



January 2021 Climate Summary

Holmes Lake in Lincoln, NE. Photo courtesy Natalie Umphlett.
<http://hprcc.unl.edu>

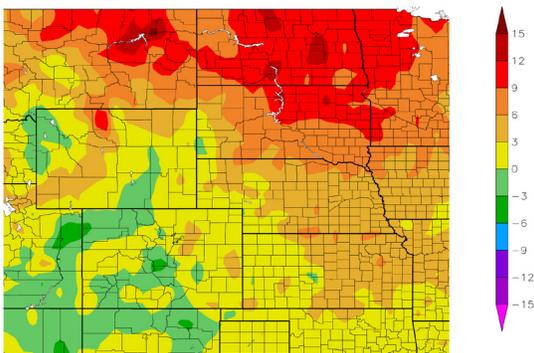
Warmth Continues Across the Northern and Central Plains

January was an eventful month for the High Plains region. In northern parts of the region, extreme “warmth” was a consistent feature, as temperatures were routinely much above normal. This resulted in monthly temperature departures of up to 15.0 degrees F (8.3 degrees C) above normal. The relative warmth, along with dry conditions, led to an overall expansion of drought conditions in the Dakotas, which is rare in the winter. Meanwhile, heavy rain and snow in eastern parts of Kansas and Nebraska set new records and helped improve or alleviate drought conditions there. In western areas of the region, drought continued to be a prominent feature, with mountain snowpack below median for this time of the year.

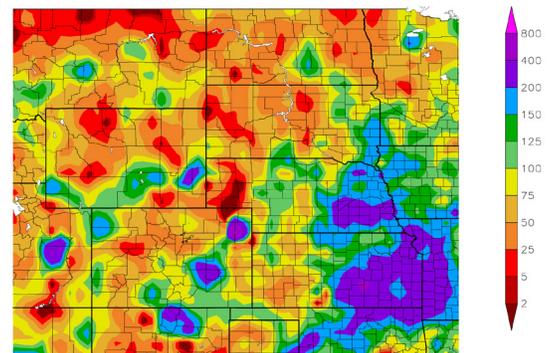
Towards the middle of the month, a powerful storm system brought widespread strong winds to the region, damaging structures, causing rollovers, and closing interstates and highways. The highest gusts were reported in western parts of the Dakotas, Nebraska, and Kansas, along with Colorado and Wyoming. Wind gusts of at least 75 mph (121 km/hr) were reported in each of the High Plains states, with gusts over 90 mph (145 km/hr) at isolated locations. These were some of the highest non-thunderstorm wind gusts in recent years. With little to no snowpack and drought conditions in place, the high winds increased the fire danger and several grass fires spread quickly in western parts of the Plains. A particularly large grass fire burned near the town of Lemmon, located in northwestern South Dakota. The fire started just across the state line in North Dakota and traveled quickly to the southeast. Ultimately, more than 15,000 acres burned, causing evacuations and structural damage. Another fire near the town of Benkelman, NE also caused evacuations. Just to the south, the high winds fueled a large dust storm, impacting areas along the Colorado/Kansas border, down into the Oklahoma and Texas panhandles. I-70 from just east of Denver, CO to the Kansas border was closed due to poor visibility and several accidents. Eastern parts of the region were also impacted by strong winds, snow, and blowing snow, which created treacherous travel conditions.

Temperature and Precipitation Overview

Departure from Normal Temperature (F)
1/1/2021 – 1/31/2021



Percent of Normal Precipitation (%)
1/1/2021 – 1/31/2021



Above: Departure from 1981-2010 normal temperature (left) and percent of normal precipitation (right) for January 2021 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

