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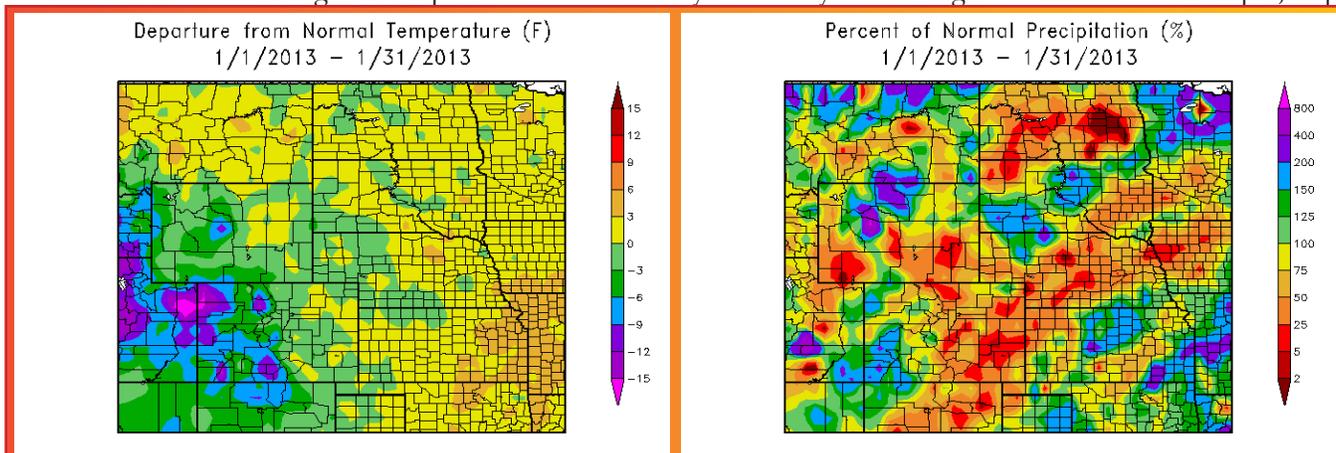
Snowy field near Harrisburg, South Dakota - Photo by Joseph Brum  
<http://hprcc.unl.edu>

# January 2013 Climate Summary

## Region Breakdown

The January 2013 nationwide picture showed that the eastern U.S. generally experienced above normal temperatures while the western U.S. had below normal temperatures. Average temperatures across the High Plains Region were generally near normal, except for western areas of Colorado and Wyoming. In fact, the western half of Colorado had some of the largest departures in the Region with average temperatures ranging from 6.0-13.0 degrees F (3.3-7.2 degrees C) below normal. This caused many stations to rank in the top 10 coolest Januarys on record. Grand Junction, Colorado had its 5th coolest January with an average temperature of 14.3 degrees F (-9.8 degrees C), which was 13.1 degrees F (7.3 degrees C) below normal (period of record 1893-2013). The coolest January occurred in 1973 with an average temperature of 11.5 degrees F (-11.4 degrees C). In addition, Alamosa, Colorado had its 4th coolest January on record with an average temperature of only 4.6 degrees F (-15.2 degrees C) which was 11.7 degrees F (6.5 degrees C) below normal. The 1992 record of 1.4 degrees F (-17.0 degrees C) held firmly (period of record 1906-2013).

