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Fargo, ND - Photo by BJ Baule  
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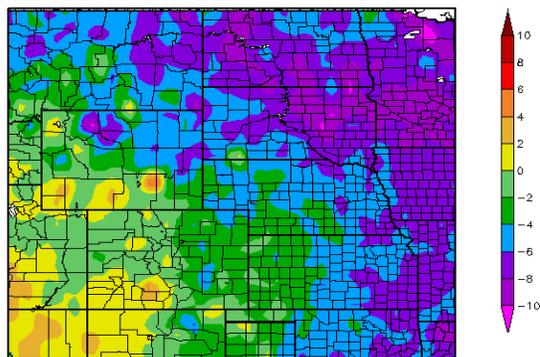
# November 2014 Climate Summary

## Region Breakdown

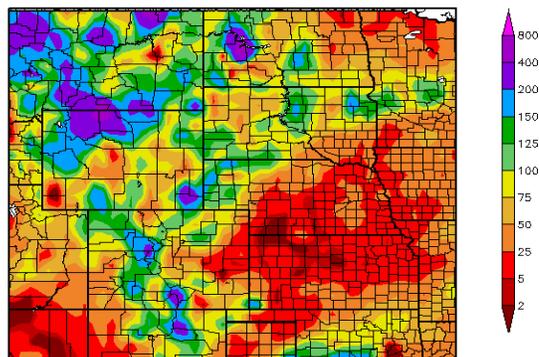
November 2014 was a month of extreme temperatures. The warmth of October carried over into the first part of the month and this was followed by an Arctic blast which brought record-breaking cold to the region and beyond. In the end, the cold weather dominated as most of the region had average temperatures which were well below normal.

Some of the largest temperature departures occurred in the Dakotas where average temperatures were 6.0-8.0 degrees F (3.3-4.4 degrees C) below normal. Isolated areas even ranged from 8.0-10.0 degrees F (4.4-5.6 degrees C) below normal. Even with these impressive departures, most locations only ranked in the top 20 coldest Novembers on record. However, there were some locations across South Dakota which ranked in the top 10 coldest Novembers. These included Rapid City (4th), Aberdeen (5th), Pierre (6th), Huron (9th), and Sioux Falls (10th). Huron had an average temperature of 24.5 degrees F (-4.2 degrees C), which was an impressive 8.1 degrees F (4.5 degrees C) below normal (period of record 1881-2014). The coldest November on record occurred back in 1896 with an average temperature of 13.5 degrees F (-10.3 degrees C).

Departure from Normal Temperature (F)  
 11/1/2014 - 11/30/2014



Percent of Normal Precipitation (%)  
 11/1/2014 - 11/30/2014



Departure from 1981-2010 Normal Average Temperature (left) and Percent of Normal Precipitation (right) for November 2014 in the High Plains Region. Maps produced by High Plains Regional Climate Center. Available at: <http://hprcc.unl.edu/maps/current>

## Temperature Summary cont.

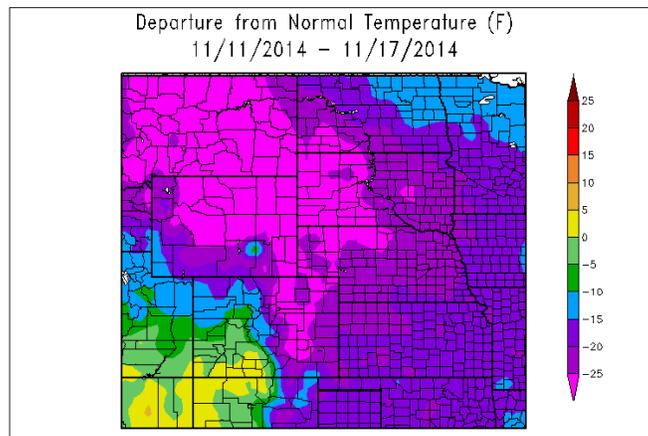
The Arctic blast mentioned above brought bitterly cold temperatures to the region. The week of the 11th-17th was particularly cold with temperature departures greater than 20 degrees F (11 degrees C) below normal for a majority of the region (see the figure to the right). A large area from central Montana through Wyoming, western South Dakota, the panhandle of Nebraska, and eastern Colorado had temperature departures exceeding 25 degrees F (13.9 degrees C) below normal! Thousands of records were set across the country, many of which occurred here in the region. Casper, Wyoming set a new record for coldest November temperature. The minimum temperature of -27 degrees F (-32.8 degrees C) on the 12th easily beat the old record of -21 degrees F (-29.4 degrees C) set on November 23, 1985 (period of record 1939-2014).

