



December 2017 Climate Summary



The Legion Lake Fire burns thousands of acres in the Black Hills of South Dakota. Photo courtesy Darren Clabo
<http://hprcc.unl.edu>

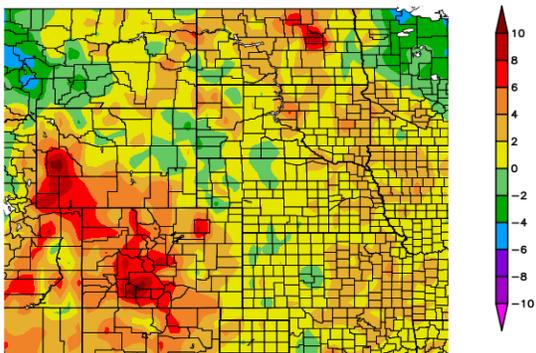
Widespread Dryness Leads to Drought Expansion

Precipitation was scarce throughout much of the High Plains during December, especially in Colorado and Kansas. Numerous locations had a top 10 driest December on record and these conditions were, in large part, a continuation of dryness since around mid-October. These dry conditions have contributed to widespread below-normal snowfall across the region, particularly in the Rockies of Colorado where the snowpack season was off to an abysmal start. A combination of these factors led to the expansion of abnormally dry conditions and drought during December, according to the U.S. Drought Monitor. While drought impacts tend to be minimal this time of year, dry soils and below-normal precipitation during winter often lead to impacts during the spring. The only state in the region that was spared from dry conditions was Wyoming, where above-normal precipitation continued to boost snowpack. As for temperatures, most of the region had normal to slightly above normal temperatures for December on the whole; however, early to mid-December was extremely warm while late December was extremely cold.

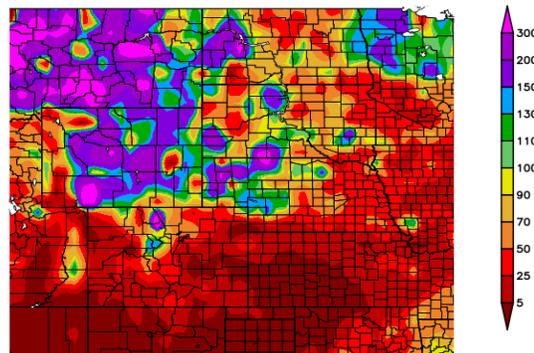
Warm, dry, and windy conditions also contributed to the spread of wildfires in December, which is outside the typical fire season in the High Plains. The most notable fire was the Legion Lake Fire, which burned over 54,000 acres and became the third largest on record in both the Black Hills and the state of South Dakota. The fire ravaged Custer State Park and threatened wildlife, such as bison, deer, and elk. The fire also damaged fences, trails, and roads, forcing the park to close temporarily to make repairs. According to Darren Clabo, South Dakota State Fire Meteorologist, the Legion Lake Fire behaved more like a summer fire in that there was high crown mortality and areas were burned beneath the overstory on the surface. Clabo stated that the ongoing drought in the area likely played a role in the large number of acres burned because heavier fuel types would have to be dry enough to burn, and that would only happen if there had been a prolonged period of precipitation deficits.

Temperature and Precipitation Overview

Departure from Normal Temperature (F)
12/1/2017 – 12/31/2017



Percent of Normal Precipitation (%)
12/1/2017 – 12/31/2017



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

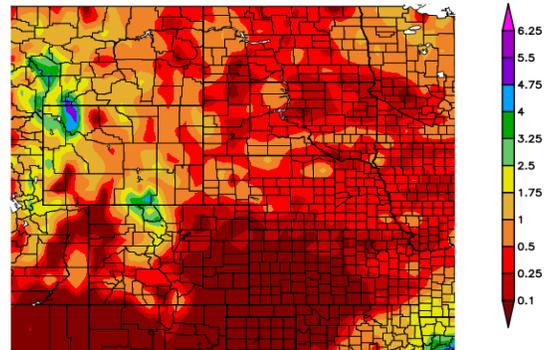
Dryness continued to prevail for much of the region to begin the winter season. A broad area that includes Colorado, Kansas, and eastern and central portions of the Dakotas and Nebraska received paltry amounts of precipitation during December. The driest area was southern and central Kansas, where precipitation was less than 5 percent of normal. For instance, only a trace of precipitation was recorded in Garden City, which tied several years for its driest December on record. Precipitation was also scarce across most of Colorado, where several locations had a top 10 driest December. On the other hand, wet conditions continued across Wyoming, with much of the state receiving greater than 150 percent of normal precipitation. In fact, Casper had its 2nd wettest and 6th snowiest December on record.

