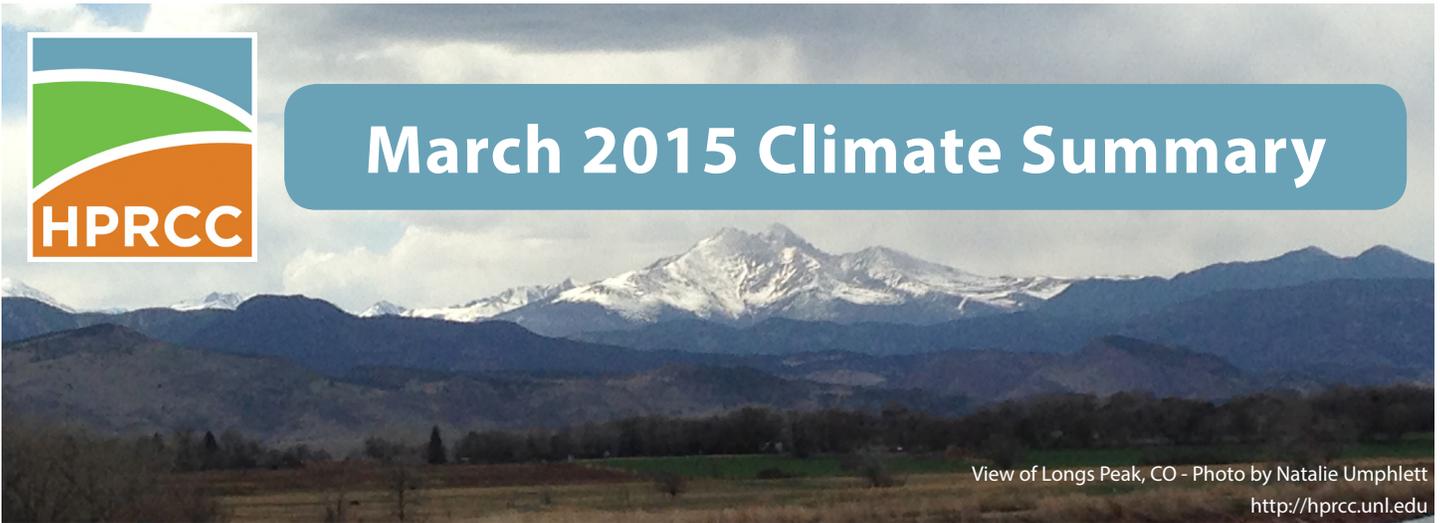




# March 2015 Climate Summary



View of Longs Peak, CO - Photo by Natalie Umphlett  
<http://hprcc.unl.edu>

## Warm and Dry

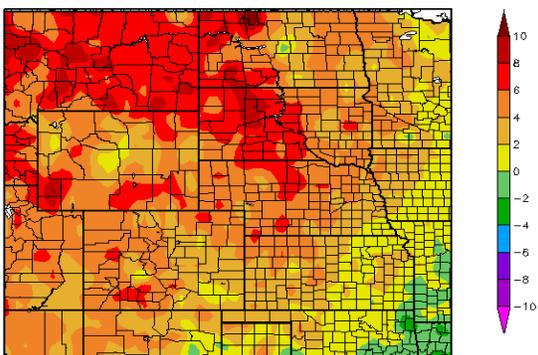
March 2015 brought a continuation of warmth to the western United States and cold for parts of the east. Unlike February, when the High Plains region had a dichotomy of temperatures, this month's temperatures were above normal for the entire region. Temperatures of at least 4.0 degrees F (2.2 degrees C) above normal were widespread, with western parts of the Dakotas, north-central Nebraska, and southern Wyoming having departures greater than 6.0 degrees F (3.3 degrees C) above normal. Where departures were the largest, many locations made the list for top 10 warmest March on record.

The warm weather this month was accompanied by extremely dry conditions as little to no precipitation fell across the region. While low precipitation totals are not as worrisome during the winter months, March marks the beginning of spring, when precipitation totals start to increase. The majority of the region had precipitation totals which were less than 50 percent of normal. Much of Kansas, Nebraska, and South Dakota picked up a paltry 5-25 percent of normal precipitation, while both central Nebraska and central Kansas received less than 5 percent of normal precipitation. This generally meant deficits of 1.00-2.00 inches (25-51 mm), with some higher deficits in southeastern Kansas. The lack of precipitation caused an expansion of drought conditions and many locations had their top 10 driest March on record. A few isolated locations even had their driest. The spring season is critical for precipitation and any continued dryness should be monitored as the season progresses.

