



# January 2017 Climate Summary

Ice on trees and power lines in Dodge City, Kansas. Photo credit Stan Rose. <http://hprcc.unl.edu>

## Wet Conditions Boost Snowpack and Bring Drought Relief

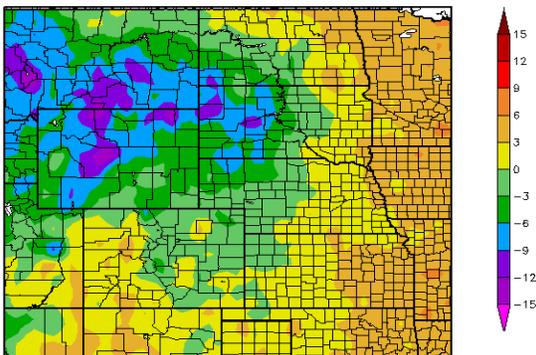
Much of the High Plains experienced wet conditions during January, as precipitation was greater than 200 percent of normal across parts of Wyoming, Colorado, Nebraska, and Kansas. This wetness led to some records across the region. For instance, Alamosa, Colorado and Dodge City, Kansas had their wettest January on record, and it was the snowiest January for Alamosa and Riverton, Wyoming. Snowfall was ample across the Rockies, which boosted snowpack but caused ski resorts to close. Farther east, heavy rain fell across parts of Kansas, with some locations receiving more than double their normal monthly precipitation total in one day. This abundant rainfall helped ease drought conditions in the region. Heavy precipitation and large changes in drought conditions in the High Plains are rare for this time of year.

Temperatures were cooler than normal in the western High Plains, while the eastern High Plains and western Colorado experienced slightly above-normal temperatures. While temperatures were not record-breaking in January, they had an impact on the type of precipitation that fell in the region. Several places that ordinarily get snowfall in January got rain or freezing rain instead, as was the case in parts of Colorado and Nebraska. Ice storm warnings were issued, which are not common in these areas in January. Some locations around the region have received a greater-than-normal proportion of precipitation falling as rain instead of snow during this snow season. For example, Lincoln, Nebraska had its 4th least snowiest October-January period on record, despite total precipitation for that period being slightly above normal.

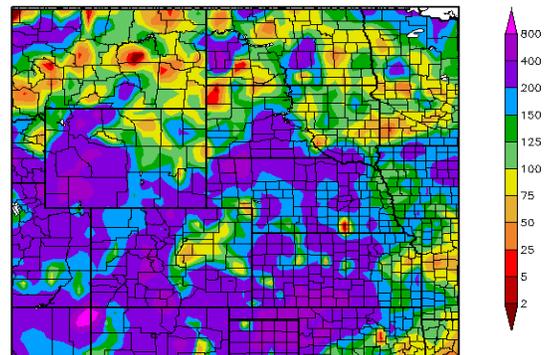
During the winter, producers in the High Plains region monitor the weather conditions closely for winter wheat. According to the U.S. Department of Agriculture, farmers in western Kansas and eastern Colorado have been concerned about winter wheat stands due to dry conditions in the fall, which has caused growth to fall behind. Also, a lack of snow cover has left the crop vulnerable during outbreaks of Arctic air. As of the end of January, the majority of the winter wheat crop in Kansas and Colorado was in fair or good condition.

### Temperature and Precipitation Overview

Departure from Normal Temperature (F)  
1/1/2017 - 1/31/2017



Percent of Normal Precipitation (%)  
1/1/2017 - 1/31/2017



Above: Departure from 1981-2010 normal temperature (left) and percent of normal precipitation (right) for January 2017 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

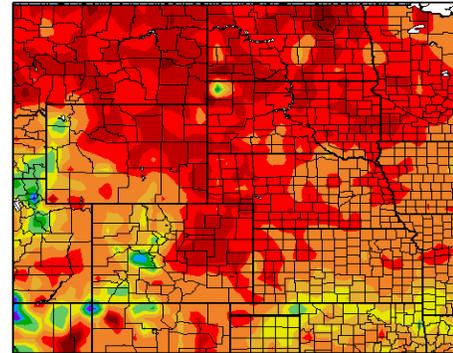
January was a wet month across much of the High Plains, as precipitation exceeded 200 percent of normal throughout much of Nebraska, Kansas, Wyoming, and Colorado. Heavy snow blanketed the Rockies, further boosting snowpack that had already begun to build rapidly due to a wet December. Meanwhile, rain and freezing rain contributed to the wetness experienced in Kansas and southern Nebraska.