While a few snowstorms did occur in December, the High Plains region has been abnormally dry during the past few months, which has resulted in widespread below-normal snowfall. For instance, as of the end of December, Grand Junction, Colorado had only received 0.1 inches (0.3 cm) of snowfall this season, which was 7.3 inches (19 cm) below normal and the 2nd least snowiest July-December period on record (period of record 1893-2018). Other locations in Colorado are experiencing a similar “snow drought” as well. According to the Denver Post, the ski industry took a hit, as there was very little open terrain available for skiing due to exposed grass, and opening dates were pushed back. On the other hand, snowfall was plentiful in Wyoming and, according to CBS Denver, ski resort areas in Jackson Hole accumulated 100.0 inches (254 cm) of snow before opening day!

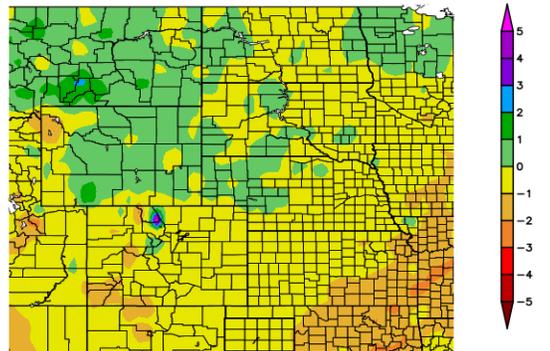
Perhaps what makes the widespread snowfall deficit more interesting is the fact that some areas of the Southeastern U.S. have received more snowfall so far this season than the High Plains! A rare snowstorm impacted parts of the Southeast in early December. For instance, Jackson, Mississippi received 5.1 inches (13 cm) of snowfall, while 4.0 inches (10 cm) of snow fell in Birmingham, Alabama. Jackson’s normal July-December snowfall is only 0.1 inches (0.3 cm), while Birmingham normally gets 0.3 inches (1 cm). Despite this peculiar snowfall pattern, it is important to point out that it is still very early in the snow season. A couple of large snowstorms could quickly erase the deficit in the High Plains, and there is plenty of time to catch up.

Regional Precipitation

Precipitation (in)
12/1/2017 – 12/31/2017



Departure from Normal Precipitation (in)
12/1/2017 – 12/31/2017



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

Mountain snowpack continued to be above normal in the Northern Rockies during December. According to the U.S. Army Corps of Engineers, Snow Water Equivalent (SWE) in the Missouri River Basin above Fort Peck Reservoir and between Fort Peck and Garrison Reservoirs was 118% and 134%, respectively, as of the end of December. Snowpack was still above normal in the Rockies of Wyoming, thanks to continued above-normal snowfall. However, snowpack was still faring poorly in Colorado, due to a continuation of abnormally warm and dry conditions into December. As for Plains snowpack, the northern portion of the region was covered in snow by the end of December because of a snowstorm that impacted the region toward the end of the month. However, the Colorado Plains and the southern two-thirds of Kansas were snow-free.

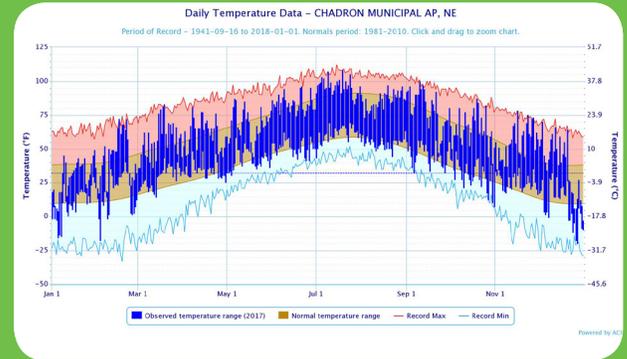
Temperatures

On the whole, December temperatures were near normal to slightly above normal throughout the majority of the High Plains. Departures were greatest across areas of Colorado and southern Wyoming, where temperatures were 3.0-8.0 degrees F (1.7-4.4 degrees C) above normal. Alamosa, Colorado had its 5th warmest December on record. However, areas that experienced near-normal temperatures for the month saw extremes on both ends of the spectrum, as temperatures were both well above and well below normal during December.