Three days this November were ranked in the top 10 coldest November temperatures in Casper, including the new record of -27 degrees F (-32.8 degrees C), the 2nd coldest of -26 degrees F (-32.2 degrees C), and the 5th coldest of -19 degrees F (-28.3 degrees C). These occurred on the 12th, 13th, and 11th respectively.

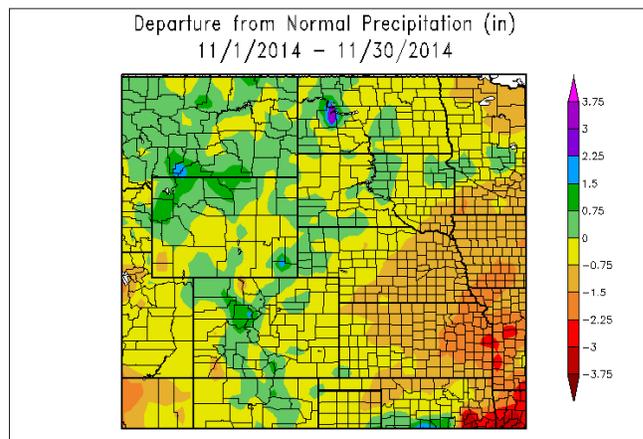
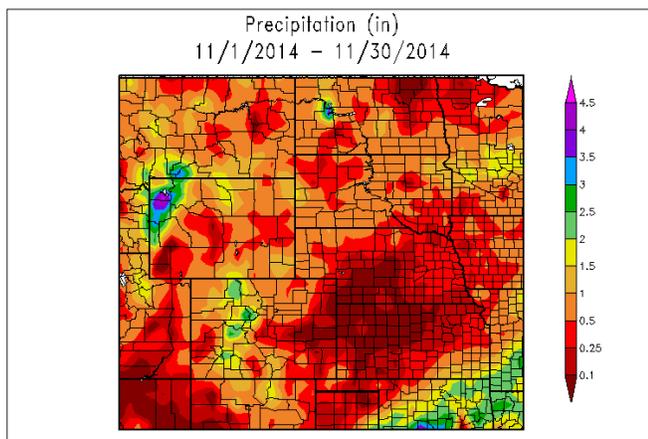
## Precipitation Summary

Precipitation varied across the High Plains Region this month. Generally, the driest areas were to the south, while the wetter areas were to the north and west. A large area of central and eastern Nebraska, as well as eastern Colorado and most of Kansas received at best 25 percent of normal precipitation. One of the driest locations was Goodland, Kansas which only received 0.02 inches (1 mm) of precipitation. This amount was only 3 percent of normal and ranked as the 6th driest November on record (period of record 1895-2014). Although some areas received near to just above normal precipitation, there were very few locations receiving much above normal precipitation. One area receiving ample precipitation was northwestern Wyoming. Sheridan, Wyoming received 1.49 inches (38 mm) of precipitation, which ranked as the 8th wettest November on record (period of record 1907-2014).

