



December 2022 Climate Summary



Medicine Bow National Forest, Photo Courtesy of Gannon Rush

Regional Breakdown

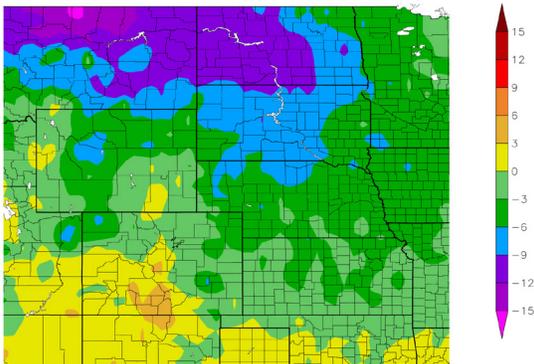
2022 will be remembered as the year of unusually high winds in the High Plains. After beginning the year with near-record strong winds, the final month brought similar conditions.

Early in December, winds gusted over 40 mph (64.4 km/h) in northwestern Kansas. With how significant the drought is in that area; large amounts of dust were picked up by the strong winds. The blowing dust led to a multi-vehicle accident and unfortunately, one person perished.

Winds were not only prevalent at the beginning of the month but also contributed to likely one of the coldest spells on record for the region. An intense cold front moved through on the 21st, with many places dropping 40 degrees F (22.2 degrees C) in under an hour. This arctic outbreak not only brought cold temperatures but also extreme winds. Wind chills surpassed -70 degrees F (-56.7 degrees C) in Wyoming, while the rest of the region saw wind chills between -40 and -50 degrees F (-40 and -45.6 degrees C) due wind gusts well over 50 mph (80.5 km/h) in some places. Although wind chills records are hard to verify, many places likely experienced their record coldest wind chill. This system also brought snow, with much of the region experiencing a white Christmas this year.

Temperature and Precipitation Overview

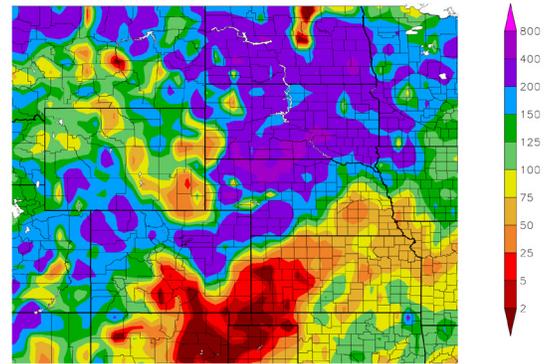
Departure from Normal Temperature (F)
12/1/2022 - 12/31/2022



Generated 1/20/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

Percent of Normal Precipitation (%)
12/1/2022 - 12/31/2022



Generated 1/20/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

Above: Departure from 1991-2020 normal temperature (left) and percent of normal precipitation (right) for December 2022 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 and Water Resources

December precipitation was much above-normal for the northern part of the region due to several winter storms, however, the drought-stricken areas along the Front Range of the Rockies and western Kansas missed this beneficial precipitation again. Many locations recorded their top 10 wettest and snowiest months on record.

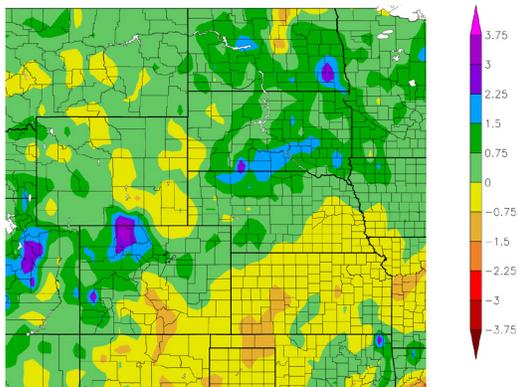
With mounting dryness from the past several months, these winter storms could not have been more beneficial. Northern Nebraska benefited greatly, with Chadron and Valentine observing their record-wettest month. Valentine also recorded their 3rd snowiest month and nearly broke the record, with 22.3 inches (56.64 cm) of snow. Across the Dakotas, numerous locations observed near-record precipitation and snowfall. Pierre and Sisseton ranked in the top 5 wettest and snowiest, while the majority of South Dakota ranked in the top 10 wettest. Bismarck, North Dakota followed up a very snowy November by recording their 2nd December, with 30 inches (76.2 cm) of snow falling.