The first two-thirds of December yielded very warm temperatures across the region, averaging 10.0-20.0 degrees F (5.6-11.1 degrees C) above normal in most areas. These warm temperatures extended the fall season, which had both positive and negative impacts to agriculture. For instance, increased recreational tillage was observed, and extended fall grazing limited the need for hay during the early part of winter. However, the extension of warm soil temperatures increased the likelihood of leaching of the soil, as well as the loss of fall-applied nitrogen.

The temperature pattern changed dramatically during the last ten days of the month, as an Arctic front brought a frigid air mass that settled over the central and eastern U.S. for the remainder of the month. Temperature departures of 20.0-30.0 degrees F (11.1-16.7 degrees C) below normal combined with moderate wind speeds to create dangerous wind chills across much of the Northern Plains. Despite this impressive cold snap, it was not enough to sway monthly departures toward colder than normal in most locations.

Station Spotlight: Chadron, NE



Above: Daily temperatures along with extremes and normals values since January 1, 2017 in Chadron, NE.

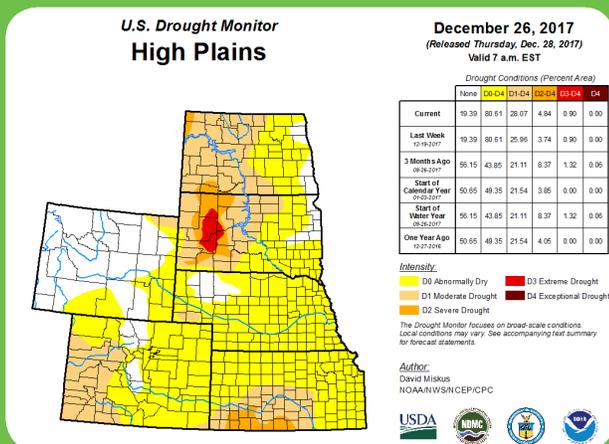
Drought Conditions

Dryness in November persisted into December across southern and eastern portions of the High Plains, which resulted in a wide expansion of abnormally dry conditions (D0) on the U.S. Drought Monitor map. The area depicted in dryness or drought (D0-D4) nearly doubled in December, from 41 percent at the end of November to 81 percent in late December. December precipitation was less than 50 percent of normal in areas where dryness spread.

Moderate drought (D1) expanded further into western Colorado. Above-normal temperatures and widespread dryness contributed to a continued lack of snowfall. In Kansas, drought expanded to encompass approximately one-third of the state, and persistent dryness since October in a portion of southern Kansas warranted the introduction of severe drought (D2) on the U.S. Drought Monitor map. October-December precipitation in this area of the state ranged from only 10-50 percent of normal.

Prolonged drought has contributed to some impacts this winter. For instance, livestock producers in North Dakota have reported a shortage of winter feed, so a hay lottery was established to help producers locate the feed that is needed for the winter. Also, drought likely played a role in the development and rapid movement of the Legion Lake Fire in South Dakota. More recently, the combination of abnormal dryness, the lack of snowfall, and above-normal temperatures followed by a cold snap may have caused winter crop damage, which will likely not be realized until spring.

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/>.

Climate Outlooks

According to the Climate Prediction Center, La Niña conditions are present in the Pacific and a La Niña Advisory is in effect. Equatorial sea surface temperatures are below average across the central and eastern Pacific Ocean. La Niña conditions are likely through the Northern Hemisphere winter 2017-18, with a transition to ENSO-neutral most likely during the mid-to-late spring. If you are looking for more information about La Niña, check out this briefing on how La Niña may impact the Missouri Basin this winter: <https://hprcc.unl.edu/pdf/LaNina-MOBasin-2017-Final.pdf>. Or, check out the ENSO blog here: <https://www.climate.gov/news-features/departments/8443/all>.