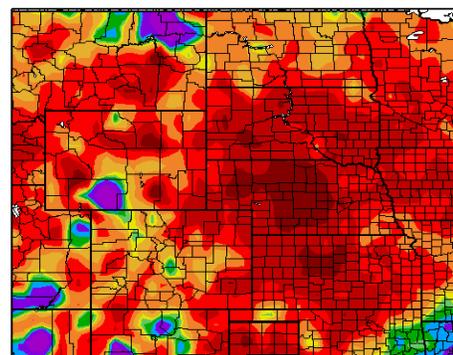
The combination of warm and dry conditions had both positive and negative impacts for the region. For instance, grass fires were an issue in many areas as dry vegetation provided quick burning fuel. Some fires threatened homes and caused road closures. On the other end of the spectrum, the warm and dry conditions were good for the calving season and also allowed producers to easily get equipment into fields. Although beneficial in the short-term, a continuation of dry conditions would not be favorable as spring rains will be needed to replenish soil moisture.

## Temperature and Precipitation Overview

Departure from Normal Temperature (F)  
3/1/2015 - 3/31/2015



Percent of Normal Precipitation (%)  
3/1/2015 - 3/31/2015



Above: Departure from 1981-2010 normal temperature (left) and percent of normal precipitation (right) for March 2015 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

March was an extremely dry month for the High Plains region. Monthly precipitation totals of less than 1.00 inch (25 mm) were common and large areas of Kansas, Nebraska, and South Dakota received less than 25 percent of normal precipitation. The ongoing dryness has led to the expansion of drought conditions in eastern Kansas, central Nebraska, and the Dakotas, with drought intensification in western Colorado. Only a few isolated locations in southwestern Wyoming received above normal precipitation this month.

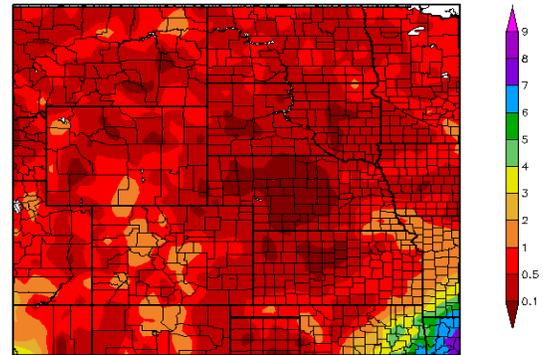
Due to the widespread lack of precipitation, numerous locations had their top 10 driest March on record. A sampling included North Platte, Nebraska (driest), Rapid City, South Dakota (2nd), Valentine, Nebraska (2nd), Cheyenne, Wyoming (4th), Goodland, Kansas (5th), and Huron, South Dakota (8th). Rapid City's March total was a mere 0.10 inches (3 mm) and came in second only to 2012's 0.05 inches (1 mm). Interestingly, three of the top five driest Marches to occur in Rapid City have all been since 2010 (period of record 1942-2015).

It was a low snowfall month for the region as well - not just in the Rocky Mountains, but also in the plains. A few locations ranking in the top 10 least snowiest Marches on record included Rapid City, South Dakota (5th), Cheyenne, Wyoming (6th), Bismarck, North Dakota (7th), and Fargo, North Dakota (9th). Fargo only picked up 0.4 inches (1 cm) of snow this month, which brought its seasonal total up to 16.0 inches (41 cm). If no more snow falls this season, this will be Fargo's 8th least snowiest season on record (period of record 1885-2015). An example from the Rockies included Winter Park, Colorado which had its second least snowiest March on record with 9.0 inches (23 cm). This total came in just behind the record of 5.0 inches (13 cm), which fell in 2012 (period of record 1942-2015). For comparison, Winter Park's normal March snowfall is 33.5 inches (85 cm).