Storm systems pushing through the Region brought both cold air down from Canada and warm air up from the south. This led to a wide range of temperatures and to many new daily record highs and lows. For example, Topeka,



Departure from 1981-2010 Normal Average Temperature (left) and Percent of Normal Precipitation (right) for January 2013 in the High Plains Region. Maps produced by High Plains Regional Climate Center. Available at: <http://hprcc.unl.edu/maps/current>

## January 2013 Climate Summary

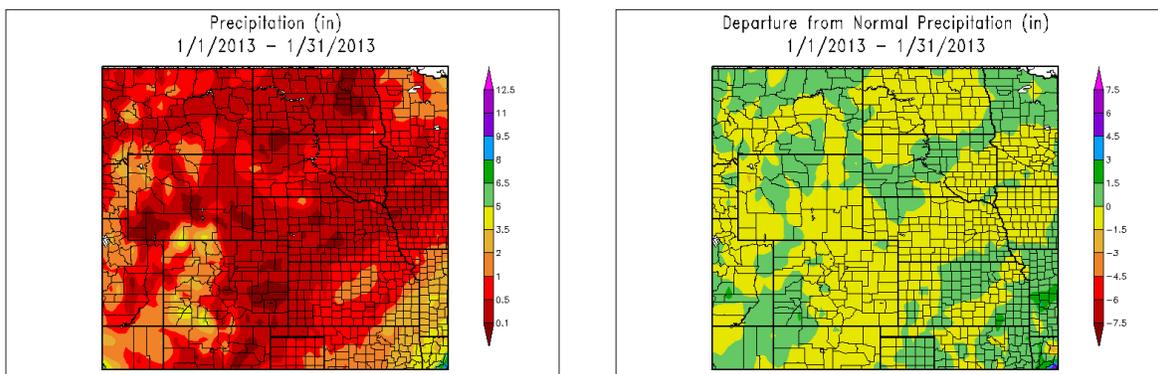
Kansas set its all-time January record high with 77 degrees F (25.0 degrees C) on the 28th. The old record of 74 degrees F (23.3 degrees C) occurred on January 8, 2003 and January 2, 1939 (period of record 1887-2013).

### Precipitation Summary

Precipitation was hit or miss across the High Plains Region this month. Because winter precipitation is generally light, there was little to no change in the drought regardless of whether a location received ample precipitation or not. Overall precipitation varied widely as totals ranged from 0 to 400 percent of normal. Above normal precipitation was concentrated in north central Wyoming, southwestern Colorado, southwestern and central South Dakota, and central and southeastern Kansas. The precipitation totals were not record breaking; however a few locations managed to get into the top 5 wettest Januarys on record. Howard 5 NE, located in southeastern Kansas, had its 4th wettest January on record with 2.81 inches (71 mm) of liquid equivalent precipitation. The record set in 1949 held at 5.40 inches (137 mm) of liquid equivalent precipitation (period of record 1907-2013). Meanwhile, other areas of the Region received little to no precipitation. Rock Springs, Wyoming had its driest January on record with only a trace amount of precipitation. The old record of 0.02 inches (1 mm) was set in 2004 (period of record 1948-2013).

Several systems affected the Region this month, bringing a wide range of temperatures and precipitation types including snow, sleet, freezing rain, and rain (some of which fell from thunderstorms). One storm to hit the Region occurred on the 11th and 12th. This was the first significant storm to hit the Black Hills, although the storm impacted each state in the Region. The heaviest snow totals in southwest South Dakota ranged from 6.0-11.0 inches (15-28 cm), while the heaviest snows in North Dakota occurred in the eastern portion of the state with 5.0-8.0 inches (13-20 cm). According to the National Weather Service in Dodge City, Kansas, this system even created a dust storm out ahead of the cold front in eastern Colorado and western Kansas. This caused visibilities to drop near zero on I-70. Another storm at the end of the month brought record breaking warmth to parts of Kansas, dangerous wind chills of -25 to -50 degrees F (-31.7 to -45.6 degrees C) to the Dakotas, and wintry precipitation in between. For instance, in eastern Nebraska, snowfall totals ranged from 2.0-8.0 inches (5-20 cm) and caused issues as portions of I-80 were closed due to blowing snow and numerous schools closed. The first severe weather of the year was also associated with this storm as high winds were reported in southeastern Kansas.