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

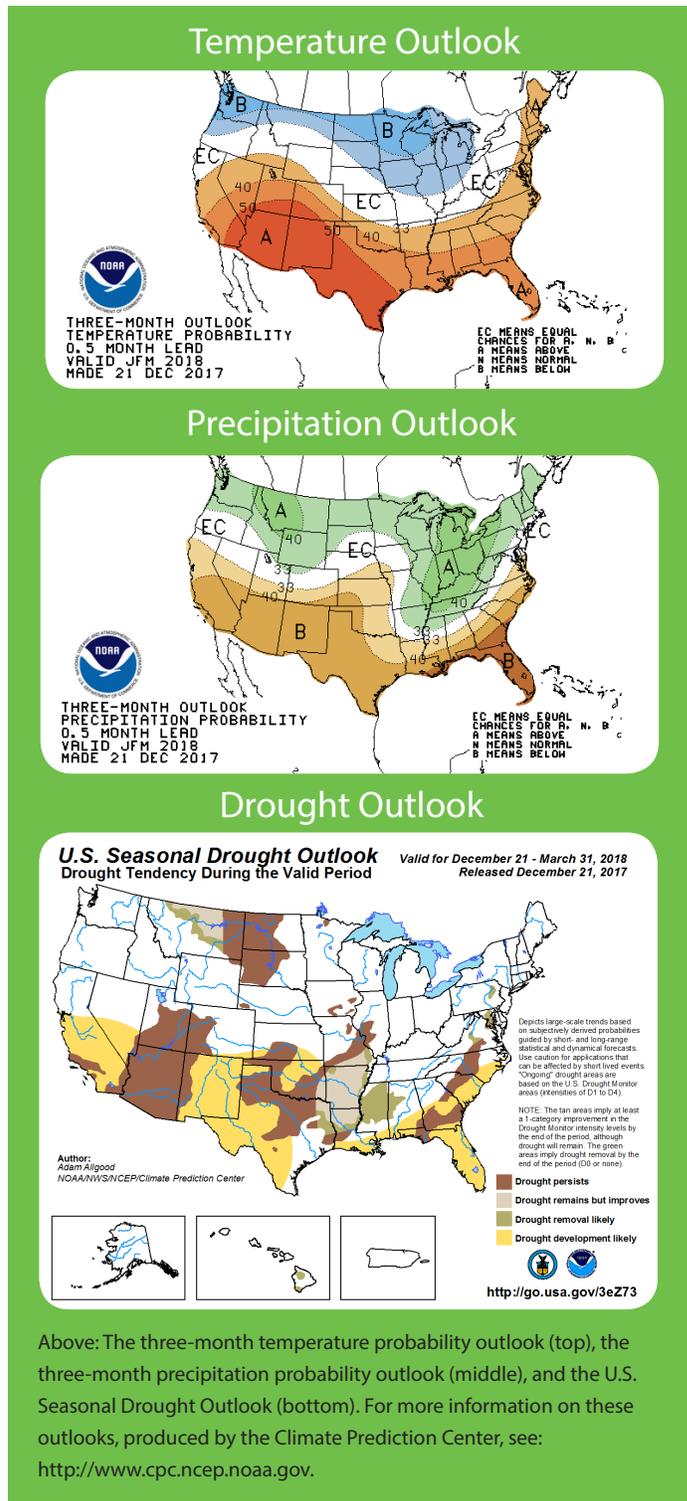
The January-March temperature outlook indicates an increased chance of above-normal temperatures for southern and eastern portions of the contiguous U.S. In the High Plains region, this includes southwestern Wyoming, much of Colorado, and southwestern Kansas. Below-normal temperatures are favored across the Pacific Northwest, Northern Plains, and Great Lakes regions, including North Dakota, central and eastern South Dakota, and northeastern Nebraska in the High Plains region. Elsewhere, there are equal chances for above-, below-, and near-normal temperatures during the January-March period.

Precipitation

The precipitation outlook for the next three months calls for a higher probability of above-normal precipitation in the Northern Rockies and Northern Plains, as well as the Ohio Valley and parts of the Northeast. In the High Plains region, this includes North Dakota, northern and western South Dakota, most of Wyoming, and northwestern parts of Colorado and Nebraska. Below-normal precipitation is expected throughout southern and central portions of the contiguous U.S., including Kansas, southern and eastern Colorado, and southern Nebraska. Elsewhere, there are equal chances for above-, below-, and near-normal precipitation in the contiguous U.S. during the January-March period.

Drought

The December 21st U.S. Seasonal Drought Outlook shows that drought is expected to persist across parts of the Southwest, the Plains, the Midwest, and the Southeast. In the High Plains, this includes the western Dakotas, northeastern Wyoming, the Nebraska Panhandle, western Colorado, and southern Kansas. Drought may improve or be removed in north-central Montana, the southern Plains, and parts of the East. Drought development is likely across much of the southern U.S. through March, which includes southern portions of Kansas and Colorado in the High 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	43.5	16.1	29.8	1.5	65	12/20	-3	12/24	0.02	-0.38	5
Alamosa San Luis Airport	47.0	3.9	25.5	7.6	63	12/30	-4	12/15	0.14	-0.21	40
Colorado Springs Municipal Airport	48.4	18.5	33.4	3.6	68	12/29	0	12/27	0.01	-0.33	3
Denver International Airport	48.3	18.0	33.2	3.2	69	12/12	-4	12/24	0.21	-0.14	60
Grand Junction Walker Field Airport	45.5	17.6	31.5	3.0	60	12/03+	10	12/24+	0.04	-0.55	7
Pueblo Memorial Airport	51.6	14.2	32.9	2.8	72	12/03	1	12/27	0.01	-0.37	3

