



September 2017 Climate Summary

Butterflies migrated in large numbers across the Plains during September. - Photo by Natalie Umphlett
<http://hprcc.unl.edu>

Heavy Rains Improve Drought Conditions

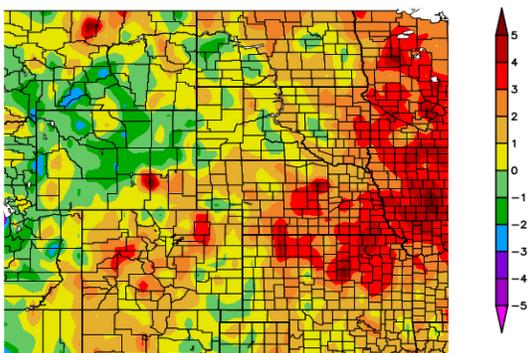
Widespread rainfall across a large portion of the High Plains brought welcomed relief to drought-stricken areas during September. In drought-stricken areas of western North Dakota and eastern Montana, September precipitation ranged from 150-300 percent of normal. As a result, pasture conditions improved and water supplies were replenished, but the rainfall came too late in the season to vastly improve row crop conditions. However, soil moisture improved across much of the region. This is particularly important going into winter as this will help ensure an ample supply during the spring. Heavy rains fell throughout parts of Colorado, South Dakota, Nebraska, and Kansas as well, with some locations having a top 10 wettest September on record. Temperatures were also rather warm, particularly in the eastern High Plains, with departures of up to nearly 5.0 degrees F (2.8 degrees C) above normal. Locations in Wyoming, Colorado, and the Nebraska Panhandle saw their first freeze of the fall season in September.

Drought conditions across Montana sparked many wildfires this year and burned over 1 million acres. The upper-level winds transported smoke from these fires eastward and southward. The smoke was so thick over Labor Day weekend, it traveled all the way to Paris, France! The smoke reduced solar radiation and visibility and created several air quality alert days. There is even speculation that smoke might have damaged dry beans in Wyoming.

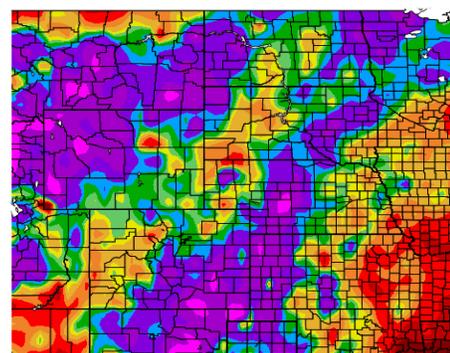
Steady winter and early spring rains across California and northern Mexico sparked an interesting phenomenon in the High Plains - a bloom of butterflies migrating across the region! According to Nebraska Extension, the climate conditions in California and northern Mexico were ideal for butterfly reproduction this year. Monarch, sulfur, and painted lady butterflies migrated in large numbers across the Plains and Midwest during September, populating pollinator gardens and bringing enjoyment to butterfly lovers. However, painted lady butterfly larvae fed on soybean pods and caused damage to the crop in some areas.

Temperature and Precipitation Overview

Departure from Normal Temperature (F)
9/1/2017 - 9/30/2017



Percent of Normal Precipitation (%)
9/1/2017 - 9/30/2017



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

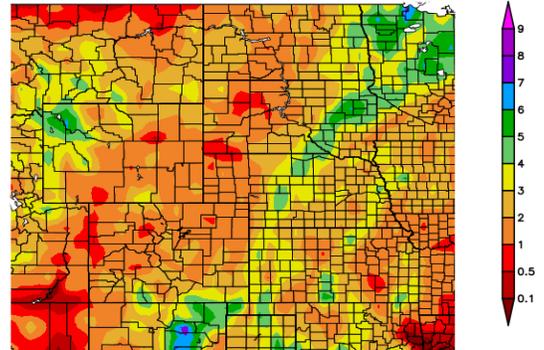
The majority of the High Plains experienced heavy rainfall during September. Two primary areas where above-normal precipitation occurred included an area from western Wyoming stretching northeastward through western North Dakota, as well as a swath from eastern Colorado northeastward through eastern North Dakota. These areas received approximately 150-300 percent of normal precipitation in September. The heavy rainfall resulted in several impressive records for September precipitation across Colorado, Kansas, Nebraska, and the Dakotas. Regions that missed out on the precipitation included an area from western Colorado northeastward through central North Dakota, and eastern portions of Nebraska and Kansas where less than 50 percent of normal precipitation occurred. However, the dryness was not record-breaking.

