

CLIMATE UPDATE

A MONTHLY SUMMARY FROM THE NEBRASKA STATE CLIMATE OFFICE

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State dry and unusually warm in November

Introduction

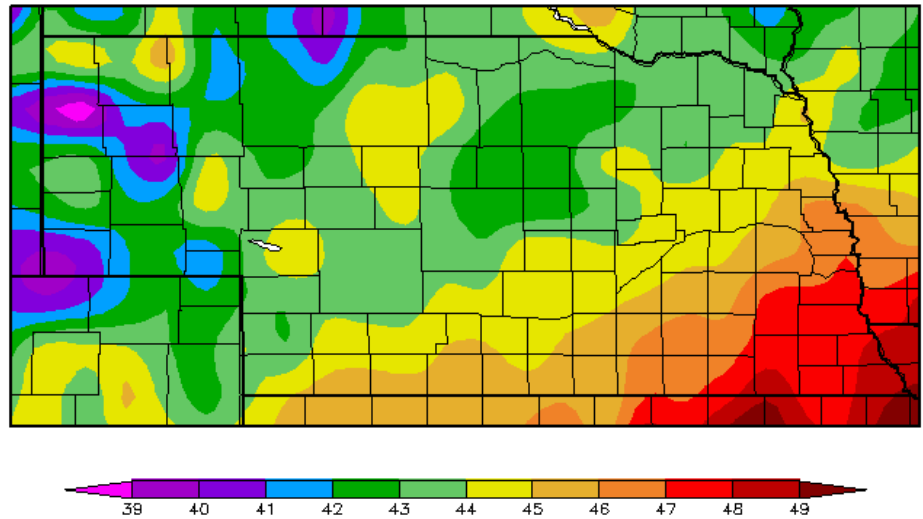
Unusually warm weather dominated the month of November as the northern jet streams failed to drive cold air outbreaks southward into the central Plains. This unusual warmth was widespread across the continental United States, as late summer to early fall temperatures dominated the month. Depending on your location in Nebraska, the number of days when temperatures were below normal ranged from one day in Omaha to four days in Scottsbluff.

The unusual warmth kept low temperatures consistently above the freezing mark during November. Omaha recorded only nine days of low temperatures reaching the 32 F or lower mark. The normal low temperatures at Omaha at the beginning of November were 36 F and 22 F on the last day of the month. Omaha's lowest temperature during the month was 23 F, recorded on both Nov. 18 and 19.

The unusual warmth led to concerns across western and southern Nebraska about whether wheat would have enough time to harden off and survive Arctic air outbreaks that occur with no significant snow cover. Across extreme southern Nebraska, several spring disease issues developed, and concern developed over whether these disease issues would reappear once wheat breaks dormancy next spring.

Precipitation during the month was hard to come by for the western third of the state. The entire region received less than 0.50 inches of moisture, which translated to percent of normal values of 25 percent to 50 percent of normal. A second area of less than 50 percent of normal moisture fell south and east of the line from Omaha to Columbus to Hastings. The only widespread area of above-normal moisture was located in an area bounded by Kearney, Grand Island, Broken Bow and Central City. A small area in the north-eastern corner of Nebraska also reported

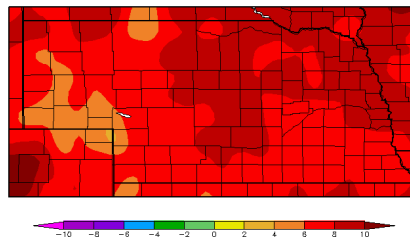
AVERAGE TEMPERATURE



HIGH PLAINS REGIONAL CLIMATE CENTER

Maps generated using provisional data for November 2016.

DEPARTURE FROM NORMAL TEMPERATURE



above-normal moisture.

The primary periods of active weather across the state were Nov. 7, 17-18, 22-24, 27, and 29-30. The two most active weather days during the month occurred on Nov. 24 and 27 and contributed in excess of 90 percent of the monthly liquid equivalent precipitation total for observation sites reporting November data.

Snowfall during November was limited to small portions of western Nebraska. A

Nov. 17 to 19 precipitation event produced a concentrated band of snow approximately two counties wide from southwest through northeast Nebraska. Snowfall was generally in the 1- to 3-inch range, but a narrow strip of 5 to 6 inches was reported in west-central Nebraska from Imperial to North Platte. The second snow event occurred on Nov. 29 to 30 in the extreme northern Panhandle and northwest Sandhills. Snow totals approached 5 inches in the Merriman area.

Temperatures

The first half of November saw an atmospheric pattern that was a continuation of conditions experienced during October. This pattern favored a trough extending from the Gulf of Alaska into the Pacific Northwest. The blocking high pressure over the southern Mississippi River valley continued and forced systems ejecting out

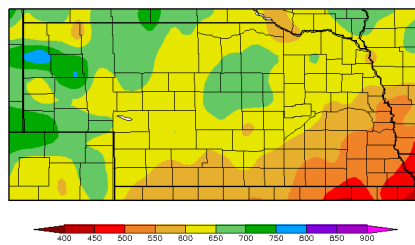
of the western U.S. into the western Great Lakes, which deflected surface lows north of Nebraska.

