



727 Hardin Hall
3310 Holdrege Street
Lincoln, NE 68583-0997
402 472-6706
Fax 402 472-8763
<http://hprcc.unl.edu>



Winter scene in rural Nebraska - Photo by Ken Dewey
<http://www.nebraskaweatherphotos.org>

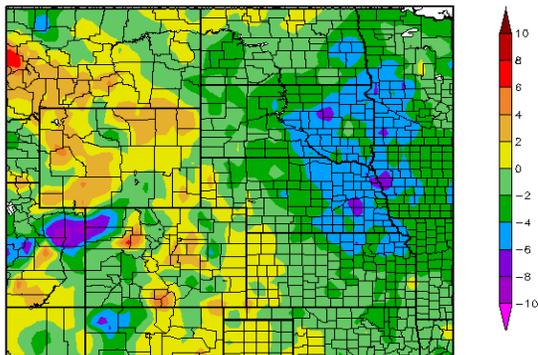
January 2011 Climate Summary

Region Breakdown

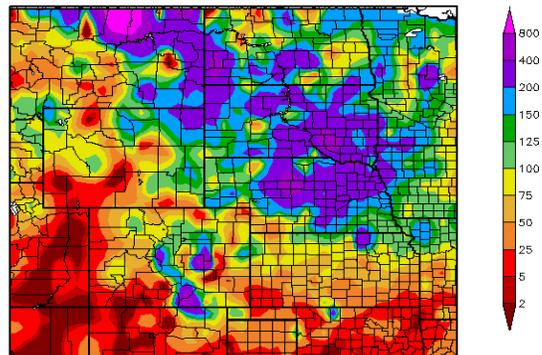
The temperatures this January were full of ups and downs. The year started off with extreme cold across Colorado and Wyoming. In the middle of the month, after a brief warm up, the High Plains Region experienced some of the coldest temperatures of the month. According to the South Dakota State Climate Office, South Dakota had the coldest temperatures in the lower 48 states on January 19th when several locations were -20 degrees F (-28.9 degrees C) or colder. While not record breaking, Pollock, South Dakota did have a low of -32 degrees F (-35.6 degrees C) that day. The warmest temperatures of the month occurred about 10 days later when temperatures ranged from 60-75 degrees F (15.6-23.9 degrees C) across Kansas and Colorado. These warm temperatures did not last long as a blast of cold Arctic air plunged south into the Region at the very end of the month.

Overall, temperatures were slightly warmer than normal across much of Wyoming, central Colorado, western Kansas, and the western edge of the panhandle of Nebraska and cooler than normal in the northern and eastern areas of the Region. Although average temperatures were 6-8 degrees F (3.3-4.4 degrees C) below normal from eastern North Dakota south through eastern Kansas, the cold weather was not record breaking. Many places did rank in the top 20 coldest Januaries on record, however. Seward, Nebraska tied for its 10th coldest January on record (period of record 1900-2011). The average temperature for Seward was 16.6 degrees F (-8.6 degrees C) this month which was 7.8 degrees F (4.3 degrees C) below normal. The coldest January on record occurred in 1940 with an average temperature of only 8.2 degrees F (-13.2 degrees C).

