



# November 2021 Climate Summary

Colorado Sunset, Photo Courtesy Jennifer Balch

## Warm and Dry in the High Plains

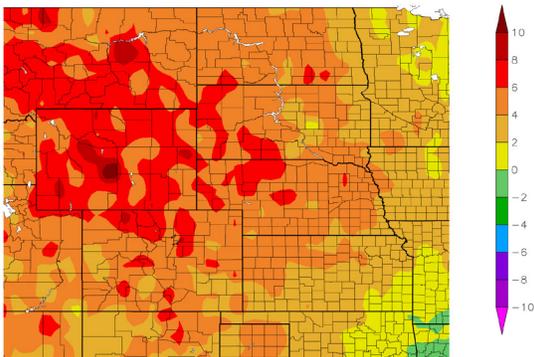
Warm and dry conditions were observed across the High Plains in November. Above-normal temperatures were observed across the entire region with the highest departures 10 degrees F (5.6 degrees C) and higher. Precipitation across the majority of the region was below-normal outside of a portion of northeast North Dakota and a few other isolated areas. These warm, dry conditions led to many impacts within our region.

Horticulturists in Wyoming are concerned after noticing trees beginning to bud as a result of above-normal temperatures in November. While the early budding or blooming can be a pretty sight, it can be damaging to the trees. When blooming early, a sudden drop in temperatures can cause shock to the tree. It can also cause the tree's flowers or fruits not to grow next year as they have exerted all of their energy in growing early. Concerns for tourism in western South Dakota have begun throughout November as it continues to be warm and dry in the region. Many commercial entities in the western portion of the state, such as the Black Hills, rely on business from winter sports. With the warm temperatures and lack of snow, opening dates have been pushed back without an indication of when they will be able to open. Warm temperatures have also impacted their ability to create synthetic snow, as temperatures 28 degrees F (-2.2 degrees C) or below are needed.

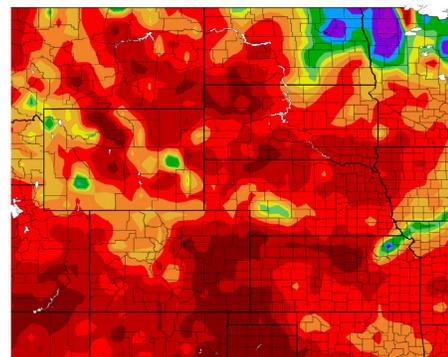
Winter crops have also been impacted by warm, dry conditions. In Kansas, warm temperatures have caused winter wheat to grow more than it should. The additional plant height can cause an increased chance of problems with plant diseases and pests. Around mid-November the crops begin to become dormant, but the warm temperatures have helped crops continue to grow using current soil moisture. With drought conditions present, use of stored soil moisture is a concern as farmers look toward next year's crops.

### Temperature and Precipitation Overview

Departure from Normal Temperature (F)  
11/1/2021 – 11/30/2021



Percent of Normal Precipitation (%)  
11/1/2021 – 11/30/2021



Above: Departure from 1991-2020 normal temperature (left) and percent of normal precipitation (right) for November 2021 in the High Plains region. Maps produced by the High Plains Regional Climate Center and are available at: <http://hprcc.unl.edu/maps/current>.

## Precipitation

November was a dry month for the High Plains with below-normal precipitation across the region. Most of the region observed less than 50 percent of normal precipitation, aside from an area in northeastern North Dakota. The largest departures from normal were observed in southwestern Colorado, eastern Kansas, and eastern Nebraska with totals as much as 3.75 inches (95.25 mm) below normal.