Precipitation during the fall (September, October, and November) also varied with some areas receiving well above normal precipitation and others receiving little precipitation. A large area of the eastern Dakotas received 25-50 percent of normal precipitation and this ongoing dryness led to the development of abnormally dry conditions. Meanwhile, the area encompassing the Black Hills and the panhandle of Nebraska had totals which exceeded 150 percent of normal. Other wet areas included central Colorado, western Wyoming, eastern Kansas, and a swath running from southeastern Colorado to the northeast through Kansas and into eastern Nebraska and central Iowa.



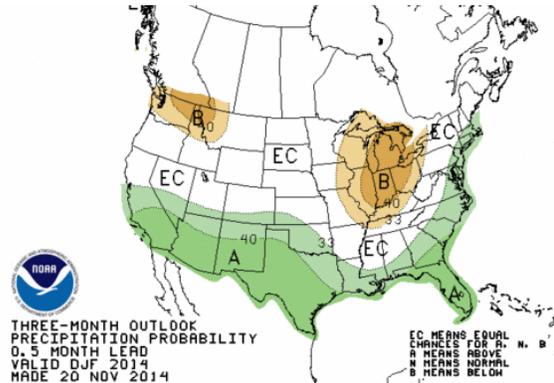
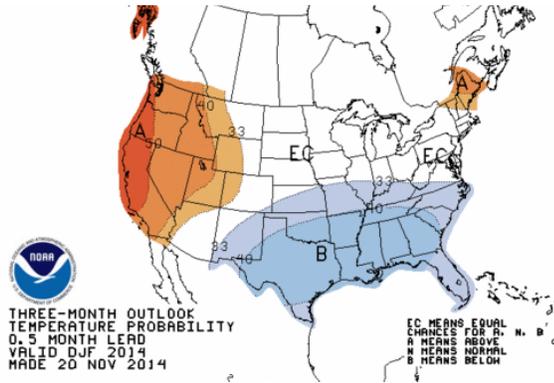
Above: Departure from Normal Temperature (degrees F) for November 11-17, 2014 in the High Plains Region.



Above: Total Precipitation (inches) (left) and Departure from Normal Precipitation (inches) (right) for November 2014 in the High Plains Region. These maps are produced by HPRCC and can be found on the Current Climate Summary Maps page at: <http://hprcc.unl.edu/maps/current>.

# Climate Outlook

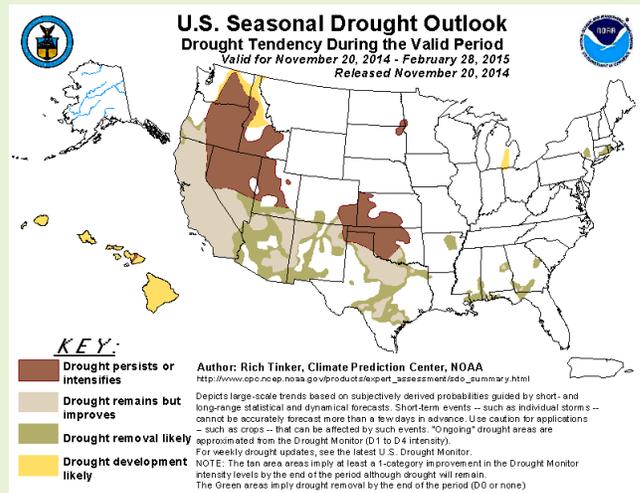
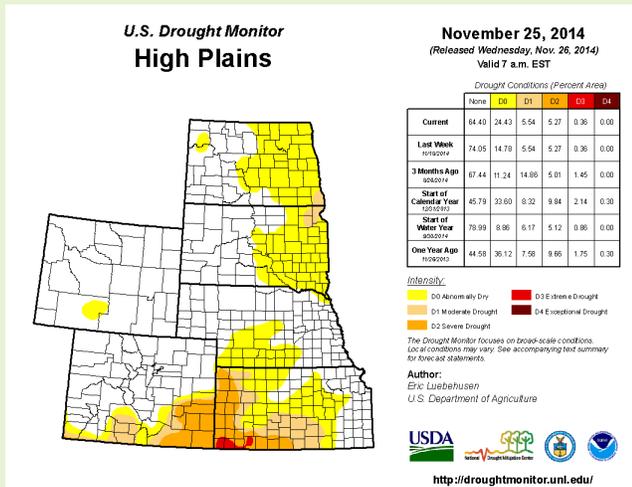
ENSO-neutral conditions continued this month, however El Niño is still favored to begin at some point this winter. The temperature outlook through February indicates a higher probability of above normal temperatures for much of the western United States including the western half of Wyoming and portions of western Colorado. The southern US has a higher probability for below normal temperatures and this includes much of Kansas and the far southeastern corner of Colorado. Meanwhile, the precipitation outlook shows equal chances for most of the region, with a higher probability for above normal precipitation in far southern Colorado and southwestern Kansas. All other areas in the Region have equal chances of above, near, or below normal temperatures and precipitation. The seasonal outlooks combine the effects of long-term trends, soil moisture, and when applicable, the El Niño Southern Oscillation cycle (ENSO).