Snowfall was quite impressive throughout the Rockies of Colorado and Wyoming in January. For instance, Alamosa, Colorado had its wettest and snowiest January on record. Alamosa received 21.9 inches (56 cm) of snow, shattering the previous record of 15.8 inches (40 cm) set in January 1939. In fact, it snowed so much in parts of Colorado, ski resorts closed due to too much snow. According to Channel 9 News in Denver, heavy, wet snow that accumulated quickly prompted Crested Butte and Monarch Mountain ski resorts to close because of avalanche concerns. Crested Butte received an astonishing 101.8 inches (259 cm) of snow, which was its 4th snowiest January on record (period of record 1910-2017). In Wyoming, it was also quite snowy. For instance, the Riverton COOP station experienced its snowiest January on record. According to the National Weather Service (NWS) in Riverton, the snow depth at Riverton on the 24th was 17.0 inches (43 cm), which was Riverton's second highest snow depth on record.

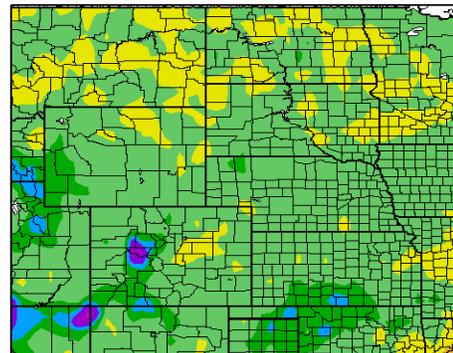
One event that was particularly impactful in the region was the ice storm that affected southeastern Nebraska and a large part of Kansas on the 14th-16th. An upper-level storm system, combined with a warm and moist low-level air mass overriding colder air at the surface, created a widespread freezing rain event that crippled travel and downed trees and power lines throughout the region. According to the NWS in Topeka, ice accumulations were greatest in southwestern Kansas, where 1.00 inches (3 cm) of ice accumulated in and around the Dodge City area. Impressive precipitation totals occurred with this storm as well. On the 15th, Dodge City received 1.41 inches (36 mm) of rain, setting a record for highest 1-day total precipitation for the month of January. Dodge City only averages 0.58 inches (15 mm) of precipitation in January. In Nebraska, ice accumulations were highest in Fairbury at 0.75 inches (2 cm). The NWS in Omaha stated that this storm event was unusual for southeastern Nebraska because the predominant form of precipitation was freezing rain rather than snow.

### Regional Precipitation

Precipitation (in)  
1/1/2017 - 1/31/2017



Departure from Normal Precipitation (in)  
1/1/2017 - 1/31/2017



Above: Total precipitation in inches (top) and departure from normal precipitation in inches (bottom) for January 2017. These maps are produced by HPRCC and can be found on the Current Climate Summary Maps page at: <http://hprcc.unl.edu/maps/current>.