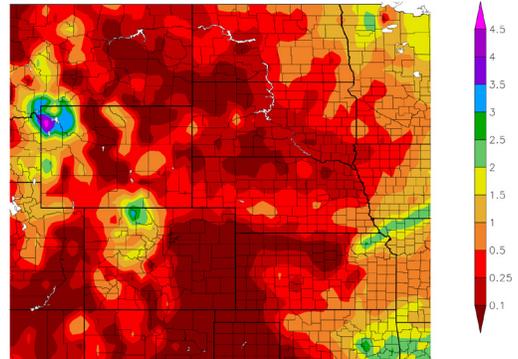
This large area of below-normal precipitation led to many locations ranking in the top 10 driest on record for November (see page 6 for November monthly rankings). Salina, KS observed a trace of precipitation for the month which tied as the 3rd driest November on record. Goodland, KS also received very little precipitation for November receiving 4 percent of normal precipitation. With 0.02 inches (0.50 mm) of precipitation for November, Goodland observed its 7th driest November on record tied with 2014 and 1950. This has led to crop concerns in Kansas as winter crops pull moisture from the soil due to lack of precipitation. This can lead to problems in the crop season next year as soil moisture will be less than optimal.

Colorado, with the largest departure from normal precipitation for November, also observed some concerns. Several locations within the state recorded among their driest. Early season snowpack in the mountains is below normal for this time of year. An above-average snowpack is essential this year due to the current drought. Without the snowpack, water levels along the Colorado River will likely remain low. While it is still early in the season, the longer Colorado remains drier, the more precipitation later in the season it will take to make up the deficit.

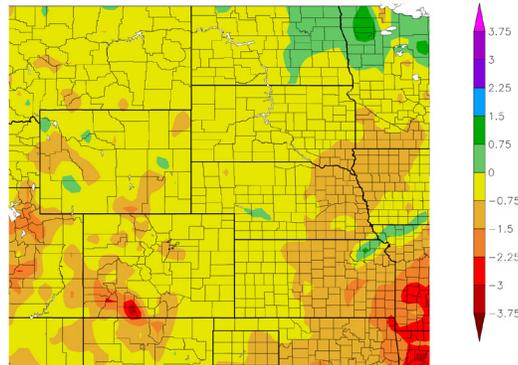
Despite a dry month, Northeastern North Dakota did receive above normal precipitation for November. While it was not enough to rank in the top 10 for the month, it did help contribute to a change from D1 to D0 drought conditions for that portion of the state.

### Regional Precipitation

Precipitation (in)  
11/1/2021 – 11/30/2021



Departure from Normal Precipitation (in)  
11/1/2021 – 11/30/2021



Above: Total precipitation in inches (top) and departure from normal precipitation in inches (bottom) for November 2021. These maps are produced by HPRCC and can be found on the Current Climate Summary Maps page at: <http://hprcc.unl.edu/maps/current>.

## Streamflow Update

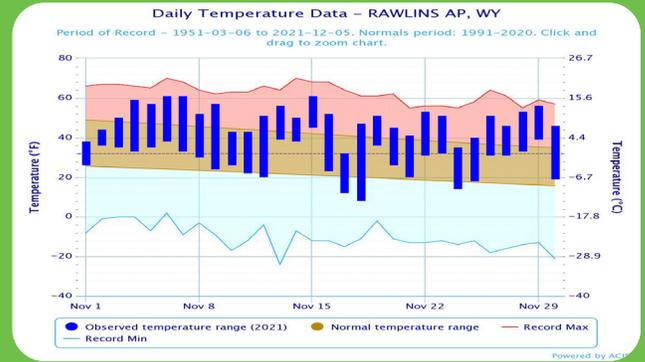
Above-normal temperatures and below-normal precipitation for November led to reduced streamflow in areas across the region. In Montana, streamflow is below normal to much below normal across most of the state, with some gauges indicating record low streamflow. Below normal to much below normal streamflow can also be observed in portions of Nebraska, South Dakota, Wyoming, and Colorado, with record low streamflow for the month in areas of western South Dakota and Nebraska. In the lower Missouri River Basin, streamflow remains normal to above normal for most of the area with a few gauges indicating below normal streamflow.

## Temperatures

Temperatures for the High Plains region were above normal for the month of November. While our entire region observed above-normal temperatures, the greatest departure from normal can be observed in the western half of the region. Temperature departures in the western High Plains were 4 degrees F (2.4 degrees C) and higher with some areas observing temperatures 10 degrees F (5.6 degrees C) or more above normal.

