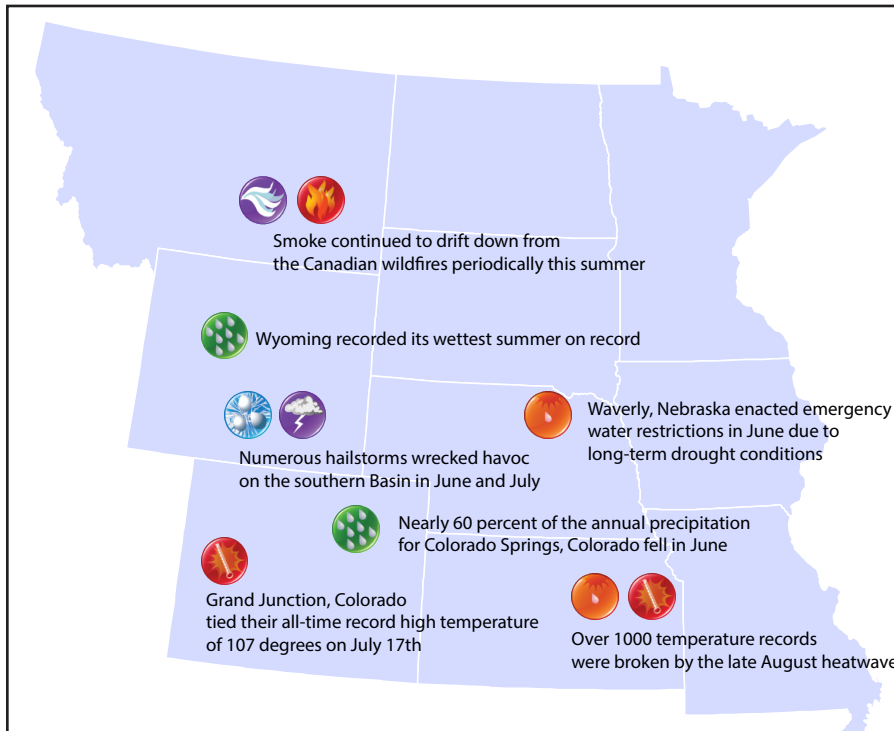




Regional – Significant Events for June - August 2023



Highlights for the Basin

A record number of severe thunderstorm warnings were issued for Colorado this summer. [One hailstorm](#) in late June led to over 100 injuries at a concert in Red Rocks Amphitheater, while the potential new state record hail stone of 5.25 inches fell from [another](#) in August.

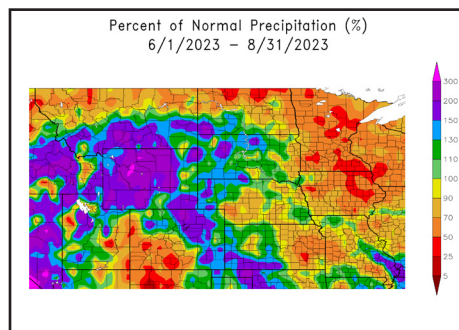
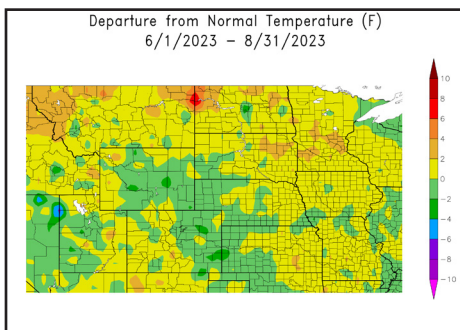
Much of Wyoming, eastern Colorado, and western Kansas received record to near-record precipitation this summer. This is a dramatic change from the severe drought conditions that has plagued this part of the region for the past three years.

A deadly and unusually long-lasting heatwave affected portions of the basin in late August. Manhattan, Kansas reached 115 degrees on the 19th, while the average high was 108 for the week. Heat indices skyrocketed to over 120 degrees in Kansas and Nebraska.

Regional – Climate Overview for June - August 2023

Temperature and Precipitation Anomalies

Departure from Normal Temperature (°F) (left) and Percent of Normal Precipitation (right) for Summer 2023

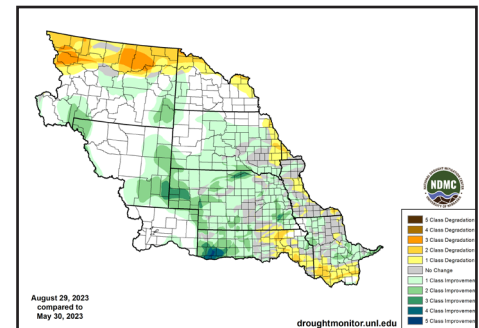


Temperatures averaged near normal despite the extreme heat waves throughout the summer. Warmer temperatures dominated the northern Basin in June, with North Dakota ranking 4th warmest. A flip to cooler temperatures only lasted through July, then reheating in August.

