

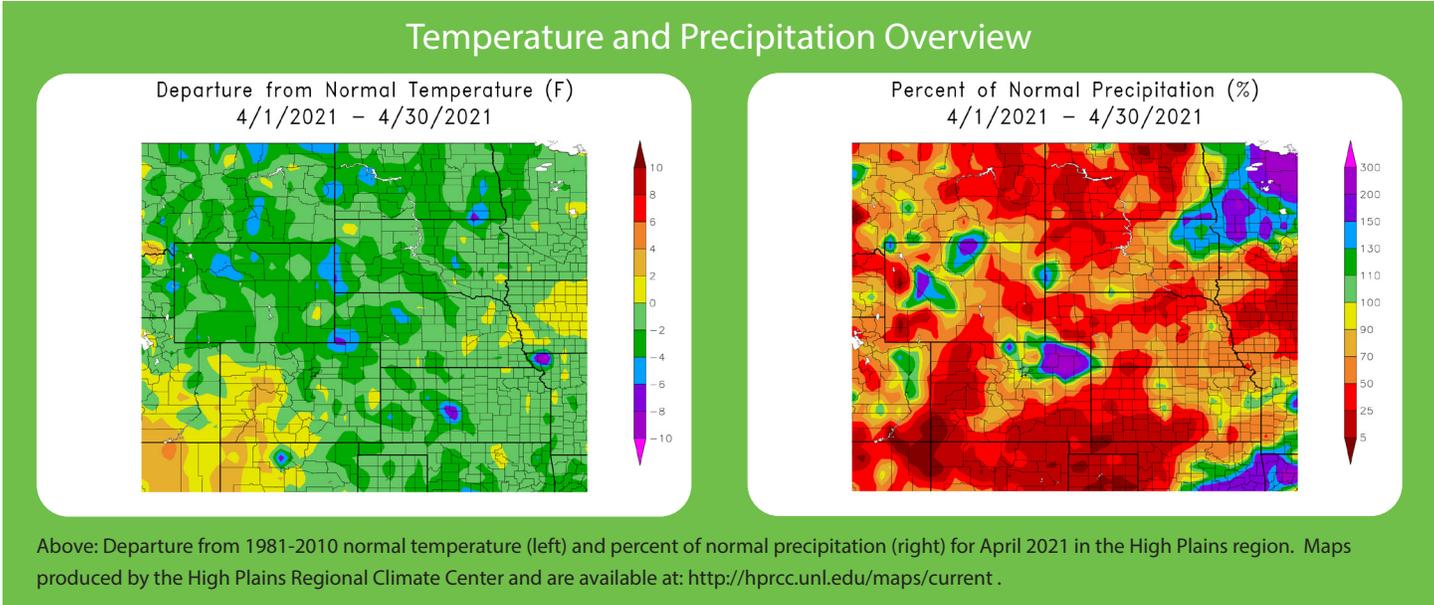


## Northern Plains Drought Intensifies

Drought continued to impact over half the region this month, with relatively cool and dry conditions overall. In the west, there were slight improvements in Colorado, but drought conditions expanded by nearly 14 percent in Wyoming. Several Colorado communities were asked to voluntarily reduce their water use in anticipation of the spring and summer. Interestingly, Fort Collins had voluntary restrictions due to concerns over potential water quality issues from runoff in areas that burned in the Cameron Peak Fire last year. The winter wheat crop in Colorado also continued to be impacted, with 31 percent in poor to very poor condition at the beginning of May, according to the USDA National Agricultural Statistics Service. Several impacts have also been reported across Wyoming, particularly for ranchers who were dealing with poor pasture and range conditions. Hunting activities may also be impacted, as the Wyoming Game and Fish Department proposed to reduce pronghorn licenses this year due to a combination of the ongoing drought and spring blizzard.