As a result of these above-normal temperatures across the region, many locations ranked in the top 10 warmest November on record (see page 6 for November rankings) and some areas broke daily records throughout the month. Wyoming observed the greatest departure from normal temperatures for November with most of the state 6 degrees F (3.3 degrees C) above normal. Rawlins, WY observed its warmest November on record with an average temperature of 38.9 degrees F (3.8 degrees C) breaking a previous record of 38.5 degrees F (3.6 degrees C) set in 2017. This was a temperature departure of 7.6 degrees F (4.2 degrees C) above normal. A few locations observed their second warmest November on record, which included Colorado Springs, CO. Colorado Springs observed an average temperature of 45.9 degrees F (7.7 degrees C) which was 6.4 degrees F (3.6 degrees C) above normal. Throughout the month many areas in the region also exceeded daily temperature records. Pueblo, CO reached a high temperature of 75 degrees F (23.9 degrees C) for November 29th, which was 1 degree F (0.6 degrees C) above the record for that day set in 1945, 1973, and 2003. On November 16th, Yankton, SD observed its warmest daily temperature of 76 degrees F (24.4 degrees C). Denver, CO reported its record for the latest measurable snowfall, which previously was November 21st, 1934, with no measurable snow seen in the month of November.

### Station Spotlight: Rawlins, WY



Above: Daily temperatures for November 2021 along with extremes and normals values in Rawlins, WY.

## Drought Conditions

Above-normal temperatures and dry conditions in the month of November led to the intensification of drought conditions. The southern part of the region saw an increase of severe drought (D2) and moderate drought (D3) as a result of these conditions. Despite this, the region remained free of exceptional drought (D4) conditions.

Colorado experienced the most significant expansion in drought conditions, with D2 and D3 conditions increasing 22 percent during the month in the eastern part of the state. The entire state is now experiencing abnormally dry or drought conditions. Western Kansas observed the introduction of D3 and the slight increase to moderate drought (D1) and D2 conditions after receiving below 25 percent of their normal precipitation. In Wyoming, D3 was reduced slightly in the south-central part of the state but was introduced in the southeastern portion and expanded across the northern part of the state. While in North Dakota, D1 and D2 conditions were reduced in the eastern part of the state after above-normal precipitation this past month. Throughout the rest of the region, other minor improvements were observed. According to the U.S. Monthly Drought Outlook for December, drought development is likely in southern Colorado and southwestern Kansas.

### U.S. Drought Monitor

#### U.S. Drought Monitor High Plains

November 30, 2021  
(Released Thursday, Dec. 2, 2021)  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0	D1	D2	D3	D4
Current	17.32	62.68	63.93	33.45	7.80	0.00
Last Week (11-23-2021)	18.05	61.95	61.17	30.89	5.91	0.00
3 Month Ago (09-29-2021)	19.70	60.30	61.28	42.33	21.41	1.98
Start of Calendar Year (01-01-2021)	3.82	96.18	82.46	50.36	27.09	5.71
Start of Water Year (03-28-2021)	14.24	65.79	63.08	43.69	18.97	0.85
One Year Ago (11-30-2020)	3.10	96.81	80.71	49.79	26.78	5.53

Intensity:  
 None (White)      D0 Abnormally Dry (Yellow)      D1 Moderate Drought (Orange)      D2 Severe Drought (Red-Orange)      D3 Extreme Drought (Red)      D4 Exceptional Drought (Dark Red)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/about.aspx>

Author:  
Richard Heim  
NCEI/NOAA



The U.S. Drought Monitor is produced as a joint effort of the U.S. Department of Agriculture (USDA), National Drought Mitigation Center, U.S. Department of Commerce, and the National Oceanic and Atmospheric Administration (NOAA). For current Drought Monitor information, please see: <http://droughtmonitor.unl.edu/>.

# November 2021 Climate Summary

## Climate Outlooks

According to the Climate Prediction Center, La Niña conditions remain present and are likely to continue throughout the winter season. A La Niña advisory is in effect. For more information, visit [https://www.cpc.ncep.noaa.gov/products/analysis\\_monitoring/lanina/enso\\_evolution-status-fcsts-web.pdf](https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf)

The National Weather Service's long-range flood outlook through February indicates a continual decrease in the chance of minor flooding. There is a greater than 50 percent chance of minor flooding in areas of the lower Missouri River Basin in December and that will continue to decrease through February where it becomes a less than 5 percent chance. According to the National Interagency Fire Center (NIFC), significant wildland fire potential has returned to normal for the High Plains and is expected to continue to remain normal through January.

