



June 2023 Climate Summary



View of Boulder, Colorado, Photo Courtesy of Gannon Rush

Regional Breakdown

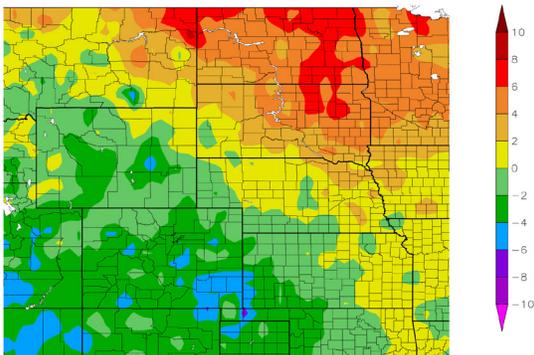
The month of June was both good and bad for the High Plains. Record precipitation greatly improved drought conditions for some, while others continued to remain dry. Drought conditions continued to intensify in the eastern portions of the region, leading to significant impacts.

The dryness plaguing the central and eastern parts of the region has created lasting impacts. The lack of recharge this past winter has led to several cities implementing water restrictions in an effort to conserve the precious resource. The town of Waverly was forced to designate emergency restrictions due to low levels, while the outskirts of Lincoln implemented mandatory restrictions of 50 percent. Other locations like Hays, Kansas reintroduced summertime restrictions that include a ban on outdoor water use from noon to 7:00 PM.

Severe weather was active throughout the region, with hail and winds being the primary threats this month. A hailstorm on the 21st interrupted a concert at Red Rocks Amphitheatre outside of Denver, Colorado. Nearly 100 people were injured, with seven taken to the hospital after concert goers failed to heed the severe thunderstorm warnings.

Temperature and Precipitation Overview

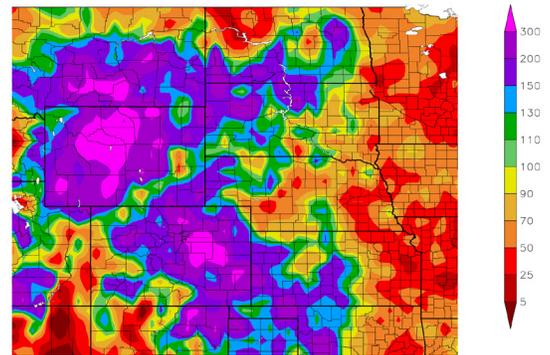
Departure from Normal Temperature (F)
6/1/2023 – 6/30/2023



Generated 7/10/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

Percent of Normal Precipitation (%)
6/1/2023 – 6/30/2023



Generated 7/10/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

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

The trend of above-normal precipitation in the west and below-normal to the east continued into June. The Front Range and Rocky Mountains observed record to near-record amounts, while eastern Kansas was below 25 percent of their normal.

Drought conditions were erased from the state of Colorado after this month's record precipitation, with only minimal dryness left. Denver surpassed their previous record by over an inch (2.54 cm), with 6.10 inches (15.49 cm) of precipitation. Nearby Akron set their new record after 7.48 inches (19 cm) fell there. Colorado Springs received 9.62 inches (24.44 cm) to break the previous record, which is nearly 60 percent of its annual precipitation.

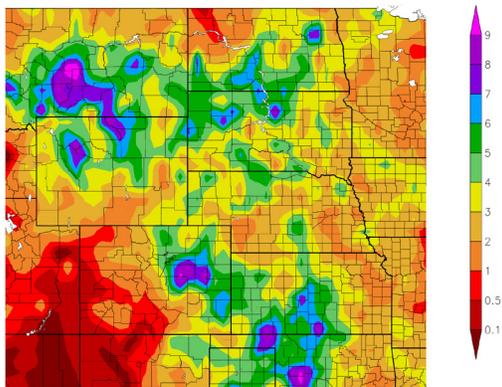
Another benefactor from the recent precipitation was Wyoming. Numerous locations recorded one of their wettest months on record, while others like Laramie and Sheridan nearly broke theirs. Similar to Colorado, drought conditions greatly improved across the state.

The severe weather this month was both ends of the extreme. The Dakotas observed record-low issuances of tornado warnings for June (period of record 2003-2023), with only three total issued for both states. On the opposite end of the spectrum, Colorado and Wyoming had near-record numbers of tornado warnings. Colorado had a particularly nasty month, with 71 tornado warnings issued and a whopping 152 reports of hail.

Snowpack melted in June, with the mainstem storage approaching the average. Releases from Gavins Point dam have been adjusted to near normal. Streamflow is average to above normal across the region except for eastern Kansas and Nebraska.

