



July 2023 Climate Summary

Storm over Lincoln, Nebraska, Photo Courtesy of Gannon Rush

Regional Breakdown

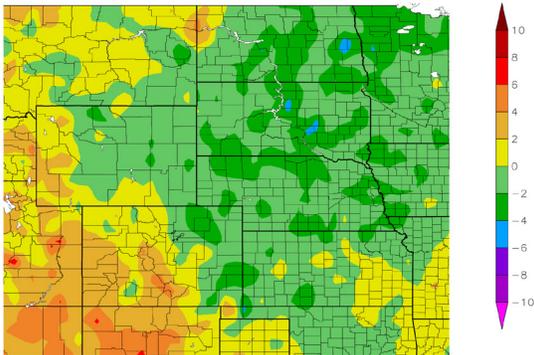
July was a mixed bag of weather for the High Plains. Precipitation was greatly needed for some, while others received next to nothing. Cooler temperatures dominated much of the region, despite a heatwave late in the month.

Wheat harvest in Kansas began at the beginning of June, with most of it harvested by the fourth of July. Around this time, however, storms pushed through the state nearly every other day which caused numerous delays. Weeds became a significant issue, and the quality of the wheat began to decline. Some places, such as Morton County, didn't have the first loads of wheat to the Co-op until early July. The same county also reported 70 to 75 percent of planted acres and were zeroed out by crop insurance due to the ongoing multi-year drought. The average yield for the state is expected to be historically low, with an average of 32 bushels an acre.

Corn and soybeans are in decent shape throughout the region, with a large portion of crops in fair to good shape. Pasture and range conditions are improving, with only small numbers in very poor shape. Conditions could see further improvement in August, with the majority of agricultural production areas having a chance of above-normal precipitation.

Temperature and Precipitation Overview

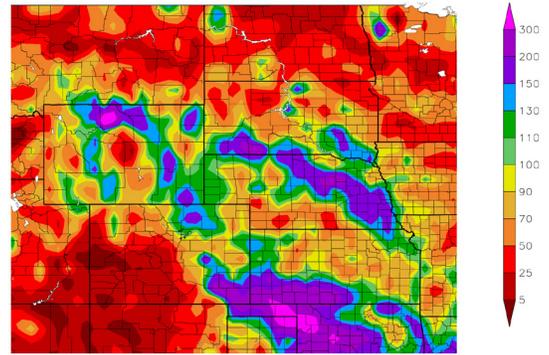
Departure from Normal Temperature (F)
7/1/2023 - 7/31/2023



Generated 8/1/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

Percent of Normal Precipitation (%)
7/1/2023 - 7/31/2023



Generated 8/1/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

Above: Departure from 1991-2020 normal temperature (left) and percent of normal precipitation (right) for July 2023 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

Aside from scattered pockets of above-normal precipitation, the region was fairly dry this month. Western Colorado and the majority of North Dakota were well below normal, with places of near-record dryness.

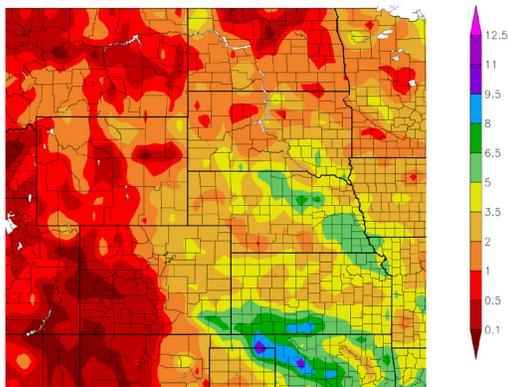
While eastern Colorado has received normal to above normal precipitation these past few months, the western part of the state has not been so lucky. Grand Junction tied with 1898 for the driest on record, while Alamosa was the driest. Next to zero precipitation occurred in both places this month and combined with the recent heat, drought conditions have begun to be reintroduced in the southwestern part of the state.

