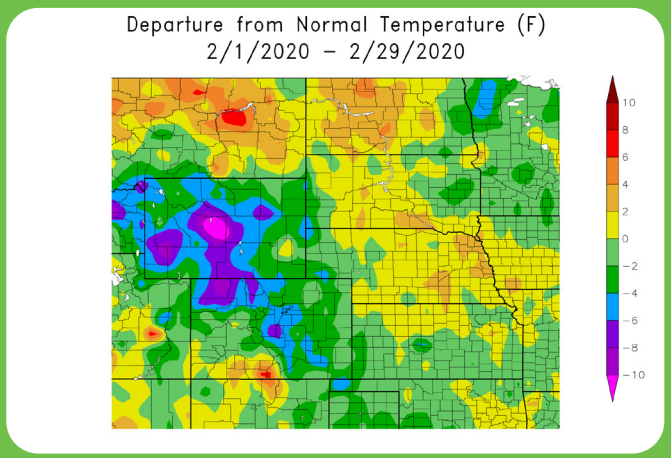
Region Prepares for Spring Flooding

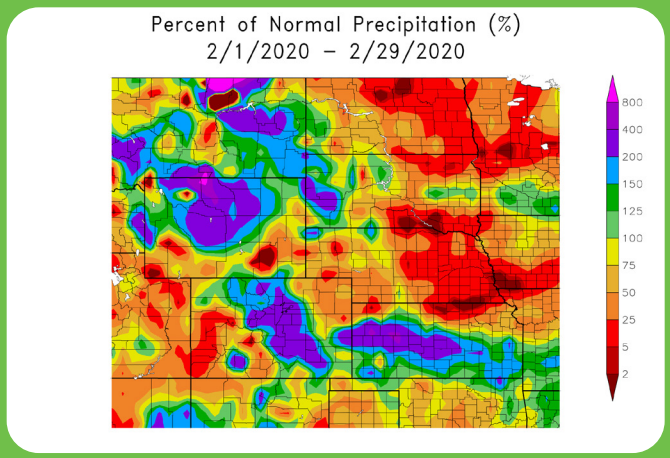
February 2020 was a variable month for the High Plains region, with western and southern areas experiencing generally cooler and wetter conditions and northern and central areas generally experiencing warmer and drier conditions. The largest temperature departures occurred in portions of Colorado and Wyoming where some locations ranked in the top 25 coolest Februarys on record (see page 3 for more details).

Meanwhile, above-normal precipitation was observed in western and southern portions of the region where totals were in excess of 150 percent of normal. Much of this precipitation fell in the form of heavy snow, especially in Colorado and Wyoming. A storm system towards the end of the month did bring impressive snowfall to portions of central Kansas as well. Elsewhere, across much of the region, below-normal precipitation was observed throughout the month. Large portions of the region received less than 25 percent of normal precipitation for the month of February, with several locations ranking in the top 10 driest Februarys on record (see page 2 for more details).

There continues to be many concerns across the region in regards to long-term wetness. For instance, due to the wet soil conditions in North Dakota, there are concerns about an increase in wheat midge populations. Another concern related to wet soil conditions is the ability to get into the fields for spring planting activities. Luckily, drier conditions for much of the central and northern portions of the region observed in February were helpful in preventing a heavier snowpack from developing and from adding additional moisture to already saturated soils. Conditions should continue to be monitored through the spring, though, as several rivers have a greater than 50 percent chance of minor, moderate, or major flooding through May. As of the end of February, parts of the James River continued to be above flood stage. This is highly unusual for this time of the year. In fact, the James River has now gone over 350 consecutive days above flood stage, which is a new record.

