



August 2017 Climate Summary



A stunning view from Grand Island, NE of the total solar eclipse that occurred August 21. - Photo by Jordan Husney.

<http://hprcc.unl.edu>

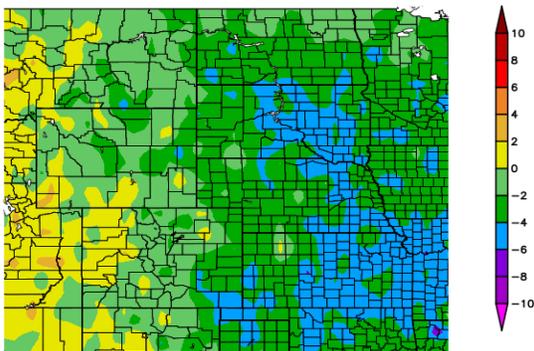
Cool Temperatures Cause Concern for Crops

The latter part of the summer turned cooler for much of the High Plains region, as August temperatures were largely below normal, particularly across the eastern part of the region. Several locations in Nebraska did not reach 90.0 degrees F (32.2 degrees C) the entire month, which is quite rare for the state. Many people enjoyed the welcomed break from the summertime heat; however, the cool temperatures have producers concerned about drying crops down for harvest and the risk of an early frost or freeze that would be especially detrimental to late-planted and replanted crops. As for precipitation, it was a mix of wet and dry conditions across the region. The excessive wetness throughout the Dakotas and Nebraska was particularly impactful, as heavy rains relieved drought conditions across these areas but caused flash flooding as well. As for the summer season, it was warm and dry across the majority of the High Plains with the exception of eastern parts of the region where summer temperatures were slightly below normal.

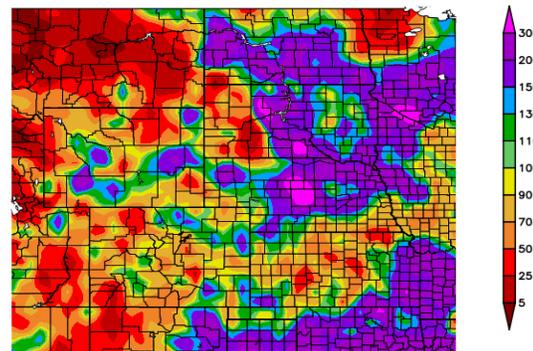
On August 21st, portions of the High Plains were treated to an extremely rare event - a total solar eclipse. This event drew an enormous amount of attention across the country, as total solar eclipses do not pass through the U.S. very often. Thousands of people traveled to the High Plains to witness this event, as the region was an attractive venue for viewing due to its low population and often clear skies. The path of totality passed through the heart of Wyoming and Nebraska, as well as extreme northeastern Kansas. Total solar eclipses impact the weather locally. The rapid decrease in solar radiation leads to a decrease in temperature, which in turn increases the relative humidity. Weather stations in the path of the eclipse captured these changes in the weather in the moments before, during, and after the eclipse. For instance, the air temperature decreased as much as 9.0 degrees F (5.0 degrees C) in the path of totality in western Wyoming. NOAA put together a website where you can learn more about how the eclipse impacted climate at the U.S. Climate Reference Network (USCRN) stations, which can be found here: <http://www.atdd.noaa.gov/crn-eclipse/>.

Temperature and Precipitation Overview

Departure from Normal Temperature (F)
8/1/2017 - 8/31/2017



Percent of Normal Precipitation (%)
8/1/2017 - 8/31/2017



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

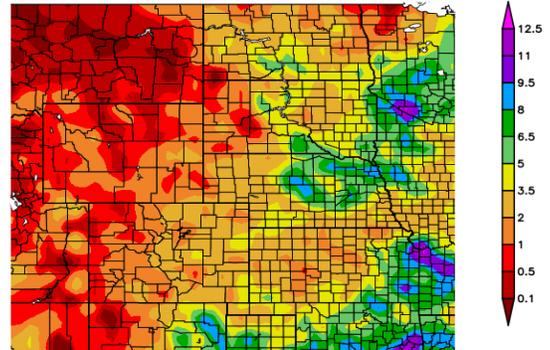
The precipitation pattern in August indicated mostly dry conditions in the western High Plains and across much of Kansas with wetter conditions to the east. While the dryness was not record-breaking, wet weather across parts of the Dakotas and Nebraska led to several locations having a top 10 wettest August on record, including Bismarck, ND (5th wettest), Williston, ND (6th wettest), Grand Island, NE (9th wettest), and Norfolk, NE (10th wettest).