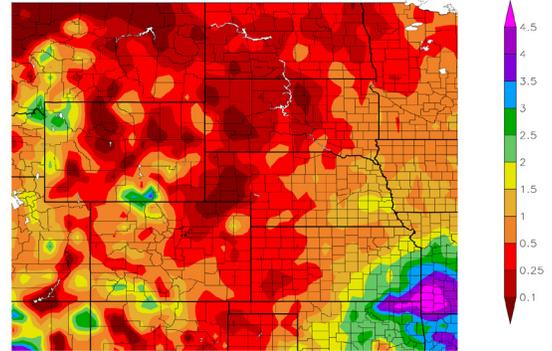
Precipitation varied across the High Plains region this month, with some areas receiving record-breaking precipitation and others receiving little to none. Overall, much of the region received less than 75 percent of normal precipitation. Although not record-breaking for most locations, a few of the drier locations did have a top 10 driest January on record. For instance, with only 0.04 inch (1 mm) received this past month, Rapid City, SD had its 4th driest January on record (period of record 1942-present). While precipitation deficits do not build quickly in the winter, it is worth noting that longer-term deficits, coupled with above-normal temperatures and a low snowpack have caused an increase in drought conditions, along with concerns about fire risk and winter wheat condition.

Not all areas of the region were dry, however. The wettest areas included eastern parts of Kansas, Nebraska, and South Dakota, along with pockets of Colorado and Wyoming, where precipitation totals were at least 150 percent of normal. Large areas of eastern Kansas and eastern Nebraska had totals up to 400 percent of normal. Since January is one of the driest months of the year, this translated into departures ranging from about 0.75 inch (19 mm) above normal in eastern Nebraska to about 3.00 inches (76 mm) above normal in portions of southeastern Kansas. This precipitation caused some locations to rank among the top 10 wettest Januarys on record. For instance, Wichita, KS had its 4th wettest January with 2.86 inches (73 mm) of precipitation (period of record 1888-present). Much of this fell in just two days - January 25th and January 30th. Both days had precipitation in excess of 1.00 inch (25 mm), which is exceedingly rare in the winter in the Plains.

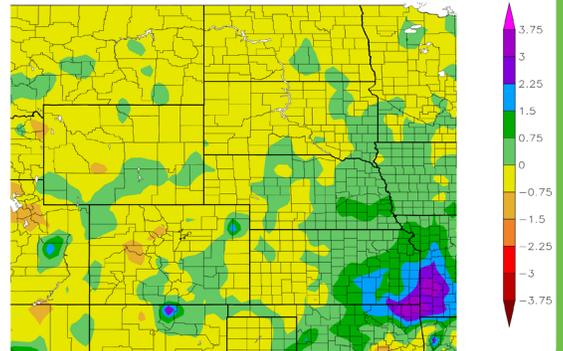
While Wichita received heavy rainfall on January 25th, areas to the north experienced an historic snowstorm. This potent storm dropped 6.0-12.0 inches (15-30 cm) of snowfall across an area stretching from north-central Kansas through eastern Nebraska and central Iowa, with snowfall rates approaching 1.0-2.0 inches (3-5 cm) per hour at times. Lincoln, NE had some of the highest snowfall amounts, with 2-day storm totals around 15.0 inches (38 cm). Observations at the Lincoln Airport indicated a storm total of 14.8 inches (38 cm), of which 14.5 inches (37 cm) fell on the 25th. This was Lincoln's highest 1-day snowfall for the month of January and the second highest 1-day snowfall for any month (period of record 1948-present). The highest 1-day snowfall for Lincoln occurred on February 11, 1965 with 19.0 inches (48 cm).

Regional Precipitation

Precipitation (in)
1/1/2021 - 1/31/2021



Departure from Normal Precipitation (in)
1/1/2021 - 1/31/2021



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

The Upper Missouri Basin mountain snowpack declined slightly this month, according to the U.S. Army Corps of Engineers. As of January 31st, Snow Water Equivalent (SWE) above Fort Peck Reservoir was 78 percent of average, while the reach between Fort Peck and Garrison Reservoirs was 79 percent of average. At the beginning of February, snowpack across Colorado and Wyoming was also behind, at 78 percent of median for each state. Only two basins in each state had snowpack that was near median. At the end of January, Plains snowpack was fairly limited with the highest SWE confined to areas of northern Kansas, eastern Nebraska, and eastern portions of the Dakotas. Aside from the Black Hills, western portions of the Dakotas, western Nebraska, much of Kansas, and the Plains of Colorado and Wyoming were largely snow-free.

