



October 2020 Climate Summary



The Cameron Peak Fire burns near Loveland, CO. Photo courtesy Becky Bolinger. <http://hprcc.unl.edu>

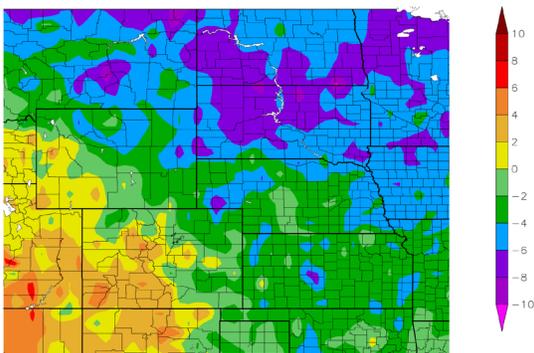
Continued Dryness Intensifies Drought Conditions, Impacts

Overall, it was a dry month for the High Plains, with much of the region experiencing an intensification of drought conditions. Perhaps the most notable impact of drought this month was the continuation of wildfires raging across Colorado and, to a lesser extent, Wyoming. The Cameron Peak Fire, which ignited on August 13th, grew to become the largest wildfire in Colorado history in October, surpassing the Pine Gulch Fire, which in August had just become the largest in state history. At the time of this writing, the Cameron Peak Fire was 92 percent contained and had burned 208,913 acres in and around the Roosevelt National Forest. Another destructive fire, the East Troublesome Fire, ignited on October 14th to the southwest of the Cameron Peak Fire. Warm temperatures, low relative humidities, and high winds produced ideal conditions for this fire to spread quickly, growing by an astonishing 100,000 acres in one night. This prompted the rapid evacuation of the town of Grand Lake. Unfortunately, two people died in this fire after being trapped in their basement. The fire jumped the Continental Divide and into Rocky Mountain National Park, forcing the closure of the Park and mandatory evacuations for the tourist town of Estes Park. Luckily, at the time of this writing, the fire had not spread any further, sparing the town. Snowfall and cooler temperatures toward the end of the month helped ease fire conditions. However, the fire was only 37 percent contained as of November 6th and it bears watching.

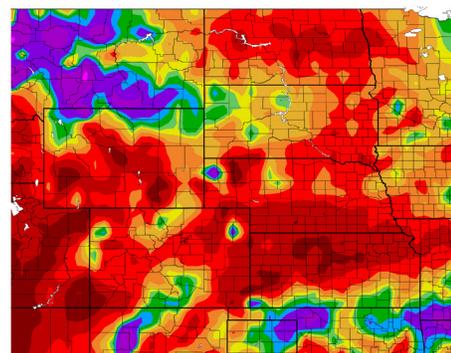
One benefit of the dryness was that producers were able to get out in the fields and harvest their crops. As of the end of October, all High Plains states were ahead of the 5-year average for both corn and soybean harvest. In fact, Nebraska and North Dakota had completed soybean harvest by the end of the month. Despite drought conditions, corn and soybeans fared pretty well throughout the region. North Dakota and South Dakota are expected to have record corn yields this year. However, drought conditions have caused winter wheat to struggle. More than 20 percent of the winter wheat crop was rated poor or very poor in Colorado, Kansas, and Nebraska, and more moisture is needed to ensure sufficient growth.

Temperature and Precipitation Overview

Departure from Normal Temperature (F)
10/1/2020 - 10/31/2020



Percent of Normal Precipitation (%)
10/1/2020 - 10/31/2020



Above: Departure from 1981-2010 normal temperature (left) and percent of normal precipitation (right) for October 2020 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

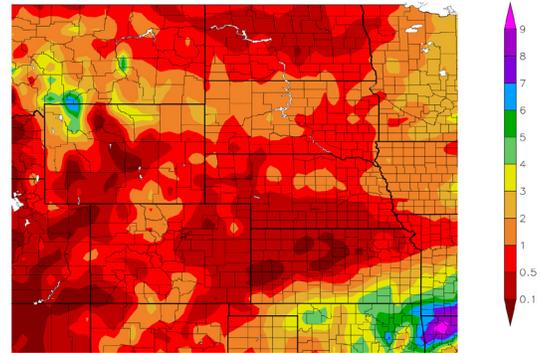
October was another dry month throughout the High Plains region. Precipitation was less than 50 percent of normal across much of North Dakota, Nebraska, Wyoming, Colorado, eastern South Dakota, and northern Kansas. Some locations received very little precipitation, which placed this October among the top 10 driest Octobers on record. Laramie, Wyoming and Akron, Colorado had their driest, receiving only a trace of precipitation and 0.01 inch (<1 mm), respectively. The persistent dryness contributed to the intensification of drought conditions throughout the region (please see page 3 for more information). While the majority of the High Plains was dry, a few areas received above-normal precipitation in October, including northern Wyoming and southern Kansas. However, these areas experienced only local improvements in drought conditions.