Departure from Normal Temperature (F)
1/1/2011 - 1/31/2011



Percent of Normal Precipitation (%)
1/1/2011 - 1/31/2011

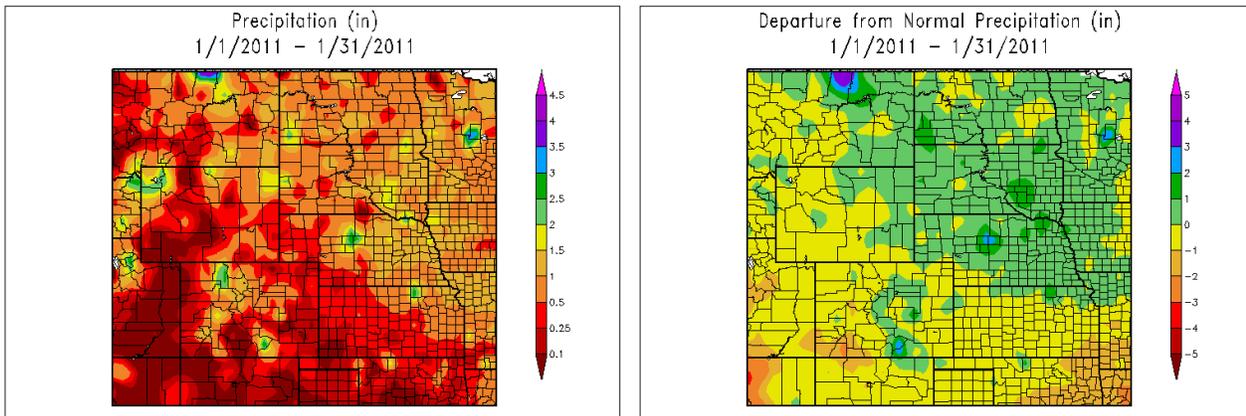


Departure from 1971-2000 Normal Average Temperature (left) and Percent of Normal Precipitation (right) for January 2011 in the High Plains Region. Maps produced by High Plains Regional Climate Center. Available at: <http://hprcc.unl.edu/maps/current>

Precipitation Summary

Precipitation varied across the Region this month. Colorado, Wyoming, and Kansas were generally drier than normal with some isolated areas receiving above normal precipitation. Enough snow fell in the higher elevations in western Wyoming to eliminate the moderate drought conditions which have been in place for months. Several rounds of snow impacted the northern and eastern portions of the Region this month. Many locations in northeast Nebraska and southeast South Dakota had snowfall totals that ranked in the top 10 snowiest Januaries on record and a few even broke monthly records. A long-standing January snowfall record was broken in Oakdale, Nebraska where 23.2 inches (59 cm) of snow fell this month. The previous record was 17.6 inches (45 cm) and occurred in 1936 (period of record 1893-2011). Interestingly, two days this month ranked as top one-day January snowfalls for Oakdale. The fifth highest one-day snow total occurred on January 23rd with 7.0 inches (18 cm) and the second highest one-day snow total occurred on January 10th with 9.5 inches (24 cm). January 2011 was also the second snowiest month of all time in Oakdale. Only March of 1911 had more snow (27.0 inches/69 cm).

Concerns of major flooding along the Red River have started again this winter. According to the National Weather Service in Grand Forks, North Dakota, the combination of a wet 2010, higher than normal snowfall this winter season, and a La Niña forecast of a cool and wet spring could lead to major spring flooding. Snowfall totals across the area have been impressive, although not near those preceding the historical flood of 1997. For instance, Fargo, North Dakota has received 59.2 inches (150 cm) of snow so far this season. This amount has already surpassed the entire 2009-2010 seasonal snowfall total of 46.6 inches (118 cm)!



Above: Total precipitation (inches) (left) and Departure from Normal Precipitation (inches) (right) for January 2011 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>.

January 2011 Records - Highlights

Monthly Records			
Precipitation in inches			
Snowiest	New Record	Old Record	Period of Record
Bartlett 4 S, NE	21.2	20.5/2001	1948-2011
Howells, NE	17.2	13.1/1993	1978-2011
Oakdale, NE	23.2	17.6/1936	1893-2011
Purdum, NE	32.0	20.5/1988	1902-2011
Pickstown, SD	29.6	18.7/2001	1948-2011
Pollock, SD	21.0	17.0/1997	1908-2011
Yankton, SD	22.5	19.7/1982	1932-2011

All Data are Preliminary and Subject to Change.