The wettest region was northern and central Nebraska, an area where drought developed during the early part of the summer as a result of a lack of precipitation. Although the heavy precipitation essentially ended the drought, storms continuously pummeled the area during August and caused flash flooding, high winds, and damaging hail. Custer County, Nebraska, which includes the town of Broken Bow, was hit particularly hard with these storms. According to the Associate State Climatologist for Nebraska, three hail events occurred in the Broken Bow area on the 13th, 15th, and 19th, causing widespread hail damage to crops in the region. On the 15th, very heavy rain fell across the northwestern portion of Custer County and, according to CoCoRaHS reports, the area received approximately 4.00-7.00 inches (102-178 mm) of rain. By the end of August, parts of central Nebraska had received over 9.00 inches (229 mm) of rain, which is more than one-third of the region's normal annual precipitation. One concern that has come about as a result of recent wetness is the drying down of crops for harvest. Typically, crops are dried naturally in Nebraska due to expected low relative humidity values in the fall. However, with the extra moisture present, propane may need to be used for drying, which could lead to a shortage of supply and an increase in cost.

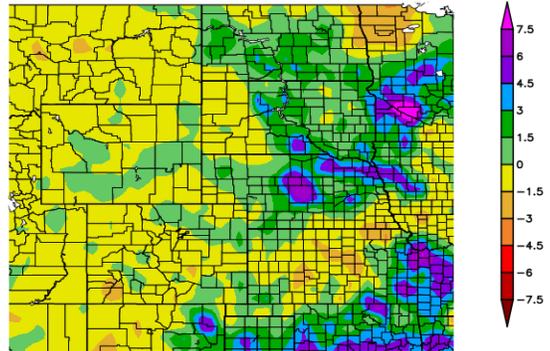
Looking at precipitation for the summer season, it was mostly a dry summer across the region. Salina, Kansas had its 4th driest summer on record, while Valentine, Nebraska and Minot, North Dakota had their 5th driest summers. Despite the presence of drought this summer across parts of the Dakotas, excessive precipitation in August brought up summer precipitation totals and prevented many locations from having record-breaking dryness for the season. Amidst the dryness, there were pockets of wetter conditions across central Nebraska, southeastern Colorado, and extreme eastern Kansas. For instance, Alamosa, Colorado had its 7th wettest summer on record.

Regional Precipitation

Precipitation (in)
8/1/2017 - 8/31/2017



Departure from Normal Precipitation (in)
8/1/2017 - 8/31/2017



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

Streamflow Update

Streamflow conditions varied widely across the High Plains region during August. Wet conditions in the Wind River Basin in Wyoming kept streamflows above normal, as they have been for most of the summer. The heavy precipitation that occurred across central Nebraska and extreme eastern Kansas significantly increased streamflow in these areas, and some streams were running very high. Flows were highest on the Elkhorn River and the Middle Loup River in Nebraska, and the Blue River in Kansas. Heavy rains brought drought relief to parts of the Dakotas and vastly improved streamflows across the area, with some streams actually running above normal for the time of year. However, prolonged dryness continued along the Kansas/Nebraska border and across northern Kansas, resulting in flows along several streams running below normal.

Temperatures

After a warm start to the summer season, the temperature pattern turned cooler in August, with much of the region experiencing below-normal temperatures. Temperatures ranged from near normal in the western High Plains to 4.0-6.0 degrees F (2.2-3.3 degrees C) below normal in the eastern High Plains. Several locations across South Dakota, Nebraska, and Kansas had a top 10 coolest August on record.