Above: 3-Month Outlook Maps Courtesy of the NOAA Climate Prediction Center - <http://www.cpc.ncep.noaa.gov>  
 (left) The Three-Month Temperature Probability Outlook, (right) The Three-Month Precipitation Probability Outlook

## Drought Watch

According to the U.S. Drought Monitor, there were only slight changes to drought conditions in the High Plains Region since last month. The total area in drought (D1-D4) remained at about 11 percent with only a slight expansion of moderate drought (D1) from northeastern South Dakota into southeastern North Dakota. Drought conditions in the southern part of the region, across Colorado and Kansas, persisted. The most notable change to conditions occurred in the eastern halves of the Dakotas and south-central Nebraska where abnormally dry conditions (D0) have emerged. These areas have been experiencing dryness over the past three months. Luckily, at this time of the year any impacts from these areas would be minor. According to the U.S. Seasonal Drought Outlook released November 20th, drought conditions in the small area of the Dakotas and across Kansas through eastern Colorado are expected to persist through winter. However, some drought conditions in southern Colorado may improve or be removed.



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). Real-time data provided through ACIS from the Regional Climate Centers are often used by the agencies involved in the U.S. Drought Monitor when determining the area and intensity of drought conditions, although the product itself is not produced by HPRCC. For current Drought Monitor information, please see: <http://droughtmonitor.unl.edu/>  
 Portions of this Drought Watch are courtesy of the Drought Monitor Text Discussion found on the Drought Monitor webpage.

## State Summaries

Colorado	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Akron Washington County Airport	48.5	20.6	34.5	-3.1	74	11/09	-10	11/13+	0.35	-0.23	60
Alamosa San Luis Airport	50.5	13.3	31.9	2.4	66	11/01	-1	11/18+	0.34	-0.08	81
Colorado Springs Municipal Airport	50.8	21.5	36.2	-1.9	71	11/01	-4	11/13	0.26	-0.14	65
Denver International Airport	50.6	21.8	36.2	-2.1	72	11/29+	-14	11/13	0.76	0.15	125
Grand Junction Walker Field Airport	49.5	22.8	36.2	-2.8	75	11/01	10	11/17	0.39	-0.34	53
Pueblo Memorial Airport	53.4	20.4	36.9	-2.4	75	11/28+	-9	11/13	0.46	-0.01	98

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	49.3	24.8	37.1	-4.5	71	11/05	8	11/18	0.11	-1.00	10
Dodge City Regional Airport	54.5	25.5	40.0	-3.1	80	11/10	3	11/17	0.15	-0.61	20
Goodland Renner Field	53.1	21.3	37.2	-1.8	80	11/28	-6	11/13	0.02	-0.69	3
Topeka Municipal Airport	50.8	27.1	38.9	-4.9	73	11/10	7	11/18	0.44	-1.41	24
Wichita Mid-Continent Airport	52.5	28.9	40.7	-4.7	77	11/10	5	11/18	0.45	-0.98	31