Meanwhile, drought intensified across the Northern Plains, with extreme drought (D3) expanding by about 11 percent in South Dakota and 36 percent in North Dakota. This intensification was due to a combination of mounting precipitation deficits, depleted soil moisture reserves, and below-normal streamflows. Spotty rain and snow showers merely helped to stave off additional degradations. Many impacts have been reported this month, including dry stock ponds and creeks, low feed supplies, the culling of herds, and an increase in fire danger. The Drought Hotline and hay map were reactivated in North Dakota, giving ranchers an outlet to buy/sell hay or offer help, while a series of drought webinars were planned in South Dakota in order to provide additional information for people there. Fire emergencies were also declared in both states at the start of April, as warm, dry conditions prevailed early in the month. Thousands of acres burned, including portions of the Theodore Roosevelt National Park in North Dakota.

\*Note: All normals in this summary use the 1981-2010 timeframe. The 1991-2020 normals will be used next month.



## Precipitation

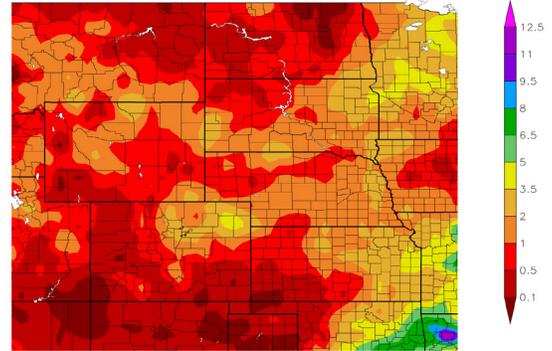
Overall, April was a dry month for the High Plains region. Large areas received less than 50 percent of normal precipitation, including much of North Dakota, western South Dakota, northern Nebraska, western and central Kansas, western and southern Colorado, and pockets of Wyoming. This caused some locations to rank among the top 10 driest Aprils on record. For example, Dodge City, KS had its 10th driest April with only 0.33 inch (8 mm), which was 18 percent of normal (period of record 1874-present). Dodge City's driest April occurred in 1909 with 0.02 inch (1 mm).

Looking back before April, mounting precipitation deficits have contributed to an expansion and intensification of drought conditions across much of North Dakota, northern South Dakota, and eastern Montana. Year-to-date deficits in these areas were generally in the range of 1.50-3.00 inches (38-76 mm), with water year-to-date deficits approaching 4.00-6.00 inches (102-152 mm) in some areas. This is a considerable deficit given that much of this area receives, on average, less than 20.00 inches (508 mm) of precipitation per year. As an example, year-to-date precipitation in Bismarck, ND was 1.15 inches (29 mm) at the end of April. This paltry amount was enough to rank as the 3rd driest January-April precipitation total on record (period of record 1874-present). The driest January-April time period occurred in 1926 with 1.00 inch (25 mm).

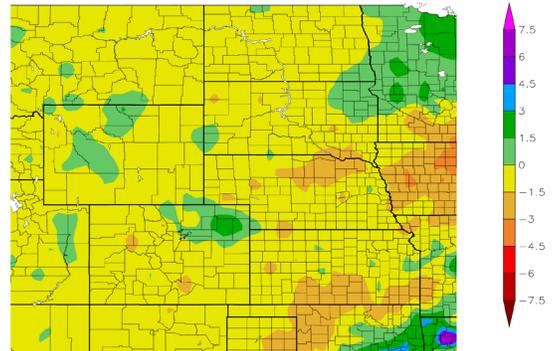
Although the majority of the region was dry, a few areas received above-normal precipitation. Northeastern Colorado, northeastern South Dakota, southeastern North Dakota, and pockets of Wyoming received at least 130 percent of normal precipitation. This precipitation helped to alleviate, or eliminate, drought conditions in some areas. A notable storm system at the end of the month brought heavy rain, snow, and severe weather to parts of Colorado. The heaviest amounts ranged from 4.00-6.00 inches (102-152 mm) of rain out on the Plains and 6.0-12.0 inches (15-30 cm) of snow in the higher elevations. One location that received ample precipitation from this storm was Akron, which is located in northeastern Colorado. Akron received 2.81 inches (71 mm) in just one day - April 27th. This amount ranked as the highest one-day precipitation total for the month of April and 6th highest for any month. Akron's monthly total was 3.58 inches (91 mm), which ranked as the second wettest April on record, just behind 1983 (3.94 inches / 100 mm) (period of record 1937-present).

