



March 2022 Climate Summary



Foothills of Colorado, Photo Courtesy of Gannon Rush

Dryness Continued into March

The dryness that has gripped parts of the region over the winter continued into March. This led to the intensification and growth of drought across South Dakota, Nebraska, and western Kansas. All three states ended the month with 45 percent of the state in severe drought (D2). In preparation for the continuation of the drought, cattle herds are being culled in Nebraska. Feedlots in the state are now near-record numbers, which is unusual for this time of the year.

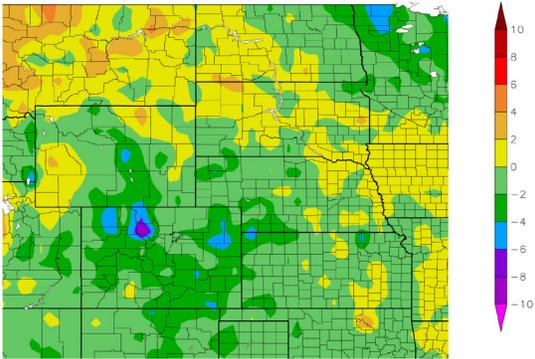
Repercussions from the drought of 2021 are becoming noticeable in North Dakota. Many cattle producers within the state rely on water from surface water sources such as stock ponds. These water sources were dried up or contained substances toxic to livestock during the drought of previous years. As a result of the lack of snowpack this winter for recharge or the dilution of toxic substances, there are concerns about the availability of water this year. Ranchers within the state have been encouraged to find other sources of water to reduce the potential for issues this year.

Another side effect of the dryness across the region is the increased risk of wildfires. Optimal conditions for wildfires across western Kansas throughout the month led the governor to declare a state of disaster. Several large fires broke out in the southern part of the state, with the largest reported to the northwest of Wichita. Fires were also reported in Colorado, Nebraska, and South Dakota in the month of March.

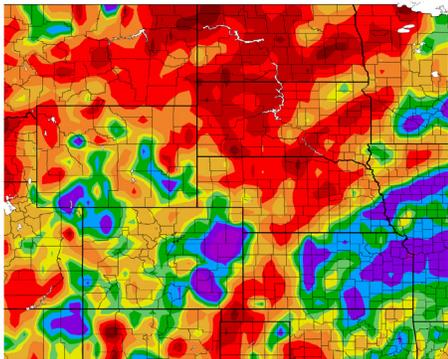
Opposite of the dryness, eastern North Dakota has been extremely wet. There are concerns about flooding along the Red River after numerous snowstorms this winter. Flooding in this region would lead to delays in planting, which could impact wheat output this year.

Temperature and Precipitation Overview

Departure from Normal Temperature (F)
3/1/2022 - 3/31/2022



Percent of Normal Precipitation (%)
3/1/2022 - 3/31/2022



Above: Departure from 1991-2020 normal temperature (left) and percent of normal precipitation (right) for March 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

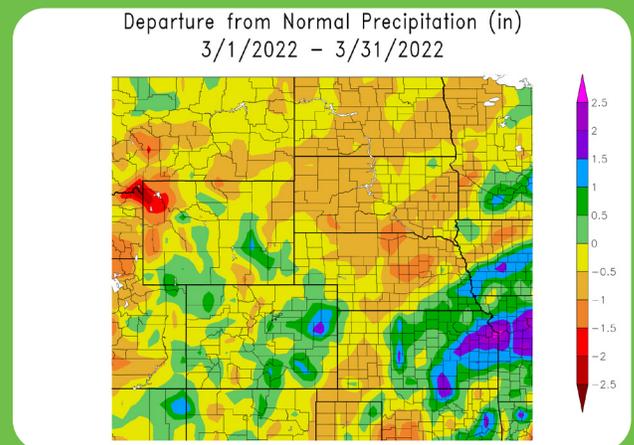
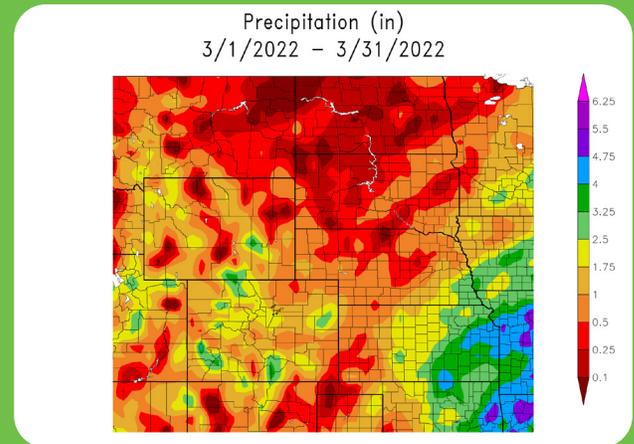
Precipitation was well below normal again in Nebraska and the Dakotas in March. Pockets of above-normal precipitation were present in eastern Colorado, eastern Kansas, southeastern Nebraska, and parts of Wyoming. The precipitation observed at these locations helped alleviate drought conditions, but deficits remain.