* indicates multiple records, latest year is listed

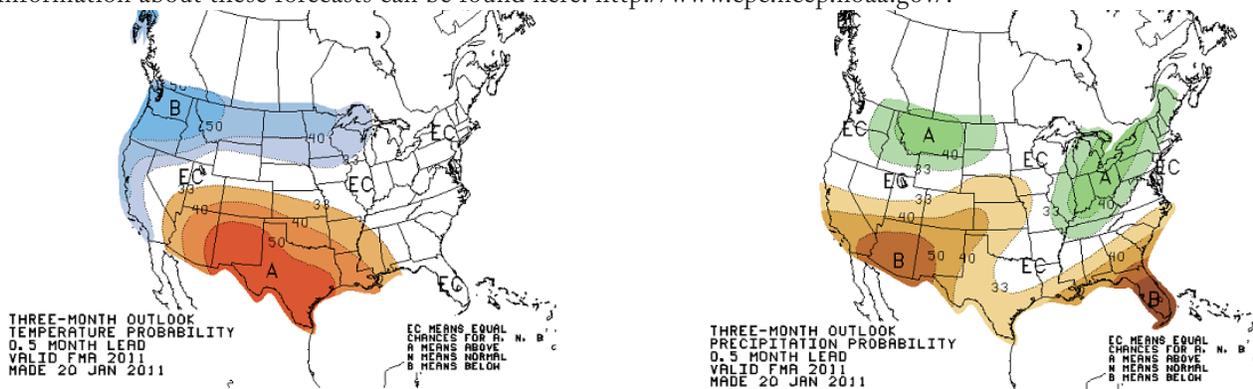
Source: National Weather Service Cooperative Observation Network Data

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

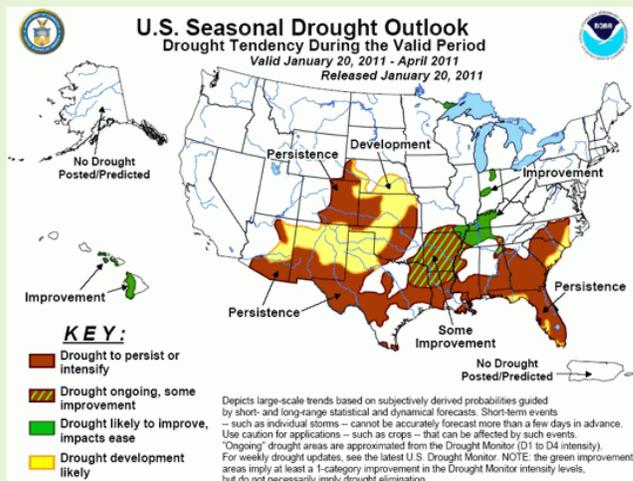
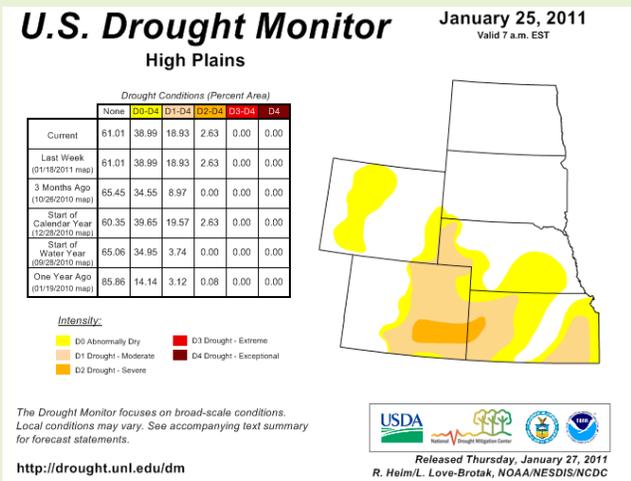
La Niña conditions were present across the equatorial Pacific this month and are expected to continue into spring 2011. The temperature outlook indicates a higher probability of above normal temperatures for much of Kansas and Colorado. North Dakota, the majority of South Dakota, and northern Wyoming have a higher probability of below normal temperatures. Equal chances of above, near, or below normal temperatures are predicted elsewhere in the Region. The precipitation outlook indicates a higher probability of above normal precipitation for the western half of North Dakota, northwestern South Dakota, and northern Wyoming. The majority of Colorado, Kansas, and Nebraska have a higher probability of below normal precipitation. Equal chances of above, near, or below normal precipitation are predicted elsewhere in the Region. The seasonal outlooks combine the effects of long-term trends, soil moisture, and when applicable, the El Niño Southern Oscillation cycle (ENSO). More information about these forecasts can be found here: <http://www.cpc.ncep.noaa.gov/>.