### Regional Precipitation

Precipitation (in)  
4/1/2021 - 4/30/2021



Departure from Normal Precipitation (in)  
4/1/2021 - 4/30/2021



Above: Total precipitation in inches (top) and departure from normal precipitation in inches (bottom) for April 2021. 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

According to the U.S. Army Corps of Engineers, snowpack has peaked in the upper Missouri Basin. This year, the Snow Water Equivalent (SWE) above Fort Peck Reservoir peaked on March 31st at 86 percent of the normal peak, while the reach between Fort Peck and Garrison Reservoirs peaked on April 26th at 96 percent of the normal peak. As of May 2nd, the SWE for both reaches was below normal, at 78 percent of normal and 91 percent of normal, respectively. The 2021 runoff forecast for the upper Missouri Basin has been adjusted downward to 17.8 MAF as of May 1st. This is 69 percent of average. Next month's summary will shift away from snowpack and will focus on streamflow. For more updates on snowpack, see the Water Supply section here: <https://hprcc.unl.edu/tribal-dashboards/dashboard.php>.

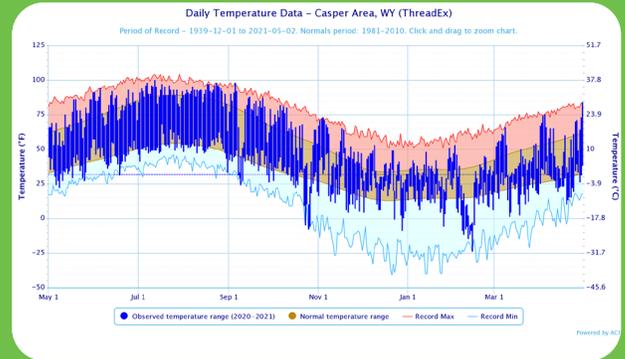
## Temperatures

After an extremely warm March, temperatures moderated during the month of April with most locations having temperature departures near or just below normal. Widespread temperature departures of 2.0-4.0 degrees F (1.1-2.2 degrees C) below normal occurred across much of the region, with the main exception in portions of southwestern Colorado where temperatures were 2.0-4.0 degrees F (1.1-2.2 degrees C) above normal. As is usually the case, the month was not consistently warm or cool for any location, with several ups and downs over the course of the month. This led to some interesting extremes that were masked by the moderate overall departures.

For instance, Casper, WY tied for its highest April temperature on record with 84.0 degrees F (28.9 degrees C) on the 30th. 84.0 degrees F (28.9 degrees C) was also reached on April 30, 1992 (period of record 1939-present). Just about a week and a half prior to this new record, Casper had a low temperature of 10.0 degrees F (-12.2 degrees C) and 4.4 inches (11 cm) of new snow on the 19th. These types of extremes are common in the spring in the High Plains region.

Temperatures have had a mixed impact on the progression of spring, according to the USA National Phenology Network. As of the beginning of May, spring leaf out had occurred across the entire High Plains region, with the exception of some mountainous areas. Spring bloom, however, was confined to Kansas, southern and eastern Nebraska, and southeastern Colorado. This was early across much of Kansas, but late in Nebraska and Colorado. To track leaf out and bloom out in your area, see: <https://www.usanpn.org/news/spring>.

### Station Spotlight: Casper, WY



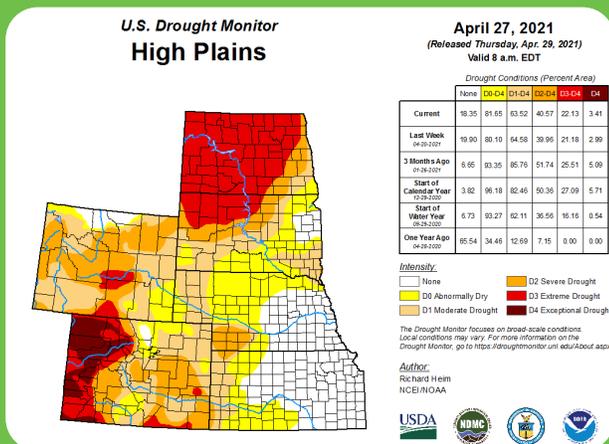
Above: Daily temperatures along with extremes and normals values since May 1, 2020 in Casper, WY.