Temperatures

Above-normal temperatures continued to prevail across the majority of the High Plains region this month. Portions of eastern and central Kansas and Nebraska had widespread departures up to 6.0 degrees F (3.3 degrees C) above normal, while much of the Dakotas had departures in the 6.0-12.0 degrees F (3.3-6.7 degrees C) above normal range. A low or non-existent snowpack across the Plains portion of the region contributed to these departures. Temperatures were generally within a few degrees of normal elsewhere in the region, with slightly below-normal temperatures confined to central and western areas of Colorado and Wyoming.

The extremely large monthly temperature departures across the northern tier of the region caused numerous locations to rank among the top 10 warmest Januarys on record. For instance, Aberdeen, SD (temperature graph pictured to the right) had its 4th warmest January on record with an average temperature of 25.1 degrees F (-3.8 degrees C), which was 13.1 degrees F (7.3 degrees C) above normal (period of record 1893-present)! Although extremely “warm” for this time of the year, this month’s temperatures could not beat out those of January 2006, which was the warmest January on record not only for Aberdeen, but for many locations throughout the region. Additional rankings may be found on page 6.

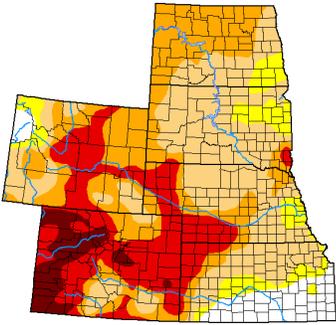
As mentioned earlier, this pattern of above-normal temperatures was a continuation from previous months. In fact, several locations have had consecutive top 10 warmest months recently. For instance, Mobridge, SD had its 9th warmest November, 3rd warmest December, and 2nd warmest January (period of record 1911-present).

Drought Conditions

There were several changes in drought conditions this month in the High Plains region, which is unusual for this time of the year. According to the U.S. Drought Monitor, the area experiencing drought (D1-D4) increased from approximately 82 percent to 86 percent since the end of last month. However, the area experiencing abnormal dryness and drought (D0-D4) decreased from 96 percent to 93 percent.

U.S. Drought Monitor

U.S. Drought Monitor
High Plains



January 26, 2021
(Released Thursday, Jan. 28, 2021)
Valid 7 a.m. EST

	Drought Conditions (Percent Area)				
	None	D0-D4	D1-D4	D2-D4	D3-D4
Current	6.65	93.35	86.76	51.74	25.51
Last Week <small>(10-14-2021)</small>	5.26	94.74	82.33	49.67	25.61
3 Months Ago <small>(10-27-2020)</small>	1.74	98.26	71.27	47.34	22.90
Start of Calendar Year <small>(1-1-2021)</small>	3.82	96.18	82.46	50.36	27.09
Start of Water Year <small>(10-1-2020)</small>	6.73	93.27	82.11	30.56	16.16
One Year Ago <small>(1-26-2020)</small>	73.21	25.79	11.87	1.31	0.00

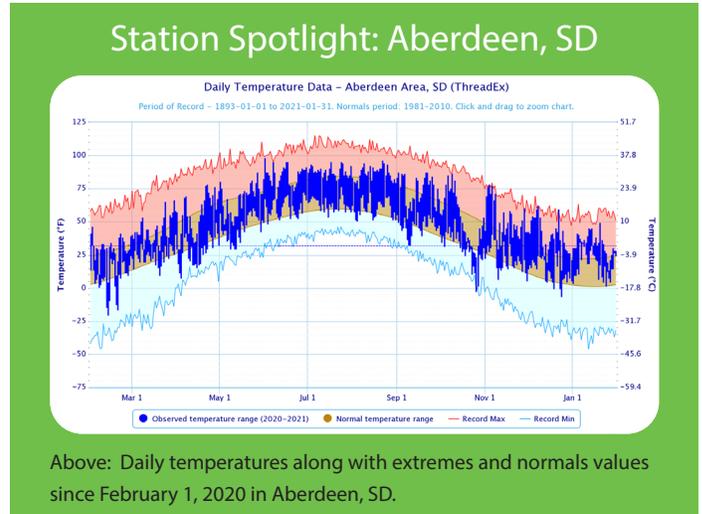
Intensity:

- 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:
Richard Tinker
CPC/NOAA/NWS/NCEP

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/>.



