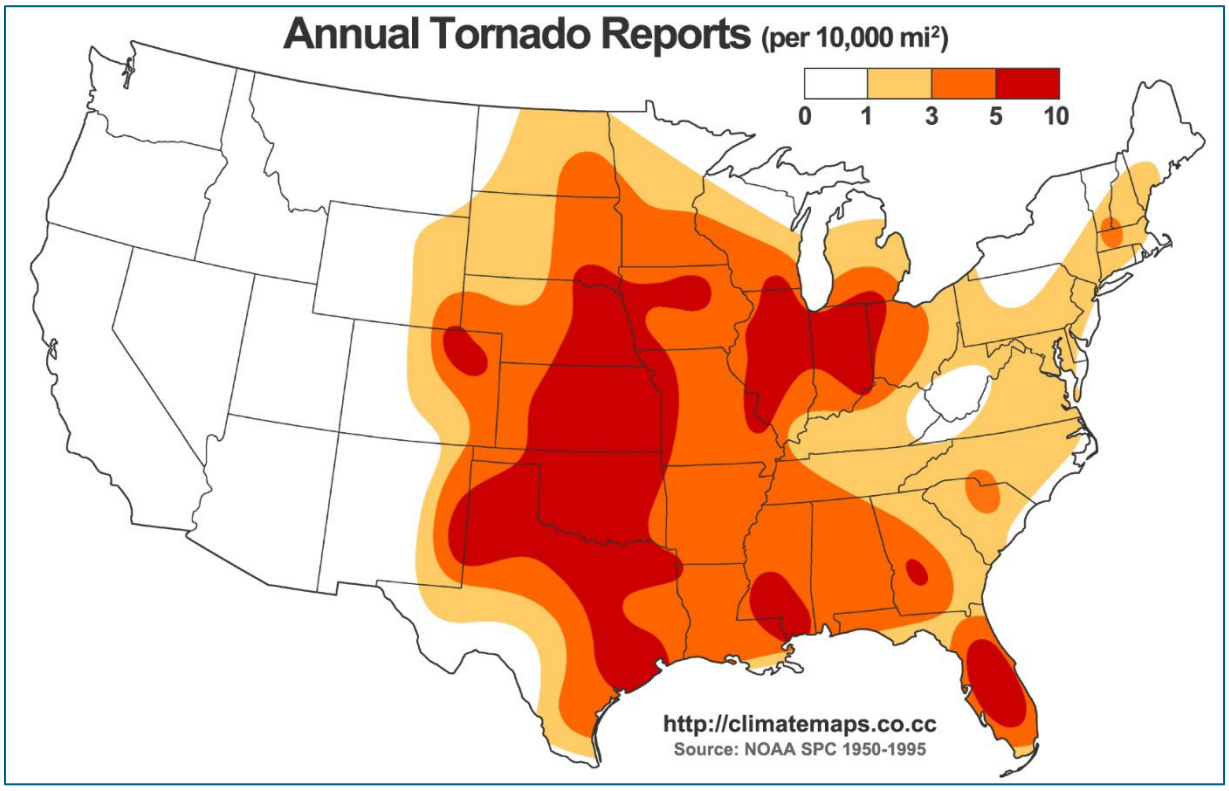



**Figure 80: Annual Tornado Reports for the Continental United States in 2024** [283]

The state of Nebraska is highly vulnerable to the impacts of tornadoes especially in the southeastern and central parts of the state. Per the National Centers for Environmental Information (NCEI) Storm Events Database, the counties of Thayer, Hamilton, Cass, Clay, Nuckolls, Stanton, York, and Fillmore have been impacted by the most tornadoes. The flat geography in these areas facilitate the development and movement of tornadoes. While these areas are highly susceptible to the impacts of tornadoes, the vulnerability extends to the entire state of Nebraska. Counties like Hall, where the city of Grand Island has

[283] NOAA Storm Prediction Center. http://climatemaps.co.cc.

been notably affected by tornadoes, are known for their frequent tornado activity, which exemplifies the broader pattern seen across the state. The state's vast open landscape, lack of natural barriers, and the weather/climate patterns all contribute to Nebraska's high tornado occurrences.

#### 3.22.2.2 EXTENT

Tornadoes have been classified using the Enhanced Fujita (EF) scale since February 1, 2007. The EF scale classifies tornadoes based on their damage pattern that is then used to derive wind speed estimations. This includes examining the damage, analyzing the ground-swirl patterns, reviewing damage imagery, collecting media reports, and utilizing photogrammetry and videogrammetry. This scale ranges from EF-0 to EF-5, with EF-0 being the weakest and EF-5 being the most powerful. Prior to 2007, the Fujita (F) scale was utilized to determine the impact of the tornado. Table 95 compares the EF scale to the F scale while summarizing damage from each classification.

**Table 95: Comparison of the Enhanced Fujita (EF) Scale to the Fujita (F) Scale[284]**

| Fujita Scale | | | Enhanced Fujita Scale | | |
|---|---|---|---|---|---|
| **F Category** | **Wind Speed (mph)** | **Potential Damage** | **EF Category** | **Wind Speed (mph)** | **Potential Damage** |
| **F0** | <73 | Light Damage: Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged. | **EF-O** | 65–85 | Light Damage: Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow rooted trees toppled. |
| **F1** | 73–112 | Moderate Damage: Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads. | **EF-1** | 86–110 | Moderate Damage: Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; broken window/other glass broken. |
| **F2** | 113–157 | Considerable Damage: Roofs torn from frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground. | **EF-2** | 111–135 | Considerable Damage: Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground. |
| **F3** | 158–206 | Severe Damage: Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown. | **EF-3** | 136–165 | Severe Damage: Entire stories of well-constructed homes destroyed; severe damage to large buildings, (e.g., shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance. |
| **F4** | 207–260 | Devastating Damage: Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown; and large missiles generated. | **EF-4** | 166–200 | Devastating Damage: Well-constructed houses and whole frame houses completely leveled; cars thrown, and small missiles generated. |

[284] National Weather Service https://www.weather.gov/oun/efscale.

| Fujita Scale | | | Enhanced Fujita Scale | | |
|---|---|---|---|---|---|
| **F5** | >261 | Incredible Damage: Strong framed houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds); trees debarked; incredible phenomena will occur. | **EF-5** | >200 | Incredible Damage: Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yd.); high-rise buildings have significant structural deformation; incredible phenomena will occur. |

### 3.22.2.3 PREVIOUS EVENTS/PROBABILITY

Since the 2021 Nebraska State Hazard Mitigation Plan, the NCEI Storm Events Database indicates 267 reported tornadoes within the state of Nebraska. The following are notable tornado outbreaks that have impacted the state of Nebraska since the 2021 Nebraska State Hazard Mitigation plan.[285]

- **December 15, 2021:** Nebraska experienced the most significant convection event on record for Nebraska in the month of December, surpassing the Christmas Day 2016 occurrence. The damaging winds stretched from South Central Nebraska and North Central Kansas to Southeast Minnesota and Western Wisconsin, marking the first December derecho in the United States. Nebraska confirmed 28 tornadoes that impacted the state, including five EF-1 and four EF-0 tornadoes.

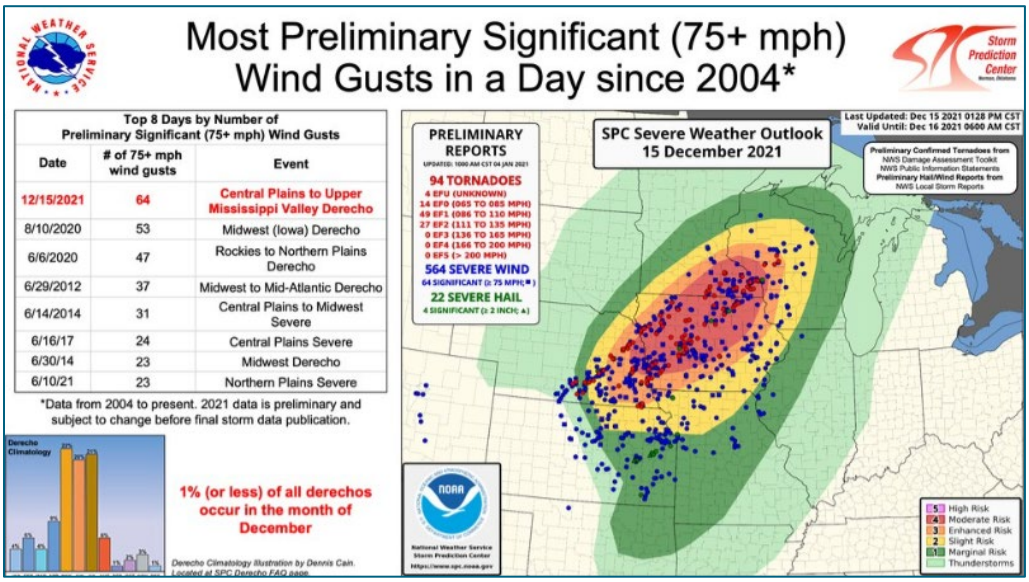



**Figure 81: Significant Wind Gusts with Tornado Occurrences, December 15, 2021**[286]

[285] National Centers for Environmental Information. "Storm Events Database." https://www.ncdc.noaa.gov/stormevents/.
[286] National Weather Service. "The December 15, 2021 Derecho & Tornado Outbreak" Story Map. https://storymaps.arcgis.com/stories/32122a8a3a8a49dd910f51f32a3a6999.



Figure 82: EF-1 Tornado Damage, Polk County, December 15, 2021 [287]



Figure 83: Heavily Damaged Barn from an EF-2 Tornado in Lancaster County December 15, 2021 [288]



Figure 84: Destroyed Shed in Platte Center from an EF-1 Tornado, December 15, 2021 [289]

[287] KMTV, "Tornadoes, Wind, Dust, Smoke, Warmth, and Snow Oh My…" https://www.3newsnow.com/weather/weather-history/december-15-2021-tornadoes-wind-dust-smoke-warmth-and-snow-oh-my.
[288] Ibid.
[289] Ibid.

- **April 26, 2024:** Thunderstorms formed along a pacific front/dryline in south-central Nebraska with one supercell producing several tornadoes including an EF-2 near Cedar Rapids. More supercells began to form in Jefferson and Saline counties leading to the worst tornado outbreak in a decade for the Omaha Weather Forecast Office. Five EF-3 tornadoes were recorded near reaching EF-4 intensity. One EF-3 tornado trapped 70 people in a collapsed manufacturing plant in northeast Lincoln. Another EF-3 tornado affected Elkhorn, Bennington, and Blair, while Eppley Airfield and parts of Pottawattamie County were also impacted. The final EF-3 tornado struck Minden, Iowa, causing one fatality and three injuries. In total, 24 tornadoes were confirmed in Nebraska and Iowa with the strongest being the EF-3 tornado in Elkhorn and Blair, which peaked at 165 mph winds.

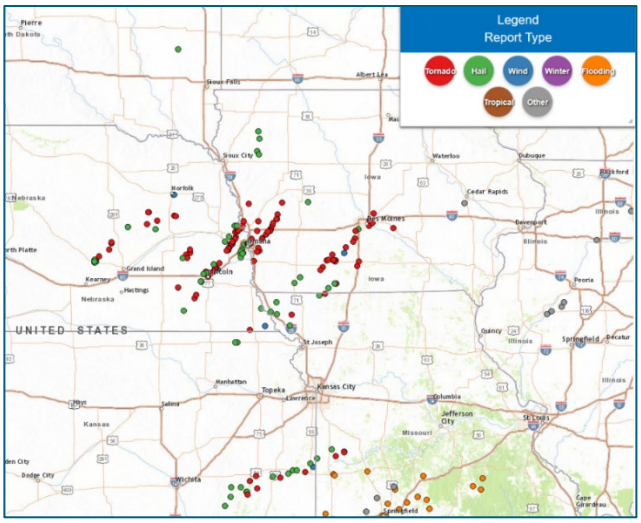



Figure 85: Storm Reports for April 26, 2024[290]

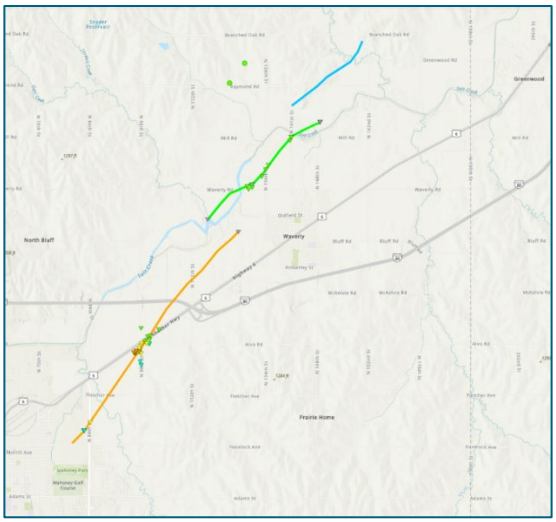


Figure 86: EF3 Tornado Tracking Map in Lincoln/Waverly Areas[291]

[290] National Weather Service. "Tornado Outbreak of April 26, 2004." https://www.weather.gov/oax/april262024.
[291] Ibid.



Figure 87: Lincoln/Waverly Tornado near 148th and Waverly Road Looking East[292]



Figure 88: Damage to Manufacturing Facility Between Lincoln and Waverly[293]

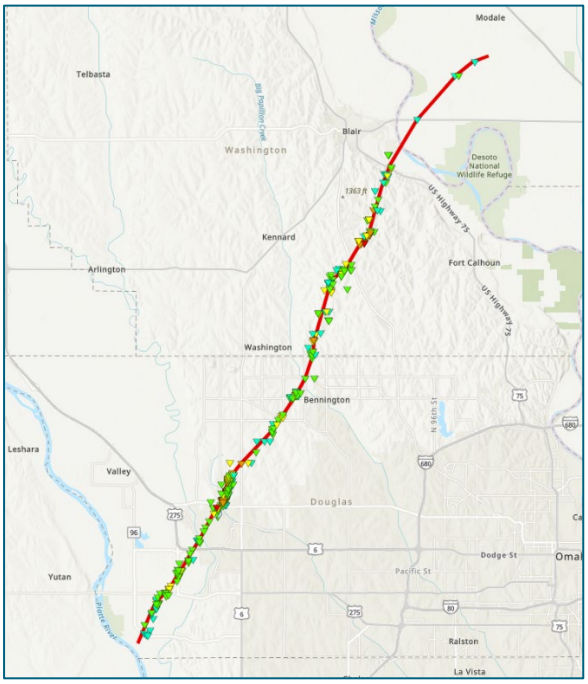



Figure 89: EF3 Tornado Tracking Map in Elkhorn/Bennington/Blair Areas[294]



Figure 90: Five Miles South of Blair[295]

[292] Ibid.
[293] Ibid.
[294] Ibid.
[295] Ibid.



Figure 91: Elkhorn Near 216th and Fort[296]



Figure 92: Lake Bennington[297]

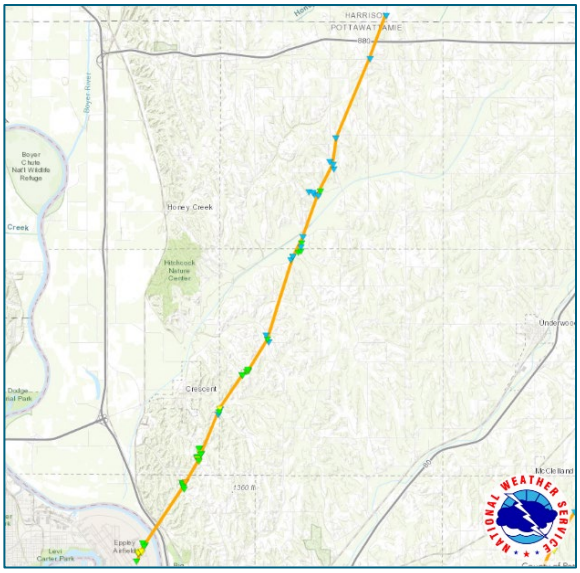



Figure 93: EF3 Tornado Tracking Map in Eppley Airfield/Crescent, IA Areas[298]

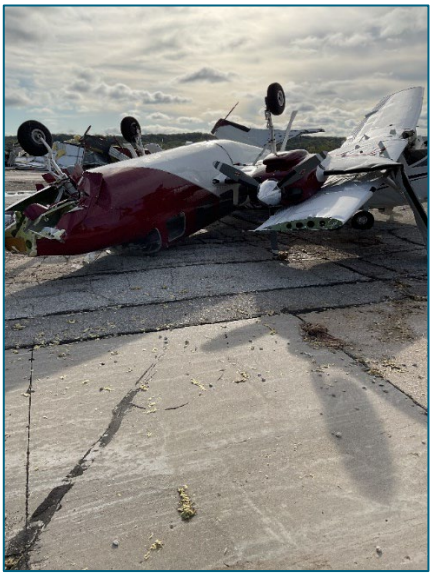


Figure 94: Eppley Airfield[299]

[296] Ibid.
[297] Ibid.
[298] Ibid.
[299] Ibid.



Figure 95: Eppley Airfield[300]

Table 96 provides a brief description and impact of each tornado occurrence that caused damage or was an EF3 or greater in intensity since the 2021 Nebraska State Hazard Mitigation Plan.

Table 96: Tornado Occurrences for the Counties of Nebraska[301]

| Date | Area | Type | Total Property Damage | Total Crop Damage | Injuries | Fatalities |
|---|---|---|---|---|---|---|
| **May 2, 2021** | Aurora | EF0 | $45,000 | $0 | 0 | 0 |
| **May 2, 2021** | Stromsburg | EF0 | $45,000 | $0 | 0 | 0 |
| **December 15, 2021** | Newark | EF0 | $400,000 | $0 | 0 | 0 |
| **December 15, 2021** | Campbell | EF0 | $50,000 | $0 | 0 | 0 |
| **December 15, 2021** | Bladen | EF0 | $400,000 | $0 | 0 | 0 |
| **December 15, 2021** | Gibbon | EF0 | $300,000 | $0 | 0 | 0 |
| **December 15, 2021** | Lowell | EF0 | $100,000 | $0 | 0 | 0 |
| **December 15, 2021** | Gibbon | EF0 | $250,000 | $0 | 0 | 0 |
| **December 15, 2021** | Holstein | EF0 | $250,000 | $0 | 0 | 0 |

[300] Ibid.
[301] NCEI, "Storm Events Database." https://www.ncdc.noaa.gov/stormevents/.

| Date | Area | Type | Total Property Damage | Total Crop Damage | Injuries | Fatalities |
|---|---|---|---|---|---|---|
| **December 15, 2021** | Blue Hill | EF1 | $50,000 | $0 | 0 | 0 |
| **December 15, 2021** | Ayr | EF1 | $350,000 | $0 | 0 | 0 |
| **December 15, 2021** | (HSI) Hastings Airport | EF1 | $200,000 | $0 | 0 | 0 |
| **December 15, 2021** | Rosedale | EF1 | $200,000 | $0 | 0 | 0 |
| **December 15, 2021** | Hastings | EF0 | $2,000 | $0 | 0 | 0 |
| **December 15, 2021** | Trumbull | EF0 | $150,000 | $0 | 0 | 0 |
| **December 15, 2021** | Giltner | EF0 | $150,000 | $0 | 0 | 0 |
| **December 15, 2021** | Giltner | EF1 | $500,000 | $0 | 0 | 0 |
| **December 15, 2021** | Kronborg | EF1 | $350,000 | $0 | 0 | 0 |
| **December 15, 2021** | Hordville | EF1 | $150,000 | $0 | 0 | 0 |
| **December 15, 2021** | Polk | EF1 | $400,000 | $0 | 0 | 0 |
| **June 7, 2022** | Ruskin | EF0 | $500,000 | $0 | 0 | 0 |
| **June 7, 2022** | Deshler | EF0 | $500,000 | $0 | 0 | 0 |
| **June 14, 2022** | Lushton | EF2 | $1,200,000 | $5,000,000 | 2 | 0 |
| **July 3, 2022** | Grand Is | EF1 | $250,000 | $100,000 | 0 | 0 |
| **July 3, 2022** | Chapman | EF1 | $250,000 | $100,000 | 0 | 0 |
| **May 5, 2023** | Darr | EF1 | $2,000,000 | $0 | 0 | 0 |
| **May 12, 2023** | Spalding | EF1 | $300,000 | $0 | 0 | 0 |
| **June 2, 2023** | Central City | EF0 | $400,000 | $1,500,000 | 0 | 0 |
| **June 23, 2023** | Gering | EF2 | $135,000 | $0 | 0 | 0 |
| **July 29, 2023** | Sutton | EF1 | $750,000 | $0 | 0 | 0 |
| **October 3, 2023** | Overton | EF0 | $225,000 | $0 | 0 | 0 |
| **October 3, 2023** | Hazard | EF0 | $15,000 | $0 | 0 | 0 |
| **October 3, 2023** | Rockville | EF0 | $1,000 | $0 | 0 | 0 |
| **October 12, 2023** | Bertrand | EF0 | $90,000 | $0 | 0 | 0 |

| Date | Area | Type | Total Property Damage | Total Crop Damage | Injuries | Fatalities |
|---|---|---|---|---|---|---|
| **October 12, 2023** | Hildreth | EF1 | $2,000 | $0 | 0 | 0 |
| **October 12, 2023** | Minden | EF1 | $225,000 | $0 | 0 | 0 |
| **October 12, 2023** | Prosser | EF0 | $0 | $50,000 | 0 | 0 |
| **April 26, 2024** | Ravenna | EF1 | $70,000 | $0 | 0 | 0 |
| **April 26, 2024** | Rockville | EF1 | $70,000 | $0 | 0 | 0 |
| **April 26, 2024** | Rockville | EF1 | $200,000 | $0 | 0 | 0 |
| **April 26, 2024** | Farwell | EF0 | $200,000 | $0 | 0 | 0 |
| **April 26, 2024** | Farwell | EF3 | $3,500,000 | $0 | 0 | 0 |
| **April 26, 2024** | Elba | EF2 | $400,000 | $0 | 0 | 0 |
| **April 26, 2024** | Wolbach | EF2 | $400,000 | $0 | 0 | 0 |
| **April 26, 2024** | Wolbach | EF2 | $25,000 | $0 | 0 | 0 |
| **April 26, 2024** | Havelock | EF3 | $0 | $0 | 3 | 0 |
| **April 26, 2024** | Waterloo | EF4 | $0 | $0 | 3 | 0 |
| **April 26, 2024** | Washington | EF4 | $0 | $0 | 1 | 0 |
| **May 3, 2024** | Atlanta | EF1 | $40,000 | $0 | 0 | 0 |
| **May 3, 2024** | Holdrege | EF1 | $500,000 | $0 | 0 | 0 |
| **May 3, 2024** | Ragan | EF0 | $600,000 | $0 | 0 | 0 |
| **May 3, 2024** | Holdrege | EF1 | $150,000 | $0 | 0 | 0 |
| **May 3, 2024** | Sacramento | EF0 | $150,000 | $0 | 0 | 0 |
| **May 3, 2024** | Guide Rock | EF0 | $75,000 | $0 | 0 | 0 |
| **May 3, 2024** | Lawrence | EF0 | $25,000 | $0 | 0 | 0 |
| **May 6, 2024** | Amboy | EF0 | $20,000 | $0 | 0 | 0 |
| **May 21, 2024** | Shelby | EF0 | $1,000,000 | $0 | 0 | 0 |
| **May 23, 2024** | Brule | EF1 | $450,000 | $0 | 0 | 0 |
| **May 23, 2024** | Brule | EF1 | $600,000 | $0 | 0 | 0 |
| **May 23, 2024** | Lake McConaughy | EF1 | $50,000 | $0 | 0 | 0 |
| **May 23, 2024** | Lake McConaughy | EF1 | $5,000 | $0 | 0 | 0 |
| **May 23, 2024** | Lake McConaughy | EF2 | $3,500,000 | $0 | 0 | 0 |
| **May 23, 2024** | Lake McConaughy | EF0 | $20,000 | $0 | 0 | 0 |
| **May 23, 2024** | Perry | EF0 | $1,000 | $0 | 0 | 0 |
| **May 23, 2024** | Holdrege | EF1 | $200,000 | $0 | 0 | 0 |
| **May 23, 2024** | Axtell | EF0 | $75,000 | $0 | 0 | 0 |
| **May 23, 2024** | Minden | EF0 | $350,000 | $250,000 | 0 | 0 |

| Date | Area | Type | Total Property Damage | Total Crop Damage | Injuries | Fatalities |
|---|---|---|---|---|---|---|
| **May 23, 2024** | Cushing | EF1 | $25,000 | $0 | 0 | 0 |
| **May 23, 2024** | Palmer | EF1 | $25,000 | $0 | 0 | 0 |
| **May 23, 2024** | Fullerton | EF1 | $25,000 | $0 | 0 | 0 |
| **May 23, 2024** | Ayr | EF1 | $400,000 | $0 | 0 | 0 |
| **June 7, 2024** | Arnold | EF2 | $80,000 | $0 | 0 | 0 |
| **June 20, 2024** | Ainsworth | EF1 | $15,000 | $0 | 0 | 0 |
| **June 20, 2024** | Long Pine | EF1 | $1,000 | $0 | 0 | 0 |
| **June 25, 2024** | Whitman | EF3 | $0 | $0 | 1 | 0 |
| **July 6, 2024** | Minden | EF1 | $500,000 | $1,000,000 | 0 | 0 |
| **July 6, 2024** | Norman | EF1 | $750,000 | $0 | 0 | 0 |
| **July 6, 2024** | Roseland | EF0 | $50,000 | $500,000 | 0 | 0 |
| **July 6, 2024** | Hastings | EF0 | $100,000 | $500,000 | 0 | 0 |
| **July 6, 2024** | Sutton | EF1 | $125,000 | $5,000,000 | 0 | 0 |
| **July 6, 2024** | Grafton | EF1 | $125,000 | $5,000,000 | 0 | 0 |
| **July 16, 2024** | Broken Bow | EF1 | $10,000 | $0 | 0 | 0 |

### 3.22.2.4 PROBABILITY

Based on historical records, the state of Nebraska has a 100% annual probability of impacted by a tornado or approximately two to three tornadoes annually.

Data from the NCEI Storm Events Database over a 29-year period (1996 to 2024) was analyzed at the county level to determine the number of events, impact, chance of occurrence, and return frequency of tornadoes. Table 97 summarizes that data at the county level.

**Table 97: Tornado Occurrences for the Counties of Nebraska[302]**

| County | Total Number of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Chance of Occurrence | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Adams** | 22 | $4,899,000 | $1,650,000 | 0 | 0 | 76% | 1 event every 1 to 2 years |
| **Antelope** | 12 | $37,000 | $0 | 0 | 0 | 41% | 1 event every 2 to 3 years |

[302] NCEI Storm Events Database. https://www.ncdc.noaa.gov/stormevents/.

| County | Total Number of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Chance of Occurrence | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Arthur** | 6 | $35,000 | $0 | 0 | 0 | 21% | 1 event every 4 to 5 years |
| **Banner** | 15 | $355,000 | $0 | 0 | 0 | 52% | 1 event every 1 to 2 years |
| **Blaine** | 6 | $20,000 | $0 | 0 | 0 | 21% | 1 event every 4 to 5 years |
| **Boone** | 12 | $15,000 | $0 | 0 | 0 | 41% | 1 event every 2 to 3 years |
| **Box Butte** | 15 | $1,000,000 | $0 | 0 | 0 | 52% | 1 event every 1 to 2 years |
| **Boyd** | 1 | $0 | $0 | 0 | 0 | 3% | 1 event every 29 years |
| **Brown** | 19 | $163,000 | $75,000 | 0 | 0 | 66% | 1 event every 1 to 2 years |
| **Buffalo** | 25 | $19,265,000 | $4,070,000 | 1 | 0 | 86% | 1 event every 1 to 2 years |
| **Burt** | 11 | $1,100,000 | $0 | 2 | 0 | 38% | 1 event every 2 to 3 years |
| **Butler** | 14 | $173,000 | $0 | 0 | 0 | 48% | 1 event every 2 to 3 years |
| **Cass** | 28 | $1,009,000 | $0 | 8 | 0 | 97% | 1 event every 1 to 2 years |
| **Cedar** | 18 | $6,100,000 | $0 | 1 | 1 | 62% | 1 event every 1 to 2 years |
| **Chase** | 18 | $436,000 | $27,000 | 0 | 0 | 62% | 1 event every 1 to 2 years |
| **Cherry** | 57 | $743,075,000 | $152,000 | 0 | 0 | 100% | 1 to 2 events every year |
| **Cheyenne** | 28 | $30,000 | $0 | 0 | 0 | 97% | 1 event every 1 to 2 years |
| **Clay** | 22 | $23,690,000 | $7,640,000 | 0 | 0 | 76% | 1 event every 1 to 2 years |
| **Colfax** | 20 | $560,000 | $0 | 0 | 0 | 69% | 1 event every 1 to 2 years |
| **Cuming** | 13 | $1,545,000 | $250,000 | 0 | 1 | 45% | 1 event every 2 to 3 years |

| County | Total Number of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Chance of Occurrence | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Custer** | 51 | $4,345,000 | $63,000 | 0 | 0 | 100% | 1 to 2 events every year |
| **Dakota** | 4 | $3,050,000 | $0 | 3 | 0 | 14% | 1 event every 7 to 8 years |
| **Dawes** | 13 | $0 | $0 | 0 | 0 | 45% | 1 event every 2 to 3 years |
| **Dawson** | 20 | $6,215,000 | $490,000 | 9 | 0 | 69% | 1 event every 1 to 2 years |
| **Deuel** | 13 | $215,00 | $12,000 | 2 | 0 | 45% | 1 event every 2 to 3 years |
| **Dixon** | 11 | $570,000 | $0 | 0 | 0 | 38% | 1 event every 2 to 3 years |
| **Dodge** | 18 | $1,555,000 | $0 | 0 | 0 | 62% | 1 event every 1 to 2 years |
| **Douglas** | 10 | $0 | $0 | 6 | 0 | 34% | 1 event every 2 to 3 years |
| **Dundy** | 20 | $747,000 | $0 | 0 | 0 | 69% | 1 event every 1 to 2 years |
| **Fillmore** | 20 | $13,828,000 | $5,975,000 | 0 | 0 | 69% | 1 event every 1 to 2 years |
| **Franklin** | 12 | $387,000 | $100,000 | 0 | 0 | 41% | 1 event every 2 to 3 years |
| **Frontier** | 19 | $758,000 | $0 | 0 | 0 | 66% | 1 event every 1 to 2 years |
| **Furnas** | 11 | $383,000 | $0 | 0 | 0 | 38% | 1 event every 2 to 3 years |
| **Gage** | 25 | $37,915,000 | $0 | 17 | 0 | 86% | 1 event every 1 to 2 years |
| **Garden** | 11 | $185,000 | $11,000 | 0 | 0 | 38% | 1 event every 2 to 3 years |
| **Garfield** | 8 | $222,000 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Gosper** | 8 | $575,000 | $250,000 | 4 | 0 | 28% | 1 event every 3 to 4 years |
| **Grant** | 3 | $10,500 | $0 | 1 | 0 | 10% | 1 event every 9 to 10 years |

| County | Total Number of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Chance of Occurrence | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Greeley** | 10 | $940,000 | $30,000 | 0 | 0 | 34% | 1 event every 2 to 3 years |
| **Hall** | 14 | $1,485,000 | $530,000 | 0 | 0 | 48% | 1 event every 2 to 3 years |
| **Hamilton** | 30 | $5,226,000 | $0 | 0 | 0 | 100% | 1 to 2 events every year |
| **Harlan** | 13 | $1,075,000 | $250,000 | 0 | 0 | 45% | 1 event every 2 to 3 years |
| **Hayes** | 10 | $160,000 | $0 | 0 | 0 | 34% | 1 event every 2 to 3 years |
| **Hitchcock** | 8 | $0 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Holt** | 46 | $8,535,000 | $1,364,000 | 4 | 0 | 100% | 1 to 2 events every year |
| **Hooker** | 9 | $5,000 | $0 | 0 | 0 | 31% | 1 event every 3 to 4 years |
| **Howard** | 18 | $5,060,000 | $100,000 | 0 | 0 | 62% | 1 event every 2 to 3 years |
| **Jefferson** | 15 | $3,220,000 | $0 | 1 | 0 | 52% | 1 event every 1 to 2 years |
| **Johnson** | 8 | $500,000 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Kearney** | 16 | $2,455,000 | $1,290,000 | 0 | 0 | 55% | 1 event every 1 to 2 years |
| **Keith** | 26 | $5,497,000 | $1,000 | 0 | 0 | 90% | 1 event every 1 to 2 years |
| **Keya Paha** | 4 | $250,000 | $15,000 | 1 | 0 | 14% | 1 event every 7 to 8 years |
| **Kimball** | 38 | $3,000 | $0 | 0 | 0 | 100% | 1 to 2 events every year |
| **Knox** | 19 | $1,020,000 | $0 | 3 | 0 | 66% | 1 event every 1 to 2 years |
| **Lancaster** | 32 | $100,300,000 | $0 | 33 | 1 | 100% | 1 to 2 events every year |
| **Lincoln** | 55 | $3,311,000 | $65,000 | 9 | 0 | 100% | 1 to 2 events every year |

| County | Total Number of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Chance of Occurrence | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Logan** | 6 | $8,000 | $0 | 0 | 0 | 21% | 1 event every 4 to 5 years |
| **Loup** | 13 | $716,000 | $6,000 | 0 | 0 | 45% | 1 event every 2 to 3 years |
| **Madison** | 19 | $83,000 | $0 | 0 | 0 | 66% | 1 event every 1 to 2 years |
| **McPherson** | 11 | $213,000 | $0 | 0 | 0 | 38% | 1 event every 2 to 3 years |
| **Merrick** | 12 | $1,530,000 | $1,700,000 | 0 | 0 | 41% | 1 event every 2 to 3 years |
| **Morrill** | 21 | $2,990,000 | $0 | 0 | 0 | 72% | 1 event every 1 to 2 years |
| **Nance** | 12 | $302,000 | $130,000 | 0 | 0 | 41% | 1 event every 2 to 3 years |
| **Nemaha** | 8 | $130,000 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Nuckolls** | 23 | $2,608,000 | $60,000 | 0 | 0 | 79% | 1 event every 1 to 2 years |
| **Otoe** | 16 | $20,146,000 | $100,000 | 0 | 0 | 55% | 1 event every 1 to 2 years |
| **Pawnee** | 8 | $0 | $0 | 0 | 0 | 28% | 1 event every 3 to 4 years |
| **Perkins** | 19 | $1,926,000 | $1,501,000 | 1 | 0 | 66% | 1 event every 1 to 2 years |
| **Phelps** | 17 | $2,830,000 | $1,250,000 | 0 | 0 | 59% | 1 event every 1 to 2 years |
| **Pierce** | 10 | $123,000 | $0 | 0 | 0 | 34% | 1 event every 2 to 3 years |
| **Platte** | 17 | $4,104,000 | $500,000 | 19 | 0 | 59% | 1 event every 1 to 2 years |
| **Polk** | 14 | $7,495,000 | $1,400,000 | 0 | 0 | 48% | 1 event every 2 to 3 years |
| **Red Willow** | 21 | $1,107,000 | $0 | 0 | 0 | 72% | 1 event every 1 to 2 years |
| **Richardson** | 14 | $35,000 | $0 | 0 | 0 | 48% | 1 event every 2 to 3 years |

| County | Total Number of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Chance of Occurrence | Return Frequency |
|---|---|---|---|---|---|---|---|
| **Rock** | 12 | $1,075,000 | $25,000 | 0 | 0 | 41% | 1 event every 2 to 3 years |
| **Saline** | 10 | $20,000,000 | $0 | 8 | 0 | 34% | 1 event every 2 to 3 years |
| **Sarpy** | 10 | $10,000 | $0 | 0 | 0 | 34% | 1 event every 2 to 3 years |
| **Saunders** | 22 | $365,000 | $0 | 0 | 0 | 76% | 1 event every 1 to 2 years |
| **Scotts Bluff** | 33 | $324,000 | $2,000 | 0 | 0 | 100% | 1 to 2 events every year |
| **Seward** | 17 | $3,401,000 | $0 | 2 | 0 | 59% | 1 event every 1 to 2 years |
| **Sheridan** | 32 | $349,000 | $261,000 | 0 | 0 | 100% | 1 to 2 events every year |
| **Sherman** | 12 | $486,000 | $25,000 | 0 | 0 | 41% | 1 event every 2 to 3 years |
| **Sioux** | 17 | $6,000 | $0 | 1 | 0 | 59% | 1 event every 1 to 2 years |
| **Stanton** | 21 | $14,430,000 | $502,000 | 20 | 1 | 72% | 1 event every 1 to 2 years |
| **Thayer** | 33 | $21,315,000 | $7,165,000 | 8 | 1 | 100% | 1 to 2 events every year |
| **Thomas** | 5 | $61,000 | $0 | 0 | 0 | 17% | 1 event every 5 to 6 years |
| **Thurston** | 5 | $0 | $0 | 2 | 0 | 17% | 1 event every 5 to 6 years |
| **Valley** | 14 | $1,890,000 | $1,225,000 | 0 | 0 | 48% | 1 event every 2 to 3 years |
| **Washington** | 13 | $925,000 | $0 | 2 | 0 | 45% | 1 event every 2 to 3 years |
| **Wayne** | 10 | $4,575,000 | $0 | 15 | 0 | 34% | 1 event every 2 to 3 years |
| **Webster** | 12 | $1,446,000 | $150,000 | 0 | 0 | 41% | 1 event every 2 to 3 years |
| **Wheeler** | 13 | $469,000 | $25,000 | 2 | 0 | 45% | 1 event every 2 to 3 years |

| County | Total Number of Events (1996–2024) | Total Property Damage | Total Crop Damage | Injuries | Fatalities | Chance of Occurrence | Return Frequency |
|---|---|---|---|---|---|---|---|
| **York** | 20 | $8,885,000 | $7,000,000 | 2 | 0 | 69% | 1 event every 1 to 2 years |

Counties with high frequency and significant damage include Cherry County, with 57 events resulting in over $700 million in property damage, and Lancaster County, with 32 events resulting in over $100 million in property damage. Counties with notable crop damage include Clay County, with over $7 million in crop damage estimates, and Fillmore County, with over $5 million in crop damage estimates. Both Gage County and Platte County have high injury and fatality rates due to tornadoes. Counties with a low frequency of events include Boyd County and Grant County, while counties with high frequency of events include Hamilton County and Kimball County.

### 3.22.2.5 EFFECTS OF FUTURE CONDITIONS

Tornadoes pose a unique challenge for identifying development and population trends due to their lack of confinement to specific geographic areas or population groups. Existing land use and building codes include standards aimed at addressing and mitigating wind loads on structures. Pre-engineered safe room designs are available for both residential and commercial buildings. The potential impacts of future growth and development on tornado risk will be monitored and evaluated in the upcoming planning cycle to assess any changes in the level of risk and to explore opportunities for mitigation through development practices that could reduce future hazard impacts.

Changes in atmospheric conditions and increasing global temperatures may also affect the development and strength of tornadoes. As air temperatures rise, the atmosphere is capable of holding more moisture, which can lead to an increase in severe thunderstorms—a key factor in tornado formation. Additionally, alterations in jet stream patterns might influence both the frequency and location of tornado activity, potentially extending the regions at risk beyond their historical boundaries. Some studies indicate that tornado events may become more concentrated within shorter timeframes, meaning that while the total annual count may not drastically increase, clusters of intense tornado outbreaks could lead to more severe localized destruction.

Shifts in temperature differences at various atmospheric levels also play a role in the wind shear required for tornadoes to form. If wind patterns become increasingly unpredictable or change in strength, the likelihood of conditions favorable for tornado formation may be affected. Observations suggest that the well-known “Tornado Alley” in the central United States could be gradually shifting eastward, exposing new areas to greater tornado risk. These evolving weather patterns present challenges for meteorologists and emergency management teams, emphasizing the need for updated forecasting methods and improved preparedness plans to address the changing landscape of severe weather threats.

## 3.22.3 Vulnerability Analysis

Nebraska is particularly vulnerable to tornadoes due to its geographic location. The state's geography, characterized by flat plains and wide-open spaces, allows tornadoes to form and travel with minimal obstruction often with little warning. Tornadoes in Nebraska can be highly destructive, as the state experiences some of the strongest tornadoes in the nation with wind speeds capable of exceeding 200 mph. Vulnerable populations, including the elderly, individuals with access and functional needs, and those living in rural or isolated areas, are at increased risk, as they may have limited access to emergency services, early warning systems, or evacuation routes. The widespread nature of tornadoes in Nebraska further exacerbates the vulnerability of communities, particularly in rural regions where infrastructure, such as emergency response systems, healthcare facilities, and transportation networks, may be underdeveloped or insufficient to handle large-scale disasters.

### 3.22.3.1 NATIONAL RISK INDEX

The National Risk Index (NRI) provides communities with an online tool to display potential risk to 18 natural hazards. The following table provides an overview of historical losses, expected annual losses, and overall risk rating for tornadoes at the county level.

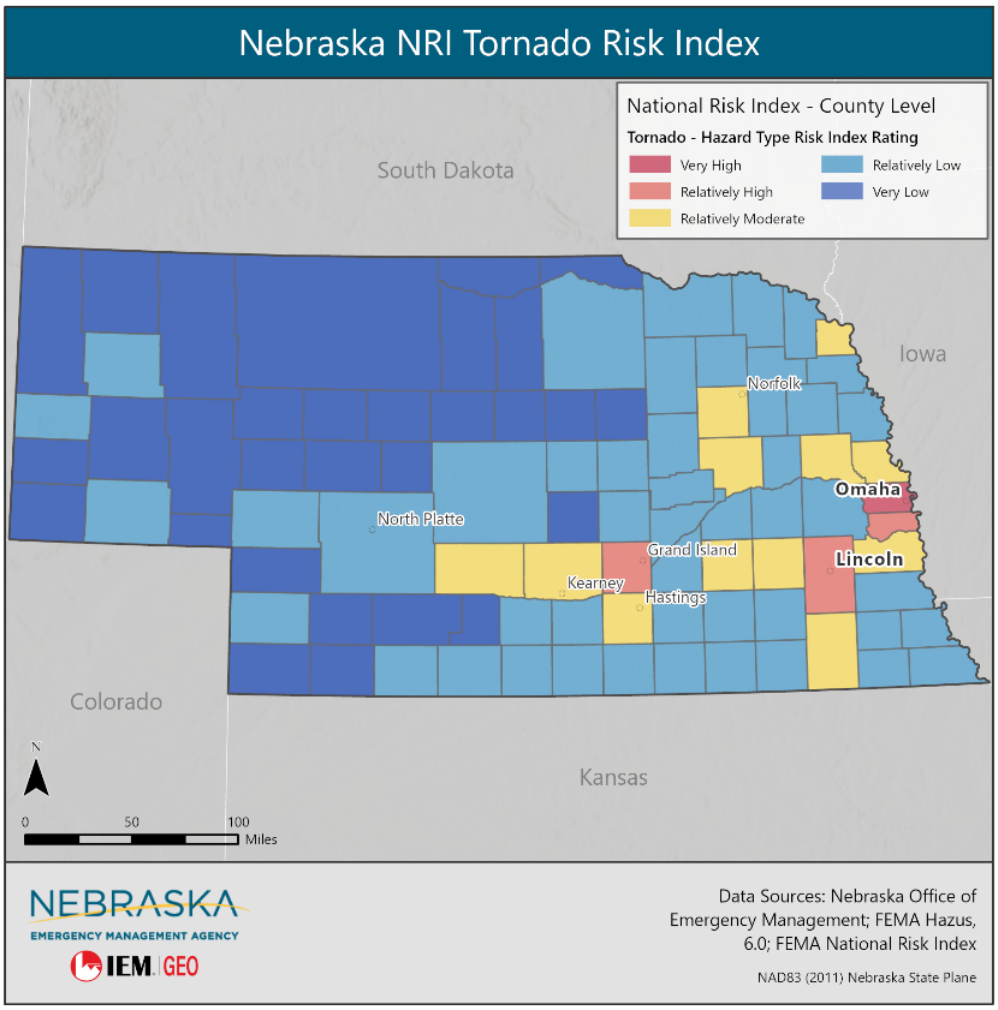



**Figure 96: National Risk Index Tornado**

**Table 98: Tornado National Risk Index for the Counties of Nebraska**

| County | Historical Loss | Expected Annual Loss | Overall Risk Rating |
|---|---|---|---|
| **Adams** | Relatively Moderate | Relatively Moderate | Relatively Moderate |
| **Antelope** | Relatively Moderate | Relatively Low | Relatively Low |
| **Arthur** | Relatively Moderate | Very Low | Very Low |
| **Banner** | Relatively Low | Very Low | Very Low |
| **Blaine** | Relatively High | Very Low | Very Low |
| **Boone** | Relatively Moderate | Relatively Low | Relatively Low |
| **Box Butte** | Relatively Low | Relatively Low | Relatively Low |
| **Boyd** | Relatively High | Very Low | Very Low |
| **Brown** | Relatively Moderate | Very Low | Very Low |

| County | Historical Loss | Expected Annual Loss | Overall Risk Rating |
|---|---|---|---|
| **Buffalo** | Relatively Low | Relatively Moderate | Relatively Moderate |
| **Burt** | Relatively High | Relatively Low | Relatively Low |
| **Butler** | Relatively Moderate | Relatively Low | Relatively Low |
| **Cass** | Relatively Moderate | Relatively Moderate | Relatively Moderate |
| **Cedar** | Relatively Moderate | Relatively Low | Relatively Low |
| **Chase** | Relatively Low | Relatively Low | Relatively Low |
| **Cherry** | Very Low | Very Low | Very Low |
| **Cheyenne** | Relatively Low | Relatively Low | Relatively Low |
| **Clay** | Relatively Moderate | Relatively Low | Relatively Low |
| **Colfax** | Relatively High | Relatively Low | Relatively Low |
| **Cuming** | Relatively High | Relatively Moderate | Relatively Low |
| **Custer** | Relatively Low | Relatively Low | Relatively Low |
| **Dakota** | Relatively High | Relatively Moderate | Relatively Moderate |
| **Dawes** | Relatively Low | Very Low | Very Low |
| **Dawson** | Relatively Low | Relatively Moderate | Relatively Moderate |
| **Deuel** | Relatively Moderate | Very Low | Very Low |
| **Dixon** | Relatively High | Relatively Low | Relatively Low |
| **Dodge** | Relatively High | Relatively Moderate | Relatively Moderate |
| **Douglas** | Relatively High | Very High | Very High |
| **Dundy** | Relatively Low | Very Low | Very Low |
| **Fillmore** | Relatively High | Relatively Low | Relatively Low |
| **Franklin** | Relatively Moderate | Relatively Low | Relatively Low |
| **Frontier** | Relatively Moderate | Relatively Low | Very Low |
| **Furnas** | Relatively Moderate | Relatively Low | Relatively Low |
| **Gage** | Relatively Moderate | Relatively Moderate | Relatively Moderate |
| **Garden** | Relatively Low | Very Low | Very Low |
| **Garfield** | Relatively Moderate | Very Low | Very Low |
| **Gosper** | Relatively High | Very Low | Very Low |
| **Grant** | Relatively Moderate | Very Low | Very Low |
| **Greeley** | Relatively High | Relatively Low | Relatively Low |
| **Hall** | Relatively Moderate | Relatively High | Relatively High |
| **Hamilton** | Relatively High | Relatively Low | Relatively Low |
| **Harlan** | Relatively High | Relatively Low | Relatively Low |

| County | Historical Loss | Expected Annual Loss | Overall Risk Rating |
|---|---|---|---|
| **Hayes** | Relatively Moderate | Very Low | Very Low |
| **Hitchcock** | Relatively Moderate | Very Low | Very Low |
| **Holt** | Relatively Low | Relatively Low | Relatively Low |
| **Hooker** | Relatively High | Very Low | Very Low |
| **Howard** | Relatively Moderate | Relatively Low | Relatively Low |
| **Jefferson** | Relatively Moderate | Relatively Low | Relatively Low |
| **Johnson** | Relatively High | Relatively Low | Relatively Low |
| **Kearney** | Relatively Moderate | Relatively Low | Relatively Low |
| **Keith** | Relatively Low | Relatively Low | Relatively Low |
| **Keya Paha** | Relatively Moderate | Very Low | Very Low |
| **Kimball** | Relatively Low | Very Low | Very Low |
| **Knox** | Relatively Moderate | Relatively Low | Relatively Low |
| **Lancaster** | Relatively Moderate | Very High | Relatively High |
| **Lincoln** | Very Low | Relatively Moderate | Relatively Low |
| **Logan** | Relatively Moderate | Very Low | Very Low |
| **Loup** | Relatively High | Very Low | Very Low |
| **Madison** | Relatively High | Relatively Moderate | Relatively Moderate |
| **McPherson** | Relatively Moderate | Very Low | Very Low |
| **Merrick** | Relatively High | Relatively Low | Relatively Low |
| **Morrill** | Relatively Low | Very Low | Very Low |
| **Nance** | Relatively High | Relatively Low | Relatively Low |
| **Nemaha** | Relatively High | Relatively Low | Relatively Low |
| **Nuckolls** | Relatively High | Relatively Low | Relatively Low |
| **Otoe** | Relatively Moderate | Relatively Low | Relatively Low |
| **Pawnee** | Relatively High | Relatively Low | Relatively Low |
| **Perkins** | Relatively Moderate | Very Low | Very Low |
| **Phelps** | Relatively Moderate | Relatively Low | Relatively Low |
| **Pierce** | Relatively High | Relatively Low | Relatively Low |
| **Platte** | Relatively High | Relatively High | Relatively Moderate |
| **Polk** | Relatively High | Relatively Low | Relatively Low |
| **Red Willow** | Relatively Moderate | Relatively Low | Relatively Low |
| **Richardson** | Relatively High | Relatively Low | Relatively Low |
| **Rock** | Relatively Moderate | Very Low | Very Low |

| County | Historical Loss | Expected Annual Loss | Overall Risk Rating |
|---|---|---|---|
| **Saline** | Relatively Moderate | Relatively Moderate | Relatively Low |
| **Sarpy** | Relatively High | Relatively High | Relatively High |
| **Saunders** | Relatively Moderate | Relatively Moderate | Relatively Low |
| **Scotts Bluff** | Relatively Low | Relatively Low | Relatively Low |
| **Seward** | Relatively Moderate | Relatively Moderate | Relatively Moderate |
| **Sheridan** | Relatively Low | Very Low | Very Low |
| **Sherman** | Relatively Moderate | Relatively Low | Very Low |
| **Sioux** | Relatively Low | Very Low | Very Low |
| **Stanton** | Relatively High | Relatively Low | Relatively Low |
| **Thayer** | Relatively High | Relatively Low | Relatively Low |
| **Thomas** | Relatively High | Very Low | Very Low |
| **Thurston** | Relatively High | Relatively Low | Relatively Low |
| **Valley** | Relatively Moderate | Relatively Low | Relatively Low |
| **Washington** | Relatively High | Relatively Moderate | Relatively Moderate |
| **Wayne** | Relatively High | Relatively Low | Relatively Low |
| **Webster** | Relatively Moderate | Relatively Low | Relatively Low |
| **Wheeler** | Relatively High | Very Low | Very Low |
| **York** | Relatively High | Relatively Moderate | Relatively Moderate |

### 3.22.3.2 ESTIMATED IMPACT AND POTENTIAL LOSSES

Tornadoes pose significant threats to Nebraska, impacting multiple aspects of the state's communities. Severe storms and destructive winds can lead to loss of life, injuries, and widespread property damage, heightening anxiety and reducing the overall quality of life for residents. The economic effects can be substantial, particularly in agriculture—a cornerstone of Nebraska's economy—as tornadoes can destroy crops, livestock, and essential farming infrastructure. The tourism sector may suffer as damage to parks, historical sites, and recreational areas discourages visitors. The strain on infrastructure, including hospitals, emergency services, and public utilities, can lead to prolonged closures and require costly repairs, stretching state and local resources.