Among those who missed the rain this month include McCook, Nebraska, and the surrounding area. Just a few months ago, they recorded their wettest month ever by a large margin and greatly improved the ongoing drought. This month was a setback, as only 0.50 inches (12.7 mm) precipitation occurred, and it was ranked 5th driest. At the end of June, they ranked 10th wettest for January through June period. Currently, they rank 25th after a meager July precipitation.

For the portions of the region that did receive precipitation, the majority of it was related to severe weather. Kansas, Colorado, and Nebraska recorded their highest number of severe thunderstorm warnings issued (period of record 2002 to present). Over 350 were issued in each state, with Colorado also recording their most tornado warnings as well. On the 20th, a whopping 115 mph (185 km/h) gust was recorded outside of Wallace, Kansas. A building was completely destroyed by the winds, while other locations were pummeled by the combination of the wind and up to 2.5 inch (6.35 cm) hail.

Regional Precipitation

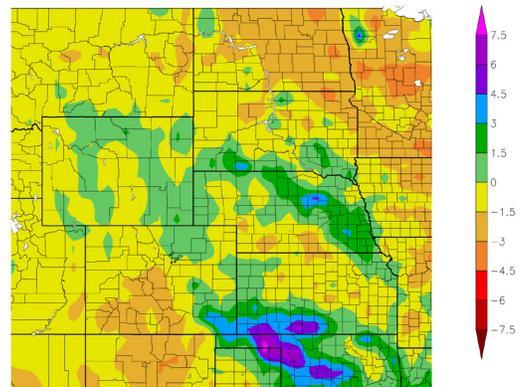
Precipitation (in)
7/1/2023 - 7/31/2023



Generated 8/1/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

Departure from Normal Precipitation (in)
7/1/2023 - 7/31/2023



Generated 8/1/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

Above: Total precipitation in inches (left) and departure from normal precipitation in inches (right) for July 2023. 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

Temperatures were cooler for many places, however, an oppressive heatwave occurred towards the end of the month with temperatures well above 100 degrees F (37.8 degrees C).

Western Colorado experienced well above-normal temperatures throughout the month, with the heatwave only adding fuel to the fire. Alamosa tied with 2003 for the 2nd warmest and narrowly missed the record, with an average temperature of 68.2 degrees F (20.1 degrees C). Grand Junction also ranked 2nd warmest, with an average temperature of 83.3 degrees F (28.5 degrees C). The average high temperature for Grand Junction was 99.3 degrees F (37.4 degrees C) for July, which is the 2nd warmest month on record.

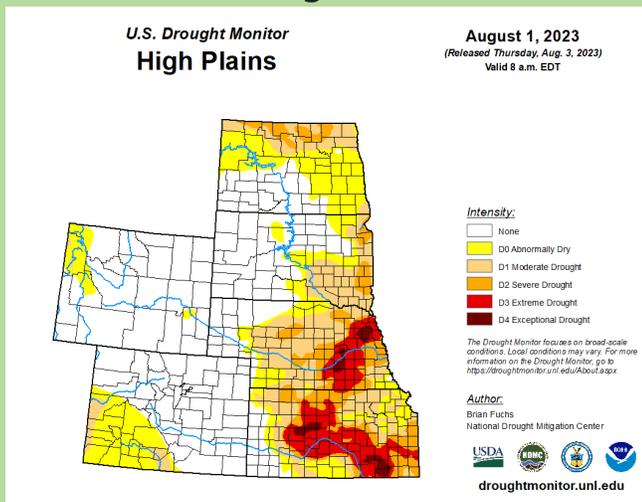
The heatwave that impacted the region late in the month not only brought scorching temperatures but also set some notable records. On the 17th, Grand Junction tied with July 9th, 2021 for the highest all-time temperature of 107 degrees F (41.7 degrees C). Lawrence, Kansas recorded its highest July low temperature 84 degrees F (28.9 degrees C) on the 27th. It was also the 4th highest low temperature of all time.