This pattern began to break down during the middle of the month and allowed the northern jet stream to push farther southward into the central Plains. Although the cooler air was welcome and aided in the development of several precipitation events, daily temperatures remained above normal for most of the period. For the month of November, most eastern Nebraska locations reported only one day of below-normal temperatures, while western Nebraska experienced as many as four days of below-normal temperatures. The surge of Arctic air into the northern Plains occurred at the end of November and impacted western Nebraska, but did not surge eastward until the beginning of December.

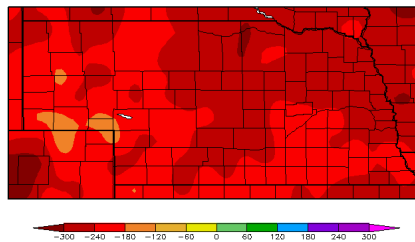
With all of the warm air in place during the first half of November, it is not surprising that peak high temperatures for the month pushed into the 80's across western Nebraska. Less than a tenth of an inch of moisture occurred at most locations statewide during the first 15 days of the month leading to a very dry air mass that was able to quickly warm during the daylight hours.

Monthly average maximum temperatures ran from 53.6 F at O'Neill to 62.1 F at Edison. Monthly minimum average temperatures ranged from 18.8 F at Agate 3 E to 37.3 F at Valley 1 WNW. Elsmere recorded the state high temperature of 89 F, while Kilgore 1 NE recorded the lowest maximum temperature during the month when

DEPARTURE FROM NORMAL HEATING DEGREE DAYS



HEATING DEGREE DAYS



the thermometer peaked out at 24 F. The maximum low temperature recorded during the month was 55 F at Falls City, while the coldest minimum temperature reported was -5 F at Bridgeport 18 WSW.

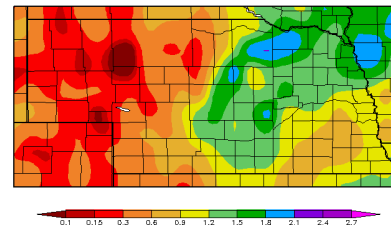
Statewide monthly average temperature departures ranged from 4 F above normal to 10 F above normal. A more detailed breakdown shows that a small pocket of 10+ F departures were confined to the Chadron to Merriman area. Average temperature departures of 8 F to 10 F were common across the northern Sandhills, northeast and east-central Nebraska. Average temperatures were 6 F to 8 F above normal for the remainder of the state except a small area of the southern Panhandle where departures were 4 F to 6 F above normal.

Heating Degree Day unit accumulations for October ranged from 2450 HDD's in extreme southeastern Nebraska to 800 HDD's in the northwestern Panhandle. The general trend over the southeastern third of Nebraska was HDD accumulations ranging from 450 to 600 HDD's. HDD's ranged from 600 to 700 units across southwest, west-central, central, east-central and northeast Nebraska. HDD accumulations across the Panhandle and northwestern Sandhills ranged from 600 to 850 units.

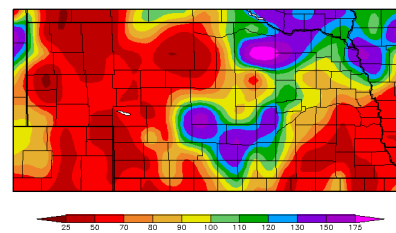
Precipitation

Very dry conditions were common across the entire state during the first half of the November. Most locations failed to receive measurable precipitation during this period and the resulting dry conditions

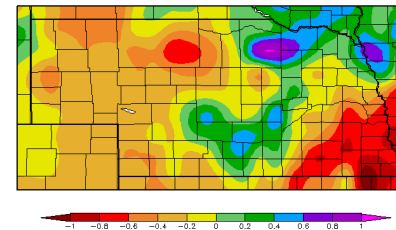
PRECIPITATION IN INCHES



PERCENT OF NORMAL PRECIPITATION



DEPARTURE FROM NORMAL PRECIPITATION



HIGH PLAINS REGIONAL CLIMATE CENTER
Maps generated using provisional data for November 2016.

resulted in an expansion of abnormally dry conditions by the U.S. Drought Monitor. This dryness was a northward expansion of the drought region that developed during the fall across northern Oklahoma and eastern Colorado.

A more active weather pattern developed during the second half of the month as the southeastern U.S. upper air ridge began to weaken in response to a series of storm systems moving across the northern half of the country. Most of the moisture remained across the northern Plains until a potent storm moved out of the southwestern U.S. and brought thunderstorm activity to central Nebraska from Nov. 22 to 24. Cold air on the back side of the surface low crossing the central Plains help a two-county-wide swath of 2- to 5-inch snowfall from southwest through northeast Nebraska.

Another potent storm entered the north-



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November 2016 Storm Reports

- [Nov. 27: NOAA](#)

western United States during the Thanksgiving weekend. Several waves of energy moved eastward out of this storm in the upper atmosphere and produced snowfall across the northeastern Panhandle and northwestern Sandhills region. Totals approaching 5 inches were reported in Chadron and Merriman, while the heaviest and most concentrated region of accumulating snows fell across the western Dakota's and eastern areas of Montana.