## Drought Conditions

Overall, the area experiencing drought (D1-D4) in the High Plains region remained at about 64 percent this month, according to the U.S. Drought Monitor, there were several areas that had improvements

or degradations over the course of the month.

### 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/>.

The largest reduction in drought conditions occurred in South Dakota, with a decrease of about 14 percent. These improvements were generally confined to eastern and southwestern areas of the state, which received above-normal precipitation. Drought intensified across the northwest, however, with an 11 percent increase in extreme drought (D3). In Wyoming, nearly the opposite occurred. Precipitation helped to improve drought conditions, particularly in the central part of the state, where D3 was reduced by about 12 percent. However, the statewide areal coverage of drought increased by nearly 14 percent due to ongoing dry conditions. North Dakota also had large changes in drought intensity, with a 36 percent increase in D3 over the course of the month. By the end of April, approximately 83 percent of the state was in D3, which was the highest amount since the U.S. Drought Monitor began. Prior to 2021, the record was about 46 percent during the 2017 Northern Plains drought (July 25, 2017).

Elsewhere in the region, only minor adjustments to drought conditions were made. Abnormally dry conditions did expand across southern Kansas due to recent dryness.

## Climate Outlooks

According to the Climate Prediction Center, La Niña conditions continued this month; however, a transition to neutral conditions is expected. There is about an 80 percent chance of neutral conditions in late spring and early summer. For more information, see: <https://www.climate.gov/news-features/department/enso-blog>.

Similar to last month's outlook, the National Weather Service's long-range flood outlook through July indicates that there is a greater than 50 percent chance of minor to moderate flooding along portions of the Missouri River and its tributaries in southeastern Nebraska and eastern Kansas, as well as tributaries of the Arkansas River in southeastern Kansas. According to the National Interagency Fire Center (NIFC), May wildland fire potential is above normal for portions of western Colorado and southeastern Colorado into south-central Kansas.

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

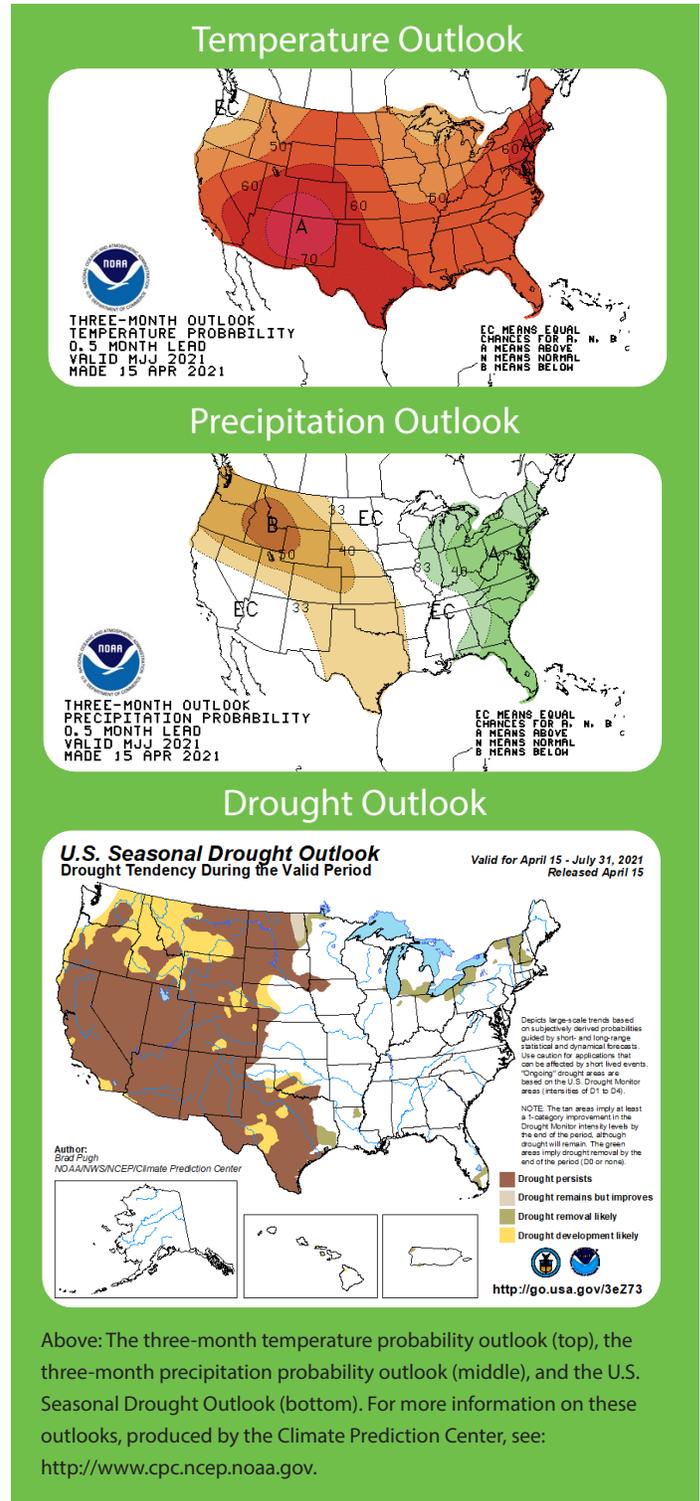
The temperature outlook for the next three months indicates increased chances of above-normal temperatures for the vast majority of the contiguous U.S. This includes the High Plains region, with the highest chances for above-normal temperatures across southern portions of Colorado. There is a small area in the Pacific Northwest that has equal chances of above-, below-, and near-normal temperatures; however, no areas have an increased chance for below-normal temperatures.