Precipitation was plentiful in the west, with Wyoming and the Front Range of the Rockies having record amounts. Cheyenne, Wyoming and Akron, Colorado narrowly missed their summertime records, however, southwestern Colorado was bone-dry. Alamosa recorded its driest summer after having its wettest in 2022.

Changes in

Drought Conditions May 30 - August 29, 2023



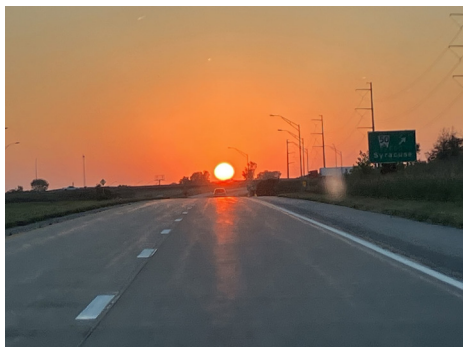
The map above shows the areas of increasing and decreasing categories of drought. Drought conditions improved significantly across western Kansas and Nebraska, with up to five class improvements. Northern Montana and North Dakota both degraded this summer after narrowly missing much of the precipitation this summer.



Regional – Impacts for June - August 2023

Agriculture

Winter wheat in Kansas was [abysmal this year](#), with the influx of rain arriving too late to improve yields and [leading to delays](#). Many fields were abandoned and the fields that were harvested produced the [smallest crop since 1966](#). Corn and soybeans were impacted by the extreme heat, with reports of corn ears having no kernels. Cattle were severely affected by the heat, with hundreds perishing in [Kansas](#) and [Nebraska](#). A dry to suddenly wet pattern in North Dakota has led to the worst [outbreak of cattle anthrax](#) in over a decade, with over 100 deaths. In Wyoming and surrounding areas, near record wetness led to an [ample production of hay](#).



Above: Hazy sunset in Nebraska due to lingering smoke (left), credit Doug Kluck, Light showers over eastern Wyoming (center), credit Gavin Rush, Platte River in central Nebraska (right), credit Gannon Rush

Infrastructure

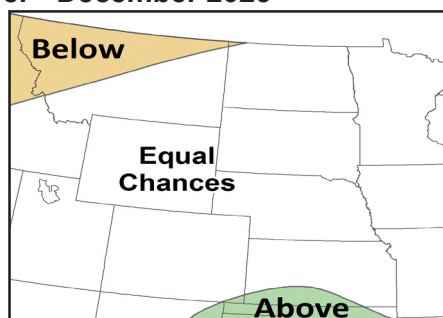
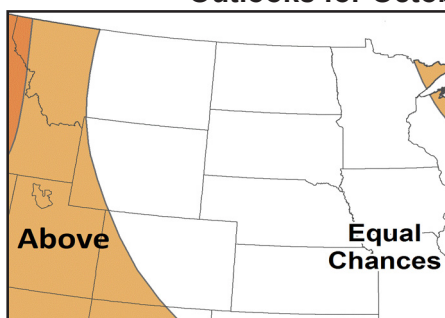
Colorado dealt with several bouts of flooding across the state after the wetness this summer, with a [disaster declaration](#) made by the President for several counties in the eastern part of the state. The heatwave in August led to [record power usage](#) for several communities, with significant stress placed on the power grid. Cities such as Manhattan, Kansas asked residents to ration energy to prevent potential catastrophic failures. In an effort to limit children to heat exposure outside or on buses, schools in [Kansas](#) and [Nebraska](#) canceled classes or released them early.

Regional – Outlook for October - December 2023

Temperature

Precipitation

Outlooks for October - December 2023



EC: Equal chances of above, near, or below normal

A: Above normal, B: Below normal

According to NOAA's Climate Prediction Center, the outlook for the upcoming season indicates increased chances of above-normal temperatures in western Montana and the southwestern portions of Wyoming and Colorado. Slight chances of below-normal precipitation are present in northwestern Montana, while southern Kansas has increased chances of above-normal precipitation. The rest of the Basin has equal chances of above, below, and near-normal precipitation. El Niño conditions exist this fall into winter and increase the likelihood of below-normal precipitation and above-normal temperatures for Northern Rockies and plains.

Recent dryness and heat can negatively impact winter wheat planting and early growth, creating concerns due to its implications on future yields.

MO River Basin Partners

[High Plains Regional Climate Center](#)

[National Drought Mitigation Center](#)

[National Integrated Drought Information System](#)

[National Centers for Environmental Information](#)

[National Weather Service- Central Region](#)

[NOAA Climate Prediction Center](#)

[NWS Missouri Basin River Forecast Center](#)

[American Association of State Climatologists](#)

[U.S. Army Corps of Engineers](#)

[U.S. Bureau of Reclamation](#)

[USDA Northern Plains Climate Hub](#)

[Bureau of Indian Affairs – Great Plains Region](#)