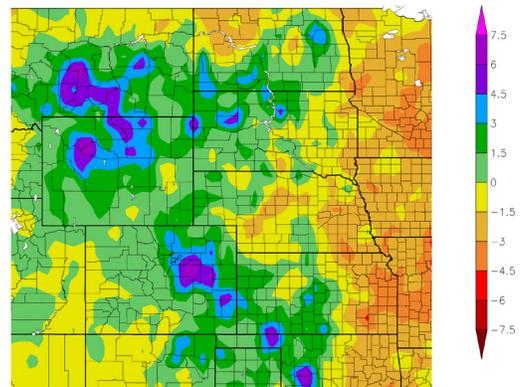
Regional Precipitation

Precipitation (in)
6/1/2023 – 6/30/2023



Generated 7/10/2023 at HPRCC using provisional data. NOAA Regional Climate Centers

Departure from Normal Precipitation (in)
6/1/2023 – 6/30/2023



Generated 7/10/2023 at HPRCC using provisional data. NOAA Regional Climate Centers

Above: Total precipitation in inches (left) and departure from normal precipitation in inches (right) for June 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

Record to near-record warmth continued in the northern part of the region this month. Parts of North Dakota were 6 degrees F (3.3 degrees C) above normal, while the cooler and wetter western portions were up to 4 degrees F (2.2 degrees C) below normal.

In North Dakota, Fargo and Grand Forks recorded their warmest June of 74.8 degrees F (23.8 degrees C) and 71.6 degrees F (22 degrees C). Both locations recorded their warmest May-June, after having their second warmest May the previous month. This contrasts sharply with early spring, when well below temperatures dominated North Dakota. Elsewhere in the Dakotas, Aberdeen and Sisseton ranked in the Top 5 warmest.

While temperatures have not been excessively hot this year in eastern Nebraska, they have been steadily very warm. At the end of June, Lincoln had recorded 46 days at or above 85 degrees F (29.4 degrees C) for the year. This is the most on record for the first six months of a year, with two more days than 1934 which was the warmest year on record.

Drought Conditions

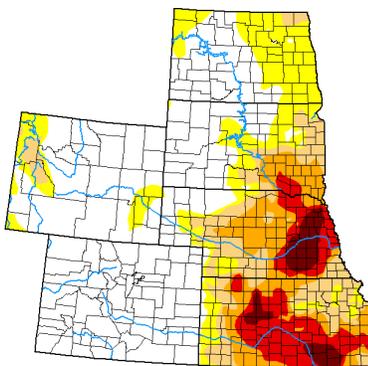
Drought conditions further improved in June, particularly in Kansas. Eastern Nebraska continued to remain dry, with exceptional drought (D4) observed over much of the area. Overall, abnormally dry to exceptional drought (D0-D4) was reduced by nearly seven percent in the High Plains.

The steady stream of precipitation in Kansas brought relief this month. D4 was reduced by nine percent, with only small pockets remaining in the state. Nebraska experienced improvements in the west and degradation in the east. Drought is firmly entrenched across the eastern part of the state, after yet another dry month. Elsewhere in the region, other localized improvements and degradations were observed.

U.S. Drought Monitor

U.S. Drought Monitor
High Plains

July 4, 2023
(Released Thursday, Jul. 6, 2023)
Valid 8 a.m. EDT



Intensity:
 None
 D0 Abnormally Dry
 D1 Moderate Drought
 D2 Severe Drought
 D3 Extreme Drought
 D4 Exceptional Drought

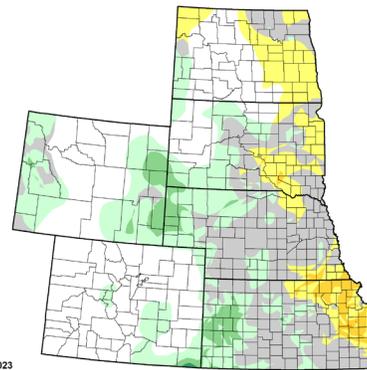
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:
Curtis Riganti
National Drought Mitigation Center



Drought Monitor 1-Month Change

U.S. Drought Monitor Class Change - High Plains Climate Region
4 Week



July 4, 2023
compared to
June 6, 2023



5 Class Degradation
 4 Class Degradation
 3 Class Degradation
 2 Class Degradation
 1 Class Degradation
 No Change
 1 Class Improvement
 2 Class Improvement
 3 Class Improvement
 4 Class Improvement
 5 Class Improvement

droughtmonitor.unl.edu

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/>.