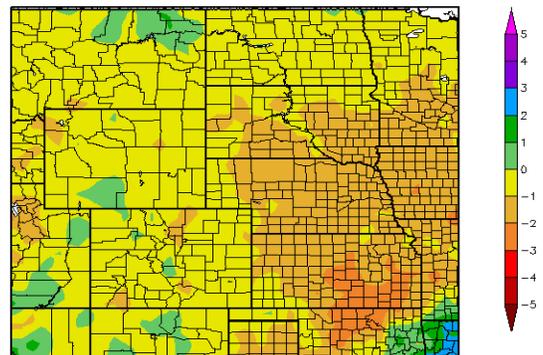
March weather can bring a wide variety of precipitation types from snow to rain to sleet to hail. A lack of precipitation in March can mean a lack of thunderstorms, especially for southern parts of the High Plains region. So far, 2015 has been an extremely slow severe weather season for the country. At the end of the month, the preliminary tornado count for 2015 was just 41 and marks the slowest start to tornado season since 1969.

### Regional Precipitation

Precipitation (in)  
3/1/2015 - 3/31/2015



Departure from Normal Precipitation (in)  
3/1/2015 - 3/31/2015



Above: Total precipitation in inches (top) and departure from normal precipitation in inches (bottom) for March 2015. These maps are produced by HPRCC and can be found on the Current Climate Summary Maps page at: <http://hprcc.unl.edu/maps/current>.

## Snowpack Update

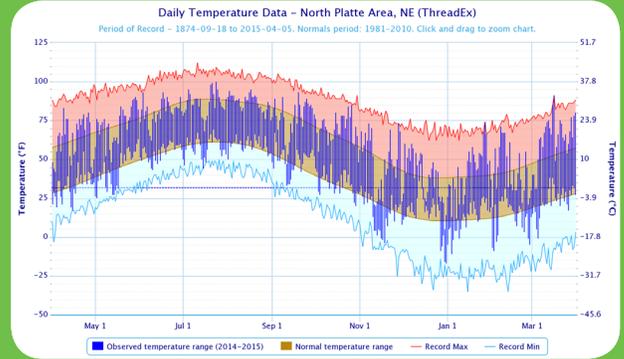
The dire snowpack situation across the western U.S. continued as warm and dry conditions prevailed. Snow water equivalent measurements were well below 50 percent of median for most of the west, which means some areas will have little spring runoff available to help fill reservoirs. While snowpack in the Rockies had been near median, March brought sharp declines. Wyoming's statewide snowpack declined from 94 percent of median to just 70 percent of median over the past month. Individual basins showed varying conditions with a low of 2 percent of median in the Belle Fourche Basin to a high of 95 percent of median in the Upper Green Basin. Colorado's statewide snowpack also declined from 88 percent of median to 69 percent of median. Basins in the western part of the state were the lowest with snow water equivalent measurements generally below 70 percent of median.

## Temperatures

Just three years ago, the U.S. experienced its warmest March on record, with Kansas, Nebraska, and South Dakota each having their warmest March on record as well. Although not as warm as 2012, this March certainly had its share of extreme temperatures. Many locations ranked in the top 10 warmest Marches on record, while many new records were set for highest March temperature and earliest 90 degrees F (32.2 degrees C) day. Locations ranking in the top 10 warmest Marches on record included Scottsbluff, Nebraska (3rd), Rapid City, South Dakota (4th), Cheyenne, Wyoming (5th), Casper, Wyoming (6th), Pierre, South Dakota (6th), Lander, Wyoming (8th), and Bismarck, North Dakota (10th).

The 10-day stretch from March 7-16 was particularly warm throughout the region. Before a cold front moved through, average temperatures ranged from 20.0-30.0 degrees F (11.1-16.7 degrees C) above normal on March 15th and 16th. Numerous daily records were shattered and some locations even set new records for highest March temperature. For instance, North Platte, Nebraska had its highest March temperature with 91 degrees F (32.8 degrees C) on the 16th. The old record of 88 degrees F (31.1 degrees C) occurred March 31, 1946 (period of record 1874-2015). This was also the earliest 90 degrees F (32.2 degrees C) day on record for North Platte. On average, this usually happens around May 24th and the previous record was April 8, 1887. Other locations around Nebraska also had their earliest 90 degrees F (32.2 degrees C) day on record, while some locations in Colorado had their earliest 80 degrees F (26.7 degrees C) day on record. The graph above shows the extreme warmth that occurred this past month in North Platte.