Temperature and Precipitation Overview





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

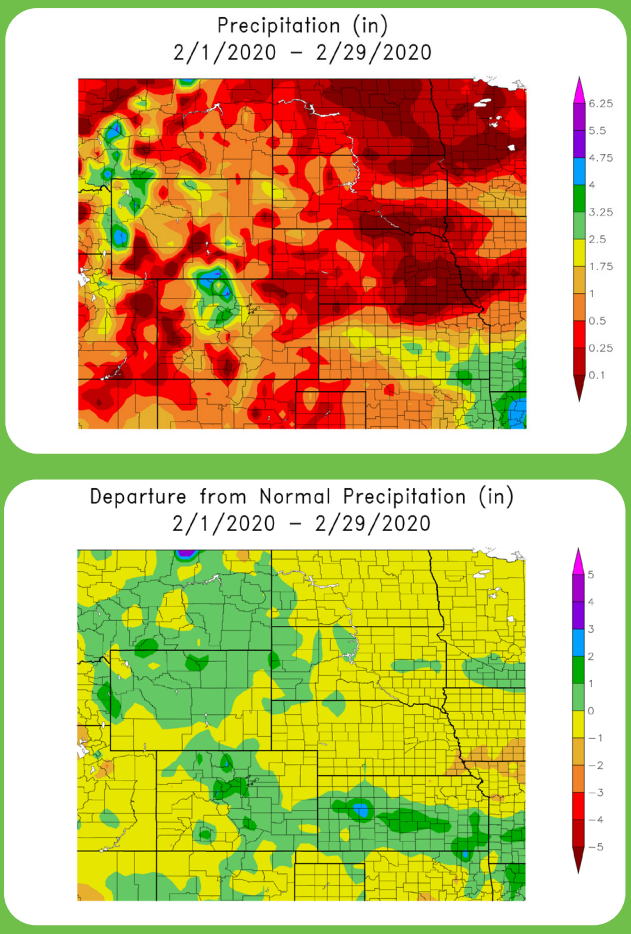
Precipitation

February precipitation was characterized by extremes on both ends of the spectrum, with some areas having a top 10 wettest February and other areas having a top 10 driest February. Above-normal precipitation occurred across central Colorado, northwestern Wyoming, the Black Hills, and central and southern Kansas where precipitation totals were in excess of 150 percent of normal. Isolated areas were in excess of 400 percent of normal. Much of the remainder of the region was quite dry, with many locations receiving less than 25 percent of normal precipitation. Dry conditions at this time of the year do not translate into large deficits, however.

With above- to well above-normal precipitation being observed over parts of western sections of the region, several locations across the region ranked in the top 10 snowiest Februarys on record, including Casper, WY (snowiest); Boulder, CO (2nd snowiest); Evergreen, CO (3rd snowiest); Steamboat Springs, CO (4th snowiest); and Colorado Springs (8th snowiest). In contrast, there were also several locations in the High Plains that ranked in the top 10 driest Februarys on record, including Laramie, WY (2nd driest); Omaha, NE (3rd driest); Fargo, ND (8th driest); Grand Junction, CO (8th driest); Grand Island, NE (9th driest); and Aberdeen, SD (10th driest).

The month of February started off snowy across western portions of the region with several snowstorms impacting Colorado and Wyoming. Further east, relatively quiet and mild conditions were observed at the start of February. A series of storm systems tracked across the higher elevations of central Colorado and the northern half of Wyoming throughout the month. The track the storm systems took was favorable for producing heavy snow across much of the Front Range in Colorado and higher elevations in Wyoming. During the last week of the month, another storm system tracked across Kansas bringing a very narrow, but impressive band of heavy snow to central portions of the state on the 25th. Within the snow band, snow totals were as high as 13.0 inches (33 cm); however, locations just a few miles outside of this heavy snow band had very little or no snow at all. This same system was also responsible for producing very intense snow squalls on the 24th across central Colorado, creating brief periods of white-out conditions along I-70 west of Denver. A ground blizzard also created significant travel issues across North Dakota on the 12th and resulted in the closure of I-29 from the South Dakota border to Canada.