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

The U.S. Drought Monitor remained largely unchanged since last month. In western Wyoming, a good snow pack and high precipitation caused the moderate drought conditions (D1) to be eliminated and the abnormally dry conditions (D0) to be trimmed slightly. The D0 in the southwest corner of Colorado were also eliminated. However, severe drought conditions (D2) remained over south-central Colorado and western Kansas. D1 across eastern Colorado, western and southeastern Kansas, and the panhandle of Nebraska were also unchanged. According to the U.S. Seasonal Drought Outlook released January 20th drought conditions across Colorado, Kansas, and Nebraska were expected to persist and drought conditions were expected to develop in south central Nebraska.



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://www.ndmc.unl.edu/dm/monitor.html>
 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
Alamosa San Luis Airport	39.5	-0.2	19.6	4.9	54	01/29	-16	01/11+	0.06	-0.19	24
Akron Washington County Airport	36.0	14.7	25.4	-1.7	63	01/28	-11	01/11	0.21	-0.12	64
Colorado Springs Municipal Airport	43.1	15.5	29.3	1.2	66	01/28	-8	01/01	0.11	-0.17	39
Grand Junction Walker Field Airport	33.9	13.7	23.8	-2.3	49	01/29	-9	01/02	0.10	-0.50	17
Pueblo Memorial Airport	43.8	10.0	26.9	-2.4	71	01/28	-21	01/01	0.29	-0.04	88

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	34.0	14.7	24.4	-2.3	60	01/28	-6	01/12	0.69	0.03	105
Dodge City Regional Airport	42.5	16.5	29.5	-0.6	71	01/28	-5	01/11	0.34	-0.28	55
Goodland Renner Field	42.5	14.6	28.5	1.0	67	01/28	-12	01/11	0.39	-0.04	91
Topeka Municipal Airport	35.2	13.2	24.2	-3.0	53	01/28	-7	01/13	1.26	0.31	133
Wichita Mid-Continent Airport	40.9	16.9	28.9	-1.3	72	01/28	-1	01/13	0.34	-0.50	40

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	33.2	8.8	21.0	-1.8	56	01/28	-17	01/12	0.47	0.01	102
Grand Island Airport	28.5	8.7	18.6	-3.8	49	01/28+	-12	01/12	1.49	0.95	276
Lincoln Municipal Airport	28.4	8.5	18.4	-4.0	50	01/28	-10	01/13	1.07	0.40	160
Omaha Eppley Airfield	26.9	9.7	18.3	-3.4	49	01/28	-5	01/23	1.14	0.37	148
Norfolk Karl Stefan Airport	25.3	6.2	15.8	-4.6	48	01/28	-16	01/23	1.56	0.99	274
North Platte Regional Airport	33.9	6.9	20.4	-2.8	60	01/28	-20	01/12	1.05	0.66	269
Valentine Miller Field	28.6	5.6	17.1	-3.7	52	01/28	-19	01/12	0.74	0.44	247

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismark Municipal Airport	18.5	-1.1	8.7	-1.5	39	01/28	-24	01/19	1.13	0.68	251
Fargo International Airport	11.4	-5.1	3.2	-3.6	37	01/28	-27	01/21	0.90	0.14	118
Grand Forks International Airport	9.7	-8.7	0.5	-4.8	36	01/28	-30	01/20	0.85	0.17	125
Theodore Roosevelt Airport	20.6	3.0	11.8	-2.4	39	01/06	-24	01/31	0.47	0.10	127
Williston International Airport	18.1	0.1	9.1	1.1	37	01/27+	-27	01/12+	1.30	0.76	241

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 2011 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	15.8	-4.1	5.8	-5.2	40	01/28	-24	01/19	1.17	0.69	244
Huron Regional Airport	18.9	-1.0	8.9	-5.3	40	01/28	-22	01/19	1.55	1.06	316
Pierre Regional Airport	22.8	2.9	12.9	-5.0	43	01/28	-17	01/19	0.93	0.41	179
Rapid City Regional Airport	31.7	7.7	19.7	-2.6	55	01/28	-13	01/31	0.54	0.17	146
Sioux Falls Joe Foss Field Airport	19.5	1.1	10.3	-3.7	39	01/28	-17	01/23	1.17	0.66	229