With precipitation deficits mounting, a continuation of relatively warm, dry conditions led to the expansion of drought in several areas of the region this month. The largest changes occurred across the Northern Plains, where North Dakota had a 7 percent increase in drought coverage, while South Dakota had a 28 percent increase. Although there was an overall degradation, there was a notable improvement in North Dakota as the area of extreme drought (D3) that was introduced in the east-central part of the state in December was removed after a reassessment of the data.

In other areas of the region, Wyoming had an overall increase in drought of 2 percent, with the most notable change occurring in the northeastern part of the state due to precipitation deficits, low snowpack, and poor soil moisture conditions. Meanwhile, drought decreased in Nebraska and Kansas by 5 percent and 10 percent, respectively, due to ample rain and snow in eastern areas of both states. The entire state of Colorado remained in drought, although there were slight improvements in some mountainous areas, as well as the southeastern part of the state.

Climate Outlooks

According to the Climate Prediction Center, La Niña conditions are present in the Pacific and a La Niña Advisory remains in effect. La Niña is expected to continue through winter, with about a 55 percent chance of a transition to neutral occurring in the spring. For more information, see: <https://www.climate.gov/news-features/department/enso-blog>.

Through April, the National Weather Service’s long-range flood outlook indicates a greater than 50 percent chance of minor flooding along parts of the Red River in North Dakota, as well as the Black Vermillion and Little Osage Rivers in Kansas. There is also a greater than 50 percent chance of moderate flooding along the Stranger Creek in Kansas. According to the National Interagency Fire Center, wildland fire potential is expected to be normal in February, while above-normal wildland fire potential is favored for southern parts of Kansas and Colorado in March and April.

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

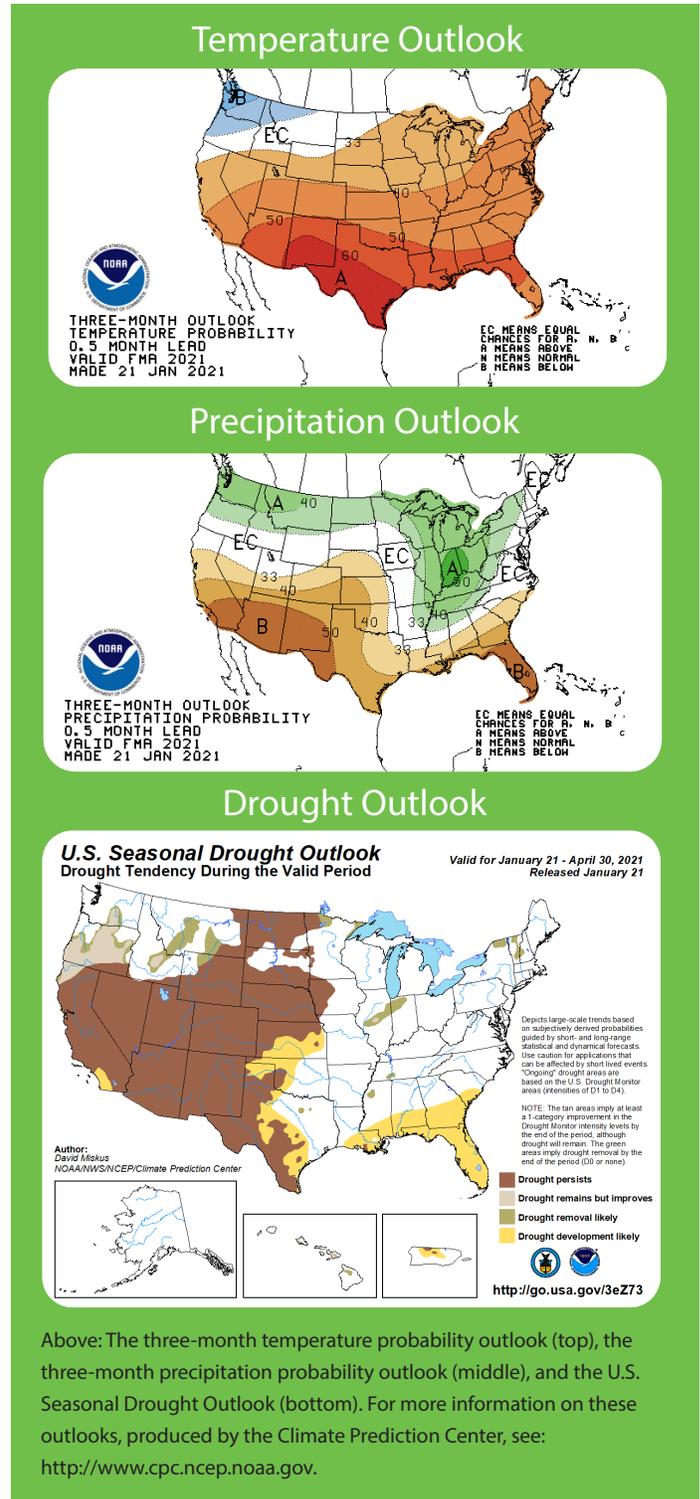
The temperature outlook for the next three months indicates increased chances of above-normal temperatures for the majority of the contiguous U.S. In the High Plains, this includes Colorado, Kansas, Nebraska, most of South Dakota, southeastern North Dakota, and the southern half of Wyoming. Below-normal temperatures are possible in the Pacific Northwest, through northern parts of Idaho and Montana. Elsewhere, there are equal chances for above-, below-, and near-normal temperatures.

