



North Central Climate Adaptation Science Center

Informing adaptive grassland management in the North Central region where winds are strong, the grazers are good-looking, and the temperature... is above average.

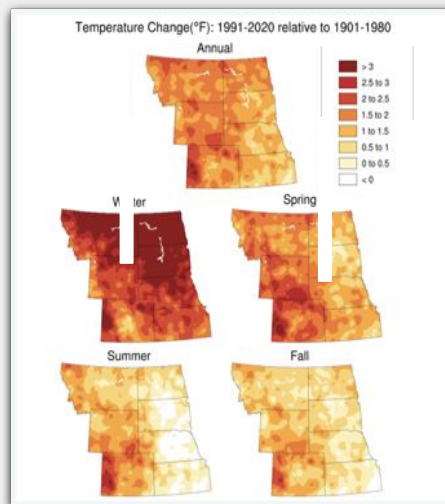


Prairie Climate Companion: Shifting Temperature and Precipitation

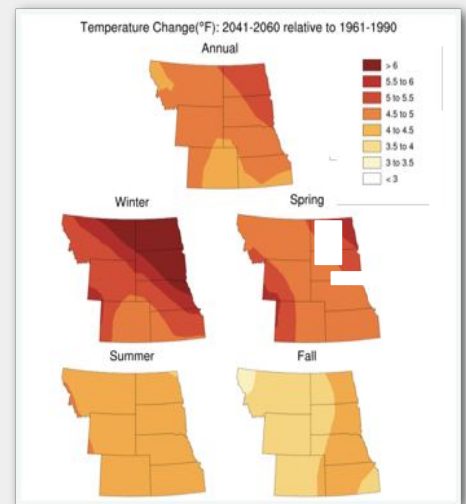
The Issue: Temperature

Temperatures across the North Central region of the US have **increased by 1 to 2 °F** since the 1900s.

They are **projected to increase** by **4 to 6 °F** by the mid-21st century and **5 to 10 °F** by the late 21st century, depending on our future greenhouse gas emissions.



Observed temperature change

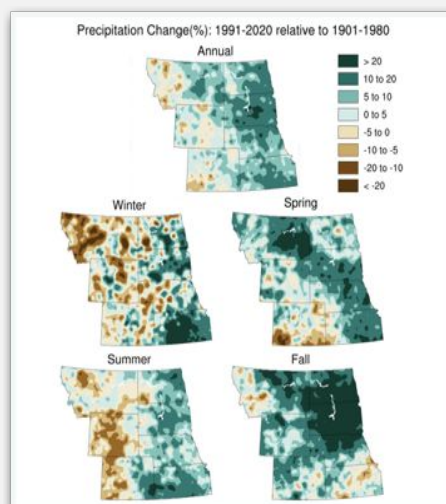


Projected temperature change

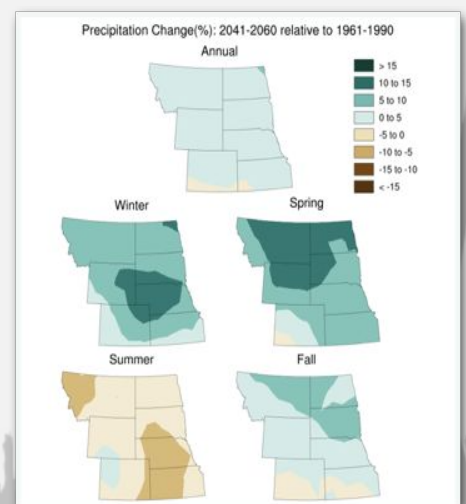
The Issue: Precipitation

Precipitation **has increased** across much of the region in all seasons in recent decades.

Climate models are projecting **significant increases** in winter and spring precipitation and **plausible decreases** in summer precipitation.



Observed precipitation change



Projected precipitation change



Warmer temperatures are expected to offset increases in future precipitation and affect water demand and availability.