One area of concern this month was the snowpack in the Rockies, which was below average. Fortunately, the snow season is far from over for the Rockies and much more snow can accumulate later in the snow season. By the end of the month, Wyoming's statewide snowpack was 76 percent of average and Colorado's statewide snowpack was 75 percent of average. In contrast, last year's statewide snowpack was 112 percent of normal in Wyoming. According to the *Billings Gazette*, the snowpack in some basins in Wyoming was low enough to negatively impact the skiing industry. Meanwhile, the snowpack in Colorado actually increased by 17 percent the last week of the month. According to *The Denver Post*, even with this increase, January's snow pack was the 8th lowest out of 32 years.

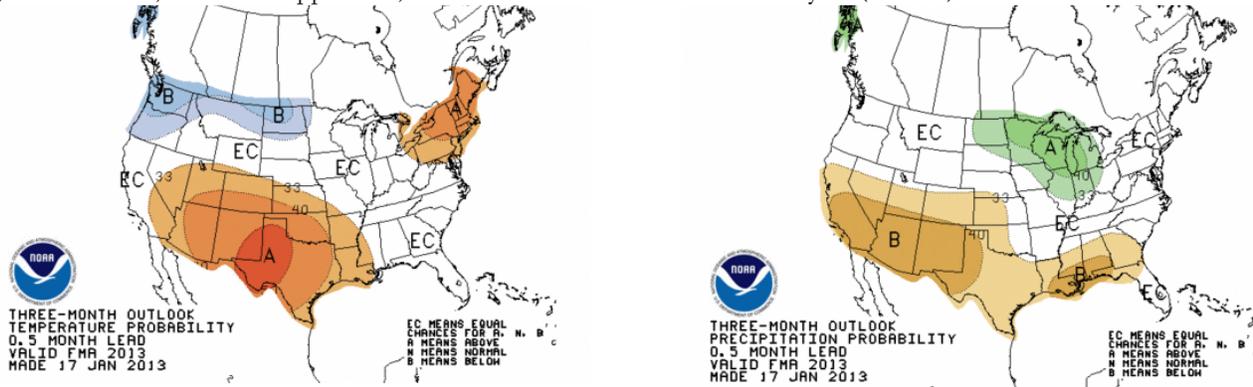


Above: Total precipitation (inches) (left) and Departure from Normal Precipitation (inches) (right) for January 2013 in the High Plains Region. These maps are produced by HPRCC and can be found on the Current Climate Summary Maps page at: <http://hprcc.unl.edu/maps/current>.

The High Plains Regional Climate Center is one of the Regional Climate Centers, and is involved in the Applied Climate Information System (ACIS) development and management effort. Data found throughout this publication were derived using products built on the ACIS framework.