Nebraska was particularly cool, as the temperature did not reach 90.0 degrees F (32.2 degrees C) in August in Grand Island, Norfolk, or Lincoln. In fact, this was the first time on record that Grand Island and Norfolk did not reach the 90s in August, and both locations had their coolest maximum temperature on record for August. The maximum temperature was 89.0 degrees F (31.7 degrees C) on the 15th in Grand Island and 87.0 degrees F (30.6 degrees C) on the 1st in Norfolk. In Lincoln, the maximum temperature in August was 89.0 degrees F (31.7 degrees C) on the 15th, and August 1915 was the only other time on record that the temperature did not reach the 90s.

While many would welcome the break from summertime temperatures, the cooler August weather has negative implications for crops. For instance, Growing Degree Days (GDDs) accumulate less quickly during cooler weather, which slows the progress of crop growth and delays crops from reaching maturity. This is particularly a concern for late-planted and replanted crops because an early frost or freeze would be detrimental. With the trend of cooler temperatures continuing well into September, this issue is certainly worth keeping an eye on.

Drought Conditions

Thanks to cooler temperatures and heavy rainfall during the month of August, drought conditions eased in portions of the High Plains. According to the U.S. Drought Monitor, the area experiencing abnormally dry or drought conditions (D0-D4) decreased from approximately 62 percent to 50 percent, and only one quarter of the region was in drought (D1-D4) by the end of the month. Beneficial rainfall occurred across parts of the Dakotas and northern Nebraska where it was needed the most. These areas received greater than 200 percent of normal precipitation during August. The rainfall helped with the green up of pastures and improvement of soil moisture and row crop conditions.

U.S. Drought Monitor

**U.S. Drought Monitor
High Plains**

August 29, 2017
(Released Thursday, Aug. 31, 2017)
Valid 8 a.m. EDT

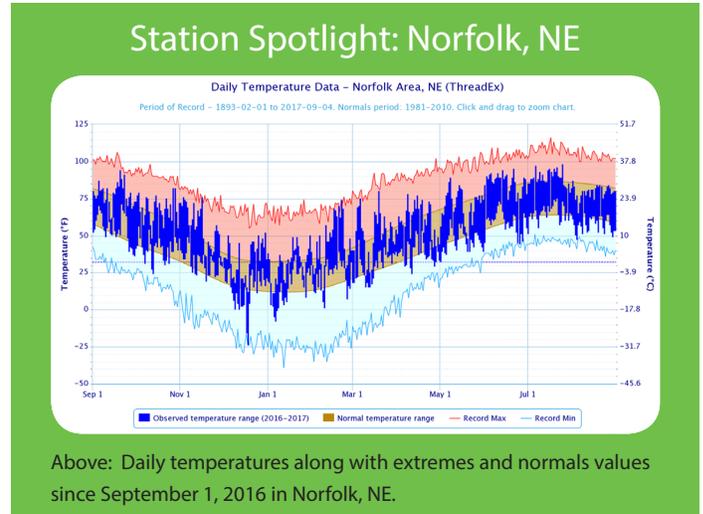
	Drought Conditions (Percent Area)				
	None	D0-D4	D1-D4	D2-D4	D3-D4
Current	50.05	49.95	25.09	13.64	4.91
Last Week (8/22/2017)	52.57	47.43	24.90	13.93	4.16
3 Month Ago (6/30/2017)	74.75	25.25	6.48	0.00	0.00
Start of Calendar Year (1/1/2017)	50.65	49.35	21.54	3.86	0.00
Start of Water Year (8/2/2016)	70.86	29.14	8.66	2.08	0.17
One Year Ago (8/30/2016)	67.61	32.39	12.02	3.87	0.72

Intensity:
■ D0 Abnormally Dry ■ D3 Extreme Drought
■ D1 Moderate Drought ■ D4 Exceptional Drought
■ D2 Severe Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Chris Fenimore
NCBI/NESDIS/NOAA

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/>.



However, other areas of the region missed out on the rainfall. For instance, central Kansas was dry this summer, receiving less than 70 percent of normal precipitation. As a result, moderate drought (D1) expanded in the area during August. Conditions also worsened in southwestern South Dakota, where extreme drought conditions (D3) expanded.