### Station Spotlight: North Platte, NE

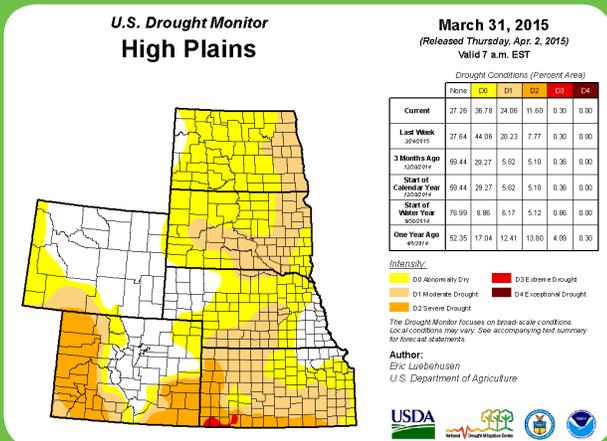


Above: Daily temperatures along with extremes and normals values over the past year in North Platte, NE.

## Drought Conditions

The extreme dryness this month was reflected in the U.S. Drought Monitor as drought conditions expanded across the High Plains region. The total area in drought (D1-D4) increased from about 20 percent to just over 35 percent. To the south, moderate drought conditions (D1) expanded in central and eastern Kansas and into south-central Nebraska. Meanwhile, to the north, D1 expanded in eastern North Dakota and westward across South Dakota. Additionally, continued warmth along with dry conditions have led to the development of severe drought conditions (D2) in western Colorado. D2 now covers about 40 percent of the state. Of all six states in the region, Kansas still had the largest area in drought with approximately 69 percent of the state experiencing drought (D1-D4) at the end of the month. Abnormally dry conditions have expanded through every state in the region and only 27 percent of the region was free of drought or abnormal dryness. The first few days of April brought some precipitation to the region; however the heaviest amounts were confined to eastern Nebraska where drought is not a concern at this time.

### U.S. Drought Monitor



The U.S. Drought Monitor is produced as a joint effort of the U.S. Department of Agriculture (USDA), National Drought Mitigation Center, U.S. Department of Commerce, and the National Oceanic and Atmospheric Administration (NOAA). For current Drought Monitor information, please see: <http://droughtmonitor.unl.edu/>.

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According to the University of Nebraska-Lincoln's CropWatch, last fall's weather may have contributed to the worst winter wheat winterkill in the past 50 years in southwestern Nebraska. Winterkill can be the result of many reasons, with extreme temperatures and a lack of rainfall and snow cover as contributing factors. Dryness is still a concern due to a lack of precipitation and low soil moisture profiles in the area.

## Climate Outlooks

El Niño conditions continue and, according to the Climate Prediction Center, there is a 50-60% chance that these conditions will continue through the summer. Current El Niño conditions are weak, however, so the High Plains Region is expected to experience little to no impacts.

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 temperature outlook through June is similar to last month's outlook with a higher probability for above normal temperatures across the western third of the U.S. There is also a chance for above normal temperatures extending across the northern tier of the central U.S. through Wisconsin and the Upper Peninsula of Michigan. For the High Plains region, this includes North Dakota, northern South Dakota, the western half of Wyoming, and a sliver of northwestern Colorado. Meanwhile, a higher probability for below normal temperatures exists for south-central parts of the country, and includes a small portion of southeastern Colorado and southwestern Kansas. The rest of the region has equal chances for above, below, or near normal temperatures.

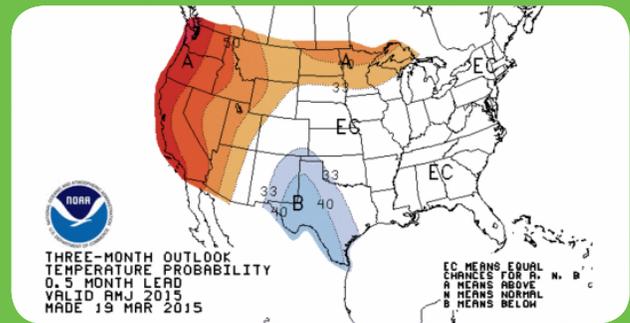
### Precipitation

The precipitation outlook for the next three months shows a higher probability for above normal precipitation for two large areas - one generally in the Four Corners region and another in the southeastern U.S. For the High Plains region, this includes the majority of Colorado, southern Wyoming, and a small portion of southwestern Kansas. Meanwhile, northern areas of the central U.S. and the Pacific Northwest have an increased chance for below normal precipitation. This includes eastern portions of the Dakotas. The remainder of the contiguous U.S. has equal chances for above, below, or near normal precipitation.