Although the severe weather season is winding down, some notable events occurred this month. For instance, on the 19th, a severe weather outbreak occurred in the eastern Dakotas and central Minnesota. Several tornadoes were reported, including an EF-1 tornado that crossed Spink County, South Dakota and caused structural damage to a farm. These storms also brought heavy rainfall that caused flooding in locations such as Watertown, South Dakota. According to the National Weather Service in Grand Forks, North Dakota, storm total rainfall was quite impressive. For example, 7.57 inches (192 mm) of rain was reported in Grandin, North Dakota!

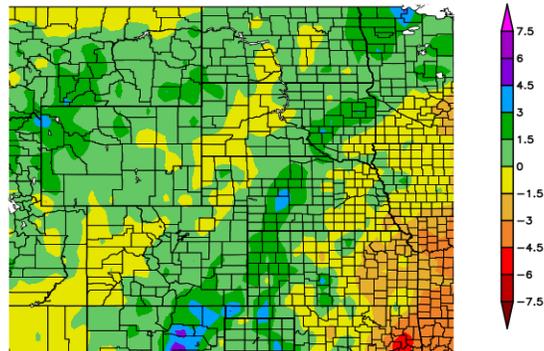
The wetness that was present throughout much of the region in September was both beneficial and problematic. For instance, heavy rain fell across many drought-stricken areas of the region, which provided welcomed relief from drought conditions. Although the damage has already been done to many crops, the rainfall helped green up pastures, replenish streams and reservoirs, and provide much-needed moisture in winter wheat growing areas. Soil moisture conditions also improved from the end of August to late September. The percent of topsoil moisture rated short to very short decreased from 54% to 32% in North Dakota, 45% to 37% in South Dakota, 36% to 23% in Nebraska, and 65% to 39% in Wyoming. However, there were drawbacks to the heavy precipitation. Dry weather is generally favored by producers this time of year, but periodic rainfall slowed down harvest. Additionally, white mold in soybeans was reported in parts of South Dakota and Nebraska.

Regional Precipitation

Precipitation (in)
9/1/2017 - 9/30/2017



Departure from Normal Precipitation (in)
9/1/2017 - 9/30/2017



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

Beneficial rainfall in September improved streamflows throughout the Dakotas and eastern Montana where drought has been present. Steady, soaking rains allowed streams to return to normal for this time of year. Much-above-normal streamflows could be found in areas where the heaviest precipitation occurred throughout the Missouri Basin in September, which included the Wind River region of Wyoming, central Colorado, eastern South Dakota, and central Nebraska. Meanwhile, drought persisted in the Missouri Basin headwaters in western Montana, so streamflows continued to be below normal. Streamflows declined rapidly in central and eastern Kansas in September, as this region has experienced several consecutive months of below-normal precipitation. The driest areas have only received 50 percent of normal precipitation, at best, since July.

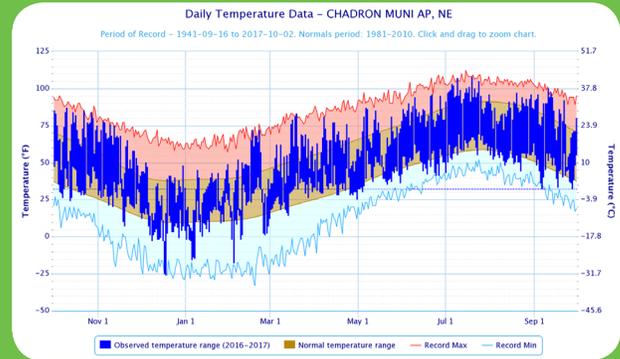
Temperatures

The fall season began quite warm across a large portion of the High Plains, with the southern and eastern parts of the region experiencing above-normal temperatures in September. While much of this area was at least 2.0 degrees F (1.1 degrees C) above normal, departures exceeding 4.0 degrees F (2.2 degrees C) above normal occurred in pockets of central and eastern Nebraska and Kansas. The warmth was not record-breaking across the region, however. One of the only locations that broke the top 10 records for warmest Septembers was Salina, Kansas, which had its 4th warmest September on record. Meanwhile, temperatures were near normal to slightly below normal throughout much of Wyoming and the central High Plains.

