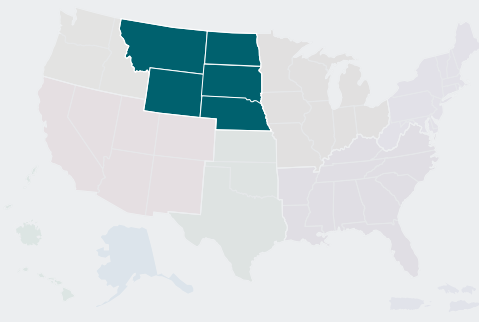


Preparing for the Health Impacts of Climate Change in Northern Great Plains



Temperature-Related Death and Illness

By midcentury, heat index values over 100°F are projected to increase threefold in the Northeast under an intermediate scenario. During extreme heat events, nighttime temperatures in the region's big cities are generally several degrees higher than in surrounding areas, leading to a higher risk of heat-related death. Temperature extremes are related to a larger fraction of cardiorespiratory deaths in the Northeast and industrial Midwest (compared with other regions), particularly in areas with higher urbanization, older people, fewer White residents, and lower socioeconomic status.



Air Quality Impacts

The Great Plains experience a great deal of dust activity. From Montana to southern Texas, dust from land use, such as agriculture, impacts air quality. These are also regions where climate change is expected to affect drought patterns, worsening this issue.

Further, wildfires are projected to increase in the region with correspondent health implications. One study found that Montana has the highest per capita rate of premature deaths attributable to wildfire smoke.



Extreme Events

The Northern Great Plains region is experiencing unprecedented extremes related to changes in climate, including severe droughts, increased hail frequency and size, floods, and wildfires. Further, climate pressures frequently act simultaneously, leading to compounding health-related outcomes. Earlier snowmelt combined with more intense precipitation events can exacerbate flooding, putting people at risk of water-borne diseases, trauma, increased mental health issues, and economic losses. Wildfires are more common during hotter months when drought is more common, exposing people to compounding risks and stress from smoke, heat, and poor water quality.

Over the last two decades, these unusually extreme events have strained the response capacities of Tribes, and climate change will only increase the need for the ability to fight fires, floods, and droughts. This has widespread impacts on Tribal economies and livelihoods, domestic and municipal water supplies, and health and well-being.



Vector-Borne Diseases

Rising temperatures and precipitation are expected to increase the population of disease-carrying insects, such as mosquitos like *Cx. tarsalis*. In the northern Great Plains, this is expected to lead to an increased risk of West Nile Virus (WNV). The locations of annual WNV outbreaks vary, but several states have reported consistently high rates of disease over the years, including North Dakota and South Dakota.



Water-Related Illness

Excess contributions of nutrients, such as nitrogen and phosphorus, from agricultural runoff or wastewater treatment plants can cause water quality issues, which are expected to be exacerbated by climate change. Nutrient runoff spikes after heavy rain and contributes to harmful algal blooms (HABs), which are toxic not only to local wildlife but to humans as well.



Food Safety, Nutrition and Distribution

Agriculture is essential to the economy and culture of the Northern Great Plains region and plays a crucial role in U.S. food security. Although growing seasons and frost-free periods are lengthening due to climate change, other factors may stress crop production. The probability of more days with maximum temperatures above 90°F is expected to increase, potentially impacting agriculture. The net effect of climate change on specific crop yields will depend on the interacting effects of temperature, moisture, carbon dioxide, and ozone, as well as adaptation through shifts in cultivars, crop mix, and management practices. Simultaneously, ranchers face increasing challenges managing livestock health due to heat stress, parasites, and pathogens.

Additionally, Indigenous peoples in the region see many changes to their natural environment and ecosystems. This impacts their livelihoods, health, traditional subsistence on wild foods, and usage of natural resources for ceremonies and medicines.



Mental Health and Well-Being

Some Tribal nations and other coastal communities may have to shift their economic or subsistence harvests to new species that are migrating into the region. However, the loss of traditional species or places will likely lead to a loss of cultural practices that will harm physical and mental health and well-being. The loss of access to culturally significant locations and wildlife will harm the physical and mental health of Indigenous peoples.





Populations of Concern

Because Tribes are among those in the region with the highest rates of poverty and unemployment, and because many are still directly reliant on natural resources, they are among the most at risk of climate change.

Additionally, pregnant people and newborns are uniquely vulnerable to flood health hazards. Flood exposure was associated with adverse birth outcomes (preterm birth, low birth weight) after the 1997 floods in North Dakota and connected to maternal experience of traumatic stress. Homes in floodplains are disproportionately occupied by renters and non-White populations.



CDC Success Stories

Blackfeet Nation

In 2017, the Blackfeet Nation (located in what is now called Montana) received a mini-grant from the CDC via the National Indian Health Board (NIHB). With these funds, they produced a Blackfeet Community Climate Health Guide that addresses climate impacts and develops activities for engaging tribal community members and leaders in best practices for addressing climate-related health impacts. This collaborative process was community-driven and responsive to local climate and health needs. Community leaders now have a path for building community engagement and awareness surrounding the health impacts of climate change.

Winnebago Tribe of Nebraska

Indigenous peoples of Nebraska observe many climate changes, such as flooding. This not only impacts their traditional subsistence on wildlife but also their ability to be self-sufficient. The Winnebago Tribe of Nebraska is implementing a climate and health communication and preparation strategy to ready community members for future flooding and increase self-reliance. To encourage self-sufficiency, raised garden beds were provided by the Food Sovereignty program, and seeds were given to the community by the Little Priest Tribal College. The project will enhance Tribal resilience, strengthen capabilities for public health preparedness following emergencies, and engage local Tribal members to focus on rural ecosystem and health needs, including climate impacts on agriculture from flooding and drought. The Winnebago Tribe of Nebraska has received several mini-grants from the CDC via the National Indian Health Board (NIHB) to support this work.

This fact sheet was prepared by the CDC Climate and Health Program, which empowers communities to protect public health from a changing climate. Information on the health impacts of climate change is provided by the Fifth National Climate Assessment. For more information on the CDC Climate and Health Program, visit <https://www.cdc.gov/climate-health/index.html>, and the Fifth National Climate Assessment, visit <https://nca2023.globalchange.gov/>.