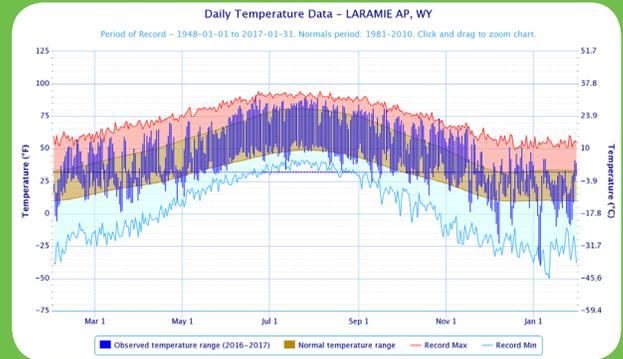
## Snowpack Update

As of the end of January, snowpack was generally above normal throughout the Rockies in Colorado and Wyoming, thanks to a continuation of wet conditions since December. January precipitation was at least 200 percent of normal in these areas, and near-normal to below-normal temperatures helped preserve the snowpack. According to the U.S. Army Corps of Engineers, Snow Water Equivalent (SWE) above Fort Peck Dam was 76 percent of average at the end of January, which was a slight decrease from the previous month but was faring better than 2001, the lowest snowpack year of the last 20-year period. Snowpack continued to improve between Fort Peck and Garrison Dams, as SWE increased slightly to 108 percent of average. Normally by February 1, about 64 percent of the peak mountain SWE has occurred in both reaches.

## Temperatures

The High Plains region was caught in the middle of a rather impressive temperature gradient across the country in January. Temperatures were much above-normal in the eastern U.S., while below-normal temperatures were prevalent in the West. The High Plains followed a similar pattern in that the western part of the region was cooler than normal, while it was warmer than normal in the eastern portion. Temperatures ranged from approximately 9.0 degrees F (5.0 degrees C) below normal to 5.0 degrees F (2.8 degrees C) above normal across the area. Locations that were especially cooler than normal included Wyoming and the western Dakotas. While temperature departures were rather impressive in these areas, this part of the region did not see the record-breaking cold that was experienced in December. Meanwhile, the greatest above-normal temperature departures occurred in eastern North Dakota and eastern Kansas.

### Station Spotlight: Laramie, WY



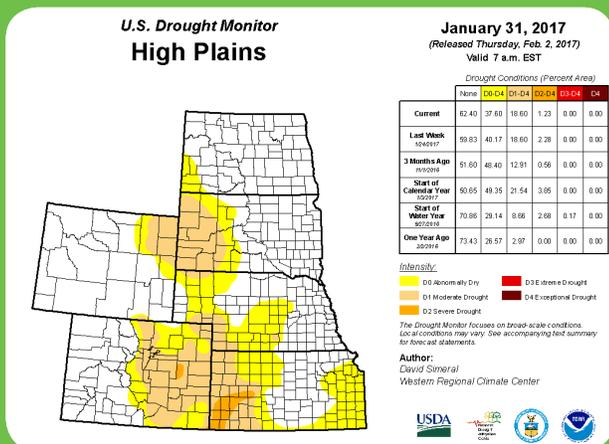
Above: Daily temperatures along with extremes and normals values since February 1, 2016 in Laramie, WY.

Cooler conditions were widespread across the region during the first half of January. An impressive Arctic air mass moved through during the 6th-7th, which brought the coldest temperatures of the month for a large part of the region. Bitterly cold temperatures of -20.0 degrees F (-28.9 degrees C) and below were prevalent in North Dakota and Wyoming. The temperature plummeted to an astounding -40.0 degrees F (-40.0 degrees C) in Laramie, Wyoming on the 6th, which was the 5th coldest temperature on record at that location (period of record 1948-2017). In fact, Wyoming Highway Patrol urged motorists to not travel unnecessarily on Interstate 80 and several other highways in the state due to the cold, which is rather rare according to the NWS in Cheyenne.

## Drought Conditions

Overall, drought conditions improved throughout the High Plains in January. It was a wet month, as many areas received greater than 200 percent of normal precipitation, which was quite beneficial in drought-stricken areas. Region-wide, the area in drought (D1-D4) on the U.S. Drought Monitor decreased from about 22 percent to 19 percent, and the area experiencing drought or abnormal dryness (D0-D4) improved from approximately 49 percent to 38 percent.

### U.S. Drought Monitor



One area that saw significant improvement of drought conditions during January was the Black Hills region of South Dakota. According to the January 31st U.S. Drought Monitor author, severe drought (D2) improved to moderate drought (D1) in the Black Hills due to wet conditions during the past 30-90 days. SNOTEL stations in the region were reporting near-normal Snow Water Equivalent (SWE) values. This particular area has been dealing with drought conditions since early summer.