# Climate Outlook

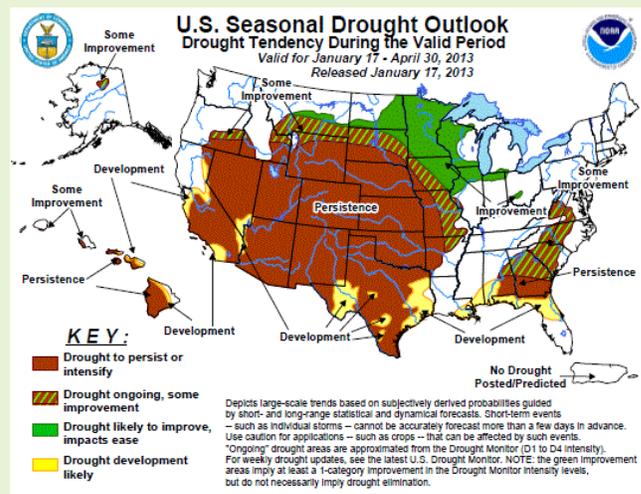
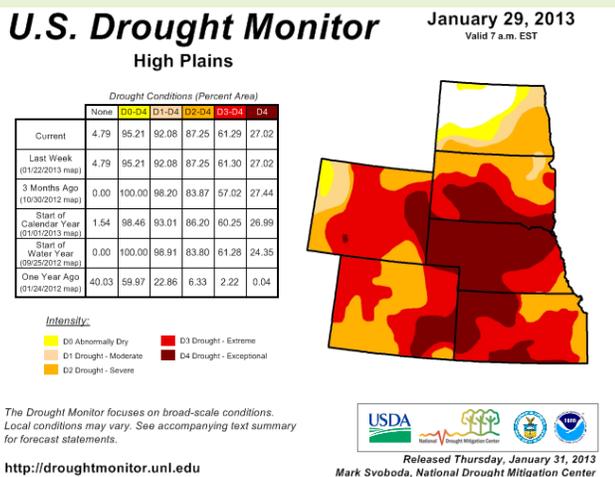
ENSO-neutral conditions are present and likely to continue through Spring 2013. For the next three months, the temperature outlook indicates a higher probability of above normal temperatures for most of Colorado and Kansas, southwestern Wyoming, and the far southwestern corner of Nebraska. A higher probability of below normal temperatures exists for much of North Dakota and northern South Dakota. The precipitation outlook indicates a higher probability of above normal precipitation for northeast South Dakota and eastern and central North Dakota. A higher probability of below normal precipitation exists for most of Colorado, the western half of Kansas, and southwest Nebraska. Equal chances of above, near, or below normal temperatures and precipitation exist for the rest of the High Plains Region. 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 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

As expected for this time of year, there was little change to the U.S. Drought Monitor over the past month. Approximately 92 percent of the Region was still in moderate (D1) to exceptional (D4) drought. This was down slightly from the end of last month when 93 percent of the Region was in D1-D4. The only improvement was in north-central North Dakota where much of the abnormally dry conditions (D0) were erased. Drought conditions worsened in Colorado where the snowpack was significantly behind. The last holdout of D1 in the north-central part of the state deteriorated to severe drought (D2). In addition, extreme drought (D3) expanded slightly in the west-central part of the state. Those changes have put the entire state of Colorado in D2-D4. Drought conditions in the remaining states in the Region did not change with Nebraska leading the way with 77 percent of the state in D4. According to the U.S. Seasonal Drought Outlook released January 17th, drought conditions were expected to improve in North Dakota, northern South Dakota, and northern Wyoming. Drought was expected to persist elsewhere through April 2013.



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 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	41.2	16.5	28.8	0.2	61	01/24	-3	01/15+	0.03	-0.27	10
Alamosa San Luis Airport	24.7	-15.6	4.6	-11.7	46	01/27	-34	01/13+	0.07	-0.19	27
Colorado Springs Municipal Airport	44.7	15.8	30.3	-0.2	68	01/23	-4	01/15	0.18	-0.14	56
Grand Junction Walker Field Airport	25.6	3.0	14.3	-13.1	42	01/27+	-12	01/15+	0.61	0.03	105
Pueblo Memorial Airport	48.2	10.6	29.4	-1.1	72	01/23	-7	01/15	0.21	-0.14	60

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	40.1	19.7	29.9	1.3	69	01/28	5	01/31	0.69	0.11	119
Dodge City Regional Airport	45.6	20.3	32.9	0.7	72	01/28	6	01/04	0.48	-0.10	83
Goodland Renner Field	45.2	15.5	30.3	0.7	69	01/28	-3	01/14	0.07	-0.31	18
Topeka Municipal Airport	46.0	22.9	34.5	4.8	77	01/28	6	01/02+	0.55	-0.31	64
Wichita Mid-Continent Airport	48.4	23.6	36.0	3.8	74	01/28	10	01/02	0.57	-0.26	69