While on the periphery of the High Plains region, it is important to note that Montana has been dealing with impacts from the Northern Plains drought. Conditions worsened across the state in August, as it was very dry throughout most of the month. Most of the state's topsoil moisture continued to be short to very short, and over two-thirds of its pastureland was in poor to very poor condition. Dry lightning has sparked fires and burned thousands of acres, and the irrigation season ended early in some locations.

Climate Outlooks

According to the Climate Prediction Center, ENSO-neutral conditions are present in the Pacific. Equatorial sea surface temperatures are near average to below average across the central and eastern Pacific Ocean. ENSO-neutral conditions are favored in the Northern Hemisphere through winter 2017-18. If you are looking for more information about ENSO, check out the ENSO blog here: <https://www.climate.gov/news-features/department/8443/all>.

According to the National Weather Service, there is less than a 50 percent chance of long-range flooding throughout most of the High Plains region through November, with the exception of a few creeks in eastern Kansas. The National Interagency Fire Center has predicted above-normal wildland fire activity in parts of the western Dakotas through October. Wildland fire potential is expected to return to normal in this region in November and December. 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 September-November temperature outlook indicates an increased chance of above-normal temperatures for the entire contiguous U.S. In the High Plains region, a greater probability for above-normal temperatures exists throughout southwestern Wyoming and western Colorado. There are no regions in the contiguous U.S. that are predicted to have below-normal temperatures or an equal chance for above-, below-, or near-normal temperatures during the September-November period.

Precipitation

The precipitation outlook for the next three months calls for a higher probability of above-normal precipitation in the Southern Plains and the Southeast. In the High Plains region, this includes southeastern Kansas. There are no regions predicted to have below-normal precipitation in the contiguous U.S. during the September-November period. The remainder of the contiguous U.S. has equal chances for above-, below-, or near-normal precipitation.

Drought

The August 17th U.S. Seasonal Drought Outlook shows that drought is expected to persist across small portions of the Southwest and in the Northern Plains region, including much of Montana, a large portion of the Dakotas, and a small sliver of the Nebraska Panhandle. Drought may improve or be removed in portions of the Plains and eastern Maine. In the High Plains, this primarily includes eastern South Dakota, northern Nebraska, and central Kansas. Drought development is likely in western Montana, northern Idaho, and eastern Washington. Additional drought development is not expected in the High Plains region through November.

Temperature Outlook

Precipitation Outlook

Drought Outlook

U.S. Seasonal Drought Outlook Valid for August 17 - November 30, 2017
Drought Tendency During the Valid Period Released August 17, 2017

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short-lived events. *Ongoing* drought areas are based on the U.S. Drought Monitor areas (percentages of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

Author: Adam Algood
NOAA/NWS/NCEP/Climate Prediction Center

<http://go.usa.gov/3eZ73>

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	84.4	57.2	70.8	-1.3	94	08/19	52	08/18+	2.31	0.01	100
Alamosa San Luis Airport	79.2	44.5	61.9	-0.8	85	08/19	39	08/30+	0.73	-0.54	57
Colorado Springs Municipal Airport	80.4	56.2	68.3	-0.4	90	08/26+	52	08/31+	2.43	-0.91	73
Denver International Airport	85.7	57.3	71.5	-1.0	95	08/19	51	08/04	1.86	0.17	110
Grand Junction Walker Field Airport	91.8	61.9	76.9	1.4	98	08/29	54	08/16	0.37	-0.58	39
Pueblo Memorial Airport	87.9	57.0	72.4	-1.0	96	08/26+	51	08/25	0.55	-1.77	24

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	83.7	60.7	72.2	-4.9	94	08/20	51	08/23	3.39	0.25	108
Dodge City Regional Airport	88.2	61.9	75.1	-3.0	100	08/19	51	08/23	0.94	-1.81	34
Goodland Renner Field	83.5	58.3	70.9	-2.8	94	08/19	52	08/17	1.75	-0.95	65
Topeka Municipal Airport	84.1	61.8	73.0	-4.4	93	08/19	53	08/04	6.93	2.69	163
Wichita Mid-Continent Airport	87.4	65.5	76.4	-3.6	99	08/19	57	08/29+	2.20	-1.51	59