Drought Conditions

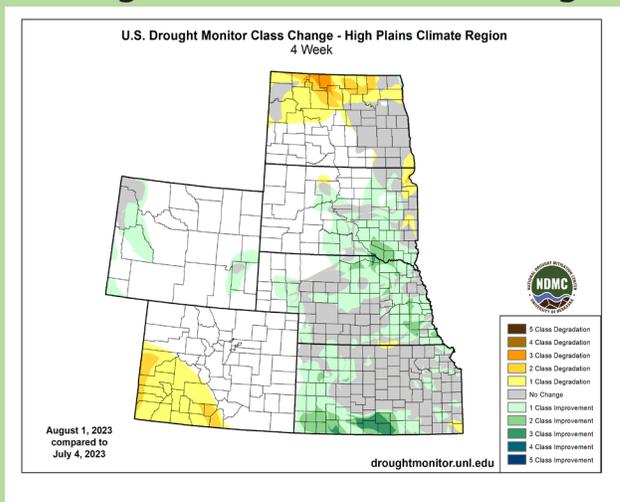
Drought conditions improved this month, particularly in Kansas and Nebraska. However, North Dakota and southwestern Colorado were extremely dry, resulting in drought conditions rapidly intensifying. Overall, abnormally dry to exceptional drought (D0-D4) was reduced by a little over 2 percent in the region.

The drought that has plagued Kansas and Nebraska has seen steady improvement this summer. Above-normal precipitation across eastern Nebraska reduced D4 in the state by nearly 11 percent this month. On the opposite end of the spectrum, southwestern Colorado was near bone dry and observed a 25 percent increase in D0-D4. North Dakota also experienced a rapid increase in moderate to exceptional drought (D1-D4).

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/>.

July 2023 Climate Summary

Climate Outlooks

According to the Climate Prediction Center, an El Niño Advisory has been issued and conditions are likely to increase over the coming months. 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 increased chances of Minor Flooding in central South Dakota and western Nebraska. According to the National Interagency Fire Center (NIFC), fire potential will be limited across the region through October.