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	38.2	12.1	25.2	0.8	59	01/27	-9	01/14	0.08	-0.28	22
Grand Island Airport	35.9	16.8	26.4	1.3	55	01/19	4	01/14	0.16	-0.37	30
Lincoln Municipal Airport	35.9	14.4	25.2	0.6	58	01/26	0	01/31	0.73	0.09	114
Norfolk Karl Stefan Airfield	34.4	13.2	23.8	1.2	60	01/18	-2	01/31+	0.24	-0.35	41
North Platte Regional Airport	39.0	10.5	24.8	-0.2	59	01/18	-8	01/14+	0.24	-0.10	71
Omaha Eppley Airport	35.4	15.9	25.6	2.1	54	01/19	-1	01/31	0.50	-0.22	69
Valentine Miller Field	36.8	11.6	24.2	0.6	64	01/26	-6	01/15+	0.25	-0.01	96

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismark Municipal Airport	24.1	3.6	13.9	1.1	42	01/18	-17	01/31	0.25	-0.18	58
Fargo International Airport	20.9	0.7	10.8	1.5	43	01/10	-18	01/31	0.97	0.27	139
Grand Forks International Airport	19.0	-1.3	8.8	2.1	40	01/10	-18	01/22	0.42	-0.13	76
Theodore Roosevelt Airport	25.6	8.0	16.8	0.5	44	01/26	-19	01/31	0.08	-0.22	27
Williston International Airport	21.7	3.3	12.5	1.5	37	01/16+	-21	01/31	0.43	-0.16	73

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>.

# January 2013 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	24.0	2.8	13.4	1.4	42	01/18	-29	01/31	0.78	0.31	166
Huron Regional Airport	26.2	6.9	16.5	-0.2	49	01/18	-10	01/31	0.29	-0.21	58
Pierre Regional Airport	28.7	10.1	19.4	-0.5	49	01/18	-10	01/31	0.87	0.45	207
Rapid City Regional Airport	37.1	12.2	24.7	-0.3	59	01/18+	-5	01/14	0.43	0.13	143
Sioux Falls Joe Foss Field Airport	26.9	8.0	17.5	0.9	46	01/18	-9	01/21	0.41	-0.15	73

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	35.8	14.5	25.2	0.5	53	01/26	-12	01/12	0.27	-0.24	53
Cheyenne Municipal Airport	39.6	15.6	27.6	-1.2	58	01/23	-15	01/14	0.15	-0.18	45
Lander Hunt Field Airport	30.2	6.7	18.5	-3.2	49	01/27	-15	01/14	0.70	0.29	171
Laramie Regional Airport	29.5	6.3	17.9	-3.8	49	01/23	-23	01/14	0.15	-0.12	56
Rawlins Municipal Airport	29.5	8.8	19.1	-2.5	49	01/23	-19	01/14	0.11	-0.25	31
Sheridan County Airport	37.5	12.0	24.7	0.9	56	01/26+	-3	01/30+	0.96	0.40	171

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).

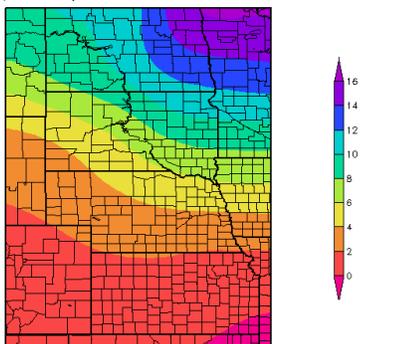
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## Climate Tools