Regional Precipitation



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

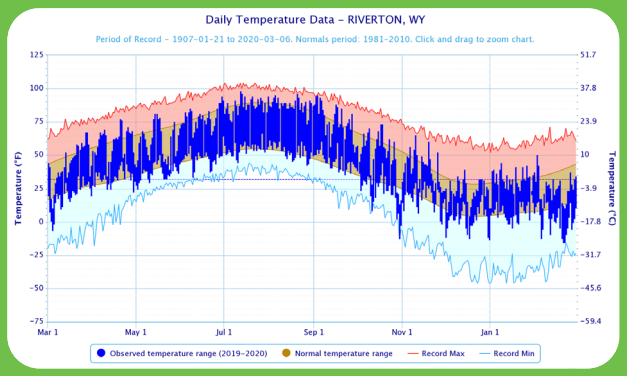
Snowpack Update

Mountain snowpack remained in generally good shape this month across Colorado and Wyoming. By the end of February, snowpack continued to be at or slightly above normal for most basins in Colorado and Wyoming. Only three basins were in the 70-89 percent of median range. This included the Belle Fourche and Sweetwater Basins in Wyoming and the San Miguel, Dolores, Animas, and San Juan Basin in Colorado. Across the Upper Missouri Basin, mountain Snow Water Equivalent (SWE) was still slightly above normal. As of March 1st, mountain SWE was 104 percent of normal above Fort Peck and 105 percent of normal in the reach from Fort Peck to Garrison, according to the U.S. Army Corps of Engineers. Across the Plains, much of the snowpack was confined to eastern areas of North Dakota and South Dakota, where SWE was in the 2.0-4.0 inch (51-102 mm) range.

Temperatures

Temperatures varied across the High Plains during the month of February. Overall, the majority of the region was within 2.0 degrees F (1.1 degrees C) of normal. However, a large part of western North Dakota and pockets of Nebraska, South Dakota, and southern Colorado had monthly departures in the 2.0-6.0 degrees F (1.1-3.3 degrees C) above normal range. On the other end of the spectrum, most of Colorado and Wyoming had monthly temperature departures of 2.0-6.0 degrees F (1.1-3.3 degrees C) below normal. An area stretching from northwestern Colorado through north-central Wyoming had larger departures of up to 12.0 degrees F (6.7 degrees C) below normal. Although these were rather large departures, these cooler conditions did not result in widespread records, with most locations in this area ranking in about the top 25 coolest Februarys on record.

Station Spotlight: Riverton, WY



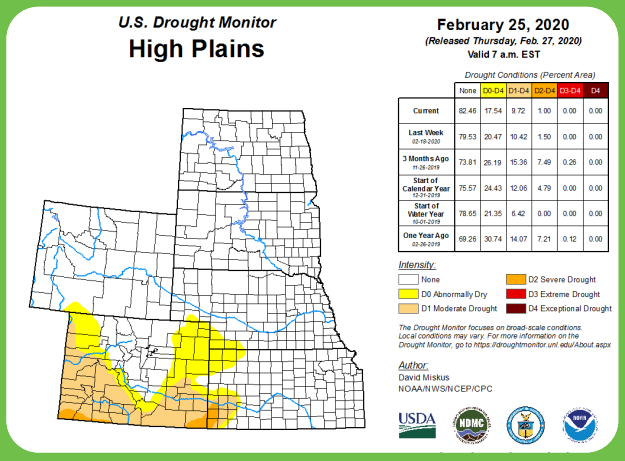
Above: Daily temperatures along with extremes and normals values since March 1, 2019 in Riverton, WY.

One location that ranked in the top 25 coolest Februarys on record was Riverton, Wyoming. Riverton had an average February temperature of 13.0 degrees F (-10.6 degrees C), which was 11.2 degrees F (6.2 degrees C) below normal. This ranked as Riverton's 8th coolest February on record (period of record 1907-present). The coolest February in Riverton's history occurred in both 1936 and 1973 with 7.6 degrees F (-13.6 degrees C). Casper, Wyoming also had a cool month, recording its 14th coolest February on record, with 21.5 degrees F (-5.8 degrees C). With records going back to 1939, this was a far cry from the 1989 record of 11.9 degrees F (-11.2 degrees C). Additional temperature data, including departures, may be found in the data tables on pages 5 and 6 of this summary, or by accessing the CLIMOD system: http://climod.unl.edu.

Drought Conditions

Drought conditions continued to gradually improve across western portions of the High Plains region through February. According to the U.S. Drought Monitor, the area experiencing drought (D1-D4) in the High Plains region decreased slightly from around 12 percent in late January to around 10 percent as of February 25th. The area of the High Plains that had the largest improvement in drought conditions was Colorado, with an 8 percent areal reduction.

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/.

This month, there was a reduction in abnormally dry conditions (D0), largely due to appreciable snow that fell across western and southern areas. Nearly all of the D0 conditions were removed in Wyoming and only a small portion remained in western Kansas. Moderate drought (D1) also decreased in coverage across southern and western portions of the High Plains region. In Kansas, the small area of D1 conditions across the central portion of the state was removed, with reductions in D1 in Colorado as well. Severe drought (D2) conditions remained unchanged across Colorado through the month of February. Meanwhile, slight improvements occurred over southwestern Kansas by the end of the month, with a small reduction of severe drought (D2) conditions across this area. Exactly 1 percent of the region remained in D2 as of late February.