The seasonal temperature and precipitation outlooks below combine the effects of long-term trends, soil moisture, and when applicable, the El Niño Southern Oscillation cycle (ENSO). To learn more about these outlooks, please visit <http://www.cpc.ncep.noaa.gov>.

### Temperature

The three-month temperature outlook shows an increased chance of above-normal temperatures for most of the contiguous United States. The highest chances for above-normal temperatures can be seen in the Southeast and Northeast portions of the country. In the High Plains, the southern portion of the region shows increased chances of above-normal temperatures, whereas, in the northern portion of the region, there is increased chances for below-normal temperatures. In the central portion of the High Plains, there are equal chances of above-, below-, and near-normal temperatures.

### Precipitation

The precipitation outlook for the next three months indicates below-normal precipitation across the Southwest and Southeast of the United States, whereas above-normal precipitation can be observed throughout the Midwest and Northwest. In most of the High Plains there are equal chances of above-, below-, and near-normal precipitation, aside from a small portion of Colorado and Kansas with increased chances of above-normal precipitation.

### Drought

The U.S. Seasonal Drought Outlook released on November 18th indicates drought conditions are expected to persist across the Western U.S. and western High Plains over the next three months. Drought conditions are expected to show minor improvements in the Northwest, with areas likely to observe return to normal conditions. Drought conditions are likely to develop in portions of Colorado, Kansas, Oklahoma, Texas, Arizona, and New Mexico.

The figure consists of three vertically stacked maps of the United States, each with a legend and a title. The top map is titled "Seasonal Temperature Outlook" and shows a color-coded probability of above-normal temperatures (orange/red) across most of the country, with some below-normal (blue) in the northwest. The middle map is titled "Seasonal Precipitation Outlook" and shows above-normal precipitation (green) in the northwest and northeast, below-normal (orange) in the southwest and southeast, and equal chances (white) in the central and high plains. The bottom map is titled "U.S. Seasonal Drought Outlook" and shows drought persistence (brown) in the west and high plains, with some improvement (tan) in the northwest and development (yellow) in the central and southern regions. Each map includes a legend for "Probability (Percent Chance)" and "Drought Tendency".

**Temperature Outlook**  
Seasonal Temperature Outlook  
Valid: Dec-Jan-Feb 2021-22  
Issued: November 18, 2021

**Precipitation Outlook**  
Seasonal Precipitation Outlook  
Valid: Dec-Jan-Feb 2021-22  
Issued: November 18, 2021

**Drought Outlook**  
U.S. Seasonal Drought Outlook  
Drought Tendency During the Valid Period  
Valid for November 18, 2021 - February 28, 2022  
Released November 18, 2021

Author: Richard Trinker  
NOAA/NWS/NCEP/Climate Prediction Center

http://go.usa.gov/3eZ73

Above: The three-month temperature probability outlook (top), the three-month precipitation probability outlook (middle), and the U.S. Seasonal Drought Outlook (bottom). For more information on these outlooks, produced by the Climate Prediction Center, see: <http://www.cpc.ncep.noaa.gov>.

## Station Summaries: By the Numbers

Colorado	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Akron Washington County Airport	59.1	29.8	44.4	6.1	79	11/06	16	11/24+	0.05	-0.37	12
Alamosa San Luis Airport	57.7	12.4	35.1	4.8	70	11/07	-1	11/23	0.05	-0.32	14
Colorado Springs Municipal Airport	60.7	31.1	45.9	6.4	77	11/07+	13	11/18	0.03	-0.34	8
Denver International Airport	59.9	30.6	45.2	5.9	76	11/06	14	11/18	0.07	-0.57	11
Grand Junction Walker Field Airport	56.0	30.0	43.0	3.4	68	11/07	20	11/27+	0.22	-0.39	36
Pueblo Memorial Airport	64.3	26.2	45.3	4.8	82	11/07	9	11/18	0.02	-0.45	4