### Wind Chill Climatology

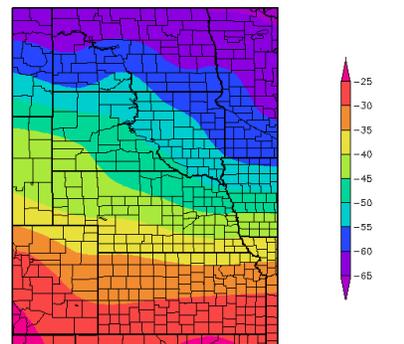
The High Plains Regional Climate Center is pleased to announce its newest climate product - a wind chill climatology for the plains portion of the High Plains Region. This climatology was constructed using hourly data available from the Integrated Surface Hourly (ISH) dataset at the National Climatic Data Center and covers the time frame of 1973-2010. Maps were created for not only winter, but also for each of the individual winter months (December, January, and February). Users can choose to look at either average number of days or hours below a certain threshold for each month or the entire winter season. Thresholds include: -10°F, -15°F, -20°F, -25°F, -30°F, -35°F, and -40°F. In addition, a map of the record low wind chills is also available. These maps can be accessed at the address below:

January - Days with Wind Chill <= -20F



High Plains Regional Climate Center

Record Low Wind Chills



High Plains Regional Climate Center

<http://hprcc.unl.edu/maps/windchill>

## State Spotlight - North Dakota

F. Adnan Akyüz - State Climatologist, Barb Mullins - Assistant to the State Climatologist  
 North Dakota State Climate Office, North Dakota State University



### Precipitation:

Precipitation amounts were below normal for most of North Dakota with most areas being less than 50% of normal based on the High Plains Regional Climate Center (HPRCC) analysis (Figure 1). The far southeast corner had above normal precipitation of ~140%. HPRCC total precipitation amounts were less than 0.6 inches for all but the southeast corner which had approximately an inch of precipitation. A winter storm that tracked across the state on the 11th and 12th brought two day snow totals ranging from 7 inches to less than an inch. The winter storm on the 28th brought a wintry mix that turned to snow. The National Weather Service (NWS) had the highest snow accumulations in the east and included Mooreton with 13", Colfax with 10.5" and Lidgerwood with 10". The U.S. Drought Monitor January 29th report listed 65.47% of the state as having anywhere from Abnormally Dry (D0) through Severe Drought (D2). The Severe Drought (D2) was reported for 30.55% of the state with 34.53% of the state having no drought conditions.

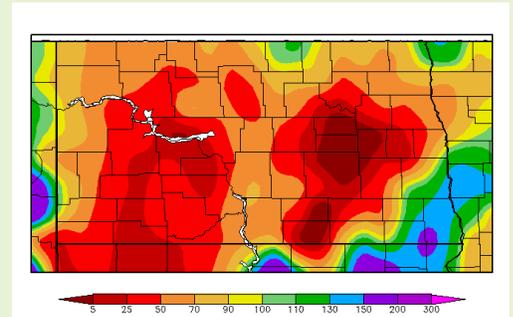


Figure 1. Percent of Normal Precipitation in January 2013 for North Dakota (High Plains Regional Climate Center)

### Temperature:

NDAWN January average air temperatures ranged from ~4 °F in the northeast to ~18 °F in the southwest. Departure from normal average air temperatures ranged from -2 °F to 3 °F (Figure 2). Daily average air temperatures were near normal or above for the first 10 days. Arctic air moved in on the 11th and brought below normal temperatures that lingered through the 14th. Temperatures rebounded to near normal for most areas from the 15th through the 18th. Cold air moved in on the 19th driving temperatures well below normal with minimum air temperatures dropping to below -20 °F over the next few days in the northeast. Temperatures gradually climbed to near normal by the 28th but then took a sharp turn to below normal temperatures for most that lasted through the end of the month.

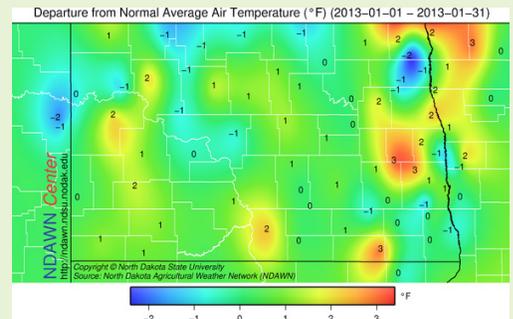


Figure 2. Temperature Departure from Normal in January 2013 for North Dakota (North Dakota State Climate Office)

# State Spotlight - Wyoming

**Tony Bergantino - Assistant State Climatologist**  
**Wyoming State Climate Office, University of Wyoming**



## Snowpack

Snowpack changes were mixed throughout the state in January. The west and north-west decreased with respect to percent of median while the north and northeast saw some improvements. There were also some minor improvements in some areas of the south and southeast.