As we are now in a transition season, large temperature swings become rather common across the High Plains. Several locations reached into the low 100s during September, while others experienced their first freeze of the fall season. Chadron, Nebraska accomplished both during September! On the 6th, the low temperature reached 32.0 degrees F (0.0 degrees C), which was Chadron's earliest fall freeze on record. Then, four days later on the 10th, the temperature reached 100.0 degrees F (37.8 degrees C), which tied 2012 for the 2nd latest 100.0 degrees F (37.8 degrees C) temperature on record (provided it does not get that warm again this season).

Product update: Are you interested in tracking maximum and minimum temperatures? The HPRCC has expanded its suite of ACIS Climate Maps to include maximum and minimum temperatures over different time periods. Be sure to check them out here: <https://hprcc.unl.edu/maps.php?map=ACISClimateMaps>

Station Spotlight: Chadron, NE



Above: Daily temperatures along with extremes and normals values since October 1, 2016 in Chadron, NE.

Drought Conditions

Drought conditions continued to improve across the Northern Plains region in September, thanks to heavy rainfall across drought-stricken areas. The largest departures occurred across western North Dakota where much of the region received 150-200 percent of normal precipitation. Therefore, this region saw the greatest improvements in drought conditions, with some areas receiving a 2-class improvement on the U.S. Drought Monitor over the course of the month.

For instance, a large portion of extreme drought (D3) was removed from North Dakota, and severe drought (D2) conditions improved across the area as well. While not in the region, it is worth noting that eastern Montana experienced above-normal precipitation in September as well, leading to slight improvements in drought conditions. Although the rainfall was untimely for row crops such as corn and soybeans, September rainfall improved pasture conditions across the Northern Plains. The rain was welcomed by winter wheat producers who have already planted some of the crop, but it slowed down harvest of row crops.

U.S. Drought Monitor

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

September 26, 2017
(Released Thursday, Sep. 28, 2017)
Valid 8 a.m. EDT

	Drought Conditions (Percent Area)				
	None	D0-D4	D1-D4	D2-D4	D3-D4
Current	56.15	43.85	21.11	8.37	1.33
Last Week (9/19/2017)	43.98	56.02	28.58	10.93	1.33
3 Months Ago (06/27/2017)	56.10	43.90	10.27	11.26	3.79
Start of Calendar Year (01/01/2017)	50.65	49.35	21.54	3.95	0.00
Start of Water Year (06/01/2016)	70.96	29.14	8.66	2.68	0.17
One Year Ago (09/27/2016)	70.96	29.14	8.66	2.68	0.17

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 forest statements.

Author:
Brad Rippey
U.S. Department of Agriculture

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/>.

Elsewhere in the High Plains, drought conditions in Nebraska and Kansas improved, as a swath of heavy rain occurred across western and central portions of the two states. However, prolonged dryness in western Colorado prompted the expansion of abnormally dry conditions (D0) and the introduction of a small area of moderate drought (D1) to western Colorado, extending west into eastern Utah. This area should be monitored for drought expansion if ample precipitation does not occur in October.

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. There is an increasing chance of La Niña conditions in the Northern Hemisphere during fall and winter 2017-18. A La Niña Watch is in effect. If you are looking for more information about La Niña, check out the ENSO blog here: <https://www.climate.gov/news-features/department/8443/all>.

The National Interagency Fire Center has predicted above-normal wildland fire activity in parts of the western Dakotas through October, but wildland fire potential is expected to return to normal in this region through January. 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