Beyond structural and economic impacts, tornadoes can also cause significant environmental disruptions, altering landscapes, uprooting forests, and damaging ecosystems vital to Nebraska's wildlife. Community traditions and cultural events, particularly those tied to historic landmarks, state fairs, and outdoor gatherings, may be affected if key venues sustain damage or become inaccessible. The redirection of funding and resources toward disaster recovery efforts may also hinder long-term community projects and initiatives. Without strong mitigation strategies and preparedness plans, tornadoes can challenge Nebraska's resilience, affecting economic stability, environmental conservation,

and the overall cohesion of its communities. Since 1996, tornadoes have resulted in over $71 million in property damage and $17 million in crop damages.[303]

### 3.22.3.3 ACCESS AND FUNCTIONAL NEEDS

Tornadoes can have devastating impacts on individuals with access and functional needs exacerbating the challenges these individuals face during and after a disaster. People with physical, sensory, intellectual, or mental health disabilities, as well as the elderly, children, and those with chronic medical conditions, are particularly vulnerable to the immediate and long-term effects of tornadoes. During the disaster, the sudden loss of power and destruction of infrastructure can impair access to life-sustaining equipment such as ventilators, oxygen tanks, and mobility aids. Emergency evacuation may be more difficult for individuals with mobility impairments, and those with cognitive or sensory impairments may struggle to understand or respond to tornado warnings and evacuation instructions increasing the risk of injury or death.

In the aftermath of a tornado, individuals may face additional barriers to recovery. Damaged homes or shelters may not be accessible for people with mobility limitations, and the loss of assistive devices or medical equipment can hinder their ability to function independently. Services that support individuals with functional needs, such as personal care aides, transportation, and healthcare facilities, may be disrupted or overwhelmed, leaving vulnerable populations without essential assistance. Mental health impacts can be severe, especially for those with preexisting conditions, as the trauma of the disaster and the strain of recovery may exacerbate feelings of anxiety, depression, and stress. Emergency response and recovery efforts must be tailored to address the unique needs of these individuals, ensuring that they receive adequate care, access, and support during every phase of the disaster.

### 3.22.3.4 COMMUNITY LIFELINES

Tornadoes have a profound impact on the Federal Emergency Management Agency's (FEMA) community lifelines, which are critical to maintaining public safety and well-being during and after a disaster. Among the most affected lifelines are energy systems, as tornadoes frequently down power lines, damage substations, and disrupt electricity distribution leading to widespread power outages. This loss of power impedes both immediate emergency response and the long-term recovery process affecting not only lighting and heating but also the operation of medical facilities, communication systems, and essential services. The transportation network is similarly vulnerable, with damaged roads, bridges, and airports complicating evacuation efforts and hindering the delivery of vital supplies such as food, water, and medical resources. In severe cases, isolated communities may be cut off from the broader response efforts, delaying critical recovery services.

Water and wastewater systems are often severely impacted by tornadoes with damage to treatment plants, pipelines, and pumping stations compromising the availability of safe drinking water and functioning sanitation. The destruction of these systems can lead to widespread public health concerns, including the risk of waterborne diseases. Communications infrastructure, including cell towers and

[303] NCEI. "Storm Events Database." https://www.ncdc.noaa.gov/stormevents/.

internet networks, is also vulnerable to tornadoes, disrupting the dissemination of timely warnings and vital information needed for public safety. The loss of communication capabilities impedes coordination among emergency services, complicates the mobilization of resources, and delays recovery efforts. As tornadoes destroy physical infrastructure and strain emergency response, the healthcare services lifeline is also tested, as medical facilities may become overwhelmed with casualties and damaged beyond operation, exacerbating the burden on already scarce resources. The cumulative impact of these disruptions underscores the cascading effects that tornadoes have on the critical systems necessary for community resilience and recovery.

### 3.22.3.5 ENHANCED PRIORITY RISK INDEX SCORE

The Enhanced Priority Risk Index (EPRI) provides the state of Nebraska with a methodology to measure the impact each profiled hazard may have on the seven Emergency Management Accreditation Program Standard 4.1.2 sectors (i.e., public; responders; continuity of operations including continued delivery of services; property, facilities, and infrastructure; the environment; the economic condition of the jurisdiction; and public confidence in the jurisdiction's governance). The following table provides the EPRI scores for the hazard with the appropriate risk factor.

**Table 99: Tornado Enhanced Priority Risk Index Score**

| | Probability Next 5 Years | Impact | Spatial Extent | Warning Time | Duration | Vulnerability | Probability | Overall Risk Factor |
|---|---|---|---|---|---|---|---|---|
| **Risk Level** | 3.6 | 2.9 | 2.2 | 3.7 | 1.4 | 3.2 | 3.5 | 2.9 |

Table 100 provides a summary of tornado impacts, including impact to the public, first responders, continuity of operations, property, infrastructure, environment, economic conditions and public confidence, and the consequences of those impacts.

**Table 100: Tornado Impacts and Consequences**

| Sector | Impacts |
|---|---|
| **Public** | **Housing** – Residences located directly within the tornado's path are at high risk for severe structural damage or complete destruction. Nearby properties may also sustain significant damage due to intense winds and airborne debris.<br>**Casualties/Fatalities** – While Nebraska has historically recorded low casualty rates due to tornadoes occurring when residents are awake and able to respond to warnings, the potential for injuries and fatalities remains. Timely warning systems, including sirens and weather alerts, play a critical role in reducing risk.<br>**Work** – The extent of disruption to workplaces depends on whether major employers or transportation routes are affected. Road closures and damage to infrastructure may lead to restricted access, impacting workers' ability to commute.<br>**Food/Water** – Emergency provisions may be required in the immediate aftermath of the event. Perishable food supplies can be replenished once temperature- |

| Sector | Impacts |
|---|---|
| | controlled storage facilities are operational. Water systems must undergo inspection to ensure safety and functionality. |
| **First Responders** | Nebraska emergency responders are well-trained and experienced in tornado response. However, in smaller communities, volunteer responders may be personally affected, reducing available personnel. Mutual aid agreements allow for rapid assistance from unaffected jurisdictions. Responders must also be prepared for secondary hazards, such as hazardous material spills. |
| **Continuity of Operations** | The degree of disruption varies based on the extent of damage to government facilities. If critical buildings suffer severe structural damage, the time required to restore operations may strain resources. continuity of operations plans will be tested in these situations. |
| **Property, Facilities, and Infrastructure** | Structures directly in the tornado's path will likely experience extensive damage or total destruction. Tornadoes may also cause property isolation due to debris-blocked roads or flash flooding from associated storms.<br>**Electricity** – Power transmission infrastructure in the tornado's path may sustain extensive damage, including destruction of power lines, substations, and maintenance facilities. Power outages may last for days or weeks, depending on the severity of destruction.<br>**Water** – Tornado-related damage to water treatment and distribution facilities can lead to contamination risks. Loss of power may further compromise water systems due to backflow issues.<br>**Roads and Bridges** – Debris accumulation and flooding may render roads and bridges impassable. Increased traffic volume from emergency responders and disaster assessment teams may further strain transportation networks. |
| **Environment** | Tornadoes can destroy large volumes of trees, significantly altering landscapes. Waterways, including streams and creeks, may become obstructed by debris and contaminated by hazardous material spills, affecting local ecosystems. |
| **Economic Conditions** | Tornado-related destruction can have severe economic consequences, particularly for small businesses that may struggle to recover. If a major city sustains extensive damage, the economic impact could extend statewide. |
| **Public Confidence** | The speed and efficiency of cleanup, recovery, and rebuilding efforts will significantly influence public perception of government effectiveness and emergency preparedness. |

# 3.23 Wildfire

## 3.23.1 Description

A wildfire, also known as a wildland fire, is an uncontrolled fire in forests, grasslands, brushlands, or croplands. The terms forest fire, brush fire, and so on may be used to describe specific types of wildfires; their usage varies according to the characteristics of the fire and the region in which it occurs.

Wildfire incidents that occur in forests, prairies, and grasslands may result from naturally occurring events or from human-caused events such as improperly extinguished campfires, sparks from vehicles, or escaped prescribed burns. States are responsible for responding to fires on nonfederal lands (state-owned, local, and private), except for land that is protected by federal agencies under cooperative agreements. Although a small percentage of fires account for the majority of acres burned, most wildfires cannot be classified as catastrophic. Only about 1% of fires become conflagrations, or raging, destructive fires. Predicting which fires will turn into conflagrations depends on multiple factors, including geography and weather conditions.

Wildfires spread primarily by consuming vegetation, and the rate, area, and extent of consumption depend on three main factors: fuel, topography, and weather. These factors can sustain a wildfire and predict a given area's fire potential and the associated damage, affecting the land, infrastructure, and people. Large-scale wildfires dramatically alter the terrain and ground conditions. Normally, vegetation absorbs rainfall, reducing runoff. However, wildfires leave the ground charred, barren, and unable to absorb water, creating conditions ripe for flash flooding and mudflow.

Wildfires can also occur in areas where development is essentially nonexistent, except for roads, railroads, and power lines. The Wildland–Urban Interface (WUI) is where residential areas meet wildland areas. It is also known as the interface zone (or I-Zone), and wildfires there present a serious threat to people and property. The urban aspect includes homes, schools, storage areas, recreational facilities, transmission lines, and commercial buildings. Wildland refers to unincorporated areas, including hills, benches, plateaus, and forests. Homes built on benches adjacent to wildland areas are at greater risk. When WUI fires materialize in a geographical area where structures and other human development adjoin wildlands, the impact increases. A fireshed is an area that will adversely affect a community or high-value resource and/or asset if ignited.

#### 3.23.1.1 FUEL

Fuel is any material that can burn. Fuels are the source of energy that drive a fire and are a significant factor in wildfire behavior. Fire behavior depends on fuel type, loading, availability, and arrangement. The amount of fuel in an area depends on the availability of water and elevation. The six major fuel types are grass, grass-shrub, shrub, timber-understory, timber litter, and slash-blowdown. Fuel sources are diverse and include everything from dead tree needles and leaves, twigs, and branches to dead standing trees, live trees, brush, and cured grasses.

Nebraska's landscape is dominated by grasslands and prairie. The forested areas are comprised of ponderosa pine, riparian deciduous forest, and red cedar (a major fire concern).

Fuel characteristics influence wildfire spread and intensity. Fuel characteristics include the following:

- **Loading:** The amount of fuel present, expressed in tons per acre.
- **Availability:** The total mass of fuel that may be consumed by a fire. Fuel moisture affects the rate of fire spread. The drier the fuels, the faster the fire spreads because the fuels are preheated and devoid of moisture, allowing the fire to move more quickly. This contrasts with fuels with more moisture, which impede the progress of a wildfire because they take longer to dry out and reach ignition temperature.
- **Arrangement:** The way fuels are spread over an identified area. Horizontal arrangement affects fire spread; patchy fuels could limit fire spread, while vertical arrangement allows a fire to move from a ground fire to a fire in the canopy of trees in a forested area.

#### 3.23.1.2 TOPOGRAPHY

The slope and aspect of an area affect its susceptibility to wildland fire spread. Both fire intensity and rate of spread increase as the slope increases because heat from a fire rises by convection. A fire burns faster uphill than downhill. Typically, a fire will burn uphill during the day, influenced by upslope winds, and downhill at night, influenced by a shift in temperature and winds that blow downhill.

The arrangement of vegetation on a hillside can also contribute to increased fire activity on slopes. The aspect of an area can affect fire spread and vegetation growth. South and southwest slopes are exposed to the sun for longer periods and have lighter, sparser vegetation with lower fuel moisture and higher temperatures due to exposure. North- and northwest-facing slopes tend to have heavier fuels with higher fuel moisture and lower temperatures due to less sun exposure. A north or northwest aspect will experience less fire activity than a south-facing slope.

#### 3.23.1.3 WEATHER

Weather is the most variable and unpredictable element of the fire environment. Weather conditions impact fire behavior and must be constantly monitored by fire suppression crews to ensure safety and make effective firefighting decisions. Weather components, such as temperature, relative humidity, wind, and lightning, affect the potential for wildfire. High temperatures and low relative humidity dry out the fuels that feed the wildfire, creating a situation in which fuel will ignite more readily and burn more intensely. Wind is the most hazardous weather factor affecting fires. The greater the wind, the faster a fire may spread and the more intense it may be. Lightning may ignite wildfires, which are often in terrain that is difficult for firefighters to reach. Drought conditions contribute to wildfire vulnerability. During periods of drought, the threat of wildfire increases.

## 3.23.2 Risk Assessment

### 3.23.2.1 LOCATION

Nebraska has historically experienced wildfires in its forested areas and rangeland prairie areas. Wildfire remains a real and ever-present hazard to the state and its growing population. Wildfires are not confined to forested areas; they can burn wherever vegetation is prevalent, including park areas. WUI areas, where human development meets or intermixes with vegetation, can fuel fires. Fires in the WUI can cause major losses of property and structures, as well as human casualties.

The State of Nebraska is comprised of 93 ecologically diverse counties. Data regarding fuel models gathered from the U.S. Geological Survey (USGS) Landscape Fire and Resource Management Planning Tools (LANDFIRE) and the National Cohesive Wildland Fire Management Strategy Landscape Classes illustrate 20 national geospatial data layers supporting regional and landscape scale projects.[304] This data is used in hazardous fuel reduction and conservation planning, community wildfire protection plans, and other initiatives. The majority of the state—50 counties—falls under landscape classes characterized as agricultural and grassland areas that have relatively little forested area or federal ownership and have historically experienced very high levels of natural fire. The second most common landscape classification (30 counties) is areas characterized as private rangelands and prairies with no federal ownership, that have had recent fires between 2002 and 2024, and have historically experienced high levels of natural fire, and have a high natural landscape and high natural mixed landscape. The remainder of the counties is a mix of eastern forest, western public lands, highly forested areas, areas with very high urban value, private fragmented forests, public rangelands, and prairies.

The National Risk Analysis Report is the third report of the National Cohesive Wildland Fire Management Strategy (Cohesive Strategy). This report aims to establish a comprehensive, science-based, cohesive strategy that addresses the significant, long-standing challenges to managing this nation's ever-growing wildfire situation. The 2014 study conducted for the National Cohesive Wildland Fire Management Strategy indicates the relationship between areas burned and structures lost.[305] Figure 97 illustrates the areas of the state at the highest risk for large, long-duration wildfires. This map reflects the intersection of areas burned (as reported in federal and state records) and structures lost (as reported in the nationwide ICS-209 incident reporting system). The combination of high rates of structure loss with low area burned is dominant in the Central Plains and eastern regions. It is recommended in this report that response resources toward structure protection be prioritized in these areas. Based on this assessment, Dawes County is at the highest risk, with Sioux, Scotts Bluff, Cherry, and Thomas Counties at moderate risk.

[304] 2021 Nebraska State Hazard Mitigation Plan, "Section 3.12: Wildfires." https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.
[305] National Environmental Modeling and Analysis Center, 2025, "The Science Analysis of National Cohesive Wildland Fire Management Strategy." https://cohesivefire.nemac.org/node/26.

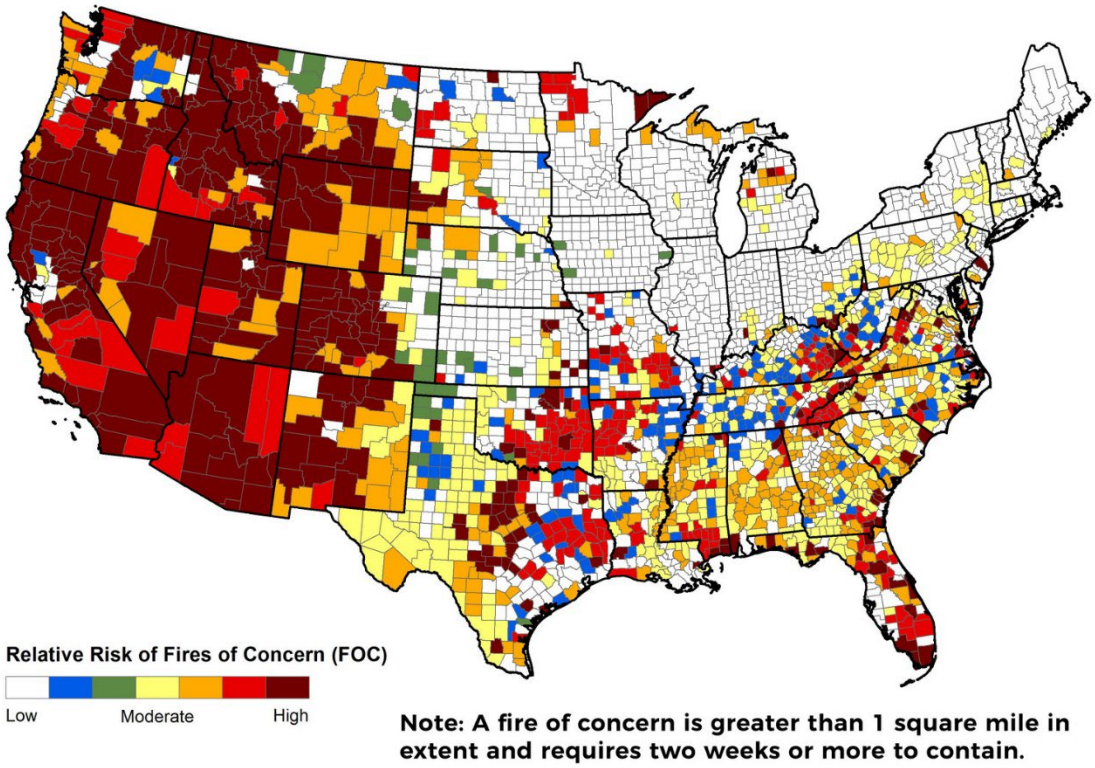



**Figure 97: Relative Risk of Large, Long-Duration Wildfire in United States**[306]

The Nebraska Forest Service provides detailed information about wildfire risk and various metrics regarding wildfire frequency, severity, behavior, and proximity to communities on the Nebraska Wildfire Risk Assessment Portal (WRAP). This portal offers a consistent, comparable set of scientific results to be used as a foundation for wildfire mitigation and prevention planning in Nebraska. The wildfire risk displayed in Figure 98 provides a visualization of the threat a structure is exposed to. The National Hazard and Risk Model (No-HARM) is a methodology that divides the landscape into firesheds, or areas based on similar topography and vegetation, which incorporates the threat to a structure from the surrounding area. Factors considered in the risk calculation for each fireshed include fire frequency, fire severity based on topography, weather patterns fuel types, distance to fire stations, potential for crown fire, percentage of non-burnable area, distance to roads, distance to water, terrain slope, and aspect. The yellow, orange, and orange areas highlight areas of moderate, high, and very high risk from wildfire based on these characteristics.

[306] The National Risk Analysis Report, 2024, "Relative Risk of Large, Long-Duration Wildfire in United States." https://www.forestsandrangelands.gov/documents/strategy/strategy/CSPhaseIIINationalStrategyApr2014.pdf.

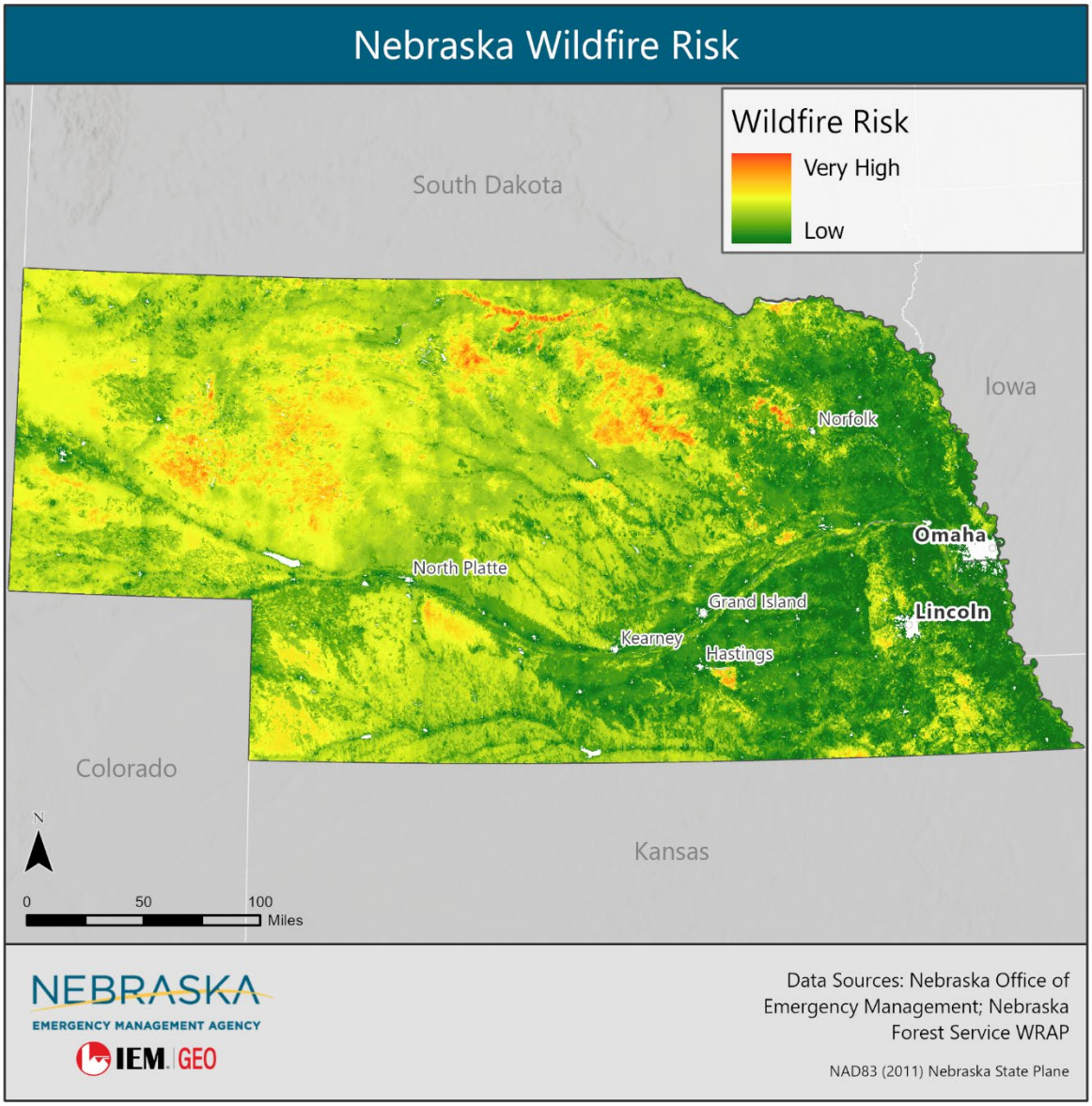



**Figure 98: Nebraska WRAP Wildfire Risk**

### 3.23.2.2 EXTENT

The National Fire Danger Rating System (NFDRS) allows fire managers to estimate today's or tomorrow's fire danger for a given area. It combines the effects of existing and expected states of selected fire danger factors into one or more qualitative or numeric indices that reflect an area's fire protection needs. It links an organization's readiness level (or pre-planned fire suppression actions) to the potential fire

problems of the day.[307] The Nebraska Forest Service utilizes the NFDRS to determine a scale rating for rangeland fire danger maximums (see Figure 99).

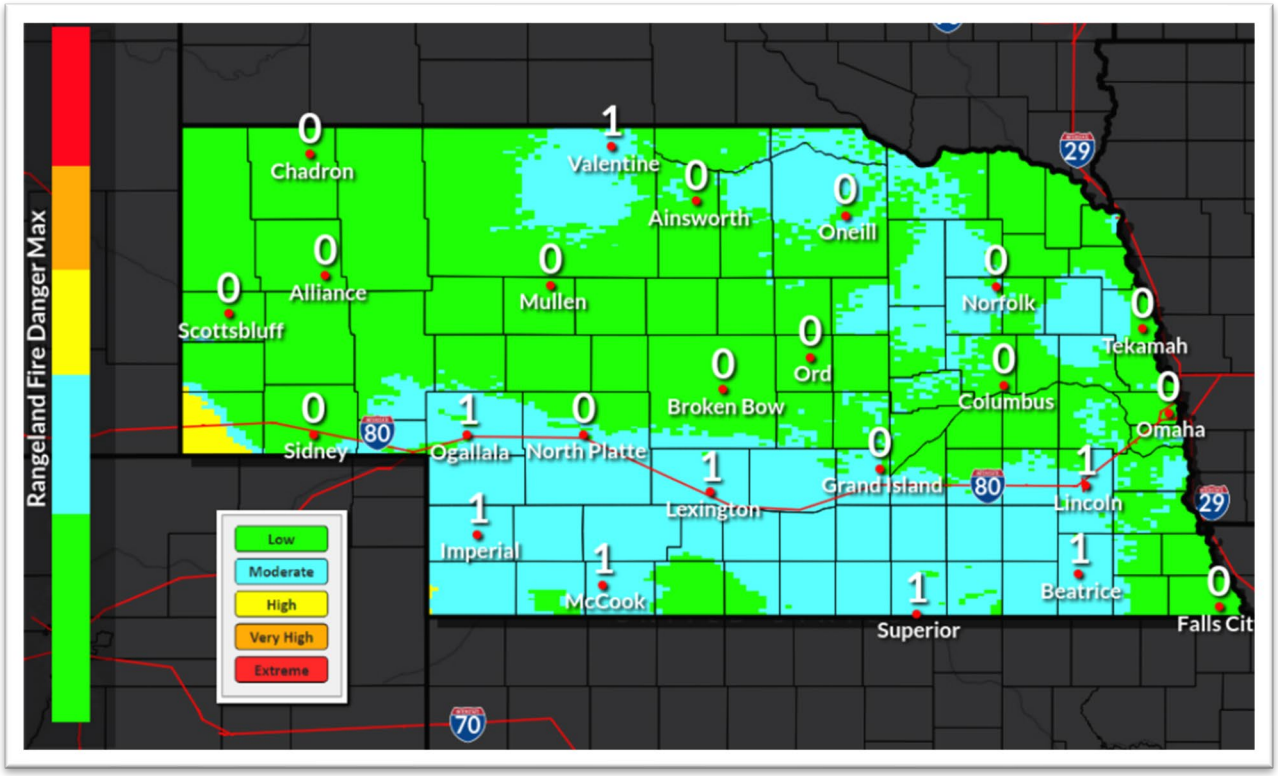



**Figure 99: Nebraska Fire Weather Forecast Map**[308]

The NFDRS uses five different color-code levels to identify fire potential, helping to understand the current conditions and mitigate actions to prevent human-caused wildfires.

[307] United States Department of Agriculture-Forest Service, 2024, "National Fire Danger Rating System." https://www.fs.usda.gov/detail/scnfs/home/?cid=fseprd634957.
[308] Nebraska Forest Service,2025, "Nebraska Fie Weather Forecast Map." https://nebraskawildfirerisk.com/.




**Figure 100: Color-Codes for National Fire Danger Rating System**[309]

Fire Danger Level: Low

When the fire danger is "low," fuels do not ignite readily from tiny embers, but a more intense heat source, such as lightning, may start fires in duff or dry rotten wood. Fires in open, dry grasslands may burn easily a few hours after rain, but most wood fires will spread slowly, creeping or smoldering. Control of these fires is generally easy.

Fire Danger Level: Moderate

When the fire danger is "moderate," it means that fires can start from most accidental causes, but the number of fire starts is usually low. If a fire does start in an open, dry grassland, it will burn and spread quickly on windy days. Most wood fires will spread slowly to moderately. Average fire intensity will be moderate except in heavy concentrations of fuel, which may burn hot. Fires are still not likely to become serious and are often easy to control.

Fire Danger Level: High

When the fire danger is "high," fires can start easily from most causes, and small fuels (such as grasses and needles) will ignite readily. Unattended campfires and brush fires are likely to escape. Fires will spread easily, with some areas of high intensity burning on slopes or concentrated fuels. Fires can become serious and difficult to control unless they are put out while they are still small.

Fire Danger Level: Very High

When the fire danger is "very high," fires will start easily from most causes. These fires will spread rapidly and have a quick increase in intensity right after ignition. Small fires can quickly become large and exhibit

[309] United States Department of Agriculture-Forest Service, 2024, "National Fire Danger Rating System." https://www.fs.usda.gov/detail/scnfs/home/?cid=fseprd634957.

extreme fire intensity, such as long-distance spotting and fire whirls. These fires can be difficult to control and will often become much larger and longer lasting.

Fire Danger Level: Extreme

When the fire danger is “extreme,” fires of all types start quickly and burn intensely. All fires are potentially serious and can spread very quickly with intense burning. Small fires become big fires much faster than at the “very high” level. Spot fires are probable, with long-distance spotting likely. These fires are very difficult to fight, may become very dangerous, and often last for several days.

#### 3.23.2.3 PREVIOUS EVENTS

The peak fire season in Nebraska typically begins in mid-February and lasts around 13 weeks. In 2022, Nebraska experienced a significant number of wildfires due to drought conditions and increased wildfire risk statewide. Historically, wildfire season in Nebraska ranged from early summer through mid-autumn, but in recent years, the threat of wildfires has become year-round.

The Region Complex 23 fire in 2012 prompted the Nebraska legislature and the Nebraska Forest Service to take action, resulting in the passage of the Nebraska Wildlife Control Act of 2013 (LB 634). This bill set goals to improve protective measures for life and property by increasing the capacity of volunteer fire districts. As of 2024, 95.3% of fire departments in Nebraska are volunteer-based, and supporting their efforts is a high priority. The bill also aimed to reduce wildfire size and intensity through the use of initial aerial attacks, improving firefighter training, enhancing suppression equipment, and expanding forest fuels reduction. The actions and components of LB 634 were in place and operational by 2019.

Global Forest Watch (GFW) is an online platform that provides data and tools for monitoring forests. By harnessing cutting-edge technology, it utilizes the Visible Infrared Imaging Radiometer Suite (VIIRS) to allow anyone to access near real-time information about where and how forests are changing around the world. VIIRS reported 230 fire alerts between February 4, 2024, and February 2, 2025, considering high-confidence alerts only. This is normal compared to previous years, going back to 2012, with 595 VIIRS alerts (see Figure 101).[310]

[310] Global Forest Watch, “About” webpage, 2025. https://www.globalforestwatch.org/about/.

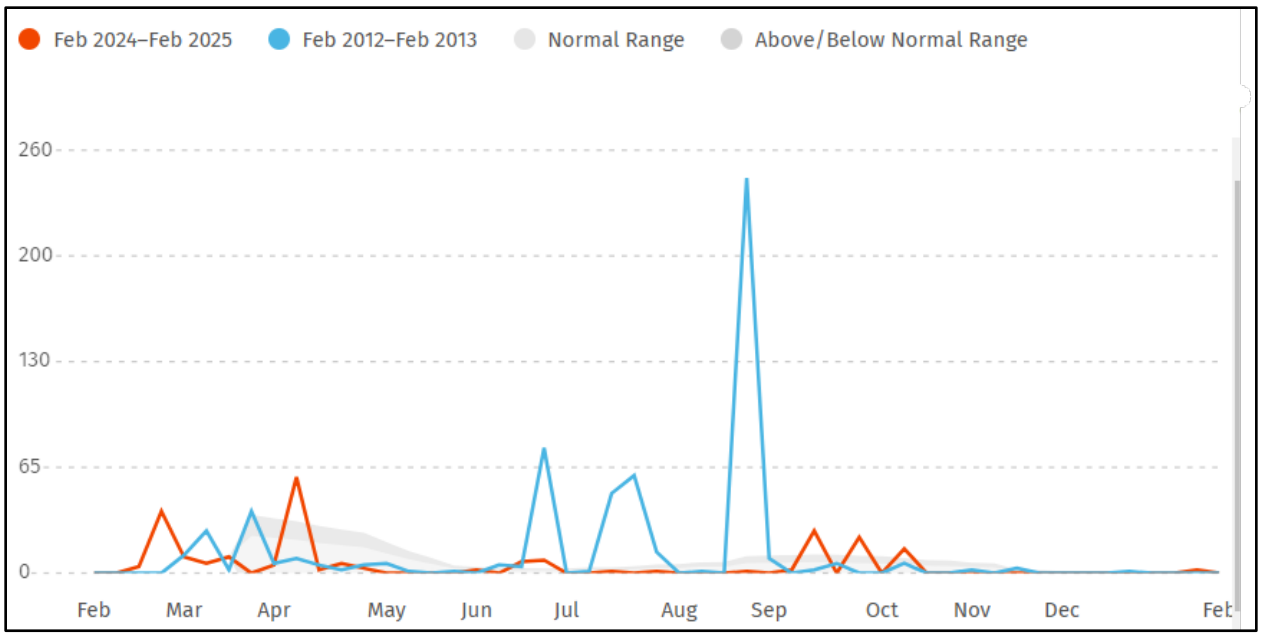



**Figure 101: Comparison Line Graphs for February 2024–February 2025 and February 2012–February 2013**[311]

The line graph in Figure 102 indicates the following high-alert weeks in 2024: for the week of February 26, there were 38 VIIRS fire alerts; for the week of April 8, there were 59; for the week of September 16, there were 26; for the week of September 30, there were 22; and for the week of October 14, there were 15 .[312]

[311] Global Forest Watch, 2025, "Comparison Line Graphs for February 2024-2025 and February 2012 to February 2013." https://www.globalforestwatch.org/dashboards/country/USA/28/?map=eyJjYW5Cb3VuZCI6dHJ1ZX0%3D.
[312] Ibid.

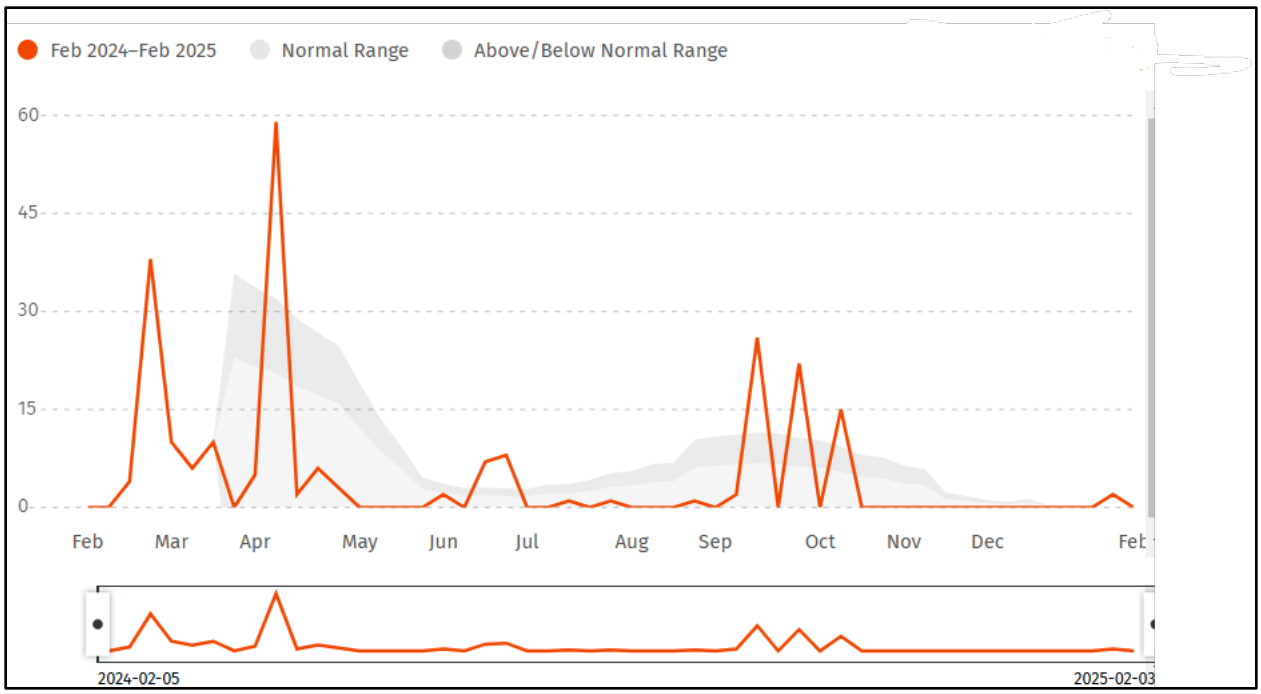



**Figure 102: Weekly VIIRS Fire Alerts in Nebraska, February 2024–February 2025**[313]

Between February 7, 2021, and February 2, 2025, Nebraska experienced a total of 1,859 VIIRS fire alerts. The highest number recorded in one day during this timeframe was on April 11, 2022, with 93 VIIRS alerts (see Figure 103).

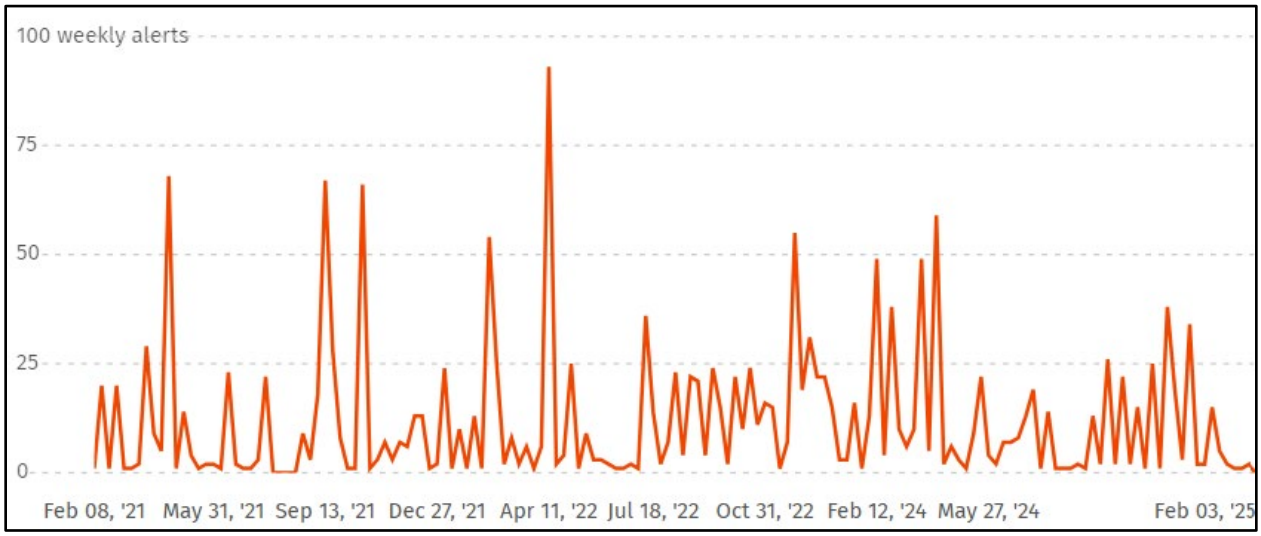



**Figure 103: Historical Fire Alerts in Nebraska, February 2021–February 2025**[314]

In addition to the catastrophic fire season of 2012, five federal Fire Management Assistance Declarations were issued in Nebraska between 2006 and 2012, with nearly $9 million in FEMA public assistance grant

[313] Ibid.
[314] Ibid.

dollars obligated. Economic losses from the fires between 2006 and 2011 are estimated at $5.6 million. During this period, 895,147 acres were burned.[315]

The most recent Fire Management Assistance Declarations for Nebraska include the Nebraska Road 702 Fire (FM-5436-NE), declared on April 23, 2022, for the incident period from April 22, 2022, to April 30, 2022. Red Willow, Furnas, and Frontier Counties received a designation for Public Assistance Category B and H grant assistance (see Table 101 for details). Also, the Waconda-Beaver Lake Fire Complex (FM-5462-NE) was declared on April 9, 2023, for the incident period from April 8, 2023, to April 11, 2023. Cass County received a designation for Public Assistance Category B and H grant assistance.[316]

Based on the FEMA Disaster Declarations Database, the State of Nebraska has received no major disaster declarations for wildfire disasters since the last plan update.

On June 21, 2024, Governor Jim Pillen declared a state of emergency due to a wildfire that started in Box Butte County and spread to Merrill County. Approximately 10,000 acres were scorched. The fire was made worse by a combination of high temperatures, high winds, low humidity, and dry conditions, resulting in a fast-moving blaze that damaged public and private property and posed health dangers. The proclamation allowed for the use of the Governor's Emergency Fund to help pay for recovery efforts beyond the scope of what local governments can handle.[317]

On September 24, 2024, Governor Jim Pillen declared a state of emergency in Sioux County for the Bronco Fire near Crawford. The fire started on September 18 and burned more than 1,000 acres.[318]

Based on a review of the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI) database for the period between 2019 and 2024 in Nebraska, 32 wildfire events were documented across various counties with statewide reports. There was one death, eight injuries, $7.96 million in property damage, and $2.75 million in crop damage associated with these incidents. While the NCEI data establishes a record of wildfire events during this period since the last plan update, it does not provide a complete picture of the weather conditions because of each reported event or the impacts felt in multiple state regions.[319]

Table 101 is an overview of wildfire occurrences in Nebraska from 2019 to December 2024.