Another area that experienced drought relief was in Kansas. Southern areas of the state received impressive rains in January that led to the trimming of D2 conditions, while abnormally dry conditions (D0) were removed from central Kansas. Improvements made were primarily due to heavy precipitation that fell as part of the major storm system that moved through in the middle part of the month. Drought conditions also improved in southeastern Wyoming, central Nebraska, and eastern Colorado.

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. Equatorial sea surface temperatures are near to below average in the central Pacific Ocean, while they are above average in the eastern Pacific Ocean. A La Niña Advisory is in effect. However, a transition to ENSO-neutral conditions is favored sometime in February 2017, and ENSO-neutral conditions are expected to continue throughout the first half of the year. If you are looking for more information about La Niña and its impacts, check out the ENSO blog here: <https://www.climate.gov/news-features/department/8443/all>. Or, take a look at this special update on La Niña in the Missouri River Basin states, which is available here: <http://hprcc.unl.edu/pdf/LaNina-MOBasin-2016-Final.pdf>.

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

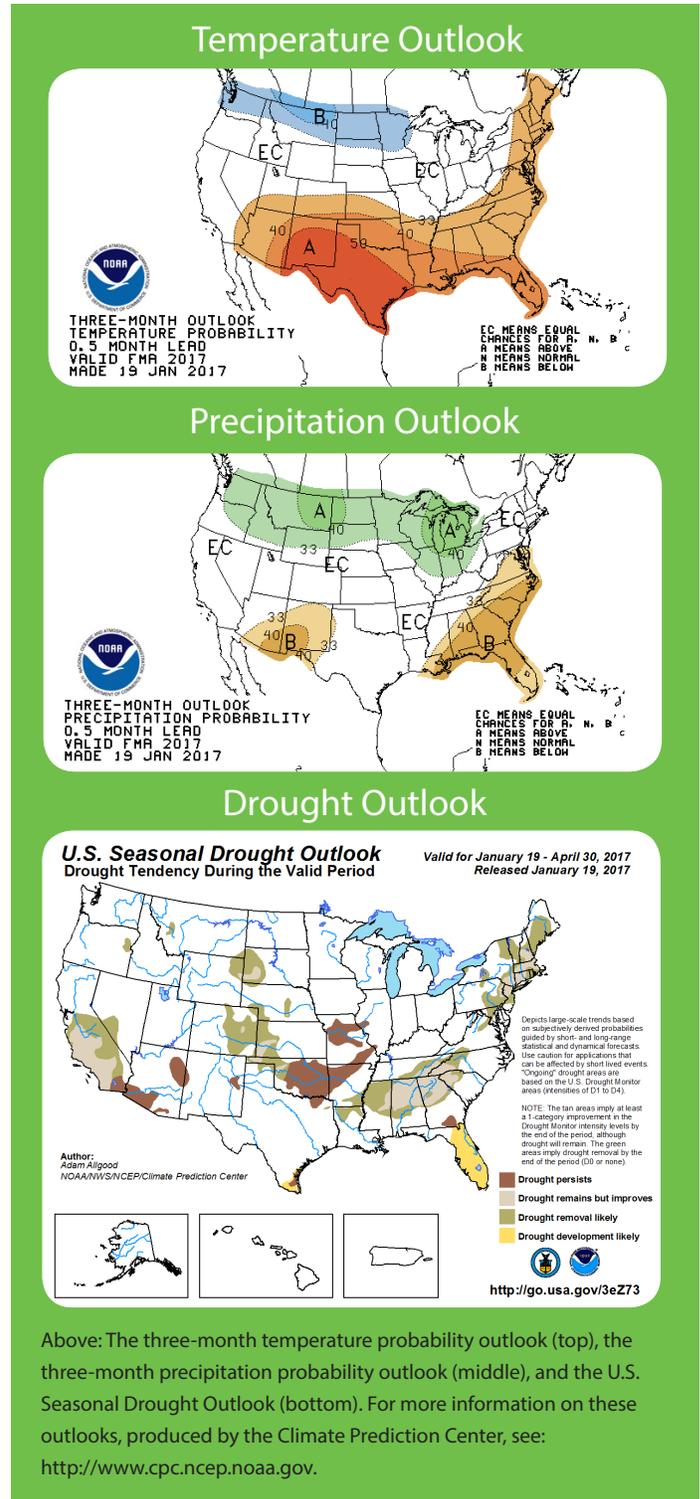
The February–April temperature outlook indicates an increased chance of above-normal temperatures for much of the southern and eastern U.S. This includes central and southern portions of Colorado and Kansas in the High Plains region. Below-normal temperatures are favored across the northern Plains and northern Rockies, including North Dakota and the northern third of South Dakota. Elsewhere, there is an equal chance for above-, below-, or near-normal temperatures in the contiguous U.S. during the February–April period.