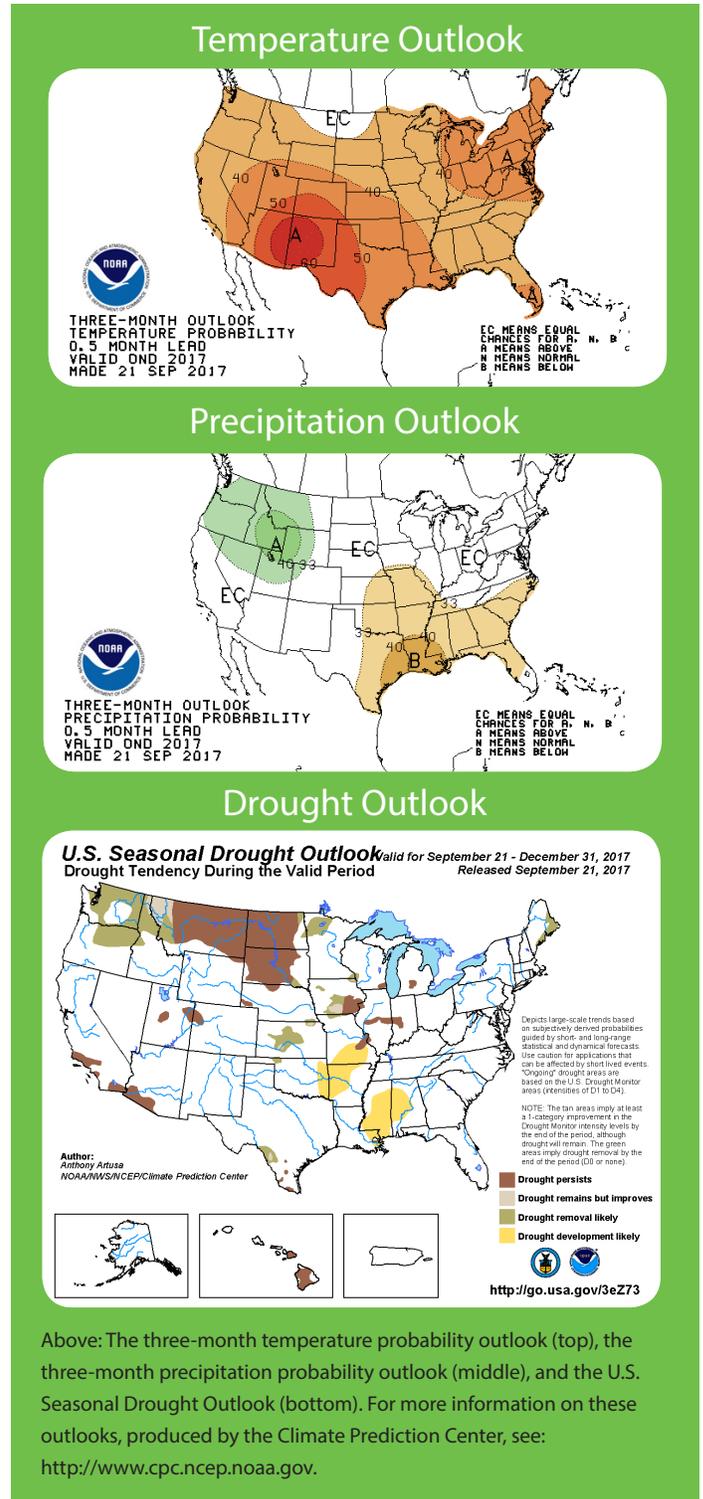
The October-December temperature outlook indicates an increased chance of above-normal temperatures for most of the contiguous U.S. This includes the High Plains region with the exception of western and central North Dakota. A greater probability for above-normal temperatures exists across Colorado, much of Kansas, southern Wyoming, and southwestern Nebraska. There are no regions in the contiguous U.S. that are predicted to have below-normal temperatures during the October-December period.

Precipitation

The precipitation outlook for the next three months calls for a higher probability of above-normal precipitation in the Pacific Northwest and the northern Rockies. In the High Plains region, this includes western and central Wyoming and northwestern Colorado. Below-normal precipitation is expected throughout portions of the central Plains and the Southeast. This includes the eastern half of Kansas and extreme southeastern Nebraska in the High Plains. Elsewhere, there are equal chances for above-, below-, and near-normal precipitation in the contiguous U.S. during the October-December period.

Drought

The September 21st U.S. Seasonal Drought Outlook shows that drought is expected to persist across small portions of the Southwest and Midwest, as well as in the Northern Plains, 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 the Pacific Northwest and portions of the Plains and eastern Maine. In the High Plains, this primarily includes parts of the eastern Dakotas and central Kansas. Drought development is likely in areas of the Midwest, southern Plains, and Southeast. Additional drought development is not expected in the High Plains region through December.