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[315] Federal Emergency Management Agency, 2025, "Active Fire Management Assistance Declarations-Nebraska." https://www.fema.gov/assistance/public/fire-management-assistance.
[316] Ibid.
[317] Nebraska Office of the Governor, 2025, "Governor Pillen Declares State of Emergency for Panhandle Wildfire." https://governor.nebraska.gov/press/gov-pillen-declares-state-emergency-panhandle-wildfire.
[318] Nebraska Office of the Governor, 2025, "Governor Pillen Declares State of Emergency for Sioux County Bronco Fire." https://governor.nebraska.gov/press/gov-pillen-declares-state-emergency-sioux-county-bronco-fire.
[319] National Oceanic and Atmospheric Administration, National Centers for Environmental Information, 2025, "Nebraska Wildfire Previous Events (2019–2024)." https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+Wildfire&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=2019&endDate_mm=12&endDate_dd=31&endDate_yyyy=2024&county=ALL&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=31%2CNEBRASKA.

Table 101: NOAA NCEI Database Previous Events of Wildfire in Nebraska, 2019–2024[320]

| Dates | County/Area Affected | Types of Damage | Total Dollar Amount of Property and/or Crop Damages |
|---|---|---|---|
| **October 26, 2019** | Chase | A 2,100-acre range fire tracked across far southwestern Chase County during the afternoon and early evening hours of October 26. The fire was started by a combine and quickly moved south approximately 3 miles, burning around 2,100 acres of grassland. The fire began 1/2 mile south of the intersection of Road 729 and Avenue 315 in SW Chase County. Aided by 30 mph northerly winds, the fire raced south and south-southeast, burning approximately 2,100 acres before it was extinguished. A fire truck was damaged, and two garages were destroyed. | $30,000 in property damage and $15,000 in crop damage |
| **August 9, 2021** | Red Willow | As storms moved across Red Willow County, lightning struck a large, well-built home constructed after 2012 along the northwest corner of the Heritage Hills Golf Course in McCook. The house fire took approximately five hours to extinguish and was considered a total loss. Lightning strikes caused four fires across the county within a 30-minute window. Two fires were structural, with one home a total loss. The remaining fires involved a tree and a hay bale. Mutual aid was requested, with a total of four fire departments battling the fires over a five-hour duration. | $550,000 |
| **March 15, 2022–March 20, 2022** | Lincoln | A wildfire developed during the evening hours of March 15. Aided by very low relative humidity and gusty winds, the fire spread to approximately 900+ acres before it was contained. The fire remained in a remote canyon area and was confined to stands of cedar trees, allowing the fire to persist through March 20. | $25,000 in property damage |
| **April 22, 2022** | Red Willow | A significant wildfire, which began in Decatur County, Kansas, and moved into Furnas County, Nebraska, eventually crossed into Red Willow County, Nebraska. The fire primarily burned across rural eastern Red Willow County, but it did cross over Highways 6/34 in the northeastern part of the county, as well as Highway 89 in the southeastern part of the county. It burned an area 28 miles long across 44,024 total acres, putting the number of acres burned in Red Willow County at around 28,000, with 15,000 in Furnas County, NE. | $0 |

[320] Ibid.

| Dates | County/Area Affected | Types of Damage | Total Dollar Amount of Property and/or Crop Damages |
|---|---|---|---|
| | | Resources from all over were deployed to help with this fire, including three Nebraska Air National Guard Blackhawk Helicopters and a Type 1 National Incident Management Team. Total personnel exceeded 100 at times. Fighting the fire was difficult due to the rural terrain it was in, as well as persistent blowing dust. One fatality occurred with this fire when a retired fire chief was overcome by smoke and fire after the vehicle left the road on Friday, April 22, during conditions of poor visibility from smoke and dust. An additional five injuries were also reported with fire fighters battling this blaze. Temporary evacuations were issued for Bartley and Indianola. | |
| **July 30, 2022–August 1, 2022** | Scotts Bluff | The Carter Canyon Fire (initially named Cedar Canyon Fire) ignited on July 30, potentially from multiple lightning strikes in the area near the Wildcat Hills south of Scottsbluff. The fire quickly grew to nearly 16,000 acres, destroying multiple structures before becoming contained in early August. Destroyed structures include three homes (primary residences), while seven others were damaged. | $500,000 in property damage |
| **October 2, 2022–October 11, 2022** | Thomas | A fire initiated in north-central portions of the Nebraska National Forest during the afternoon of October 2, aided by strong southerly winds and dry relative humidity. One death was attributed to the fire, and much of the Nebraska 4H camp was consumed by the flames. At this camp, 18 buildings were destroyed, including the main lodge. The fire then jumped the Middle Loup River and Nebraska Highway 2, racing across several miles of open rangeland. One firefighter perished from a medical emergency while battling the blaze. Approximately 200 to 250 personnel battled this fire. When the fire was fully extinguished, 19,000 total acres had burned. The fire took over a week to fully extinguish and was out on October 11. | $2,000,000 in property damage and $1,000,000 in crop damage |
| **October 23, 2022–October 24, 2022** | Nuckolls | A transformer malfunction ignited a wildfire near the intersection of Road D and Road 3100, about 1 mile east of Bostwick. Pushed by strong southerly winds gusting to at least 50 mph, this fire raced north along Road 3100 and across Highway 136, making a slight turn to the north-northwest between Roads J and K. This swiftly moving fire was finally halted approximately 6 miles west of Nelson, near the intersection of PQ Road and Road 3000. Along the way, this fire scorched roughly 11,000 acres of crop and pastureland, along a swath around 12 miles long and up to 2 miles wide. | $750,00 in property damage |

| Dates | County/Area Affected | Types of Damage | Total Dollar Amount of Property and/or Crop Damages |
|---|---|---|---|
| | | One rural home and six outbuildings were destroyed. Around 20 antique cars and a semi-truck were also destroyed. As for utility infrastructure, South Central Public Power District reported the loss of around 30 utility poles along with two electrical transmission buildings. Agriculture-wise, numerous hay bales and some unharvested crops also went up in flames. Smoke from the fire caused widespread visibility restrictions in the area, and Highway 136 was closed for a period of time. In all, approximately 20 area fire departments (and 150–200 firefighters) were involved in the response, mainly from Nuckolls, Clay, Thayer, and Webster Counties (along with a few from Jewell County, Kansas). | |
| **October 23, 2022–October 24, 2022** | Franklin | A wildfire ignited approximately one mile northeast of Naponee near the intersection of 22 1/2 Road and G Road (this fire was later determined to be caused by a hot brake). Driven by strong southwesterly winds gusting to around 50 mph, the fire raced to the northeast over the next few hours, crossing Highway 136 and eventually being halted near the intersection of Ridge Road and M Road, approximately 7 miles northeast of Naponee. Along the way, the fire scorched roughly 5,000 acres of crop and pastureland (per post-fire satellite imagery), along a swath around 6.5 miles long and generally one-half mile to one mile wide. No injuries were reported and no homes were impacted, but at least two structures were destroyed, including one that contained some computer equipment at a sand and gravel business toward the end of the fire's path. At least 25 agencies were involved in the response (fire, EMS, and law enforcement). It was reported that efforts to contain the fire were hindered not only by the strong and shifting winds, but also by the relatively rough terrain in the very rural area. | $80,000 in property damage |
| **April 11, 2023** | Western Cherry | A fire started in the McCann Canyon area, approximately 10 miles south of Kilgore. Known as the McCann Fire and aided by strong southerly winds, the fire raced 8 miles to the north, approaching the town of Kilgore late Tuesday, April 11. The town of Kilgore was evacuated as a precaution, and fire crews were able to keep the fire from reaching it. Approximately 7,000 acres of mainly grassland were consumed in the fire. No injuries or deaths were reported. | $100,000 in crop damage |

| Dates | County/Area Affected | Types of Damage | Total Dollar Amount of Property and/or Crop Damages |
|---|---|---|---|
| **April 11, 2023–April 13, 2023** | Garfield | A fire started approximately 15 miles north of Burwell during the morning of April 11. Named the Lowry Fire and aided by strong southerly winds, low relative humidity, and hot temperatures, the fire traveled approximately 6 miles to the north-northeast, consuming around 6,000 acres. Along with two injuries, a total of four structures were destroyed, including a storage building at the Rowse Hydraulic Rake Factory. The fire was contained on April 13. | $1,000,000 in property damage and $100,000 in crop damage |
| **April 12, 2023–April 14, 2023** | Custer | A fire initiated along Highway 2 in the vicinity of the Cooksley Ranch, 6 miles northwest of Anselmo, during the morning hours of April 12. Known as the Cooksley Complex Fire, it was aided by strong southerly winds pushing the fire to the north and north-northwest during the afternoon hours. Dry lightning and a wind shift forced the fire east on April 13. By the time the fire was contained the next morning, it had consumed approximately 37,000 acres of rangeland. A home was destroyed at the McGinn Ranch, and a bunkhouse was lost as well. Several calves were also lost in the fire, in addition to outbuildings. | $1,500,000 in property damage and $750,000 in crop damage |
| **February 26, 2024** | Lincoln | A fire started along Betty Way Road north of North Platte at approximately 10:30 a.m. Aided by westerly winds gusting over 40 mph, the fire raced 26 miles east into western portions of Custer County. By the time the fire was completely contained on September 29, over 71,000 acres of rangeland had burned. A farmstead north of Maxwell was completely destroyed by the fire. In addition, approximately half a dozen outbuildings were destroyed, along with numerous windbreaks and fencing. | $1,500,000 in property damage and $700,000 in crop damage |
| **February 26, 2024** | Logan | A fire developed 7 miles west of Stapleton during the late afternoon hours of February 26. Aided by strong westerly winds, the fire raced east, barely missing the town of Stapleton. The town was evacuated as a precaution, but the fire missed it. Approximately 7,000 acres of rangeland were burned in the fire. The fire was under control by mid-evening. | $20,000 in property damage and $7,000 in crop damage |

**Table 102: Fires Across Nebraska, 2002–2024**[321]

| Year | Total Fires | Acres Burned |
|---|---|---|
| **2024** | 1,105 | 115,634.33 |
| **2023** | 1,053 | 189,429.42 |
| **2022** | 2,173 | 274,607.49 |
| **2021** | 1,147 | 49,636.38 |
| **2020** | 1,423 | 41,381.18 |
| **2019** | 1,110 | 27,067 |
| **2018** | 956 | 12,975 |
| **2017** | 1414 | 22,466 |
| **2016** | 873 | 32,689 |
| **2015** | 907 | 47,164 |
| **2014** | 1132 | 26,005 |
| **2013** | 525 | 11,333 |
| **2012** | 1625 | 520,326 |
| **2011** | 1019 | 36,582 |
| **2010** | 759 | 24,163 |
| **2009** | 901 | 12,611 |
| **2008** | 751 | 8,456 |
| **2007** | 801 | 20,301 |
| **2006** | 1858 | 120,076 |
| **2005** | 1375 | 25,289 |
| **2004** | 1010 | 17,654 |
| **2003** | 1017 | 19,068 |
| **2002** | 1935 | 90,531 |
| **2001** | 618 | 17,127.32 |
| **2000** | 1,986 | 252,290.19 |

[321] 2021 Nebraska State Hazard Mitigation Plan and Nebraska Forest Service, "Section 3.12: Wildfires." https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.

### 3.23.2.4 PROBABILITY

Figure 104 illustrates the likelihood of wildfire in the state of Nebraska, with a rating of low, moderate, or high to indicate risk for each county. The map indicates a moderate to high likelihood in various sections of the state and, on average, a greater wildfire likelihood than 52% of states in the U.S. The probability of future wildfire events in Nebraska is likely.

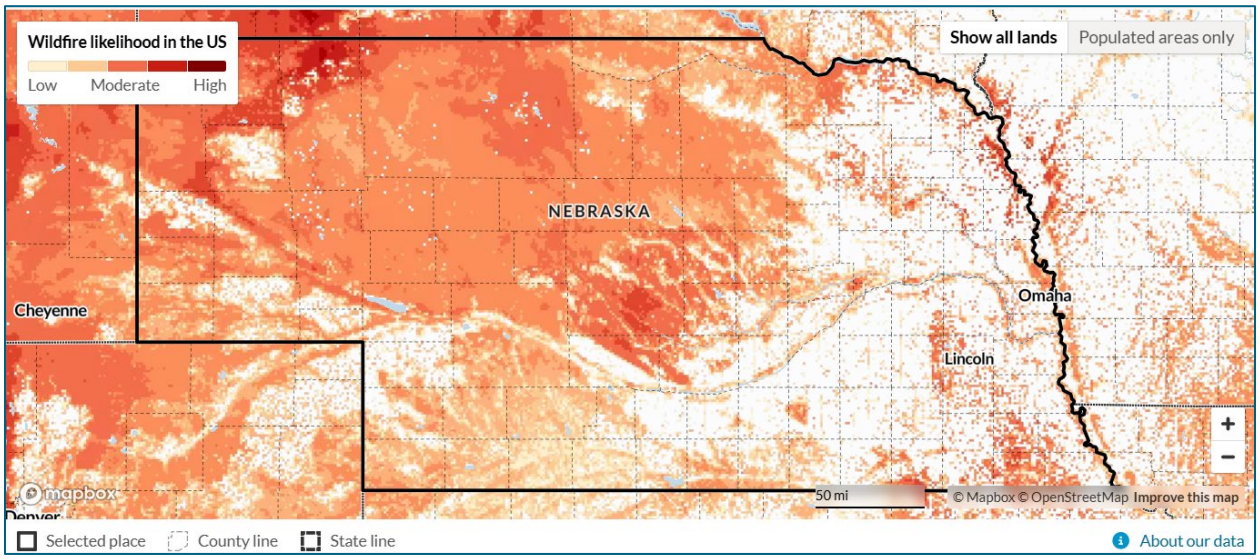



**Figure 104: Wildfire Likelihood in Nebraska**[322]

The Nebraska WRAP tool provides another assessment of wildfire probability. The map in Figure 105 provides a visualization of the likelihood that a wildfire will burn in a given fireshed over a specific period of time. Burn probability is related to the sizes of fires that occur on a given landscape. Large fires produce higher probability than small fires. Probability is higher in the western and northern areas of the state.

[322] United States Department of Agriculture, United States Fire Service, 2025, Wildfire Risk to Communities, "Nebraska – Wildfire Likelihood Map of State." https://wildfirerisk.org/explore/wildfire-likelihood/31/.

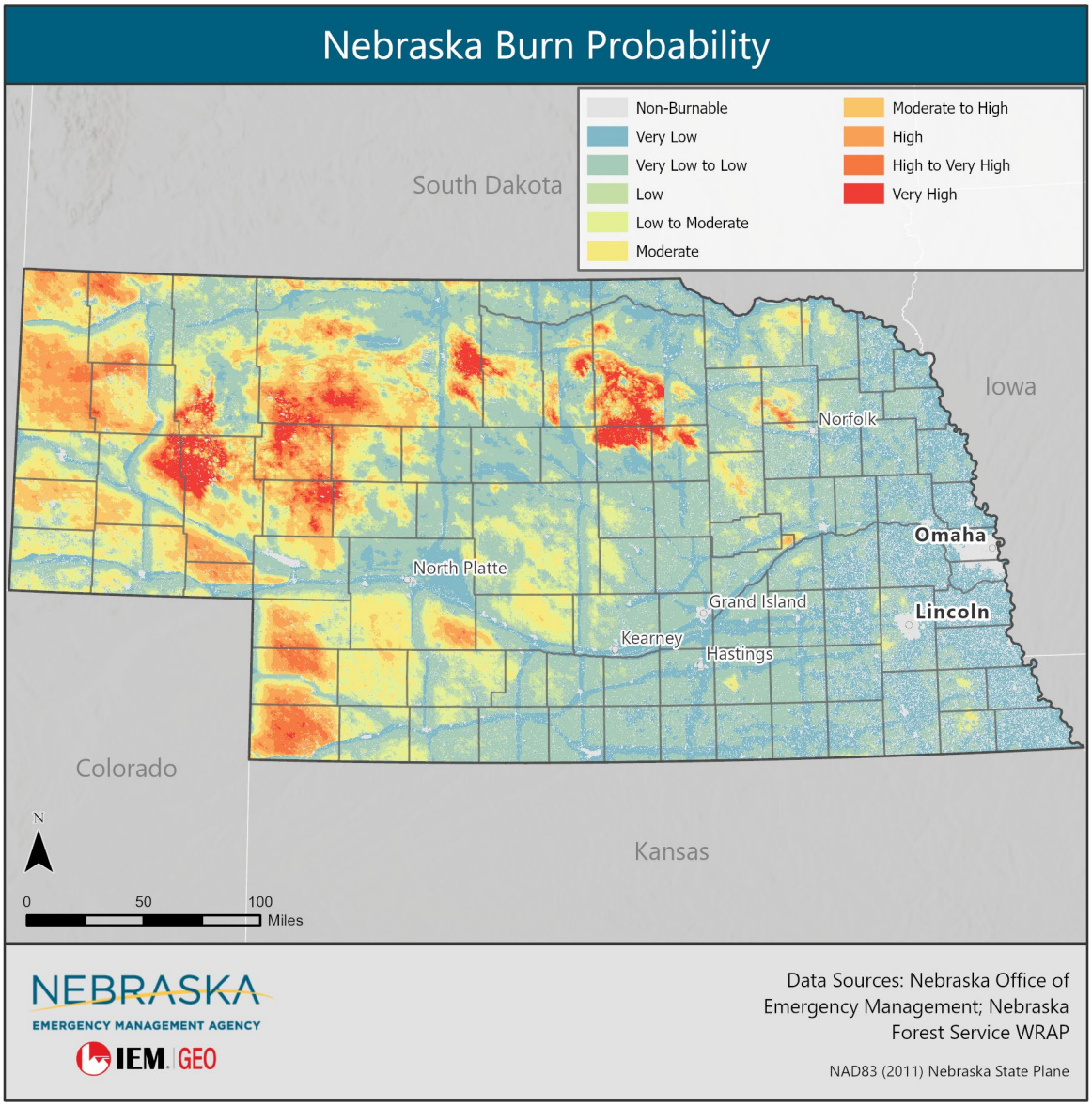



**Figure 105: Nebraska WRAP Burn Probability**

## RISK REDUCTION ZONES

Risk reduction zones are areas where mitigation activities will be most effective at protecting homes and other buildings from wildfires. Homes with minimal exposure are unlikely to be subjected to wildfire. Homes with indirect exposure may be ignited by embers or home-to-home ignition. Homes with direct exposure may be ignited by adjacent vegetation, flying embers, or nearby structures. Effective wildfire

risk-reduction activities will vary depending on the zone. Homes and buildings in Nebraska are predominantly in the minimal exposure zone (see Figure 106). [323]

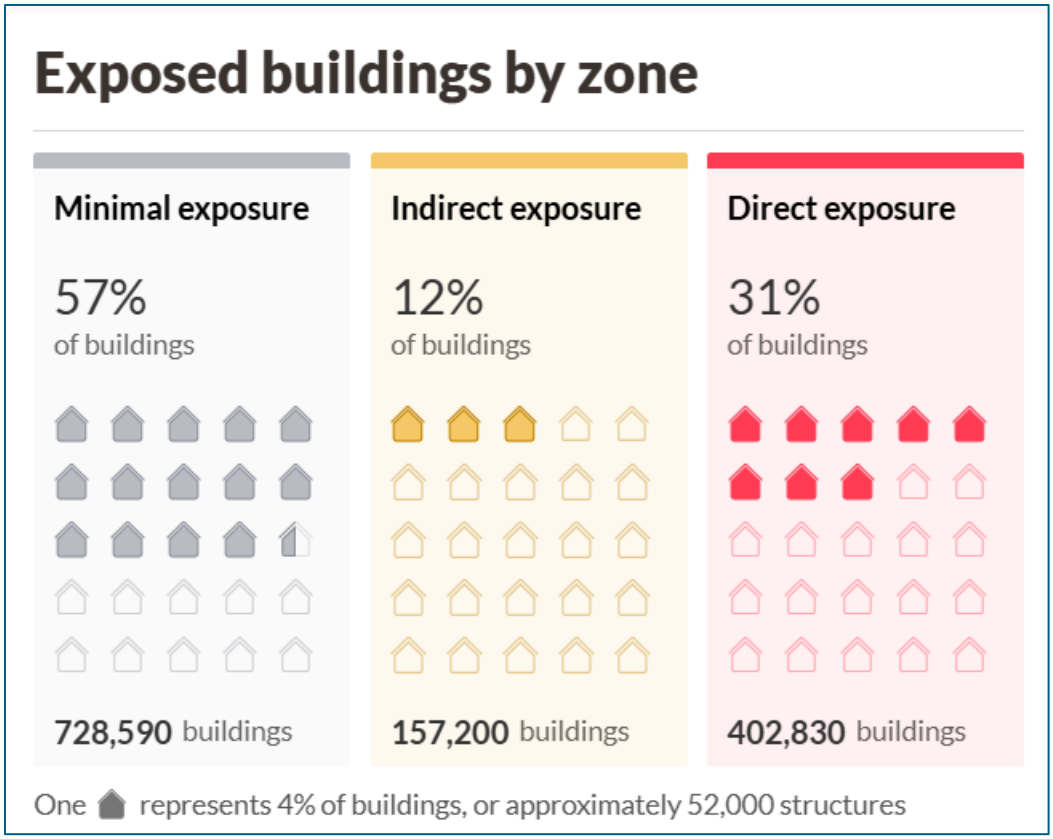



**Figure 106: Exposed Buildings by Zone in Nebraska [324]**

### 3.23.2.5 EFFECTS OF FUTURE CONDITIONS

Because Nebraska experiences hundreds of wildfires each year, calculating a recurrence interval is not applicable. Instead, it is more beneficial to calculate the average number of wildfires that can be anticipated in a given year. Based on the historic occurrence of wildfires in Nebraska between 2002 and 2024, an average of 1,109 fires can be expected annually. Most of these occur during the late summer and fall, as periods of dry weather increase fuel loads. The size and intensity of an individual fire or fire season are highly dependent on environmental conditions related to excessive heat, moisture levels, and short- or long-term drought conditions. With the historical record pointing to many wildfires every year, there is a 100% probability that a wildfire will impact an area of the state in a given year.

Wildfire characteristics are highly dependent on vegetation as a fuel source. Increases in temperatures and longer periods of drought can lead to an increase in wildfires and contribute to faster growth. Prolonged drought can result in dead or dying vegetation providing additional fuel for fires.

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[323] United States Department of Agriculture, United States Fire Service, 2025, Wildfire Risk to Communities, "Nebraska – Risk Reduction Zones." https://wildfirerisk.org/explore/risk-reduction-zones/31/.
[324] Ibid.

Meteorological surface parameters can influence the extent of wildfire when conditions include low amounts of precipitation, low soil moisture, wind, relative humidity and high temperatures. Climate is inherently variable, making it difficult for climate scientists to predict these conditions for more than a few months in advance for most locations. In addition, anomalies in precipitation and temperature may last from several months to several decades. The duration of drought-causing climate events depends on air–sea interactions, soil moisture and land surface processes, topography, internal dynamics, and the accumulated influence of dynamically unstable synoptic weather systems at the global scale.

Although the impacts and consequences of human-caused wildfires may be mitigated with aggressive public education and rapid response operations, not all wildfires can be prevented. Specific monitoring systems can help to lower the number of fires or reduce their volume once started. The Keetch-Byram Drought Index (KBDI) is one type of forecasting tool frequently used by fire service organizations to monitor potential fire conditions. The KBDI, introduced in 2013, is generally used to determine potential wildfire hazard levels based on a scale ranging from less than 200 to 800, with the lower number representing wetter conditions and the higher representing drier conditions. Areas showing a KBDI range between 600 and 800 represent the most severe drought conditions within the index levels and are closely associated with increased wildfire occurrence. Many counties begin more intensive monitoring of potential wildfire areas, initiate public information campaigns, and issue burn bans when the KBDI is within this range. Figure 107 provides a graphic representation of the KBDI map for February 3, 2025. At that time, most of the state was in the KBDI range between 100 and 301, indicating moderate risk for wildfire as soil moisture and large class fuel moistures were high and did not contribute much to fire intensity, typical of the spring dormant season following winter precipitation.

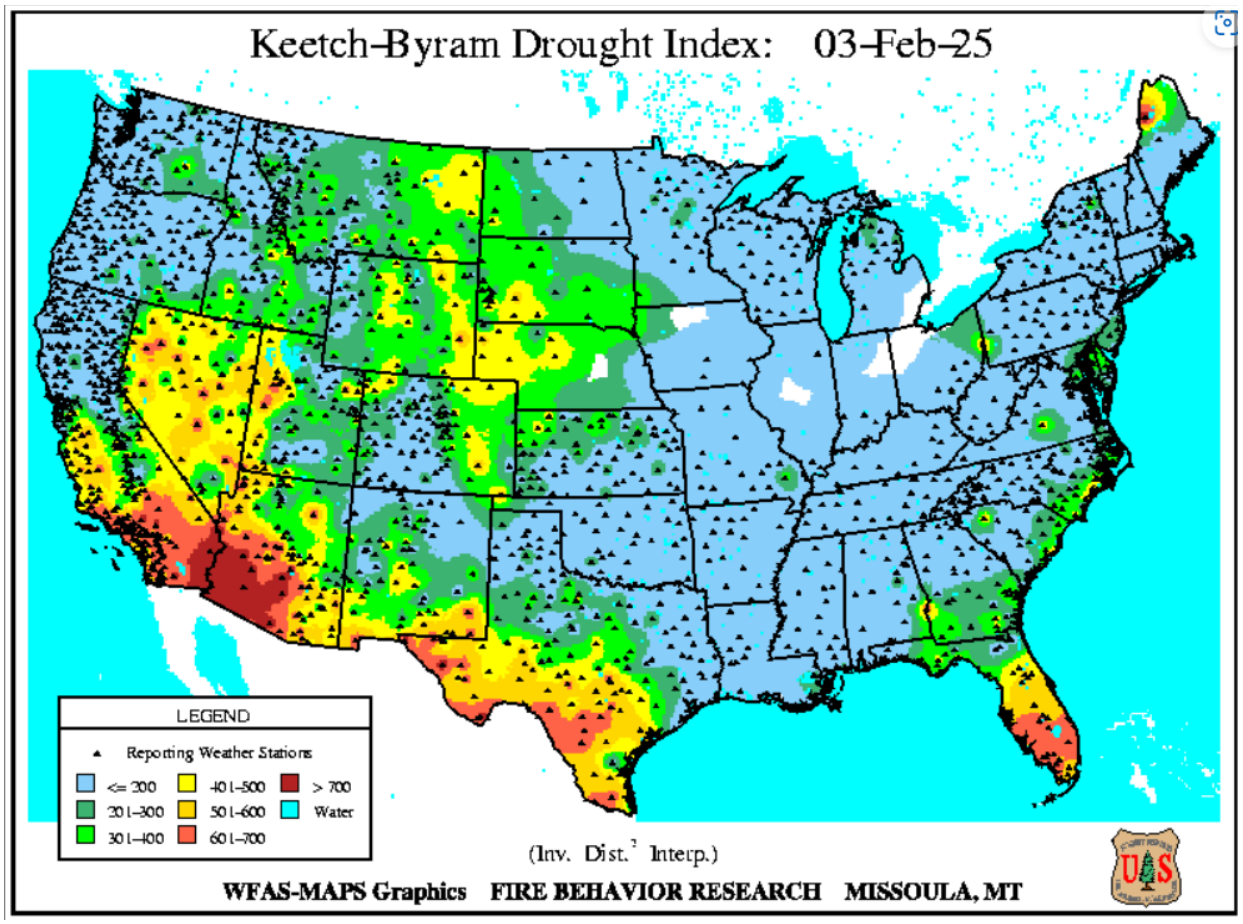



**Figure 107: Keetch-Byram Drought Index Wildfire Assessment System Map of the United States, February 3, 2025**[325]

The U.S. Drought Monitor also provides information that can assist in anticipating potential wildfire conditions.

## 3.23.3 Vulnerability Analysis

Wildfires are unplanned fires that burn in natural areas, including grasslands, forests, and other environments, even those areas where people live. These fires can be caused by humans and natural events (such as lightning), and affect every state in the U.S. Most wildfires are attributed to human causes, including uncontrolled campfires, burning brush or debris, sparks from equipment and vehicles, discarded smoking materials, and arson. Wildfires can affect Nebraska's air quality, even far from the state. Air quality impacts from wildfires can occur at any time of the year and may persist for days, depending on weather patterns.[326]

[325] Wildfire Assessment System, 2025, "Map of Keech-Byram Drought Index of the United States February 4, 2025." https://www.wfas.net/index.php?option=com_content&view=article&id=86&Itemid=487.
[326] Nebraska Department of Environment and Energy, 2025, "Wildfires and Impacts in Nebraska." https://dee.nebraska.gov/wildfires-and-impacts-nebraska.

In 2022, Nebraska experienced a significant number of wildfires due to drought conditions and increased wildfire risk statewide. Historically, wildfire season in Nebraska ranged from early summer through mid-autumn, but in recent years, the threat of wildfires has become year-round.[327]

In 2023, Nebraska's air quality was impacted by wildfires. These impacts are ongoing and are attributed to fires in other states and Canada. Drought conditions have persisted in eastern and central Nebraska, and harvest and hunting activities can increase the risk of wildfires.[328]

Air quality impacts from wildfire smoke can extend over a large area and impact rural and urban communities at any time of the year. Likewise, wildfires burning in areas located hundreds (or thousands) of miles from Nebraska—such as those on the West Coast or in Canada—can produce smoke that ultimately affects air quality.[329]

The jurisdictional vulnerabilities and potential losses from this hazard include the following:

- Risk of injury or death for residents and firefighting personnel
- Displacement of people and loss of homes
- Transportation routes that may be blocked by fire, preventing evacuation
- Damage to buildings and property, with significant losses to business owners
- Damage to critical infrastructure such as power lines and utility structures
- Increased chance of landslides and erosion
- Exacerbation of post-fire flash flooding events

#### 3.23.3.1 VULNERABILITY OF STATE FACILITIES

Large areas of the state are vulnerable to wildfires, and state assets in those regions could be impacted. State property replacement values in the top 10 most populated counties, which have increased concentrations of infrastructure and buildings, are listed in Table 103.

[327] Ibid.
[328] Nebraska Department of Environment and Energy, 2025, "Wildfires and Impacts in Nebraska." https://dee.nebraska.gov/wildfires-and-impacts-nebraska.
[329] Ibid.

**Table 103: State Asset Replacement Values in the Top 10 Most Populated Counties[330]**

| County | # of Properties | Insurance Value | Contents Insurance | Total Value | Replacement Cost |
|---|---|---|---|---|---|
| **Brown** | 28 | $0 | $0 | $4,236,570 | $4,236,570 |
| **Lancaster** | 329 | $327,401,529 | $419,606,538 | $ 747,008,067 | $747,008,067 |
| **Douglas** | 107 | $117,350,452 | $31,371,276 | $148,721,729 | $81,423,950 |
| **Buffalo** | 76 | $6,447,797 | $12,095,960 | $18,543,757 | $210,296,611 |
| **Johnson** | 26 | $157,136,447.60 | $29,311,747 | $186,448,194 | $3,184,781 |
| **Hall** | 81 | $7,321,520 | $2,719,927 | $10,041,447 | $10,634,654 |
| **Cass** | 225 | $0 | $1,494,524 | $1,494,524 | $104,597,718 |
| **Dawes** | 146 | $1,279,931 | $1,127,496 | $2,407,427 | $97,713,764 |
| **Gage** | 63 | $7,106,900 | $709,783 | $7,816,684 | $90,815,987 |
| **Adams** | 29 | $10,000 | $130,574 | $140,574 | $10,886,734 |
| **TOTAL** | **1,110** | **$624,054,576** | **$498,567,826** | **$1,126,858,972** | **$1,360,798,834** |

There are 401 critical infrastructure sites in High Vulnerability areas, with a total replacement value of more than $364 million. Nebraska State Risk Management does not insure all of the buildings or require the contents of the buildings to be insured. The three Thomas County properties are operated and insured by the Nebraska Department of Transportation, and the eight Sioux County properties are operated and insured by the Nebraska Game & Parks Commission and the Nebraska Department of Transportation. There are 442 state-owned structures at Moderate Risk, totaling nearly $520 million in replacement value.

### 3.23.3.2 NATIONAL RISK INDEX

Figure 108 illustrates the National Risk Index for Nebraska for wildfires. Most of the state has a risk rating of relatively low or very low wildfire risk.

[330] 2021 Nebraska State Hazard Mitigation Plan, "Section 3.12 Wildfires." https://nema.nebraska.gov/assets/files/hazard-mitigation/hazmitplan2021.pdf.

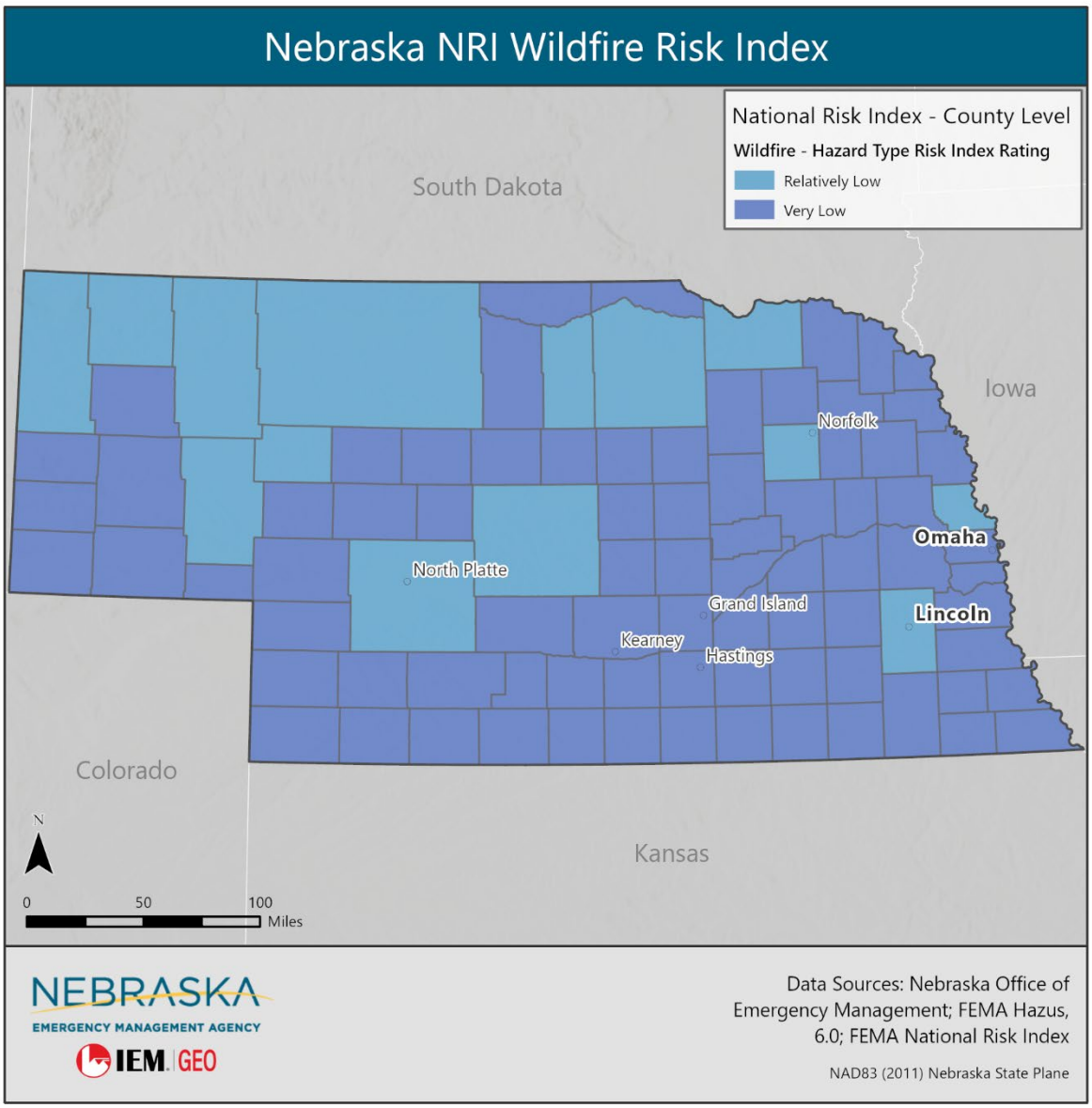



**Figure 108: Nebraska National Risk Index for Wildfire Risk**[331]

### 3.23.3.3 ESTIMATED IMPACT AND POTENTIAL LOSSES

Wildfires cause more frequent and wider-ranging societal impacts, especially as residential communities continue to expand into wildland areas. Since 2000, 12 wildfires in the United States have each caused damages exceeding $1 billion; cumulatively, these 12 wildfires have caused a total of $44 billion in damages.[332]

[331] Nebraska Office of Emergency Management, FEMA Hazus 6.0, FEMA National Risk Index.
[332] American Geosciences Institute, 2025, "Wildfires." https://profession.americangeosciences.org/society/intersections/wildfires.

Wildfires are detrimental to many aspects of agriculture, including crops, grasslands, and livestock. Producers across Nebraska are more impacted by this natural disaster than some may know. Unfortunately, 2022 was the second worst year for wildfires in Nebraska history. Worsening drought, coupled with strong, sustained winds, resulted in wildfires burning 200,000 acres of grasslands, cropland, and forests in the state. This compares with the previous record holder, about 502,000 acres blackened in 2012. Two of the largest and fastest-moving fires in 2022 were the Road 702 and Road 739 fires in April. Pushed by high winds, the fires quickly spread, outracing fire lines and fire crews. One fire burned 22 miles across pastures and crop fields.[333]

Over 2.5 million acres of land were burned from 55,571 recorded wildfires across the U.S. in 2023, and Nebraska was hit particularly hard. At the beginning of 2024, after Nebraska called for a fire ban, the Betty's Way fire swept through central Nebraska and burned over 70,000 acres.[334]

Figure 109 shows confirmed wildfire disaster events in Nebraska with losses exceeding $1 billion between 1980 and 2024. The one confirmed wildfire event was in 2012, with an estimated $1.5 billion in economic losses from that event.[335]

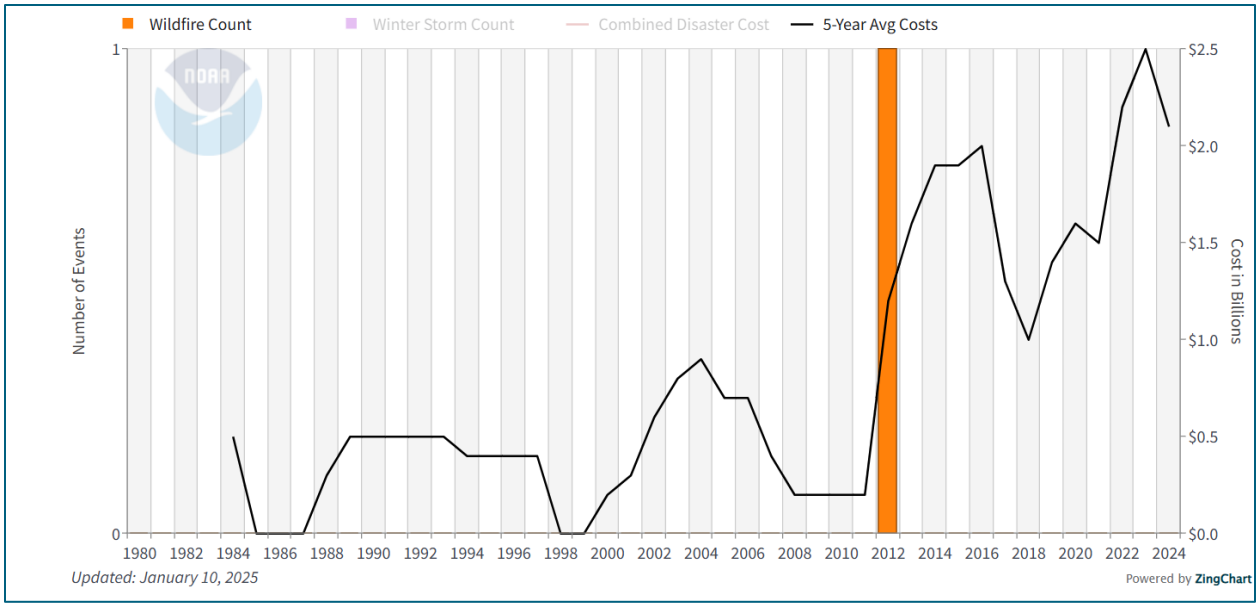



**Figure 109: Nebraska Billion-Dollar Disaster Events – Wildfire 1980–2024 (CPI Adjusted)[336]**

[333] University of Nebraska-Lincoln, Institute of Agriculture and Natural Resources, 2024, "A Burning Issue: Wildfire Impact on Nebraska Agriculture." https://sdn.unl.edu/news/burning-issue-wildfire-impact-nebraska-agriculture/.
[334] Ibid.
[335] National Oceanic and Atmospheric Administration, National Centers for Environmental Information, 2025, "Billion Dollar Weather and Climate Disasters-Nebraska Summary." https://www.ncei.noaa.gov/access/billions/state-summary/NE.
[336] Ibid.

### 3.23.3.4 ACCESS AND FUNCTIONAL NEEDS

Some people are disproportionately impacted by wildfire due to social and economic conditions. Families in poverty, the elderly, people with mobility challenges, and those who live in mobile homes are more likely to experience the negative impacts of wildfires. Wildfires may disproportionately affect those living in poverty because of factors such as inadequate housing, social exclusion, and a diminished ability to prepare before a fire or relocate afterward. Vulnerable populations may lack access to resources, experience cultural and institutional barriers, have limited mobility, or have medical conditions exacerbated by stress or smoke.

For example, people over age 65 and those who are disabled are more susceptible to air pollution and particulates associated with wildfire smoke. Language barriers can make it difficult to follow directions during an evacuation or to access support after a disaster. Race and ethnicity are strongly correlated with disparities in health and access to aid and resources. Wildfires disproportionately impact people with low incomes due to factors such as inadequate housing and a diminished ability to evacuate or relocate.[337]

## Vulnerable populations in Nebraska

Vulnerable populations: All areas in Nebraska

| Indicator | Number | MOE | Percent | MOE |
|---|---|---|---|---|
| Families in poverty | 32,681 | ±1,292 | 6.7% | ±0.3% |
| People with disabilities | 231,213 | ±3,200 | 12% | ±0.2% |
| People over 65 years | 316,709 | ±3,267 | 16.2% | ±0.2% |
| People under 5 years | 127,312 | ±2,590 | 6.5% | ±0.1% |
| People of color | 449,163 | ±14,331 | 22.9% | ±0.7% |
| Black | 93,555 | ±3,716 | 4.8% | ±0.2% |
| Native American | 18,550 | ±1,323 | 0.9% | ±0.1% |
| Hispanic | 230,769 | ±5,304 | 11.8% | ±0.3% |
| Difficulty with English | 47,196 | ±2,316 | 2.6% | ±0.1% |
| Households with no car | 39,240 | ±1,362 | 5.1% | ±0.2% |
| Mobile homes | 19,337 | ±980 | 2.5% | ±0.2% |

**Figure 110: Vulnerable Populations in Nebraska[338]**

### 3.23.3.5 COMMUNITY LIFELINES

Wildfires threaten safety, security, and access to important resources such as food, water, shelter, health and medical services, energy, communication, and transportation. The destruction caused by wildfires

[337] United States Department of Agriculture, United States Fire Service, 2025, Wildfire Risk to Communities, "Nebraska-Vulnerable Populations." https://wildfirerisk.org/explore/vulnerable-populations/31/.
[338] Ibid.

can lead to homelessness and food insecurity in affected areas, as property, crops, and livestock are lost. Road closures and communication disruptions may also hinder emergency services, making it difficult to respond to those in need. The spread of hazardous materials and toxic plumes into the air, soil, and water supplies can further harm affected communities.

### 3.23.3.6 ENHANCED PRIORITY RISK INDEX SCORE

The EPRI provides the state of Nebraska with a methodology to measure the impact each profiled hazard may have on the seven Emergency Management Accreditation Program (EMAP) Standard 4.1.2 sectors: public; responders; continuity of operations, including continued delivery of services; property, facilities, and infrastructure; the environment; the economic condition of the jurisdiction; and public confidence in the jurisdiction's governance. The following table provides the EPRI scores for the hazard with the appropriate risk factor.

**Table 104: Wildfire Enhanced Priority Risk Index Score**

| | Probability Next 5 Years | Impact | Spatial Extent | Warning Time | Duration | Vulnerability | Probability | Overall Risk Factor |
|---|---|---|---|---|---|---|---|---|
| **Risk Level** | 3.3 | 2.6 | 3 | 4 | 3.2 | 2.6 | 3.3 | 3.12 |

Table 105 provides a summary of wildfire impact, including impacts to the public, first responders, continuity of operations, property, infrastructure, environment, economic conditions, and public confidence, as well as the consequences of those impacts.

**Table 105: Wildfire Impacts and Consequences**

| Sector | Impact |
|---|---|
| **Public** | **Housing:** If the wildfire spreads to a populated area, the impact would be similar to an urban fire, with damage from water and smoke and property being destroyed.<br>**Casualties/Fatalities:** With good warning and citizen evacuation, casualties and or fatalities can be mitigated. Adherence to safety protocols and the proper use of personal protective equipment (PPE) can prevent or minimize responder casualties and fatalities.<br>**Work:** If the fire is contained to the wildland area, there should be little to no impact on work.<br>**Food/Water:** If a wildfire burns agricultural fields, it could impact food supplies and pollute water sources. Supplies of food and water may need to be brought in for firefighters. Additional water resources should be considered for firefighting. |
| **First Responders** | Fighting wildfires is dangerous, and extreme caution and strict adherence to safety measures and the use of incident management is important for responder safety and accountability.<br>Evacuation may be necessary for vulnerable populations, requiring multiple agency support and resources. |

| Sector | Impact |
|---|---|
| **Continuity of Operations** | If the wildfire is contained outside of municipalities, there should be no impact on continuity of operations. |
| **Property, Infrastructure, and Roads** | Wildfires are destructive and move very quickly. Homes and businesses in an area adjacent to wilderness areas are vulnerable to destruction from fire. Field crops and rangeland for livestock and other animals may be destroyed.<br>Infrastructure in wilderness areas is vulnerable to fire, especially electrical structures such as transmission and distribution lines, poles, and towers. Runoff from suppression activities can pollute streams and rivers that provide drinking water. Roads and bridges may become isolated during the fire and could need repairs due to the fire or the large amounts of heavy equipment used to fight the fire. |
| **Environment** | Wildfires are a natural occurrence in wilderness areas, and although not all wildfires start from natural causes, forests and grasslands do replenish themselves over time. Streams and rivers can become temporarily polluted from fire, but the natural dilution factor helps clean the waterway over time. Wildlife is displaced and lost but also returns to the area as it recovers. |
| **Economic Conditions** | There is not a large logging industry in Nebraska, so wildfires do not disrupt the economy significantly. Tourism can be temporarily disrupted during the season of the fire. |
| **Public Confidence** | Public confidence depends on the existing relationship between the affected communities and the government. If there is a weak relationship, the community will likely have less confidence in the government's response to the situation and will depend on proper management of the firefighting operation and activities taken to return the area to normal. |

# 4.0 Mitigation Strategy

## 4.1 Overview

This section outlines Nebraska's mitigation strategy, starting with an overview of the vision, mission, and guiding principles that shape the approach. It then details how the strategy will be implemented through clearly defined goals and objectives. Mitigation actions supporting these objectives are identified, assessed, and ranked based on priority, with a summary of potential funding sources included. Additionally, the section examines the existing mitigation capabilities of both state and local agencies and organizations, showcasing Nebraska's ongoing commitment to reducing risks.