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	44.7	16.6	30.6	-3.4	69	11/28+	-13	11/13	0.42	-0.20	68
Grand Island Airport	47.3	21.0	34.2	-3.9	78	11/29	-3	11/16	0.29	-0.88	25
Lincoln Municipal Airport	46.6	22.5	34.6	-4.3	75	11/29	4	11/14	0.47	-0.96	33
Norfolk Karl Stefan Airfield	43.3	20.1	31.7	-4.7	77	11/29	-5	11/16	0.32	-1.05	23
North Platte Regional Airport	48.4	15.1	31.8	-3.8	73	11/28+	-4	11/18	0.08	-0.56	13
Omaha Eppley Airport	44.0	23.9	34.0	-4.9	67	11/05+	6	11/16	0.22	-1.42	13
Valentine Miller Field	44.0	15.7	29.8	-4.6	73	11/02	-14	11/18	0.55	-0.10	85

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismark Municipal Airport	31.9	11.1	21.5	-7.7	66	11/02	-14	11/14	0.60	-0.11	85
Fargo International Airport	30.9	14.7	22.8	-6.0	57	11/02	-13	11/27	0.71	-0.29	71
Grand Forks International Airport	29.4	12.0	20.7	-5.4	54	11/07+	-17	11/17	0.31	-0.64	33
Theodore Roosevelt Airport	32.3	11.6	22.0	-7.5	59	11/07	-11	11/14	0.29	-0.25	54
Williston International Airport	31.3	9.9	20.6	-6.5	58	11/07	-19	11/30	0.63	-0.02	97

All Data are Preliminary and Subject to Change. + indicates multiple dates, latest date listed.

Source: National Weather Service Cooperative Observation Network Data

Data are retrieved through the Applied Climate Information System (ACIS).

These data are available for the entire period of record through the CLIMOD system. For more information please see <http://hprcc.unl.edu/services>.

## November 2014 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	32.6	11.3	21.9	-7.4	68	11/07	-17	11/14	0.64	-0.09	88
Huron Regional Airport	35.1	13.8	24.5	-8.1	69	11/07	-9	11/14	0.74	-0.13	85
Pierre Regional Airport	37.2	16.0	26.6	-7.1	68	11/07	-8	11/14	0.82	0.06	108
Rapid City Regional Airport	39.6	14.1	26.9	-7.6	64	11/28+	-14	11/13	0.81	0.28	153
Sioux Falls Joe Foss Field Airport	35.9	16.5	26.2	-6.4	59	11/05+	-7	11/27	0.56	-0.80	41

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	41.3	15.9	28.6	-4.6	72	11/01	-27	11/12	0.81	0.05	107
Cheyenne Municipal Airport	45.3	21.0	33.2	-2.1	66	11/01	-14	11/13+	1.19	0.60	202
Lander Hunt Field Airport	42.4	16.6	29.4	-1.8	71	11/01	-18	11/13	0.59	-0.27	69
Laramie Regional Airport	40.8	15.1	28.0	-1.3	64	11/01	-24	11/13	0.54	0.00	100
Rawlins Municipal Airport	40.2	19.1	29.7	-0.4	66	11/01	-24	11/13	0.67	0.12	122
Sheridan County Airport	42.2	14.2	28.2	-4.5	70	11/06	-17	11/13	1.49	0.78	210

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Source: National Weather Service Cooperative Observation Network Data

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## November 2014 Top 10 Rankings - Highlights