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

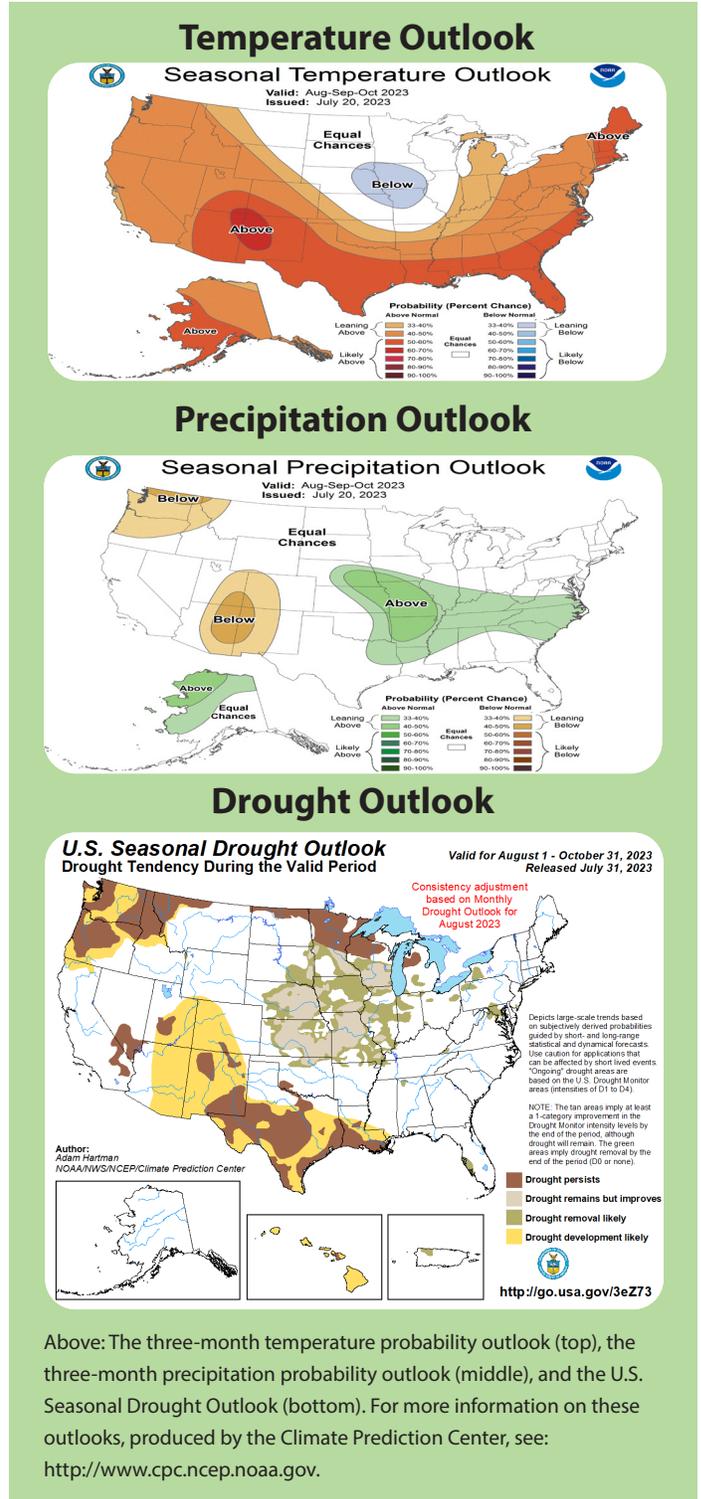
The three-month temperature outlook shows an increased chance of above-normal temperatures across the United States, except for the central states. Increased chances of above-normal temperatures are present in Colorado, Wyoming, and western Kansas. Slight chances of below normal temperatures are present in eastern Nebraska, northeastern Kansas, and southeastern South Dakota.

Precipitation

The outlook for the next three months indicates below-normal precipitation in parts of the southwestern and northwestern United States, while above-normal precipitation is favored for the east-central part of the country.

Drought

The U.S. Seasonal Drought Outlook released on July 31st indicates drought conditions will likely improve across the region, while development is likely in western 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	85.1	59.8	72.5	-2.0	96	07/24	51	07/09	3.70	0.92	133
Alamosa San Luis Airport	89.2	47.2	68.2	2.9	95	07/17	39	07/06	0.01	-1.03	1
Colorado Springs Municipal Airport	86.2	58.9	72.6	0.2	96	07/25	51	07/01	2.86	-0.26	92
Denver International Airport	88.0	59.8	73.9	-1.2	98	07/25	52	07/21	2.1	-0.04	98
Grand Junction Walker Field Airport	99.3	67.2	83.3	4.1	107	07/17	56	07/01	T	-0.59	-
Pueblo Memorial Airport	95.8	61.3	78.6	1.4	106	07/25	51	07/01	1.4	-0.49	74

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	92.1	68.0	80.1	1.2	109	07/28	59	07/09	2.37	-1.78	57
Dodge City Regional Airport	91.5	66.4	78.9	-1.2	103	07/18	56	07/09	5.87	2.79	191
Goodland Renner Field	87.5	61.8	74.7	-1.4	102	07/25	49	07/09	4.17	1.09	135
Topeka Municipal Airport	91.3	69.0	80.2	0.4	104	07/28	59	07/10	4.47	0.48	112
Wichita Mid-Continent Airport	92.0	69.5	80.8	-0.7	103	07/31	62	07/10	4.60	0.62	116

