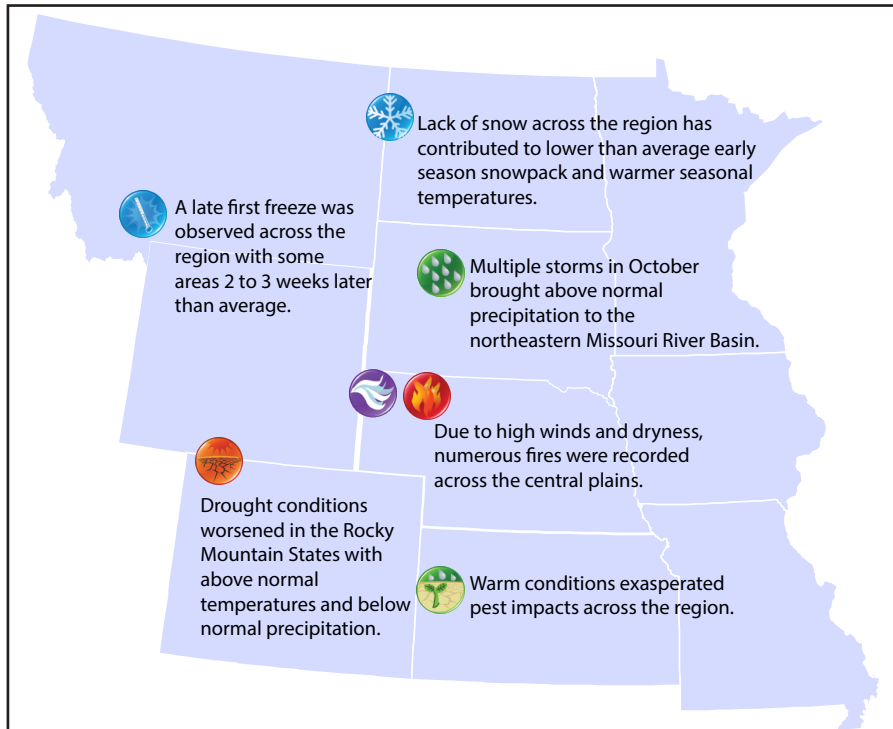




## Regional – Significant Events for September - November 2021



### Highlights for the Basin

Most of the Missouri River Basin observed temperatures 3 to 6 degrees F above normal.

As a result, all of the states within the Basin ranked in the top 10 warmest falls on record. Wyoming, Montana, and Colorado had their 2nd warmest fall on record, while The Dakotas and Nebraska observed their 3rd warmest fall.

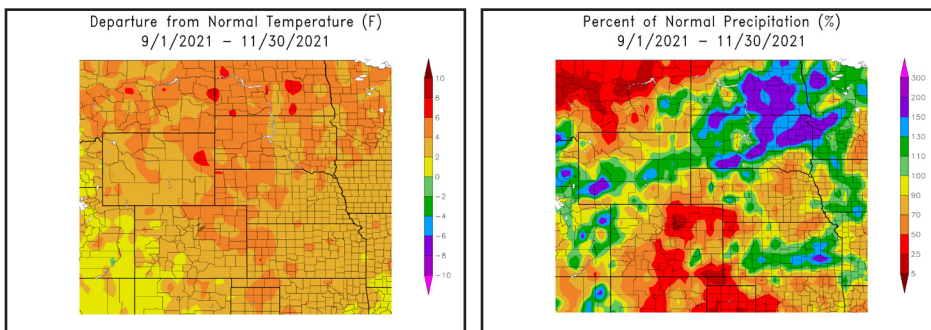
Denver, CO reported its first measurable snow of the season on December 10th surpassing the previous record of November 21st, 1934 by 19 days.

Record precipitation was observed in parts of South Dakota, with some areas reporting 4 inches above normal for the season.

## Regional – Climate Overview for September - November 2021

### Temperature and Precipitation Anomalies

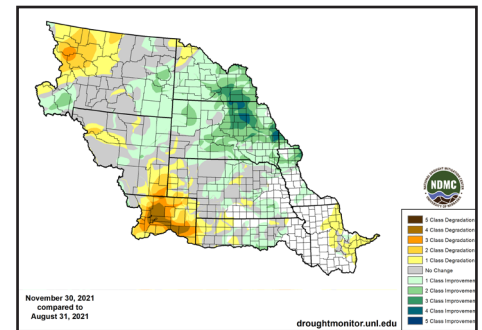
#### Departure from Normal Temperature (°F) (left) and Percent of Normal Precipitation (right) for Fall 2021



Temperatures remained much above normal across the entire Missouri River Basin. The largest temperature departures were across the High Plains where upwards of 6 degrees F was recorded. These above normal temperatures resulted in all the states within the Missouri River Basin ranking in the top 10 warmest falls on record. Precipitation this fall varied with most of the region observing below normal precipitation aside from the Northeast and Kansas. Above normal precipitation in some areas of South Dakota was the result of multiple storm systems in October. Many areas in South Dakota ranked in the top 3 wettest for the month. Despite this above-normal precipitation, drought conditions persisted across the region.