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	85.8	53.9	69.8	-2.4	97	08/19	44	08/22	1.91	0.33	121
Grand Island Airport	81.3	58.9	70.1	-3.9	89	08/15	48	08/04	6.19	3.07	198
Lincoln Municipal Airport	82.5	60.2	71.4	-3.9	89	08/15	50	08/04	3.38	-0.11	97
Norfolk Karl Stefan Airfield	79.4	57.0	68.2	-4.6	87	08/01	47	08/04	5.60	2.35	172
North Platte Regional Airport	84.3	56.3	70.3	-1.8	93	08/19	47	08/11+	3.60	1.31	157
Omaha Eppley Airport	83.1	62.0	72.5	-2.1	90	08/01	52	08/04	3.29	-0.53	86
Valentine Miller Field	85.4	56.9	71.1	-1.7	98	08/19	42	08/04	2.32	0.14	106

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismarck Municipal Airport	79.7	54.6	67.1	-2.4	88	08/31+	46	08/22	5.09	2.81	223
Fargo International Airport	78.3	55.3	66.8	-2.5	87	08/29	45	08/23	2.30	-0.26	90
Grand Forks International Airport	79.8	53.0	66.4	-0.7	89	08/29	45	08/23	1.16	-1.72	40
Theodore Roosevelt Airport	79.7	51.1	65.4	-3.0	92	08/29	41	08/22	2.13	0.59	138
Williston International Airport	82.5	53.2	67.9	-1.0	97	08/29	40	08/22	3.73	2.28	257

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>.

August 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	78.5	53.4	66.0	-3.0	86	08/01	42	08/23+	2.69	0.26	111
Huron Regional Airport	79.2	55.8	67.5	-4.1	86	08/01	46	08/22+	1.78	-0.65	73
Pierre Regional Airport	81.9	56.2	69.0	-4.7	93	08/19	46	08/04	3.12	1.32	173
Rapid City Regional Airport	83.7	53.7	68.7	-2.8	95	08/19	47	08/22+	2.07	0.51	133
Sioux Falls Joe Foss Field Airport	78.6	57.6	68.1	-2.5	89	08/01	48	08/04	5.42	2.37	178

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	84.8	49.9	67.3	-1.7	93	08/29+	44	08/22+	0.94	0.09	111
Cheyenne Municipal Airport	80.5	53.4	67.0	-0.6	89	08/19+	49	08/18	2.11	0.16	108
Lander Hunt Field Airport	*	*	*	*	*	*	*	*	*	*	*
Laramie Regional Airport	77.9	45.3	61.6	-0.7	86	08/04	41	08/28	1.51	0.28	123
Rawlins Municipal Airport	82.3	49.3	65.8	0.6	90	08/29	43	08/18+	0.80	0.04	105
Sheridan County Airport	85.3	49.4	67.3	-1.7	97	08/28	42	08/07	0.43	-0.29	60

August 2017 Highlights

Monthly Rankings

Precipitation in inches, Temperature in degrees F

Coollest	Temperature / Ranking	Record / Year	Period of Record
Pierre, SD	69.0 / 2nd coolest	67.0 / 1992	1933-2017
Norfolk, NE	68.2 / 4th coolest	67.4 / 1927	1894-2017
Concordia, KS	72.2 / 6th coolest	70.1 / 1915	1885-2017
Grand Island, NE	70.1 / 7th coolest	68.9 / 1915	1896-2017
Aberdeen, SD	66.0 / 10th coolest	63.4 / 2004	1893-2017
Lincoln, NE	71.4 / 10th coolest (tie, 1891)	67.9 / 1915	1887-2017
Wettest	Precipitation / Ranking	Record / Year	Period of Record
Bismarck, ND	5.09 / 5th wettest	9.29 / 1998	1875-2017
Williston, ND	3.73 / 6th wettest	5.06 / 1947	1894-2017
Grand Island, NE	6.19 / 9th wettest	8.73 / 1977	1896-2017
Norfolk, NE	5.60 / 10th wettest	8.27 / 1923	1893-2017

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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 August precipitation was 2.85", 1.57" wetter than last month, 0.44" more than the last year, and 0.76" more than the 1981-2010 average, making it the 21st wettest August in the 123-year period of record. It was the wettest August since 2006, and the first wetter than normal month since February 2017. Below-average precipitation was common in the northern valley, northwest ND, and southwest ND. Above-to-near-normal conditions were observed elsewhere (Figure 1). The greatest monthly precipitation accumulation was 6.04" recorded in New Salem, Morton County. The greatest 24-hr precipitation was 3.62" recorded in Ellendale, Dickey County on August 12. Based on historical records, statewide August precipitation showed a slight positive long-term trend of 0.08" per century since 1895. The highest and the lowest August precipitation for the state ranged from 4.54" in 1900 to 0.73" in 1929.