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	59.2	36.6	47.9	5.8	76	11/29	22	11/13	0.09	-1.07	8
Dodge City Regional Airport	61.0	32.9	46.9	3.2	80	11/07	16	11/18	0.38	-0.42	48
Goodland Renner Field	62.1	28.8	45.5	5.9	81	11/07+	13	11/25	0.02	-0.52	4
Topeka Municipal Airport	59.5	35.0	47.3	3.4	74	11/29+	21	11/25	1.12	-0.69	62
Wichita Mid-Continent Airport	61.1	35.6	48.4	2.6	76	11/29+	24	11/25+	0.46	-0.90	34

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	57.9	25.5	41.7	6.3	77	11/06	8	11/25	0.08	-0.32	20
Grand Island Airport	57.6	32.3	44.9	5.3	76	11/15	19	11/25	0.47	-0.63	43
Lincoln Municipal Airport	57.3	32.4	44.8	5.0	75	11/16	22	11/25	0.49	-0.81	38
Norfolk Karl Stefan Airfield	56.2	30.4	43.3	6.5	74	11/16	19	11/25	0.16	-1.06	13
North Platte Regional Airport	59.9	25.9	42.9	5.9	81	11/07	11	11/25	0.25	-0.24	51
Omaha Eppley Airport	55.6	33.4	44.5	4.3	71	11/16+	23	11/25	0.34	-1.11	23
Valentine Miller Field	59.9	27.2	43.6	7.4	81	11/07+	7	11/25	0.10	-0.47	18

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismarck Municipal Airport	48.0	22.6	35.3	5.4	67	11/06	2	11/25	0.26	-0.43	38
Fargo International Airport	41.0	24.4	32.7	3.2	62	11/06	2	11/25	1.21	0.24	125
Grand Forks International Airport	38.9	21.7	30.3	3.6	62	11/06	-1	11/25	1.12	0.20	122
Theodore Roosevelt Airport	48.8	23.0	35.9	5.6	69	11/06	1	11/25+	0.04	-0.43	9
Williston International Airport	43.3	22.7	33.0	5.2	63	11/05	2	11/24	0.21	-0.46	31

All data are preliminary and subject to change. + indicates multiple dates, latest date listed. \* indicates some missing data for the period. \*\* indicates value is under evaluation. Data are retrieved through the Applied Climate Information System (ACIS) and are available online through the CLIMOD system. For more information please contact us: <http://www.hprcc.unl.edu/contact.php>.

# November 2021 Climate Summary

South Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Aberdeen Regional Airport	47.7	24.2	35.9	5.0	68	11/06+	3	11/25	0.26	-0.48	35
Huron Regional Airport	49.4	26.2	37.8	4.7	69	11/06+	5	11/25	0.52	-0.30	63
Pierre Regional Airport	51.8	25.9	38.8	4.7	70	11/16+	6	11/25	0.25	-0.52	32
Rapid City Regional Airport	55.3	25.7	40.5	5.9	76	11/06	9	11/18	0.19	-0.28	40
Sioux Falls Joe Foss Field Airport	50.0	27.4	38.7	3.9	70	11/16	12	11/25	0.29	-0.93	24

Wyoming	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Casper Natrona County International AP	52.7	27.8	40.3	6.3	65	11/06	12	11/17	0.48	-0.16	75
Cheyenne Municipal Airport	55.1	30.3	42.7	6.6	71	11/07	12	11/17	0.20	-0.41	33
Lander Hunt Field Airport	53.8	26.4	40.1	8.0	69	11/06	12	11/18	0.10	-0.68	13
Laramie Regional Airport	50.8	25.3	38.1	7.9	64	11/06	8	11/24	0.15	-0.27	36
Rawlins Municipal Airport	49.4	28.4	38.9	7.6	61	11/15+	8	11/18	0.16	-0.31	34
Sheridan County Airport	55.9	27.1	41.5	8.2	74	11/15	10	11/18	0.15	-0.61	20