Monthly Rankings			
Temperature in degrees F / Precipitation in inches			
<b>Cooltest</b>	<b>Average Temperature / Ranking</b>	<b>Record / Year</b>	<b>Period of Record</b>
Dickinson, ND	22.0 / 5th coolest	15.7 / 1955	1948-2014
Aberdeen, SD	21.9 / 5th coolest	9.7 / 1896	1893-2014
Huron, SD	24.5 / 9th coolest	13.5 / 1896	1881-2014
Pierre, SD	26.6 / 6th coolest	19.9 / 1985	1933-2014
Rapid City, SD	26.9 / 4th coolest	16.0 / 1985	1942-2014
Sioux Falls, SD	26.2 / 10th coolest	18.2 / 1896	1893-2014
Casper, WY	28.6 / 9th coolest	20.2 / 1985	1939-2014
<b>Wettest / Driest</b>	<b>Precipitation / Ranking</b>	<b>Record / Year</b>	<b>Period of Record</b>
Goodland, KS	0.02 / 6th driest	0.00 / 1939	1895-2014
Sheridan, WY	1.49 / 8th wettest	2.41 / 1991	1907-2014

All Data are Preliminary and Subject to Change.

\* indicates multiple records, latest year is listed

# State Spotlight - Kansas

Mary Knapp - Service Climatologist  
 Kansas State Climate Office, Kansas State University

## Arctic Outbreak

The major weather story in November was the abrupt arrival of winter weather, including extremely cold temperatures. The chill started on the 11th, when highs were in the 70s and 80s. In western KS, Tribune (Greeley County) went from a high of 76F on the 11th to a high of 13F on the 13th. Low temperatures below zero were common in the western third of the state, with low temperatures in the single digits reaching as far as Columbus (Cherokee County) in southeastern KS. State-wide average temperature was 38.1F, or 4.5 degrees cooler than normal. This ranks as the 15th coldest November since 1895. The warmest reading for the month was 86F at Ashland (Clark County) on the 11th. The coldest reading for the month was -6F, which was reported at multiple locations, the latest occurrence of which was at Mankato (Jewell County) on the 18th. Despite the cold weather, 5 new daily high temperature records were set and 16 records were tied. In addition, 9 record warm minimum records were set and 2 records were tied. On the cold side of things, 200 record low maximum temperatures were recorded and 28 records were tied. Two of those records were record low maximums for the month: Oakley 4W at 15F on the 13th and Mound Valley 3WSW on the 18th with 23F.

After a wetter than normal October, precipitation dropped dramatically in November. The state-wide average precipitation for November was 0.28 inches, which is a 1.16 inch deficit for the month. The total is just 16 percent of the normal precipitation for the month, and is tied for the 22nd driest of 120 years. The Northwest fared the worst, with an average of just 0.02 inches or 2 percent of normal. The North Central Division fared only slightly better with an average of 0.05 inches or 3 percent of normal. The wettest day of the month was on the 4th, when the average reported precipitation was 0.13 inches, with the highest daily total reported for the CoCoRaHS network as 1.23 inches at Arkansas City 3.9 SSW (Cowley County). The highest 24hr total reported for the month at a National Weather Service Coop site was 1.50 inches on the 16th at Richfield 1NE (Morton County) in southwestern KS. Highest monthly totals were 11.50 inches at Columbus (Cherokee County) for the National Weather Service and 1.77 inches at Cherokee 0.3 N (Crawford County) for the CoCoRaHS network.

November was quiet on the severe weather side. There were no reports of severe weather during the month. There was one snow event, but amounts were not troublesome. Highest daily total reported was 3.7 inches at Johnson (Stanton County) on the 16th. Unfortunately, the moisture from the snow was limited, with just 0.21 inches of liquid equivalent from the event.

Drought conditions persist across the state, particularly in the west. There was some degradation in the eastern portions of the state. At the end of October the drought-free area had increased to almost 33 percent. By the end of November, the drought-free area had shrunk to 29 percent. The colder temperatures during this month and the residual moisture from October moderated some of the negative impacts from the lack of moisture in November. However, the continued dry pattern is likely to result in further expansion of drought in the North Central Division. The likelihood of an El Niño/Southern Oscillation (ENSO) continues to diminish. It is still expected to switch to an El Niño event, but it also remains to be seen what impact will be felt. Other global circulation patterns, including the North Atlantic Oscillation (NAO), can have significant impacts on the winter season. The December temperature outlook is for warmer than normal temperatures for the entire state. The precipitation outlook is neutral, with precipitation equally likely to be above normal, normal, or below normal. This does not indicate how that moisture might be distributed, and means snow events or extended dry periods are both possible.