Precipitation

The precipitation outlook shows a higher probability of above-normal precipitation across the northern tier of the contiguous U.S., as well as the Ohio Valley. In the High Plains, this includes the majority of North Dakota, northwestern South Dakota, and northern Wyoming. Meanwhile, there are increased chances for below-normal precipitation across southern portions of the U.S., as well as the Central Plains. This includes most of Colorado, Kansas, and Nebraska. Elsewhere, there are equal chances for above-, below-, and near-normal precipitation through April.

Drought

The January 21st U.S. Seasonal Drought Outlook indicates that, over the next three months, drought is expected to persist or develop across much of the West, the Plains, and the Southeast. In the High Plains, current drought conditions are expected to persist, with development likely across southern and eastern Kansas. Drought may improve or be removed in portions of the Pacific Northwest, the Midwest, the Northeast, and small areas of the South and Texas. In the High Plains, a small area of drought is likely to be removed in northwestern Wyoming.



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	42.0	20.2	31.1	2.5	60	01/13	0	01/27	0.08	-0.22	27
Alamosa San Luis Airport	36.6	0.9	18.8	2.5	48	01/15	-14	01/27	0.23	-0.03	88
Colorado Springs Municipal Airport	43.5	19.5	31.5	1.0	60	01/13	0	01/27	0.57	0.25	178
Denver International Airport	46.2	21.6	33.9	3.2	63	01/13	2	01/27	0.22	-0.19	54
Grand Junction Walker Field Airport	39.2	17.0	28.1	0.7	55	01/29	4	01/02+	0.36	-0.22	62
Pueblo Memorial Airport	47.8	16.6	32.2	1.7	67	01/13	1	01/27	0.57	0.22	163

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	42.6	24.9	33.7	5.1	62	01/13	0	01/28	0.92	0.34	159
Dodge City Regional Airport	47.5	22.5	35.0	2.8	68	01/13	2	01/27	0.32	-0.26	55
Goodland Renner Field	43.3	18.4	30.8	1.2	64	01/13	-5	01/27	0.46	0.08	121
Topeka Municipal Airport	44.0	25.6	34.8	5.1	60	01/21+	16	01/03	2.32	1.46	270
Wichita Mid-Continent Airport	45.5	25.6	35.6	3.4	58	01/21+	19	01/28+	2.86	2.03	345

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	41.0	14.6	27.8	3.4	56	01/13	-1	01/27	0.06	-0.30	17
Grand Island Airport	39.1	22.3	30.7	5.6	64	01/13	2	01/27	1.32	0.79	249
Lincoln Municipal Airport	38.1	19.5	28.8	4.2	55	01/13	8	01/29+	1.53	0.89	239
Norfolk Karl Stefan Airfield	35.6	20.1	27.8	5.2	57	01/13	4	01/02	0.74	0.15	125
North Platte Regional Airport	40.9	18.8	29.9	4.9	63	01/13	0	01/27	0.41	0.07	121
Omaha Eppley Airport	36.0	21.1	28.5	5.0	52	01/13	6	01/26	1.52	0.80	211
Valentine Miller Field	40.9	21.4	31.1	7.5	62	01/13	4	01/27	0.51	0.25	196

