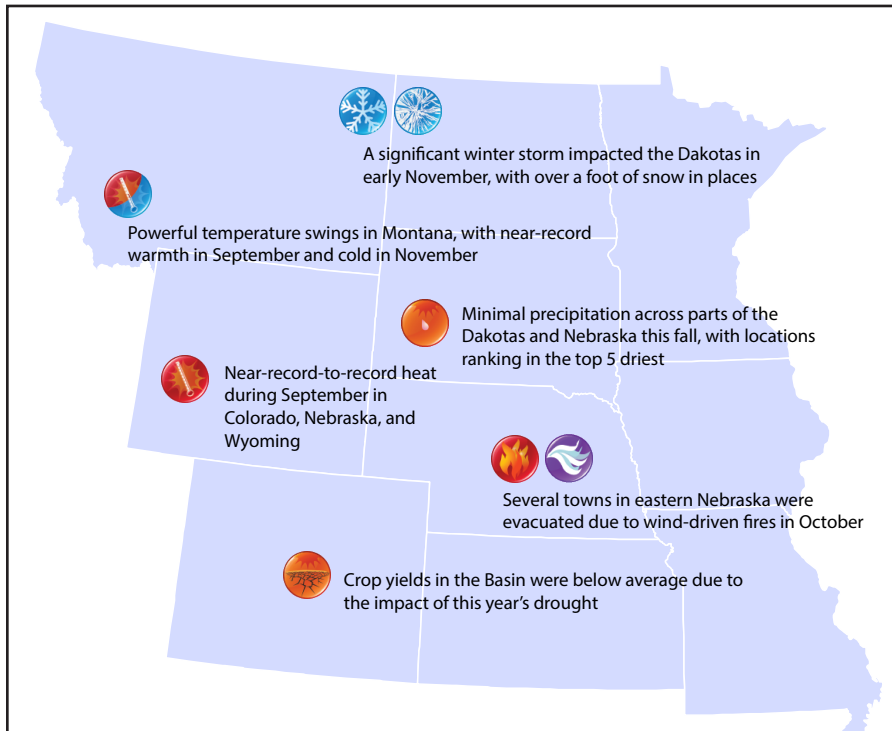




## Regional – Significant Events for September - November 2022



### Highlights for the Basin

Above-normal temperatures continued into September, with the Basin recording its second-warmest September. Driven by the scorching temperatures in Montana and Wyoming, the Basin observed the warmest August to September on record.

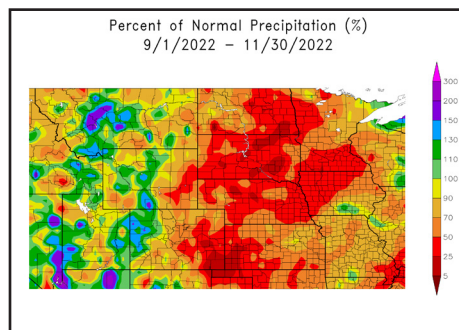
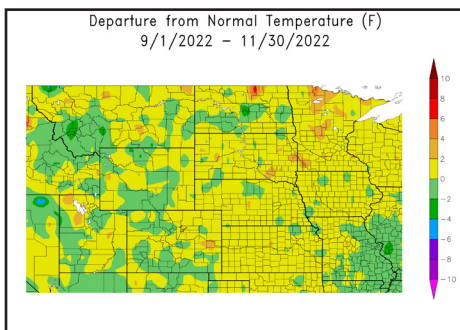
Nebraska continued to be dry this fall, ranking 5th driest on record. From January to November, the state ranked 4th driest in 128 years.

The first winter storm of the season impacted the western Dakotas in early November. Bismarck, North Dakota recorded their 2nd highest daily snowfall amount, with 17 inches falling on the 10th. In South Dakota, significant ice accumulations led to power outages and transportation issues.

## Regional – Climate Overview for September - November 2022

### Temperature and Precipitation Anomalies

#### Departure from Normal Temperature (°F) (left) and Percent of Normal Precipitation (right) for Fall 2022

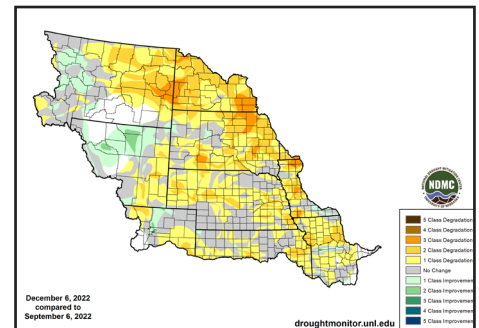


Temperatures were near to slightly above-normal for the majority of the Missouri River Basin this fall. September was well above-normal for the region, with numerous locations in the top five warmest of all time. Cooler temperatures finally arrived in November, with much of the northwestern part of the basin experiencing 6 degrees Fahrenheit below normal.