### Precipitation

The precipitation outlook for the next three months calls for a higher probability of above-normal precipitation across the Pacific Northwest, northern Rockies, northern Plains, the Great Lakes, and northern portions of the Ohio Valley. In the High Plains region, this includes North Dakota, northern and central South Dakota, and the northern half of Wyoming. Below-normal precipitation is favored across parts of the Southwest and the Southeast. The remainder of the contiguous U.S. has equal chances for above-, below-, or near-normal precipitation.

### Drought

The January 19th U.S. Seasonal Drought Outlook shows that drought is expected to persist across portions of the Southwest, the southern Plains, the Midwest, and the Southeast. Drought may improve or be removed in portions of the West, the Plains, the Northeast, and the Southeast. This includes the area in drought in the Black Hills region of South Dakota extending west into Wyoming, eastern Colorado, western Kansas, and pockets of Nebraska. Drought development is likely along the southern tip of Texas and the Florida Peninsula, but drought development is not likely in the High Plains region through April.



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	37.7	16.0	26.9	-1.7	61	01/31+	-11	01/06	0.11	-0.19	37
Alamosa San Luis Airport	29.9	3.5	16.7	0.4	45	01/09	-36	01/07	1.36	1.10	523
Colorado Springs Municipal Airport	42.9	18.8	30.8	0.3	64	01/31	-7	01/06	0.32	0.00	100
Denver International Airport	42.3	17.7	30.0	-0.7	63	01/30	-7	01/06	0.54	0.13	132
Grand Junction Walker Field Airport	39.1	22.3	30.7	3.3	50	01/23+	-4	01/06	1.01	0.43	174
Pueblo Memorial Airport	45.6	18.7	32.1	1.6	70	01/31	-15	01/07	0.75	0.40	214

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	40.3	22.1	31.2	2.6	65	01/30	-5	01/06	1.75	1.17	302
Dodge City Regional Airport	45.0	21.8	33.4	1.2	72	01/30	0	01/07	2.56	1.98	441
Goodland Renner Field	40.9	16.6	28.8	-0.8	64	01/30	-8	01/07+	0.92	0.54	242
Topeka Municipal Airport	43.7	23.0	33.4	3.7	65	01/30	-1	01/07	1.28	0.42	149
Wichita Mid-Continent Airport	47.6	25.6	36.6	4.4	73	01/30	4	01/07	2.79	1.96	336

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	29.7	9.5	19.6	-4.8	49	01/30	-16	01/05	0.99	0.63	275
Grand Island Airport	34.6	17.9	26.3	1.2	59	01/30	-11	01/06	1.07	0.54	202
Lincoln Municipal Airport	35.9	19.2	27.5	2.9	61	01/30	-9	01/06	1.10	0.46	172
Norfolk Karl Stefan Airfield	32.0	15.7	23.9	1.3	50	01/30	-8	01/06	1.25	0.66	212
North Platte Regional Airport	36.8	12.9	24.9	-0.1	60	01/30	-21	01/06	0.67	0.33	197
Omaha Eppley Airport	34.8	20.5	27.7	4.2	56	01/30	-3	01/06	0.86	0.14	119
Valentine Miller Field	34.7	10.9	22.8	-0.8	61	01/18	-11	01/06	0.91	0.65	350

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismarck Municipal Airport	20.3	1.9	11.1	-1.7	43	01/30	-30	01/07	0.64	0.21	149
Fargo International Airport	21.8	7.8	14.8	5.5	41	01/30	-22	01/13	0.98	0.28	140
Grand Forks International Airport	19.2	4.5	11.9	5.2	37	01/30+	-27	01/13	0.45	-0.10	82
Theodore Roosevelt Airport	18.7	4.7	11.7	-4.6	40	01/18	-21	01/07+	0.04	-0.26	13
Williston International Airport	19.1	2.3	10.7	-0.3	42	01/18	-27	01/07	0.44	-0.15	75

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>.