Despite the region-wide dryness, some locations received impressive snowfall from a couple of systems. A particularly powerful storm system came through the 24th-25th, bringing snow and frigid temperatures to northern and central portions of the Rockies and Plains. Ultimately, the following locations ranked among the top 5 snowiest Octobers on record: Mobridge, SD (snowiest); Sisseton, SD (snowiest); Aberdeen, SD (2nd snowiest); Fargo, ND (2nd snowiest); Wichita, KS (2nd snowiest); Pierre, SD (3rd snowiest); Huron, SD (4th snowiest); Pueblo, CO (4th snowiest); Grand Junction, CO (4th snowiest); Norfolk, NE (4th snowiest); and Lincoln, NE (5th snowiest). Cheyenne, WY received an impressive 1-day snowfall total of 14.0 inches (36 cm), which was its highest 1-day total snowfall on record for October, smashing the previous record of 8.9 inches (23 cm) set in 1906 (period of record 1883-2020).

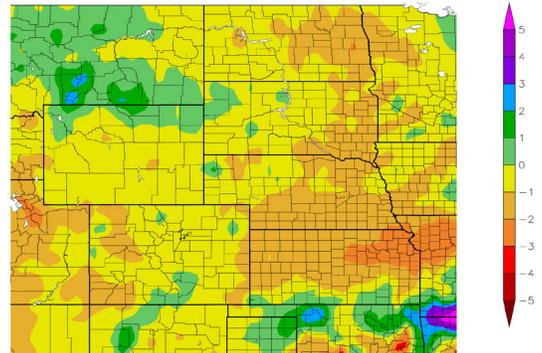
A separate storm system originating from the southern Rockies tracked across southern Kansas on the 28th-29th, and with rich Gulf moisture in place thanks to Hurricane Zeta, this region received heavy rainfall. Most locations reported 1.00-4.00 inches (25-102 mm) of precipitation, with locally higher amounts. While this precipitation was beneficial for easing drought conditions, unfortunately some locations received freezing rain, causing ice accumulations of at least 0.1 inch (<1 cm). This amount of ice was enough to create hazardous road conditions, as well as downed trees and power lines. The city of Winfield was hit particularly hard. According to the National Weather Service in Wichita, Winfield received 0.5 inch (1 cm) of ice and citizens reported hearing trees snapping.

Regional Precipitation

Precipitation (in)
10/1/2020 - 10/31/2020



Departure from Normal Precipitation (in)
10/1/2020 - 10/31/2020



Above: Total precipitation in inches (top) and departure from normal precipitation in inches (bottom) for October 2020. These maps are produced by HPRCC and can be found on the Current Climate Summary Maps page at: <http://hprcc.unl.edu/maps/current>.