Precipitation was below normal for much of the northern Great Plains, while mountainous areas to the west observed normal to above-normal precipitation. Several locations in the Dakotas and Nebraska experienced their top 5 driest falls, with some places recording less than an inch of precipitation.

### Changes in Drought Conditions

#### September 6 - December 6, 2022



Drought conditions significantly degraded across the Dakotas, however, they improved in the mountainous areas in the western portions of the basin. According to the Drought Monitor, D4 encompasses over 17 percent of Nebraska and nearly 36 percent of Kansas. The map above shows the areas of increasing and decreasing categories of drought since September 6th.



## Regional – Impacts for September - November 2022

### Agriculture

The drought of this year severely impacted crops and will likely have lingering effects into next year. [Sorghum yields were down 53% and soybeans were down 27% in Kansas this year](#) due to the ongoing drought. Harvest throughout the region progressed quickly due to the dry conditions and optimal temperatures. This fall's dryness has taken a toll on winter wheat, with the percentage rated poor to very poor was the highest in the past 20 years. Cover crops also had a poor establishment due to a dry early fall. Dust storms continue to be an issue in the southern part of the region, with reports of cattle suffering respiratory issues due to dust inhalation.

### Water Resources

Although early into the season, mountain snowpack is off to a good start and is near normal levels. The transition to winter releases from Gavins Point Dam began and reached the minimum rate (12,000 cubic feet per second) on December 11th. Releases will be adjusted throughout the winter to minimize ice jams and their impacts. Fall runoff was 53 percent of the average in all reaches due to limited rainfall and dry soil profiles. Soil moisture is at or near record lows throughout much of the southern basin. Irrigation use in several states this past growing season was reduced by up to 25 percent due to drought and the need to conserve water.



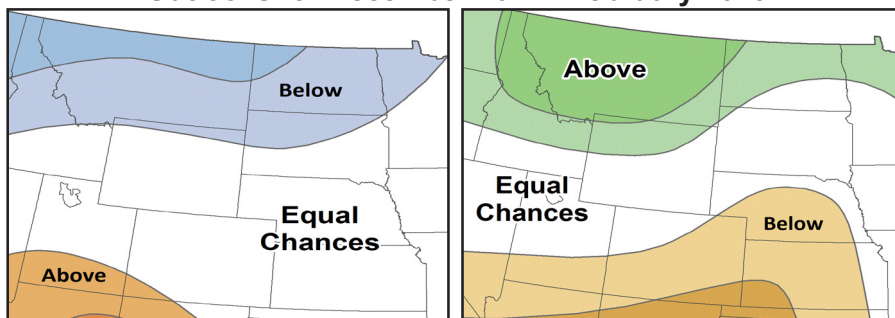
Above: Stressed pastures in western Kansas, credit Gannon Rush (left); Aftermath of the Holiday fire in central South Dakota, credit David Martin (center); Ice frozen to tree branches in South Dakota, credit Laura Edwards (right).

## Regional – Outlook for December - February 2022

### Temperature

### Precipitation

#### Outlooks for December 2022 - February 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 below-normal temperatures across Montana and the Dakotas. Equal chances of above, below, and near-normal temperatures are present in the rest of the basin. Slightly increased chances of below-normal precipitation are present in drought-stricken areas. Chances of above-normal precipitation are present in Montana and parts of North Dakota and Wyoming.

Dry conditions will continue without ample precipitation this winter. Based on the outlooks, drought will continue in the southern plains. Chances of above normal precipitation in the northern basin could lead to drought improvement.

## MO River Basin Partners

High Plains Regional Climate Center  
[www.hprcc.unl.edu](http://www.hprcc.unl.edu)

National Drought Mitigation Center  
<http://drought.unl.edu/>

National Integrated Drought Information System  
<https://www.drought.gov/>

NOAA NCEI  
[www.ncdc.noaa.gov](http://www.ncdc.noaa.gov)

NOAA NWS- Central Region  
[www.weather.gov/crh](http://www.weather.gov/crh)

NOAA NWS Climate Prediction Center  
[www.cpc.ncep.noaa.gov](http://www.cpc.ncep.noaa.gov)

NOAA NWS Missouri Basin River Forecast Center  
[www.weather.gov/mbrfc](http://www.weather.gov/mbrfc)

American Association of State Climatologists  
<https://www.stateclimate.org/>

U.S. Army Corps of Engineers  
[www.nwd-mr.usace.army.mil/rcc/](http://www.nwd-mr.usace.army.mil/rcc/)

U.S. Bureau of Reclamation  
<https://www.usbr.gov/>

USDA Natural Resources Conservation Service  
[www.nrcs.usda.gov](http://www.nrcs.usda.gov)

USDA Northern Plains Climate Hub  
[www.climatehubs.ocs.usda.gov](http://www.climatehubs.ocs.usda.gov)

Bureau of Indian Affairs – Great Plains Region  
[www.bia.gov/regional-offices/great-plains](http://www.bia.gov/regional-offices/great-plains)