For more information about the Kansas State Climate Office: <http://www.ksre.ksu.edu/wdl/>  
 The KSU's AWDN is a part of the High Plains Automated Weather Data Network (AWDN). Data are available through KSU or HPRCC.

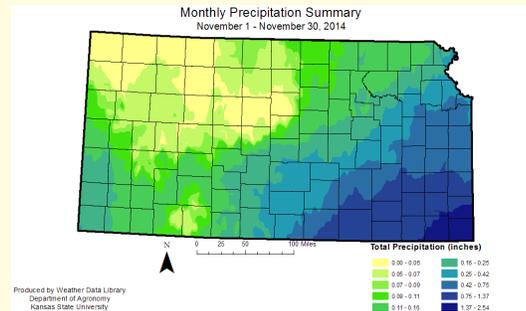


Figure 1. November 2014 total precipitation for Kansas (Kansas State Climate Office)

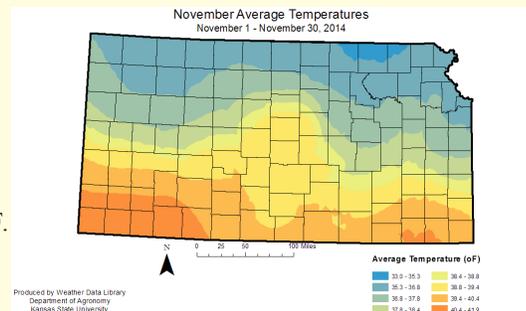


Figure 2. November 2014 average temperatures for Kansas (Kansas State Climate Office)

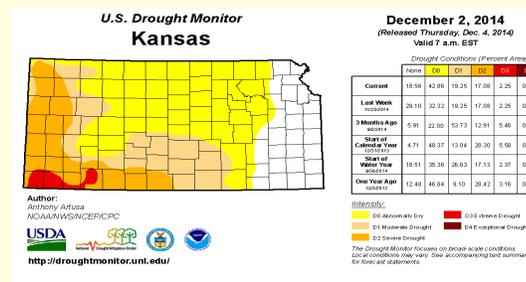


Figure 3. December 2, 2014 U.S. Drought Monitor map and statistics for Kansas (U.S. Drought Monitor)

## State Spotlight - North Dakota

F. Adnan Akyüz - State Climatologist, Daryl Ritchison - Research Specialist  
North Dakota State Climate Office, North Dakota State University



### Precipitation:

There were pockets of above average precipitation during November 2014 in both western and far southern North Dakota, but otherwise, the rest of North Dakota recorded below average precipitation for the month (Figure 1). Using data from the Cooperative Network, the statewide average precipitation for November 2014 was 0.57 inches. That is below the 30 year average of 0.68 inches. November was the third consecutive month with below average precipitation in many parts of North Dakota. Because of that recent dryness, the U.S. Drought Monitor now lists 56% of North Dakota in either Abnormally Dry or Moderate Drought conditions.

### Temperature:

The first week of November 2014 recorded above average temperatures, but the rest of the month was exceptionally cold. In fact, the period from November 10th to the 30th all NDAWN (North Dakota Agricultural Weather Network) stations in North Dakota recorded temperatures from 9 to 15 degrees below normal. The mild start to the month offset that cold snap making the temperature anomalies for the month mostly in the 5 to 10 degrees below average range (Figure 2). The NDAWN average temperature was 20.0 degrees which is 7.3 degrees below the average temperature of 27.3 degrees. That would rank November 2014 as one of the Top 15 coldest Novembers since such records began in 1895.