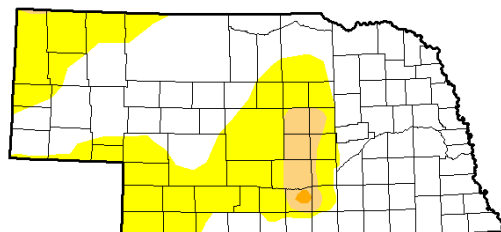
There were 12 locations in the state that reported more than 2 inches of liquid equivalent moisture during November, according to the NeRAIN data base. Burwell 20.4 NNW reported the state high precipitation value of 2.67 inches. There were 56 locations reporting between 1.50 and 2.00 inches of moisture, while another 158 locations reported between 1.00 and 1.50 inches. However, the vast majority of locations (341) reported less than an inch of moisture and most of these reports occurred across the western half of the state.

In general terms, the western half of the state saw less than an inch of liquid equivalent moisture, but more than half of the Panhandle failed to receive more than 0.30 inches. The eastern half of the state experienced a wide divergence of precipitation totals. East-central and southeast Nebraska totals ranged from 0.60 to 1.20 inches of moisture. The eastern Sandhills, northeast, and central Nebraska precipitation totals ranged from 1.2 to 1.5 inches. There were several pockets of 1.5 to 2.5 inches where thunderstorm activity dropped localized heavy rainfall.

Precipitation departures generally ranged from 0.2 to 0.4 inches below normal for the western half of the state and 0.20 to 1.00 inches below normal across south-central, east-central and southeast Nebraska. Positive precipitation departures ranged from 0.2 to 0.60 inches for the eastern Sandhills, central and northeastern Nebraska. The heaviest pocket of above-normal moisture was centered around the Ord and Broken Bow region with surpluses ranging from 0.75 to 1.25 inches above normal.

U.S. DROUGHT MONITOR FOR NEBRASKA

NOV. 1, 2016



Drought Conditions (Percent Area)

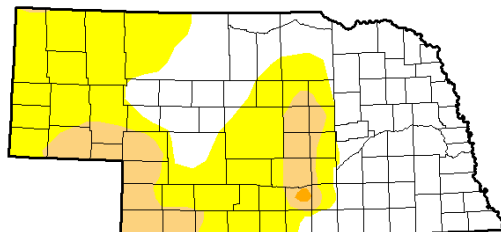
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	63.62	36.38	4.12	0.16	0.00	0.00
Last Week 10/25/2016	82.17	17.83	1.59	0.16	0.00	0.00
3 Months Ago 8/2/2016	58.00	42.00	10.35	0.61	0.00	0.00
Start of Calendar Year 1/22/2015	99.99	0.01	0.00	0.00	0.00	0.00
Start of Water Year 9/27/2015	77.29	22.71	1.59	0.16	0.00	0.00
One Year Ago 11/3/2015	76.12	23.88	1.69	0.00	0.00	0.00

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

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

Author:
Deborah Bathke
National Drought Mitigation Center

NOV. 29, 2016



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	48.04	51.96	12.70	0.16	0.00	0.00
Last Week 11/22/2016	56.06	43.94	10.68	0.16	0.00	0.00
3 Months Ago 8/29/2016	61.96	38.04	2.09	0.33	0.00	0.00
Start of Calendar Year 1/22/2015	99.99	0.01	0.00	0.00	0.00	0.00
Start of Water Year 9/27/2015	77.29	22.71	1.59	0.16	0.00	0.00
One Year Ago 12/1/2015	92.09	7.91	0.00	0.00	0.00	0.00

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

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

Author:
Richard Heim
NCE/NOAA

SOURCE: DROUGHTMONITOR.UNL.EDU

Drought Conditions

Drought conditions increased during the month, especially across the western third of the state with the lack of above-normal moisture coupled with well above-normal temperatures. The Nov. 1 U.S. Drought Monitor indicated that 32.26 percent of Nebraska was experiencing Abnormally Dry (D0) conditions, which increased to 39.26 percent by the Nov. 29 USDM depiction. This represented a 20 percent increase in areal coverage of Abnormally Dry conditions.

Although Abnormal Dry conditions increased 20 percent as measured by areal coverage, the more significant increase in percentage term was the area of Moderate Drought (D1) conditions. On Nov. 1, 3.96 percent of the

state showed Moderate Drought, which increased to 12.54 percent by months' end. The amount of surface area increase in D1 conditions was 215 percent and was primarily confined to the southeastern Panhandle and southwest Nebraska.

There was no increase in Severe Drought (D2) conditions during the month, and this area represented 0.16 percent of the surface area of Nebraska. However, the dry pattern during October and November is concerning since winter precipitation usually is insufficient to significantly reduce drought signatures across the central Plains. Winter precipitation accounts for an average of 7 percent of our annual moisture total, so significant drought improvement likely will not occur until the spring months.