At the beginning of the month, much of the region was near record lows for soil moisture. While the southern part of the region missed out, much of the region greatly benefited from the precipitation this past month.

While it is still early into the season, the mountain snowpack is in good shape. The majority of the basins are at or near average. This is favorable for improving streamflow conditions, as they are incredibly low throughout the drought-stricken southern Plains. The Corps of Engineers announced that releases from Gavins Point Dam will reach wintertime levels by mid-December.

Regional Precipitation

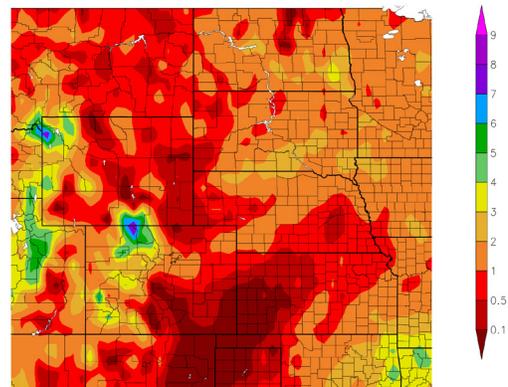
Departure from Normal Precipitation (in)
12/1/2022 – 12/31/2022



Generated 1/20/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

Precipitation (in)
12/1/2022 – 12/31/2022



Generated 1/20/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

Above: Total precipitation in inches (left) and departure from normal precipitation in inches (right) for December 2022. These maps are produced by HPRCC and can be found on the Current Climate Summary Maps page at: <http://hprcc.unl.edu/maps/current>.

Temperatures

The first half of the month began with warmer temperatures, however, things rapidly changed in the back half. A vigorous low-pressure system led to significant temperature drops and record cold. Overall, most of the region ended with below to well below normal temperatures.

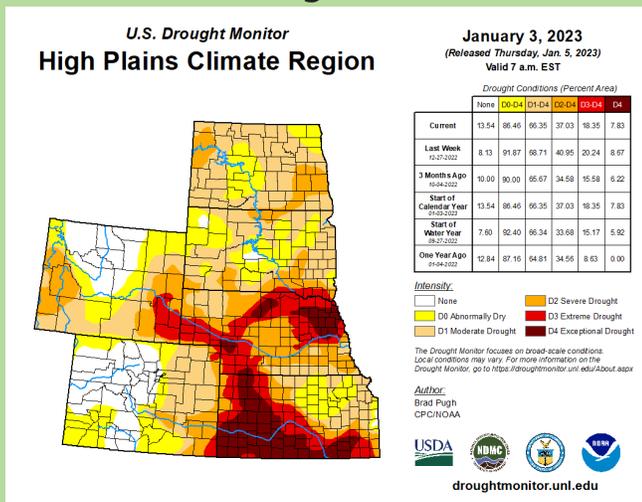
After enjoying normal to above-normal temperatures for the first part of the month, the region experienced dangerously cold temperatures and wind chills. Many locations experienced record temperature drops on the afternoon of the 21st after a remarkable cold front advanced across the central United States. Cheyenne, Wyoming dropped 40 degrees F (22.2 degrees C) from 43 degrees F (6.1 degrees C) to 3 degrees F (-16.1 degrees C) in just 30 minutes, beating the previous record of 37 degrees F (20.6 degrees C) in an hour. Temperatures continued to drop, with the thermometer falling a total of 51 degrees F (28.3 degrees C) in two hours. Combined with high winds, dangerous and record wind chills were present across much of the region for the next few days. Temperatures rebounded, with Cheyenne reaching 57 degrees F (13.9 degrees C) on the 27th.