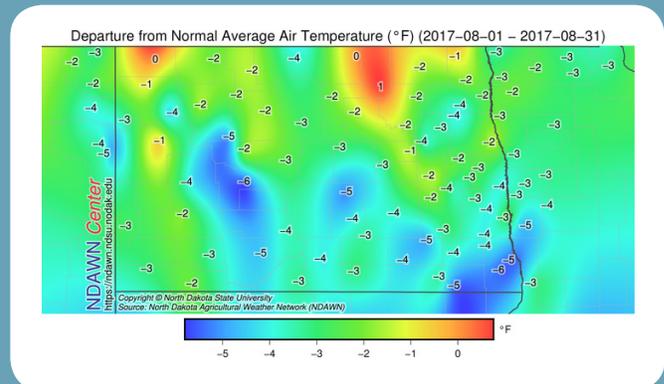
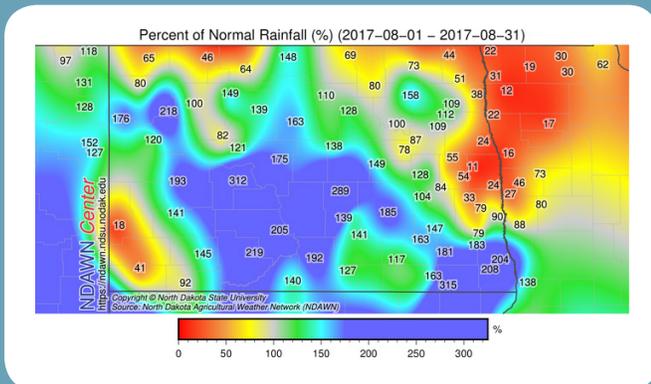
Temperature:

The official state average August temperature was 65.4°F, 6.7° colder than last month, 2.6° colder than the last year, and 2.2° colder than the 1981-2010 average, making it the 40th coldest August in the 123-year period of record. It was the coldest August since 2009. Below-average temperatures were observed commonly in all parts of the state with the greatest departure from average conditions being observed in the central and southeastern parts of the state (Fig. 2). The state's highest and lowest daily temperatures ranged from 98° on August 1 in Hettinger, Adams County to 38° on August 22 in Hettinger, Adams County giving a 60° temperature range in 22 days. Based on the historical records, the state average August temperature showed a positive trend of 0.2°F per decade since 1895. The highest and the lowest monthly state August average temperatures ranged from 73.8° in 1983 to 61.2° in 1977.

Drought and other notable impacts:

Changing precipitation patterns in most drought stricken areas improved conditions. Even nearly 100% of the state still experienced some kind of dryness, the exceptional drought conditions were reduced significantly by the end of the month. Although the rains greened pastures and row crops, limited growth and volume prevented further improvement of the drought conditions. Cooler and wetter than normal conditions also eased the fire danger across the region. However, expanding exceptional drought coverage and much-warmer than normal conditions in western Montana caused a continuation of forest fires, reducing air quality in the western and central parts of North Dakota. Based on the DM map on August 29, only a less than 1% of the state was in Exceptional Drought (D4), 21% of the state was in Extreme Drought (D3), 29% of the state was in Severe Drought (D2), 15% of the state was in Moderate Drought (D1), and the rest of the state was in abnormally dry conditions (D0). Even though the majority of the state received an above-average rainfall throughout August, the southwest and northwestern parts of the state missed most August precipitation exacerbating the drought conditions in these areas. Even though the moisture was limited, it was welcomed by the area producers. However, the precipitation only helped the topsoil leaving the subsoil parched. Since the soil was dry, any additional precipitation immediately soaked into the soil with no surface drainage into dugouts.