Despite large portions of the region observing below normal precipitation, only two locations ranked in the top 10 driest. Williston, North Dakota recorded 0.06 inches (1.5 mm) of precipitation to rank 5th driest, while Rapid City, South Dakota observed 0.25 inches (6.35 mm) which ranked 8th driest. Several locations have also started the year among the driest on record. In Nebraska, Valentine and Norfolk were the 2nd driest on record since January 1st. Williston and Rapid City also ranked in the top 10 driest since January 1st.

Above normal precipitation this month helped reduce drought conditions. Several storms moved across eastern Kansas, which helped remove abnormally dry conditions while also improving drought conditions. Precipitation towards the end of the month slightly eased drought conditions in eastern Colorado, however, long-term dryness continues to impact the area. After a very wet March, Casper, Wyoming observed its 3rd wettest start to the year, with 3.29 inches (8.36 cm) of precipitation falling.

The region also experienced its first severe weather of the season. On the 29th, a storm progressed across eastern Kansas with 1 inch (2.54 cm) hail and 60 miles per hour (96.56 km/h) wind gusts. An EF-1 tornado was observed in Jefferson County, with minor damage reported.

Regional Precipitation



Above: Total precipitation in inches (top) and departure from normal precipitation in inches (bottom) for March 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>.

Snowpack Update

Snowpack for the end of winter remained just below normal for the Upper Missouri River Basin mountains. According to the U.S. Army Corps of Engineers, as of March 27, Snow Water Equivalent (SWE) above Fort Peck Reservoir is currently at 12.2 inches (30.99 cm) which is 79% of the average (1981-2010). The reach between Fort Peck and Garrison Reservoirs is currently 10.4 inches (26.42 cm) which are 76% of the average (1981-2010). In the Plains, areas with snow on the ground at the end of January were observed in southern North Dakota and northeastern South Dakota. Meanwhile, warm and dry conditions resulted in snow-free areas across the remainder of the plains.

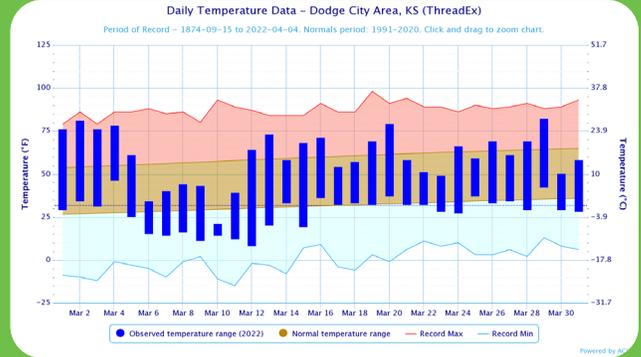
Temperatures

Temperatures were near normal for the month of March. Isolated pockets of 8 degrees F (4.4 C) below normal were observed in north-central Colorado. Meanwhile, areas of above normal temperatures were recorded in northeastern Wyoming, northeastern South Dakota, and southwestern North Dakota.

Despite temperatures being near normal throughout the region, temperatures fluctuated during the month. Temperatures were well above normal on the 21st, reaching 80 degrees F (26.7 C) in the southern High Plains. The highest temperature was recorded in northwestern Kansas, with an observation of 93 degrees F (33.9 C) near Wallace. Opposite of these warm temperatures, much below normal temperatures were recorded from March 10th to 11th. Low temperatures of -25 degrees F (-31.7 C) were observed in the higher elevations of Colorado, South Dakota, and Wyoming. A brisk temperature of -40 degrees F (-40 C) was reported near Yellowstone National Park in Wyoming.

The much above normal temperatures have also coincided with high winds during the month. Red flag warnings were issued on many days in March in all states except North Dakota. Conditions were ripe for fires to break out on the 29th, which led the Storm Prediction Center to issue a rare extremely critical fire day.

Station Spotlight: Dodge City, KS

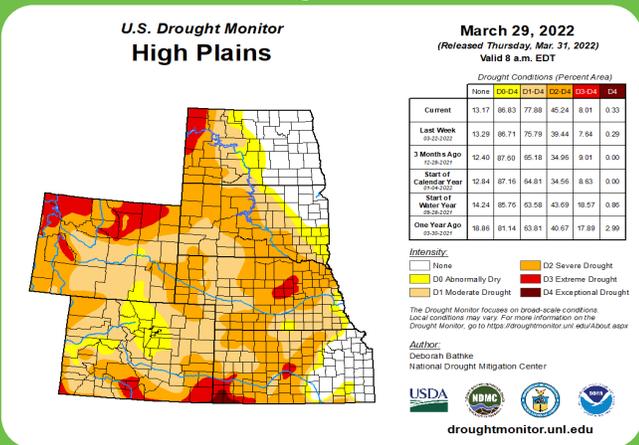


Above: Daily temperatures for March 2022, along with extremes and normals values in Dodge City, Kansas.

Drought Conditions

Persistent dryness that has plagued parts of the region continued into March. Conditions rapidly deteriorated across the western parts of Nebraska and South Dakota, while drought intensified in western Kansas.

U.S. Drought Monitor



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/>.