Mitigation, in this context, refers to sustained efforts aimed at minimizing or eliminating long-term risks posed by natural hazards to people and property. This distinguishes mitigation from short-term emergency preparedness, response, and recovery measures. Furthermore, routine maintenance, which ensures the upkeep of infrastructure without enhancing protective measures, is not considered a mitigation activity.

This section also presents the objectives, strategies, and goals of the 2026 Hazard Mitigation Plan, as well as the state's existing mitigation capabilities, establishing a framework for measuring readiness in alignment with other statewide preparedness initiatives. To ensure effectiveness, these capability assessments must be realistic and attainable. The impact of mitigation initiatives carried out by state and local governments, private nonprofit organizations, and community members plays a vital role in public safety and resilience.

The Nebraska Emergency Management Agency (NEMA) operates under a guiding framework shaped by its vision, mission, and core principles, directing its overall approach to hazard mitigation and disaster preparedness.

### 4.1.1 Vision Statement

The State of Nebraska will reduce the vulnerability of people and communities of the state to damage, injury, and loss of life and property resulting from terrorism, natural disasters, and major emergencies; it will authorize and provide for cooperation and coordination of activities relating to mitigation of, protection of, prevention of, preparedness for and response to terrorism, natural disasters, and major emergencies by agencies and officers of this state and its political subdivisions and similar state, local/regional, tribal, interstate, federal-state and foreign activities in which the state and its political subdivisions may participate and assist in mitigation and prevention of terrorism, natural disasters, and major emergencies.

### 4.1.2 Mission Statement

Our mission is to coordinate, support, and serve Nebraska through an effective and relevant emergency management agency.

### 4.1.3 Guiding Principles for Operations

- All emergencies begin at the local level. NEMA shall collaborate with local, state, tribal, and national officials to provide coordinated assistance to Nebraska communities to augment local capabilities when appropriate.
- NEMA activities are grounded in principles of emergency management. Emergency management must be comprehensive, progressive, risk-driven, cost-effective, and flexible.
- Respectful and collaborative relationships coupled with professional leadership are integral to an effective emergency management program. Activities must be inclusive and engage the whole community.

## 4.2 Mitigation Goals

The goals outlined in this plan are structured around five key mitigation themes, which provide the foundation for defining specific goals and implementing mitigation strategies to support them:

- **Prevention**: This category includes government policies, regulations, and administrative actions that guide land use and building practices to minimize hazard risks. These efforts also involve public initiatives aimed at reducing potential losses from disasters. Examples include zoning regulations, building codes, infrastructure investment plans, land conservation efforts, and stormwater management policies.
- **Property Protection**: Strategies in this area focus on modifying or relocating existing structures to reduce their vulnerability to hazards. Methods may include acquiring at-risk properties, elevating buildings, relocating structures away from high-risk zones, retrofitting for improved resilience, installing storm shutters, or using impact-resistant materials such as shatterproof glass.
- **Public Education and Awareness**: Raising awareness and informing residents, policymakers, and property owners about potential hazards and available mitigation measures is crucial. Outreach initiatives may include public information campaigns, real estate hazard disclosures, community resource centers, and educational programs for both students and adults.
- **Natural Resource Protection**: These actions aim to both reduce hazard-related damage and preserve the ecological functions of natural systems. Examples include erosion and sediment control, restoration of stream corridors, watershed management, forest and vegetation conservation, and wetland protection and rehabilitation.
- **Structural Projects**: This category involves the construction of physical structures designed to lessen the impact of disasters. Examples include flood barriers, levees, dams, retaining walls, seawalls, and designated safe rooms for extreme weather events.

The following are the key mitigation goals that guide Nebraska's hazard reduction efforts. These goals serve as the foundation for coordinated federal, state, and local mitigation planning and implementation. They emphasize reducing long-term risks to people, property, and infrastructure while promoting sustainability, resilience, and public awareness. By addressing hazard mitigation through policy, education, and strategic project development, the state aims to enhance its preparedness and reduce vulnerabilities across communities.

1. Promote a comprehensive state hazard mitigation policy framework to coordinate federal, state, and local hazard mitigation planning and program efforts.
2. Reduce or eliminate long-term risk to property, including critical facilities and infrastructure, as well as historic and private property.
3. Promote public awareness of hazards and how to reduce their impacts to all individuals, especially those with functional and access needs.
4. Encourage the development and implementation of long-term, cost-effective, and resilient mitigation projects that preserve or restore the functions of natural systems.
5. Build stronger by promoting mitigation actions emphasizing sustainable construction and design measures to reduce or eliminate the impacts of natural hazards.
6. Identify opportunities for risk reduction by strategizing long-term actions designed to lessen the potential failure of medium and high hazard dams and the cascading consequences.

### 4.2.1 Mitigation Objectives

Table 106 outlines the specific objectives that support Nebraska's hazard mitigation goals. These objectives provide a detailed framework for reducing risks, enhancing resilience, and fostering sustainable development across communities. By addressing key areas such as policy development, infrastructure protection, public education, and natural resource conservation, these objectives help guide strategic actions that strengthen hazard preparedness and response efforts.

Each objective falls under a broader theme, ensuring a comprehensive approach to hazard mitigation. These themes include policy and planning, property protection, public awareness, environmental conservation, and infrastructure resilience. The objectives aim to integrate best practices in land use planning, promote hazard insurance participation, support sustainable construction, and encourage community collaboration to minimize risks statewide.

**Table 106: Mitigation Objectives**

| Objective Number | Description |
|---|---|
| **1.1** | Promote and support integrated land use planning to encourage resilient and sustainable efforts throughout statewide programs that address zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations. |

| Objective Number | Description |
|---|---|
| **1.2** | Continue to participate in state and local efforts and programs that focus on policy development and practices that support accepted resiliency measures. |
| **1.3** | Promote and support policy-making that excludes new human habitation and new infrastructure and building development in flood zones. |
| **1.4** | Promote and support policy-making that reduces vulnerability to other (i.e., non-flood) hazards. |
| **1.5** | Support policy-related studies, research, and mapping that enhances data and information related to the impacts of hazards and related risk, vulnerability, and losses. |
| **2.1** | Promote hazard insurance opportunities for homeowners, renters, and businesses, including flood coverage under the National Flood Insurance Program (NFIP). |
| **2.2** | Provide counties and communities with technical assistance on acquisition, retrofit, or relocation of repetitive loss properties from flood-prone areas in the state. |
| **2.3** | Promote resilient and sustainable building to reduce vulnerabilities, encouraging the use of green and natural infrastructure, when appropriate. |
| **2.4** | Identify opportunities to mitigate vulnerable critical infrastructure, such as utilities, roads and bridges, and other community lifeline-related facilities. |
| **3.1** | Offer trainings about hazard awareness, mitigation planning and grants, and how to incorporate mitigation into ongoing program functions. |
| **3.2** | Reduce the impact of hazards on at-risk and vulnerable populations through education and awareness programs. |
| **3.3** | Improve systems that provide warning, awareness, and emergency communication. |
| **3.4** | Conduct education and awareness programs for flood mitigation planning and funding assistance. |
| **4.1** | Encourage the use of green and natural infrastructure for mitigation projects, when applicable. |
| **4.2** | Provide technical assistance to communities and stakeholders in the application and implementation of mitigation projects that preserve or restore natural systems. |
| **4.3** | Maintain and encourage ongoing relationships between state and local agencies and federal partners to play an active and vital role in identifying appropriate preservation and restoration of vulnerable natural systems. |
| **4.4** | Promote the continued use of natural systems and features, and open space preservation, in land use planning and development by local jurisdictions. |
| **5.1** | Encourage building and rebuilding practices that address resiliency through higher standards and sustainable design to resist impacts of natural hazards. |
| **5.2** | Enhance coordination with state and local agencies that promote resiliency and sustainability. |
| **5.3** | Identify sustainable flood and erosion control projects and activities that demonstrate resiliency practices. |
| **5.4** | Promote and support the building of safe rooms in areas highly vulnerable to wind damages. |

| Objective Number | Description |
|---|---|
| **5.5** | Improve transportation infrastructure to ensure safe passage of people, goods, and services statewide. |
| **5.6** | Reduce long-term vulnerabilities from eligible high hazard potential dams that pose an unacceptable risk to the public, property, and infrastructure. |

# 4.3 Prioritization of Mitigation Actions

To ensure that limited resources are used effectively and that the most beneficial mitigation actions are implemented first, a structured prioritization process has been established. This process uses a comprehensive scoring system to evaluate potential projects and initiatives based on a range of critical criteria. The primary objective is to identify and rank actions that provide the greatest potential for reducing risk, enhancing public safety, preserving property, and supporting overall community resilience.

## 4.3.1 Mitigation Ranking System

Table 107 presents a structured scoring system designed to evaluate and prioritize potential projects or initiatives based on key criteria related to public safety, funding, feasibility, and community impact. Each category is assigned a point value ranging from 0 to 4, with higher scores indicating greater alignment with strategic goals such as life safety, financial viability, and environmental compatibility. This scoring framework helps decision-makers objectively assess the merits of each proposal, ensuring that resources are directed toward projects with the highest potential benefit. The total possible score ranges from 0 to 28, with overall rankings categorized as Low (0–14), Medium (15–24), or High (25–32), providing a clear basis for comparison and prioritization.

**Table 107: Mitigation Ranking System**

| Category | Points | Criteria |
|---|---|---|
| **(1) Life Safety/Property Protection** | 4 | Likely to protect more than 50% of the population and/or critical infrastructure and community assets. |
| | 3 | Likely to protect between 25% and 50% of the population and/or critical infrastructure and community assets. |
| | 2 | Could potentially protect up to 25% of the population and could potentially protect critical infrastructure and community assets |
| | 1 | Could potentially protect up to 10% of the population and could potentially protect critical infrastructure and community assets |
| | 0 | Potential for protecting lives and critical infrastructure and/or community assets cannot be determined at this time. |
| **(2) Funding Availability** | 4 | Little to no direct expenses |
| | 3 | Can be funded by operating budget |
| | 2 | Grant funding identified |

| Category | Points | Criteria |
|---|---|---|
| | 1 | Grant funding needed |
| | 0 | Potential funding source unknown |
| **(3) Probability of Matching Funds** | 4 | Funding match is available or funding match not required |
| | 3 | N/A |
| | 2 | Partial funding match available |
| | 1 | N/A |
| | 0 | No funding match available or funding match unknown |
| **(4) Benefit Cost Review** | 4 | Likely to meet Benefit Cost Review |
| | 3 | N/A |
| | 2 | Benefit Cost Review not required |
| | 1 | N/A |
| | 0 | Benefit Cost Review unknown |
| **(5) Environmental Benefit** | 4 | Environmentally sound and relatively easy to implement or no adverse impact on environment |
| | 3 | Environmentally acceptable and not anticipated to be difficult to implement |
| | 2 | Environmental concerns are somewhat difficult to implement because of complex requirements |
| | 1 | Difficult to implement because of significantly complex requirements and environmental permitting |
| | 0 | Very difficult to implement due to extremely complex requirements and environmental permitting problems |
| **(6) Technical Feasibility** | 4 | Proven to be technically feasible |
| | 3 | N/A |
| | 2 | Expected to be technically feasible |
| | 1 | N/A |
| | 0 | Technical feasibility unknown or additional information needed |
| **(7) Timeframe of Implementation** | 4 | 1 year or less (Short Term) |
| | 3 | N/A |
| | 2 | 2–5 years (Long Term) |
| | 1 | N/A |
| | 0 | More than 5 years (Long Term) |
| **(8) Community Lifelines Impacted** | 4 | 4 or more |
| | 3 | N/A |
| | 2 | 1–3 community lifelines |

| Category | Points | Criteria |
|---|---|---|
| | 1 | N/A |
| | 0 | No community lifelines |
| **Minimum = 0**<br>**Maximum = 32** | Ranking Level: Low: 0–14 Medium: 15–24 High: 25–32 | |

## 4.4 Types of Mitigation Actions

Local plans and regulations are foundational tools for guiding the safe and sustainable development of communities. These mitigation actions involve the use of government policies, planning documents, codes, and ordinances to shape land use, building practices, and infrastructure investment. By integrating hazard mitigation strategies into comprehensive plans, zoning codes, and other regulatory mechanisms, communities can reduce their long-term risk exposure and improve resilience to natural disasters. These actions ensure that future growth occurs in ways that minimize vulnerability to hazards while promoting public safety and environmental stewardship.

**Table 108: Types of Mitigation Actions and Examples**

| Mitigation Measure | Examples |
|---|---|
| **Local Plans and Regulations** | |
| These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built. | • Comprehensive plans<br>• Land use ordinances<br>• Subdivision regulations<br>• Development Review<br>• Building codes and enforcement<br>• National Flood Insurance Program Community Rating System<br>• Capital improvement programs<br>• Open space preservation<br>• Stormwater management regulations and master plans<br>• Community wildfire protection plans, fuels management, and fire breaks |
| **Structure and Infrastructure Projects** | |
| These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. | • Acquisitions and elevations of structures in flood prone areas<br>• Utility undergrounding<br>• Structural retrofits (e.g., shelters)<br>• Floodwalls and retaining walls<br>• Detention and retention structures<br>• Culverts |

| Mitigation Measure | Examples |
|---|---|
| This type of action also involves projects to construct manmade structures to reduce the impact of hazards.<br>Many of these types of actions are projects eligible for funding through the FEMA Hazard Mitigation Assistance program. | • Safe rooms |
| **Natural Systems Protection** | |
| These are actions that minimize damage and losses and also preserve or restore the functions of natural systems. | • Sediment and erosion control<br>• Stream corridor restoration<br>• Forest management<br>• Conservation easements<br>• Wetland restoration and preservation |
| **Education and Awareness Programs** | |
| These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady, or Firewise Communities. Although this type of mitigation reduces risk less directly than structural projects or regulation, it is an important foundation to sustaining mitigation planning and implementation. A greater understanding and awareness of hazards and risk among local officials, stakeholders, and the public is more likely to lead to direct actions. | • Radio or television spots<br>• Websites with maps and information<br>• Social media<br>• Real estate disclosure<br>• Presentations to school groups or neighborhood organizations<br>• Mailings to at-risk populations and residents in hazard-prone areas<br>• StormReady<br>• Firewise Communities |

# 4.5 Funding Sources

Throughout the state, numerous hazard mitigation projects have been funded through federal programs such as the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), and Flood Mitigation Assistance (FMA). In addition to these, a variety of agencies and organizations provide funding support for mitigation activities. The following is an overview of key grant programs commonly used by the state, along with additional funding resources. For more details on application processes and program specifics, applicants can visit the official websites of NEMA, Nebraska Department of Natural Resources, and other relevant agencies.

## 4.5.1 Hazard Mitigation Grant Program

HMGP, established under Section 404 of the Robert T. Stafford Act and 44 CFR Part 206, offers financial support to states, territories, tribal governments, and local jurisdictions to lessen or eliminate risks to

people and property from future natural hazards. Applicants must have an approved hazard mitigation plan to qualify.

Funding from HMGP becomes available following a presidential disaster declaration and represents 15% of the federal portion of disaster response funds. These funds are distributed into three categories:

- 5% for initiative projects
- 7% for the development or revision of mitigation plans
- 88% for standard mitigation initiatives

The application window remains open for one year following the disaster declaration, with proposals submitted through the state and ultimately approved by FEMA.

### 4.5.2 Flood Mitigation Assistance

Managed by the Nebraska Department of Natural Resources, the FMA program focuses on reducing or preventing long-term flood damage to NFIP-insured properties. It provides funds for community planning, risk assessments, and mitigation projects such as property acquisitions, structure elevations, relocations, and demolitions.

Communities with repetitive or severe repetitive loss properties may be eligible for up to 90% federal funding for qualified mitigation actions under the strategies outlined in the state mitigation plan.

### 4.5.3 Public Assistance – Section 406 Mitigation

Under the Stafford Act, Section 406 provides mitigation funding for infrastructure repairs following a presidential disaster declaration. This funding supports efforts to rebuild stronger and reduce repeated damages to public facilities, thereby decreasing future recovery costs.

### 4.5.4 Rehabilitation of High Hazard Potential Dams Grant Program

The High Hazard Potential Dams (HHPD) program offers grant funding to support the technical assessment, planning, design, and rehabilitation of eligible dams classified as high hazard potential. In Nebraska, oversight and coordination of this funding are managed by the appropriate state agency, in alignment with federal guidelines. A dam is generally considered high hazard if its failure would likely result in loss of life or significant property damage.

### 4.5.5 Other Potential Funding Sources

Beyond FEMA programs, a variety of other entities provide financial assistance for mitigation and resilience efforts. These include the following:

- Nebraska Environmental Trust
- Nebraska Forest Service (Surplus Generator Program)

- NFIP's Increased Cost of Compliance (ICC) for policyholders
- Nebraska's Natural Resources Districts (NRDs)
- U.S. Department of Commerce – Economic Development Administration
- U.S. Small Business Administration – Disaster Loan Program
- U.S. Department of Housing and Urban Development – Disaster Recovery Block Grants
- U.S. Department of Agriculture – Community Loan Programs
- U.S. Environmental Protection Agency
- U.S. Army Corps of Engineers
- Collaborative partnerships among government agencies, nonprofit organizations, and the private sector

These resources collectively support comprehensive mitigation strategies that protect communities, strengthen infrastructure, and reduce the overall impacts of future disasters.

## 4.6 Future Capability Development and Implementation Challenges (HHPD)

Nebraska faces several challenges in implementing local mitigation policies, programs, and capabilities aimed at reducing vulnerabilities associated with HHPDs. These challenges span technical, financial, regulatory, and institutional domains and directly affect both state and local implementation capacity. Many local jurisdictions lack comprehensive data identifying dam ownership, classification, condition, and downstream inundation zones. This absence of standardized datasets limits accurate risk assessment and the prioritization of mitigation actions. Funding constraints further complicate progress, as local governments often have limited access to dedicated funding sources for dam safety assessments, rehabilitation, or removal projects. Competing fiscal priorities related to infrastructure, public safety, and community services make it difficult to allocate sufficient resources for dam mitigation efforts. Smaller and rural jurisdictions may lack the technical expertise, modeling tools, and staffing resources necessary to assess dam safety and design appropriate mitigation measures.

Regulatory and jurisdictional complexities also create significant barriers, as dams are regulated by multiple entities, including federal agencies, the Nebraska Department of Natural Resources (NeDNR), and local owners, resulting in coordination challenges and sometimes overlapping or unclear responsibilities for maintenance, upgrades, and emergency planning. Public awareness and engagement present another obstacle, as limited community understanding of dam risks can reduce support for mitigation initiatives, particularly when they involve property acquisition, land-use restrictions, or increased costs.

To address these barriers, Nebraska will implement a comprehensive approach that enhances coordination, data management, and technical capability across all levels of government. The state will develop a centralized Dam Safety and Risk Database in coordination with NeDNR, integrating dam

inventory data with GIS-based inundation mapping and community lifeline analyses to improve statewide risk understanding. Interagency coordination will be strengthened through formal agreements among NEMA, NeDNR, Natural Resources Districts (NRDs), and local emergency management agencies to streamline communication, clarify roles, and enhance response planning for dam-related hazards. Nebraska will also leverage federal and state funding opportunities, such as FEMA's Rehabilitation of High Hazard Potential Dams (HHPD) Grant Program and the Hazard Mitigation Grant Program (HMGP).

Technical assistance and training will be provided to local jurisdictions to build capacity for risk analysis, benefit-cost assessments, and integration of dam safety into local hazard mitigation and capital improvement plans. Public outreach and education campaigns will be expanded to increase awareness of dam safety, emergency preparedness, and available mitigation options, particularly for downstream populations. Finally, dam failure scenarios will be incorporated into state and local exercises to strengthen readiness, refine emergency action plans (EAPs), and ensure that mitigation priorities align with actual exposure.

**Table 109: Sources for Federal and State Mitigation Funding and Assistance**

| Program | Description | Lead Agency | Link | Regulatory | Technical | Financial |
|---|---|---|---|---|---|---|
| **Federal and State Mitigation Funding and Assistance** | | | | | | |
| **Grants.gov** | Searchable catalog of federal grant opportunities in health and human services | U.S. Department of Health and Human Services (HHS) | http://www.grants.gov/web/grants/home.html | x | x | x |
| **Federal Grant Programs for State and Local Governments** | Website that lists types of FEMA grant programs, including policies, eligibility, agencies, and type of funding instrument | Federal Emergency Management Agency (FEMA) | https://www.grants.gov/ | | x | x |
| **National Earthquake Hazards Reduction Program** | Program research to advance understanding earthquakes occurrence and impact | National Institute of Science and Technology (NIST) | http://www.nehrp.gov/index.htm | | x | |
| **Decision, Risk and Management Science Program** | Scientific research directed at increasing the understanding and effectiveness of decision making by individuals, groups, organizations, and society | National Science Foundation (NSF) | https://www.nsf.gov/funding/opportunities/drms-decision-risk-management-sciences | | x | |
| **Science and Technology Studies** | Proposals benefiting the study of interactions of engineering, science, technology, and society | NSF | https://www.nsf.gov/funding/opportunities/sts-science-technology-studies/nsf22-629/solicitation | | x | |

| Program | Description | Lead Agency | Link | Regulatory | Technical | Financial |
|---|---|---|---|---|---|---|
| **Aquatic Ecosystem Restoration** | Direct support for carrying out aquatic ecosystem restoration projects, such as wetlands, repairing and other floodplain and aquatic systems, that will improve the quality of the environment; regulatory and adaptation planning initiatives for climate change | U.S. Army Corps of Engineers (USACE) | http://www.nae.usace.army.mil/Missions/Public-Services/Ecosystem-Restoration-Authorities/ | x | x | x |
| **Beneficial Uses of Dredged Materials** | Direct assistance for projects that protect, restore, and create aquatic and ecological habitats, including connection with dredging in authorized federal wetlands, in navigation projects | Environmental Protection Agency (EPA) | https://www.epa.gov/cwa-404/beneficial-use-dredged-material-under-cwa-section-404 | x | x | x |
| **Water Grants** | A variety of grants related to water and wastewater infrastructure projects, including a catalog of federal funding for watershed protection projects | EPA | https://www.epa.gov/nps/watershed-funding | | x | x |
| **Urban Waters Small Grants Program** | Protect and restore urban waters by improving water quality through activities that also support community revitalization and other local priorities | EPA | https://www.epa.gov/urbanwaterspartners/urban-waters-small-grants | | x | x |
| **Community Development Block Grant (CDBG)** | Grants to states and local governments to develop viable communities (e.g., housing, suitable living environment, expanded | U.S. Department of Housing and Urban | https://www.hud.gov/hud-partners/community-cdbg | x | x | x |

| Program | Description | Lead Agency | Link | Regulatory | Technical | Financial |
|---|---|---|---|---|---|---|
| | economic opportunities) and recover from federally declared disasters; principally for low- and moderate-income areas | Development (HUD) | | | | |
| **Disaster Housing Assistance Program** | Emergency assistance for housing, including minor repair of home to establish livable conditions, mortgage, and rental assistance | U.S. Dept. of Housing and Urban Development (HUD) | https://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/publications/dhap | | | x |
| **HOME Investment Partnerships Program** | Grants to state and local government and consortia for permanent and transitional housing (including financial support for property acquisition and rehabilitation for low-income persons) | HUD | https://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/affordablehousing/programs/home/ | | | x |
| **HUD Disaster Resources** | Grants and a variety of disaster assistance related to housing, including mortgage assistance | HUD | https://portal.hud.gov/hudportal/HUD?src=/info/disasterresources | | | x |
| **Section 108 Loan Guarantee** | Offers states and local governments a source of financing for certain community development activities, such as housing rehabilitation, economic development, and large-scale physical development projects | HUD | https://portal.hud.gov/hudportal/HUD?src=/hudprograms/section108 | | | x |
| **National Flood Insurance Program (NFIP)** | Formula grants to states to assist FEMA communities to comply with NFIP floodplain management | FEMA | https://www.fema.gov/national-flood-insurance-program | x | | |

| Program | Description | Lead Agency | Link | Regulatory | Technical | Financial |
|---|---|---|---|---|---|---|
| | requirements (Community Assistance Program) | | | | | |
| **Hazard Mitigation Assistance (HMA)** | Grants to provide funding for eligible mitigation activities that reduce disaster losses and protect life and property from future disaster damages (includes FMA, HMGP, PDM, below) | FEMA | http://www.fema.gov/hazard-mitigation-assistance | | x | x |
| **Flood Mitigation Assistance (FMA) Program** | Grants to states and communities for pre-disaster mitigation planning and projects to help reduce or eliminate the long-term risk of flood damage to structures insurable under NFIP | FEMA | http://www.fema.gov/flood-mitigation-assistance-program | | x | x |
| **Hazard Mitigation Grant Program (HMGP)** | Grants to states and communities for planning and projects providing long-term hazard mitigation measures following a major disaster declaration | FEMA | http://www.fema.gov/hazard-mitigation-grant-program | | x | x |
| **Pre-Disaster Mitigation (PDM) Competitive Grant Program** | Grants to states and communities for planning and projects that provide long-term hazard pre-disaster mitigation measures | FEMA | http://www.fema.gov/pre-disaster-mitigation-grant-program | | x | x |
| **Public Assistance: Hazard Mitigation Funding under Section 406** | 9526.1 Hazard mitigation discretionary funding available under Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act following a federally declared disaster | FEMA | https://www.fema.gov/95261-hazard-mitigation-funding-under-section-406-stafford-act | | | x |

| Program | Description | Lead Agency | Link | Regulatory | Technical | Financial |
|---|---|---|---|---|---|---|
| **Assistance to Firefighters Grant Program** | Assists in local funding for fire equipment, staffing, facility construction, and emergency response costs | FEMA | https://www.fema.gov/welcome-assistance-firefighters-grant-program | | | x |
| **Partners for Fish and Wildlife** | Financial and technical assistance to private landowners interested in pursuing restoration projects affecting wetlands and riparian habitats | U.S. Fish and Wildlife Service (USFWS) | https://www.fws.gov/program/partners-fish-and-wildlife | | x | x |
| **National Trust Preservation Funds (NTPF)** | Funding awarded to nonprofit organizations and public agencies for planning and education projects | National Trust for Historic Preservation (NTHP) | https://savingplaces.org/grants | | x | x |
| **Historic Preservation Financial Assistance – General** | Federal financial assistance specifically for historic preservation; initiatives include sustainability and climate resilience, and community revitalization and economic benefits | Advisory Council on Historic Preservation | https://www.achp.gov/initiatives | | x | x |
| **Federal Highway Administration Emergency Relief Program** | Funding for the repair or reconstruction of federal-aid highways that have suffered serious damage as a result of (1) natural disasters, or (2) catastrophic failures from an external cause | U.S. Department of Transportation (USDOT) | http://www.fhwa.dot.gov/programadmin/erelief.cfm | | | x |
| **Transportation Investment Generating** | Investing in surface transportation infrastructure for roads, bridges, transit, rail, ports or intermodal | USDOT | https://www.transportation.gov/BUILDgrants | | x | x |

| Program | Description | Lead Agency | Link | Regulatory | Technical | Financial |
|---|---|---|---|---|---|---|
| **Economic Recovery (BUILD)** | transportation (replaces previous TIGER program) | | | | | |
| **Emergency Loan Program** | U.S. Department of Agriculture (USDA) Farm Service Agency (FSA) provides emergency loans to help producers recovery from production and physical losses due to drought, flooding, other natural disasters, or quarantine | USDA | https://www.fsa.usda.gov/programs-and-services/farm-loan-programs/emergency-farm-loans/ | | | x |
| **Emergency Watershed Protection (EWP) Program** | Provides assistance to relieve imminent hazards to life and property caused by floods, fires, drought, windstorms, and other natural occurrences | National Resources Conservation Service (NRCS) | https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/ | | x | x |
| **Financial Assistance** | Financial assistance to help plan and implement conservation practices that address natural resource concerns or opportunities to help save energy, improve soil, water, plant, air, animal, and related resources on agricultural lands and non-industrial private forest land | NRCS | https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/ | | x | x |
| **Homeland Security Grant Program** | Supports efforts to build and sustain core capabilities across the five mission areas of Prevention, Protection, Mitigation, Response, and Recovery based on allowable costs | U.S. Department of Homeland Security (DHS) | https://www.fema.gov/homeland-security-grant-program | | x | x |

| Program | Description | Lead Agency | Link | Regulatory | Technical | Financial |
|---|---|---|---|---|---|---|
| **Emergency Management Performance Grant (EMPG) Program** | Assists local, tribal, territorial, and state governments in enhancing and sustaining all-hazards emergency management capabilities | DHS | https://www.fema.gov/emergency-management-performance-grant-program | | x | x |
| **Land and Water Conservation Fund** | Funding allows four federal agencies to acquire and develop private lands for public outdoor recreation areas and facilities and congressional appropriation for matching funds for state and local government land acquisition projects | U.S. Bureau of Land Management, Forestry Service, Fish & Wildlife Service and National Park Service | http://www.lwcfcoalition.org/ | | x | x |
| **Missions and Appropriations** | Federal budget and funding to support USACE missions including research, feasibility studies, construction, and disaster relief | USACE | https://www.usace.army.mil/Missions/ | x | x | x |
| **Flood Risk Management Program** | The program objective is to foster public understanding of the options for dealing with flood hazards and to promote prudent use and management of the Nation's floodplains; types of assistance: 1) General Technical Services, and 2) General Planning Guidance | USACE | https://www.iwr.usace.army.mil/Missions/Flood-Risk-Management/Flood-Risk-Management-Program/ | | x | |
| **Economic Injury Disaster Loans** | Low-interest disaster loans to businesses of all sizes, private nonprofit organizations, homeowners, | SBA | https://www.sba.gov/funding-programs/disaster- | | | x |

| Program | Description | Lead Agency | Link | Regulatory | Technical | Financial |
|---|---|---|---|---|---|---|
| | and renters; Small Business Administration (SBA) disaster loans can be used to repair or replace the following damaged property, equipment, inventory, or other business assets | | assistance/economic-injury-disaster-loans | | | |
| **National Dam Safety Program/High Hazard Potential Dam Grant Program** | The primary purpose of the National Dam Safety Program (NDSP) is to provide financial assistance to the states for strengthening their dam safety programs | FEMA | https://www.fema.gov/emergency-managers/risk-management/dam-safety/grants | | | x |
| **Community Emergency Response Team (CERT)** | Nine-week citizen training program for disaster preparedness and basic disaster response skills for individuals, families, neighborhoods, community organizations, and businesses | Nebraska Emergency Management Agency | https://www.fema.gov/emergency-managers/individuals-communities/preparedness-activities-webinars/community-emergency-response-team | | x | |
| **Nonprofit Organizations (NPOs) Mitigation Funding and Assistance** | | | | | | |
| **ARC Nebraska** | Support services for vulnerable populations: assistance with social services, healthcare, housing, family support, education, and government benefits | The ARC of Nebraska | https://www.arc-nebraska.org/ | | x | x |

| Program | Description | Lead Agency | Link | Regulatory | Technical | Financial |
|---|---|---|---|---|---|---|
| **American Red Cross** | Shelter, food, support, supplies, and direct assistance to populations impacted by disaster | American Red Cross, Nebraska Region | https://www.redcross.org/local/nebraska.html | | x | x |
| **The Nature Conservancy** | Conservation organization partnering with communities, business, government, and other nonprofits to protect ecologically important lands and waters for nature and people | The Nature Conservancy | http://www.nature.org | | x | x |
| **The Trust for Public Land** | Assistance to state and local governments including land conservation transactions, conservation finance, and park design and development | The Trust for Public Land | http://www.tpl.org/services/conservation-finance | | x | x |
| **Public Health Programs** | Provides funding, expertise, information, leadership, and/or connections to specific groups of people for projects addressing priority public health challenges | CDC Foundation | http://www.cdcfoundation.org | | x | X |
| **State Mitigation Funding and Assistance** | | | | | | |
| **Federal Grants: Nebraska Government Grants** | Federal funding distributed to various sectors with the majority in business, education, housing, veteran and personal grants | Various | https://www.usgrants.org/nebraska | | | x |

| Program | Description | Lead Agency | Link | Regulatory | Technical | Financial |
|---|---|---|---|---|---|---|
| **Grants and Contract Opportunities** | Listing of various grants and contract opportunities that support public health objectives in the community (COVID-19 CARES Act funding is available) | Nebraska Department of Health and Human Services | http://dhhs.ne.gov/Pages/Grants-and-Contract-Opportunities.aspx | | | x |
| **Homeland Security Grants** | NEMA is the designated State Administrative Agency (SAA) for all homeland security grants coming into the state from the U.S. Department of Homeland Security | NEMA | https://nema.nebraska.gov/grants.php | | x | x |

## 4.7 Mitigation Action Plan and Status

Table 110 outlines Nebraska's 2026 Mitigation Actions, which serve as a strategic roadmap to reduce risk and enhance resilience across the state. Each action is aligned with specific goals and objectives to address hazards through coordinated planning, sustainable development, public engagement, and targeted investments. This table captures both ongoing initiatives and newly developed actions, identifying their status, responsible agencies, and funding sources. By connecting each action to the state's broader mitigation goals—such as strengthening critical infrastructure, promoting community resilience, and enhancing public awareness—this framework ensures a cohesive and prioritized approach to hazard mitigation across all levels of government and the whole community. All five of the mitigation actions in the previous plan are carried forward into the current plan, listed below in Table 110. There are no actions listed previously that are not carried forward, as all remain relevant.

Table 110: 2026 Mitigation Action Plan and Status

| 2026 Mitigation Action | Action Description | Action Establishment Year | Current Status | Hazard(s) Addressed | Priority | Goal | Objective | Funding Source(s) | Primary Agency | Supporting Agency | 2026 Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **NE1** | Create a Central Repository for Risk Assessment Data. This would promote a comprehensive state hazard mitigation policy framework to coordinate federal, state, and local hazard mitigation planning and program efforts. | 2020 | Carried forward from previous plan | All hazards | Medium | 1 | 1.1 | HMGP | NEMA | | Ongoing |
| **NE2** | Develop a Statewide Acquisition Strategy for Repetitive Loss Properties. This would reduce or eliminate long-term risk to property, including critical facilities and infrastructure, as well as historic and private property. | 2020 | Carried forward from previous plan | Flood | High | 2 | 2.4 | HMGP | NEMA | | Ongoing |
| **NE3** | Promote participation in Hazard Reduction Community Programs. This would promote public awareness of hazards and how to reduce their impacts for all individuals, especially those with functional and access needs. | 2020 | Carried forward from previous plan | All hazards | High | 3 | 3.2 | HMGP | NEMA | | Ongoing |
| **NE4** | Establish floodplain management program for channel migration. This would encourage the development and implementation of long-term, cost-effective, and resilient mitigation projects that preserve or restore the functions of natural systems. | 2020 | Carried forward from previous plan | All hazards | Medium | 4 | 4.2 | FMA | NEMA | | Ongoing |

| 2026 Mitigation Action | Action Description | Action Establishment Year | Current Status | Hazard(s) Addressed | Priority | Goal | Objective | Funding Source(s) | Primary Agency | Supporting Agency | 2026 Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **NE5** | Establish a program to promote building code updates and enforcement. This would build stronger by promoting mitigation actions emphasizing sustainable construction and design measures to reduce or eliminate the impacts of natural hazards. | 2020 | Carried forward from previous plan | Flood, Severe Storms, Tornado | Medium | 5 | 5.1 | HMGP | NEMA | | Ongoing |
| **NE6** | Collaborate with public and private dam owners to evaluate dams where downstream development may have increased, potentially altering the dam's hazard classification. | 2026 | New | Dams | Medium | 5, 6 | 5.6 | HHPD Grant Program and HMGP | DNR | NEMA and Local Emergency Mangers | New |
| **NE7** | Collaborate with local and tribal governments to connect with communities designated as Economically Disadvantaged Rural Communities or Community Disaster Resilience Zones in order to gain deeper insight into their characteristics, needs, and capabilities. Develop and carry out projects aimed at reducing their vulnerabilities and enhancing their resilience. | 2026 | New | All hazards | High | 3 | 3.2 | HMGP | NEMA | NRD's and Tribal Governments | New |
| **NE8** | Offer training, financial assistance, or outreach efforts that promote the adoption and enforcement of building codes, regulations, or incentive programs aimed at enhancing the resilience of new and existing | 2026 | New | All hazards | Medium | 5 | 5.1 | HMGP | NEMA | | New |

| 2026 Mitigation Action | Action Description | Action Establishment Year | Current Status | Hazard(s) Addressed | Priority | Goal | Objective | Funding Source(s) | Primary Agency | Supporting Agency | 2026 Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | structures to natural hazards. Focus these efforts on jurisdictions facing specific hazards to which they are most at risk. | | | | | | | | | | |
| **NE9** | Offer both technical support and financial resources to local and tribal jurisdictions as they develop or update local hazard mitigation plans (LHMPs), and support communities in advancing other related mitigation planning efforts. | 2026 | New | All hazards | Medium | 1 | 1.2 | HMGP | NEMA | | New |
| **NE10** | Identify and implement enhancements to GIS systems or develop new data sources to effectively utilize information provided by external partners. Ensure these efforts support the efficient creation of web-based GIS tools for analysis and shared decision-making across operations. | 2026 | New | All hazards | Medium | 1 | 1.5 | HMGP | NEMA | | New |
| **NE11** | Design and deliver training sessions on mitigation funding to enhance both (1) awareness of available programs and (2) the ability of local and tribal communities to successfully apply for funding opportunities. | 2026 | New | All hazards | High | 3 | 3.1 | HMGP | NEMA | | New |

| 2026 Mitigation Action | Action Description | Action Establishment Year | Current Status | Hazard(s) Addressed | Priority | Goal | Objective | Funding Source(s) | Primary Agency | Supporting Agency | 2026 Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **NE12** | Enhance or maintain the local core capability of community resilience by providing programmatic and technical support through assistance with local hazard mitigation plan (HMP) efforts. | 2026 | New | All hazards | Medium | 1 | 1.2 | HMGP | NEMA | | New |
| **NE13** | Carry out appropriate mitigation measures in collaboration with all-hazards operators who are identified as stakeholders in local hazard mitigation plans. | 2026 | New | All hazards | Medium | 2 | 2.4 | HMGP | NEMA | | New |
| **NE14** | Promote community fire adaption. | 2026 | New | Wildfire | Medium | 4 | 4.2 | HMGP | NEMA | | New |
| **NE15** | Enhance hazard mitigation planning efforts across state, local, and tribal jurisdictions.<br>Objective 1: Strengthen and update the 23 multijurisdictional and tribal hazard mitigation plans to ensure they remain effective tools for integrating broader community planning and risk reduction strategies.<br>Objective 2: Collaborate with local and tribal planning teams to incorporate considerations for climate variability and potential climate change impacts into their hazard mitigation plans.<br>Objective 3: Organize and deliver annual training sessions and/or workshops focused on hazard | 2026 | New | All hazards | Medium | 1, 3 | 1.2, 1.5, 3.1 | HMGP | NEMA | | New |

| 2026 Mitigation Action | Action Description | Action Establishment Year | Current Status | Hazard(s) Addressed | Priority | Goal | Objective | Funding Source(s) | Primary Agency | Supporting Agency | 2026 Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | mitigation planning for emergency managers, first responders, planners, subject matter experts, community partners, and elected officials. | | | | | | | | | | |
| **NE16** | Strengthen and broaden public education efforts to improve awareness of natural hazard risks and climate-related vulnerabilities, while emphasizing the importance of community-wide mitigation and adaptation strategies.<br>Objective 1: Collaborate with subject matter experts and industry leaders to provide engaging and informative hazard mitigation resources, tools, and guidance.<br>Objective 2: Focus outreach activities on reaching vulnerable and underserved populations throughout Nebraska.<br>Objective 3: Work with local and tribal leaders, emergency managers, and the State Hazard Mitigation Team to hold regular plan development meetings and equity mapping sessions aimed at identifying and addressing the needs of underserved communities in mitigation planning.<br>Objective 4: Share public | 2026 | New | All hazards | Medium | 3 | 3.1, 3.2, 3.3 | HMGP | NEMA | | New |

| 2026 Mitigation Action | Action Description | Action Establishment Year | Current Status | Hazard(s) Addressed | Priority | Goal | Objective | Funding Source(s) | Primary Agency | Supporting Agency | 2026 Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | education and awareness materials through both traditional and emerging platforms to improve outreach effectiveness and technology integration.<br>Objective 5: Create strategic outreach channels to connect with organizations that serve underserved populations, using equity mapping data to guide community engagement efforts. | | | | | | | | | | |
| **NE17** | Promote a comprehensive, multi-sectoral mitigation strategy that addresses natural, technological, and adversarial hazards equitably by enhancing the use of grant funding.<br>Objective 1: Regularly align funding priorities with the ranked hazards and threats identified in the 2026 Mitigation Plan.<br>Objective 2: Broaden outreach efforts to prospective grant applicants by offering guidance, resources, and technical support as opportunities become available.<br>Objective 3: Organize annual, cross-disciplinary training sessions to strengthen the quality of grant applications and improve competitiveness for both Hazard Mitigation Assistance (HMA) and other funding opportunities. | 2026 | New | All hazards | Medium | 1, 3 | 1.2, 1.5, 3.1, 3.2 | HMGP | NEMA | | New |

| 2026 Mitigation Action | Action Description | Action Establishment Year | Current Status | Hazard(s) Addressed | Priority | Goal | Objective | Funding Source(s) | Primary Agency | Supporting Agency | 2026 Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Objective 4: Collaborate consistently with emergency managers to support broad community eligibility for grants, with a focus on reaching underserved populations. | | | | | | | | | | |
| **NE18** | Integrate nature-based and climate adaptation strategies into practical, sustainable, and cost-effective mitigation efforts.<br>Objective 1: Partner with state agencies, tribal communities, nonprofits, and private organizations to raise awareness about climate variability and encourage action through public events and educational outreach.<br>Objective 2: Rehabilitate degraded environments using native plant species and science-driven methods to enhance ecological resilience.<br>Objective 3: Support the improvement of natural resources—such as water, soil, and air—through the use of green infrastructure and nature-based practices.<br>Objective 4: Apply sustainable planning, design, environmental management, and engineering techniques that incorporate natural elements into built | 2026 | New | All hazards | Medium | 4 | 4.1, 4.2, 4.4 | HMGP | NEMA | | New |

| 2026 Mitigation Action | Action Description | Action Establishment Year | Current Status | Hazard(s) Addressed | Priority | Goal | Objective | Funding Source(s) | Primary Agency | Supporting Agency | 2026 Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | environments to strengthen resilience and adaptive capacity. | | | | | | | | | | |
| **NE19** | Offer State Direct Technical Assistance (SDTA) with a focus on supporting local project applications and assist communities across the state in obtaining funding for the development and operation of hardened shelters and safe rooms. | 2026 | New | All hazards | High | 5 | 5.4 | HMGP | NEMA | | New |
| **NE20** | Offer technical support for public education and outreach initiatives focused on all-hazards awareness and safety. Efforts should address the effects of drought-related issues, including degraded air and water quality and the spread of vector-borne diseases. | 2026 | New | All hazards | Medium | 3 | 3.1, 3.2, 3.3 | HMGP | NEMA | | New |
| **NE21** | Conduct additional analysis on the impacts of climate change in Nebraska, including changes in the frequency of flooding and other hazard events. This effort will support the state in determining priority areas and populations for targeted mitigation efforts. Share relevant findings—through email or other appropriate channels—with local mitigation plan developers to | 2026 | New | All hazards | High | 1 | 1.5 | HMGP | NEMA | | New |

| 2026 Mitigation Action | Action Description | Action Establishment Year | Current Status | Hazard(s) Addressed | Priority | Goal | Objective | Funding Source(s) | Primary Agency | Supporting Agency | 2026 Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | address information gaps and support informed planning. | | | | | | | | | | |
| **NE22** | Collaborate with the Census Data Center to examine current and projected development patterns at both the state and local levels. This analysis will assist in identifying rapidly growing areas that overlap with hazard-prone zones, which could lead to heightened vulnerability without proper mitigation. It will also improve understanding of at-risk and underserved populations across the state and support efforts to advance equity in disaster mitigation. The state will share pertinent findings—via email or other appropriate channels—with local mitigation plan developers to address data gaps and strengthen planning efforts. | 2026 | New | All hazards | High | 1 | 1.5 | HMGP, HUD, and EDA | NEMA | | New |
| **NE23** | Collaborate with local and tribal governments to engage communities designated as Economically Disadvantaged Rural Communities or Community Disaster Resilience Zones. Work to gain a deeper understanding of their characteristics, needs, and strengths, and develop and implement initiatives aimed at | 2026 | New | All hazards | Medium | 2 | 2.2 | HMGP | NEMA | | New |

| 2026 Mitigation Action | Action Description | Action Establishment Year | Current Status | Hazard(s) Addressed | Priority | Goal | Objective | Funding Source(s) | Primary Agency | Supporting Agency | 2026 Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | lowering risk and building long-term resilience. | | | | | | | | | | |
| **NE24** | Utilize State Disaster Technical Assistance (SDTA) to strengthen local capacity for acquiring and relocating structures located in floodplains and other hazard-prone areas through the development and support of local project applications. | 2026 | New | All hazards | Medium | 2 | 2.2 | FMA and HMGP | NEMA | | New |
| **NE25** | Leverage SDTA to enhance local capabilities in acquiring and relocating structures situated in floodplains or other high-risk areas by supporting the development and implementation of local project applications. | 2026 | New | All hazards | Medium | 2 | 2.2 | HMGP | NEMA | | New |
| **NE26** | Use SDTA to build local capacity for acquiring and relocating structures located in floodplains or other high-risk zones by assisting with the creation and execution of local project applications. | 2026 | New | All hazards | Medium | 2 | 2.2 | HMGP | NEMA | | New |
| **NE27** | Utilize SDTA to promote and support fire risk reduction initiatives—such as fire breaks, fuel breaks, and defensible space projects—between private properties, state-owned facilities, and forested lands through locally developed project applications. | 2026 | New | Wildfire | Medium | 2 | 2.4 | HMGP | NEMA | | New |