### Notable Weather:

The persistent cold weather for the final three weeks of November was the most notable weather feature during the month of November. The coldest readings for most of the state occurred on Thanksgiving morning, November 27 (Figure 3). The cold temperatures led to at least two record lows being recorded that morning. Although the NDAWN station near Jamestown recorded a low of -21 degrees F that morning, the airport (KJMS) dropped to -28 degrees. That was significantly colder than the previous record of -13 degrees set in 1985. The Minot airport also recorded a record low that morning with a minimum temperature of -18 degrees which surpassed the old record of -17 degrees set in 1985.

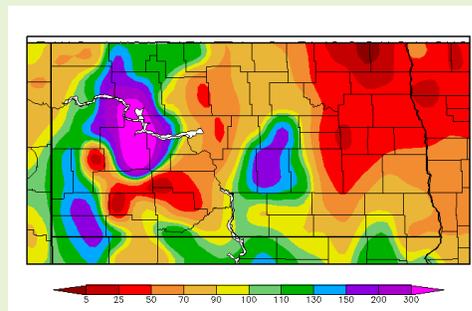


Figure 1. Percent of Normal Precipitation in November 2014 for North Dakota (HPRCC)

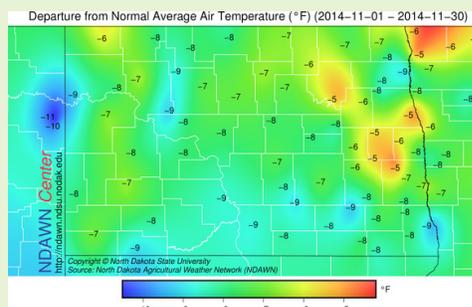


Figure 2. Temperature Departure from Normal in November 2014 for North Dakota (NDSO)

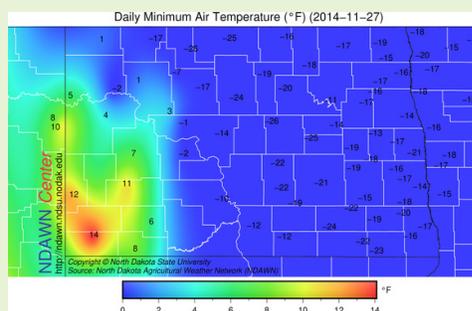


Figure 2. Minimum Temperatures on November 27, 2014 across the North Dakota Agricultural Weather Network (NDAWN)

For more information about the North Dakota State Climate Office: <http://www.ndsu.edu/ndSCO>

For more information on the North Dakota Agricultural Weather Network: <http://www.ndawn.ndsu.nodak.edu>

The North Dakota Agricultural Weather Network is a part of the Automated Weather Data Network (AWDN).

# About the High Plains Regional Climate Center

The High Plains Regional Climate Center (HPRCC) operates out of the University of Nebraska - Lincoln (UNL) in Lincoln, Nebraska. As one of 6 regional climate centers throughout the nation, HPRCC works closely with other organizations such as the National Climatic Data Center (NCDC), Local and Regional National Weather Service (NWS) Offices, and other climate services organizations such as the National Drought Mitigation Center (also located at UNL) to provide climate data services and specialized climate products.

## For More Information Online

High Plains Regional Climate Center: <http://hprcc.unl.edu>

High Plains Regional Climate Services: <http://hprcc.unl.edu/services>

CLIMOD: <http://climod.unl.edu>

Regional Climate Centers and ACIS: <http://www.rcc-acis.org>

National Weather Service: <http://www.weather.gov>

National Climatic Data Center: <http://ncdc.noaa.gov>

University of Nebraska - Lincoln: <http://www.unl.edu>

National Drought Mitigation Center: <http://drought.unl.edu>

Climate Prediction Center: <http://www.cpc.noaa.gov>

NOAA Storm Prediction Center: <http://www.spc.noaa.gov>



Photo of the Nebraska Sandhills by Bill Sorensen - Senior Programmer - HPRCC

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