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	32.3	14.5	23.4	1.1	49	01/28	-24	01/10	0.44	-0.14	76
Cheyenne Municipal Airport	37.5	17.9	27.7	1.8	57	01/28	-13	01/31	0.16	-0.29	36
Lander Hunt Field Airport	34.1	11.2	22.6	2.3	51	01/17+	-13	01/01	0.59	0.07	113
Laramie Regional Airport	29.9	10.5	20.2	-0.2	44	01/30+	-12	01/31	0.04	-0.34	11
Rawlins Municipal Airport	28.7	14.7	21.7	-1.3	43	01/28	-13	01/31	0.20	-0.36	36
Sheridan County Airport	35.1	11.2	23.1	1.9	52	01/28	-18	01/31	0.74	-0.03	96

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State Spotlight - North Dakota

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



Precipitation:

Precipitation ranged from roughly 25% to 300% percent of normal. Above normal precipitation fell primarily in the south central, southwestern, and north-eastern regions with below normal elsewhere (Figure 1. High Plains Regional Climate Center). Precipitation totals ranged mostly from 0.3 to 1.2 inches across the state with greater than an inch falling in the southwest corner. The National Weather Service released it's 2011 spring flood predictions in which many locations across North Dakota were rated as greater and far greater than normal of reaching and exceeding flood stage. Factors that contributed to the spring flood concerns include the wet fall soil conditions, above normal snow-fall, and a persisting La Niña pattern in conjunction with a negative Arctic Oscillation. The USDA, National Agricultural Statistics Service, North Dakota Field Office reported the average statewide snow depth was 24.3 inches on January 30th compared with 13.3 inches this time last year.

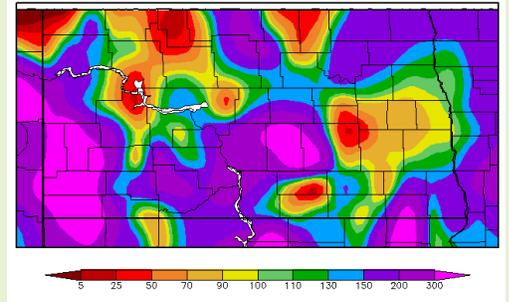


Figure 1. Percent of Normal Precipitation in January 2011 for North Dakota (High Plains Regional Climate Center)

Temperature:

The North Dakota Agricultural Weather Network (NDAWN) January average air temperatures ranged from 1 °F to 14 °F. NDAWN departure from normal temperatures ranged from 3 °F to -6 °F (Figure 2. North Dakota State Climate Office). Most of the state had near normal or slightly below normal average temperatures. Areas with -4 °F or less departure from normal temperatures were the southwest corner, the eastern edge, and the southeast. Most of the daily average air temperatures in January were below normal. There were a couple of days in the first few days of January that were above normal and a stretch from around the 24th through the 28th that were above normal. Otherwise, most days were near normal or below. Days with far colder than normal temperatures fell around the 10th to the 12th primarily in the west, 18th to the 22nd primarily in the east, and the last three days which took a sharp downward turn to the upper teens and 20 °F below normal for most of the state and 30 °F below normal in the southwest.

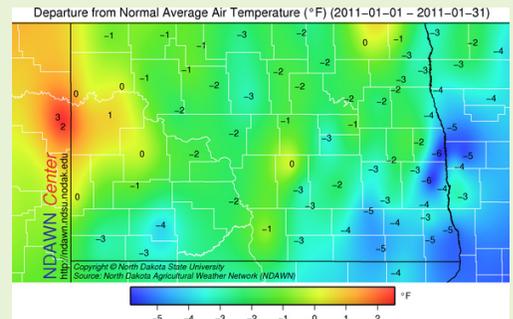


Figure 2. Temperature Departure from Normal in January 2011 for North Dakota (North Dakota State Climate Office)

State Spotlight - South Dakota

Dennis Today - State Climatologist, Nathan Skadsen
 South Dakota State Climate Office, South Dakota State University



Synopsis

The month of January began and ended with much of South Dakota digging out from two major storm systems that brought a snowy beginning to 2011. These two storms, along with a number of smaller snowfall events that occurred throughout the month, brought January snowfall totals to near record levels across the state. While temperatures did not come near any records, they remained well below average for much of the state.