Temperature and Precipitation Overview



Above: Percent of normal precipitation (left, figure 1) and departure from normal average temperature (right, figure 2) for August 2017 in North Dakota. Both figures produced by NDAWN.

Kansas Climate Summary

Mary Knapp - Service Climatologist
Kansas Weather Data Library, Kansas State University
For more information: www.ksre.ksu.edu/wdl



Cool

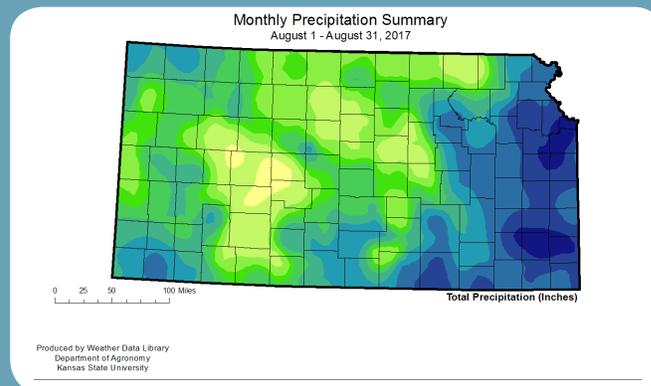
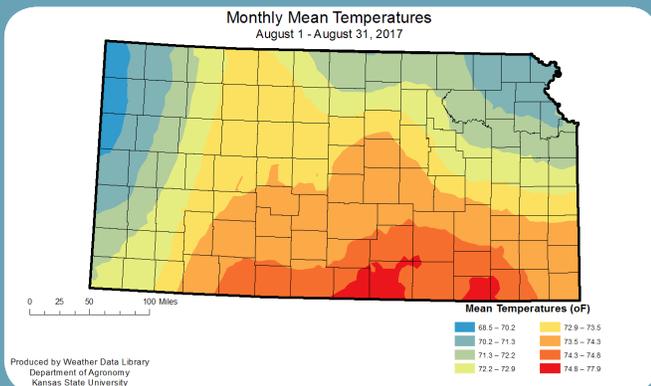
The most notable weather feature for August was the cooler than normal temperatures. The state-wide average temperature was 72.7 oF, which is a -4.4 degree departure from normal. All divisions were in the cooler than normal range. The Northwest Division was closest to normal with an average temperature of 71.1 oF, or -3.6 degrees from normal. The East Central Division had the greatest departure; the average for that division was 72.1 oF which resulted in a departure of -5.0 degrees. Only the three eastern divisions failed to break the 100 degree mark. The warmest reading was 104 oF, reported at Larned #2, Pawnee County, on the 21st. The coldest reading was 43 oF, reported at Brewster 4W, Thomas County, on the 28th. Not surprisingly, there were no new record high maximum temperatures and only three new record high minimum temperatures. On the other hand, there were 49 new record low daily maximum temperatures and 16 new record low minimum temperatures. None of the temperature records were records for the month.

August had closer to normal precipitation than July, but was skewed heavily to the east. State-wide precipitation averaged 3.46 inches which was 104 percent of normal. All three eastern divisions plus the South Central division averaged at or above normal for the month. The Central and West Central divisions tied for the lowest percent of normal at 60 percent each. For the Central Division that meant an average of 2.51 inches or a departure of -1.42 inches. For the West Central that was an average of 1.56 inches with a departure of -1.05 inches. The greatest daily precipitation total reported at a National Weather Service Coop (NWS) station was 8.85 inches at Hillsdale Lake, Miami County, on the 22nd. The greatest daily total reported at a Community Collaborative Rain Hail and Snow network station (CoCoRaHS) was 8.30 inches at Wellsville 3.6 NNW, Douglas County, also on the 22nd. The monthly extremes for both networks: 12.52 inches at Erie, Neosho County (NWS) and 13.00 inches at Overland Park 1.7 NE, Johnson County (CoCoRaHS).