Unfortunately, even with improvements, over half the state is at less than 90% of the median with most areas of the southeast quarter being around 75% or less of the median. With the important March and April time period still ahead, there is time for growth, but the current pattern will have to change. The one- and three-month outlooks for precipitation both have Wyoming with “Even Chances” meaning that the odds are about the same that it will be above normal as they are for being below normal.

## Precipitation

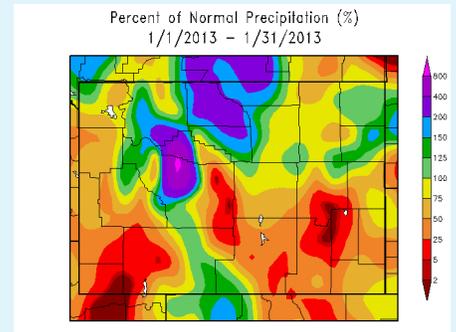
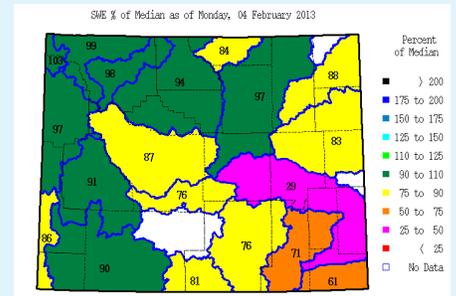
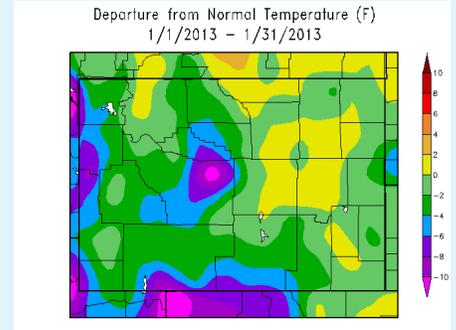
Much of the state saw below normal precipitation in January although there were some notable exceptions such as Big Horn and Sheridan counties where many stations reported monthly precipitation totals that were more than 150% of normal. The west and southwest were just below to much below normal and most of the southeastern quarter of the state was at less than 50% of normal.

## Temperature

The cooler temperatures that were experienced in the latter part of December for much of the state continued and intensified in January with only a few stations being more than 2°F above their normal for January. These stations were mainly in Sheridan and Natrona counties. These counties also saw a few additional stations that were up to 2°F above their normal.

A few other stations around the state were in the 0°F to 2°F range above their normal, these being in Johnson, Converse, Platte, Crook, and Park counties. On the below side of normal there were a large group of stations spread throughout the state that were 0°F to 4°F below normal. Teton, Lincoln, Sweetwater, southern Carbon, Fremont, and Hot Springs counties all had stations running 4°F to more than 10°F below normal.

There was very little change in the drought depiction in January. The only change was a small area of D1 (Moderate Drought) in south-central Laramie County which gave way to D2 (Severe Drought) during the January 15th Drought Monitor update.



Above: (top) January 2013 precipitation as a percentage of historical averages (vs. 1981-2010 normals). Courtesy HPRCC.

(middle) End of January snow water equivalent as a percentage of historical averages (vs. 1981-2010 normals). Courtesy of the NRCS National Water and Climate Center, map by Wyoming State Climate Office.

(bottom) Mean January 2013 temperatures from historical averages (vs. 1981-2010 normals) for Wyoming. Courtesy HPRCC.

# 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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