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	78.5	50.3	64.4	1.4	99	09/03	37	09/26	1.29	0.13	111
Alamosa San Luis Airport	74.1	39.1	56.6	1.6	87	09/03	24	09/26	1.75	0.84	192
Colorado Springs Municipal Airport	75.6	51.1	63.4	2.5	95	09/03	40	09/20	2.77	1.58	233
Denver International Airport	79.0	51.3	65.1	1.7	97	09/03	40	09/20	1.26	0.30	131
Grand Junction Walker Field Airport	81.3	53.7	67.5	1.4	99	09/04	32	09/25	0.74	-0.45	62
Pueblo Memorial Airport	81.1	52.4	66.8	2.1	98	09/03	39	09/21	1.20	0.43	156

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	82.8	58.6	70.7	2.7	95	09/14	44	09/07+	5.25	2.34	180
Dodge City Regional Airport	85.9	58.1	72.0	2.8	101	09/21	45	09/06	1.54	-0.13	92
Goodland Renner Field	80.1	51.5	65.8	1.2	96	09/03	38	09/27	3.85	2.63	316
Topeka Municipal Airport	83.9	59.9	71.9	3.6	92	09/22+	46	09/07	1.78	-1.88	49
Wichita Mid-Continent Airport	86.2	61.3	73.8	2.8	98	09/21+	46	09/06	2.34	-0.80	75

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	79.9	45.0	62.4	1.4	100	09/10	32	09/27+	0.68	-1.05	39
Grand Island Airport	80.5	55.0	67.8	2.7	96	09/22	42	09/06	2.68	0.45	120
Lincoln Municipal Airport	82.8	57.8	70.3	4.3	97	09/22	43	09/06	1.85	-1.17	61
Norfolk Karl Stefan Airfield	78.6	53.2	65.9	2.1	94	09/22	39	09/06	2.08	-0.61	77
North Platte Regional Airport	80.5	50.6	65.6	3.3	98	09/03	34	09/06	4.75	3.34	337
Omaha Eppley Airport	82.3	59.0	70.6	4.9	96	09/14	47	09/29+	2.59	-0.09	97
Valentine Miller Field	80.1	50.2	65.1	2.8	101	09/03	37	09/27+	2.62	0.98	160

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismarck Municipal Airport	73.8	46.9	60.4	1.9	96	09/12	35	09/27	1.39	-0.20	87
Fargo International Airport	73.0	50.9	62.0	2.9	93	09/12	35	09/06	2.83	0.26	110
Grand Forks International Airport	71.9	48.2	60.0	3.1	94	09/12	34	09/29	4.45	2.40	217
Theodore Roosevelt Airport	71.8	44.1	58.0	0.8	98	09/12	34	09/17	2.83	1.36	193
Williston International Airport	71.2	45.3	58.3	1.6	94	09/09	33	09/17	1.83	0.77	173

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>.

September 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	75.0	48.5	61.8	2.9	93	09/12	33	09/17	1.89	-0.30	86
Huron Regional Airport	76.5	51.8	64.1	2.4	94	09/13+	37	09/06	5.97	3.51	243
Pierre Regional Airport	77.4	50.8	64.1	1.2	100	09/12	38	09/17	1.86	-0.01	99
Rapid City Regional Airport	75.6	46.7	61.1	0.3	97	09/03	33	09/17	1.14	-0.15	88
Sioux Falls Joe Foss Field Airport	76.4	53.8	65.1	3.8	91	09/22	41	09/27+	1.62	-1.15	58

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	72.7	41.7	57.2	-0.7	95	09/03	30	09/27	1.42	0.34	131
Cheyenne Municipal Airport	73.4	46.7	60.1	1.9	92	09/03	35	09/26	1.08	-0.40	73
Lander Hunt Field Airport	*	*	*	*	*	*	*	*	*	*	*
Laramie Regional Airport	69.6	38.8	54.2	0.9	87	09/03	25	09/26	0.99	-0.12	89
Rawlins Municipal Airport	69.9	41.5	55.7	0.3	88	09/03	27	09/26	1.20	0.23	124
Sheridan County Airport	72.4	42.1	57.3	-0.6	95	09/12	32	09/26+	1.89	0.46	132