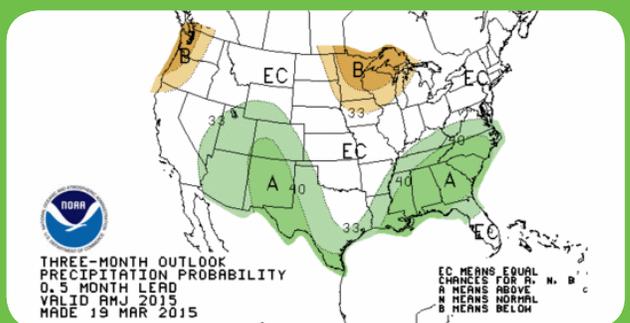
### Drought

According to the U.S Seasonal Drought Outlook released March 19th, drought conditions are forecast to persist over much of the western U.S., with some drought development likely in the Pacific Northwest. In contrast, some portions of the south-central U.S. could see improvements or even drought removal over the next three months. For the High Plains region, the Seasonal Drought Outlook indicates that current drought conditions centered over Minnesota and extending into the eastern Dakotas and western Wisconsin will persist. Further drought development in the area is likely over the next three months. To the west, current drought conditions across western Colorado into southwestern Wyoming are also expected to persist. On a bright note, drought conditions in eastern Colorado stretching into western and southern Kansas are expected to improve or be removed.

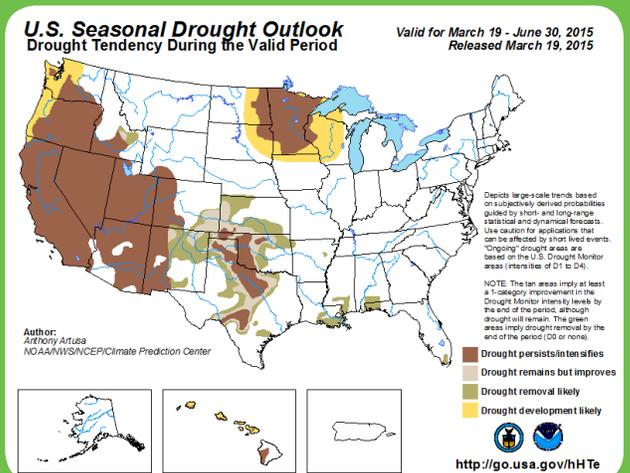
#### Temperature Outlook



#### Precipitation Outlook



#### Drought Outlook



Above: The three-month temperature probability outlook (top), the three-month precipitation probability outlook (middle), and the U.S. Seasonal Drought Outlook. For more information on these outlooks, produced by the Climate Prediction Center, see: <http://www.cpc.ncep.noaa.gov>.

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 area's intensity 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).

Legend:  
 ■ Drought persists in tenafies  
 ■ Drought remains but improves  
 ■ Drought removal likely  
 ■ Drought development likely

<http://go.usa.gov/hHTE>

## 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	59.8	30.7	45.2	6.0	82	03/16	8	03/04	0.22	-0.65	25
Alamosa San Luis Airport	56.4	22.5	39.4	5.9	71	03/30+	6	03/05	0.40	-0.13	75
Colorado Springs Municipal Airport	57.4	28.8	43.1	4.0	80	03/16	-2	03/05	0.81	-0.19	81
Denver International Airport	58.9	31.2	45.0	4.6	81	03/16	2	03/05	0.79	-0.13	86
Grand Junction Walker Field Airport	63.0	32.6	47.8	3.9	78	03/28	20	03/05	0.27	-0.65	29
Pueblo Memorial Airport	61.7	28.6	45.1	2.8	85	03/16	2	03/05	0.57	-0.36	61