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	42.1	20.4	31.2	1.2	68	12/03	-7	12/31+	0.13	-0.72	15
Dodge City Regional Airport	47.5	18.9	33.2	0.4	78	12/03	-5	12/31	T	-0.84	0
Goodland Renner Field	44.2	16.0	30.1	0.2	65	12/12	-4	12/24	0.09	-0.37	20
Topeka Municipal Airport	44.2	22.5	33.3	1.3	70	12/04	-4	12/31	0.31	-1.04	23
Wichita Mid-Continent Airport	48.1	25.4	36.7	2.9	67	12/11+	4	12/31	0.03	-1.17	3

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	37.8	8.7	23.3	-1.1	70	12/03	-20	12/27	0.01	-0.51	2
Grand Island Airport	37.3	16.0	26.6	-0.1	63	12/10	-17	12/26	0.45	-0.18	71
Lincoln Municipal Airport	38.9	16.8	27.9	1.1	63	12/04+	-17	12/27	0.38	-0.57	40
Norfolk Karl Stefan Airfield	35.0	14.1	24.6	0.3	58	12/03	-21	12/31	0.32	-0.43	43
North Platte Regional Airport	40.1	10.6	25.3	-0.1	65	12/10	-9	12/27+	0.55	0.14	134
Omaha Eppley Airport	37.1	17.6	27.4	1.4	63	12/04	-14	12/31	0.42	-0.62	40
Valentine Miller Field	36.5	13.9	25.2	1.4	63	12/02	-20	12/31	0.34	-0.03	92

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismarck Municipal Airport	29.7	9.5	19.6	3.4	56	12/01	-27	12/31	0.42	-0.07	86
Fargo International Airport	22.9	4.7	13.8	-0.3	49	12/02	-24	12/31	0.77	-0.06	93
Grand Forks International Airport	20.5	2.3	11.4	-0.1	44	12/02	-25	12/31	0.77	0.16	126
Theodore Roosevelt Airport	27.0	7.6	17.3	-0.6	55	12/12	-31	12/31	0.13	-0.11	54
Williston International Airport	26.3	6.8	16.5	2.6	51	12/12	-31	12/31	0.54	-0.08	87

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>.

December 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	28.6	6.5	17.6	1.9	51	12/02	-32	12/31	0.35	-0.17	67
Huron Regional Airport	31.2	10.5	20.8	1.6	54	12/18	-31	12/31	0.50	-0.02	96
Pierre Regional Airport	33.5	13.5	23.5	1.8	58	12/10	-25	12/31	0.47*	-0.08	85
Rapid City Regional Airport	36.4	10.8	23.6	-1.3	64	12/10	-21	12/31+	0.27	-0.15	64
Sioux Falls Joe Foss Field Airport	30.3	11.9	21.1	1.9	56	12/02	-20	12/31	0.68	-0.01	99

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	33.0	12.1	22.5	-1.3	57	12/03	-18	12/31	1.37	0.88	280
Cheyenne Municipal Airport	42.3	17.3	29.8	2.1	61	12/12+	-2	12/26	0.48	-0.01	98
Lander Hunt Field Airport	33.8	10.2	22.0	1.3	56	12/03	-10	12/24	1.23	0.65	212
Laramie Regional Airport	38.2	12.7	25.4	4.3	56	12/12+	-16	12/22	0.23	-0.09	72
Rawlins Municipal Airport	36.2	15.6	25.9	4.4	51	12/03+	-8	12/24	0.04*	-0.39	9
Sheridan County Airport	35.5	11.9	23.7	0.8	70	12/12	-18	12/31	1.11	0.55	198