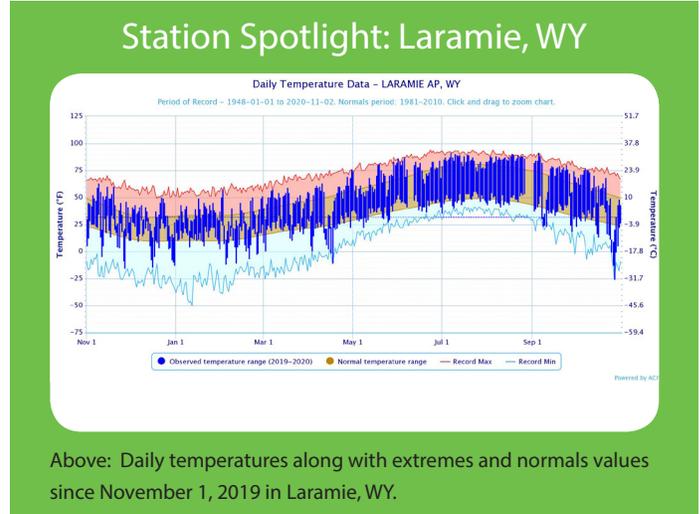
Streamflow Update

According to the U.S. Army Corps of Engineers, upper Missouri Basin runoff this year is forecast to be 30.2 million acre-feet, which is approximately 4 million acre-feet above the long-term average. While saturated soils during the spring led the Corps to expect another high runoff year, the rapid development and intensification of drought throughout much of the Basin during the summer and fall prevented that from happening. As for streamflows in the region, they were mostly normal to above normal in October throughout the Dakotas, Nebraska, and Kansas, thanks in part to melting snow from the winter storm that passed through the region toward the end of the month. However, not surprisingly, streamflows were much below normal throughout the majority of Colorado and Wyoming where drought conditions were most intense.

Temperatures

Below-normal temperatures prevailed throughout a large part of the High Plains in October. Departures generally ranged from 2.0-8.0 degrees F (1.1-4.4 degrees C) below normal, with the Dakotas experiencing the greatest departures. Numerous locations throughout the region ranked among the top 10 coolest Octobers on record, with several locations in the Dakotas ranking among the top 5 (see page 6 for more details). The only area that experienced above-normal temperatures in October was western and central Colorado, where departures were up to 4.0 degrees F (2.2 degrees C) above normal.

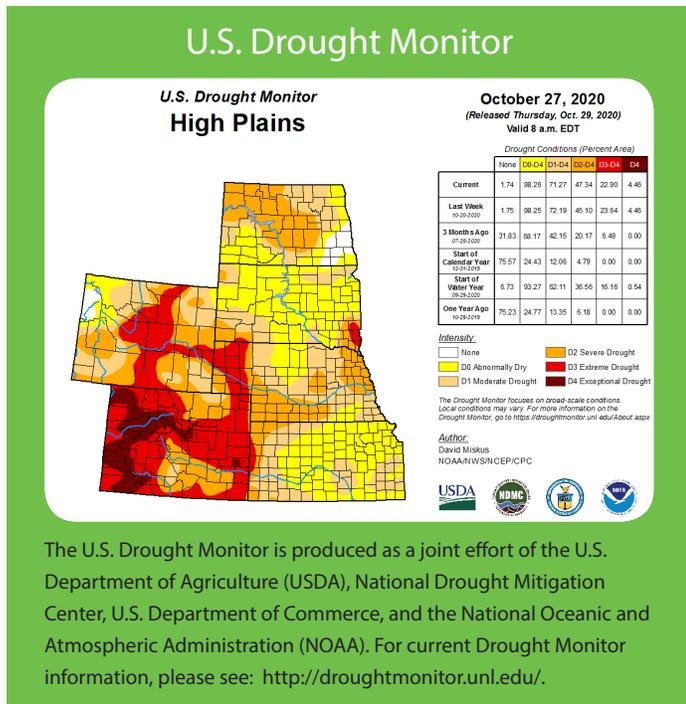
October started off rather warm, with many locations experiencing above-normal temperatures for the first half of the month. However, the second half of October turned colder, with much of the region experiencing daily departures of at least 20.0 degrees F (11.1 degrees C) below normal for a few days. Not only did numerous locations break daily records for minimum temperature, but some places had their coldest October temperature on record, including Akron, CO, Pueblo, CO, Goodland, KS, Chadron, NE, Scottsbluff, NE, Rapid City, SD, and Laramie, WY. Temperatures reached as low as -10.0 degrees F (-23.3 degrees C) in Chadron on the 26th, which crushed the previous record for lowest October temperature of 0.0 degrees F (-17.8 degrees C), set just last year (period of record 1941-2020). In Laramie, the temperature plummeted to -26.0 degrees F (-32.2 degrees C) on the 27th, obliterating the previous record of -18.0 degrees F (-27.8 degrees C) set in 1993 (period of record 1948-2020). It is interesting to note that Laramie's record for coldest November temperature is also -26.0 degrees F (-32.2 degrees C), occurring in late November, so to record a temperature this low nearly a month prior is quite impressive.