September 2017 Highlights

Monthly Rankings

Precipitation in inches, Temperature in degrees F

Warmest	Temperature / Ranking	Record / Year	Period of Record
Salina, KS	75.1 / 4th warmest	76.9 / 1954	1948-2017
Wettest	Precipitation / Ranking	Record / Year	Period of Record
Huron, SD	5.97 / 3rd wettest	6.75 / 1901	1881-2017
Alamosa, CO	1.75 / 6th wettest	2.98 / 2013	1907-2017
Goodland, KS	3.85 / 8th wettest	6.49 / 2013	1895-2017
North Platte, NE	4.75 / 8th wettest	7.54 / 1942	1874-2017
Grand Forks, ND	4.45 / 11th wettest	6.77 / 1912	1893-2017
Colorado Springs, CO	2.77 / 11th wettest	5.91 / 2011	1895-2017
Concordia, KS	5.25 / 11th wettest	8.94 / 1946	1885-2017
Dickinson, ND	2.83 / 11th wettest (tie, 1981)	6.25 / 1977	1948-2017

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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 September precipitation was 2.42", 0.43" less than last month, 0.63" less than the last September, but 0.72" more than the 1981-2010 average, making it the 28th wettest September in the 123-year period of record. It was the wettest September since 2016. Above-average precipitation was observed commonly in all parts of the state, except for a few pockets in central ND where drier than normal conditions were observed (Figure 1). The greatest monthly precipitation accumulation was 8" recorded in Litchville, Barnes County. The greatest 24-hr precipitation was 5.07" recorded also in Litchville, Barnes County on September 20. Based on historical records, statewide September precipitation showed a slight positive long-term trend of 0.08" per century since 1895. The highest and the lowest September precipitation for the state ranged from 4.54" in 1900 to 0.73" in 1929.

Temperature:

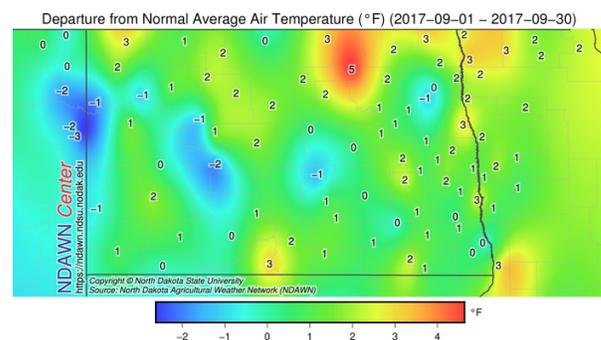
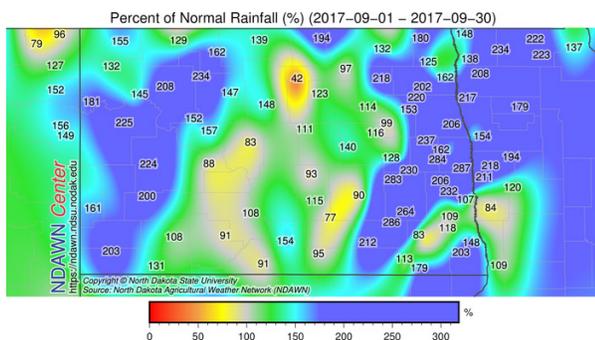
The official state average September temperature was 58.2°F, 7.2° colder than last month, 0.5° colder than the last September, but 1.3° warmer than the 1981-2010 average, making it the 40th warmest September in the 123-year period of record. It was the warmest September since 2016. Above-average temperatures were observed commonly in all parts of the state except for a few pockets where cooler than normal conditions were observed (Fig. 2). The state's highest and lowest daily temperatures ranged from 98° on September 12 in Minot, Ward County to 23° on September 23 in Medora, Billings County. Based on the historical records, the state average September temperature showed a positive trend of 0.2°F per decade since 1895. The highest and the lowest monthly state September average temperatures ranged from 63.5° in 1897 to 45.5° in 1965.