June 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

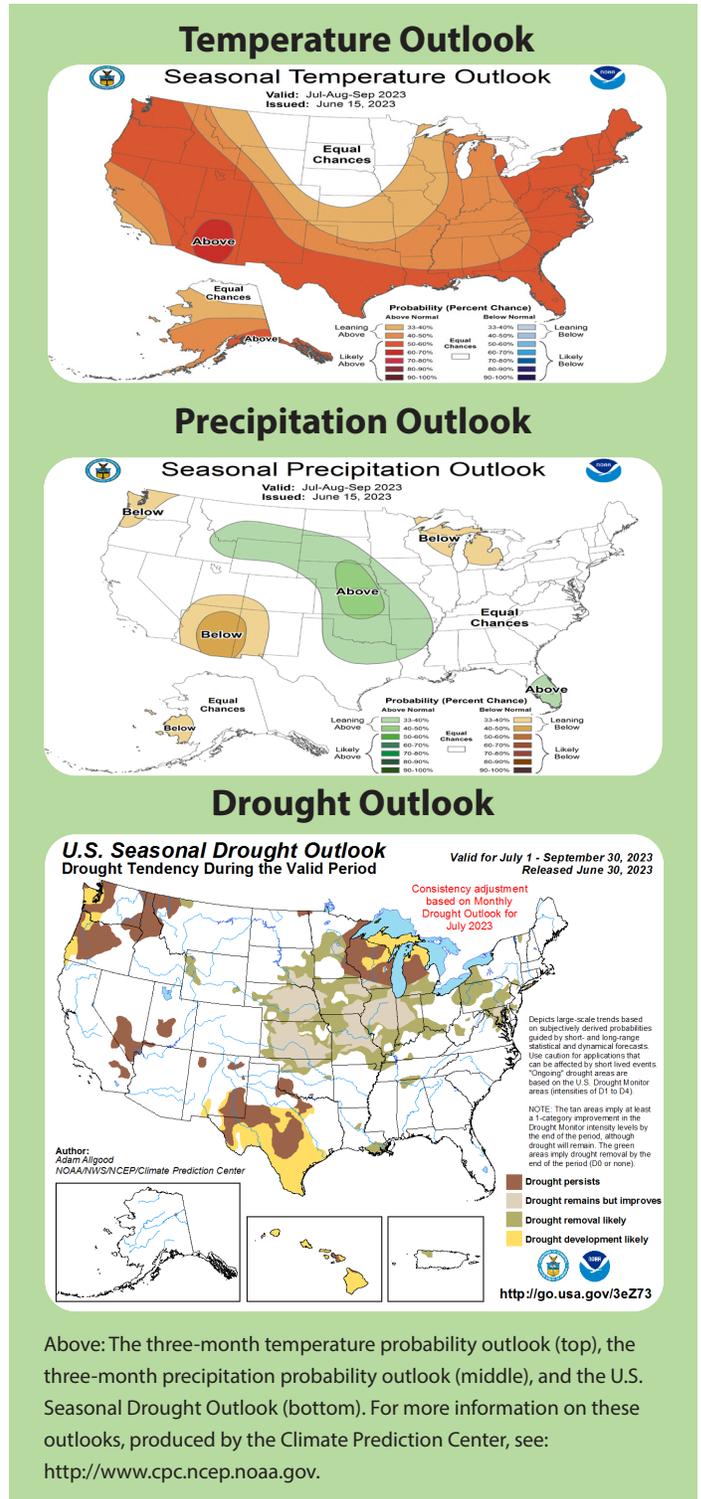
The three-month temperature outlook shows an increased chance of above-normal temperatures across the majority of the United States. Increased chances of above-normal temperatures are present in Colorado, Kansas, and Wyoming.

Precipitation

The outlook for the next three months indicates below-normal precipitation across the southwestern and northwestern United States, while above-normal precipitation is favored for the central part of the country. Kansas, Nebraska, South Dakota, and Wyoming have increased chances of above normal precipitation.

Drought

The U.S Seasonal Drought Outlook released on June 30th indicates drought conditions will likely improve across the region.



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	76.1	54.1	65.1	-3.1	91	06/27	49	06/25	7.48	5.24	334
Alamosa San Luis Airport	77.3	39.4	58.4	-2.2	88	06/26	31	06/02	0.16	-0.27	37
Colorado Springs Municipal Airport	75.6	52.1	63.9	-3.3	91	06/27	44	06/13	9.62	7.35	424
Denver International Airport	75.6	52.7	64.2	-4.0	92	06/27	47	06/17	6.10	4.16	314
Grand Junction Walker Field Airport	86.4	56.4	71.4	-1.6	97	06/26	47	06/03	0.27	-0.14	66
Pueblo Memorial Airport	83.1	54.1	68.6	-3.2	100	06/27	45	06/18	3.85	2.57	301

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	88.1	63.6	75.9	1.5	98	06/28	51	06/13	3.57	-0.26	93
Dodge City Regional Airport	83.9	60.9	72.4	-2.7	97	06/27	52	06/14	6.29	3.00	191
Goodland Renner Field	80.4	56.5	68.4	-2.3	91	06/28	50	06/13	5.56	2.60	188
Topeka Municipal Airport	89.6	64.7	77.2	1.7	101	06/29	52	06/13	1.83	-3.09	37
Wichita Mid-Continent Airport	87.5	64.9	76.2	-0.7	102	06/29	59	06/15	4.70	-0.23	95