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Drought Conditions

Dry conditions in October led to continued development and intensification of drought throughout the High Plains. According to the U.S. Drought Monitor, the area experiencing drought (D1-D4) increased from approximately 62 percent to 71 percent over the course of the month. By the end of October, over 98 percent of the region was experiencing drought or abnormal dryness (D0-D4).



Exceptional drought (D4) increased in areal coverage across Colorado, expanding into northwestern, southwestern, and central parts of the state. Extreme drought (D3) spread into eastern Colorado and further expanded in Wyoming and the Nebraska Panhandle, reaching into southwestern South Dakota and western Kansas. D3 developed in southeastern South Dakota as well. Severe drought (D2) expanded across western and central North Dakota, western Wyoming, southern and eastern areas of Nebraska, and northwestern Kansas. Moderate drought (D1) developed in portions of central and eastern Kansas, while abnormally dry conditions (D0) developed across the rest of the state.

Only minor improvements in drought conditions occurred in October. D3 was removed from eastern Nebraska and slightly reduced in southern Colorado and northern Wyoming. Meanwhile, D1 was reduced in northeastern and west-central South Dakota. Localized precipitation in mid-October brought relief to eastern Nebraska, while other areas were fortunate to receive enough precipitation from the late-October winter storm to improve conditions.

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/>.

Climate Outlooks

According to the Climate Prediction Center, La Niña conditions are present in the Pacific and a La Niña Advisory is in effect. La Niña is expected to continue through the winter, with about a 60 percent chance of persisting into spring. Learn about how La Niña is expected to impact the Missouri Basin region from the 2020 briefing on our ENSO page: https://hprcc.unl.edu/enso_reports.php. For more information about ENSO, check out the ENSO blog here: <https://www.climate.gov/news-features/department/enso-blog>.

According to the National Weather Service’s long-range flood outlook, there is less than a 50 percent chance of long-range flooding across the High Plains through January. Normal wildland fire potential is expected through December across the region, while above-normal wildland fire potential is favored for southern Kansas and southeastern Colorado in January and February.

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 see: <http://www.cpc.ncep.noaa.gov>.

Temperature

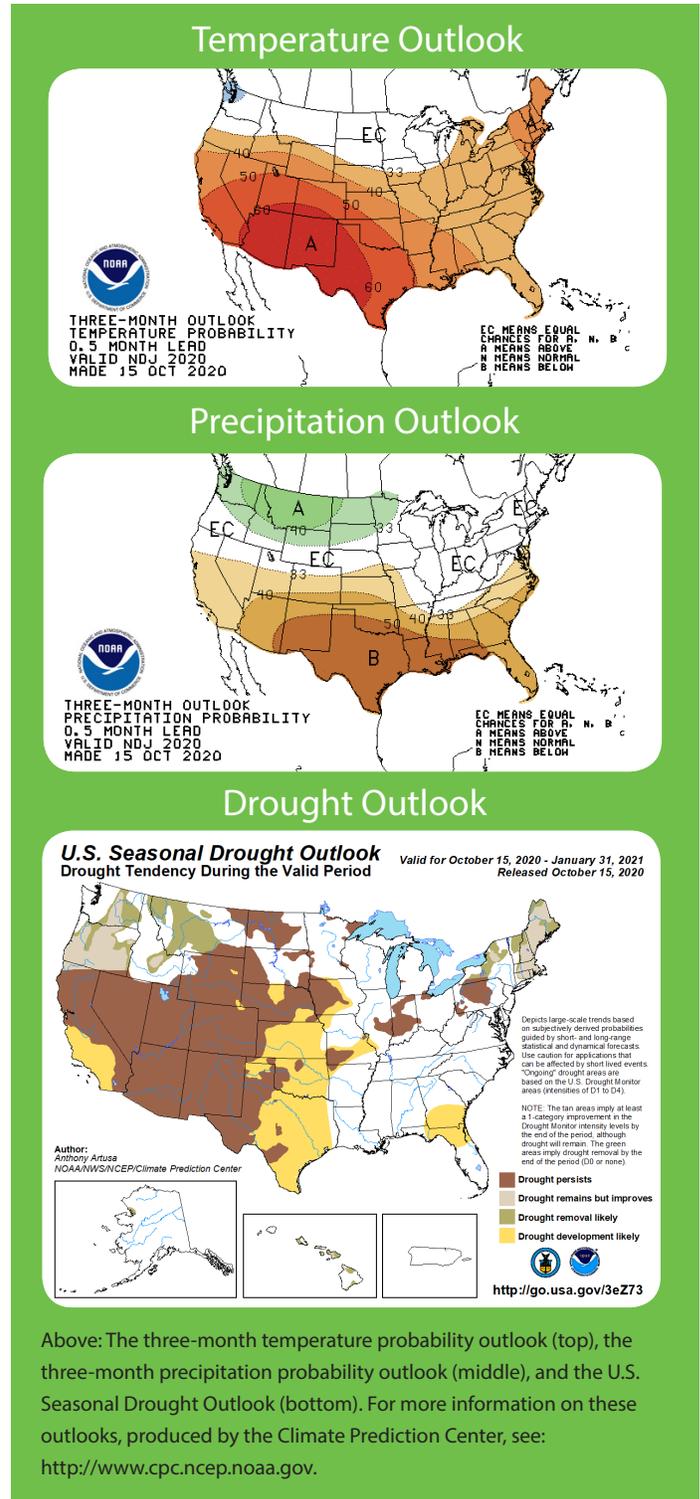
The November-January temperature outlook indicates an increased chance of above-normal temperatures for western, central, southern, and eastern portions of the contiguous U.S. In the High Plains, this includes Colorado, Kansas, the majority of Wyoming and Nebraska, and southwestern South Dakota. Below-normal temperatures are anticipated in northwestern Washington. Elsewhere, there are equal chances for above-, below-, and near-normal temperatures during the November-January period.