### Changes in Drought Conditions

#### September 1- November 30, 2021

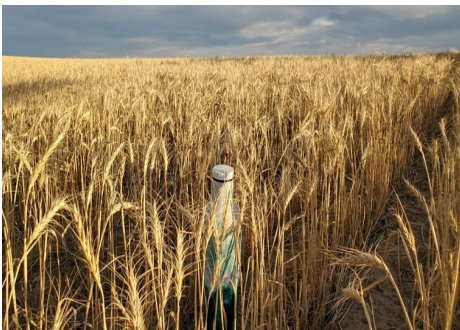


Drought conditions persisted through fall, however, much of the Dakotas observed 1 to 3 class drought monitor improvements with the help of above-normal precipitation. Although class rating improved, 81 percent of South Dakota and 93 percent of North Dakota remain in D0-D4 drought conditions. Colorado, Montana, and portions of Wyoming observed worsening conditions with up to 4 levels of class degradation in areas.

## Regional – Impacts for September- November 2021

### Agriculture

Above normal temperatures have impacted agriculture throughout the fall. In Kansas, winter wheat has been a concern as crops continued to mature faster than optimal. With the increased maturity comes the risk of disease, due to warm ground conditions, and pests. Pests are especially concerning for farmers as armyworms have thrived in warm conditions and impacted the state in larger than average numbers. Dry conditions and high winds have led to piles of tumbleweed around buildings and fences in North Dakota leading to increased fire danger. Low soil moisture has prevented the roots from holding the ground causing them to roll. Impacts on livestock in the northern High Plains include poor forage, higher feed prices, lifting restrictions on hauling hay, and some producers downsizing herds.



Above: Drought stressed wheat in MT, credit Tanja Fransen (left); Pastures in western KS, credit Gannon Rush (center); Missouri River ice jam in MT, credit U.S. Fish and Wildlife (right).

### Missouri River

The Missouri River water level remained below normal this fall with a lack of precipitation and warm temperatures. Mainstem reservoirs Fort Peck, Garrison, and Oahe are 8 to 11 feet below their desired levels and expected to continue to decline if the drought continues. As a result, work is underway with low-elevation boat ramps, constructed during the 2000-07 drought, being put back into operation. The runoff forecast for the calendar year is 15.0 MAF for the upper Basin near Sioux City, which would be the 10th lowest since 1898.

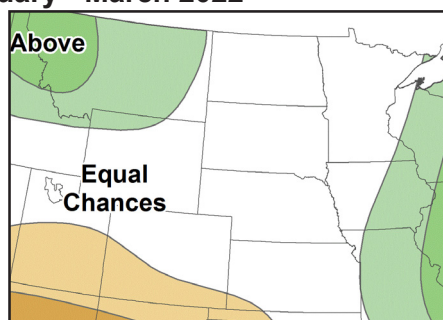
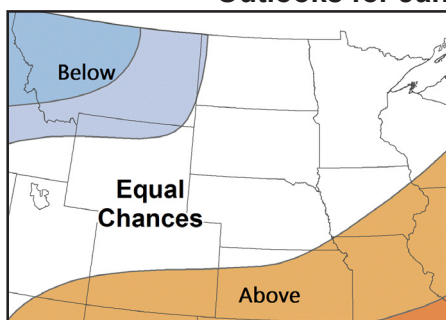
## Regional – Outlook for January- March 2022

## MO River Basin Partners

### Temperature

### Precipitation

#### Outlooks for January - March 2022



According to NOAA's Climate Prediction Center, the outlook for the upcoming season indicates increased chances of above-normal temperatures for the lower portion of the basin, and increased chances of below normal in the far upper basin. For Wyoming and Nebraska, equal chances of above, below, and near-normal temperatures are favored. There are equal chances of above, below, and near-normal precipitation for most of the Missouri River Basin. In Montana and Missouri, there is an increased chance of above-normal precipitation, whereas in Colorado there is an increased chance of below-normal precipitation. If dry conditions continue, some potential impacts with low runoff include ice jams, water intake, and navigation issues. As we continue to move into winter, La Niña conditions are likely to persist. Currently, A La Niña Advisory is in effect.

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

USGS, Water Mission Area  
[www.usgs.gov/water](http://www.usgs.gov/water)