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	80.6	54.8	67.7	0.7	97	06/19	43	06/17	4.01	1.55	163
Grand Island Airport	86.7	60.7	73.7	0.9	98	06/19	47	06/12	1.94	-2.07	48
Lincoln Municipal Airport	89.2	61.6	75.4	1.7	101	06/28	45	06/12	4.53	0.05	101
Norfolk Karl Stefan Airfield	87.0	60.0	73.5	3.1	96	06/07	46	06/12	3.33	-1.04	76
North Platte Regional Airport	82.3	56.1	69.2	-0.5	91	06/19	44	06/12	2.59	-0.95	73
Omaha Eppley Airport	87.7	63.4	75.5	1.6	96	06/28	45	06/12	2.52	-1.92	57
Valentine Miller Field	81.8	56.3	69.1	0.1	95	06/19	44	06/12	5.81	1.85	147

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismarck Municipal Airport	83.3	58.1	70.7	5.3	96	06/20	47	06/12	4.56	1.20	136
Fargo International Airport	85.9	63.7	74.8	8.0	98	06/20	52	06/12	3.75	-0.54	87
Grand Forks International Airport	83.8	59.4	71.6	7.0	100	06/20	44	06/11	2.23	-1.54	59
Theodore Roosevelt Airport	79.6	53.6	66.6	4.1	91	06/07	40	06/11	4.00	0.95	131
Williston International Airport	81.7	56.6	69.1	5.6	93	06/07	49	06/17	1.10	-1.54	42

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>.

June 2023 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	87.3	60.7	74.0	6.4	102	06/19	47	06/18	3.30	-0.46	88
Huron Regional Airport	86.4	60.8	73.6	5.3	99	06/19	48	06/12	3.79	-0.10	97
Pierre Regional Airport	85.6	58.4	72.0	4.2	103	06/19	44	06/17	3.05	-0.64	83
Rapid City Regional Airport	76.2	53.3	64.8	0.2	87	06/19	43	06/17	3.93	1.06	137
Sioux Falls Joe Foss Field Airport	87.1	62.9	75.0	5.1	96	06/19	48	06/12	1.42	-2.81	34

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	73.2	47.1	60.2	-2.3	84	06/19	38	06/25	3.29	1.95	246
Cheyenne Municipal Airport	72.3	50.7	61.5	-1.6	90	06/27	45	06/25	3.55	1.39	164
Lander Hunt Field Airport	71.0	48.7	59.9	-2.9	79	06/06	42	06/24	3.14	2.06	291
Laramie Regional Airport	70.1	44.6	57.4	-0.6	84	06/26	38	06/25	3.90	2.41	262
Rawlins Municipal Airport	73.3	46.0	59.6	-0.3	84	06/26	39	06/06	1.33	0.46	153
Sheridan County Airport	74.9	50.3	62.6	0.8	84	06/06	40	06/17	5.29	3.31	267

June 2023 Highlights

Monthly Rankings

Temperature in degrees Fahrenheit, Precipitation in inches

Precipitation	Precipitation/ Ranking	Record / Year	Period of Record
Colorado Springs, Colorado	9.62 / Wettest	8.00 / 1965	1894-2023
Denver, Colorado	6.10 / Wettest	4.96 / 1882	1872-2023
Akron, Colorado	7.48 / Wettest	7.18 / 1965	1937-2023
Laramie, Wyoming	3.90 / 2nd Wettest	4.75 / 1991	1948-2023
Sheridan, Wyoming	5.29 / 3rd Wettest	9.54 / 1944	1907-2023
Pueblo, Colorado	3.85 / 3rd Wettest	7.14 / 1921	1888-2023
Temperature	Temperature/ Ranking	Record / Year	Period of Record
Fargo, North Dakota	74.8 / Warmest	73.8 / 1988	1881-2023
Grand Forks, North Dakota	71.6 / Warmest	71.4 / 1988	1893-2023
Aberdeen, South Dakota	74.0 / 4th Warmest	79.1 / 1933	1893-2023
Sisseton, South Dakota	72.5 / 5th Warmest	75.4 / 1933	1931-2023
Bismarck, North Dakota	70.7 / 6th Warmest	75.6 / 1988	1874-2023
Huron, South Dakota	73.6 / 6th Warmest (tied with 2021)	78.3 / 1933	1881-2023
Sioux Falls, South Dakota	75.0 / 6th Warmest	76.3 / 1988	1893-2023

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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 video content displays a "Forecast Precipitation Amounts (7 day)" map of the Midwest and Great Plains regions, with a color scale ranging from 0.00 to 2.00 inches. The video player interface includes a play button, a progress bar at 0:00 / 54:51, and a YouTube logo.

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>