The remainder of the region continued to remain free of drought. In fact, Nebraska and South Dakota have been drought-free since the end of 2018.

Climate Outlooks

According to the Climate Prediction Center, ENSO-neutral conditions continued through February in the Pacific. These conditions are favored through the spring and may continue into summer. 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 a greater than 50 percent chance of minor, moderate, and major flooding across portions of the region. This includes portions of the Missouri River mainstem in Nebraska, along with several tributaries, such as the Big Sioux, James, and Vermillion Rivers. This also includes portions of the Red and Souris Rivers in North Dakota. Normal wildland fire potential is expected through June for the High Plains.

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 March-May temperature outlook indicates a higher probability of above-normal temperatures for much of the western, southern, and eastern U.S. In the High Plains, this includes much of Colorado and the southwestern half of Wyoming. Meanwhile, there is an increased chance for below-normal temperatures through May for portions of the north central U.S. including areas of western North Dakota, western South Dakota, and northeastern Wyoming. Elsewhere, there are equal chances for above-, below-, and near-normal temperatures through May.

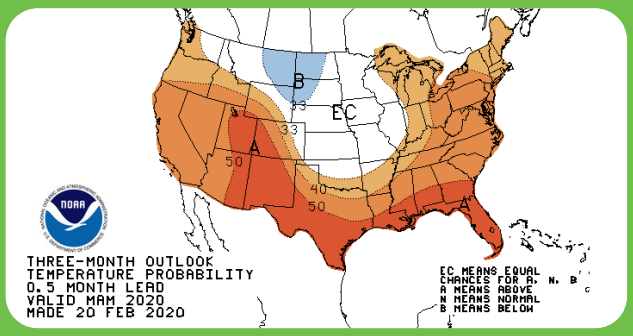
Precipitation

The precipitation outlook through May calls for a higher probability of above-normal precipitation across much of the northern, central, and eastern U.S. In the High Plains, this includes Nebraska, Wyoming, much of South Dakota, western North Dakota, northern Colorado, and portions of northern and eastern Kansas. Across the western and southwestern U.S., there is an increased chance for below-normal precipitation through May. Elsewhere, there are equal chances for above-, below-, and near-normal precipitation for the March through May period.

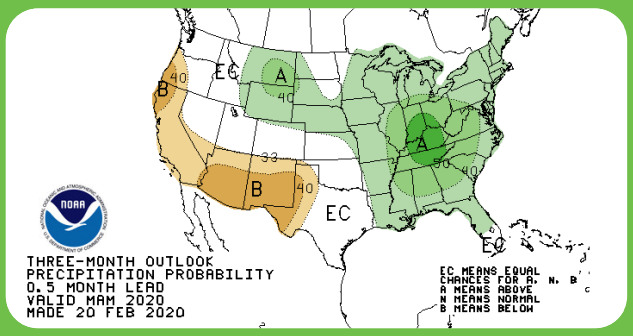
Drought

The February 20th Seasonal Drought Outlook indicates that drought is expected to persist across parts of the West, the Four Corners region, and the Plains. Drought may improve or be removed across portions of the southern U.S. Development of drought is likely for parts of the western and southwestern U.S. In the High Plains region, drought conditions are expected to persist across southern and western Colorado and southwestern Kansas. At the time of this writing, drought conditions have already improved in central Kansas. Through May, further drought development is not expected in the High Plains region.