Implications for Grasslands Management

Changing seasonal patterns of water availability, which could include wetter springs and drier late-summers and falls, will decrease windows for conducting prescribed burns. It could increase wildfire risk and may decrease availability of late-summer and fall forage for livestock and wildlife.

The projected increase in **flash droughts** and **hotter droughts** may result in direct mortality of wildlife and plant species in their current range. Improved habitat connectivity or translocation may be required to allow species to migrate to suitable conditions.

Incorporating greater flexibility in the timing and application of grassland management practices will be important for responding to **increased climate variability**.

Selected Resources



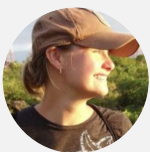
The **Climate Toolbox** is a collection of web tools for visualizing past and projected climate and hydrology of the contiguous United States, including:

- The **Historical Climograph** shows monthly average climate for a location.
- The **Historical Climate Tracker** which shows graphs and trend lines for historical climate variability for a location.
- The **Climate Mapper** which maps historical and future climate information across multiple sectors.
 - *The output from this tool is compatible with applications on GIS-type analytical platforms.*

Contacts



Dr. Imtiaz Rangwala, Climate Science Lead, North Central Climate Adaptation Science Center (NC CASC), imtiaz.rangwala@colorado.edu



Dr. Heather Yocum, Principal Investigator, NC CASC, heather.yocum@colorado.edu



Dr. Christy Miller Hesed, Regional Climate Adaptation Scientist, NC CASC, christine.hesed@colorado.edu

Check out the synthesis report here!



Miller Hesed, C. D., Yocum, H., Rangwala, I., & Peña, U. (2023). *Prairie Climate Companion: Shifting Temperature and Precipitation*. North Central Climate Adaptation Science Center, Cooperative Institute for Research in Environmental Sciences, University of Colorado Boulder, Boulder, CO.



NORTH CENTRAL
Climate Adaptation
Science Center





North Central Climate Adaptation Science Center

Informing adaptive grassland management in the North Central region where winds are strong, the grazers are good-looking, and the temperature... is above average.

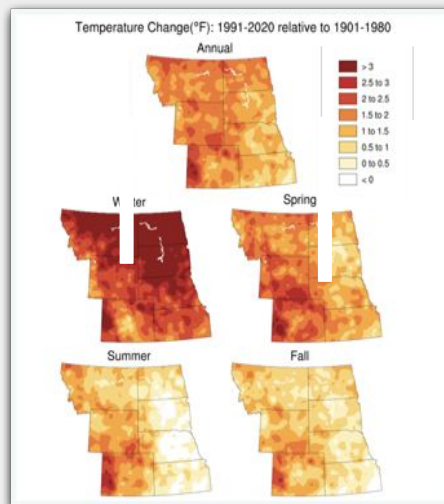


Prairie Climate Companion: Shifting Temperature and Precipitation

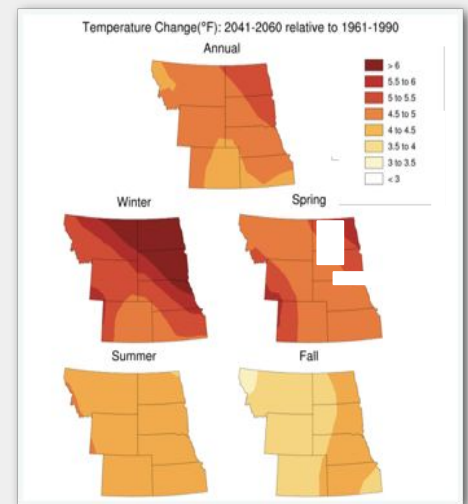
The Issue: Temperature

Temperatures across the North Central region of the US have **increased by 1 to 2 °F** since the 1900s.

They are **projected to increase by 4 to 6 °F** by the mid-21st century and **5 to 10 °F** by the late 21st century, depending on our future greenhouse gas emissions.