Drought Conditions

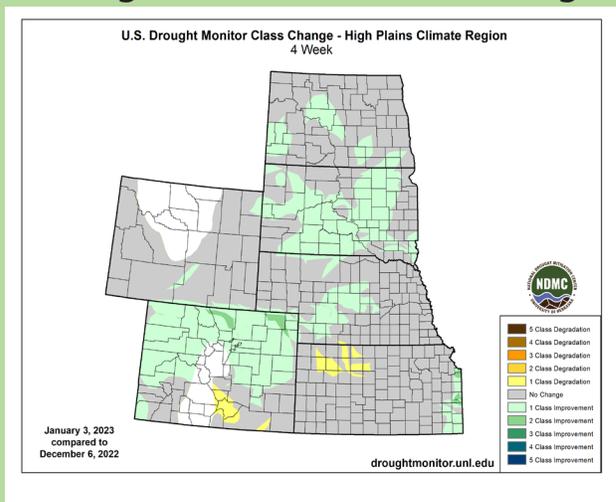
The record to near-record wetness across the northern part of the region eased drought conditions. In the southern portions, the precipitation deficits continued to increase and further elevated the situation. Overall, there were minimal changes in D0 to D4 (abnormally dry to exceptional drought conditions).

The multiple winter storms led to large-scale improvements in the Dakotas. South Dakota observed a 26 percent decrease in D1-D4 (moderate to exceptional drought) after multiple locations in the state were in the top 10 snowiest December. The area coverage of extreme drought (D3) was reduced by almost 10 percent and is now limited to a small portion in the southeastern part of the state. While D4 was trimmed slightly in southeastern Kansas, it was expanded in the northwestern part of the state and is now connected to the area of D4 in southwestern Nebraska. Elsewhere in the region, other improvements and degradation were observed.

U.S. Drought Monitor



Drought Monitor 1-Month Change



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/>.

December 2022 Climate Summary

Climate Outlooks

According to the Climate Prediction Center, La Niña conditions are likely to continue through the end of the year. A La Niña advisory is currently in effect. For more information, visit 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 indicates a low probability of Minor Flooding in eastern Kansas through February. According to the National Interagency Fire Center (NIFC), fire potential will be limited across the region through next year.

The seasonal temperature and precipitation outlooks presented 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

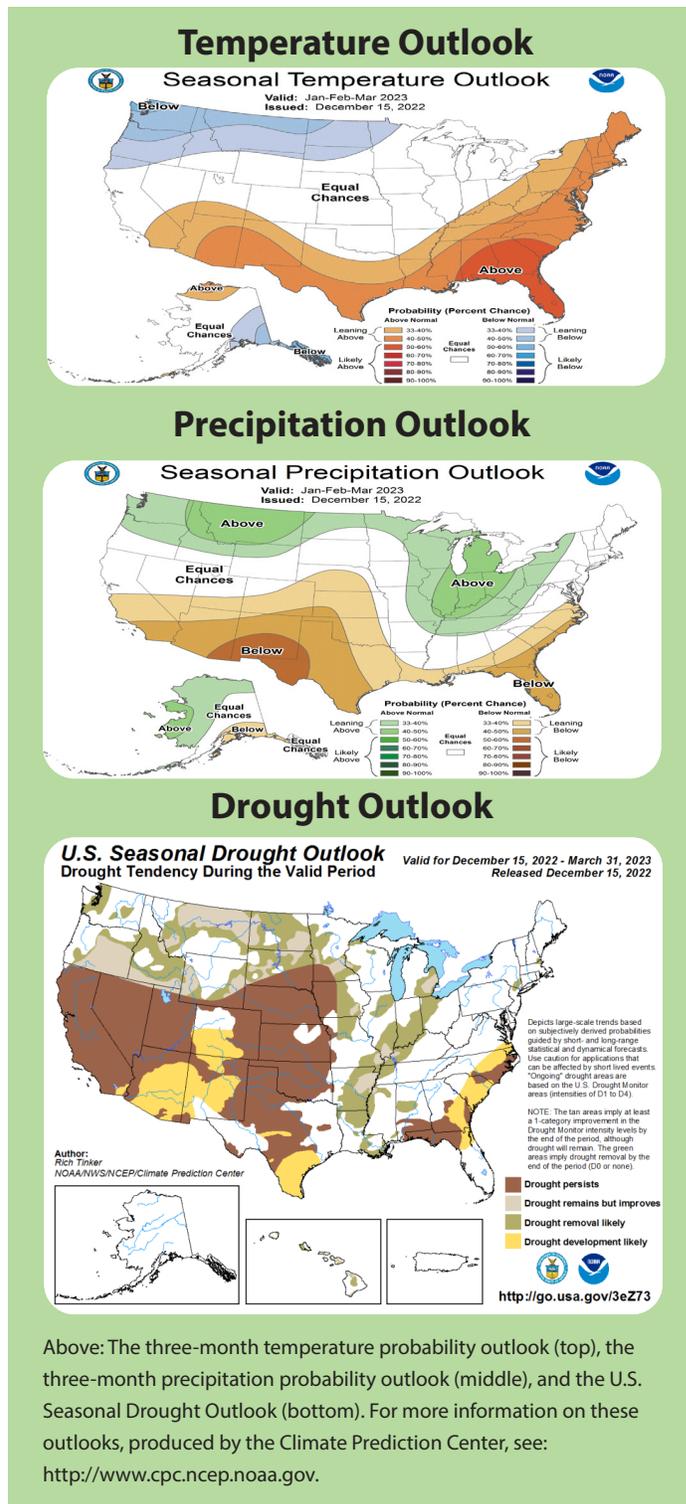
The three-month temperature outlook shows an increased chance of above-normal temperatures in the southern part of the United States, while below normal temperatures are favored in the north-western part. Across the High Plains there are equal chances of above-, below-, and near-normal temperatures across much of the region. The Dakotas and parts of Wyoming have increased chances of below-normal temperatures.