# January 2017 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	21.0	4.6	12.8	0.8	41	01/30	-19	01/13+	0.51	0.04	109
Huron Regional Airport	24.8	8.3	16.5	-0.2	44	01/20	-15	01/13	0.58	0.08	116
Pierre Regional Airport	22.4	8.4	15.4	-4.5	43	01/30	-12	01/12	0.95	0.53	226
Rapid City Regional Airport	28.7	9.5	19.1	-5.9	55	01/30+	-14	01/05	0.35	0.05	117
Sioux Falls Joe Foss Field Airport	28.1	14.1	21.1	4.5	45	01/18	-6	01/05+	0.62	0.06	111

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	29.5	11.7	20.6	-4.1	42	01/31+	-28	01/05	0.54	0.03	106
Cheyenne Municipal Airport	38.4	16.0	27.2	-1.6	56	01/19+	-17	01/06	0.77	0.44	233
Lander Hunt Field Airport	22.2	2.3	12.2	-9.5	48	01/09	-25	01/06	1.27	0.86	310
Laramie Regional Airport	26.9	5.8	16.4	-5.3	42	01/09+	-40	01/06	0.55	0.28	204
Rawlins Municipal Airport	27.6	10.0	18.8	-2.8	41	01/09+	-32	01/06	0.53	0.17	147
Sheridan County Airport	27.8	3.8	15.8	-8.0	53	01/09	-15	01/04+	1.04	0.48	186

## January 2017 Highlights

### Monthly Rankings

Temperature in degrees F / Precipitation and Snowfall in inches

Wettest / Driest	Precipitation / Ranking	Record / Year	Period of Record
Alamosa, CO	1.36 / WETTEST	1.09 / 2005	1933-2017
Dodge City, KS	2.56 / WETTEST	1.96 / 1949	1875-2017
Wichita, KS	2.79 / 4th wettest	6.29 / 1949	1889-2017
Lander, WY	1.27 / 4th wettest	2.06 / 1910	1892-2017
Concordia, KS	1.75 / 7th wettest	2.16 / 1949	1886-2017
Scottsbluff, NE	1.02 / 7th wettest	1.26 / 1978	1893-2017
Snowiest / Least Snowiest	Snowfall / Ranking	Record / Year	Period of Record
Alamosa, CO	21.9 / SNOWIEST	15.8 / 1939	1933-2017
Riverton, WY (COOP)	16.8 / SNOWIEST	16.5 / 1962	1907-2017
Scottsbluff, NE	14.4 / 7th snowiest	23.7 / 1949	1893-2017
Lander, WY	18.3 / 8th snowiest	26.5 / 1962	1892-2017
Cheyenne, WY	13.1 / 9th snowiest	35.5 / 1980	1883-2017
Valentine, NE	11.5 / 10th snowiest	18.3 / 1929	1890-2017
Bismarck, ND	15.2 / 10th snowiest	25.0 / 1982	1886-2017

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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

Quarterly Climate Impacts and Outlook  
Missouri River Basin  
December 2014

National - Significant Events for September - November 2014

Highlights for October and the first week of November 2014

Significant Events for November and Autumn 2014

Regional - Impacts for September - November 2014

Regional - Climate Overview for September - November 2014

Drought Co-Occurrence

3-Month Precipitation and Temperature Outlooks

Soil Moisture Conditions

MO River Basin Partners

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

20141120 Monthly Climate and Drought Webinar

Forecast Precipitation Amounts (7 day)

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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