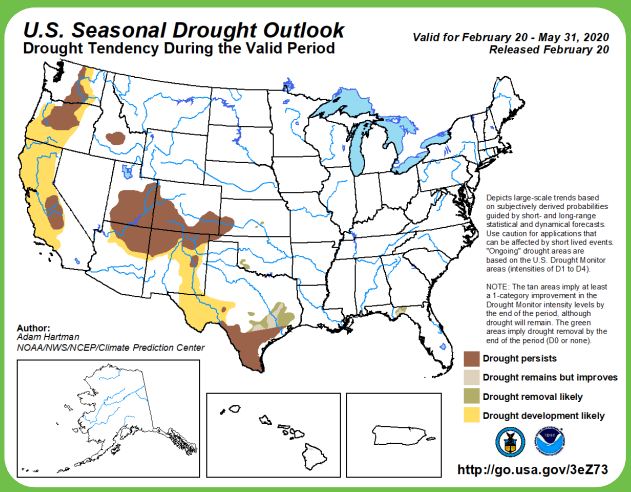
Temperature Outlook



Precipitation Outlook



Drought Outlook



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	43.6	16.4	30.0	-1.4	78	02/02	-5	02/05	0.06	-0.38	14
Alamosa San Luis Airport	46.6	12.5	29.6	6.8	58	02/29	-6	02/05	0.12	-0.14	46
Colorado Springs Municipal Airport	41.8	18.2	30.0	-2.1	73	02/02	0	02/05+	0.62	0.28	182
Denver International Airport	39.9	16.3	28.1	-4.4	74	02/02	-5	02/05+	0.88	0.51	238
Grand Junction Walker Field Airport	45.8	19.6	32.7	-1.8	57	02/29	7	02/05	0.07	-0.47	13
Pueblo Memorial Airport	46.4	17.1	31.8	-2.1	79	02/02	-2	02/05	0.68	0.38	227

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	47.3	24.9	36.1	3.4	71	02/02	4	02/02	0.18	-0.61	23
Dodge City Regional Airport	47.8	24.6	36.2	0.3	74	02/02	8	02/13	0.95	0.27	140
Goodland Renner Field	46.5	18.8	32.7	0.4	79	02/02	1	02/20	0.40	-0.09	82
Topeka Municipal Airport	46.6	23.6	35.1	0.7	72	02/02	1	02/14	0.82	0.50	62
Wichita Mid-Continent Airport	48.4	26.5	37.4	0.2	76	02/02	9	02/13	1.94	0.76	170

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	39.7	14.5	27.1	-0.3	58	02/29+	-7	02/26	0.61	0.0	100
Grand Island Airport	44.1	19.8	31.9	2.8	67	02/29	-5	02/20	0.11	0.57	16
Lincoln Municipal Airport	44.2	18.5	31.3	2.3	68	02/29	-2	02/13	0.13	-0.64	17
Norfolk Karl Stefan Airfield	42.1	16.3	29.2	2.4	66	02/29	-10	02/20	0.15	-0.61	20
North Platte Regional Airport	46.3	15.1	30.7	1.7	74	02/02	-9	02/20	0.35	-0.15	70
Omaha Eppley Airport	42.0	19.5	30.8	2.7	64	02/29	-4	02/13	0.05	-0.80	6
Valentine Miller Field	44.2	16.6	30.4	3.2	67	02/29	-10	02/13	0.24	-0.24	50

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismarck Municipal Airport	32.6	12.2	22.4	4.3	48	02/29+	-12	02/19+	0.27	-0.24	53
Fargo International Airport	23.6	1.6	12.6	-2.0	42	02/01	-24	02/13+	0.09	-0.52	15
Grand Forks International Airport	21.8	-1.9	10.0	-2.0	41	02/01	-28	02/13	0.12	-0.40	23
Theodore Roosevelt Airport	35.0	13.0	24.0	3.5	54	02/29	-22	02/13	0.11	-0.22	33
Williston International Airport	30.3	11.3	20.8	-	49	02/29	-18	02/13	0.33	-	-

All data are preliminary and subject to change. + indicates multiple dates, latest date listed. * indicates some missing data for the period.
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.

February 2020 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	29.2	7.4	18.3	0.7	46	02/02	-21	02/13	0.11	-0.44	20
Huron Regional Airport	29.7	9.5	19.6	-2.0	45	02/02	-23	02/13	0.90	0.30	150
Pierre Regional Airport	36.9	14.9	25.9	1.6	60	02/29	-16	02/13	0.51	-0.08	86
Rapid City Regional Airport	38.9	14.3	26.6	-0.8	69	02/01	-2	02/26	0.97	0.53	220
Sioux Falls Joe Foss Field Airport	32.7	13.9	23.3	1.8	56	02/29	-13	02/13	0.18	-0.42	30