Drought and other notable impacts:

Changing precipitation patterns in August continued into September, making it the 18th wettest August through September period on record. Drought conditions improved mostly in the central and eastern parts of the state where 2-category improvements were implemented. By the end of the month, the percent of the state experiencing drought was reduced to 60%. Exceptional Drought conditions (D4) that first impacted the state on July 18, 2017, was removed by the end of the month. However, there are still parts of the state in the northwest feeling the lingering effects of Extreme Drought. Based on the DM map on October 3, only less than 2% of the state was in Extreme Drought (D3), 17% of the state was in Severe Drought (D2), and 40% of the state was in Moderate Drought (D1).

Significant rain all across the state was beneficial for livestock water supplies. However, it halted agricultural activities in areas with heavy precipitation. Livestock producers moved livestock to fall pastures. Producers in some counties such as Hettinger claimed the precipitation was not enough or not timely to change the conditions the county was under since March. Precipitation in other counties such as Pierce and LaMoure was beneficial but not enough to fill the sloughs. Drought in Pierce County impacted fishing due to the algae growth. Pastures in the far western counties are still showing stress due to overgrazing.

Temperature and Precipitation Overview



Above: Percent of normal precipitation (left, figure 1) and departure from normal average temperature (right, figure 2) for September 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



Split pattern

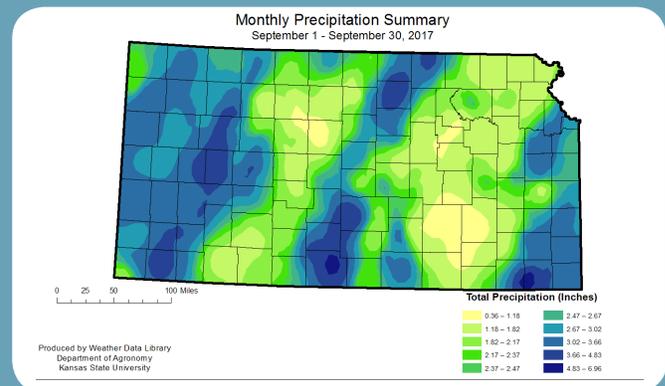
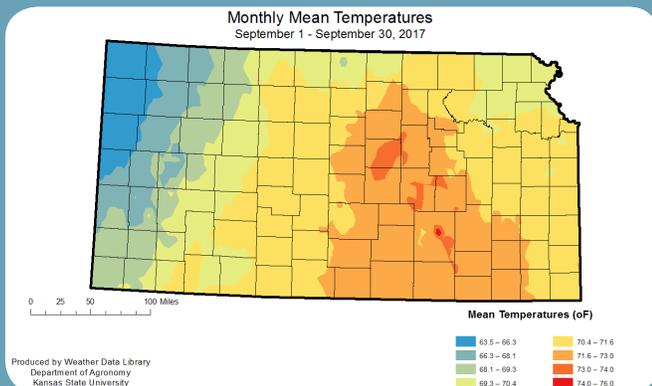
September saw a split pattern in the precipitation, with the heaviest rains in the western third of the state. All three western divisions saw more than 100 percent of normal, as did the South Central Division. None of the eastern divisions saw even half of their normal rainfall. This wasn't as much of a challenge in the East Central Division, which saw the only heavy precipitation in August. Statewide average precipitation was 2.09 inches or 94 percent of normal. Despite the overall low precipitation in the eastern third of the state, the greatest monthly total at a National Weather Service Coop (NWS) station was 6.79 inches at Mound Valley 3WSW, Labette County. The greatest monthly total at a Community Collaborative Rain Hail and Snow (CoCoRaHS) network station was 6.98 inches at Medicine Lodge 0.4 WSW, Barber County. The greatest daily totals for each network: 5.91 inches at Mound Valley 3WSW, Labette County, on the 19th (NWS); 6.40 inches at Preston 1.2 SE, Pratt County, on the 26th (CoCoRaHS).

Temperatures averaged warmer than normal across all divisions. With all the rain, it isn't surprising that the western divisions came closest to normal for the month. The Southwest Division averaged 68.9 oF, or just 0.3 degrees warmer than normal. In contrast, the Northeastern Division averaged 70.5 oF or 3.2 degrees warmer than normal. The warmest reading for the month was 102 oF recorded at multiple locations and dates. The latest of those at Alton 6ESE on the 22nd. The coldest reading was 30 oF reported at Brewster 4W, Thomas County on the 6th. Most of the departure from normal came on the low temperature side. There were 67 new daily records for warm minimum temperatures, and only 51 new daily records for high maximum temperatures. Despite the warmth, there were 26 new record cold minimum temperatures and 6 new record low maximum temperatures. None of these set new records for the month.