| 2026 Mitigation Action | Action Description | Action Establishment Year | Current Status | Hazard(s) Addressed | Priority | Goal | Objective | Funding Source(s) | Primary Agency | Supporting Agency | 2026 Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **NE28** | Utilize SDTA to assist with bank stabilization efforts and the reduction of geohazard risks by supporting the development of local project applications. | 2026 | New | All hazards | Medium | 2 | 2.4 | HMGP | NEMA | | New |
| **NE29** | Utilize SDTA to support enhancements to existing power lines through locally developed project applications. Examples include power line burial, installation of spoilers, strengthening of poles, and the use of heavier-gauge wiring. | 2026 | New | All hazards | Medium | 2 | 2.4 | HMGP | NEMA | | New |
| **NE30** | Facilitate the acquisition of generators through SDTA to provide backup power for critical infrastructure and storm shelters. Ensure regular testing is conducted to maintain readiness and operational preparedness. | 2026 | New | All hazards | Medium | 2 | 2.4 | HMGP | NEMA | | New |
| **NE31** | Utilize SDTA to support and facilitate drainage improvement projects through locally submitted applications, including efforts such as ensuring proper system sizing. | 2026 | New | All hazards | Medium | 5 | 5.3 | HMGP | NEMA | | New |
| **NE32** | Improve and simplify collaboration with the State Historic Preservation Officer, Tribal Historic Preservation Officer (when applicable), and relevant agencies for projects requiring their involvement. | 2026 | New | All hazards | Medium | 1 | 1.2 | HMGP | NEMA | | New |

| 2026 Mitigation Action | Action Description | Action Establishment Year | Current Status | Hazard(s) Addressed | Priority | Goal | Objective | Funding Source(s) | Primary Agency | Supporting Agency | 2026 Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **NE33** | Continue to support public outreach initiatives focused on reducing the impacts of natural hazards. The state will share educational materials and resources through various platforms, including email and social media. | 2026 | New | All hazards | Medium | 3 | 3.2 | HMGP | NEMA | | New |
| **NE34** | Maintain collaboration with local governments to support the development of approvable hazard mitigation plans and qualified mitigation project grant applications. | 2026 | New | All hazards | Medium | 1 | 1.2 | HMGP | NEMA | | New |
| **NE35** | Utilize SDTA to promote and support safer construction practices within local communities to help minimize risks associated with all types of hazards. | 2026 | New | All hazards | Medium | 5 | 5.1 | HMGP | NEMA | | New |
| **NE36** | Provide tribes with information on available funding opportunities for mitigation, public assistance, individual assistance, and Small Business Administration programs to support risk reduction and disaster recovery efforts. | 2026 | New | All hazards | Medium | 3 | 3.2 | Tribal Assistance Programs, HMGP | NEMA | | New |

| 2026 Mitigation Action | Action Description | Action Establishment Year | Current Status | Hazard(s) Addressed | Priority | Goal | Objective | Funding Source(s) | Primary Agency | Supporting Agency | 2026 Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **NE37** | Maintain collaboration with tribal governments to support the creation of approvable hazard mitigation plans and the development of eligible project grant applications. | 2026 | New | All hazards | Medium | 1 | 1.2 | HMGP | NEMA | | New |
| **NE38** | Collaborate with tribal representatives and local planning staff to develop joint initiatives and enhance data sharing efforts. Strengthen engagement with tribal entities specifically in the areas of drought planning and mitigation. | 2026 | New | All hazards | Medium | 1 | 1.5 | HMGP | NEMA | | New |
| **NE39** | Work in partnership with tribes to assess needs and carry out activities that strengthen mitigation capabilities, where appropriate and achievable. | 2026 | New | All hazards | Medium | 2 | 2.4 | HMGP | NEMA | | New |
| **NE40** | Maintain or strengthen the core capability of community resilience at the local level by providing programmatic and technical support through assistance with local hazard mitigation plans. | 2026 | New | All hazards | Medium | 3 | 3.4 | HMGP | NEMA | | New |
| **NE41** | Maintain or enhance the local core capability for Risk and Disaster Resilience Assessment by providing programmatic and technical support through local hazard mitigation plan assistance. | 2026 | New | All hazards | High | 1 | 1.2 | HMGP | NEMA | | New |

| 2026 Mitigation Action | Action Description | Action Establishment Year | Current Status | Hazard(s) Addressed | Priority | Goal | Objective | Funding Source(s) | Primary Agency | Supporting Agency | 2026 Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **NE42** | Maintain a focus on securing consistent and sustainable funding sources to support adaptable community resilience initiatives and ensure continuous updates to the Nebraska Resiliency Framework. | 2026 | New | All hazards | Medium | 1 | 1.2 | HMGP | NEMA | | New |
| **NE43** | Continue seeking funding opportunities to support the implementation of the recommendations outlined in this plan. | 2026 | New | All hazards | Medium | 1 | 1.2 | HMGP | NEMA | | New |
| **NE44** | Create and regularly update an interactive geologic hazards map viewer to support the needs of emergency managers in Nebraska. | 2026 | New | Geological Hazards | High | 1 | 1.5 | HMGP | NEMA | | New |
| **NE45** | Create a public risk communication study. | 2026 | New | All hazards | Medium | 3 | 3.3 | HMGP | NEMA | | New |
| **NE46** | Maintain collaboration with emergency managers to strengthen risk communication strategies for rare or unexpected events. | 2026 | New | All hazards | High | 3 | 3.3 | | NEMA | | New |
| **NE47** | Identify and map geologic hazards in locations where risks to people and infrastructure are highest. Collaborate with local governments to support the adoption and use of these maps. | 2026 | New | Geological Hazards | High | 1 | 1.5 | HMGP | NEMA | | New |

| 2026 Mitigation Action | Action Description | Action Establishment Year | Current Status | Hazard(s) Addressed | Priority | Goal | Objective | Funding Source(s) | Primary Agency | Supporting Agency | 2026 Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **NE48** | Support funding for community-level initiatives—such as creating defensible space, reducing fuels through vegetation management, using ignition-resistant building materials, installing fire suppression systems, and implementing measures to prevent post-wildfire flooding and reduce sediment—to lower wildfire risk to people, property, and infrastructure. | 2026 | New | All hazards | High | 2 | 2.4 | HMGP | NEMA | | New |
| **NE49** | Support local communities and partners in carrying out wildfire mitigation efforts—such as creating defensible space, managing vegetation and fuel loads, using ignition-resistant materials, installing fire suppression systems, and implementing measures to prevent post-wildfire flooding and reduce sediment—in order to decrease their risk and vulnerability to wildfire hazards. | 2026 | New | Wildfires | High | 2 | 2.4 | HMGP | NEMA | | New |
| **NE50** | Enhance risk assessments in local hazard mitigation plans by incorporating estimates of potential structural losses associated with each identified natural hazard. | 2026 | New | All hazards | High | 1 | 1.5 | HMGP | NEMA | | New |

| 2026 Mitigation Action | Action Description | Action Establishment Year | Current Status | Hazard(s) Addressed | Priority | Goal | Objective | Funding Source(s) | Primary Agency | Supporting Agency | 2026 Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **NE51** | Communities, counties, and governments need to plan for management of wastes that occur from natural disasters (tornadoes, floods, high winds, wildfires), accidents, bad actors (internal and external), and infrastructure failures. | 2026 | New | All hazards | High | 3,4,5 | 3.1, 3.2, 3.3, 4.2, 4.3, 5.1, 5.2, and 5.5 | HMGP | NEMA | | New |
| **NE52** | Develop statewide standard administrative procedures for floodplain development permit review at the local level. | 2026 | New | Flood | High | 1, 2, 3, 5 | | Community Assistance Program | Nebraska Department of Natural Resources Floodplain Division | | New |
| **NE53** | Provide agency specific floodplain development permit training to agencies that are active in development activities/projects across the state. Target agencies include: DOT, NGPC, DED, NEMA, DEE, DAS. | 2026 | New | Flood | High | 1, 2, 3, 4, 5 | | CAP SSSE | Nebraska Department of Natural Resources Floodplain Management Division | | New |
| **NE54** | Initiate quarterly meetings between mitigation/development grant administering agencies: NEMA, DED, DNR/DEE. | 2026 | New | Flood, Levee, Severe Winter Storms, Severe Thunderstorm, Tornado, Power and Infrastructure Failure | High | 1, 2, 4, 5 | | HMGP, FMA | Nebraska Department of Natural Resources Floodplain Management Division | | New |
| **NE55** | Promote enrollment of communities into the NFIP Community Rating System through training and annual | 2026 | New | Flood | Medium | 3, 4, 5 | | Community Assistance Program | Nebraska Department of Natural Resources | | New |

| 2026 Mitigation Action | Action Description | Action Establishment Year | Current Status | Hazard(s) Addressed | Priority | Goal | Objective | Funding Source(s) | Primary Agency | Supporting Agency | 2026 Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | outreach, incentivizing the adoption of higher standards for floodplain development, and reducing the cost of flood insurance of property owners. | | | | | | | | Floodplain Management Division | | |
| **NE56** | Provide training related to the adoption of local higher standards for floodplain development. | 2026 | New | Flood | Medium | 2, 4, 5 | | CAP SSSE | Nebraska Department of Natural Resources Floodplain Management Division | | New |
| **NE57** | Release Nebraska's new Model Floodplain Management Ordinance and coordinate with community stakeholders interested in updating local floodplain regulations. | 2026 | New | Flood | Medium | 2, 4, 5 | | CAP SSSE | Nebraska Department of Natural Resources Floodplain Management Division | | New |
| **NE58** | Provide regular reminder to state agencies as to how and when to contact NeDNR with floodplain development questions. Target agencies include: DOT, NGPC, DED, NEMA, DEE, DAS. | 2026 | New | Flood | High | 1, 2, 3, 4, 5 | | CAP SSSE | Nebraska Department of Natural Resources Floodplain Management Division | | New |
| **NE59** | Create and distribute NFIP informational materials to realtors and realtor groups. | 2026 | New | Flood | High | 3, 5 | | Community Assistance Program | Nebraska Department of Natural Resources | | New |

| 2026 Mitigation Action | Action Description | Action Establishment Year | Current Status | Hazard(s) Addressed | Priority | Goal | Objective | Funding Source(s) | Primary Agency | Supporting Agency | 2026 Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **NE60** | Provide training on and assist communities with the creation of local Substantial Damage Management Plans, including the development of local databases tracking flood-prone addresses, and the identification of potential mitigation actions for at-risk properties. | 2026 | New | Flood | Medium | 2, 4, 5 | | CAP SSSE | Nebraska Department of Natural Resources Floodplain Management Division | | New |
| **NE61** | Create a database of critical infrastructure by type, location, and community lifeline that could potentially be impacted by a HHPD. | 2026 | New | Dams | Medium | 5, 6 | 5.6 | HHPD Grant Program and HMGP | DNR | NEMA and Local Emergency Mangers | New |
| **NE62** | Work with local governments that own HHPDs to conduct feasibility studies. These studies will determine appropriate actions that can be taken to improve dams to satisfactory condition, taking into account current deficiencies. | 2026 | New | Dams | High | 5, 6 | 5.6 | HHPD Grant Program and HMGP | DNR | NEMA and Local Emergency Mangers | New |
| **NE63** | Work with the local government owner of Valentine Mill Pond Dam to develop a dam emergency action plan. This plan will outline the process of responding to a dam failure, potential points of failure, and the inundation zone in the event of a dam failure. | 2026 | New | Dams | High | 5, 6 | 5.6 | HHPD Grant Program and HMGP | DNR | NEMA and Local Emergency Mangers | New |

| 2026 Mitigation Action | Action Description | Action Establishment Year | Current Status | Hazard(s) Addressed | Priority | Goal | Objective | Funding Source(s) | Primary Agency | Supporting Agency | 2026 Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **NE64** | Conduct outreach to private dam owners to discuss potential mitigation actions they can take to prevent dam failures. The state will provide dam owners with information on state and federal funding opportunities and expertise that can support mitigation actions on their dams. | 2026 | New | Dams | High | 5, 6 | 5.6 | HHPD Grant Program and HMGP | DNR | NEMA and Local Emergency Mangers | New |
| **NE65** | Work with public utilities that own HHPDs to conduct feasibility studies. These studies will determine appropriate actions that can be taken to improve dams to satisfactory condition, taking into account current deficiencies. | 2026 | New | Dams | High | 5, 6 | 5.6 | HHPD Grant Program and HMGP | DNR | NEMA and Local Emergency Mangers | New |
| **NE66** | Meet yearly with federal agencies in charge of dam operations and the counties where they are located to discuss any possible mitigation actions that can be taken to reduce dam failure risk. Ensure that local governments downstream of each dam understand the risks and the emergency procedures to follow in the event of a dam failure. | 2026 | New | Dams | High | 5, 6 | 5.6 | HHPD Grant Program and HMGP | DNR | NEMA and Local Emergency Mangers | New |

# 5.0 Mitigation Capabilities

## 5.1 Overview

A thorough evaluation of the state's existing capabilities for risk reduction measures and developing community resilience is an essential step in the hazard mitigation process. After the risk assessment, the capability assessment helps inform the state about which mitigation actions are feasible. A deeper understanding of state and local hazard mitigation capabilities helps the state develop risk-based, capability-informed mitigation actions that are comprehensive and feasible given current capabilities.

Mitigation capabilities are traditionally divided into four categories:

- **Planning and Regulatory:** State plans, programs, statutes, or regulations that could affect the state's resilience to future hazard events and other future conditions, including climate change. This includes plans and regulations that guide growth and development.
- **Administrative and Technical:** State staff, skills, and tools that can be utilized for hazard mitigation planning and reducing risk through mitigation projects. These capabilities can belong both to state agencies and departments as well as academic partners, county and regional quasi-governmental or nongovernmental organizations, non-profits, private organizations, and community-based organizations.
- **Financial:** Resources to fund mitigation actions. This includes state, federal, private, or non-profit resources that may be able to support risk reduction.
- **Education and Outreach:** Programs and methods of communication that communicate risk, support mitigation actions, and encourage risk reduction. This includes technical assistance, training, and education and awareness campaigns that build capacity.

Capabilities can also be classified as pre-disaster and post-disaster mitigation capabilities. Pre-disaster capabilities include activities such as training staff, educating the public about their risk and how to mitigate it, and successfully applying for annual mitigation grants. Post-disaster capabilities include adhering to substantial damage assessment requirements, educating the public on how to build back better, and successfully applying for grants that are available only after a disaster. Due to the nature of disaster events, both types of capabilities are often needed to be employed simultaneously. Figure 111 displays the four categories of mitigation capabilities:

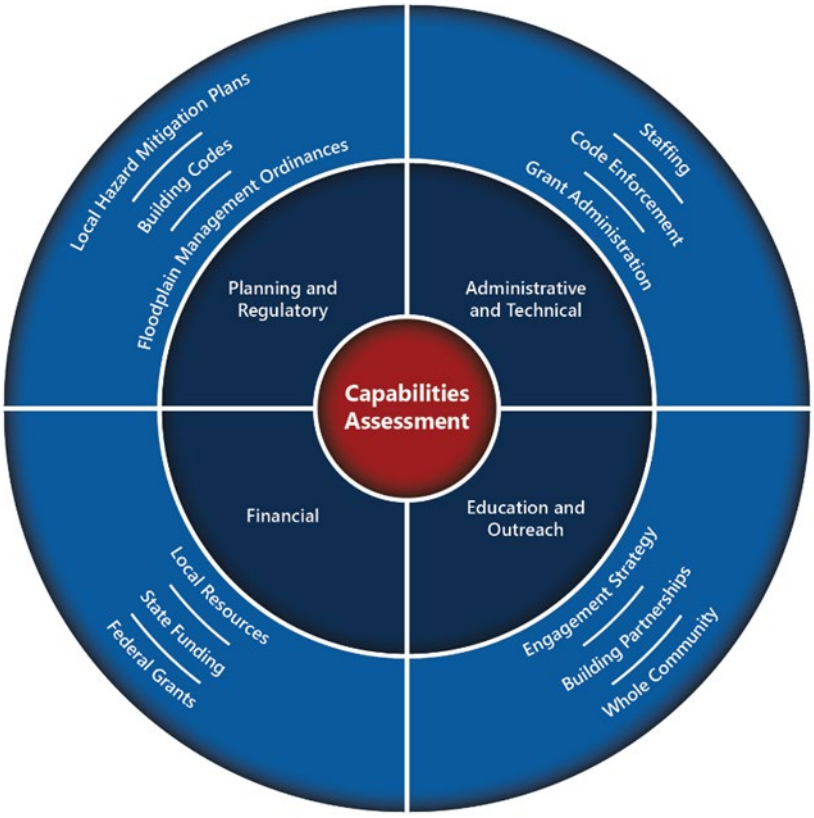



**Figure 111: Hazard Mitigation Capabilities**

# 5.2 State Capability Assessment

The assessment of mitigation capabilities is the next step after assessing hazard risk. An understanding of state and local government capabilities is necessary to develop a comprehensive mitigation strategy. A capabilities assessment shows how a program, policy, regulation, or practice contributes to a statewide mitigation program, but also addresses areas in which the state needs to strengthen its capabilities by providing applicable limitations. Additionally, the discussion of state capabilities is extended to provide an overview of how they address development in hazard-prone areas to emphasize changes in capabilities since the previous plan. Additional discussion on state government capabilities includes what funding mechanisms and outreach programs are in place to improve capabilities and implement the mitigation strategy.

## 5.2.1 Planning and Regulatory Capabilities

#### 5.2.1.1 STATE STATUTES, REGULATIONS, AND PROGRAMS

Table 111 reflects the statutes, regulations, and programs that are implemented in the state that relate to hazard mitigation efforts.

Table 111: Statute, Regulations, and Programs

| Statute, Regulation, or Program | Agency | Description |
|---|---|---|
| **Article XI-5, Nebraska State Constitution** | Cities | Allows for cities of more than 100,000 to adopt home rule charters, by majority vote of qualified electors. This permits a city to be independent of state legislation where strictly municipal matters are concerned. As an example, cities and counties are the entities responsible for the prevention of development in hazard-prone areas. |
| **Nebraska Revised Statute 71-6403** | State Building Code Official, local jurisdiction | Creation of the state building code. The Legislature hereby adopts by reference:<br>(a) The International Building Code (IBC), 2018 edition, except section 101.4.3 and chapter 29, published by the International Code Council. |
| **Nebraska Revised Statute 81-829** | Nebraska Emergency Management Agency (NEMA) | Establishes the authorities and responsibilities of the state's emergency management agency, maintained in the office of the Adjutant General. Responsibilities include assisting local governments and cooperating with federal government and any public or private agency or entity in achieving any purpose of the act and in implementing programs that include disaster mitigation. |
| **RRS §81-829.31 to §81.829.73 Nebraska Emergency Management Act** | NEMA | The Nebraska Emergency Management Act is the foundation of the Nebraska Emergency Management Agency. Effective July 19, 1996, the purpose of the Emergency Management Act is to reduce vulnerabilities pertaining to people and the community in the state of life by providing an emergency management system that includes all aspects of preparedness, response, recovery, and mitigation.<br>• The Nebraska Emergency Management Act authorizes the coordination of mitigation activities within the state and assistance in mitigation and prevention of disasters. The act addresses pre-disaster mitigation, post-disaster mitigation, and development in hazard prone areas.<br>• For pre-disaster mitigation, "the governor shall consider, on a continuing basis, steps that could be taken to prevent or reduce the harmful consequences of disasters, emergencies, and civil defense emergencies" (§81-829.43). It also provides the governor with the power to make recommendations for mitigation projects.<br>• This act also gives power to NEMA and other state agencies to study and monitor vulnerable |

| Statute, Regulation, or Program | Agency | Description |
|---|---|---|
| | | areas and then pursue appropriate mitigation actions.<br>• Section 81-829.42 of the Nebraska Emergency Management Act lists appropriate post-disaster mitigation actions such as clearing debris and provides for "other measures as are customarily necessary to furnish adequate relief in cases of disaster, emergency, or civil defense emergency." |
| **Title 173 Communicable Disease, Chapter 6, Directed Health Measures to Prevent or Limit the Spread of Communicable Disease, Illness, or Poisoning, dated February 21, 2017** | Nebraska Department of Health and Human Services | Policy for the state's authority to prevent, limit, or slow the spread of communicable diseases. This regulatory document includes criteria and procedures to mitigate spread by ordering quarantine or isolation as a Directed Health Measure that may be targeted to "an individual, group of individuals, or a population, or directed to the public at large in regard to identified premises or activities, and public and private property including animals." |
| **RRS §2-1501 to §2-15,106 Operation of the Department of Natural Resources** | Nebraska Department of Natural Resources | The statutes identify the goals, rules, regulations, policies, and procedures pertaining to the protection and conservation of the state's land and water resources. Included within the literature is the assistance provided by the state for soil and water conservation and flood control needs as well as the conditions to the available assistance. The statues of the Nebraska Natural Resources Commission (§2-1504.) list the creation, functions, membership, selection, number of terms, and vacancies of the commission. The existences of such statues are important to the capabilities of the state to protect its valuable resources that cannot otherwise protect themselves. Protecting these resources in turn leads to the protection of Nebraska's population from disaster damages and the impact they have on communities. |
| **RRS §31-1001 to §31-1023 State Floodplain Management Program** | Nebraska Department of Natural Resources | • The legislature finds that recurrent flooding in various areas of the state presents serious hazards to the health, safety, welfare, and property of the people of the state, both within and outside such areas. The hazards include loss of life, loss of and damage to private and public property, disruption of lives and of livelihoods, interruption of commerce, transportation, communication, and governmental services, and unsanitary and unhealthy living and environmental conditions. The wise use of land subject to flooding is a |

| Statute, Regulation, or Program | Agency | Description |
|---|---|---|
| | | matter of state concern. The legislature further finds that the establishment of improved flood plain management practices and the availability of financial assistance to citizens of the state whose property is damaged during times of flooding are essential to the health, safety, and general welfare of the people of Nebraska.<br>• The purposes of sections 31-1001 to 31-1023 shall be to:<br>› Accelerate the mapping of flood-prone areas.<br>› Assist local governments in the promulgation and implementation of effective floodplain management regulations and other floodplain management practices.<br>› Assure that when state lands are used and state-owned and state-financed facilities are located and constructed, flood hazards are prevented, flood losses are minimized, and the state's eligibility for flood insurance is maintained.<br>› Encourage local governments with flood-prone areas to qualify for participation in the national flood insurance program. |
| **RRS §2-3201 to §2-3281 Operations of the Natural Resources District** | Nebraska Natural Resources Commission | The statutes discuss the essentiality of natural resources protection within the state and therefore created Natural Resource Districts as the most efficient way of managing these resources. There are 23 Natural Resource Districts in Nebraska and by state statute they are responsible for the conservation, protection, development, and management of the state's natural resources. The state's Natural Resource Districts have been taken the lead in creating multijurisdictional hazard mitigation plans in their areas of the state. |
| **RRS §19-901 and §23-114 Municipal Zoning** | Municipalities | Section §19-901 gives the legislative bodies in cities of the first and second class and in villages the power to adopt zoning regulations. The powers can only be exercised after a planning commission has been established by the municipal legislative body and a recommended comprehensive development plan has been received. The purpose of such is to promote the health, safety, morals, or the general welfare of the community. The zoning regulations adopted by legislative bodies may regulate and restrict the height, number of stories, |

| Statute, Regulation, or Program | Agency | Description |
|---|---|---|
| | | and size of buildings and other structures; the percent of a lot that may be occupied; the size of yards, courts, and other open spaces; the density of population; and the location and use of buildings, structures, and land for trade, industry, residence, or other purposes. Again, this can only be done after the planning commission has been created and a comprehensive development plan completed. §19-903 regulates what must be included in said comprehensive development plan. Regulations for the plan are designed to "lessen congestion in the streets; to secure safety from fire, panic and other dangers; promote the health and general welfare; to provide adequate light and air; to prevent the overcrowding of land; to secure safety from flood; to avoid undue concentration of population; to facilitate the adequate provision of transportation, water, sewage, schools, parks, and other public requirements; to protect property against blight and depreciation; to protect tax base; to secure economy in governmental expenditures, and to preserve, protect, and enhance historic buildings, places, and districts." The existence of these statutes enhances the ability of local communities to prevent building in hazardous areas and relates to the goals and objectives of this plan. Section §23-114 gives the county board powers to create a planning commission and implement a county comprehensive development plan with regulations and restrictions. |
| **RRS §-1601 to 46-1670** | Nebraska Department of Natural Resources (NeDNR) | The Safety of Dams and Reservoirs Act requires NeDNR to regulate dams in Nebraska to protect life and property from dam failure. NeDNR maintains an inventory of dams in Nebraska and conducts routine dam safety inspections. High hazard potential dam owners are required to develop and update emergency action plans for their dams. |
| **RRS §-13-1901-131907** | National Regional Officials Council (NROC) | NROC is the statewide organization of Nebraska's eight Economic Development Districts. These professional organizations represent the entire state and are committed to enhancing the communities and businesses within each region. Economic Development Districts are engaged in a variety of activities including community development, business development, housing development, and transportation planning. |

| Statute, Regulation, or Program | Agency | Description |
|---|---|---|
| **Nebraska Revised Statutes 72-804 and 72-805** | Nebraska Department of Environment and Energy | "The Legislature hereby adopts the 2018 International Energy Conservation Code published by the International Code Council as the Nebraska Energy Code. The Director of Environment and Energy may adopt regulations specifying alternative standards for building systems, techniques, equipment designs, or building materials that shall be deemed equivalent to the Nebraska Energy Code. Regulations specifying alternative standards may be deemed equivalent to the Nebraska Energy Code and may be approved for general or limited use if the use of such alternative standards would not result in energy consumption greater than would result from the strict application of the Nebraska Energy Code." |
| **Strategic National Stockpile** | Nebraska Department of Health and Human Services | In 1999, Congress charged the Department of Health and Human Services and the Centers for Disease Control and Prevention with the establishment of the National Pharmaceutical Stockpile. The mission was to provide a resupply of large quantities of essential medical material to states and communities during an emergency within 12 hours of the federal decision to deploy. The program distributes medicine and medical supplies in the event of a disaster. These items often come from the Strategic National Stockpile (SNS), a supply of emergency items. The SNS supplies antibiotics, vaccines, antitoxins, chemical antidotes, and medical/surgical items. SNS materials are designed to supplement and resupply state and local public health resources, as well as other healthcare agencies, in the event of a national emergency. |
| **National Flood Insurance Program (NFIP)** | NeDNR | Congress established NFIP in 1968 due to a lack of available private insurance and increased federal costs to repair flood damage. Local capabilities for flood mitigation vary widely across the state with this variability largely due to population levels and funding levels. Larger cities such as Lincoln, Omaha, Norfolk, Columbus, Fremont, and Grand Island have large resources. Smaller communities and counties share limited resources for floodplain management and emergency management in general. Implementation of mitigation projects in these areas is often difficult.<br>As of January 13, 2025, 432 communities participate in NFIP. Of these participating communities, eight jurisdictions (1%)—Lincoln, Scottsbluff, Papillion, Omaha, Fremont, Valley, |

| Statute, Regulation, or Program | Agency | Description |
|---|---|---|
| | | Waverly, and Waterloo—participate in the Community Rating System by meeting higher standards of floodplain management. This scale rates 1–10 with 1 being the best. Lincoln rates at class 5 with Omaha and Papillion at class 7. Fremont and Scottsbluff are at class 8 and Waverly, Valley, and Waterloo are at class 9. |
| **Firewise Communities** | Nebraska Forest Service | The Firewise Communities Program is a voluntary program that helps protect people, property, and nature from wildland fires. It involves agencies, homeowners, and community leaders and emphasizes responsibility for safer homes and communities. |

#### 5.2.1.2 STATE PLANS

Table 112 reflects plans in the state that relate to hazard mitigation efforts.

**Table 112: State Plans**

| Plans | Lead Agency | Involvement in Hazard Mitigation | Last updated? When will it be updated? |
|---|---|---|---|
| **Nebraska Hazard Mitigation Administrative Plan** | Nebraska Emergency Management Agency (NEMA) | The administrative plan serves to outline the processes and standards the state will use to administer the Hazard Mitigation Grant Program for a major disaster declaration as mandated by 44 CFR part 206.437. | Annually and after any disaster declaration |
| **State Emergency Operations Plan** | NEMA | The State Emergency Operations Plan (EOP) outlines the coordination and response framework for disasters while integrating mitigation strategies to reduce future risks. It identifies critical infrastructure, resources, and procedures needed to protect lives and property before, during, and after emergencies. By aligning with the Hazard Mitigation Plan, the EOP ensures a seamless transition from immediate response to long-term recovery and risk reduction, promoting community resilience. | Updated every 5 years |

| Plans | Lead Agency | Involvement in Hazard Mitigation | Last updated? When will it be updated? |
|---|---|---|---|
| **Nebraska Flood Hazard Mitigation Plan** | Nebraska Department of Natural Resources (NeDNR) | A Flood Hazard Mitigation Plan is a specialized component of hazard mitigation that focuses on identifying and reducing risks associated with flood events. It outlines strategies such as floodplain management, infrastructure improvements, and natural flood prevention methods to minimize damage to lives, property, and critical facilities. By aligning with broader hazard mitigation efforts, the plan ensures that flood-specific actions are integrated into a comprehensive approach to community resilience and disaster risk reduction.<br>The Nebraska State Hazard Mitigation Plan (SHMP) presents four state-level Mitigation Goals that address broad local initiatives as well as problem areas identified after the 2019 flooding event:<br>1. Promote a comprehensive state hazard mitigation policy framework to coordinate federal, state, and local hazard mitigation planning and program efforts.<br>2. Reduce or eliminate long-term risk to property, including critical facilities and infrastructure, historic, and private property.<br>3. Promote public awareness of hazards and how to reduce their impacts.<br>4. Encourage the development and implementation of long-term, cost effective, and resilient mitigation projects that preserve or restore the functions of natural systems.<br>The SHMP considers flood risk reduction projects identified in local hazard mitigation plans. | Last updated June 30, 2022 |
| **Nebraska Integrated Preparedness Plan (IPP)** | NEMA | An IPP is integrated into hazard mitigation by aligning training, exercises, and planning efforts with strategies to reduce disaster risks. The IPP ensures that hazard mitigation priorities, such as infrastructure resilience and risk assessment, are included in preparedness activities to build community capacity. This integration | Annual review |

| Plans | Lead Agency | Involvement in Hazard Mitigation | Last updated? When will it be updated? |
|---|---|---|---|
| | | creates a cohesive approach where mitigation actions are informed by preparedness insights, enhancing both disaster readiness and long-term risk reduction. | |
| **Continuity of Operations (COOP) Plans** | Administrative Services, Agriculture, Banking and Finance, Office of the Chief Informational Officer, Correctional Services, Parole Board, Economic Development, Education, Labor, Motor Vehicles, Natural Resources, Transportation. Veterans Affairs, Environment and Energy, Health and Human Services, Insurance, Military, Revenue, Fire Marshal, State Patrol, Emergency Management | A COOP Plan is an integral component of the State Hazard Mitigation Plan, ensuring operational resilience during and after disasters. By aligning COOP strategies with hazard mitigation goals, the state enhances its ability to reduce risks and maintain critical functions. This coordination supports a comprehensive approach to preparedness, strengthening both immediate response capabilities and long-term resilience. | 2018, 2024, 2024, 2024, 2022, 2021, 2020, 2020, 2024, 2020, 2020, 2020, 2024, 2024, Unknown, 2023, Unknown, 2023, Unknown, Under development, and Unknown |
| **Nebraska Priority Climate Action Plan** | Nebraska Department of Environment and Energy | A Priority Climate Action Plan is integrated with hazard mitigation by addressing the impacts of climate change that exacerbate natural hazards, such as rising temperatures, extreme weather, and sea level rise. The plan focuses on reducing greenhouse gas emissions and enhancing adaptive strategies, which align with hazard mitigation goals to reduce vulnerabilities and build resilience. By incorporating climate projections into mitigation planning, communities can implement sustainable, forward-thinking measures to protect infrastructure, ecosystems, and populations from future climate-related disasters. | 2024 |

| Plans | Lead Agency | Involvement in Hazard Mitigation | Last updated? When will it be updated? |
|---|---|---|---|
| **Comprehensive Action Plan** | Nebraska Department of Environment and Energy | The Comprehensive Action Plan from the Department of Environment and Energy integrates with hazard mitigation by addressing environmental sustainability and energy resilience in disaster planning. It incorporates strategies such as renewable energy development, ecosystem restoration, and pollution reduction, which align with hazard mitigation goals to reduce risks and enhance community resilience. By coordinating efforts, the plan ensures that energy and environmental priorities are embedded in mitigation projects, supporting sustainable solutions that protect infrastructure and natural resources from future hazards. | Will be updated by December 2025 |
| **Nebraska Drought Management Plan** | NeDNR | The Drought Management Plan integrates with the Hazard Mitigation Plan by addressing strategies to reduce vulnerabilities to prolonged periods of water scarcity. It identifies actions such as water conservation, sustainable agricultural practices, and improved water storage systems that align with hazard mitigation goals to minimize the impact of droughts on communities and ecosystems. By incorporating drought-specific risks and mitigation strategies, the plans work together to enhance resilience and ensure long-term water resource sustainability in the face of future drought events. | 2000 |
| **Nebraska Energy Security Plan** | Nebraska Department of Environment and Energy | Nebraska's Energy Security Plan is a comprehensive operating manual for state government leaders charged with the responsibility of ensuring the health and safety of its citizens during periods of energy emergencies. This plan is updated annually and submitted to Nebraska's governor for review. The governor sends a letter to the U.S. Department of Energy certifying that he has reviewed the plan and whether or not he has determined that the plan is in compliance with the U.S. Department of Energy's requirements. | Updated annually, Submitted to the Department of Energy on 9/30/2024 |

| Plans | Lead Agency | Involvement in Hazard Mitigation | Last updated? When will it be updated? |
|---|---|---|---|
| **Community Wildfire Protection Plans** | Nebraska Fire Service | Community Wildfire Protection Plans gathers together each community's resources to enhance wildfire mitigation and preparedness. This plan is geographically located around the state in the Community Wildfire Protection Plan regions. | Depending on area in the state |
| **Nebraska Debris Management Plan** | Nebraska Department of Environment and Energy and NEMA | The Nebraska Debris Management Plan is closely integrated with the state's Hazard Mitigation Plan to enhance disaster preparedness, response, and long-term resilience. The debris management plan outlines strategies for the efficient removal, recycling, and disposal of debris generated by disasters such as floods, tornadoes, and severe storms. This integration with hazard mitigation ensures that debris-related activities address vulnerabilities and reduce future risks. | 2018 |
| **Economic Community Development Consolidated Plan** | Nebraska Department of Economic Development | The Economic and Community Development Consolidated Plan is a strategic framework used by states and local governments to prioritize funding for housing, infrastructure, and community development projects, particularly for underserved areas. Its involvement in hazard mitigation stems from its focus on creating sustainable, resilient communities that can withstand future disasters. | Updated every 5 years, next plan will be from 2025 to 2029 |
| **Long-Term Recovery Plan** | NEMA | The integration of these plans ensures that recovery efforts align with mitigation priorities, avoiding rebuilding in hazard-prone areas and implementing resilient infrastructure designs. By coordinating both plans, Nebraska can prioritize mitigation projects during recovery, such as upgrading building codes, improving drainage systems, and fostering community resilience, ultimately reducing vulnerability to future disasters. | July 2020 |
| **Nebraska Statewide Forest Action Plan** | Nebraska Fire Service | Nebraska's Forest Action Plan – 2020 represents a multiyear effort by Nebraska Forest Service staff to ensure trees continue to play a role in the lives of all Nebraskans. It includes assessments in | 2020, 2025 |

| Plans | Lead Agency | Involvement in Hazard Mitigation | Last updated? When will it be updated? |
|---|---|---|---|
| | | locations considered to be priority forested areas; the strategies that will be implemented to address the challenges that exist; and, how the agency's resources will coalesce to bring the state's trees and forests to a healthy and sustainable condition. | |

## 5.2.2 Administrative and Technical Capabilities

Administrative capabilities are determined by evaluating whether there is an adequate number of personnel to complete mitigation activities. Technical capabilities show the ability for the state to develop and implement mitigation projects, policies, and programs is contingent upon its staff and resources.

### 5.2.2.1 STATE AGENCIES AND QUASI-STATE ENTITIES

Many agencies share the responsibility of hazard mitigation. Table 113 displays agencies that play an important role in hazard mitigation and emergency management in Nebraska.

**Table 113: State Agencies and Quasi-State Entities Involved in Hazard Mitigation**

| Agency | Purpose and Programs |
|---|---|
| **Nebraska Emergency Management Agency (NEMA)** | • NEMA is charged by state statute to reduce the vulnerabilities of the people and communities of Nebraska from the damage, injury, loss of life, and loss of property resulting from natural, technological, or manmade emergencies and disasters. NEMA is the lead agency, along with Nebraska Department of Natural Resources (NeDNR), for the agencies in the Governor's Task Force for Disaster Recovery (GTFDR), who work together to pursue appropriate mitigation actions.<br>• The recovery section of NEMA serves as the focal point for state recovery and mitigation efforts by reviewing and monitoring mitigation projects across the state. It also manages the Public Assistance Grant Program (PA), Hazard Mitigation Grant Program (HMGP), and Pre-Disaster Mitigation Grant (PDM). High Hazard Potential Grant (HHPD). |
| **NeDNR** | • Under **Article 10, Section 31 of the Floodplain Management Statute**, NeDNR has authority for all matters pertaining to floodplain management, including the coordination of the National Flood Insurance Program.<br>• NeDNR administers the flood mitigation programs authorized by the National Flood Insurance Reform Act of 1994 and by the Flood Insurance Reform Act of 2004 including the **Flood Mitigation Assistance (FMA) Grant.** NeDNR receives and approves planning grant applications, recommends projects for FEMA approval, coordinates and participates in all activities concerning flood mitigation plans, and completes all required financial and performance reports for all FMA grants. |

| Agency | Purpose and Programs |
|---|---|
| | • NeDNR contributes to state mitigation planning efforts by researching past flooding disasters, recognizing areas of high vulnerability, making informed predictions of potential flooding issues, and providing **technical assistance to communities** on flood hazard mitigation.<br>• NeDNR also works closely with Nebraska's Natural Resources Districts, the entities that sponsor or assist with the funding of many mitigation projects and plans across the state. NeDNR receives federal funding and can help local jurisdictions with mitigation planning and floodplain mapping.<br>• NeDNR has been in FEMA's **Coordinating Technical Partnership (CTP) program** since August 1999. Through this agreement, NeDNR has been able to map unstudied areas in the State of Nebraska, providing flood hazard data that was not available before. See NeDNR's CTP Business Plan for the State of Nebraska Floodplain Mapping Strategy: https://dnr.nebraska.gov/sites/default/files/doc/floodplain/Floodplain-Mapping/FY2024_Business_Plan.pdf<br>• NeDNR provides state coordination for the **National Flood Insurance Program (NFIP)**. NeDNR is required by state statute to encourage participation in the NFIP, and promote safe building in floodplains. NeDNR also promotes the Community Rating System (CRS) program to communities so they can be rewarded for the floodplain management activities they do in their communities. The **CRS** program rewards participating jurisdictions with reduced flood insurance premiums in exchange for going above and beyond the minimum NFIP requirements. Participating in CRS promotes economic resiliency by making flood insurance more affordable, while restricting development within regulatory floodplains limits actual flood damages.<br>• NeDNR manages the state Dam Safety Program, which regulates the construction, operation, and maintenance of dams statewide. NeDNR maintains an online interactive map that can be used to locate any dams in the state by name, National Inventory of Dams ID number, county, or downstream town. |
| **Nebraska Department of Administrative Services (NDAS) – Risk Management** | • NDAS manages **insurance purchase/self-insurance of state-owned property**, maintaining a database of state-owned properties for state agencies and insured assets. This allows agencies to see how many insured resources are vulnerable to specific hazards, such as flood.<br>• During disasters, the agency captures losses to state-owned and managed properties. |
| **Nebraska Department of Agriculture** | • The Department of Agriculture provides disaster support that includes connecting producers with the Farm Service Agency and the U.S. Department of Agriculture's **Natural Resources Conservation Service (NRCS).** The NRCS provides financial and technical assistance to farmers, ranchers and forest landowners, and other private landowners and managers.<br>• The agency **protects critical infrastructure, preserving natural resources and reducing vulnerabilities**.<br>• The agency conducts internal **tracking of agriculture-related damages and losses** during disasters. |
| **Nebraska Department of Economic** | • NDED administers the Community Development Block Grant (CDBG), which provides grants to the state for communities to use in revitalizing neighborhoods, expanding housing, economic opportunities, and community facilities. These |

| Agency | Purpose and Programs |
|---|---|
| **Development (NDED)** | funds can be used to incorporate pre-disaster mitigation activities into communities as they address needs and issues creating a more resilient community. Additionally, CDBG funds may be used for the local match on Hazard Mitigation Assistance (HMA) projects.<br>• The state receives funds as a Participating Jurisdiction from the National Housing Trust Fund (HTF) and the NDED is the administering agency.<br>• NDED serves three core sectors of development: business, community, and housing. In support of its mission, NDED administers state and federal aid, including the State Program for CDBG, which makes grants available to local governments for strategic investments in residential areas. These federal funds can be used for mitigation activities, addressing needs in support of more resilient communities, and may be used for the local match on FEMA HMA projects. Additionally, when funds are appropriated by Congress to address a specific major disaster, the NDED also administers the CDBG for Disaster Recovery (CDBG-DR) program.<br>• CDBG and CDBG-DR are made available to the state through the U.S. Department of Housing and Urban Development.<br>• NDED also administers state and federal funding to support affordable housing development throughout the state. |
| **Nebraska Department of Environment and Energy (NDEE)** | • Formerly the Nebraska Department of Environmental Quality and the Nebraska Energy Office, the two agencies were merged in July 2019. The NDEE coordinates with the U.S. Environmental Protection Agency to regulate, monitor, protect, preserve, and enhance the state's air, land, and water resources. The NDEE also coordinates with the U.S. Department of Energy to monitor the state's energy resources.<br>• The agency has broad mitigation capabilities related to its authorities, including oversight of hazardous materials mitigation, water and wastewater facilities, monitoring/permitting related to air quality, disaster debris management, implementation of local weatherization programs, and low-interest loans to upgrade and improve energy efficiency. |
| **Nebraska Forest Service (NFS)** | • As a component of the University of Nebraska, the Nebraska Forest Service provides education, resources, and funding to Nebraskans. This includes mitigation activities involving fuel reduction and the Firewise management program. These activities can reduce the loss of life and property in the event of a fire. NFS provides assistance to fire departments during incidents. Planning efforts include addressing fire hazards in each region of the state through Community Wildfire Protection Plans. |
| **Nebraska Game and Parks Commission (NGPC)** | • The mission of NGPC is stewardship of the state's fish, wildlife, park, and outdoor recreation resources in the best long-term interests of the people and those resources. NGPC is responsible for disaster operations, including damage assessments and mitigation, throughout the entire state, but also on Nebraska's state-owned parks, state-recreation areas, and wildlife management areas.<br>• NGPC has a Wildfire Response Plan that was developed to instruct NGPC staff on designating crews for wildfire response statewide in case of an emergency. Within the Response Plan is a Communication Plan that determines the first points of contact and associated staff members by region. Fire crews are formed utilizing NGPC personnel from the Wildlife, Parks, Fisheries, and Law Enforcement |

| Agency | Purpose and Programs |
|---|---|
| | Divisions, but response teams are also made up of local firefighters and law enforcement.<br>• Per the Nebraska Nongame and Endangered Species Conservation Act (Neb. Rev. Stat. § 37-801 to 37-814) (NESCA), any project that requires a state-issued permit, uses state funds, or is conducted by a state agency requires an environmental review for impacts on endangered and threatened species.<br>• As defined in Nebraska Administrative Code (NAC) Title 163, Chapter 4, Section 012.02 B Emergencies, should emergency circumstances occur involving acts of God, disasters, casualties, national defense or security emergencies, formal consultation should be initiated as soon as practicable after the emergency is under control. |
| **Nebraska Department of Health and Human Services (NDHHS)** | • NDHHS is assigned the responsibility for all public health-related and protection and safety programs, which includes oversight of public health surveillance systems, hospital and medical care facilities licensure, behavioral health, and resources and support to children and families.<br>• During a disaster, NDHHS monitors the capacities of state and local health and medical services, and the continuity of support and assistance to children and families.<br>• NDHHS has the lead role in health and medical preparedness, response, recovery, and mitigation. In coordination with local health departments, tribes, federally qualified health centers, and healthcare providers. NDHHS supports those with access and functional needs to plan and prepare for public health-related events. |
| **Nebraska Department of Insurance (NDOI)** | • The agency provides technical assistance related to homeowner's insurance and other types of insurance coverage. In addition, it monitors incidents of potential fraud and serves as a consumer advocate for the public with insurance providers. |
| **Nebraska State Historic Preservation Office (SHPO)** | • Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies to consider the effects on historic properties of projects they carry out, assist, fund, permit, license, or approve. The SHPO reviews all mitigation projects to ensure respect for all historic properties across the state and certified local governments when undertaking any project that might affect these sites. Additionally, the relationship between NEMA and the SHPO allows for the development of mitigation activities to reduce risk to the state's historic properties.<br>• The SHPO manages state and National Register data on historical structures and archaeological sites, much of which are privately owned properties. |
| **Nebraska Department of Transportation (NDOT)** | • NDOT assists in mitigation and disaster response, including reducing hazards due to flooding, fire, winter storms, and other natural and human-made disasters. NDOT will assist with debris removal; traffic control, including detours; and alerting the public of incidents or potential hazards on the roadway through the use of the Advanced Traveler Information System (511) and the Dynamic Message Signs along state-owned roadways. |
| **University of Nebraska** | • University of Nebraska–Lincoln (UNL) has various academic and research centers that support mitigation-related fields, including the following:<br>› The **Nebraska Public Policy Center** focuses on research and projects to support policy-related initiatives, in coordination with partners in a wide variety of topics such as plans, studies, white papers and briefing papers. A current |

| Agency | Purpose and Programs |
|---|---|
| | project in 2020 is "Drought Planning Using Community Threat and Hazard Identification and Risk Assessment," which is using "climate data from the Platte River basin to develop and implement a decision-support model for drought planning." See http://ppc.unl.edu/projects/drought-planning-using-community-threat-hazard-identification-risk-assessment/<br>› The **School of Natural Resources** acts as a provider of natural resources information for stakeholders across Nebraska. **Information on natural resources, ecosystems, climate, soils, air, plants, wildlife**, and their interaction with citizens helps guide development of mitigation projects that are a positive impact on the surrounding environment.<br>› **Nebraska State Climate Office** compiles, synthesizes and translates climate information for dissemination, providing near-term and long-term climate forecasts to the media, agriculture and educational audiences, government agencies and the public.<br>› **Nebraska Extension Service** serves as a resource center to technical information to families, businesses and communities prepare for and recover from a disaster. UNL has a **statewide disaster coordinator** and **83 extension offices** to support local communication and education.<br>› **National Drought Mitigation Center** monitors conditions that contribute to drought, providing planning and technical assistance. Capabilities include climatology and social science. The NDMC prepares the U.S. Drought Monitor Map.<br>› Other centers focus on **transportation, virology, energy, agriculture, business resiliency,** and more. |
| **Public Power Districts (PPDs)** | • PPDs in Nebraska have historically played a significant role in mitigation projects across the state. Hundreds of miles of power lines have been rebuilt or added using the latest in mitigation techniques. One power district estimated that several million dollars in savings have occurred over the past several years because of mitigation actions. Additionally, PPDs provide communities information on outages to assist in calculating benefit cost analysis on potential projects. |
| **Natural Resources Districts (NRDs)** | • NRDs across the state act as the champions of the majority of the regional multi-jurisdictional hazard mitigation plans. As such, they provide guidance and assistance to communities who would otherwise be unable to engage in such planning efforts. Additionally, NRDs have engaged in placing outdoor warning sirens and community safe rooms in their recreational areas and sponsoring regional mitigation activities. |

#### 5.2.2.2 MULTIAGENCY AND MULTIJURISDICTIONAL COORDINATION ORGANIZATIONS

Partnerships play a pivotal role in hazard mitigation efforts. By collaborating, decision-makers can harness the collective expertise and resources of diverse partners to identify hazards and vulnerabilities, evaluate solutions, and mitigate risks. This approach minimizes duplication of effort and ensures the completion of high-priority actions. Through joint efforts, partners can secure funding, design, and implement innovative strategies that enhance resilience, reduce risk, and address the unique needs of

communities across the state. Table 114 shows organizations that play an important role in hazard mitigation and emergency management in Nebraska.