### Precipitation

The precipitation outlook for the next three months shows a higher probability of above-normal precipitation across portions of the Northeast, Midwest, and Southeast. There are increased chances for below-normal precipitation across portions of the West and the Plains. In the High Plains, this includes Colorado, Wyoming, southwestern North Dakota, western South Dakota, and most of Nebraska and Kansas. The highest chances for below-normal precipitation are in northwestern Wyoming. Elsewhere, there are equal chances for above-, below-, and near-normal precipitation.

### Drought

The April 15th U.S. Seasonal Drought Outlook indicates that drought is expected to persist or develop across much of the West and the Great Plains over the next three months. In the High Plains, current drought conditions are largely expected to persist, with development likely across portions of western Nebraska, southwestern South Dakota, northwestern Wyoming, southwestern Wyoming, and pockets of Colorado. Drought may improve or be removed in eastern North Dakota and portions of the Midwest, Northeast, South, and the southern Plains.



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	60.0	31.4	45.7	-1.3	98**	04/05	9	04/20	3.58	1.93	217
Alamosa San Luis Airport	62.6	22.2	42.4	0.6	75	04/30	11	04/18	0.21	-0.38	36
Colorado Springs Municipal Airport	61.0	32.7	46.9	0.4	80	04/25	18	04/20	0.75	-0.67	53
Denver International Airport	59.8	32.6	46.2	-1.2	81	04/05	15	04/20	2.02	0.31	118
Grand Junction Walker Field Airport	68.2	36.9	52.6	0.9	84	04/30	23	04/20	0.30	-0.61	33
Pueblo Memorial Airport	69.0	33.3	51.1	0.5	87	04/25	23	04/10+	0.52	-0.88	37

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	65.7	41.6	53.6	0.5	92	04/26	24	04/01	1.66	-0.79	68
Dodge City Regional Airport	66.8	38.6	52.7	-1.2	91	04/26	27	04/21+	0.33	-1.49	18
Goodland Renner Field	63.4	31.9	47.7	-1.5	88	04/26+	18	04/21	0.93	-0.66	58
Topeka Municipal Airport	66.4	42.9	54.6	-0.5	87	04/26	22	04/01	2.25	-1.28	64
Wichita Mid-Continent Airport	67.5	42.9	55.2	-0.9	83	04/11	28	04/01	0.81	-1.78	31