December 2017 Highlights

Monthly Rankings

Precipitation in inches, Temperature in degrees F

Wettest/Driest	Precipitation / Ranking	Record / Year	Period of Record
Casper, WY	1.37 / 2nd wettest	3.71 / 1982	1939-2018
Garden City, KS	T / DRIEST (tie, 1976+)	T / 1976+	1947-2018
Dodge City, KS	T / 2nd driest (tie, 1996+)	0.00 / 1889	1874-2018
Wichita, KS	0.03 / 2nd driest (tie, 1996+)	0.02 / 1950	1888-2018
Chadron, NE	0.01 / 3rd driest	T / 2010+	1941-2018
Akron, CO	0.02 / 4th driest (tie, 2015+)	T / 2001+	1937-2018
Grand Junction, CO	0.04 / 4th driest	T / 1900	1893-2018
Salina, KS	0.05 / 4th driest	T / 1976	1948-2018
Colorado Springs, CO	0.01 / 6th driest (tie, 1922)	T / 1995+	1894-2018
Pueblo, CO	0.01 / 9th driest (tie, 1980+)	T / 1995+	1888-2018
Warmest	Temperature / Ranking	Record / Year	Period of Record
Alamosa, CO	25.5 / 5th warmest	28.1 / 1980	1932-2018

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North Dakota Climate Summary

Adnan Akyuz - State Climatologist

North Dakota State Climate Office, North Dakota State University

For more information: www.ndsu.edu/ndsco or www.ndawn.ndsu.nodak.edu



Precipitation:

Based on the National Centers for Environmental Information (NCEI), the statewide total December precipitation was 0.44 inch, which was 0.15 inch greater than last month, 0.86 inch less than in December 2016 and 0.08 inch less than the 1981-2010 average, making it the 59th driest December in the 123-year period of record. It was the driest December since 2014. Below-average precipitation was observed commonly in central parts of the state, while above-normal precipitation was common in eastern and western parts of the state (Figure 1). The greatest monthly precipitation accumulation was 1.69 inches, recorded in Grand Forks, Grand Forks County. The greatest 24-hour precipitation was 1.15 inches, also recorded in Grand Forks, on Dec. 5. The greatest monthly snowfall accumulation was 15 inches, recorded in Grand Forks. The greatest 24-hour snowfall was 8 inches, also recorded in Grand Forks, on Dec. 5. Based on historical records, statewide December precipitation showed a slight positive long-term trend of 0.05 inch per century since 1895. The highest and the lowest December precipitation for the state ranged from 1.27 inches in 2008 to 0.05 inch in 1944.

Temperature:

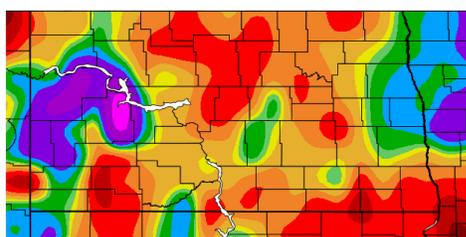
The official state average December temperature was 16.8 F, 9.7 F colder than last month, but 6.6 F warmer than December 2016, and 2.8 F warmer than the 1981-2010 average, making it the 42nd warmest December in the 123-year period of record. It was the warmest December since 2015. Below-average temperatures were observed commonly in eastern parts of the state. Elsewhere, warmer-than-average or near-average conditions were observed (Figure 2). The state's highest and lowest daily temperatures ranged from 59 F on Dec. 13 in Hettinger, Adams County, to minus 42 F on Dec. 31, also in Hettinger, yielding a staggering 101 F temperature gradient in less than 18 days. Based on the historical records, the state average December temperature showed a positive trend of 0.24 F per decade since 1895. The highest and the lowest monthly state December average temperatures ranged from 25.4 F in 1939 to minus 3.2 F in 1927.

Drought and other notable impacts:

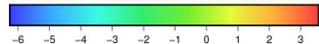
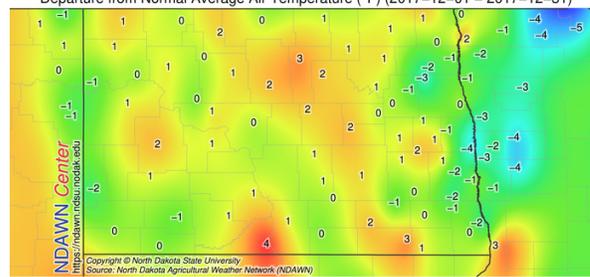
Dry conditions continued from the previous month. By the end of the month, the percent of the state experiencing drought was nearly 61, a 13 percent increase, compared with the previous month. Based on the DM map on Dec. 26, only 5 percent of the state was in severe drought (D2). NDAWN's highest peak gust in December was 49 mph, recorded at the Dazey weather station in Barnes County on Dec. 4, 2017. The NOAA Storm Report reported no significant storm events in December. Across the observation network of weather stations with at least 30 years of history, a total of 25 daily high-temperature-related and 41 daily low-temperature-related records were set or tied. A total of 16 highest daily precipitation-related records were set or tied.