**Table 114: Multiagency and Multijurisdictional Coordination Organizations Involved in Hazard Mitigation**

| Organization | Functions or Goals |
|---|---|
| **Hazard Mitigation Assistance Ranking Team (HMAR Team)** | • Ensure disaster relief and recovery operations are efficiently coordinated between all agencies.<br>• Make a detailed examination of all features of state recovery efforts, including hazard mitigation grant projects with emphasis on the efficient utilization of the resources made available by federal grant programs. |
| **Nebraska Silver Jackets** | • The **Silver Jackets** are a collaborative group that designs plans and solutions for statewide issues in flood risk management. Functions include the following:<br>› Facilitate strategic life-cycle flood risk reduction.<br>› Create or supplement a continuous mechanism to collaboratively solve state-prioritized issues and implement or recommend those solutions.<br>› Improve processes, identifying and resolving gaps and counteractive programs.<br>› Leverage and optimize resources.<br>› Improve and increase flood risk communication and present a unified interagency message.<br>› Establish close relationships to facilitate integrated post-disaster recovery solutions. |
| **Nebraska State Emergency Response Commission (SERC)** | • **Title III of the Superfund Amendments and Reauthorization Act (SARA)**, known as the **Emergency Planning & Community Right-to-Know Act (EPCRA)** is national legislation that establishes requirements for federal, state, and local governments, tribes, and industry in an effort to protect public health, safety, and the environment from a hazardous materials disaster. The Nebraska SERC was created in accordance with this law and **Nebraska Revised Statute 81-15.210**.<br>• SERC responsibilities include the following:<br>› Establishing procedures for receiving and processing public requests for information collected under EPCRA<br>› Reviewing local emergency response plans<br>› Designating local emergency planning districts<br>› Appointing a Local Emergency Planning Committee (LEPC) for each district<br>› Supervising the activities of the LEPC<br>› Planning for chemical emergencies<br>• The SERC is comprised of 19 members representing state and local government, private and public sectors, including fire, law, public health, school, industry, transportation, and military. |

### 5.2.2.3 STATE COORDINATION CAPABILITIES WITH FEDERAL AGENCIES

Table 115 displays state coordination with federal agencies that play an important role in hazard mitigation and emergency management in Nebraska.

Table 115: State Coordination Capabilities with Federal Agencies

| Agency | Purpose, Policies, and/or Programs |
|---|---|
| **U.S. Department of Agriculture** | • The **Farm Service Agency (FSA)** maintains an emergency conservation program that provides technical assistance and allows for cost-share for damaged farms and ranches (fences, equipment, etc.) and rehabilitation of cropland, terraces, and permitted farm dams, as well as a livestock indemnity program.<br>• **The National Resources Conservation Service (NRCS**) protects natural resources and critical infrastructure, also assisting in helping property owners achieve a high level of resilience on the landscape to protect from future disasters. Project types include streambank stabilization, removing debris from the stream, repairing severely damaged and eroding stream banks (stabilization) that threaten critical infrastructure and other assets, and acquisition and relocation of critical infrastructure if unable to be restored. Through participation in the Nebraska Healthy Soil Task Force, opportunities are sought to promote soil health and reduce water runoff and flooding and drought impacts.<br>• The **Risk Management Division** maintains high risk maps of areas along the Missouri River (including Richardson, Nemaha, Sarpy and Cass Counties) available to the public at http://www.rma.usda.gov.<br>› The agency establishes policy rates using a risk assessment model (high risk areas identified along the Missouri River based on historic losses and events). Coverage for future planting losses is typically available within a specific timeframe. It provides the opportunity to reduce the loss of products in storage through rebuilding with consideration of future flood risk.<br>• **Rural Development** provides services that include Emergency Community Water Assistance Grants, direct loans for disaster losses to single-family housing, and potential cost share for recovery of waste water treatment plants. |
| **U.S. Geological Survey (USGS)** | • The USGS **provides geospatial data** that is publicly available for hazard research and analysis. The agency has the capability to do **real-time flood inundation mapping** that has included two flood inundation libraries for Papillion Creek watershed in Omaha and North Platte River in Scottsbluff. The Flood Event Viewer provides easy public access to data collected (at gauge locations) during large, short-term floods to help document high water mark events and scour during flooding; this data is also uploaded to the USGS Short-Term Network for archival purposes.<br>• The agency's flood frequency analysis uses actual data from past 1% and 0.2% floods to redefine what the accurate 1% annual change flood.<br>• The agency supports U.S. Army Corps of Engineers (USACE) in **levee breach work**. |
| **U.S. Department of Homeland Security, Cybersecurity and Infrastructure Security Agency (CISA)** | • The CISA has **physical security, cybersecurity** and **emergency communication** experts who can be deployed to support state and local incidents, as requested and pending availability.<br>• CISA conducts **Risk Assessments for all 16 sectors of Critical Infrastructure** (C/I), focusing on dependencies, interdependencies and cascading impacts for Lifeline functions.<br>• The CISA provides **data support** to inform response, recovery and mitigation planning, including a static C/I list of Tier I and II assets whose disruption could cause national/regional catastrophic effects; and a "dynamic" C/I list produced |

| Agency | Purpose, Policies, and/or Programs |
|---|---|
| | during an incident that analyzes threats and vulnerabilities and potential consequences of disruption to C/I in impact areas.<br>• The CISA maintains **a list of C/I in the 100- and 500-year floodplain**. In addition, the Protective Security Advisor assigned to the State can advise C/I owners/operators on potential mitigation strategies to reduce facility vulnerability, and works with the State **to identify C/I sites that have sustained damage** and that could benefit from HMA programs. |
| **U.S. Army Corps of Engineers (USACE)** | • USACE assists the state in reducing risk to the public, property, and the environment by providing **direct and technical assistance to communities**. USACE studies provide information on flooding hazards and assists in identifying projects that address hazards. Various **trainings** such as sandbagging and flood operations are also available via USACE. The Nebraska Silver Jackets program is supported by the Flood Risk Management Program. Two **funding programs** of note include the following:<br>› **Section 22:** Study-level program that can be used for the development of flood mitigation plans with a 50% cost share from a non-federal sponsor.<br>› **Section 205**: Flood Damage Reduction program that can be used to study flooding problems in urban areas, towns, and villages. If a federal interest is found, this program can assist in designing and building flood reduction mitigation projects. |
| **U.S. Fish and Wildlife Service (USFWS)** | • USFWS ensures that action agencies and mitigation projects **meet federal requirements** to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the benefit of the American people. This includes providing biological advice, technical assistance, and input on regulatory guidelines for mitigation projects. |
| **U.S. Department of Housing and Urban Development (USHUD)** | • The USHUD works with the NeDED to adapt programs to meet post-disaster needs and coordinates with the agency for the Community Development Block Grant-Disaster Recovery (**CDBG-DR**), **CDBG-MIT** (Mitigation) programs, which provide flexible grants to help cities, counties, and states recovery from presidentially declared disasters, especially in low income areas. |
| **Federal Emergency Management Agency (FEMA)** | • FEMA supports the mitigation efforts of Nebraska in several ways. **FEMA conducts a thorough review** of all **local hazard mitigation plans (LHMPs)** before approval. Additionally, **FEMA Hazard Mitigation Assistance grants** provide funding for mitigation projects across the state. The **National Flood Insurance Program (NFIP)** assists in protecting local property owners financially from flooding by providing insurance for participating communities and encouraging smart floodplain management decisions. |
| **National Oceanic and Atmospheric Administration (NOAA)/National Weather Service (NWS)** | • The NWS provides **site-specific weather forecasting and data** with a focus on weather, water and climate. There are six offices located in the State of Nebraska. The NOAA National Center for Environmental Information (NCEI) provides a national clearinghouse for all natural weather events reported through NWS, which provides data from 1950 to current date. Data reports include a summary of the incident (by county and zone), number of deaths and/or injuries, and the amount of property and/or crop damage resulting from the event. |

| Agency | Purpose, Policies, and/or Programs |
|---|---|
| | • NWS data supports hazard risk and vulnerability analysis, and provides site-specific data that can assists in developing mitigation action applications for grant funding. |

## 5.2.3 Financial Capabilities

A comprehensive review of the state's mitigation capabilities should include a description of the available funding for mitigation programs. An unprecedented amount of funding for hazard mitigation actions is available. In the following section, state, and federal funding resources are described in further detail. A "whole community" approach to funding cannot be discounted.

### 5.2.3.1 FEDERAL PROGRAMS

Table 116 describes federal programs that play an important role in funding hazard mitigation and emergency management efforts in Nebraska.

**Table 116: Funding from Federal Programs**

| Program | Description | Lead Agency | Timeframe |
|---|---|---|---|
| **Emergency Management Performance Grant (EMPG)** | The EMPG is designed to sustain and improve state and local emergency management programs for all hazard events through mitigation, preparedness, response, and recovery activities. | NEMA/FEMA | Notice of funding opportunity is announced early in the year, around February. Application submission deadlines are usually in May, or just a few months after the notice. |
| **Fire Management Assistance Grants (FMAG)** | Fire management assistance grants are available to state, local, and tribal governments for the mitigation, management, and control of fires on publicly or privately owned forests or grasslands, that threatens such destruction as would constitute a major disaster. | NEMA/FEMA | The state must submit a request for an FMAG declaration from FEMA when a "threat of a major disaster" exists. |
| **Flood Mitigation Assistance (FMA) Program** | FMA was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 (42 U.S.C. 4101) with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP). It provides funding to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and | Nebraska Department of Natural Resources (NeDNR)/FEMA | Applications typically open in September or later in the year. Submissions are due in late January, or a few months after the notice. |

| Program | Description | Lead Agency | Timeframe |
|---|---|---|---|
| | other structures insurable under the NFIP. The grant program is competitive and funded annually. | | |
| **Swift Water Flood Mitigation Assistance (FMA)** | The Swiftwater FMA grant program is a FEMA initiative designed to provide funding to states, local governments, tribal entities, and territories to reduce or eliminate the risk of repetitive flood damage to buildings and infrastructure. This program focuses on projects that mitigate risks in areas vulnerable to swift water flooding, such as properties in flood-prone zones, including those identified as repetitive loss or severe repetitive loss properties under the NFIP.<br>Eligible activities include property acquisition and demolition, relocation, elevation, and other flood-proofing measures. The grant prioritizes cost-effective solutions that align with local hazard mitigation plans to promote community resilience and reduce disaster recovery costs. | NeDNR/FEMA | Applications typically open in September or later in the year. Submissions are due in late January, or a few months after the notice. |
| **Hazard Mitigation Grant Program (HMGP)** | HMGP was created in November 1988 by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288 as amended by Public Law 100-707, Public Law 103-181, the Hazard Mitigation and Relocation Assistance Act (1993), Public Law 106-390, and the Disaster Mitigation Act of 2000. The purpose of the program is to reduce the (long-term) loss of life and property due to natural disasters and enable mitigation measures to be implemented during the immediate recovery from a disaster declaration. (See 44 CFR Part 206, Subpart N, for guidance and implementation.) | NEMA/FEMA | This grant funding is available only after a presidentially declared disaster. The amount of funding is based on the estimated total federal assistance, subject to a sliding scale formula. Applications must be submitted within 12 months of the disaster declaration. |

| Program | Description | Lead Agency | Timeframe |
|---|---|---|---|
| **Hazard Mitigation Grant Program Post Fire (HMGP-PF)** | States that receive an FMAG declaration after October 2018 are eligible to apply for HMGP-PF funds. This program is designed to help communities recover from a wildfire. Eligible project types include wildfire mitigation, infrastructure retrofit, soil and slop stabilization, post-wildfire flood prevention and sediment reduction, and items that qualify for the 5% initiative, such as installing warning signs. | NEMA/FEMA | The application period opens after the state's first FMAG declaration of the fiscal year. The FEMA deadline is 6 months after the end of that fiscal year. |
| **Public Assistance 406 Mitigation Program** | This grant is available through FEMA's Public Assistance (PA) program. PA is designed to help communities' recovery from a major disaster or emergency declared by the disaster. Eligible projects include debris removal, emergency protective measures, and the permanent restoration of infrastructure. Funds can be used toward hazard mitigation for permanent projects to reduce the likelihood of damaged facilities being damaged in the future. | NEMA/FEMA | This grant funding is available only after a presidentially declared disaster. |
| **Rehabilitation of High Hazard Potential Dam (HHPD) Grant Program** | This grant is available through FEMA's Dam Safety Program for technical, planning, design, and construction grants for eligible dams. Eligible dams needed to be documented as "high hazard potential" in the USACE's National Inventory of Dams. Additional requirements include being in a state with a dam safety program, being classified as "high hazard potential" by the state, having an Emergency Action Plan (EAP), being located in a jurisdiction with a FEMA-approved hazard mitigation plan that includes dam risk, and failing to meet minimum standards that constitute an unacceptable risk to the public. | NEMA/FEMA | Applications typically open in May and have a deadline in June. |
| **Small Business Loan Program** | The Small Business Administration (SBA) provides loans to private industry before and after a disaster event to increase economic resilience. These loans have low interest rates and provide coverage for damages incurred that will not be reimbursed by | SBA | Available after a declared disaster event. SBA thresholds are typically lower than FEMA's and may count disasters that are not presidentially declared. |

| Program | Description | Lead Agency | Timeframe |
|---|---|---|---|
| | a FEMA presidentially declared disaster declaration. SBA loans can provide mitigation assistance pre and post-event to make property improvements to reduce potential future losses. Loans received can be increased by up to 20% to allow for these mitigation measures to take place and may address many natural hazards, including floods, wildfires, earthquakes, wind, and hail. | | |
| **Community Development Block Grant Program (CDBG)** | The primary purpose of the CDBG program is the development of viable urban communities by providing decent housing, suitable living environments, and expanding economic opportunities, principally for persons of low and moderate income. The CDBG program is sponsored by the U.S. Department of Housing and Urban Development (HUD). Grant dollars are available to communities with a population of fewer than 50,000 residents for the purpose of attracting new or expanding existing companies, as long as the projects align with one of three national objectives: (1) principally benefit low and/or moderate-income people; (2) eliminate or prevent slums and/or blight; and (3) address imminent health and/or safety problems. | Nebraska Department of Economic Development (NDED)/HUD | Application deadlines are typically around March for the current fiscal year. |
| **Pre-Disaster Mitigation (PDM) Grant Program** | The PDM grant program makes federal funds available to state, local, tribal, and territorial governments to plan for and implement sustainable, cost-effective measures designed to reduce the risk to individuals and property from future natural hazards while also reducing reliance on federal funding from future disasters. The program is authorized by Section 203 of the Stafford Act. | NEMA/FEMA | Allocated by Congress and notice of funding is typically announced around March, and the closing date for applications is in April. |
| **Public Assistance (PA) Program** | PA is FEMA's largest grant program, providing funds to assist communities in responding to and recovering from major disasters or emergencies declared by the President. The program provides emergency assistance to save lives and protect | NEMA/FEMA | When an area has received a presidential declaration of an emergency or major disaster, then its state, tribal, territorial, and local governments— |

| Program | Description | Lead Agency | Timeframe |
|---|---|---|---|
| | property and assists with permanently restoring community infrastructure affected by a federally declared incident. | | and certain types of private non-profits—may be eligible to apply for PA. |
| **WaterSMART (Sustain and Manage America's Resources for Tomorrow) Program** | The WaterSMART Program is a grant initiative by the Bureau of Reclamation designed to support water conservation and management projects across the United States. The program provides funding to states, tribes, local governments, and other organizations to improve water efficiency, enhance water supplies, and address drought resilience in areas experiencing water scarcity.<br>Eligible projects include water recycling and reuse, advanced water management technologies, drought planning and response actions, and efforts to improve ecosystem health. The grant focuses on fostering collaboration among stakeholders to implement sustainable water management practices while reducing conflicts over water resources and ensuring long-term water availability. | Bureau of Reclamation | The Bureau of Reclamation's WaterSMART Program offers various grants with specific application periods. For instance, the Water and Energy Efficiency Grants for Fiscal Year 2024 had two application periods:<br>Application Period 1: Closed on February 22, 2024.<br>Application Period 2: Closed on November 13, 2024. |
| **Infrastructure Investment and Jobs Act (IIJA) of 2021** | Over time, the Nebraska Department of Environment and Energy (NDEE) State Energy Program expects to receive approximately $37 million in IIJA formula funds and approximately $91 million from IRA formula funds from the DOE for grid resilience, energy efficiency and conservation, renewable energy technologies, and workforce development. The formula funding described below is predetermined and noncompetitive, but NDEE must apply for it to receive the funds.<br>State Energy Program – IIJA/BIL Funding: The purpose of this grant is to provide funding to States for planning activities and programs that help reduce carbon emissions in all sectors of the economy. NDEE plans to support K–12 public schools with grants for energy audits to identify retrofit projects that could improve energy efficiency and/or air quality in school buildings and other planning activities | NDEE/U.S. Department of Energy | Still ongoing in development |

| Program | Description | Lead Agency | Timeframe |
|---|---|---|---|
| | and programs to reduce carbon emissions.<br>Energy Efficiency Revolving Loan Fund Capitalization Grant Program: This formula grant provides capitalization grants to States to establish a revolving loan fund, through which the State will provide loans and grants for energy efficiency audits, upgrades, and retrofits to increase energy efficiency and improve the comfort of buildings. NDEE plans to support energy efficient measures in residential, public, and commercial buildings, with an emphasis on K–12 schools, by providing low-interest loans to finance projects. NDEE will partner with Nebraska lenders by purchasing a percentage of the loans at zero interest, which lowers the interest rate and leverages lender funds for each loan. NDEE will use a portion of the funding to provide free energy audits to qualifying schools.<br>Preventing Outages and Enhancing the Resilience of the Electric Grid/Hazard Hardening: The purpose of this formula award is to prevent outages and enhance the resilience of the electric grid. NDEE plans to support grid improvement projects that result in a more resilient electrical grid and promote a clean and equitable energy economy. Eligible projects will rebuild and restore infrastructure for transmission and distribution, protect existing equipment from weather-related events, support new adaptive protection technology, and provide recruitment and retention of energy technology workers. Funding will be distributed equitably to Nebraskans, including underserved communities that are more susceptible or vulnerable to electric power outages.<br>Energy Efficiency and Conservation Block Grant Program: This formula grant assists states, local governments, and tribes in implementing strategies to reduce energy use, reduce fossil fuel | | |

| Program | Description | Lead Agency | Timeframe |
|---|---|---|---|
| | emissions, and improve energy efficiency. NDEE plans to support local communities in implementing high-impact, self-sustaining clean energy projects. This program will provide funding for communities based on their individual needs.<br>Home Efficiency Rebates (IRA §50121) (HER): The purpose of this program is to award grants to state energy offices to develop a whole house energy saving retrofits program that will provide rebates to homeowners for whole-house energy saving retrofits. Depending on whether a project meets several different rules, eligible projects can include attic insulation, whole home air sealing, duct sealing and insulation.<br>Home Electrification and Appliance Rebates (IRA §0122) (HEAR): This program provides federally funded rebates to eligible property owners who replace energy inefficient appliances with efficient ones or have other work performed to improve the energy efficiency of the property. Example electrification projects include the following:<br>• Electric heat pump water heater<br>• Electric heat pump for space heating and cooling<br>• Electric stove, cooktop, range, or oven<br>• Electric heat pump clothes dryer<br>• Electric load service center (e.g., circuit breaker panel)<br>• Insulation<br>• Air sealing and materials | | |
| **Emergency Watershed Protection (EWP) Program** | Administered by the Natural Resources Conservation Service (NRCS), the EWP Program provides technical and financial assistance to help local communities address imminent threats to life and property caused by natural disasters such as floods, fires, and windstorms. Eligible activities include debris removal, streambank | U.S. Department of Agriculture (USDA) | The EWP Program does not have a standard application period. Assistance is initiated following a natural disaster when a local sponsor, such as a city, county, or conservation district, |

| Program | Description | Lead Agency | Timeframe |
|---|---|---|---|
| | stabilization, and repairing damaged drainage facilities. | | submits a request for assistance to the NRCS. The local NRCS office must be contacted immediately after a disaster to begin the process. |
| **Environmental Quality Incentives Program (EQIP)** | EQIP is NRCS's flagship conservation program that assists farmers, ranchers, and forest landowners in integrating conservation practices into working lands. The program offers financial and technical assistance to implement structural and management practices that optimize environmental benefits on agricultural land. | USDA | EQIP applications are accepted on a continuous basis throughout the year. However, NRCS establishes cutoff dates for ranking and funding decisions. These dates vary by state and are typically announced annually. Applicants should contact their local NRCS office or visit the NRCS website for specific state deadlines. |
| **Rural Energy for America Program (REAP)** | REAP provides guaranteed loan financing and grant funding to agricultural producers and rural small businesses for renewable energy systems and energy efficiency improvements. The program supports the installation of renewable energy systems such as solar, wind, and biomass, as well as energy efficiency enhancements. | USDA | REAP applications are accepted year-round. USDA Rural Development sets specific application deadlines for grants and loan guarantees, which can vary annually. Applicants should consult the USDA Rural Development website or contact their state Rural Development office for the most current deadlines. |
| **Community Wildfire Defense Grant (CWDG)** | The CWDG Program, managed by the U.S. Forest Service, provides grants to communities at risk from wildfire to develop or revise Community Wildfire Protection Plans (CWPPs) and implement projects described within those plans. The program aims to reduce wildfire risk and enhance community resilience. | USDA | For the 2024 cycle, applications are being accepted until 11:59 p.m. Eastern Standard Time on February 28, 2025. Applicants are encouraged to develop proposals in consultation with state or Forest Service |

| Program | Description | Lead Agency | Timeframe |
|---|---|---|---|
| | | | regional cooperative fire contacts. Future application periods will be announced by the U.S. Forest Service. |
| **Rural Economic Development Loan & Grant (REDLG) Program** | The REDLG Program provides funding to rural projects through local utility organizations. Under the program, USDA provides zero-interest loans to local utilities, which they, in turn, pass through to local businesses for projects that will create and retain employment in rural areas. Grants are also provided to local utility organizations to establish revolving loan funds. | USDA | The deadlines for completed applications to be received in the Rural Development State Office for quarterly funding competitions are no later than 4:30 p.m. (local time). |

#### 5.2.3.2 STATE PROGRAMS

Table 117 describes state programs that play an important role in funding hazard mitigation and emergency management efforts in Nebraska.

**Table 117: Funding from State Programs**

| Program | Description | Lead Agency | Timeframe |
|---|---|---|---|
| **Nebraska Environmental Trust** | Any project or portion of a project funded by the Nebraska Environmental Trust must achieve one or more of the following Trust categories: habitat, surface and ground water, waste management, air quality, or soil management. | Nebraska Environmental Trust | The Nebraska Environmental Trust accepts and awards grants annually. The current application deadline is midnight on the first Tuesday in September after Labor Day. |
| **Nebraska Dollar and Energy Saving Loans** | The state provides loans for energy efficiency audits, upgrades, and retrofits to increase energy efficiency and improve the comfort of buildings. Nebraska Department of Environment and Energy (NDEE) supports energy-efficient measures in residential, public, and commercial buildings, with an emphasis on K–12 schools, by providing low-interest loans to finance projects. NDEE will partner with Nebraska lenders by purchasing a percentage of the loans at zero interest, which lowers the interest rate and leverages lender funds for each | NDEE and the state's lending institutions | The estimated date for funding to be awarded to states is Quarter 3 annually. |

| Program | Description | Lead Agency | Timeframe |
|---|---|---|---|
| | loan. NDEE will use a portion of the funding to provide free energy audits to qualifying schools. | | |

## 5.2.4 Education and Outreach Capabilities

Education and outreach capabilities include tools to educate the public on hazards that pose a risk to their community, and it is an important part of enabling individuals to take mitigation actions related to personal property or safety. The types of educational and outreach capabilities are explained in Table 118.

**Table 118: Education and Outreach Capabilities**

| Agency | Description |
|---|---|
| **Nebraska Emergency Management Agency** | • Utilized CodeRED to get important information out promptly<br>• Preparedness month where social media posts to educate the public in multiple realms on preparedness<br>• Facebook, X, Flickr, and YouTube to share information |
| **Nebraska Department of Agriculture** | • Hosts an agriculture awareness newsletter shared with multiple stakeholders including EMA, law enforcement, and LEADRS.<br>• Applied for a grant with University of California–Davis that would conduct public outreach to multiple at-risk populations in Nebraska.<br>• Developing a curriculum for SE Community College about biosecurity development.<br>• Attending multiple conferences with the agriculture community to educate on biosecurity plans.<br>• Utilized CodeRED to get important information out promptly. |
| **Nebraska Forest Service** | • Homeowner awareness on the impact of tree damage after a storm |
| **Nebraska Department of Transportation** | • Utilized CodeRED to get important information out promptly<br>• 511 system shares critical road conditions at any time; will share weather warning conditions or wildfire danger weather information<br>• Shared over email and on social media platforms: Facebook, LinkedIn, and X<br>• Traffic incident management program that trains first responders on hazards that would impact their response especially hazardous materials, winter weather, etc.<br>• Utilize dynamic messaging signs to share critical information on the roads, including pre-messaging and storm warnings. |
| **Nebraska Game and Parks Commission** | • Gathers core information from a point person in the field who is coordinating with partners<br>• Developing internal talking points based on known information and actions the public should take |

| Agency | Description |
|---|---|
| | • Issuing press releases via traditional media outlets and new media (release should include current known hazard information, safety tips, and where/how to stay up to date)<br>• Responding promptly to inquiries from the public and media with talking points<br>• Posting signs as needed depending on hazard and location |
| **Nebraska Environment and Energy** | • The NDEE posts an energy tip each day of October on social media. The governor proclaims the month of October as the Energy Awareness Month. The NDEE has various internal activities to enhance energy awareness.<br>• Nebraska Energy Codes Training: The Nebraska Energy Codes Training Program is designed to prepare the Nebraska workforce for upcoming changes in construction best practices—from the adoption of the 2018 IECC as the statewide energy code, as well as advanced building technologies that are becoming more widely available and increasingly incorporated into projects. The program will run from August 2020 through 2028 and will provide trainings on energy codes, building science, and advanced technologies to traditional industry groups, including builders, code officials, and design professionals, as well as other important stakeholders, including students and public officials. |
| **Nebraska Department of Natural Resources** | • Floodplain training and outreach including an annual floodplain conference and the NSMA annual conference where the state hosts multiple seminars about floodplain education<br>• There are 3–4 community assistance visits a year, and 70 direct contacts, making it that every community is reached every 5 years<br>• Multiple social media platforms (Instagram, Facebook, LinkedIn, X) to educate on flooding insurance |
| **Health and Human Services** | • The Preparedness Unit has sub-awards with local health departments, tribes, Federally Qualified Health Centers, and the Hospital Preparedness program to provide funding for preparedness and response activities. These are federal pass-through funds from the Centers for Disease Control and Prevention Administration for Strategic Preparedness and Response. These entities then utilize the funds for preparedness activities in accordance with their subaward agreements. |

## 5.2.5 Challenges in State Capabilities

Throughout the planning process there were identified obstacles and challenges relating to statewide mitigation capabilities (Table 119). From those conversations came ideas for potential solutions to some of these challenges, resulting in some of the newly identified mitigation actions.

**Table 119: Challenges in State Capabilities**

| Category | Description |
|---|---|
| **Staffing Issues** | Historically, the state plan has identified staffing issues as a challenge to the state capability to implement hazard mitigation projects. The state continues to take steps to address staffing shortages and training levels to meet the needs of the Hazard Mitigation and Public Assistance programs. Additionally, an active training program is cross training recovery staff to give all staff skills in hazard mitigation. |
| **Recent Disasters** | The state currently has 11 disaster declarations in all different stages; the large number of disasters has resulted in stretched staff to be able to conduct all the necessary capabilities due to limited bandwidth and competing priorities. |
| **Funding Sources** | Limited funding can result in many shortcomings including more staff to conduct public outreach to community organizations and education. |
| **Engagement** | One of the challenges in mitigation is lack of engagement until a disaster may occur. It results in low participation levels with outreach. Floodplain map changes are always changing and often times it can take the public and floodplain managers by surprise, even when multiple outreach methods were attempted. |
| **Enforcement of Hazard-resistant Building Codes** | There may be a challenge with municipalities adopting their own building codes, but the state statute provides a default code requirement to state standards. NE Statutes. Statute 71-6046 states: "If a county, city, or village does not adopt a code as authorized under subdivision (a) of NE State Statute 71-6406 within two years after an update to the state building code, the state building code shall apply in the county, city, or village, except that such code shall not apply to construction on a farm or for farm purposes." DWEE Floodplain Management Division provides technical assistance for codes related to floodplain management and participation in the NFIP. |

## 5.3 Local Planning Capability Assessment

The Nebraska Emergency Management Agency (NEMA) manages a program to coordinate local mitigation planning and project implementation. This oversight and management process is carried out through multiple methods, processes, and funding streams. Key to the state's management of local mitigation efforts is identifying mitigation opportunities, providing technical assistance in implementing mitigation activities and coordinating and participating in multi-jurisdictional mitigation planning, project development, and administration.

### 5.3.1 Process to Support the Development of Approvable Local and Tribal Mitigation Plans

Local plans are submitted to NEMA for review before submission to the Federal Emergency Management Agency (FEMA). Using the local hazard mitigation plan review tool, NEMA Recovery Section staff reviews the plan and suggests revisions or forwards the plan on for FEMA review. NEMA's goal is to review plans within 30 days of submission and to process applications in a manner that reduces the number of plan

revisions to meet eligibility requirements. The general outline of the planning review process is as follows:

1. Draft of plan is submitted to NEMA for review.
2. NEMA Recovery Section staff complete a formal review of the submitted plan.
3. After inclusion of required plan elements, NEMA sends plan to FEMA for approval pending adoption.
4. FEMA notifies NEMA of approval pending adoption of the plan by participating jurisdictions.
5. NEMA notifies the submitting jurisdiction of pending approval.
6. Participating jurisdictions adopt the plan and resolutions are sent to NEMA.
7. Adoption resolutions are forwarded on to FEMA.
8. FEMA grants final approval of plan.
9. NEMA notifies the jurisdictions of approval.
10. Plan revisions begin, with approval being no later than 5 years after previous approval.

The state stands ready to support tribal plan development and maintenance, if requested, which can include planning, training, funding assistance, and mitigation project administration. Tribes may participate in local mitigation plans, if desired.

#### 5.3.1.1 CHALLENGES IN LOCAL JURISDICTION PARTICIPATION AND PLAN INTEGRATION

The state's capabilities can be limited by a jurisdiction's ability to fully engage in pre-disaster planning. These limitations arise from various factors, including funding constraints, lack of administrative capacity, and inadequate technical resources. Additionally, community support for local hazard mitigation planning remains a challenge, as many communities do not prioritize hazard mitigation until they experience a disaster event firsthand.

A key issue affecting participation is the need to address the unique vulnerabilities of access and functional need populations, including the elderly, individuals with disabilities, children, and those with language barriers. These residents experience hazards differently and must be actively included in planning efforts to ensure comprehensive mitigation actions.

Beyond traditional local government participation, engagement efforts must extend to special districts such as irrigation districts, school districts, local fire districts, private non-profits, and other agencies that play critical roles in community resilience. These special districts face distinct challenges during disasters and their experiences should be incorporated into planning discussions to improve overall hazard reduction efforts across Nebraska.

#### 5.3.1.2 CHALLENGES IN HAZARD IDENTIFICATION AND MITIGATION SUPPORT

One major barrier in advancing mitigation planning is the difficulty communities face in quantifying hazards. Many jurisdictions lack recent historical data, making it challenging to demonstrate the risks of specific hazards and the benefits of mitigation actions. This lack of data can lead to reduced community buy-in and a failure to recognize the importance of proactive hazard mitigation planning.

Also, many communities struggle with funding and resource limitations. Strict policies and regulation often do not account for the unique constraints of these jurisdictions, leading to difficulties in selecting and implementing mitigation actions. Common barriers include the following:

- Prohibitive costs associated with mitigation projects
- Low benefit–cost ratios, which can disqualify projects from funding
- Administrative limitations, such as difficulty tracking plan updates and project progress
- Challenges in maintaining long-term engagement due to staff turnover or capacity issues

#### 5.3.1.3 COMMUNICATION AND COORDINATION CHALLENGES

At both the state and local levels, a lack of communication and responsiveness is affecting the completion of hazard mitigation plans and related projects. Subrecipients, partners, and contractors are frequently unresponsive at various phases of the planning and project implementation process, from application to closeout. These delays directly impact the ability to meet deadlines, secure funding, and implement mitigation actions effectively.

While spreadsheets exist to track plan approval, expiration, and adoption dates, there is currently no centralized system that comprehensively monitors mitigation actions, project implementation, and progress. Moving forward, efforts should focus on integrating mitigation action tracking into the database to enhance accountability and measure progress in risk reduction more effectively. Through continued training, technical assistance, and policy adjustments, NEMA aims to reduce participation barriers, strengthen data collection, and ensure hazard mitigation planning remains accessible and actionable for all Nebraska communities.

# 5.4 Grant-Approved Projects

## 5.4.1 Hazard Mitigation Grant Program Funding Projects

Since 2015, Nebraska has allocated roughly $35 million within the Hazard Mitigation Grant Program (HMGP) grant. The amount varies, but typically, it provides Nebraska with up to 15% of the total disaster grants awarded by FEMA.

Figure 112 shows precisely where these projects have been allocated across Nebraska based upon each Master Disaster Declaration (DR) grant number.

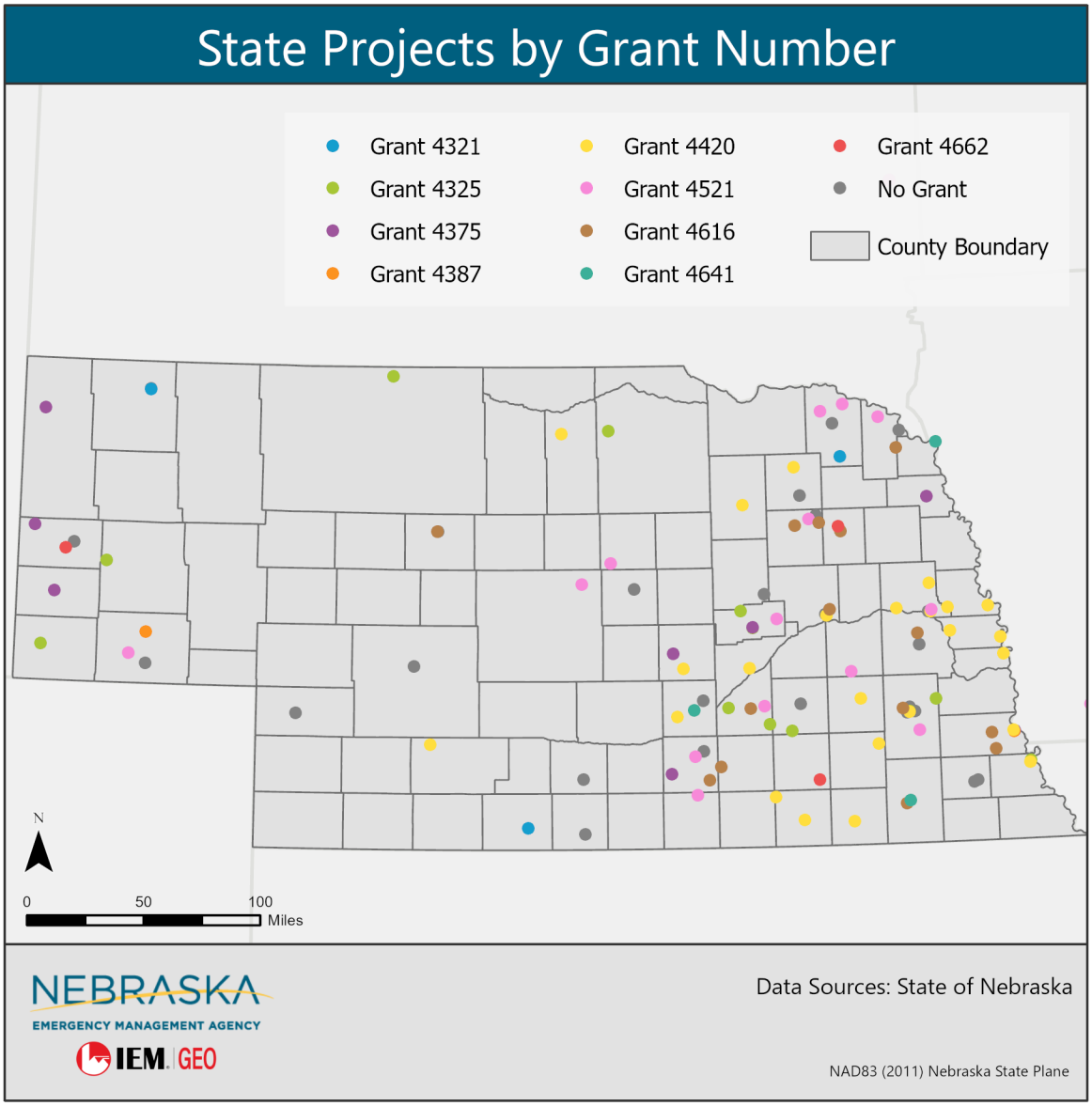



**Figure 112: Nebraska HMGP Projects Since 2015**

## 5.4.2 Building Resilience Infrastructure and Communities Funding Projects

Since 2020, Nebraska has allocated about $7.5 million within the Building Resilience Infrastructure and Communities (BRIC) grant. Most applications have been toward enhancing planning operations, project scoping, and flood mitigation. This grant has been a helpful resource that the state partners can utilize to propose large impact projects that would enhance the state's resiliency. Figure 113 shows the breakdown of BRIC projects since 2020.

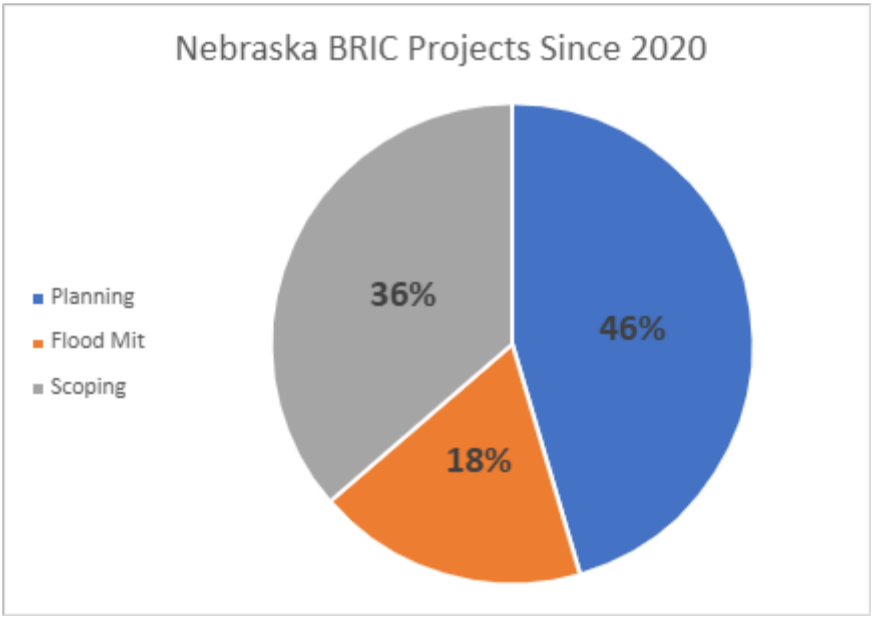



**Figure 113: Nebraska BRIC Projects Since 2020**

# 6.0 Plan Maintenance and Implementation

## 6.1 Overview

Hazard mitigation planning is an ongoing effort that tracks the state's advancements in minimizing and preventing risks and damages caused by both natural and human-induced hazards. The strategies and protocols outlined in this plan represent the current approach to emergency management and hazard mitigation at both state and national levels.

The state remains responsible for overseeing programs that impact Nebraska's residents. As an ongoing effort, the Nebraska Emergency Management Agency (NEMA) leads the development and assessment of the State Hazard Mitigation Plan. Updates to hazard mitigation policies or programs, shifts in funding, or significant disasters will drive future reviews and revisions of this plan.

## 6.2 Method and Schedule for Monitoring, Evaluating, and Updating the Plan

As the primary agency responsible for mitigation planning, NEMA will continuously assess and address implementation challenges—whether technical, political, legal, or financial—throughout the monitoring, evaluation, and update process. When such obstacles arise, efforts will be made to develop strategic recommendations for effective resolution.

The State Hazard Mitigation Officer (SHMO), serving as the Plan Coordinator, will oversee plan maintenance meetings in collaboration with the Hazard Mitigation Assistance Ranking Team (HMAR Team), acting as the Planning Committee. Additional stakeholders, identified by NEMA or the Nebraska Department of Natural Resources (NeDNR), will also be engaged in these discussions. Meeting agendas may include the following key aspects:

- Meetings will be held at a minimum of once a year.
- Meetings will be held within three months after the declaration of a federal disaster for plan review, revision, and/or project prioritization.
- Meetings will be held when required or needed due to changes in federal or state legislation and/or regulations that impact hazard mitigation in Nebraska.

The following sub-sections describe the method and schedule for monitoring, evaluating and updating the plan, including processes and criteria used to evaluate effectiveness. In addition, responsibilities for these processes are described.

## 6.2.1 Method and Schedule for Monitoring the 2026 Plan

To develop a systematically structured approach to plan maintenance that ensures continuity across future planning cycles, the following tables delineate assigned roles and responsibilities, monitoring methodologies, and a defined schedule. This schedule encompasses a sequential outline of procedural actions and specific tasks correlated with each phase of implementation. Table 120 outlines plan monitoring roles and responsibilities by office.

**Table 120: Plan Monitoring Roles and Responsibilities**

| Office | Responsibility |
|---|---|
| **State Hazard Mitigation Officer (SHMO)/Designee (Plan Coordinator)** | • Coordinate and facilitate the monitoring process.<br>• Maintain and schedule of monitoring activities.<br>• Collect data and disseminate reports.<br>• Maintain records and documentation of all monitoring activities. |
| **Hazard Mitigation Planning Committee** | • Participate in the monitoring process as requested by the Plan Coordinator.<br>• Assist in collecting and analyzing data.<br>• Assist in disseminating reports to stakeholders and the public.<br>• Promote the mitigation planning process with the public and solicit public input, as appropriate. |
| **Stakeholder Representatives – Subject Matter Experts (SME)** | • Represent the agency/discipline during the monitoring process.<br>• Collect, analyze, and report data to the Plan Coordinator.<br>• Maintain records and documentation of monitoring activities.<br>• Assist in disseminating reports to agency/discipline and the public, as appropriate. |

The steps outlined below detail the process for tracking progress, identifying challenges, and exploring new opportunities for hazard mitigation:

- Step 1: Plan Coordinator – Initiate monitoring process.
  - Notify Planning Committee members of the annual/post-disaster review.
    - Disseminate Mitigation Action Progress Report Form for mitigation action updates to Project Leads/Representatives, along with the current list of mitigation actions in the plan.
    - Disseminate Mitigation Action Implementation Worksheet to representatives of agencies with potential new mitigation actions.
- Step 2: Plan Coordinator and Planning Committee – Collect and assess status of actions (current and new).
  - Assess progress in current mitigation actions, including implemented and funded actions, and any new opportunities for mitigation actions:
    - Are there different or additional resources now available?

    - Are mitigation actions being implemented and monitored?
    - Have new mitigation actions been identified?
    - Have any mitigation actions been completed?
- Step 3: Plan Coordinator and Planning Committee – Assess new opportunities for mitigation.
    - Has a major disaster occurred that presents opportunities for mitigation?
    - How have mitigation goals, objectives, and/or actions been incorporated into existing planning mechanisms or information?
    - Is there a new initiative, agency priority, existing planning mechanism or information that is not represented in the current actions?
- Step 4: Plan Coordinator and Planning Committee – Prepare and disseminate status report to all plan stakeholders, including elected officials.
    - Status of current and implemented actions
    - Proposed new actions
    - Potential funding sources
    - New opportunities for mitigation (actions in development, new programs, etc.)