Temperature

During the month of January, average temperatures ranged from around 4 °F in the northeast to the low 20s F in the southwest. Almost the entire state experienced temperatures that were 0 - 8 °F below zero for the month of January. Although no record temperatures were recorded during the month of January, northeastern South Dakota had the distinction of being the coldest place in the lower 48 states during the morning of January 19. The recorded temperature in Aberdeen, SD was -24 °F while Pollock, SD recorded a temperature of -32 °F. Most locations reached double digits below 0 °F with a number of stations reaching the -20 °F or colder level.

Unfortunately, the low temperatures claimed two South Dakotan lives in the month of January. Both individuals passed away due to exposure to the cold temperatures.

Precipitation and Drought

With two large snowfall events to begin and end the month and many smaller snowfalls occurring throughout the month, much of the state experienced above normal precipitation for the month of January. The areas that saw the greatest amounts of precipitation, which included Britton and Wessington Springs in eastern South Dakota and the Black Hills in western South Dakota, saw 200-400% of average precipitation.

Both Wessington Springs and Britton experienced their second wettest month of January. White Lake and Lake Sharpe Project set new records for January precipitation with 2.14 and 1.33 inches recorded respectively. Many other locations were near record precipitation totals.

Snow totals for the month set or were near record for the month. Nine stations, including Pollock, Selby, Roscoe, Shadehill RSVR, Columbia 8 N, Roy Lake, Redfield, Montrose, and White Lake set new snowfall records for the month of January. Seventeen other stations saw snowfalls that were in the top five on record for the month of January. Lead received the most snowfall in the state with 30.5 inches.

Comparing the last two month totals at least half a dozen stations set records over the December to January period. Snow totals during these months broke records or compared closely with those seen during previously severe winters of 1968-69 and 1996-97 at several of these stations.

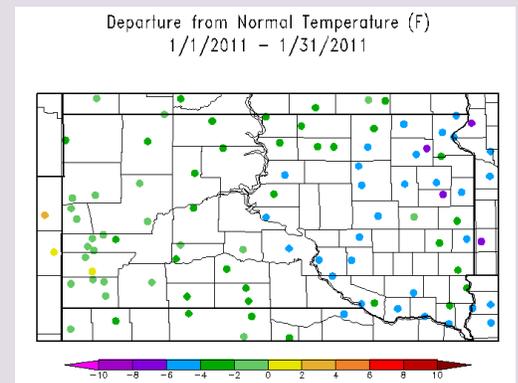


Figure 1. Departure from Normal Temperature in January 2011 for South Dakota (High Plains Regional Climate Center)

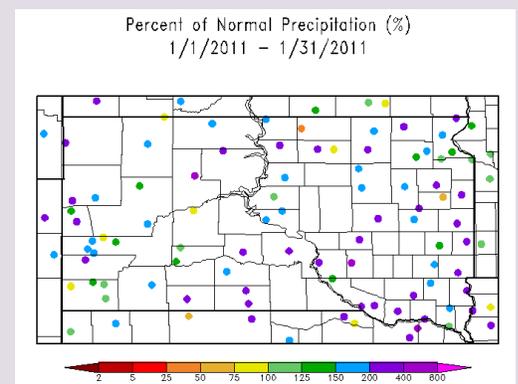


Figure 2. Percent of Normal Precipitation in January 2011 for South Dakota (High Plains Regional Climate Center)

State Spotlight - South Dakota

Dennis Todey - State Climatologist, Nathan Skadsen
South Dakota State Climate Office, South Dakota State University



Precipitation and Drought cont.

The only drought conditions present in the state of South Dakota by the end of January are an area of D0, or abnormally dry, conditions in southwestern Fall River County due to some longer term dryness since the summer of 2010.

Agricultural Impacts

Despite the cold temperatures overall agricultural impacts remained limited. South Dakota Agricultural Statistics reported increased demand for feed due to colder temperatures. But overall feed supplies remained strong. All livestock reports listed a high percentage in good to excellent condition with calf deaths 12% below average.