Temperature and Precipitation Overview

Percent of Normal Precipitation (%)
12/1/2017 - 12/31/2017



Departure from Normal Average Air Temperature (°F) (2017-12-01 - 2017-12-31)



Above: Percent of normal precipitation (left, figure 1) and departure from normal average temperature (right, figure 2) for December 2017 in North Dakota. Figure 1 produced by the Applied Climate Information System, Figure 2 produced by NDAWN.

Kansas Climate Summary

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 Kansas Weather Data Library, Kansas State University
 For more information: www.ksre.ksu.edu/wdl



Roller Coaster Temperatures

December started on a very warm note, but ended in the deep freeze. The statewide average temperature was 32.9 oF, or 1.5 degrees warmer than normal. The very cold end wasn't enough to outweigh the very warm start to the month. The first three weeks of the month all averaged above normal, while the week ending January 2nd averaged 12 degrees cooler than normal. The western divisions came closest to normal, with the West Central Division averaging 30.8 oF, or 0.1 degrees warmer than normal. The eastern divisions had the greatest departures, with the Southeast Division averaging 36.8 oF, or 2.7 degrees warmer than normal. The warmest temperature reported for the month was 80 oF at Ashland, Clark County, on the 4th. The coldest reading was -11 oF at Baileyville, Nemaha County, on the 28th. Records were set on both the cold and warm end of the spectrum. On the cold side, there were 90 new record low maximum temperatures, but no new record low minimum temperatures. On the warm side, there were 33 new record high maximum temperatures and 31 new record high minimums.

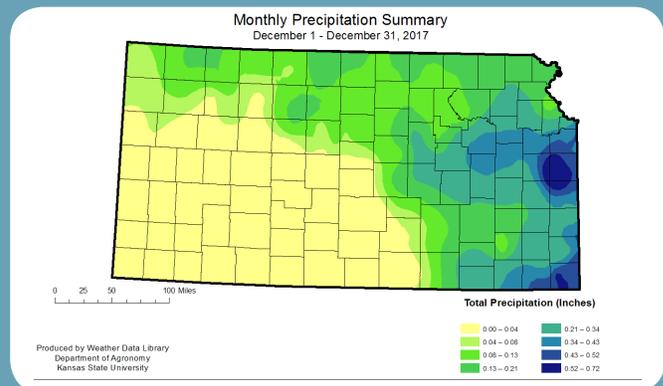
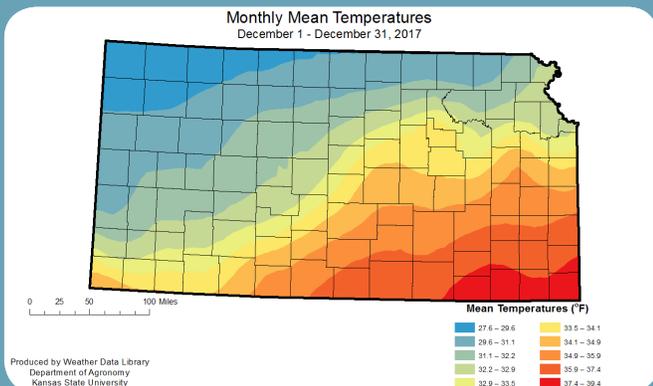
Moisture was limited in December. The statewide average precipitation was just 0.08 inches. That places it as the 4th driest December since 1895. December 1976 was the driest, when statewide average precipitation was just 0.05 inches. The Southwest and West Central Divisions tied for the driest division with average precipitation of zero. The South Central Division wasn't much better with an average of just 0.01 inches. The Southeastern Division was one of the wetter divisions with an average of 0.19 inches, but it had the greatest departure from normal at -1.63 inches. The greatest precipitation total for the month at a National Weather Service Cooperative (NWS) station was 0.57 inches at Lecompton, Douglas County. For the Community Collaborative Rain Hail and Snow network (CoCoRaHS) the greatest monthly total was 0.49 inches at Garland 2.7 SW, Bourbon County. The greatest 24-hour totals were 0.57 inches at Lecompton, Douglas County (NWS) and 0.49 inches at Garland 2.7 SW, Bourbon County (CoCoRaHS). Despite the dry weather, twelve stations still managed to set daily precipitation records during the month.