Exceptional Drought (D4) was reintroduced to the region for the first time since November of 2021. Long-term dryness led to the expansion of D4 into southwestern Kansas and the slight expansion over the course of the month. Another dry month in Nebraska led to a 20 percent increase to severe drought (D2) and the introduction of extreme drought (D3) in the north-central part of the state. Drought conditions also intensified in South Dakota, with 46 percent of the state now experiencing D2. Despite the dryness plaguing the region, some areas received above normal precipitation which led to improvements. Beneficial precipitation in eastern Colorado eased conditions and led to a 24 percent reduction of D2 area coverage for the state. In eastern Kansas, abnormally dry conditions were significantly reduced. Throughout the rest of the region, other improvements and degradations were observed. According to the Climate Prediction Center's U.S. Monthly Drought Outlook for April, drought development is likely in south-central Nebraska.

March 2022 Climate Summary

Climate Outlooks

According to the Climate Prediction Center, La Niña conditions are likely to continue into the summer. 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 through May indicates an increased chance of minor flooding in eastern South Dakota and the lower basin. According to the National Interagency Fire Center (NIFC), in the High Plains, Kansas, Nebraska, and eastern Colorado have above-normal wildland fire potential throughout April.

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 across the majority of the United States. The highest chances of below-normal temperatures can be observed in the Northwestern United States. In the High Plains, North Dakota and northwestern South Dakota have equal chances of above-, below-, and near-normal temperatures. Meanwhile, the rest of the region has increased chances of above-normal temperatures.

Precipitation

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

Drought

The U.S. Seasonal Drought Outlook released on March 31st indicates drought conditions are expected to persist across the Southwest and High Plains over the next three months. Drought conditions are expected to remain and development is likely in eastern Kansas and south-central Nebraska.

Temperature Outlook

Seasonal Temperature Outlook
Valid: Apr-May-Jun 2022
Issued: March 17, 2022

Precipitation Outlook

Seasonal Precipitation Outlook
Valid: Apr-May-Jun 2022
Issued: March 17, 2022

Drought Outlook

U.S. Seasonal Drought Outlook
Drought Tendency During the Valid Period
Valid for April 1 - June 30, 2022
Released March 31, 2022

Consistency adjustment based on Monthly Drought Outlook for April 2022

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

Author: Brad Pielke
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	51.2	22.9	37.1	-3.4	79	03/28	-5	03/10	0.97	0.26	137
Alamosa San Luis Airport	52.6	12.7	32.7	-2.5	73	03/27	-3	03/11	0.44	-0.07	86
Colorado Springs Municipal Airport	54.7	27.5	41.1	0.0	80	03/26	4	03/11+	0.81	0.02	103
Denver International Airport	53.7	25.2	39.4	-2.2	80	03/28	-7	03/10	1.17	0.31	136
Grand Junction Walker Field Airport	55.6	30.6	43.1	-1.9	78	03/27	14	03/11+	0.68	-0.12	85
Pueblo Memorial Airport	58.2	24.3	41.2	-2.7	84	03/26	4	03/10	1.33	0.51	162

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	57.6	30.4	44.0	0.5	86	03/29	6	03/12	2.06	0.53	135
Dodge City Regional Airport	59.9	27.4	43.6	-1.8	82	03/29	8	03/12	0.86	-0.49	64
Goodland Renner Field	54.5	22.8	38.6	-2.8	76	03/02	3	03/11	0.82	-0.06	93
Topeka Municipal Airport	58.3	31.7	45.0	-0.6	84	03/29+	7	03/12+	3.55	1.30	158
Wichita Mid-Continent Airport	60.5	32.9	46.7	-0.7	82	03/02	15	03/12	4.09	1.79	178

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	51.6	21.1	36.4	-1.5	83	03/28	-15	03/10	0.69	-0.12	85
Grand Island Airport	54.7	26.2	40.4	-0.3	80	03/29	5	03/12	1.01	-0.38	73
Lincoln Municipal Airport	55.0	26.1	40.6	-0.6	81	03/02	5	03/12	1.96	0.41	127
Norfolk Karl Stefan Airfield	51.5	25.0	38.2	0.4	79	03/20	-1	03/12	0.46	-0.98	32
North Platte Regional Airport	53.2	21.0	37.1	-2.5	76	03/02	-2	03/11	0.85	-0.15	85
Omaha Eppley Airport	53.2	28.2	40.7	-0.3	79	03/02	7	03/12	2.68	0.89	150
Valentine Miller Field	52.9	21.7	37.3	-0.3	77	03/20	-1	03/10	0.25	-0.76	25

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismarck Municipal Airport	43.5	19.9	31.7	1.6	70	03/24	-2	03/11	0.25	-0.59	30
Fargo International Airport	34.2	16.4	25.3	-1.9	56	03/21	-9	03/12	0.51	-0.74	41
Grand Forks International Airport	31.3	12.6	22.0	-2.4	52	03/21+	-14	03/12	0.30	-0.61	33
Theodore Roosevelt Airport	43.7	17.9	30.8	0.5	65	03/20	-7	03/11	0.06	-0.50	11
Williston International Airport	41.5	18.6	30.0	1.2	60	03/20	-10	03/11	0.06	-0.57	10

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>.

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

Author Information

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

