LTAR Network and USDA Climate Hubs are working to develop knowledge and technology for sound resource management via research with partners. The goal is to ensure sustained crop and livestock production and ecosystem services from agroecosystems, and to forecast and verify the effects of environmental changes, public policies, and emerging technologies.

**Location and Climate**

The Northern Plains (NP) site is located within the Northern Great Plains farm resource region and within the USDA Northern Plains Climate Hub (NPCH). The climate is semiarid continental.

**Historic Temperature**

Historic average annual temperature is 39°F, though daily averages range from 70°F in summer to 12°F in winter.

**Historic Precipitation**

Long-term mean annual precipitation is 18 inches with 14 inches (78%) received during the growing season (Apr-Sep).

**Growing Season**

The average frost-free period is 131 days which approximates the length of growing season for crops (~ late-Apr to early-Sep).

**Impacts to Agriculture**

The Northern Great Plains agriculture has recently benefited from longer growing seasons and recent climatic changes. But rising temperatures and changes in extreme weather events are very likely to have negative impacts on parts of the region. Adaptation to climate changes will likely require transformative adjustments in agricultural management, including regional shifts of agricultural practices and enterprises 4th NCA.

USDA is an equal opportunity provider and employer.
To manage land sustainably, consider weather and climate.

**Vegetation**
- Agricultural shifts, pasture to corn and soybean, or small grains (wheat, barley, millet) to corn and soybeans due to changing climate and economy
- Important crops include alfalfa, hay, sunflower, potato, sugar beet, dry bean
- Reductions in grassland area of the Prairie Pothole Region
- Increased abundance and competition by weeds and invasive species

**Water Resources**
- Water is the lifeblood of the NP, thus efficient water management is crucial to the region’s livelihood, agroecosystems, and energy resource
- Large annual precipitation variabilities provide risks and challenges in agricultural management

**Climate Change**
- Climate models predict a warmer future in the NGP
- Less snow and large variations in annual water availability
- Greater uncertainties (risks) due to high interannual variability, e.g., 2011 flood and 2012 drought
- Increased probability of very hot days (> 90°F) with potential impacts on agriculture

**Decision Support**
- The Cover Crop Chart (v3.0) is designed to assist producers with decisions on the use of cover crops in forage and crop production systems.
- The Crop Sequence Calculator (v3.1) is designed to assist agricultural managers to determine optimal crop sequences for the NGP.

**Livestock**
- The NGP is important for U.S. food security - beef, dairy, and pork production are prevalent in the region
- Despite having only 1.5% of the U.S. population, the region provides 12.7% of the market value of all agricultural commodities sold nationally
- Increased animal production and efficiency due to higher net primary production and longer growing season, but adverse effects with hotter summer
- Warmer and wetter conditions may decrease quality of forage, which may reduce nutrients in livestock products

For more information contact:
- Site Lead: david.archer@usda.gov
- NPCH Director: dannele.peck@usda.gov

For more information visit https://ltar.ars.usda.gov/sites/np Date Modified: October 27, 2020 2:16 PM