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	30.4	12.6	21.5	-5.2	44	02/29	-6	02/13	0.82	0.25	144
Cheyenne Municipal Airport	37.1	15.7	26.4	-3.1	67	02/02	-9	02/04	0.66	0.19	140
Lander Hunt Field Airport	30.2	7.7	19.0	-6.2	55	02/01	-7	02/04	1.45	0.87	250
Laramie Regional Airport	32.8	9.8	21.3	-2.2	57	02/02	-12	02/04	0.03	-0.31	9
Rawlins Municipal Airport	27.3	8.9	18.1	-5.6	44	02/02	-13	02/20	0.42	0.0	100
Sheridan County Airport	37.3	12.0	24.6	-2.0	64	02/01	-9	02/04	0138	0.84	256

February 2020 Highlights

Monthly Rankings

Precipitation and Snowfall in inches

Snowiest	**Snowfall / Ranking**	**Record / Year**	**Period of Record**
Casper, WY	28.4 / SNOWIEST	23.8 / 1949	1939-present
Boulder, CO	35.2 / 2nd snowiest	54.6 / 2015	1893-present
Evergreen, CO	28.2 / 3rd snowiest	34.8 / 2012	1961-present
Steamboat Springs, CO	56.5 / 4th snowiest	65.8 / 1936	1893-present
Colorado Springs, CO	13.0 / 8th snowiest	23.2 / 1987	1894-present
Driest	**Precipitation / Ranking**	**Record / Year**	**Period of Record**
Laramie, WY	0.03 / 2nd driest	0.02 / 1999	1948-present
Omaha, NE	0.05 / 3rd driest	0.03 / 1931	1871-present
Fargo, ND	0.09 / 8th driest	0.03 / 1954	1881-present
Grand Junction, CO	0.07 / 8th driest	T / 1972	1893-present
Grand Island, NE	0.11 / 9th driest	0.01 / 1904	1895-present
Aberdeen, SD	0.11 / 10th driest	0.00 / 1894	1893-present
Wettest	**Precipitation / Ranking**	**Record / Year**	**Period of Record**
Boulder, CO	1.95 / 3rd wettest	3.69 / 2015	1893-present
Sheridan, WY	1.38 / 8th wettest	2.68 / 1955	1907-present
Rapid City, SD	0.97 / 9th wettest	2.46 / 1953	1942-present

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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.

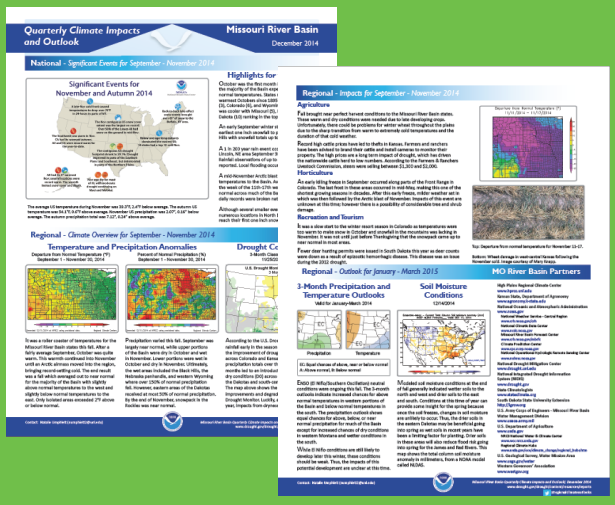
Much of the data and products found throughout this publication were built on the Applied Climate Information System (ACIS) framework. ACIS was designed to manage the complex flow of information from climate data collectors to the end users of climate data information. The main purpose of ACIS is to 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.

ACIS Applied Climate Information System

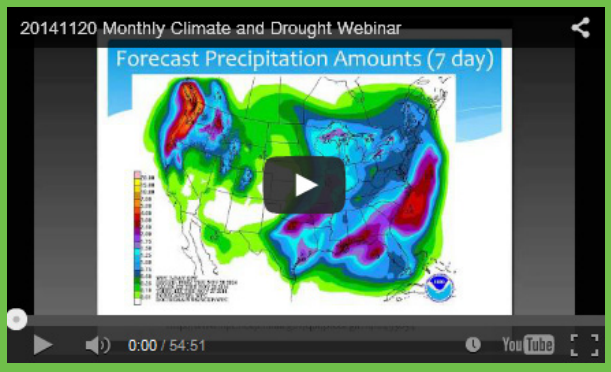
Additional Summary Information for the High Plains

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



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For an archive:
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