Not all of the precipitation came in the form of rainfall. Many locations in the northern half of the state recorded snowfall on the 24th and 26th of December. Eleven locations set daily records for snowfall. Multiple locations tied for the greatest daily snowfall at 2.5 inches on the 24th. The greatest snowfall report for the month was 4.3 inches at Norton Dam, Norton County.

Unsurprisingly, given the dry conditions, there were no severe weather reports during the month. There were several days with extreme fire danger, and also several days with wind chill warnings.

With much below normal precipitation and warmer than normal temperatures there was a steep increase in the drought conditions. Abnormally dry conditions now encompass the entire state, while the moderate drought area has increased to cover 24 percent of the state. Severe drought is also present, covering approximately 9 percent of the state. The January outlook has a slight chance for wetter than normal conditions in the eastern portion of the state, and equal chances for above or below normal precipitation in the rest of the state. Given the low amount of moisture that typically is seen in January, improvement in the current drought status is unlikely. With the wet summer and current dryness, increased fire danger is likely.

Temperature and Precipitation Overview



Above: December 2017 monthly mean temperatures (left) and total precipitation (right) in Kansas. Maps produced by Weather Data Library, Department of Agronomy, Kansas State University.

Nebraska Climate Summary

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For more information: <https://nsco.unl.edu/>



NEBRASKA STATE
CLIMATE OFFICE

A tale of two Decembers

Believe it or not, temperatures in Nebraska this December averaged mostly warmer than normal. We did begin the month on the warm side. Temperatures reached as high as 71°F (in Chadron on December 4th) and in the mid 60s to high 50s elsewhere. This was followed by a cold front passage and temperatures fell to more seasonable highs (30s). During the last 10 days of the month the furnace got turned off and temperatures plummeted. An Arctic airmass that settled into the eastern two thirds of the contiguous U.S. brought unseasonably cold weather. Many daily minimum temperature records were broken during the last week of 2017. Temperatures in the teens and even 20s below zero were reported throughout the state. Wind chill factors were in the -40 range. The lowest reported temperature for the month was -26°F at Spencer, in Boyd County just north of the Niobrara River.

Air temperatures took a dive late in the month, but what about soil temperatures? To start off 2018, the bare soil temperature at 4 inch depth was mostly below freezing, aside from a few locations with temperatures at 33 or 34°F. Locations without snow cover to insulate the ground reported temperatures in the low 20s.

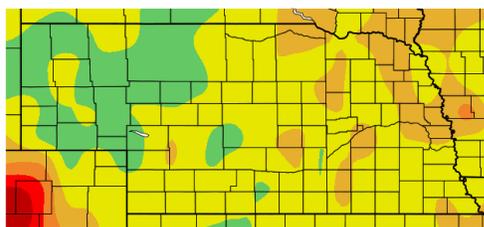
Both rain and snow fell this December around the state. Conditions were generally dry in the east and south with roughly a quarter inch of precipitation (liquid water equivalence). This amounts to about half an inch less than average. The month was generally wetter than normal in the west with a monthly amount that totaled about half an inch.

Snowfall amounts were highest in the west and lowest in the south and east. A few locations in the Panhandle reported more than 20 inches – 21 inches at Thedford and 24.1 inches at Brideport. Most locations reported in the 3 to 6 inch range for the monthly total. Snow cover blanketed much of the state to start of the new year.

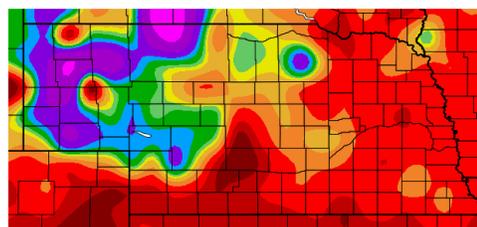
The general dryness in Nebraska since about mid-October has resulted in an expansion of the U.S. Drought Monitor D1 conditions (abnormal dryness). Nebraska went from 59% in D0 and 2% in D2 (moderate drought) at the beginning of December, to 88% in D0 at the start of January. The two pockets of moderate drought remained unchanged.

Temperature and Precipitation Overview

Departure from Normal Temperature (F)
12/1/2017 – 12/31/2017



Percent of Normal Precipitation (%)
12/1/2017 – 12/31/2017



Above: December 2017 departure from normal temperature (left) and percent of normal precipitation (right) in Nebraska. Maps produced by the Applied Climate Information System.

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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