Precipitation

The outlook for the next three months indicates below-normal precipitation across central parts of the United States. Across the High Plains there are equal chances of above-, below-, and near-normal precipitation in North Dakota. The rest of the region has increased chances of below-normal precipitation.

Drought

The U.S Seasonal Drought Outlook released on December 15th indicates that drought conditions will likely improve across the northern part of the region. Opposite of this, development is likely in southern Colorado.



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	39.0	13.5	26.2	-3.1	65	12/01	-19	12/23	0.2	0	100
Alamosa San Luis Airport	42.3	4.6	23.5	5.4	53	12/27	-10	12/18	0.02	-0.33	6
Colorado Springs Municipal Airport	45.1	16.2	30.7	-1.0	63	12/27	-10	12/22	0.5	0.27	217
Denver International Airport	44.6	14.0	29.3	-1.9	64	12/11	-24	12/22	1.18	0.83	337
Grand Junction Walker Field Airport	39.1	22.0	30.5	2.1	53	12/02	9	12/19	1.29	0.69	215
Pueblo Memorial Airport	48.5	10.6	29.5	-2.2	69	12/27	-15	12/22	0.13	-0.16	45

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	41.1	19.4	30.2	-1.3	75	12/2	-9	12/22	0.67	-0.37	64
Dodge City Regional Airport	46.4	18.5	32.5	-1.4	73	12/2	-8	12/22	0.09	-0.87	9
Goodland Renner Field	42.4	13.1	27.7	-3.1	69	12/27	-17	12/22	0.63	0.16	134
Topeka Municipal Airport	42.9	22.6	32.7	-1.2	69	12/2	-4	12/22	0.99	-0.50	66
Wichita Mid-Continent Airport	44.6	23.3	33.9	-1.7	66	12/2	-5	12/22	0.93	-0.29	76

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	30.8	7.1	18.6	-7.1	62	12/1	-17	12/22	1.67	1.36	539
Grand Island Airport	36.5	14.4	25.4	-3.5	59	12/28	-15	12/22	0.46	-0.38	55
Lincoln Municipal Airport	37.4	14.2	25.8	-3.0	61	12/2	-13	12/22	0.64	-0.54	54
Norfolk Karl Stefan Airfield	31.3	13.0	22.1	-3.6	51	12/4	-18	12/22	0.67	-0.17	80
North Platte Regional Airport	37.9	11.4	24.7	-2.8	57	12/1	-16	12/22	1.40	0.95	311
Omaha Eppley Airport	33.9	14.6	24.3	-4.4	58	12/2	-14	12/22	1.05	-0.17	86
Valentine Miller Field	29.4	7.7	18.5	-7.8	52	12/4	-19	12/22	2.22	1.79	516

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismarck Municipal Airport	16.8	-0.5	8.2	-9.7	40	12/28	-20	12/22	1.57	0.97	262
Fargo International Airport	16.2	1.7	9.0	-6.7	33	12/15	-25	12/20	1.95	1.06	219
Grand Forks International Airport	16.0	1.0	8.5	-4.3	35	12/4	-26	12/20	1.57	0.91	238
Theodore Roosevelt Airport	18.3	0.8	9.5	-10.4	43	12/27	-25	12/21	T*	-0.19	0
Williston International Airport	13.4	-1.9	5.7	-10.4	38	12/28	-29	12/20	1.26	0.63	200

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>.