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	58.9	27.8	43.4	-1.4	87	04/30	16	04/21	0.82	-1.16	41
Grand Island Airport	64.6	38.2	51.4	0.8	94	04/26	24	04/01	1.43	-1.10	57
Lincoln Municipal Airport	66.2	39.5	52.9	1.3	92	04/26	17	04/01	1.74	-0.97	64
Norfolk Karl Stefan Airfield	62.6	37.3	49.9	0.3	85	04/26+	18	04/01	1.66	-0.90	63
North Platte Regional Airport	64.3	29.5	46.9	-0.7	90	04/05	16	04/21	1.52	-0.75	67
Omaha Eppley Airport	65.4	40.9	53.2	1.5	92	04/26	20	04/01	1.21	-1.75	41
Valentine Miller Field	61.5	31.7	46.6	-0.1	89	04/05+	15	04/20	2.20	-0.02	99

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismarck Municipal Airport	57.6	28.6	43.1	-0.7	83	04/03	17	04/01	0.66	-0.60	52
Fargo International Airport	54.4	30.3	42.4	-1.8	73	04/28	17	04/20+	1.64	0.28	121
Grand Forks International Airport	54.8	27.0	40.9	-1.1	74	04/28	15	04/20+	0.89	-0.12	88
Theodore Roosevelt Airport	56.4	27.2	41.8	-0.5	85	04/30	17	04/21	0.03*	-1.44	2
Williston International Airport	55.3	30.1	42.7	-0.7	84	04/30	18	04/19	0.54	-0.46	54

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>.

# April 2021 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	58.7	30.6	44.7	0.3	80	04/04	12	04/01	2.59	0.74	140
Huron Regional Airport	59.4	32.5	46.0	-0.5	88	04/05	17	04/20	1.24	-1.07	54
Pierre Regional Airport	59.2	30.9	45.0	-2.0	84	04/04	18	04/20	1.28	-0.53	71
Rapid City Regional Airport	56.9	29.5	43.2	-1.8	86	04/30	18	04/21	0.96	-0.84	53
Sioux Falls Joe Foss Field Airport	60.6	36.4	48.5	2.1	90	04/05	16	04/01	2.07	-0.94	69

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	55.0	26.7	40.8	-1.9	84	04/30	10	04/19	0.87	-0.42	67
Cheyenne Municipal Airport	53.2	28.5	40.9	-1.9	76	04/30	11	04/20	1.99	0.21	112
Lander Hunt Field Airport	54.6	29.0	41.8	-2.1	81	04/30	10	04/20	2.44	0.57	130
Laramie Regional Airport	49.5	20.8	35.2	-2.7	74	04/30	-8	04/20	0.91	-0.16	85
Rawlins Municipal Airport	53.6	24.2	38.9	-1.2	78	04/30	4	04/20	0.44	-0.61	42
Sheridan County Airport	56.3	29.0	42.7	-0.9	84	04/30	14	04/21	2.60	1.00	163

## April 2021 Highlights

### Monthly Rankings

Temperature in degrees Fahrenheit, Precipitation/Snowfall in inches

Wettest / Driest	Precipitation / Ranking	Record / Year	Period of Record
Akron, CO	3.58 / 2nd wettest	3.94 / 1983	1937-2021
Yuma, CO	4.04 / 7th wettest	8.67 / 1900	1893-2021
Dodge City, KS	0.33 / 10th driest	0.02 / 1909	1874-2021

## Year-to-Date 2021 Highlights

### Year-to-Date Rankings

Temperature in degrees Fahrenheit, Precipitation/Snowfall in inches

Wettest / Driest	Precipitation / Ranking	Record / Year	Period of Record
Grand Island, NE	12.20 / 2nd wettest	12.41 / 1984	1895-2021
Lincoln, NE	9.29 / 10th wettest	11.55 / 1951	1887-2021
Denver, CO	6.84 / 10th wettest	9.55 / 1900	1872-2021
Lemmon, SD	0.71 / DRIEST	0.94 / 1981	1909-2021
Bismarck, ND	1.15 / 3rd driest	1.00 / 1926	1874-2021
Mobridge, SD	0.87 / 4th driest	0.63 / 1934	1911-2021
Grand Forks, ND	1.58 / 9th driest	1.06 / 1958	1893-2021
Williston, ND	1.22 / 10th driest	0.86 / 1981	1894-2021

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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](http://www.hprcc.unl.edu/webinars.php)

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