## 6.2.2 Method and Schedule for Evaluating the 2026 Plan

To develop a structured and well-defined framework for plan maintenance that ensures continuity across future planning cycles, the following tables outline designated roles and responsibilities, along with the systematic evaluation procedure and schedule. This schedule incorporates a sequential methodology detailing each procedural step and the corresponding tasks essential for effective implementation. Table 121 outlines the plan evaluation roles and responsibilities by office.

**Table 121: Plan Evaluation Roles and Responsibilities**

| Office | Responsibility |
|---|---|
| **State Hazard Mitigation Officer (SHMO)/Designee (Plan Coordinator)** | • Coordinate and facilitate the evaluation process.<br>• Maintain schedule of evaluation activities.<br>• Collect data and disseminate reports.<br>• Maintain records and documentation of all evaluation activities. |
| **Hazard Mitigation Planning Committee** | • Participate in the evaluation process, as requested by the Plan Coordinator.<br>• Assist in collecting and disseminating information.<br>• Assist in disseminating reports to stakeholders and the public.<br>• Promote the mitigation planning process with the public and solicit public input. |

| Office | Responsibility |
|---|---|
| **Stakeholder Representatives – Subject Matter Experts** | • Represent the agency/discipline during the evaluation process.<br>• Collect and report data to the Stakeholder Working Group and Plan Coordinator.<br>• Maintain records and documentation of all jurisdictional evaluation activities. |

Table 122 describes the steps that the state of Nebraska will take annually and/or following major disaster(s) to evaluate the effectiveness of the plan.

**Table 122: Evaluation Procedure and Schedule**

| Action | Responsible Party | Tasks | Deliverable/Outcome |
|---|---|---|---|
| **Initiate Annual Review** | State Hazard Mitigation Officer (SHMO) | Notify Planning Committee members to facilitate annual evaluation.<br>Disseminate Plan Evaluation Checklist to members and key stakeholders. | Work plan, schedule, and assigned resources to implement plan review process |
| **Stakeholder Working Group and Key Stakeholders** | SHMO (or designee) | Invite members and key stakeholders, and new agency representatives to participate in the plan monitoring and evaluation process. | List of invited current and new stakeholders and other key planning partners invitation to participate |
| **Review Policies and Regulations** | SHMO (or designee) | Research new or updated laws, policies, regulations, initiatives, and studies that contribute to the hazard risk assessment or identified mitigation actions. | Status report: current and new policies, regulations, initiatives and/or studies |
| **Review Programs** | SHMO (or designee) | Assess changes in state and local programs, new grant programs or areas of focus, integration into existing planning mechanisms. | Status report: current and new stakeholders, programs, grant programs, planning mechanisms, and/or new areas of focus |
| **Hazards** | SHMO (or designee) | Research new or updated data and information that contributes to the risk assessments, loss estimates, or | Status report: recent disasters, hazard impacts and losses, lessons learned, status of jurisdictional facilities and infrastructure; update plan annually to reflect new risk assessment and |

| Action | Responsible Party | Tasks | Deliverable/Outcome |
|---|---|---|---|
| | | vulnerabilities in assets, by jurisdiction. | capability data gathered from review of hazard events and impacts |
| **Mitigation Actions** | SHMO (or designee) | Assess progress in previously implemented actions that reduce vulnerability and losses, and any new opportunities for mitigation actions. | Status report: Completed actions, pending actions, implementation status of actions (collected through monitoring procedure) |
| **Outcomes** | SHMO (or designee) | Maintain and complete documentation of the plan review process, including any needed plan updates, and prepare summary report. | Submit Summary Report: Mitigation Strategy Annual Update (incorporating results of annual monitoring and evaluation process) |

## 6.2.3 Method and Schedule for Updating the Plan

The plan review and revision process plays a crucial role in ensuring the ongoing accuracy and relevance of key components, including hazard identification, risk assessment, and mitigation strategies and priorities.

The plan update framework is structured to systematically address different aspects over a five-year cycle. By following the outlined schedule, all sections of the plan will have undergone thorough review by the end of the cycle, potentially minimizing resource demands in the final year of planning. Consistent adherence to the monitoring, evaluation, and update schedule will ensure that the plan remains up to date throughout its five-year duration. The current planning cycle will conclude five years after the official adoption date by the State of Nebraska. The following tables outline the process and responsible parties.

Table 123 outlines the plan update roles and responsibilities by office.

**Table 123: Plan Update Roles and Responsibilities**

| Office | Responsibility |
|---|---|
| **State Hazard Mitigation Officer (SHMO)/Designee (Plan Coordinator)** | • Coordinate and facilitate the plan review, revision and update process.<br>• Maintain schedule of all plan update activities.<br>• Collect data and disseminate reports.<br>• Maintain records and documentation of all evaluation activities.<br>• Identify and implement opportunities for public participation and input in the planning process, including review of the revised draft plan. |

| Office | Responsibility |
|---|---|
| | • Maintain records and documentation of all evaluation activities. |
| **Hazard Mitigation Planning Committee** | • Participate in the plan review, revision, and update process, as requested by the SHMO.<br>• Assist in collecting and disseminating information.<br>• Assist in disseminating reports to stakeholders and the public.<br>• Promote the mitigation planning process with stakeholders and the public and solicit public input. |
| **Stakeholder Representatives – Subject Matter Specialists** | • Represent the agency/discipline during the planning cycle, including plan review, revision and update process.<br>• Collect and report data to the Planning Committee and SHMO.<br>• Maintain records and documentation of plan review and revision activities.<br>• Assist in disseminating information and reports to stakeholders and the and the public. |

Table 124 outlines the five-year plan update process and schedule by responsibility.

**Table 124: Five-Year Plan Update Process and Schedule**

| Phase | Responsibility |
|---|---|
| **Monitoring and Evaluation Activities – Ongoing Throughout the Five-Year Planning Cycle** | • Monitoring and evaluation results, meeting documentation, and other pertinent documents will be collected throughout the five-year life cycle of the plan and used in the next plan update.<br>• Multiple meetings with elected officials, ), stakeholders, local and federal agencies, and interested parties will be conducted.<br>• Activities, meetings, and interactions will be tracked and documented throughout the planning cycle.<br>• The annual evaluation review will be conducted using the most recent update of the plan as the basis. |
| **Update Risk Assessment – Conducted in the First Quarter of the Fifth Year of the Planning Cycle** | • State Hazard Mitigation Officer (SHMO)/designee and planning committee representatives will identify key stakeholders to contribute to the updated risk assessment.<br>• Monitoring and evaluation results will be incorporated.<br>• Changes since the previous plan approval will be identified.<br>• Each hazard will be assessed and updated to include new data since the date of plan adoption.<br>• New hazard occurrences and potential changes in low-ranked hazards will be identified and assessed.<br>• Any significant changes in the jurisdictional risk assessment will be noted during plan review and integrated into the updated plan. |

| Phase | Responsibility |
|---|---|
| **Review and Update Goals and Objectives – Conducted in the Second Quarter of the Fifth Year of the Planning Cycle** | • SHMO/designee will coordinate with Planning Committee and key partners to assess the status of current plan goals and objectives for potential revision.<br>• Assess how have mitigation goals and objectives been integrated with existing planning mechanisms.<br>• Any significant changes in mitigation goals, especially those that are not consistent with the current plan goals, will be assessed and incorporated as appropriate in the updated plan.<br>• Monitoring and evaluation results will be utilized to modify the goals and objectives and describe achievements. |
| **Review and Update Mitigation Actions – Conducted in the Third Quarter of the Fifth Year of the Planning Cycle** | • SHMO/designee will coordinate with Planning Committee and key partners to obtain an update on the current status of actions.<br>• Monitoring and evaluation results will be utilized to assess the effectiveness of mitigation actions in meeting the goals and reducing risks.<br>• Assess jurisdictional mitigation actions implemented since the plan was last adopted and how they have contributed to the achievement of goals and objectives.<br>• Management and maintenance data from the implemented activities will be used to describe progress in the previous five years. |
| **Compile and Review – Conducted in the Third Quarter of the Fifth Year of the Planning Cycle** | • SHMO/designee will coordinate with Planning Committee to compile the data and develop the updated plan.<br>• Draft will be made available for stakeholder review and input.<br>• Draft will be made available for public review and comment.<br>• All comments and suggestions will be incorporated and the final draft completed. |
| **Review and Approval – Conducted in the Fourth Quarter of the Fifth Year of the Planning Cycle** | • Plan update will be submitted for FEMA review and approval. |
| **Adopt Plan – Conducted in 4th Quarter of the Fifth Year of the Planning Cycle** | • Updated plan will be adopted prior to the plan expiration date. |

## 6.3 Implementation of the Plan

The systems and procedures described in this section support the implementation of this plan through the following measures:

- Annual review method and schedule that monitors and evaluates all elements of the plan and tracks the implementation of the plan over time

- Incorporating the plan into existing planning mechanisms that support long-term resiliency planning
- Documenting progress in risk reduction through prioritizing and implementing state and local mitigation actions

Annual reviews will involve plan evaluation in the context of the state's current hazard environment, vulnerabilities, funding availability and needs, and federal and state policy changes. The Planning Team will be responsible for the annual plan review, focusing on the following questions:

- Does the state have the resources it needs to continue implementing the plan as written?
- Are there new hazards that threaten the state or new vulnerabilities that require a shift in hazard priorities?
- Are the goals and objectives still relevant?
- Have there been any changes in state capabilities?
- Are the actions being implemented as planned?
- Are the actions helping to meet goals and objectives?
- Can action effectiveness be documented?
- Has the process to monitor and evaluate the plan been effective?

NEMA and NeDNR serve as the recipients for project management and accountability of funds under the Hazard Mitigation Assistance grants in accordance with federal regulations and program guidance. As most mitigation projects are funded by these three grants, NEMA and NeDNR staff track mitigation projects, monitoring costs, progress, project modifications, and track project timelines. The following is a general summary of project monitoring:

- Quarterly Progress Reports:
  - Quarterly progress reports are completed by each subrecipient at the end of each quarter. These reports detail progress, fiscal expenditures, project modifications, milestone completion, and any other data deemed necessary. Reports are required until the grant is closed out with FEMA.
- Audits:
  - Audits are conducted in accordance with state and federal regulations and can include the grant overall, individual projects, or payments. Any audit findings are reviewed to ensure that discrepancies are addressed. Complete documentation of all expenditures is required for all reimbursement requests.
- Benefit Cost Analysis (BCA):
  - BCA review required for project development, project scope, and cost changes of a project.
- Closeout Process:
  - Upon completion of a grant or subgrant, all financials are reviewed and accounts reconciled. A final site inspection is conducted by state staff to determine that the project was completed

according to the approved scope and location and any environmental and/or historic considerations have been evaluated and addressed. This is documented via photographs and a signed inspection form. After review, a completed closeout packet is sent to FEMA.

- Record Retention:
  - The state of Nebraska maintains files on each project containing the records of the project for the longest period of time identified by state or federal regulations or policy. Subrecipients are required to maintain files for three years after the complete of the final Financial State Report to FEMA.
- Project Database:
  - The NEMA Recovery Section and NeDNR maintain databases of information on current and previous projects including dates approved, completed, financial amounts, location, and project types. As new data is identified, the database is updated accordingly.

The NEMA and NeDNR staff maintain monitoring oversight through the following activities:

- Review submitted hazard mitigation planning applications and multi-jurisdictional hazard mitigation plans.
- Assist local/regional jurisdictions and contractors with the development of hazard mitigation plans.
- Act as a liaison between FEMA and the local/regional jurisdictions during the review process.
- Conduct on-site visits and monitor projects to ensure applicants are implementing hazard mitigation plans and project development as planned.
- Review and revise the Nebraska State Hazard Mitigation Plan as needed.

Coordination of the process to monitor progress in plan implementation across the various stakeholders continues to improve the state's ability to address hazards statewide. As the hazards in this plan are unpredictable, the plan will continue to evolve and adapt to current conditions. The mitigation capabilities and implementation will continue to be enhanced through this process.

### 6.3.1 Incorporating the Plan into Existing Planning Mechanisms

An ongoing responsibility of Planning Committee members is to identify additional stakeholders and existing planning mechanisms that can assist in integrating mitigation planning into short- and long-term community development and resiliency planning. This involves establishing hazard mitigation as a state and local planning priority that can be supported through the same capabilities defined in the plan.

- Planning and Regulatory
- Administrative and Technical
- Smart Growth
- Fiscal and Resources
- Education and Outreach

Each step in the planning cycle includes ongoing opportunities to identify existing planning processes that provide a platform for integration of hazard mitigation planning. Each annual review of the plan will include an analysis of how the mitigation plan has been incorporated into existing planning mechanisms.

# Appendix A: Planning Process Documentation

# Appendix A: Planning Process Documentation

## A-1: Engagement Strategy

### STATE OF NEBRASKA HAZARD MITIGATION PLAN 2026 UPDATE – ENGAGEMENT STRATEGY

#### PURPOSE

- Meet requirements of 44 CFR Part 201.4.
- Develop ongoing support for the plan and its strategies.
- Enhance “buy-in” from state and federal agencies, stakeholders, local jurisdictions, and organizations, resulting in greater success in implementing mitigation actions and projects to reduce risk.
- Integrate mitigation planning into state planning and resiliency practices.
- Provide an ongoing opportunity for public agencies, nongovernmental and community-based organizations, the private sector, and residents to participate in and support mitigation planning, activities, and initiatives.

#### ENGAGEMENT METHODS AND SCHEDULE

| Topic/Activity | Method |
|---|---|
| **Kickoff Meeting: September 24, 2024** | Email invitation |
| **Meeting 2: Capabilities Meeting December 10, 2024** | 1. Email invitation<br>2. Meeting hosted by NEMA, contractor presentation; participant discussion input<br>3. Follow-up emails and phone calls to non-participating agencies and jurisdictions |
| **Meeting 3: Mitigation Actions Meeting February 11, 2025** | 1. Email invitation<br>2. Meeting hosted by NEMA with Contractor presentation; Participant discussion input<br>3. Contractor follow-up emails and phone calls to non-participating agencies |

# A-2: Record of Participation

| Name | Title | Agency | Plan Kickoff Meeting | Capabilities Meeting | Mitigation Action Meeting | Plan Review/Approval Process |
|---|---|---|---|---|---|---|
| **Derek Schriner** | Engineer/ Silver Jackets Coordinator | U.S. Army Corps of Engineers (USACE) | ✓ | ✓ | | |
| **Amelia Baker** | Environmental Specialist II | Nebraska Game and Parks Commission | ✓ | ✓ | ✓ | ✓ |
| **Russ Wren** | Emergency Response Coordinator/ Emergency Support Function (ESF) 8 | Nebraska Department of Health and Human Services | ✓ | | | ✓ |
| **Jeffery Edwards** | Environmental Supervisor | Nebraska Department of Environment and Energy (NDEE) | ✓ | | | |
| **Adele Phillips** | Flood Mitigation Planner | Nebraska Department of Natural Resources (NeDNR) | ✓ | | | |
| **Stephanie Drake** | Community Planner | Federal Emergency Management Agency (FEMA) | ✓ | | | |
| **Lexy Hindt** | Recovery Section Manager | Nebraska Emergency Management Agency (NEMA) | ✓ | ✓ | ✓ | ✓ |
| **Joel Beckman** | Public Assistance Unit Supervisor | NEMA | ✓ | | | |
| **Angelina Allen** | State Hazard Mitigation Program Specialist | NEMA | ✓ | ✓ | ✓ | |

| Name | Title | Agency | Plan Kickoff Meeting | Capabilities Meeting | Mitigation Action Meeting | Plan Review/Approval Process |
|---|---|---|---|---|---|---|
| **Joseph Lauber** | Deputy Director – Operations | Nebraska Department of Economic Development (DED) | ✓ | | | |
| **Chelsea Harris** | State Hazard Mitigation Officer/ Hazard Mitigation Unit Supervisor | NEMA | ✓ | | ✓ | ✓ |
| **Heaven McKinley** | Civil Engineer | USACE | ✓ | | | |
| **Scott Cordes** | State Fire Marshal Agency Director | State Fire Marshal's Office | ✓ | ✓ | ✓ | |
| **Donny Christensen** | Recovery Section Administrator | NEMA | ✓ | | | ✓ |
| **Penn Pennel** | Emergency Management Specialist Hazard Mitigation HMGP Grants Project Officer | FEMA | ✓ | | | |
| **Erv Portis** | Assistant Director | NEMA | ✓ | | | |
| **Marisa Alvares** | Hazard Mitigation Program Specialist I | NEMA | ✓ | | | |
| **Steven Jara** | Deputy Director | Nebraska Forest Service | ✓ | | ✓ | |
| **Kevin Cotter** | Program Specialist I | NEMA | ✓ | ✓ | ✓ | |

| Name | Title | Agency | Plan Kickoff Meeting | Capabilities Meeting | Mitigation Action Meeting | Plan Review/Approval Process |
|---|---|---|---|---|---|---|
| **Logan Lueking** | Planner | NEMA | ✓ | | | |
| **Casey Hartline** | Supervisory Emergency Management Specialist | FEMA | ✓ | | | |
| **Erica Wertz** | Deputy State Hazard Mitigation Officer | NEMA | ✓ | ✓ | | |
| **Bobbi Brooks** | Highway Emergency Program Specialist | Nebraska Department of Transportation (NDOT) | | ✓ | | |
| **Mike Gibson** | Emergency Response Coordinator | Nebraska Department of Agriculture | | ✓ | ✓ | |
| **Josh Yox** | State VAL Long-Term Recovery Specialist | NEMA | | ✓ | ✓ | |
| **Tim Gokie** | Chief Engineer | NeDNR | | ✓ | | ✓ |
| **Doris Jansky** | ESF 12 | NDEE | | ✓ | | ✓ |
| **Luke Bonkiewicz** | Research Analyst | Nebraska Association of County Officials | | ✓ | | |
| **Jenny B. Mason** | Director of Community Development and Disaster Recovery | DED | | ✓ | ✓ | |
| **Jessica Sherwood** | Highway Operations Communications Manager | NDOT | | ✓ | ✓ | |

| Name | Title | Agency | Plan Kickoff Meeting | Capabilities Meeting | Mitigation Action Meeting | Plan Review/Approval Process |
|---|---|---|---|---|---|---|
| **Bryce Puck** | Professional Engineer I | NDEE | | | ✓ | |
| **Jason Prante** | Emergency Preparedness Coordinator | Nebraska State Patrol | | | ✓ | ✓ |
| **James Dukesherer** | Director of Government Relations | Nebraska Rural Electric Association | ✓ | | | |

# A-3: Planning Meetings and Engagement Documentation

## NEBRASKA STATE HAZARD MITIGATION PLAN 2026 UPDATE – KICKOFF MEETING 09/24/2024

### PARTICIPANTS

| Name | Title | Agency/Jurisdiction |
|---|---|---|
| **Derek Schriner** | Engineer/ Silver Jackets Coordinator | U.S. Army Corps of Engineers (USACE) |
| **Amelia Baker** | Environmental Specialist II | Nebraska Game and Parks Commission |
| **Russ Wren** | Emergency Response Coordinator/ Emergency Support Function 8 | Nebraska Department of Health and Human Services |
| **Jeffery Edwards** | Environmental Supervisor | Nebraska Department of Environment and Energy |
| **Adele Phillips** | Flood Mitigation Planner | Nebraska Department of Natural Resources |
| **Stephanie Drake** | Community Planner | Federal Emergency Management Agency (FEMA) |
| **Lexy Hindt** | Recovery Section Manager | Nebraska Emergency Management Agency (NEMA) |
| **Joel Beckman** | Public Assistance Unit Supervisor | NEMA |
| **Angelina Allen** | State Hazard Mitigation Program Specialist | NEMA |
| **Joseph Lauber** | Deputy Director – Operations | Nebraska Department of Economic Development |
| **Chelsea Harris** | State Hazard Mitigation Officer/ Hazard Mitigation Unit Supervisor | NEMA |
| **Heaven McKinley** | Civil Engineer | USACE |
| **Scott Cordes** | State Fire Marshal Agency Director | State Fire Marshal's Office |
| **Donny Christensen** | Recovery Section Administrator | NEMA |
| **Penn Pennel** | Emergency Management Specialist Hazard Mitigation HMGP Grants Project Officer | FEMA |
| **Erv Portis** | Assistant Director | NEMA |
| **Marisa Alvares** | Hazard Mitigation Program Specialist I | NEMA |
| **Steven Jara** | Deputy Director | Nebraska Forest Service |
| **Kevin Cotter** | Program Specialist I | NEMA |

| Name | Title | Agency/Jurisdiction |
|---|---|---|
| **Logan Lueking** | Planner | NEMA |
| **Casey Hartline** | Supervisory Emergency Management Specialist | FEMA |
| **Erica Wertz** | Deputy State Hazard Mitigation Officer | NEMA |
| **James Dukesherer** | Director of Government Relations | Nebraska Rural Electric Association |
| **Jeanne Bunting** | Project Manager | IEM |
| **Kim Anthony** | Lead Planner | IEM |
| **Sabrina Lunsford** | Planner | IEM |

### WELCOME AND INTRODUCTIONS – JEANNE BUNTING, IEM

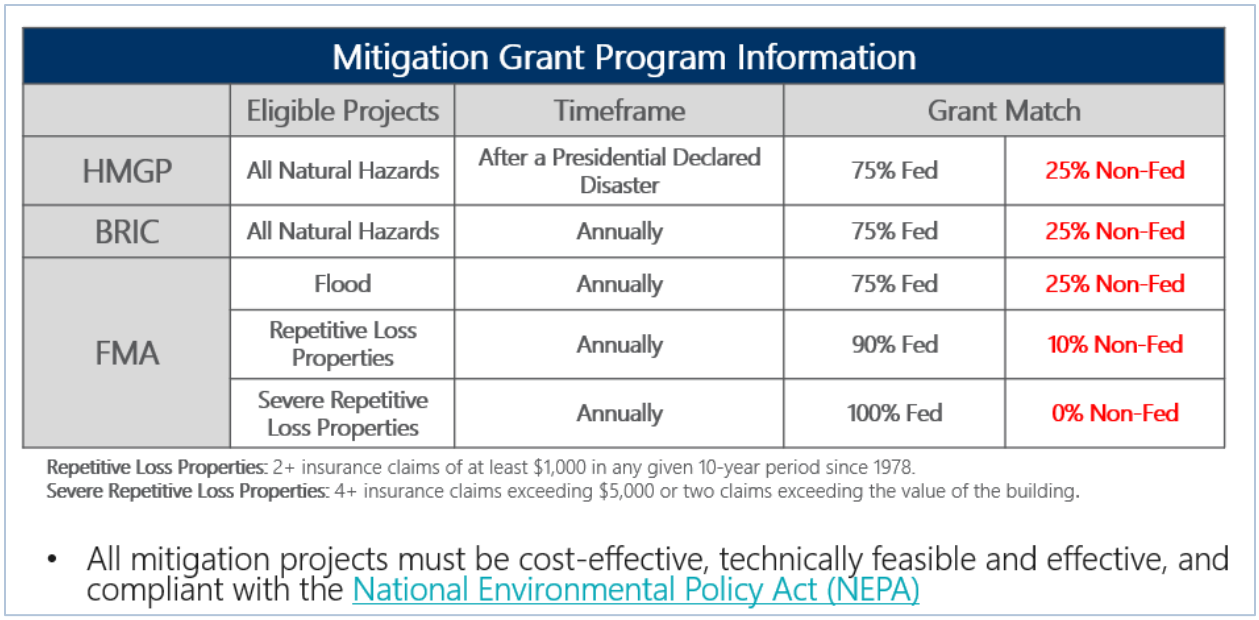
Kim Anthony, IEM Lead Planner, began the discussion.

### DISCUSSION

- Agenda
  - Introductions
  - Overview
  - What Is Hazard Mitigation?
  - Hazard Mitigation Planning
  - Hazard Mitigation Grants
  - Hazard Review
  - Risk Assessment
  - Goals
  - Stakeholder Expectations
- Context
  - Plan expiration 01/26/2026
  - Draft ready 06/1/2025
  - FEMA Submittal 08/01/2025
- Mitigation
  - Any **sustained** action taken to reduce or eliminate long-term risks from hazards to people or property

- New FEMA Guidance
  - State Mitigation Planning Policy Guide (effective April 19, 2023)
  - Updates
    - Emphasis on partnerships
    - Requires addressing future conditions/climate change
    - Increased discussion of the National Flood Insurance Program
    - High Hazard Potential Dam (HHPD) element
- What is a mitigation plan?
  - **Hazard mitigation plans** are prepared and adopted by jurisdictions to identify, assess, and reduce the long-term risk to life and property based on natural and human-caused hazards.
- Components of a Mitigation Plan
  - Planning Process
    - Hazard Mitigation Planning Committee Structure
    - Previous Plan Updates
    - Planning Mechanisms Review
    - Hazard Assessment
    - Community Resource Capabilities
    - Community Demographics and Vulnerability
  - Hazard and Risk Assessment
    - Profile past occurrences of the impact of the hazards
    - Discuss differences for the hazards
    - Addressing the impact of the hazards on critical community lifelines
    - Address the climate trends and variations of specific hazards
    - Risk Assessment needs to identify the following elements of hazards:
      - Location
      - Extent (magnitude/strength)
      - Previous occurrences
      - Future probability
      - Population
      - Build environment

        - Natural environment
        - Economy
    - Mitigation Strategy
        - Determining goals to be achieved and areas in which they can be expanded or improved upon
        - Maintaining compliance with the National Flood Insurance Program
        - Prioritizing and identifying projects to reduce the most vulnerable areas identified
        - Describing funding sources, timeframes, and project details
    - Implementation, Integration, and Plan Maintenance
        - Plan adoption
        - Plan implementation
        - Integration into local planning mechanisms
        - Monitoring, evaluating, and updating the plan
        - Continued public involvement
- Why is a plan needed?
    - A FEMA-approved and adopted plan is required to receive funding through grant programs, such as the following:
        - Hazard Mitigation Grant Program (HMGP)
        - Hazard Mitigation Grant Program – Post Fire (HMGP-PF)
        - Building Resilient Infrastructure and Communities (BRIC)
        - Flood Mitigation Assistance (FMA)
        - FMA Swift Current
        - High Hazard Potential Dam (HHPD) grants
        - Public Assistance (PA)
    - Hazard Mitigation Assistance Grants



| Mitigation Grant Program Information | | | | |
|---|---|---|---|---|
| | Eligible Projects | Timeframe | Grant Match | |
| HMGP | All Natural Hazards | After a Presidential Declared Disaster | 75% Fed | 25% Non-Fed |
| BRIC | All Natural Hazards | Annually | 75% Fed | 25% Non-Fed |
| FMA | Flood | Annually | 75% Fed | 25% Non-Fed |
| | Repetitive Loss Properties | Annually | 90% Fed | 10% Non-Fed |
| | Severe Repetitive Loss Properties | Annually | 100% Fed | 0% Non-Fed |

**Repetitive Loss Properties**: 2+ insurance claims of at least $1,000 in any given 10-year period since 1978.
**Severe Repetitive Loss Properties**: 4+ insurance claims exceeding $5,000 or two claims exceeding the value of the building.

- All mitigation projects must be cost-effective, technically feasible and effective, and compliant with the National Environmental Policy Act (NEPA)

**Figure 114: Mitigation Grant Cost-Share Overview**

- 2024 Hazards
  - Animal disease
  - Plant disease and pests
  - Dam failure
  - Levee failure
  - Drought
  - Flood/flash flood
  - Human infectious disease
  - Severe thunderstorms (lighting, strong winds, hail)
  - Sever winter storm
  - Terrorism (include cyberterrorism)
  - Tornado
  - Wildfire
  - Chemical and radiological fixed sites and transportation (hazmat incidents)
  - Extreme temperatures (heat and cold)
  - Power and infrastructure failure
- Changes from 2021 Plan
  - Add cyberterrorism to terrorism

  - Keep dam failure and levee failure as separate hazards
  - Break out “Other hazards of concern” into individual hazards
- Goals from 2021 will be updated to reflect new guidance
  - Promote a comprehensive state hazard mitigation policy framework to coordinate federal, state, and local hazard mitigation planning and program efforts.
  - Reduce or eliminate long-term risk to property, including critical facilities and infrastructure, as well as historic and private property.
  - Promote public awareness of hazards and how to reduce their impacts to all individuals especially those with functional and access needs.
  - Encourage the development and implementation of long-term, cost-effective, and resilient mitigation projects that preserve or restore the functions of natural systems.
  - Build stronger by promoting mitigation actions emphasizing sustainable construction and design measures to reduce or eliminate the impacts of natural hazards.
    - Reduce the number of High Hazard Potential Dams.
- Planning expectations
  - Active participation
  - Active communication
  - Respect deadlines
- IEM Goals
  - Ensure customer/client satisfaction.
  - Ensure all voices are heard.
  - Reflect Nebraska’s vision in the plan update.
  - Approved Pending Adoption (APA) Plan.

## NEXT STEPS

- IEM will send a risk assessment survey with PowerPoint to Nebraska State
- Capability meeting first week of December

## QUESTIONS AND COMMENTS

- Questions for IEM
  - None

## NEXT MEETINGS AND UPCOMING DEADLINES

- Risk Assessment to Nebraska State mid-October
- The capability assessment meeting is in the first week of December, and the date will be determined.

Minutes prepared by Sabrina Lunsford, IEM Mitigation Planner


IEM
Nebraska State Hazard Mitigation Plan
2025 Update: Kick-Off Meeting
NEBRASKA

1


NEBRASKA
IEM
Context
Nebraska
5-year hazard mitigation plan expires with FEMA on 1/26/2026
Draft Ready: 6/1/2025
FEMA Submittal: 8/1/2025

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IEM
Presentation Agenda
Introductions
Overview
What is Hazard Mitigation?
Hazard Mitigation Planning
Hazard Mitigation Grants
Hazard Review
Risk Assessment
Goals
Stakeholder Expectations
Nebraska State Hazard Mitigation Plan Kick-Off

2


NEBRASKA
IEM
What is Hazard Mitigation?

5


NEBRASKA
IEM
Welcome and Introductions
IEM
Jeanne Bunting
- Project Manager
Kim Anthony
- Planning Lead
Sabrina Lunsford
- Planner
IEM Years of Experience
39+
39+
27+
28+
21+

3


NEBRASKA
IEM
NEW FEMA Planning Mitigation Policy
New federal guidance as of April 2023
Big Updates Include:
- Emphasis on partnerships
- Requires addressing future conditions/climate change
- Increased discussion of the National Flood Insurance Program
- High Hazard Potential Dams (HHPD) element
State Mitigation Planning Policy Guide
Hazard Mitigation Assistance Program and Policy Guide

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NEBRASKA
IEM
What is a Hazard Mitigation Plan?
Hazard mitigation plans are prepared and adopted by jurisdictions to identify, assess, and reduce the long-term risk to life and property based on natural and human-caused hazards.
Components:
1. Planning Process
2. Hazard & Risk Assessment
3. Mitigation Strategy
4. Implementation, Integration & Plan Maintenance

7


IEM
FOREST FIRE DANGE
MODERATE
ROAD CLOSED
3. Mitigation Strategy
• Determining goals to be achieved and areas in which they can be expanded or improved upon
• Maintaining compliance with the National Flood Insurance Program
• Prioritize and identify projects to reduce the most vulnerable areas identified
• Describing funding sources, timeframes, and project details

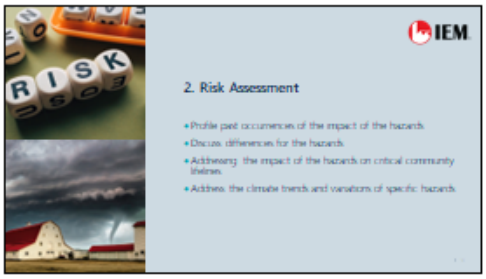
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IEM
1. Planning Process
• Hazard Mitigation Planning Committee Structure
• Previous Plan Updates
• Planning Mechanisms Review
• Hazard Assessment
• Community Resource Capabilities
• Community Demographics & Vulnerability

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IEM
4. Plan Maintenance
• Plan Adoption
• Plan Implementation
• Integration into local planning mechanisms
• Monitoring, evaluating, and updating the plan
• Continued public involvement

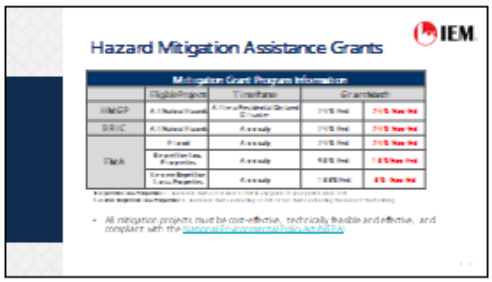
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IEM
RISK
2. Risk Assessment
• Profile past occurrences of the impact of the hazards
• Discuss differences for the hazards
• Addressing the impact of the hazards on critical community lifelines
• Address the climate trends and variations of specific hazards

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NEBRASKA
IEM
Why do we need a Plan?
A FEMA-approved and adopted plan are required to receive funding through grant programs, such as:
- Hazard Mitigation Grant Program (HMGP)
- Building Resilient Infrastructure and Communities (BRIC)
- Flood Mitigation Assistance (FMA)
- High Hazard Potential Dams grants (HHPD)
- Public Assistance (PA)
Hazard Mitigation Assistance
FEMA

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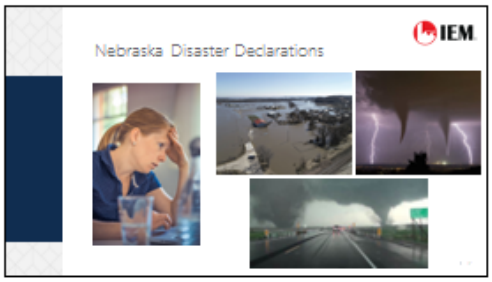

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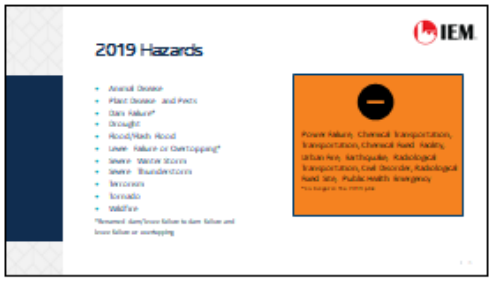

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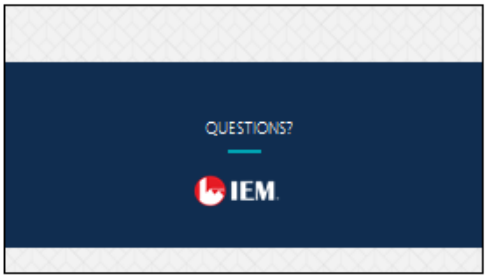

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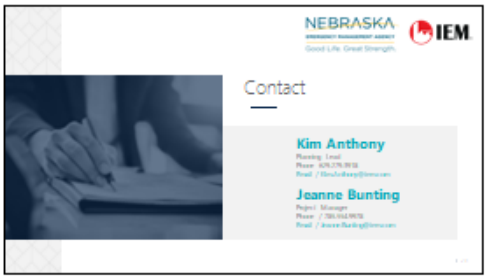

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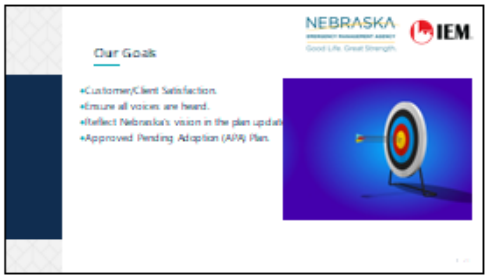

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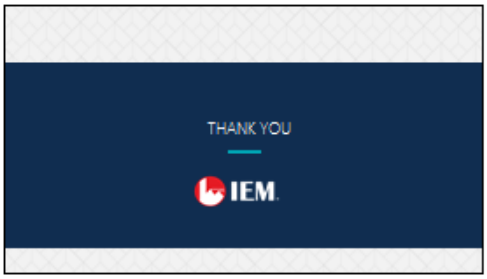

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# NEBRASKA STATE HAZARD MITIGATION PLAN 2026 UPDATE – CAPABILITIES MEETING 12/10/2024

## PARTICIPANTS

| Name | Title | Agency/Jurisdiction |
|---|---|---|
| **Bobbi Brooks** | Highway Emergency Program Specialist | Nebraska Department of Transportation |
| **Mike Gibson** | Emergency Response Coordinator | Nebraska Department of Agriculture |
| **Josh Yox** | State VAL Long-Term Recovery Specialist | Nebraska Emergency Management Agency (NEMA) |
| **Tim Gokie** | Chief Engineer | Nebraska Department of Natural Resources |
| **Lexy Hindt** | Recovery Section Manager | NEMA |
| **Doris Jansky** | Emergency Support Function 12 | Nebraska Department of Environment and Energy |
| **Angelina Allen** | Hazard Mitigation Program Specialist | NEMA |
| **Luke Bonkiewicz** | Research Analyst | Nebraska Association of County Officials |
| **Derek Schriner** | Engineer | U.S. Army Corps of Engineers |
| **Amelia Baker** | Environmental Specialist II | Nebraska Game and Parks Commission |
| **Erica Wertz** | Deputy State Hazard Mitigation Officer | NEMA |
| **Kevin Cotter** | Program Specialist | NEMA |
| **Scott Cordes** | Fire Marshal | State Fire Marshal Agency |
| **Jenny B. Mason** | Director of Community Development and Disaster Recovery | Nebraska Department of Economic Development |
| **Jessica Sherwood** | Highway Operations Communications Manager | Nebraska Department of Transportation |
| **Kim Anthony** | Lead Planner | IEM |
| **Sabrina Lunsford** | Planner | IEM |

## WELCOME AND INTRODUCTIONS – KIM ANTHONY, IEM

Kim Anthony, IEM Lead Planner, began the discussion by sharing the QC code and asking everyone to take the icebreaker survey.

## DISCUSSION

- Agenda
  - Risk Assessment results
  - Review of Previous Capabilities
  - Types of Capabilities
  - Capabilities Work Sheet
  - Plan Integration
- Risk Assessment Results – Hazard Rankings
  - Drought-1
  - Wildfires-2
  - Severe Thunderstorms-3
  - Severe Winter Storms-4
  - Power and Infrastructure Failure-5
  - Floods-6
  - Terrorism/Cyberterrorism-7 (tied)
  - Tornado-7
  - Extreme Temperatures-8
  - Chemical and Radiological Fixed Sites and Transportation-9
  - Dam Failure-10 (tied)
  - Human Disease-10
  - Levee Failure-11
  - Animal Disease (Foreign)-12
  - Animal Disease (Domestic)-13
  - Plant Disease-14
    - Discussion followed regarding the increase in animal disease cases and the potential of increasing risk rating.
- Review of Previous Plan Capabilities
  - Planning and Regulatory Capabilities
    - Add NROC statute 13-1907
    - Nebraska Plans
      - Add Department of Environment and Energy Consolidated Plan (updated every 5 years)

- Add Nebraska Energy Security Plan – updated 09/30/2024
- Add Community Protection Wildfire Plan
- Add Nebraska Long-Term Recovery Plan

- Administrative and Technical Capabilities
  - Multi-agency/Multijurisdictional Coordination Organizations
    - Add anyone who was on the Governor's Task Force
    - Silver Jackets will send updated statutes
    - Lexi will provide contact information for Larry to send updates on the Nebraska State Emergency Response Commission (SERC)
  - State Coordination Capabilities with Federal Agencies
    - USACE will make sure previous capabilities information is still accurate
    - FEMA will make sure previous capabilities information is still accurate
    - NOAA/NWS 6 Locations in Nebraska
- Financial Capabilities
  - State Programs
    - Add Energy Savings Loan
    - Add Water Sustainability Fund
  - Federal Programs
    - Add Swift Current Grant
    - Add Water Smart Program
    - Add USDA Programs
- Education and Outreach
  - Social Media
    - Be prepared training, partners with state troopers, Facebook, LinkedIn, and email
  - Hazard Awareness Campaigns
    - Press releases about fire
  - Outreach organizations that represent, advocate for, and interact with underserved and vulnerable communities
    - Mapping – Host meetings and send postcards to people who may be impacted in floodplains
  - Miscellaneous

- Department of Agriculture – Disaster Awareness Training for Emergency Services Personnel
- Group Leaders-Veterans
- Code Red, NEMA, and FEMA
- Agriculture security goes to community events, posts videos, and training websites
- PET – Planning, exercises, and training
- Traffic Incident Program – Has dynamic message signs
- Floodplain training for professionals, Insurance Agents, and surveyors – Use Facebook, LinkedIn, Twitter and Instagram
- FEMA provides watches, warnings, and advisories through alert systems such as dialing #511.
- Energy Awareness month – Provides information daily in October through social media
- Energy Code Training
- NIAC – cybersecurity security training

## NEXT STEPS

- Silver Jackets will send updated statutes.
- Lexi will provide contact information for Larry to send updates on SERC.

## QUESTIONS AND COMMENTS

- Questions for IEM
  - None

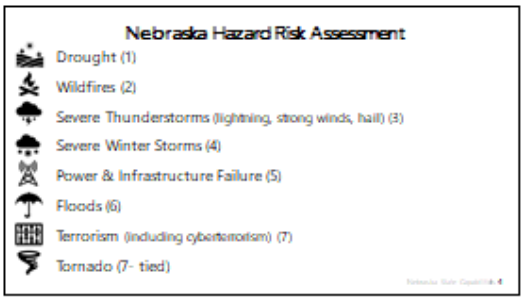
## NEXT MEETINGS AND UPCOMING DEADLINES

- Capabilities due by December 23, 2024.
- Mitigation Actions Development meeting, mid-February; the exact date will be determined later.

Minutes prepared by Sabrina Lunsford, IEM Mitigation Planner


IEM
NEBRASKA STATE CAPABILITIES
December 10,2021

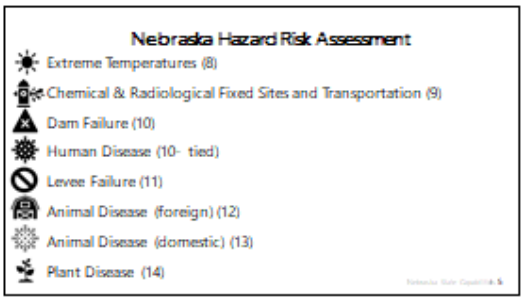
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Nebraska Hazard Risk Assessment
Drought (1)
Wildfires (2)
Severe Thunderstorms (lightning, strong winds, hail) (3)
Severe Winter Storms (4)
Power & Infrastructure Failure (5)
Floods (6)
Terrorism (including cyberterrorism) (7)
Tornado (7- tied)

4

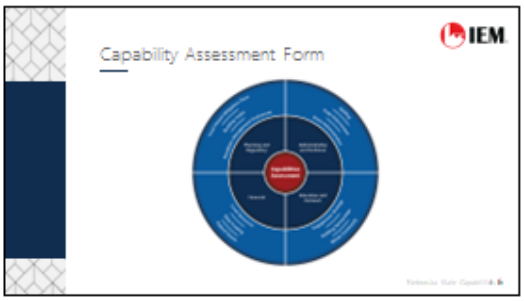

IEM
Sign In & Ice Breaker Survey

2


Nebraska Hazard Risk Assessment
Extreme Temperatures (8)
Chemical & Radiological Fixed Sites and Transportation (9)
Dam Failure (10)
Human Disease (10- tied)
Levee Failure (11)
Animal Disease (foreign) (12)
Animal Disease (domestic) (13)
Plant Disease (14)

5


IEM
Agenda
Risk Assessment Results
Review of Previous Plan Capabilities
Types of Capabilities
Capability Worksheet
Plan Integration


IEM
Capability Assessment Form




7



# NEBRASKA STATE HAZARD MITIGATION PLAN 2026 UPDATE – MITIGATION ACTIONS MEETING 02/11/2025

## PARTICIPANTS

| Name | Title | Agency/Jurisdiction |
|---|---|---|
| **Bryce Puck** | Professional Engineer I | Nebraska Department of Environment and Energy |
| **Jessica Sherwood** | Hwy Operations Communications Manager | Nebraska Department of Transportation |
| **Kevin Cotter** | Program Specialist | Nebraska Emergency Management Agency (NEMA) |
| **Chelsea Harris** | Hazard Mitigation supervisor | NEMA |
| **Amelia Baker** | Environmental Specialist II | Nebraska Game and Parks Division |
| **Josh Yox** | State VAL Citizen Corps Coordinator Long-Term Recovery Specialist DR-4778 DCM Project Director Fiscal Specialist | NEMA |
| **Steven Jara** | Deputy Director | Nebraska Forest Service |
| **Lexy Hindt** | Recovery Section Manager | NEMA |
| **Jason Prante** | Emergency Preparedness Coordinator | Nebraska State Patrol |
| **Jenny B. Mason** | Director of Community Development and Disaster Recovery | Nebraska Department of Economic Development |
| **Mike Gibson** | Emergency response coordinator | Nebraska Department of Agriculture |
| **Scott Cordes** | Director | State Fire Marshal's Office |
| **Angelina Allen** | Hazard Mitigation Program Specialist | NEMA |
| **Jeanne Bunting** | Project Manager | IEM |
| **Joseph Harris** | Planner | IEM |
| **Sabrina Lunsford** | Planner | IEM |

## WELCOME AND INTRODUCTIONS – JEANNE BUNTING, IEM

Jeanne Bunting, IEM Project Manager, began the discussion.

## DISCUSSION

- Agenda
  - Introductions

- Overview of Mitigation Strategy
- Mitigation Goals
- State Mitigation Action Examples
- Previous Mitigation Actions
- FEMA Requirements for Mitigation Actions
- Mitigation Action Item Development

- Quick Review
  - Determining goals
  - Maintaining compliance
  - Prioritizing and identifying projects
  - Describing funding sources, timeframes, and project details
- Mitigation Goals Review
  - Promote a comprehensive state hazard mitigation policy framework.
  - Reduce or eliminate long-term risk to property.
  - Promote public awareness of hazards.
  - Encourage developing and implementing long-term, cost-effective, and resilient mitigation projects.
  - Build stronger.
- Mitigation Action Examples
  - South Dakota
  - Iowa
  - North Dakota
  - Colorado
- Status of Previous Mitigation Actions
  - Need a narrative of whether actions have been completed and whether the action is no longer relevant or included in the updated plan.
  - Action 1: Create a repository for risk assessment data would allow authorized agencies to access vital information related to hazard impacts on people, critical infrastructure, property, the environment, and the economy, thereby increasing the efficiency and effectiveness of disaster preparedness, response, recovery, and mitigation.
    - NE wants to carry it forward into the current plan and ongoing.