December 2022 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	20.4	2.0	11.2	-7.1	42	12/11	-20	12/25	1.45	0.84	238
Huron Regional Airport	24.0	6.4	15.2	-5.4	47	12/4	-19	12/22	2.11	1.45	320
Pierre Regional Airport	25.3	6.7	16.0	-6.8	50	12/4	-17	12/22	1.91	1.27	298
Rapid City Regional Airport	31.7	8.1	19.9	-5.7	61	12/11	-18	12/22	0.70	0.35	200
Sioux Falls Joe Foss Field Airport	25.1	9.2	17.1	-5.4	41	12/4	-18	12/22	2.59	1.76	312

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	33.2	12.3	22.8	-2.0	51	12/11	-42	12/22	0.74	0.13	121
Cheyenne Municipal Airport	39.5	17.0	28.2	-0.5	57	12/27	-25	12/22	0.18	-0.30	38
Lander Hunt Field Airport	28.7	4.1	16.4	-5.2	51	12/27	-32	12/22	1.32	0.69	210
Laramie Regional Airport	33.6	13.1	23.3	1.8	48	12/27	-24	12/22	0.07	-0.25	22
Rawlins Municipal Airport	30.5	12.6	21.6	-0.5	45	12/11	-25	12/22	0.76	0.36	190
Sheridan County Airport	29.3	7.5	18.4	-6.1	58	12/27	-23	12/23	1.03	0.49	191

December 2022 Highlights

Monthly Rankings

Temperature in degrees Fahrenheit, Precipitation in inches

Temperature	Temperature / Ranking	Record / Year	Period of Record
Dickinson, North Dakota	9.5 / 7th Coldest (tied with 2013)	7.3 / 1951	1938-2022
Precipitation	Precipitation / Ranking	Record / Year	Period of Record
Chadron, Nebraska	1.67 / Wettest	1.37 / 2014	1941-2022
Valentine, Nebraska	2.22 / Wettest	1.81 / 1987	1889-2022
Huron, South Dakota	2.11 / 3rd Wettest	2.15 / 1931	1881-2022
Sioux Falls, South Dakota	2.59 / 3rd Wettest	2.97 / 1945	1893-2022
Fargo, North Dakota	1.95 / 3rd Wettest	2.28 / 1927	1881-2022
Bismarck, North Dakota	1.57 / 3rd Wettest	2.05 / 2016	1874-2022
Pierre, South Dakota	1.91 / 4th Wettest	2.91 / 1951	1893-2022
Grand Forks, North Dakota	1.57 / 5th Wettest	2.29 / 1918	1893-2022
Sisseton, South Dakota	1.73 / 5th Wettest	2.03 / 1968	1931-2022
Mobridge, South Dakota	1.15 / 5th Wettest	1.41 / 1911	1911-2022
Snowfall	Snowfall / Ranking	Record / Year	Period of Record
Sisseton, South Dakota	23.2 / 2nd Snowiest	36 / 2010	1931-2022
Bismarck, North Dakota	30 / 2nd Snowiest	33.3 / 2008	1886-2022
Pierre, South Dakota	19.1 / 3rd Snowiest	31.3 / 1951	1893-2022
Valentine, Nebraska	22.3 / 3rd Snowiest	22.5 / 1987 and 1924	1889-2022

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

The screenshot shows the cover page of a report titled "Missouri River Basin Quarterly Climate Impacts and Outlook" for September-October 2014. It features a map of the basin, a table of contents, and several sections of text and graphics. Key sections include "National - Significant Events for September - November 2014", "Regional - Impacts for September - November 2014", "Regional - Climate Overview for September - November 2014", "Drought Co-Occurrence", "3 Month Precipitation and Temperature Outlooks", and "Soil Moisture Conditions".

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

The screenshot shows a video player for a webinar titled "20141120 Monthly Climate and Drought Webinar". The main content is a map titled "Forecast Precipitation Amounts (7 day)" showing precipitation forecasts for the Midwest and Great Plains regions. The map uses a color scale from blue (low) to red (high). A play button is visible in the center of the map.

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

For an archive:
www.hprcc.unl.edu/webinars.php

Author Information

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