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	61.8	32.5	47.2	4.2	89	03/16	5	03/05	0.11	-1.90	5
Dodge City Regional Airport	64.2	32.9	48.5	4.1	91	03/16	16	03/05	0.29	-1.30	18
Goodland Renner Field	62.7	30.3	46.5	6.0	89	03/16	13	03/05	0.11	-0.96	10
Topeka Municipal Airport	61.2	32.7	46.9	2.1	85	03/16	10	03/05	0.77	-1.72	31
Wichita Mid-Continent Airport	63.9	35.0	49.5	3.0	84	03/31	10	03/05	0.28	-2.41	10

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	60.9	25.0	42.9	7.1	83	03/28+	-9	03/05+	0.28	-0.95	23
Grand Island Airport	60.4	27.2	43.8	4.4	90	03/16	2	03/05	0.16	-1.64	9
Lincoln Municipal Airport	60.2	26.4	43.3	3.2	90	03/16	-1	03/05	0.77	-1.16	40
Norfolk Karl Stefan Airfield	59.0	26.5	42.7	5.3	92	03/16	-6	03/05	0.82	-0.95	46
North Platte Regional Airport	63.5	23.4	43.5	5.5	91	03/16	-1	03/05	0.01	-1.04	1
Omaha Eppley Airport	58.4	29.0	43.7	4.2	88	03/16	3	03/05	0.54	-1.45	27
Valentine Miller Field	60.5	24.7	42.6	6.4	84	03/15	-3	03/05	0.03	-1.04	3

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismark Municipal Airport	50.5	21.7	36.1	6.2	76	03/31	-8	03/05	0.45	-0.42	52
Fargo International Airport	45.8	21.3	33.5	5.7	75	03/15	-11	03/05	0.30	-1.00	23
Grand Forks International Airport	42.9	18.9	30.9	5.7	70	03/15	-15	03/05	0.31	-0.65	32
Theodore Roosevelt Airport	52.8	23.3	38.0	8.0	80	03/28	-6	03/04	0.47	-0.22	68
Williston International Airport	50.4	23.0	36.7	7.4	79	03/28	-10	03/04	0.47	-0.24	66

All data are preliminary and subject to change. + indicates multiple dates, latest date listed.  
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 For more information please contact us: <http://www.hprcc.unl.edu/contact.php>.

## March 2015 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	50.0	19.8	34.9	5.0	79	03/15	-19	03/05	0.23	-0.93	20
Huron Regional Airport	52.7	21.5	37.1	4.0	81	03/15	-10	03/05+	0.16	-1.30	11
Pierre Regional Airport	57.3	24.4	40.8	6.4	83	03/15	-9	03/05+	0.33	-0.90	27
Rapid City Regional Airport	59.4	24.9	42.1	6.7	84	03/15	-3	03/04	0.10	-0.83	11
Sioux Falls Joe Foss Field Airport	52.1	24.6	38.4	5.5	78	03/15	-10	03/05	0.33	-1.43	19

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	54.7	25.1	39.9	4.7	76	03/31	-13	03/03	0.64	-0.18	78
Cheyenne Municipal Airport	55.7	28.0	41.9	6.0	76	03/15	1	03/04	0.11	-0.94	10
Lander Hunt Field Airport	53.4	26.6	40.0	4.5	76	03/31	-7	03/04	0.55	-0.61	47
Laramie Regional Airport	51.0	22.4	36.7	5.8	70	03/15	-10	03/04	0.17	-0.41	29
Rawlins Municipal Airport	51.7	24.3	38.0	5.7	71	03/31+	-21	03/04	0.61	-0.07	90
Sheridan County Airport	57.5	26.7	42.1	6.9	80	03/28	-7	03/03	0.40	-0.58	41

## March 2015 Highlights

### Monthly Rankings

Temperature in degrees F

Highest March Temperature	Temperature / Date	Previous Record / Date	Period of Record
Grand Island, NE	90 / March 16, 2015	tie / March 29, 1986+	1895-2015
Norfolk, NE	92 / March 16, 2015	tie / March 22, 1910	1893-2015
North Platte, NE	91 / March 16, 2015	88 / March 31, 1946	1874-2015
Rapid City, SD	84 / March 15, 2015	83 / March 28, 2015+	1942-2015
Earliest 90F Day	Temperature / Date	Previous Record / Date	Period of Record
Grand Island, NE	90 / March 16, 2015	90 / March 23, 1910	1895-2015
Lincoln, NE	90 / March 16, 2015	90 / March 22, 1910	1887-2015
Norfolk, NE	92 / March 16, 2015	91 / March 21, 1907	1893-2015
North Platte, NE	91 / March 16, 2015	90 / April 8, 1887	1847-2015
Earliest 80F Day	Temperature / Date	Previous Record / Date	Period of Record
Colorado Springs, CO	80 / March 16, 2015	81 / March 26, 1971	1894-2015
Denver, CO	81 / March 16, 2015	82 / March 18, 1907	1872-2015

All data are preliminary and subject to change. + indicates multiple dates, latest date listed.