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	87.4	57.1	72.3	-3.0	102	07/26	48	07/09	1.83	-0.16	92
Grand Island Airport	87.1	64.4	75.8	-1.2	104	07/28	57	07/08	3.35	-0.16	95
Lincoln Municipal Airport	86.4	65.4	75.9	-2.2	102	07/28	56	07/06	5.61	2.36	173
Norfolk Karl Stefan Airfield	85.3	63.0	74.2	-0.6	101	07/26	50	07/06	5.37	2.39	180
North Platte Regional Airport	86.3	61.1	73.7	-1.9	102	07/27	51	07/09	3.27	0.09	103
Omaha Eppley Airport	85.8	65.4	75.6	-2.5	102	07/28	55	07/08	6.30	2.75	177
Valentine Miller Field	85.8	59.0	72.4	-3.3	99	07/26	45	07/06	5.71	2.89	202

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismarck Municipal Airport	83.6	56.5	70.1	-1.2	101	07/26	44	07/17	1.39	-1.68	45
Fargo International Airport	82.2	58.6	70.4	-0.3	98	07/26	48	07/11	0.95	-2.12	31
Grand Forks International Airport	81.0	53.7	67.4	-1.5	97	07/26	42	07/11	1.87	-1.65	53
Theodore Roosevelt Airport	81.2	53.8	67.5	-1.9	97	07/25	40	07/05	1.07	-1.48	42
Williston International Airport	82.1	56.5	69.3	-1.1	102	07/24	43	07/05	4.02	1.54	162

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>.

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South Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Aberdeen Regional Airport	84.7	57.3	71.0	-1.3	101	07/26	44	07/06	1.62	-1.47	52
Huron Regional Airport	84.5	59.5	72.0	-1.7	100	07/25	47	07/17	2.40	-0.43	85
Pierre Regional Airport	87.9	59.6	73.7	-1.2	107	07/26	47	07/06	1.42	-0.97	59
Rapid City Regional Airport	84.9	56.0	70.5	-1.9	99	07/26	46	07/05	1.47	-1.40	51
Sioux Falls Joe Foss Field Airport	86.5	61.5	74.0	-0.4	104	07/26	48	07/06	1.28	-1.97	39

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	88.0	51.6	69.8	-1.2	101	07/17	40	07/07	1.33	0.14	112
Cheyenne Municipal Airport	82.5	55.7	69.1	-1.0	93	07/24	48	07/01	4.26	2.15	202
Lander Hunt Field Airport	85.8	54.5	70.2	-1.3	97	07/17	45	07/08	0.34	-0.25	58
Laramie Regional Airport	81.8	49.2	65.5	0.7	93	07/17	42	07/07	1.47	0.13	110
Rawlins Municipal Airport	86.2	51.5	68.8	0.9	96	07/17	42	07/05	0.04	-0.68	6
Sheridan County Airport	85.8	53.4	69.6	-1.1	101	07/24	45	07/06	1.36	0.29	127

July 2023 Highlights

Monthly Rankings

Temperature in degrees Fahrenheit, Precipitation in inches

Precipitation	Precipitation/ Ranking	Record / Year	Period of Record
Cheyenne, Wyoming	4.26 / 6th Wettest	6.35 / 1896	1871-2023
Valentine, Nebraska	5.71 / 10th Wettest	8.96 / 1983	1889-2023
Grand Junction, Colorado	Trace / Driest (tied with 1898)		1893-2023
Alamosa, Colorado	0.01 / Driest	0.02 / 1994	1906-2023
Rawlins, Wyoming	0.04 / 2nd Driest (tied with 2003+)	0.02 / 1955	1951-2023
McCook, Nebraska	0.61 / 5th Driest	0.02 / 2002	1894-2023
Temperature	Temperature/ Ranking	Record / Year	Period of Record
Grand Junction, Colorado	83.3 / 2nd Warmest	84.1 / 2003	1893-2023
Alamosa, Colorado	68.2 / 2nd Warmest (tied with 2003)	68.4 / 2011	1906-2023

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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

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