    - Action 2: Development of a statewide acquisition strategy that would align the state's flood mitigation efforts and resources to work together towards a common goal. Acquisition projects could apply to critical facilities, infrastructure, and private property.
        - It is in progress and will be carried forward into the plan update.
    - Action 3: Promote participation in Hazard Reduction Community Programs (StormReady, Firewise, CRS, Community Wildfire Protection Plan, etc.).
        - It is in progress and will be carried forward into the plan update.
    - Action 4: Establish a floodplain management program for channel migration to meet existing infrastructure and emphasize nature-based solutions.
        - It is in progress and will be carried forward into the plan update.
    - Action 5: Establish a program to promote building code updates and enforcement.
        - Focus more on education, promoting local enforcement and education of building codes.
- Mitigation Action Requirements
    - Hazard addressed
    - Prioritization criteria and ranking
    - Responsible agency
    - Funding source
    - Goal alignment
    - Address state-owned assets or critical infrastructure.
- Mitigation Actions Overview – Actions Supported by the State:
    - Planning and Regulatory Mitigation Actions
    - Structural and Infrastructure Mitigation Actions
    - Nature System Protection
    - Public Education, Technical Assistance, and Partnerships
- Hazards
    - Animal Disease
    - Dam Failure
    - Drought (natural)
    - Flood/Flash Flood (natural)
    - Human Infectious Disease
    - Levee Failure
    - Plant Disease and Pests

- Severe Thunderstorm (natural)
- Severe Winter Storm (natural)
- Terrorism
- Tornado (natural)
- Wildfire
- Chemical Fixed Sites and Transportation
- Extreme Temperatures
- Power Failure

- Discussion of Mitigation Actions Prioritization Worksheet
  - Category: Life Safety/Property Protection
    - Points 0–4
    - Criteria
      - 4 – Likely to protect more than 50% of the population and/or critical infrastructure and community assets.
      - 3 – Likely to protect between 25% and 50 % of the population and/or critical infrastructure and community assets.
      - 2 – Could potentially protect up to 25% of the population and could potentially protect critical infrastructure and community assets.
      - 1 – Could potentially protect up to 10% of the population and could potentially protect critical infrastructure and community assets.
      - 0 – Potential for protecting lives and critical infrastructure and/or community assets cannot be determined at this time.
  - Funding Availability
    - Points 0–4
    - Criteria
      - 4 – Little to no direct expenses
      - 3 – Can be funded by the operating budget
      - 2 – Grant funding identified
      - 1 – Grant funding needed
      - 0 – Potential funding source unknown
  - Probability of Matching Funds
    - Points 0, 2, 4

- Criteria
  - 4 – Funding match is available, or funding match not required.
  - 2 – Partial funding matches are available.
  - 0 – No funding match is available or funding match unknown

- Benefit–Cost Review
  - Points 0, 2, 4
  - Criteria
    - 4 – Likely to meet Benefit–Cost Review
    - 2 – Benefit–Cost Review not required
    - 0 – Benefit–Cost Review unknown

- Environmental Benefit
  - Points 0–4
  - Criteria
    - 4 – Environmentally sound and relatively easy to implement, or without adverse environmental impact
    - 3 – Environmentally acceptable and not anticipated to be difficult to implement
    - 2 – Environmental concerns are somewhat difficult to implement because of complex requirements
    - 1 – Difficult to implement because of significantly complex requirements and environmental permitting
    - 0 – Very difficult to implement due to extremely complex requirements and environmental permitting problems

- Technical Feasibility
  - Points 4, 2, 0
  - Criteria
    - 4 – Proven to be technically feasible
    - 2 – Expected to be technically feasible
    - 0 – Technical feasibility unknown or additional information needed

- Timeframe of Implementation
  - Points 4, 2, 0
  - Criteria
    - 4 – 1 year or less (short term)

    - 2 – 2 to 5 years (long-term)
    - 0 – More than 5 years (long-term)
- Best Practices
    - Loss avoidance study: Form a committee to study how mitigation projects enacted by State Hazard Mitigation Team partners have resulted in losses avoided.
    - Plan integration: Integrate mitigation plans with comprehensive plans, climate action plans, drought mitigation, and other resiliency initiatives.
- Planner Point of View on Worksheets
    - Importance of communication
    - Completion of all worksheets and not leaving any blanks

## NEXT STEPS

- **Mitigation worksheets must be completed and submitted to Kim Anthony by COB on February 20, 2025.**

## QUESTIONS AND COMMENTS

- Questions for IEM
    - Can NE take time to work through the worksheets so they can address items with their teams? Yes.

## NEXT MEETINGS AND UPCOMING DEADLINES

Mitigation Action Worksheets will need to be provided to Kim Anthony by COB on February 20, 2025.

Minutes prepared by Sabrina Lunsford, IEM Mitigation Planner

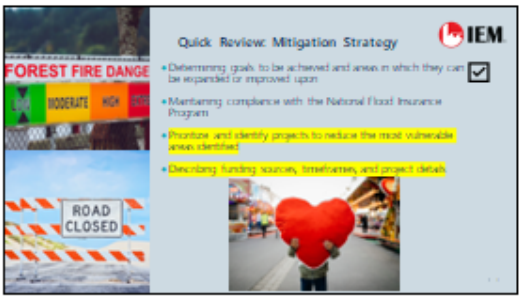

Sign In

1

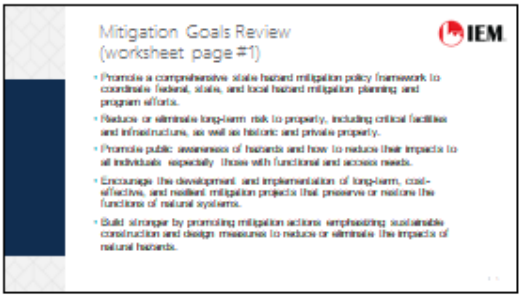

IEM
Nebraska State Hazard Mitigation Plan
2025 Update: Mitigation Actions Meeting
NEBRASKA

2


Presentation Agenda
Introductions
Overview of Mitigation Strategy
Mitigation Goals
State Mitigation Action Examples
Previous Mitigation Actions
FEMA Requirements for Mitigation Actions
Mitigation Action Item Development

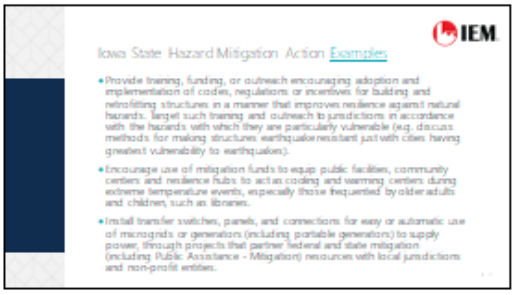

FOREST FIRE DANGE
ROAD CLOSED
Quick Review: Mitigation Strategy
IEM

4

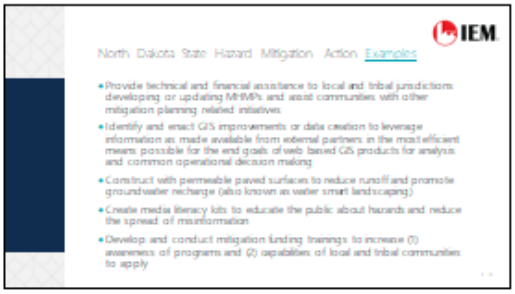

Mitigation Goals Review
(worksheet page #1)
IEM

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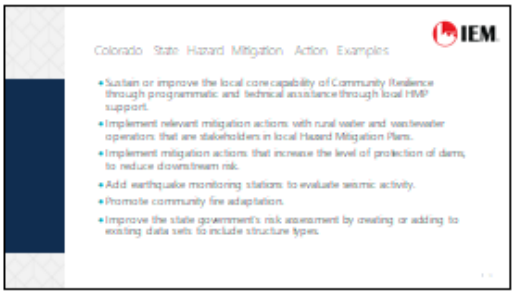

South Dakota State Mitigation Action Examples
IEM

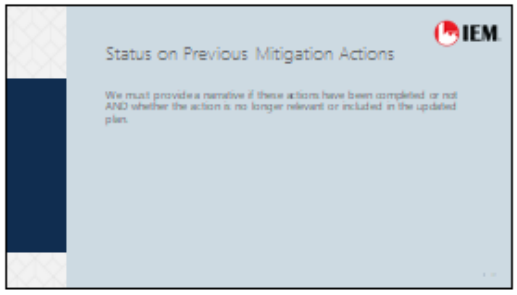

IEM
Iowa State Hazard Mitigation Action Examples
• Provide training, funding, or outreach encouraging adoption and implementation of codes, regulations or incentives for building and retrofitting structures in a manner that improves resilience against natural hazards. Target such training and outreach to jurisdictions in accordance with the hazards with which they are particularly vulnerable (e.g. discuss methods for making structures earthquake-resistant just with cities having greatest vulnerability to earthquakes).
• Encourage use of mitigation funds to equip public facilities, community centers and resilience hubs to act as cooling and warming centers during extreme temperature events, especially those frequented by older adults and children, such as libraries.
• Install transfer switches, panels, and connections for easy or automatic use of microgrids or generators (including portable generators) to supply power, through projects that partner federal and state mitigation (including Public Assistance - Mitigation) resources with local jurisdictions and non-profit entities.

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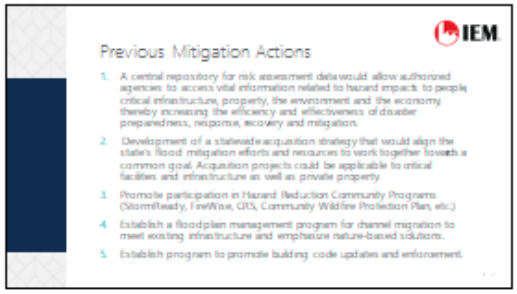

IEM
North Dakota State Hazard Mitigation Action Examples
• Provide technical and financial assistance to local and tribal jurisdictions developing or updating MHMPs and assist communities with other mitigation planning related initiatives.
• Identify and enact GIS improvements or data creation to leverage information as made available from external partners in the most efficient means possible for the end goals of web based GIS products for analysis and common operational decision making
• Construct with permeable paved surfaces to reduce runoff and promote groundwater recharge (also known as water smart landscaping)
• Create media literacy kits to educate the public about hazards and reduce the spread of misinformation
• Develop and conduct mitigation funding trainings to increase (1) awareness of programs and (2) capabilities of local and tribal communities to apply

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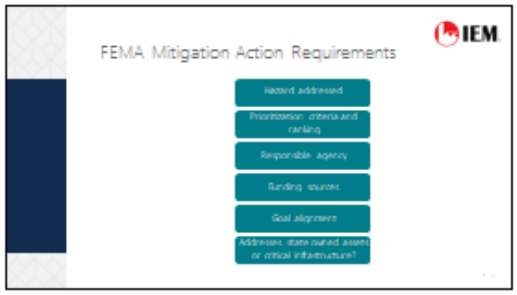

IEM
Colorado State Hazard Mitigation Action Examples
• Sustain or improve the local core capability of Community Resilience through programmatic and technical assistance through local HMP support.
• Implement relevant mitigation actions with rural water and wastewater operators that are stakeholders in local Hazard Mitigation Plans.
• Implement mitigation actions that increase the level of protection of dams, to reduce downstream risk.
• Add earthquake monitoring stations to evaluate seismic activity.
• Promote community fire adaptation.
• Improve the state government's risk assessment by creating or adding to existing data sets to include structure types.


IEM
Status on Previous Mitigation Actions
We must provide a narrative if these actions have been completed or not AND whether the action is no longer relevant or included in the updated plan.

10


IEM
Previous Mitigation Actions
1. A central repository for risk assessment data would allow authorized agencies to access vital information related to hazard impacts to people, critical infrastructure, property, the environment and the economy thereby increasing the efficiency and effectiveness of disaster preparedness, response, recovery and mitigation.
2. Development of a statewide acquisition strategy that would align the state's flood mitigation efforts and resources to work together towards a common goal. Acquisition projects could be applicable to critical facilities and infrastructure as well as private property.
3. Promote participation in Hazard Reduction Community Programs (StormReady, FireWise, CRS, Community Wildfire Protection Plan, etc.)
4. Establish a floodplain management program for channel migration to meet existing infrastructure and emphasize nature-based solutions.
5. Establish program to promote building code updates and enforcement.

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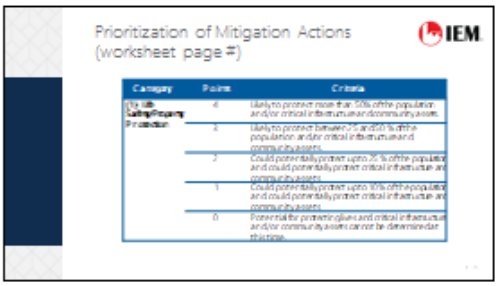

IEM
FEMA Mitigation Action Requirements
Hazard addressed
Prioritization criteria and ranking
Responsible Agency
Funding sources
Goal Alignment
Addresses state-owned assets or critical infrastructure?



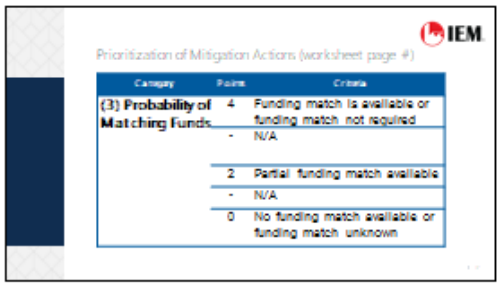

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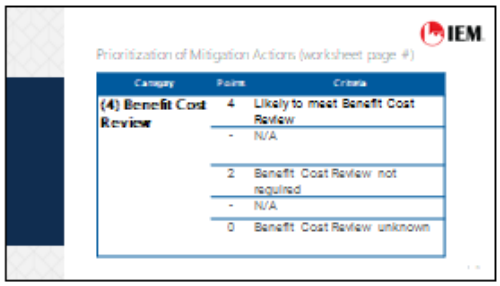

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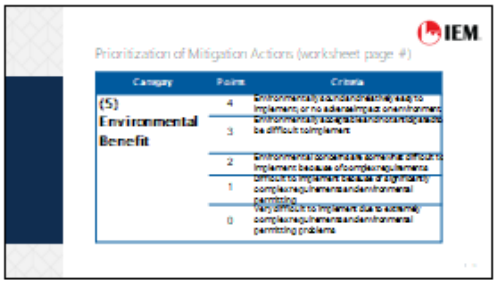

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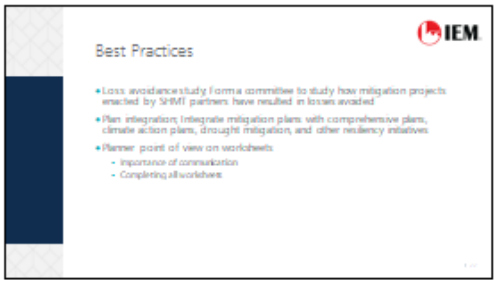

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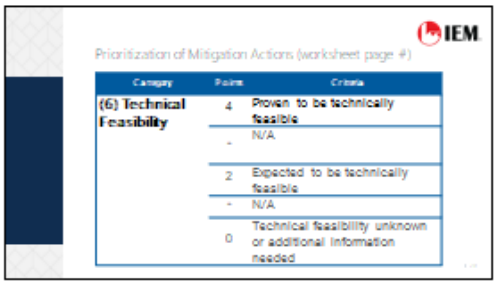

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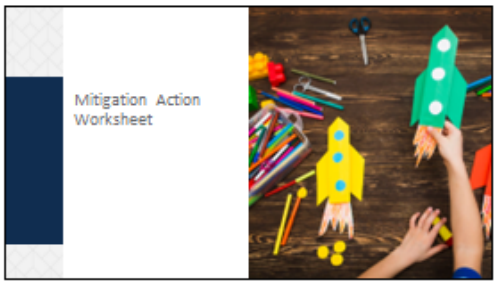

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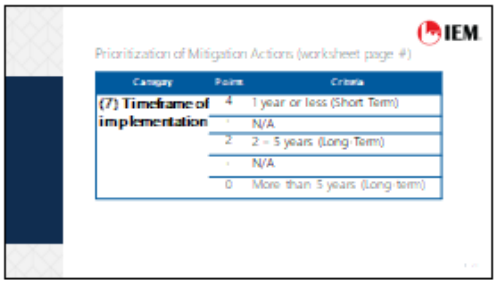

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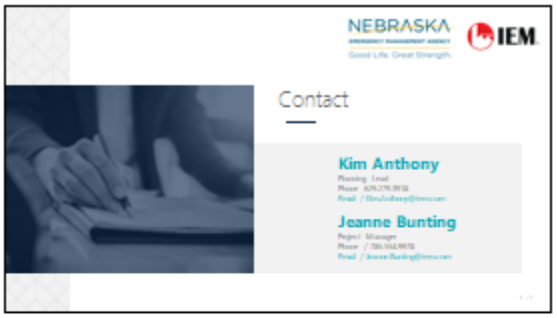

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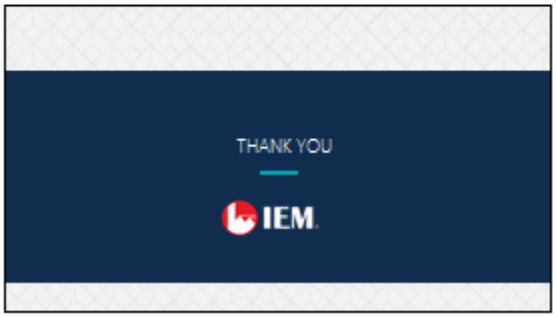

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24


NEBRASKA
IEM
Contact
Kim Anthony
Jeanne Bunting

25


THANK YOU
IEM

26

# Appendix B: Local Mitigation Plan

# Appendix B: Local Mitigation Plan

## Local Mitigation Plan Status

The Nebraska Emergency Management Agency (NEMA) has developed an interactive digital map to provide updates on the status of each local hazard mitigation plan (LHMP) across the state. This map offers users an overview of county-level mitigation plans, and it serves as a tool for local jurisdictions, emergency managers, and community stakeholders to track local hazard mitigation plans throughout the state. If a jurisdiction's LHMP is approaching expiration, stakeholders are encouraged to engage with their local emergency manager to participate in the planning and update process. The interactive map can be accessed here: https://nema.nebraska.gov/hazard-mitigation-planning.php.

**Table 125: Nebraska Local Hazard Mitigation Plans**

| Region Hazard Mitigation Plan | Plan Approval Date | Plan Expiration Date |
|---|---|---|
| Cedar/Dixon HMP | 2021 | 2026 |
| Central Platte NRD HMP | 2022 | 2027 |
| Hayes Hitchcock Frontier HMP | 2023 | 2028 |
| Lower Big Blue NRD and Little Blue NRD HMP | 2021 | 2026 |
| Lower Elkhorn NRD HMP & Lewis and Clark NRD HMP | 2025 | 2030 |
| Lower Loup NRD HMP | 2022 | 2027 |
| Lower Platte North NRD HMP | 2020 | 2025 |
| Lower Platte South NRD HMP | 2025 | 2030 |
| Nemaha NRD HMP | 2020 | 2025 |
| North Platte NRD HMP | 2022 | 2027 |
| Papio-Missouri River NRD HMP | 2021 | 2026 |
| Perkins Chase Dundy HMP | 2020 | 2025 |
| Quad Counties HMP | 2021 | 2026 |
| Region 23 HMP | 2020 | 2025 |
| Region 24 HMP | 2021 | 2026 |
| South Platte NRD HMP | 2022 | 2027 |
| Tri-Basin NRD HMP | 2023 | 2028 |
| Tri-County HMP | 2023 | 2028 |
| Twin Platte NRD HMP | 2021 | 2026 |
| Upper Big Blue NRD HMP | 2019 | 2024 |
| Upper Loup NRD HMP | 2025 | 2030 |

*Cedar/Dixon has opted to join Lower Elkhorn NRD & Lewis and Clark NRD's HMP Update this year. They will no longer have their own plan but will have adoption resolutions for this new 2025 plan.

## Local Plan Review and Integration

When a local plan is submitted to NEMA, it undergoes a review by either the State Response and Recovery Program Specialist, the State Hazard Mitigation Officer, or the Response and Recovery Section Manager using the local Hazard Mitigation Plan Review Tool. The plan is either sent back to the author for revisions or forwarded to the Federal Emergency Management Agency (FEMA) Region 7 for an initial review. This state review is completed as quickly as possible, but no later than 30 days after receiving the plan. If the review takes longer than 30 days, NEMA will inform the submitting jurisdiction in writing, explaining the delay.

The current process for reviewing and approving both new and updated plans involves several steps. First, the draft plan is submitted to NEMA for review. NEMA's mitigation staff then conduct a formal review of the submitted plan. Once the required elements are included, NEMA sends the plan to FEMA Region 7 for approval pending adoption. FEMA notifies NEMA of the approval pending the adoption of the plan by participating jurisdictions. NEMA then informs the submitting jurisdiction of the pending approval.

FEMA grants final approval of the plan and sends a notification letter to NEMA, which includes the date of approval. NEMA then notifies the jurisdictions of the approval. Participating jurisdictions must adopt the plan and send resolutions to NEMA within one year. NEMA forwards the adopted plan with resolutions to Region 7. Plan updates must be approved no later than five years after the initial approval date.

The Local Risk Assessment Hazards Profiled in Table 126 highlights the prevalence of various hazards included in county-level hazard mitigation plans across the state. Flooding, severe thunderstorms, severe winter storms, and tornadoes are the most commonly profiled hazards, appearing in 100% of local plans. Other widely recognized hazards include terrorism, extreme temperatures, and wildfires, which are covered in 95% of plans, while animal disease, plant disease and pests, and chemical/radiological hazards appear in 90% of plans. Less frequently included hazards, such as levee failure (65%) and human infectious disease (30%), indicate varying risk perceptions across counties. Notably, power and infrastructure failure is the least profiled hazard, appearing in only 5% of local plans, suggesting it may not be widely considered a significant risk.

**Table 126: Local Risk Assessment Hazards Profiled**

| State-Profiled Hazard | County Plans with Similar Hazard | Percent of Total Local Plans |
|---|---|---|
| **Animal Disease** | 19 | 90% |
| **Dam Failure** | 18 | 86% |
| **Drought** | 18 | 86% |
| **Flood/Flash Flood** | 21 | 100% |

| State-Profiled Hazard | County Plans with Similar Hazard | Percent of Total Local Plans |
|---|---|---|
| **Human Infectious Disease** | 8 | 36% |
| **Levee Failure** | 14 | 67% |
| **Plant Disease and Pests** | 19 | 90% |
| **Severe Thunderstorm** | 21 | 100% |
| **Severe Winter Storm** | 21 | 100% |
| **Terrorism** | 20 | 95% |
| **Tornado** | 21 | 100% |
| **Wildfire** | 20 | 95% |
| **Chemical and Radiological Fixed Sites and Transportation** | 17 | 81% |
| **Extreme Temperatures** | 20 | 95% |
| **Power and Infrastructure Failure** | 1 | 5% |

## Funding

There are various hazard mitigation grant resources available to aid in the update of local mitigation plans and projects. These funding sources include several FEMA programs such as Building Resilient Infrastructure and Communities (BRIC), Flood Mitigation Assistance (FMA), the Hazard Mitigation Grant Program (HMPG), Pre-Disaster Mitigation (PDM) and Post-Fire (HMPG).

## Prioritizing Local Assistance and Funding

Assisting communities with their hazard mitigation projects is a crucial step toward achieving Nebraska's statewide goals of reducing long-term risks to human life, property, and the environment. To qualify for Hazard Mitigation Assistance (HMA) funding, local jurisdictions must actively participate in their LHMP, ensuring that planning efforts address high-risk areas, repetitive loss properties, and development pressures. Additionally, for non-planning grants, project prioritization is primarily based on a cost-benefit analysis, maximizing the effectiveness of available resources.

NEMA follows a structured strategy for selecting grant recipients; however, projects are prioritized for the application process based on Notice of Interests (NOIs) that are on record. The State Hazard Mitigation Officer solicits applications from county emergency managers, Natural Resource Districts (NRDs), and Public Power Districts across the state. Submitted applications undergo a review process led by NEMA's Response and Recovery Section and the Governor's Disaster Recovery Task Force to ensure completeness, eligibility, and adherence to FEMA regulations. Various state agencies provide technical assistance, including the Nebraska Department of Roads, which evaluates environmental impacts, and the Nebraska State Historical Society, which assesses historic preservation concerns. Additionally, the

Nebraska Department of Natural Resources (NeDNR) offers expertise in floodplain management and benefit-cost analysis for relevant projects.

Only jurisdictions with FEMA-approved hazard mitigation plans are eligible for project grants, and proposed projects should align with both local and state mitigation objectives. If a proposed project is not already included in a jurisdiction's LHMP, additional documentation must be provided to justify its inclusion. Priority is given to projects in high-risk areas, locations with repetitive property losses, and regions experiencing significant development pressures. Nebraska's selection criteria align with the Disaster Mitigation Act of 2000, ensuring that mitigation efforts focus on reducing future disaster damages, demonstrating local commitment to hazard reduction, and providing measurable community benefits.

NEMA further evaluates projects based on cost-effectiveness, environmental impact, feasibility, and long-term sustainability. Eligible projects must address known hazards, significantly reduce risks, and provide long-term solutions while remaining economically viable. Additionally, projects must comply with federal environmental and floodplain management regulations and should function as standalone mitigation efforts or integral parts of larger resilience initiatives. Cost-benefit analysis is a critical component, ensuring that the anticipated reduction in damages outweighs the project costs.

Another key requirement for funding is participation in the National Flood Insurance Program (NFIP). Communities located in Special Flood Hazard Areas must be enrolled in the NFIP to be eligible for mitigation grants. However, newly eligible communities that enter the NFIP within six months following a major disaster declaration may still be considered for grant funding.

The Governor's Disaster Recovery Task Force plays a key role in prioritizing project applications based on the state's mitigation goals. Projects identified as top priorities are forwarded to the relevant federal grant agencies for final approval. By following this structured and strategic approach, Nebraska ensures that mitigation efforts are effective, sustainable, and aligned with both local and state resilience objectives, ultimately breaking the cycle of disaster damage and reconstruction.

In Nebraska, funding for High Hazard Potential Dams (HHPDs) is prioritized based on a conditional assessment conducted by NeDNR through the state's dam safety program. This assessment is performed annually to identify the most at-risk dams, ensuring that those with the highest hazard potential receive funding priority for repair and rehabilitation efforts. The goal is to address the most critical dam safety concerns first, reducing the risk of failure and protecting downstream communities.

One limitation of the current process is that HHPD prioritization is not yet fully integrated into Nebraska's existing infrastructure management and risk assessment systems. However, there is potential to enhance this approach in future system updates by incorporating HHPD scoring elements into statewide risk management frameworks.

The methodology for prioritizing funding under FEMA's Rehabilitation of HHPD Grant Program is still evolving because the program is relatively new. NEMA is actively working to refine its prioritization strategy to align with FEMA's requirements. To optimize funding opportunities, NEMA will utilize the

existing conditional assessment framework or an adapted version that meets FEMA's HHPD prioritization criteria. Additionally, NEMA may adopt FEMA's Risk-Based Prioritization Method, which includes the following steps:

- Identify static, hydrologic, and seismic failure modes for each dam.
- Determine qualitative risk values for each failure mode and plot them in the Risk Prioritization Matrix.
- Differentiate among dams with similar risk values by considering factors such as population at risk (PAR), asset value of the dam, critical infrastructure threats, and impact on community lifelines.
- Evaluate potential projects using the same risk-based methodology to justify a prioritized project list, ensuring funding is allocated to the most impactful risk reduction efforts.

By implementing this structured approach, Nebraska aims to enhance dam safety, maximize available funding, and ensure that the most vulnerable dams receive the necessary improvements to protect public safety and infrastructure.

## Local Capabilities

Nebraska has a substantial number of dams classified as high hazard potential, meaning failure could result in significant loss of life, property damage, and environmental impacts. As a state with extensive agricultural and municipal water needs, ensuring dam safety through mitigation policies and programs is crucial for preventing disasters and maintaining infrastructure integrity.

Nebraska's approach to dam safety is guided by regulations established by NeDNR. The state enforces the Dam Safety Act, which aligns with federal guidelines from FEMA and the U.S. Army Corps of Engineers. Key mitigation strategies include the following:

- Inspection and Monitoring Requirements
  - Nebraska mandates regular inspections of high hazard potential dams by licensed engineers.
  - Annual assessments identify structural weaknesses, seepage, erosion, and potential failure risks.
  - Local jurisdictions collaborate with state agencies to ensure compliance with safety regulations.
- Emergency Action Plans (EAPs)
  - Dams classified as high hazard potential must have an approved EAP.
  - These plans outline evacuation procedures, communication protocols, and coordination with emergency responders.
  - Local emergency management agencies conduct periodic drills to test the effectiveness of EAPs.
- Floodplain Management and Land Use Planning

- Local governments implement zoning laws to limit development in areas prone to dam failure-induced flooding.
- Collaboration between municipalities and NRDs ensures flood mitigation strategies, such as levees and reservoirs, are in place.
- The state integrates dam safety considerations into broader floodplain management policies.

Several programs support Nebraska's efforts to mitigate risks associated with high hazard dams:

- Nebraska Dam Safety Program
  - Administered by NeDNR, this program oversees inspections, compliance, and public awareness campaigns.
  - It works closely with dam owners to ensure necessary repairs and upgrades are completed on schedule.
- FEMA's High Hazard Potential Dam Rehabilitation Grant Program
  - Nebraska receives federal funding to improve dam infrastructure.
  - Grants assist with engineering studies, structural reinforcements, and emergency preparedness initiatives.
- Local Emergency Management Agencies (LEMAs) Initiatives
  - LEMAs collaborate with state and federal agencies to enhance local response capabilities.
  - Public education campaigns inform residents about evacuation routes and flood risk awareness.

Nebraska's local mitigation policies and programs have demonstrated effectiveness in managing dam-related hazards through the following:

- Proactive Inspections and Maintenance
  - Regular inspections help identify and address structural deficiencies before they escalate into major risks.
- Community Preparedness
  - EAPs and public awareness efforts enhance community resilience, ensuring timely evacuation and coordinated responses in case of dam failure.
- Infrastructure Upgrades
  - State and federal funding programs have facilitated critical repairs, reducing the likelihood of catastrophic dam failures.

However, challenges remain, including funding limitations, aging dam infrastructure, and climate change-driven weather extremes, which increase flood risks. Strengthening interagency cooperation, securing sustainable funding, and advancing early warning technologies will be crucial for enhancing Nebraska's dam safety framework in the future.

The provided tables summarize local hazard mitigation and community planning capabilities across various regions, highlighting the presence of key planning tools, regulatory frameworks, and personnel dedicated to hazard resilience and development planning. Table 127 provides a key to abbreviations used in the headers found in Table 128. Table 128 categorizes counties by their participation in hazard mitigation plans (HMPs) and other essential programs, such as NFIP and the Community Rating System (CRS). It also identifies the existence of zoning ordinances, subdivision regulations, building codes, comprehensive plans, capital improvement plans, and economic development plans. These frameworks help shape risk reduction strategies, land-use policies, and long-term community resilience. Additionally, the table includes emergency and floodplain management efforts, stormwater management initiatives, and the presence of key personnel such as planners, engineers, certified floodplain managers (CFMs), and building inspectors. These individuals play a crucial role in implementing and enforcing regulatory measures to ensure safety, sustainable development, and disaster preparedness.

The data reveals notable variations in local capabilities. Some counties have robust planning and regulatory structures with established building codes, zoning ordinances, and floodplain management plans, while others lack key components, particularly in land use and stormwater management. Counties with a broader array of plans and personnel are better positioned to mitigate hazards and adapt to evolving risks. Overall, this assessment underscores the importance of integrated planning and the need for counties with limited resources to strengthen their capabilities through policy adoption, interagency collaboration, and investment in hazard mitigation strategies.

**Table 127: Jurisdiction-Specific Capabilities**

| Abbreviation | Community Capability |
|---|---|
| **HMP** | Hazard Mitigation Plan |
| **NFIP** | National Flood Insurance Program |
| **CRS** | Community Rating System |
| **Zone** | Zoning Ordinance |
| **Sub Reg** | Subdivision Regulations |
| **Bldg Code** | Building Codes |
| **Comp Plan** | Comprehensive Plan |
| **CIP** | Capital Improvement Plan |
| **Econ** | Economic Development Plan |
| **EOP** | Local Emergency Operations Plan |
| **Flood** | Floodplain Management Plan |
| **Storm** | Storm Water Management Plan |
| **Plnr** | Planner |
| **Engr** | Engineer |
| **CFM** | Certified Floodplain Manager |
| **Bldg Insp** | Building Inspector |

Table 128: Local Capabilities by Region

| Region | HMP | NFIP | CRS | Zone | Sub Reg | Bldg Code | Comp Plan | CIP | Econ | EOP | Flood | Storm | Plnr | Engr | CFM | Bldg Insp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cedar/Dixon HMP** | | | | | | | | | | | | | | | | |
| **Cedar County** | Yes | No | No | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Dixon County** | Yes | No | No | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Central Platte NRD HMP** | | | | | | | | | | | | | | | | |
| **Buffalo County** | Yes | Yes | No | Yes | Yes | Yes | Yes | No | No | Yes | No | No | Yes | No | Yes | Yes |
| **Dawson County** | Yes | Yes | No | Yes | No | Yes | Yes | No | Yes | Yes | No | No | Yes | Yes | Yes | No |
| **Hall County** | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | No | Yes | No | No | Yes | Yes | Yes | Yes |
| **Merrick County** | Yes | Yes | No | Yes | Yes | No | Yes | No | Yes | Yes | No | No | Yes | Yes | Yes | No |
| **Polk County** | Yes | Yes | No | Yes | Yes | Yes | Yes | No | No | Yes | No | No | Yes | No | Yes | No |
| **Hayes Hitchcock Frontier HMP** | | | | | | | | | | | | | | | | |
| **Frontier County** | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | No | Yes | Yes | Yes | No |
| **Hayes County** | Yes | Yes | No | Yes | No | Yes | Yes | No | Yes | Yes | No | No | Yes | No | Yes | Yes |
| **Hitchcock County** | Yes | Yes | No | Yes | Yes | Yes | Yes | No | Yes | Yes | No | No | Yes | Yes | Yes | No |
| **Lower Big Blue NRD and Little Blue NRD HMP** | | | | | | | | | | | | | | | | |
| **Adams County** | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | Yes | No |
| **Clay County** | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | Yes | No |
| **Fillmore County** | Yes | Yes | No | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Gage County** | Yes | Yes | No | Yes | Yes | No | Yes | No | No | Yes | Yes | No | Yes | No | Yes | Yes |
| **Jefferson County** | Yes | Yes | No | Yes | Yes | No | Yes | No | Yes | Yes | Yes | No | Yes | No | Yes | Yes |
| **Nuckolls County** | Yes | Yes | No | No | No | No | Yes | No | Yes | Yes | Yes | No | No | No | Yes | No |

| Region | HMP | NFIP | CRS | Zone | Sub Reg | Bldg Code | Comp Plan | CIP | Econ | EOP | Flood | Storm | Plnr | Engr | CFM | Bldg Insp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Saline County** | Yes | Yes | No | Yes | Yes | No | Yes | No | No | Yes | Yes | No | Yes | Yes | Yes | Yes |
| **Thayer County** | Yes | Yes | No | Yes | Yes | No | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No |
| **Webster County** | Yes | Yes | No | Yes | Yes | Yes | Yes | No | No | Yes | Yes | No | Yes | Yes | Yes | No |
| **Lower Elkhorn NRD HMP & Lewis and Clark NRD HMP** | | | | | | | | | | | | | | | | |
| **Burt County** | Yes | Yes | No | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Cedar County** | Yes | No | No | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Colfax County** | Yes | Yes | No | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Cuming County** | Yes | Yes | No | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Dixon County** | Yes | Yes | No | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Dodge County** | Yes | Yes | No | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Knox County** | Yes | Yes | No | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Madison County** | Yes | Yes | No | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Pierce County** | Yes | Yes | No | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Platte County** | Yes | Yes | No | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Stanton County** | Yes | Yes | No | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Wayne County** | Yes | Yes | No | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Lower Loup NRD HMP** | | | | | | | | | | | | | | | | |
| **Boone County** | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | Yes | No |
| **Custer County** | Yes | Yes | No | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Garfield County** | Yes | No | No | Yes | Yes | No | Yes | No | Yes | Yes | Yes | No | Yes | Yes | Yes | No |
| **Greeley County** | Yes | Yes | No | Yes | Yes | No | Yes | No | Yes | Yes | Yes | No | Yes | No | No | No |
| **Howard County** | Yes | Yes | No | Yes | Yes | No | Yes | No | No | Yes | Yes | No | Yes | No | Yes | No |
| **Loup County** | Yes | No | No | Yes | No | No | Yes | No | No | Yes | No | No | Yes | No | No | No |

| Region | HMP | NFIP | CRS | Zone | Sub Reg | Bldg Code | Comp Plan | CIP | Econ | EOP | Flood | Storm | Plnr | Engr | CFM | Bldg Insp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nance County** | Yes | Yes | No | Yes | Yes | No | Yes | No | Yes | Yes | Yes | No | Yes | Yes | Yes | No |
| **Platte County** | Yes | Yes | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | No | Yes | Yes | No |
| **Sherman County** | Yes | Yes | No | Yes | Yes | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Valley County** | Yes | Yes | No | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | No | Yes | No | Yes | No |
| **Wheeler County** | Yes | Yes | No | Yes | Yes | No | Yes | No | No | Yes | Yes | No | Yes | No | Yes | No |
| **Lower Platte North NRD HMP** | | | | | | | | | | | | | | | | |
| **Butler County** | Yes | Yes | No | No | No | No | No | No | Yes | Yes | Yes | No | No | No | Yes | No |
| **Dodge County** | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | Yes | Yes | Yes | No |
| **Saunders County** | Yes | Yes | No | Yes | Yes | Yes | Yes | No | Yes | Yes | No | NO | Yes | Yes | Yes | Yes |
| **Lower Platte South NRD HMP** | | | | | | | | | | | | | | | | |
| **Cass County** | Yes | Yes | No | Yes | Yes | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | No | Yes | Yes |
| **Lancaster County** | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Nemaha NRD HMP** | | | | | | | | | | | | | | | | |
| **Johnson County** | Yes | Yes | No | Yes | N/A | Yes | Yes | Yes | No | Yes | No | No | Yes | Yes | Yes | Yes |
| **Nemaha County** | Yes | Yes | No | No | N/A | No | Yes | No | No | Yes | No | No | Yes | Yes | Yes | No |
| **Otoe County** | Yes | Yes | No | No | N/A | No | Yes | No | No | Yes | Yes | No | Yes | Yes | Yes | No |
| **Pawnee County** | Yes | Yes | No | Yes | N/A | Yes | Yes | Yes | Yes | Yes | No | No | Yes | Yes | Yes | No |
| **Richardson County** | Yes | Yes | No | No | N/A | Yes | Yes | No | No | Yes | No | No | Yes | Yes | Yes | No |
| **North Platte NRD HMP** | | | | | | | | | | | | | | | | |
| **Banner County** | No | No | No | No | No | No | Yes | No | No | Yes | No | No | Yes | No | No | No |

| Region | HMP | NFIP | CRS | Zone | Sub Reg | Bldg Code | Comp Plan | CIP | Econ | EOP | Flood | Storm | Plnr | Engr | CFM | Bldg Insp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Garden County** | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | Yes | No | Yes | No |
| **Morrill County** | No | No | No | Yes | No | No | Yes | No | NO | Yes | No | No | Yes | No | No | Yes |
| **Scotts Bluff County** | Yes | Yes | No | Yes | Yes | Yes | Yes | No | No | Yes | No | No | Yes | No | Yes | Yes |
| **Papio-Missouri River NRD HMP** | | | | | | | | | | | | | | | | |
| **Burt County** | Yes | Yes | No | Yes | Yes | No | Yes | No | Yes | Yes | Yes | No | Yes | No | Yes | No |
| **Dakota County** | Yes | Yes | No | Yes | Yes | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | No | Yes | No |
| **Douglas County** | Yes | Yes | No | Yes | Yes | Yes | Yes | No | No | Yes | Yes | Yes | Yes | No | Yes | Yes |
| **Sarpy County** | Yes | Yes | No | Yes | Yes | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Thurston County** | Yes | Yes | No | No | No | No | Yes | No | No | Yes | No | No | No | No | Yes | Yes |
| **Washington County** | Yes | Yes | No | Yes | Yes | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Perkins Chase Dundy HMP** | | | | | | | | | | | | | | | | |
| **Chase County** | Yes | Yes | No | Yes | N/A | No | Yes | No | No | Yes | No | No | Yes | No | Yes | No |
| **Dundy County** | Yes | Yes | No | Yes | N/A | No | Yes | Yes | Yes | Yes | No | No | Yes | Yes | Yes | No |
| **Perkins County** | Yes | Yes | No | Yes | N/A | No | Yes | No | No | Yes | Yes | No | Yes | Yes | Yes | No |
| **Quad Counties HMP** | | | | | | | | | | | | | | | | |
| **Franklin County** | Yes | Yes | No | Yes | Yes | Yes | Yes | No | No | Yes | No | No | Yes | No | Yes | No |
| **Furnas County** | Yes | Yes | No | Yes | Yes | No | Yes | Yes | No | Yes | No | No | Yes | No | Yes | No |
| **Harlan County** | Yes | Yes | No | Yes | Yes | Yes | No | No | No | Yes | No | No | Yes | No | Yes | No |
| **Red Willow County** | Yes | Yes | No | Yes | Yes | Yes | No | Yes | No | Yes | No | No | Yes | No | Yes | No |

| Region | HMP | NFIP | CRS | Zone | Sub Reg | Bldg Code | Comp Plan | CIP | Econ | EOP | Flood | Storm | Plnr | Engr | CFM | Bldg Insp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Region 23 HMP** | | | | | | | | | | | | | | | | |
| **Box Butte County** | Yes | No | No | Yes | Yes | Yes | Yes | No | Yes | Yes | No | No | Yes | No | Yes | No |
| **Dawes County** | Yes | Yes | No | Yes | No | Yes | Yes | No | Yes | Yes | No | No | Yes | No | Yes | Yes |
| **Sheridan County** | Yes | Yes | No | Yes | Yes | No | Yes | No | No | Yes | No | No | Yes | No | Yes | No |
| **Sioux County** | Yes | No | No | Yes | No | Yes | Yes | No | No | Yes | No | No | Yes | No | No | No |
| **Region 24 HMP** | | | | | | | | | | | | | | | | |
| **Boyd County** | Yes | Yes | No | Yes | No | No | Yes | No | No | Yes | No | No | Yes | No | Yes | No |
| **Brown County** | Yes | No | No | Yes | Yes | Yes | Yes | No | Yes | Yes | No | No | Yes | No | No | No |
| **Cherry County** | Yes | No | No | Yes | No | No | Yes | No | No | Yes | No | No | Yes | No | No | No |
| **Keya Paha County** | Yes | No | No | Yes | No | Yes | Yes | No | NO | Yes | No | No | Yes | No | No | No |
| **Rock County** | Yes | No | No | Yes | No | No | Yes | No | Yes | Yes | No | No | Yes | Yes | No | No |
| **South Platte NRD HMP** | | | | | | | | | | | | | | | | |
| **Cheyenne County** | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | No | Yes | No | No | Yes | No | No | No |
| **Deuel County** | Yes | Yes | No | No | Yes | No | Yes | No | No | Yes | Yes | No | Yes | No | Yes | No |
| **Kimball County** | Yes | No | No | Yes | Yes | No | Yes | Yes | No | Yes | No | No | Yes | No | No | No |
| **Tri-Basin NRD HMP** | | | | | | | | | | | | | | | | |
| **Gosper County** | Yes | Yes | No | Yes | Yes | No | Yes | No | No | Yes | Yes | No | Yes | No | Yes | No |
| **Kearney County** | Yes | Yes | No | Yes | Yes | Yes | Yes | No | No | Yes | No | No | Yes | Yes | Yes | Yes |
| **Phelps County** | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | No | Yes | No | Yes | No |

| Region | HMP | NFIP | CRS | Zone | Sub Reg | Bldg Code | Comp Plan | CIP | Econ | EOP | Flood | Storm | Plnr | Engr | CFM | Bldg Insp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Tri-County HMP** | | | | | | | | | | | | | | | | |
| **Antelope County** | Yes | Yes | No | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Holt County** | Yes | Yes | No | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Knox County** | Yes | Yes | No | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Twin Platte NRD HMP** | | | | | | | | | | | | | | | | |
| **Arthur** | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | No | Yes | No | No | Yes | No | No | No |
| **Keith** | Yes | Yes | No | Yes | Yes | Yes | Yes | No | Yes | Yes | No | No | Yes | No | Yes | Yes |
| **Lincoln** | Yes | Yes | No | No | Yes | Yes | Yes | Yes | Yes | Yes | No | No | Yes | Yes | Yes | Yes |
| **McPherson** | Yes | No | No | Yes | Yes | Yes | Yes | No | Yes | Yes | No | No | Yes | No | No | No |
| **Upper Big Blue NRD HMP** | | | | | | | | | | | | | | | | |
| **Hamilton County** | Yes | Yes | No | Yes | Yes | No | Yes | No | No | Yes | Yes | No | Yes | No | Yes | No |
| **Seward County** | Yes | Yes | No | Yes | Yes | Yes | Yes | No | Yes | Yes | Yes | No | Yes | Yes | Yes | Yes |
| **York County** | Yes | Yes | No | Yes | Yes | Yes | Yes | No | Yes | Yes | No | No | Yes | No | Yes | No |
| **Upper Loup NRD HMP** | | | | | | | | | | | | | | | | |
| **Blaine County** | Yes | No | No | No | No | No | Yes | No | No | Yes | No | No | Yes | No | No | No |
| **Grant County** | Yes | No | No | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Hooker County** | Yes | No | No | Yes | Yes | No | Yes | Yes | No | Yes | No | No | Yes | No | No | No |
| **Logan County** | Yes | No | No | Yes | No | No | Yes | No | No | Yes | No | No | Yes | No | No | No |
| **Thomas County** | Yes | No | No | Yes | No | Yes | Yes | Yes | No | Yes | No | No | Yes | No | No | No |