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For more information please contact us: <http://www.hprcc.unl.edu/contact.php>.

# North Dakota Monthly Climate Summary

Daryl Ritchison - Assistant State Climatologist  
 North Dakota State Climate Office, North Dakota State University  
 For more information: [www.ndsu.edu/ndsco](http://www.ndsu.edu/ndsco) or [www.ndawn.ndsu.nodak.edu](http://www.ndawn.ndsu.nodak.edu)



## Precipitation:

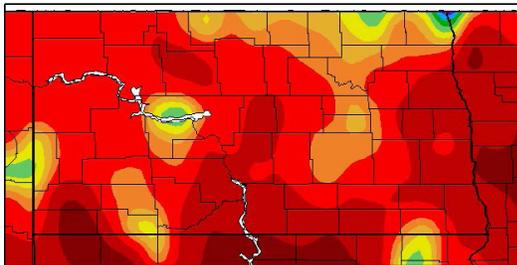
Rain and snow were rare commodities in much of North Dakota during the month. Although light scattered precipitation did fall on several occasions, more widespread moisture only occurred on two days, March 24 and March 29. Those two days attributed to a high percent of what little total moisture was recorded during the month (Figure 1). March was the 7th straight month of overall dryness in North Dakota, especially the eastern one-third of the state. The March 31 Drought Monitor now lists 95% of the state in either abnormally dry or moderate drought conditions, with the eastern one-quarter of North Dakota being in that moderate drought category.

## Temperature:

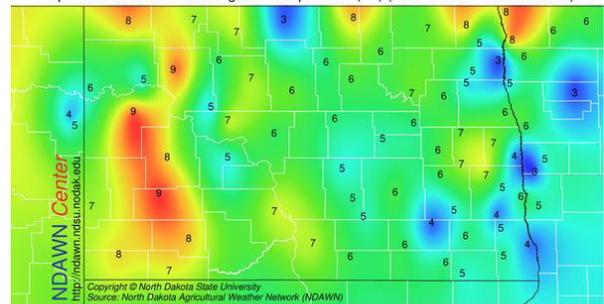
March 2015 had many ups and downs temperature wise. The first week was quite cold but then the next 10 days turned very warm for so early in the year. The ten day stretch from March 9-18 recorded temperatures of 15 to 20 degrees above average. That period was then followed by a week of cooler weather that was replaced by much warmer temperatures once again as the month finished. The NDAWN (North Dakota Agricultural Weather Network) average temperature for the month was 32.9 degrees which is 5.9 degrees above normal (Figure 2). The warmth of the month was in stark contrast to the past two years with March 2013 finishing 10 degrees below average and March 2014 recording temperatures 5 degrees below normal.

## Temperature and Precipitation Overview

Percent of Normal Precipitation (%)  
 3/1/2015 - 3/31/2015



Departure from Normal Average Air Temperature (°F) (2015-03-01 - 2015-03-31)



Above: Percent of normal precipitation (left, figure 1, produced by HPRCC) and departure from normal average temperature (right, figure 2, produced by NDAWN) for March 2015 in North Dakota.

# 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:  
[www.drought.gov/drought/content/resources/reports](http://www.drought.gov/drought/content/resources/reports)

### Midwest and Great Plains Monthly Climate and Drought Webinar

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## Author Information

For questions, comments, or suggestions, please contact:  
 Natalie Umphlett, Regional Climatologist  
 (402) 472-6764 - [numphlett2@unl.edu](mailto:numphlett2@unl.edu)  
 712 Hardin Hall, 3310 Holdrege Street  
 Lincoln, NE 68583-0997  
<http://hprcc.unl.edu>