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismarck Municipal Airport	33.6	17.9	25.8	13.0	52	01/12	-1	01/24	0.29	-0.14	67
Fargo International Airport	26.8	11.9	19.3	10.0	41	01/14	-9	01/27	0.37	-0.33	53
Grand Forks International Airport	25.7	9.3	17.5	10.8	39	01/20+	-20	01/27	0.30	-0.25	55
Theodore Roosevelt Airport	35.7	16.8	26.3	10.0	55	01/13	-3	01/26	T*	-0.30	0
Williston International Airport	29.6	14.6	22.1	11.1	51	01/13	-17	01/26	0.33	-0.26	56

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>.

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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	33.1	17.0	25.1	13.1	49	01/20	1	01/24	0.52	0.05	111
Huron Regional Airport	32.8	18.4	25.6	8.9	49	01/13	-2	01/24	0.57	0.07	114
Pierre Regional Airport	37.5	20.3	28.9	9.0	54	01/13+	0	01/24	0.20	-0.22	48
Rapid City Regional Airport	41.1	18.2	29.6	4.6	55	01/12	5	01/27	0.04	-0.26	13
Sioux Falls Joe Foss Field Airport	32.5	19.0	25.7	9.1	47	01/20	4	01/01	0.97	0.41	173

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	34.9	15.9	25.4	0.7	51	01/29	-6	01/25	0.48	-0.03	94
Cheyenne Municipal Airport	40.2	19.0	29.6	0.8	59	01/29	3	01/27	0.14	-0.19	42
Lander Hunt Field Airport	37.0	13.9	25.4	3.7	57	01/13	2	01/27	0.09	-0.32	22
Laramie Regional Airport	34.6	9.8	22.2	0.5	49	01/29+	-13	01/11	T*	-0.27	0
Rawlins Municipal Airport	31.3	11.5	21.4	-0.2	43	01/29	-6	01/11	0.54	0.18	150
Sheridan County Airport	41.2	16.7	29.0	5.2	66	01/13	1	01/24	0.46	-0.10	82

January 2021 Highlights

Monthly Rankings

Temperature in degrees Fahrenheit, Precipitation/Snowfall in inches

Warmest	Temperature / Ranking	Record / Year	Period of Record
Bismarck, ND	25.8 / 2nd warmest	26.8 / 2006	1874-2021
Mobridge, SD	28.9 / 2nd warmest	30.1 / 2006	1911-2021
Aberdeen, SD	25.1 / 4th warmest	27.1 / 2006	1893-2021
Grand Forks, ND	17.5 / 4th warmest	21.3 / 2006	1893-2021
Pierre, SD	28.9 / 4th warmest	35.1 / 2006	1933-2021
Huron, SD	25.6 / 5th warmest (tie)	31.0 / 2006	1881-2021
Valentine, NE	31.1 / 5th warmest	36.5 / 2006	1889-2021
Fargo, ND	19.3 / 6th warmest	23.5 / 2006	1881-2021
Sioux Falls, SD	25.7 / 9th warmest	31.1 / 2006	1893-2021
Wettest	Precipitation / Ranking	Record / Year	Period of Record
Wichita, KS	2.86 / 4th wettest	6.29 / 1949	1888-2021
Lincoln, NE	1.53 / 8th wettest	3.15 / 1949	1887-2021
Grand Island, NE	1.32 / 9th wettest	2.60 / 1932	1895-2021
Snowiest	Snowfall / Ranking	Record / Year	Period of Record
Lincoln, NE	18.9 / SNOWIEST	15.6 / 2011	1948-2021
Omaha, NE	16.0 / 9th snowiest	25.7 / 1936	1881-2021
Grand Island, NE	12.6 / 10th snowiest	26.0 / 1932	1895-2021

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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

Author Information

For questions, comments, or suggestions, please contact:
Natalie Umphlett, Regional Climatologist
(402) 472-6764 - numphlett2@unl.edu
711 Hardin Hall, 3310 Holdrege Street
Lincoln, NE 68583-0997
<http://hprcc.unl.edu>