Severe weather was extremely limited this month. The Storm Prediction Center's storm data base only notes two hail events recorded in September, and no records of wind damage or tornadoes. The most damaging event of the month was the flooding in South Central, KS, following the heavy rains from the 25th through the 26th of September.

The variable precipitation coupled with warmer than normal temperatures resulted in expansion of the abnormally dry condition. Areas of the state with much lower than normal precipitation had an expansion of moderate drought. The October outlook calls for wetter than normal conditions from Southwest to North Central KS, with equal chances of above or below normal precipitation across the rest of the state. This is coupled with increased chances of above 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 and the rainy start will alleviate some of the drought.

Temperature and Precipitation Overview



Above: September 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

Martha Shulski - State Climatologist

Nebraska State Climate Office, University of Nebraska-Lincoln

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



NEBRASKA STATE
CLIMATE OFFICE

After a cooler than normal August, Nebraska ended September on the warm side overall. Temperatures were warmest in the eastern half of the state with monthly departures up to 3°F or greater. There were some cool spots in areas of the southern and northern panhandle, however, with monthly temperatures about a degree cooler than normal. A few locations in western Nebraska reached the freezing point during September. The furthest east was the Nebraska Mesonet site in the sandhills near Whitman and occurred on September 6th. A hard freeze of 28°F was reported at a few locations in the northern panhandle. The freeze was isolated and elevation driven, not a widespread event.

On the warm side, the Nebraska Mesonet station four miles northeast of McCook reported a high of 102°F on the afternoon of September 3rd. More than a dozen locations reached triple digit heat during the month, which was concentrated in the western half of the state.

Temperatures under bare ground gradually declined with seasonally cooling air temperatures. By month's end, temperatures were in the 50s in the west and 60s in the east.

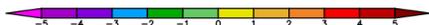
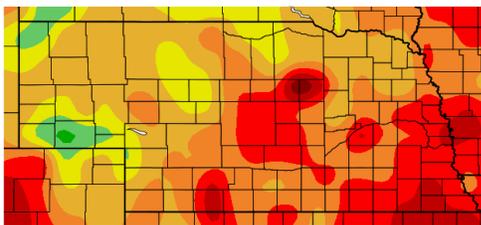
Portions of west-central and central Nebraska received more than 3 inches above normal for September. Monthly totals in these areas were in the four inch range. A few locations in central Nebraska received more than 6 inches of rain for the month. Another swath of heavier precipitation was in southeast to east central Nebraska. Areas that missed out include extreme southeast Nebraska, portions of east central, and from Lake McConaughy westward.

According to the National Agricultural Statistics Service, percent corn (12%) and soybean (19%) harvests were both below last year as well as the respective 5 year averages, as of October 1. Wheat planting (70%) and emergence (42%) were also below last year and the 5 year average.

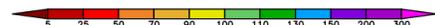
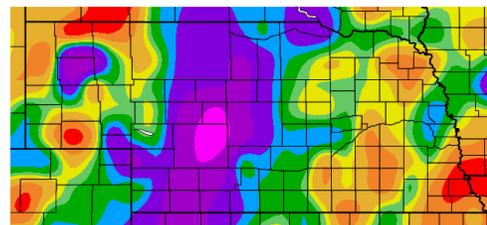
Thanks to above average rainfall amounts, abnormal dryness was removed for a large area of the state during the month. West central, northcentral, a pocket north of Omaha and a small area in the southeast all showed improvements, according to the U.S. Drought Monitor.

Temperature and Precipitation Overview

Departure from Normal Temperature (F)
9/1/2017 - 9/30/2017



Percent of Normal Precipitation (%)
9/1/2017 - 9/30/2017



Above: September 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

Author Information

For questions, comments, or suggestions, please contact:
 Crystal Stiles, Applied Climatologist
 (402) 472-8208 - cstiles3@unl.edu
 712 Hardin Hall, 3310 Holdrege Street
 Lincoln, NE 68583-0997
<http://hprcc.unl.edu>