## November 2021 Highlights

### Monthly Rankings

Temperature in degrees Fahrenheit, Precipitation in inches

Warmest	Temperature / Ranking	Record / Year	Period of Record
Rawlins, WY	38.1 / WARMEST	38.5 / 2017	1951-2021
Valentine, NE	43.6 / 2nd warmest	44.3 / 1949	1889-2021
Colorado Springs, CO	45.9 / 2nd warmest	47.4 / 1949	1894-2021
Alamosa, CO	35.1 / 2nd warmest	38.4 / 2017	1906-2021
Denver, CO	46.3 / 3rd warmest	50.9 / 1949	1872-2021
Cheyenne, WY	42.7 / 3rd warmest	45.2 / 1949	1871-2021
Scottsbluff, NE	43.9 / 3rd warmest	44.3 / 1949	1893-2021
Chadron, NE	41.7 / 3rd warmest	44.1 / 1949	1941-2021
Lander, WY	40.1 / 3rd warmest	42.6 / 1949	1891-2021
Precipitation	Precipitation / Ranking	Record / Year	Period of Record
Salina, KS	Trace / 3rd driest (tied 1989+)	0.00 / 1954+	1948-2021
Goodland, KS	0.02 / 7th driest (tied 2014+)	0.00 / 1939	1895-2021
Sheridan, WY	0.15 / 7th driest (tied 1951)	Trace / 1939	1907-2021
Akron, CO	0.05 / 8th driest (tied 1954)	Trace / 2006+	1937-2021
Chadron, NE	0.08 / 8th driest	Trace / 2001+	1941-2021
Denver, CO	0.07 / 9th driest	Trace / 1949+	1872-2021
Rawlins, WY	0.16 / 9th driest (tied 2000+)	0.03 / 2007+	1951-2021
Dickinson, ND	0.04 / 10th driest	Trace / 1963+	1938-2021

All data are preliminary and subject to change. + indicates multiple dates, latest date listed. \* indicates some missing data for the period. Data are retrieved through the Applied Climate Information System (ACIS) and are available online through the CLIMOD system. For more information please contact us: <http://www.hprcc.unl.edu/contact.php>.

# About the High Plains Regional Climate Center

The High Plains Regional Climate Center (HPRCC) is one of six NOAA Regional Climate Centers (RCCs) that has been providing timely climate data and information to the public for cost effective decision-making since 1987. The HPRCC primarily serves the six-state region of Colorado, Kansas, Nebraska, North Dakota, South Dakota, and Wyoming, but has also served people from all across the country and even throughout the world. HPRCC operates under a three-tiered structure of climate services and works closely with other organizations on the local, regional, and national levels. HPRCC staff engage with a wide range of stakeholders including K-20 education, the public, media, private industry, research, and state/tribal/federal entities, among others.

Much of the data and products found throughout this publication were built on the Applied Climate Information System (ACIS) framework. ACIS was designed to manage the complex flow of information from climate data collectors to the end users of climate data information. The main purpose of ACIS is to alleviate the burden of climate information management for people who use climate information to make management decisions.

HPRCC is involved in the ongoing development and management of ACIS. In the spring of 2014, the RCCs released a new website for ACIS. This new and improved website not only contains descriptions of ACIS and the sources of data found within, but also features real-world examples of how RCCs and external groups are using ACIS for their particular climate data needs. In addition to these examples, there is extensive documentation and tutorials on how ACIS can be used and accessed by external clients using Web Services. For more information see: <http://rcc-acis.org>.



## Additional Summary Information for the High Plains

### Missouri River Basin Quarterly Climate Impacts and Outlook

For more information:  
<https://www.drought.gov/drought/dews/missouri-river-basin/reports-assessments-and-outlooks>

### Midwest and Great Plains Monthly Climate and Drought Webinar

To sign up for future webinars:  
<https://www.drought.gov/drought/calendar/webinars>

For an archive:  
[www.hprcc.unl.edu/webinars.php](http://www.hprcc.unl.edu/webinars.php)

## Author Information

For questions, comments, or suggestions, please contact:  
Heleena Pettee or Gannon Rush  
702 Hardin Hall, 3310 Holdrege Street  
Lincoln, NE 68583-0997  
402-472-8968  
<https://hprcc.unl.edu/contact.php>