Severe weather was again limited this month, with most of the events in the form of hail and high winds. There was one reported tornado, which is less than the 1950-2016 average of 3 tornadoes in August. In addition to the tornado, there were 56 hail reports, and 63 high wind reports. The most damaging event of the month was the flooding in Eastern Kansas, following the heavy rains on the 5th and 6th of August. Flooding was reported along several local streams, including areas that had been flooded at the end of July.

The near normal precipitation coupled with cooler than normal temperatures limited the expansion of the abnormally dry condition. However, areas of the state with much lower than normal precipitation had an expansion of moderate drought. The September outlook calls for drier than normal conditions state-wide. This is coupled with increased chances of below normal temperatures in the eastern half of the state, with equal chances of above or below normal temperatures across the rest of the state. The much cooler than normal temperatures that have started the month will reduce some of the evaporative demand. Extended dry weather, however, will result in further intensification of the drought.

Temperature and Precipitation Overview



Above: August 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/>



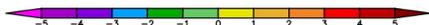
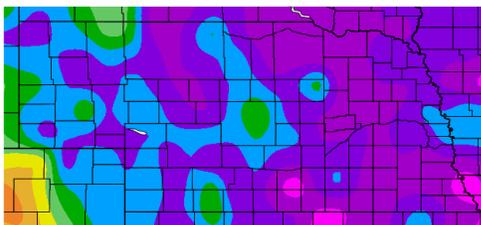
Nebraskans experienced a cool end to the summer months with August temperatures that were as much as five degrees below normal. The coolest weather overall was in the east, while temperatures were only slightly cooler than normal in the west. Nebraska Mesonet observations recorded a high for the month of 99°F at McCook on the afternoon of the 19th. There were no triple digit temperatures reported by National Weather Service observing stations. Hot weather seemed to be missing from eastern portions of the state as the mercury never even reached 90°F at Norfolk, Lincoln, Grand Island and elsewhere. For Lincoln, it was 1915 the last time this occurred. The lack of a 90 degree temperature at Norfolk and Grand Island has not happened in recorded history.

Much of the state received above normal monthly precipitation. The strongest positive departures were seen in central and north-east portions of Nebraska with monthly totals that were three inches above normal, or about seven inches or greater for August. Localized convective precipitation impacted these and other areas of the state. Some of the highest daily rainfall amounts for National Weather Service and NERain networks were five inches or more. The Nebraska Mesonet weather network reported a 4.29 inch daily rain event at Wausa 2SW on August 15th. This station reported a monthly total of 10.49 inches of rain. There were a handful of storm reports this August. The 7th, 15th and 19th all reported tornadic activity in southwest and central Nebraska.

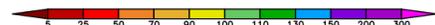
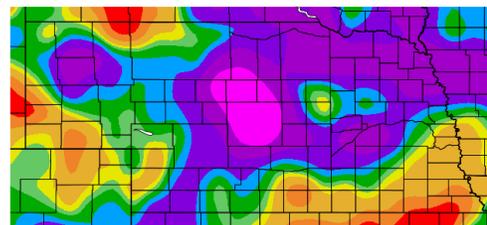
Portions of the northern and southern Panhandle, southwest, and a large swath in the southeast were all drier than normal for August. These areas missed out on convective rain events moving across the state. With the above normal rainfall and lack of excessive heat for portions of the state, dryness and drought conditions saw an overall improvement, according to the U.S. Drought Monitor. At the start August, the worst conditions were in northcentral and northeast Nebraska with D2 (severe drought) covering 6% of the state. This D2 area was eliminated by month's end and improved to at least a D1. A removal of D1 occurred in some east-central counties and a one-category improvement was made for a large swath of the state. By the start of September, 12% of the state was in D1, 45% in D0, and 42% in the clear. The areas to watch in terms of dryness currently include the far southeast, southwest, southern Panhandle and northcentral to northeast.

Temperature and Precipitation Overview

Departure from Normal Temperature (F)
8/1/2017 - 8/31/2017



Percent of Normal Precipitation (%)
8/1/2017 - 8/31/2017



Above: August 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

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 - Impact for September - November 2014

Regional - Climate Overview for September - November 2014

Temperature and Precipitation Anomalies

Drought CI

Regional - Outlook for January - March 2015

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

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