Precipitation

The precipitation outlook for the next three months calls for a higher probability of above-normal precipitation across northern portions of the contiguous U.S. from Washington to Minnesota. In the High Plains, this includes North Dakota, northern and central South Dakota, and the northern half of Wyoming. Below-normal precipitation is anticipated across the southern U.S., as well as the central Plains. In the High Plains, this includes Kansas, central and southern Colorado, and southern Nebraska. Elsewhere, there are equal chances for above-, below-, and near-normal precipitation during the November-January period.

Drought

The October 15th U.S. Seasonal Drought Outlook indicates that drought is expected to persist and further develop throughout much of the West, the Plains, the Midwest, and the Southeast. In the High Plains, drought persistence is likely, with further development possible in Nebraska and much of Kansas. Drought may improve or be removed in the Pacific Northwest and in the Northeast. However, drought is not expected to improve in any areas of the High Plains through January.



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	62.5	31.9	47.2	-3.0	87	10/09+	0	10/27	0.01	-1.10	1
Alamosa San Luis Airport	67.4	22.8	45.1	2.0	80	10/14	1	10/27	1.03	0.35	151
Colorado Springs Municipal Airport	66.8	35.2	51.0	1.6	87	10/14+	1	10/27	0.25	-0.57	30
Denver International Airport	66.3	33.4	49.8	-1.1	87	10/06	4	10/26	0.26	-0.76	25
Grand Junction Walker Field Airport	70.1	37.5	53.8	0.8	82	10/14+	11	10/27	0.59	-0.47	56
Pueblo Memorial Airport	70.3	32.8	51.5	-0.3	94	10/14	-8	10/27	0.67	-0.05	93

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	66.7	43.5	55.1	-0.3	94	10/07	22	10/26	0.12	-1.80	6
Dodge City Regional Airport	68.5	39.3	53.9	-2.7	96	10/07	18	10/27+	1.34	-0.40	77
Goodland Renner Field	64.4	31.7	48.1	-3.8	93	10/09	0	10/27	0.23	-1.14	17
Topeka Municipal Airport	65.5	41.2	53.4	-3.2	94	10/07	27	10/26	0.36	-2.67	12
Wichita Mid-Continent Airport	66.6	43.0	54.8	-3.5	92	10/07	24	10/26	2.06	-0.72	74

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	59.8	27.9	43.8	-3.8	92	10/08	-10	10/26	0.17	-1.14	13
Grand Island Airport	63.5	37.1	50.3	-1.9	91	10/09	18	10/27+	0.08	-1.78	4
Lincoln Municipal Airport	62.3	36.6	49.5	-3.7	88	10/11+	16	10/27	0.40	-1.57	20
Norfolk Karl Stefan Airfield	59.7	34.3	47.0	-4.0	87	10/09+	14	10/27+	0.56	-1.51	27
North Platte Regional Airport	64.5	30.1	47.3	-1.8	95	10/09	5	10/27	0.38	-1.17	25
Omaha Eppley Airport	60.7	38.2	49.5	-3.7	88	10/09	20	10/26	1.02	-1.13	47
Valentine Miller Field	61.2	29.9	45.6	-2.9	91	10/09	-4	10/27	0.79	-0.46	63