Observed temperature change

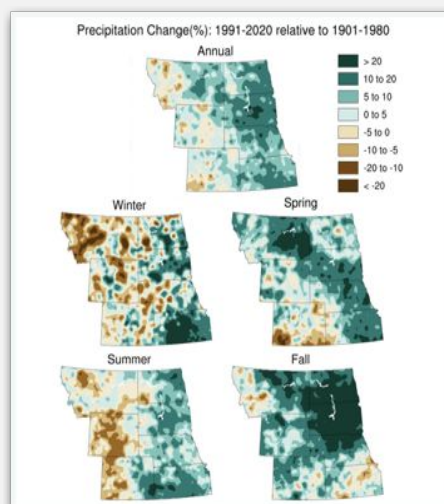


Projected temperature change

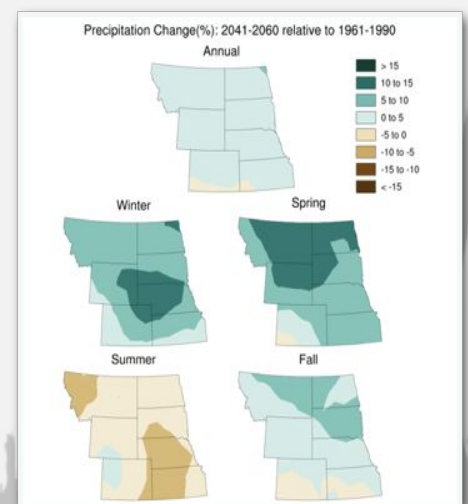
The Issue: Precipitation

Precipitation **has increased** across much of the region in all seasons in recent decades.

Climate models are projecting **significant increases** in winter and spring precipitation and **plausible decreases** in summer precipitation.



Observed precipitation change



Projected precipitation change



Warmer temperatures are expected to offset increases in future precipitation and affect water demand and availability.

Implications for Grasslands Management

Changing seasonal patterns of water availability, which could include wetter springs and drier late-summers and falls, will decrease windows for conducting prescribed burns. It could increase wildfire risk and may decrease availability of late-summer and fall forage for livestock and wildlife.

The projected increase in **flash droughts** and **hotter droughts** may result in direct mortality of wildlife and plant species in their current range. Improved habitat connectivity or translocation may be required to allow species to migrate to suitable conditions.

Incorporating greater flexibility in the timing and application of grassland management practices will be important for responding to **increased climate variability**.

Selected Resources



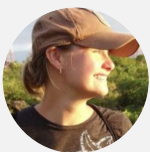
The **Climate Toolbox** is a collection of web tools for visualizing past and projected climate and hydrology of the contiguous United States, including:

- The **Historical Climograph** shows monthly average climate for a location.
- The **Historical Climate Tracker** which shows graphs and trend lines for historical climate variability for a location.
- The **Climate Mapper** which maps historical and future climate information across multiple sectors.
 - *The output from this tool is compatible with applications on GIS-type analytical platforms.*

Contacts



Dr. Imtiaz Rangwala, Climate Science Lead, North Central Climate Adaptation Science Center (NC CASC), imtiaz.rangwala@colorado.edu



Dr. Heather Yocum, Principal Investigator, NC CASC, heather.yocum@colorado.edu



Dr. Christy Miller Hesed, Regional Climate Adaptation Scientist, NC CASC, christine.hesed@colorado.edu

Check out the synthesis report here!



Miller Hesed, C. D., Yocum, H., Rangwala, I., & Peña, U. (2023). *Prairie Climate Companion: Shifting Temperature and Precipitation*. North Central Climate Adaptation Science Center, Cooperative Institute for Research in Environmental Sciences, University of Colorado Boulder, Boulder, CO.

Supported by Cooperative Agreement No. G20AC00075 from the United States Geological Survey. Contents do not necessarily represent the views of USGS.



NORTH CENTRAL
Climate Adaptation
Science Center