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismarck Municipal Airport	50.7	30.0	40.3	-4.5	78	10/06	8	10/26	0.73	-0.52	58
Fargo International Airport	48.9	28.8	38.8	-6.7	75	10/09	11	10/27+	1.07	-1.08	50
Grand Forks International Airport	49.2	27.5	38.3	-4.8	75	10/11	15	10/27	0.37	-1.60	19
Theodore Roosevelt Airport	49.6	25.6	37.6	-6.2	77	10/08	-1	10/26	0.31	-0.92	25
Williston International Airport	47.8	26.9	37.4	-5.6	81	10/10	2	10/26+	0.48	-0.44	52

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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	52.6	29.5	41.1	-4.1	86	10/09	-3	10/26	1.27	-0.72	64
Huron Regional Airport	54.1	30.5	42.3	-5.6	86	10/09	4	10/26	0.90	-0.89	50
Pierre Regional Airport	54.2	31.1	42.6	-6.1	86	10/06	2	10/27	1.23	-0.42	75
Rapid City Regional Airport	55.2	28.4	41.8	-5.9	89	10/08	-7	10/26	0.95	-0.47	67
Sioux Falls Joe Foss Field Airport	55.6	33.0	44.3	-3.6	86	10/06	13	10/27+	0.93	-1.24	43

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	59.3	26.0	42.6	-2.6	82	10/06	-8	10/25	0.32	-0.79	29
Cheyenne Municipal Airport	59.1	29.8	44.5	-1.8	83	10/08+	0	10/27+	0.85	-0.08	91
Lander Hunt Field Airport	59.8	28.8	44.3	-1.3	82	10/08+	-9	10/26	0.68	-0.61	53
Laramie Regional Airport	55.3	23.5	39.4	-2.4	77	10/07	-26	10/27	T	-0.80	0
Rawlins Municipal Airport	58.1	28.4	43.2	-0.1	77	10/08	-12	10/26	0.34	-0.41	45
Sheridan County Airport	56.6	26.2	41.4	-4.1	85	10/06	-10	10/26	2.62	1.21	186

October 2020 Highlights

Monthly Rankings

Temperature in degrees Fahrenheit, Precipitation in inches

Coolest	Temperature / Ranking	Record / Year	Period of Record
Grand Forks, ND	38.3 / 4th coolest	34.1 / 1925	1893-2020
Dickinson, ND	37.6 / 5th coolest	32.8 / 2002	1938-2020
Williston, ND	37.4 / 5th coolest	32.1 / 1919	1894-2020
Aberdeen, SD	41.1 / 5th coolest	37.6 / 2002	1893-2020
Pierre, SD	42.6 / 5th coolest	39.7 / 2002	1893-2020
Rapid City, SD	41.8 / 5th coolest	38.1 / 2019	1942-2020
Chadron, NE	43.8 / 5th coolest	39.5 / 2019	1941-2020
Norfolk, NE	47.0 / 9th coolest	38.9 / 1925	1893-2020
Akron, CO	47.2 / 10th coolest	39.5 / 1969	1937-2020
Goodland, KS	48.1 / 10th coolest	43.7 / 2009	1895-2020
Wichita, KS	54.8 / 10th coolest	49.0 / 1925	1888-2020
Driest	Precipitation / Ranking	Record / Year	Period of Record
Akron, CO	0.01 / DRIEST	0.02 / 2003	1937-2020
Laramie, WY	Trace / DRIEST (tie)	Trace / 1964	1948-2020
Concordia, KS	0.12 / 5th driest	0.02 / 1999	1885-2020
Chadron, NE	0.17 / 6th driest (tie)	0.04 / 1960	1941-2020
Grand Island, NE	0.08 / 9th driest	0.00 / 1958+	1895-2020
Topeka, KS	0.36 / 10th driest (tie)	0.04 / 1952	1887-2020

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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

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

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