The heavier snowfall increased snow cover on winter wheat acres leading to more protection from cold temperatures. The snow pack also was keeping freezing depths in soils relatively shallow. In most of the snow covered areas of the east soils were frozen between 4-8". In areas of the west that were not snow covered the freezing layer is deeper. There are fewer sensors in this area to report to more specific depths. Four inch soil temperatures were much lower in the western areas.

Severe Weather

Two consecutive storms started 2011 with much of the eastern half of the state under a Blizzard Warning. High winds and heavy snow fall resulted in low visibility and significant drifting across many roads. As a result of the blowing snow parts of Interstate 29 from Sioux Falls, SD to Grand Forks, ND and Interstate 90 from Ellsworth Air Force Base to Sioux Falls, SD were closed until January 2nd. Two day snowfall totals for the event included 14.3 inches of snow at Roscoe and 3 W Sisseton, 11.8 inches of snow at the Aberdeen ASOS, and 10 inches at the Watertown ASOS and DeSmet.

State Spotlight - Wyoming

Steve Gray - State Climatologist
Wyoming State Climate Office, University of Wyoming



The climate of January 2011 was characterized by significant drying in many parts of Wyoming, but it was also marked by high spatial variability in precipitation. Generally speaking, mountain snowpack remains high compared to much of the previous decade, yet many observing stations in the valleys and basins were dry for the month. Similarly, over a distance of 50 miles one might go from a site that received > 200% of its historical average precipitation for the month to a location that received < 5%.

Generally speaking, southwestern Wyoming was quite dry during the month of January, whereas the northeast tended toward wetness. In Evanston (far southwest Wyoming), for example, the entire month passed with only 0.01" of precipitation recorded. In contrast, locations such as Sundance and Newcastle near the border with South Dakota reported 150 to > 200% of historical average (calculated from 1971-2000) precipitation. Located in the Bighorn Basin of northwestern Wyoming, the two stations at Cody and Powell recorded 0.02 and 0.00" of precipitation for the month, respectively. Parts of neighboring Bighorn and Washakie Counties, on the other hand, were well above average for the same period.

Regarding high-country snowpack, by the end of January state average snow water equivalent (SWE) was at 117% of historical average (compared to 1971-2000), which is far better than 73% of average for the same date last year. The Shoshone basin in the northwest corner of Wyoming had the lowest SWE of any drainage in the state, but values still topped 105% of average. The Upper Bear basin in the far southwest reported 140% of average SWE, which was the highest recorded for any drainage. This high snowpack in the Upper Bear is especially notable when one considers how dry Evanston, the largest municipality in this basin, has been in recent weeks (see above).

On the whole, temperatures for January 2011 were unremarkable. When averaged over the entire month, temperatures were near or slightly above the long-term (vs. 1971-2000) mean. Generally speaking, the month featured two cold snaps; one in the days immediately following New Years, and one centered on the 10th and 11th. In both cases temperatures tended to be 10 to 15° F below average, and few records were broken. Warm temperatures were the story on January 28, with some locations in southeastern Wyoming (e.g., Cheyenne) approach 60° F. The month ended with plummeting temperatures as an Arctic front entered the region on January 31.

According to the U.S. Drought Monitor, Wyoming remained nearly drought free through the month of January 2011 (see <http://www.drought.unl.edu/dm/monitor.html>). In fact, the state is now enjoying its smallest area in drought since late 2009. However, given precipitation deficits that have developed at some lower-elevation sites over the past 30 days, it will be essential to monitor for the potential of drought onset in coming weeks and months.

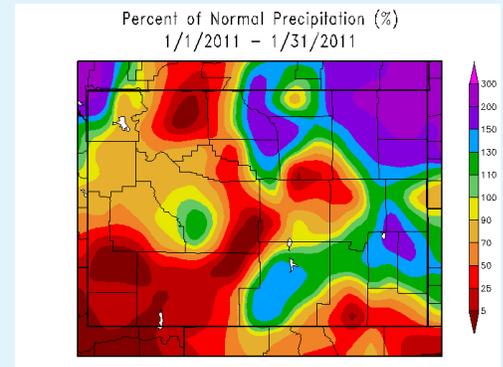


Figure 1. Map showing January 2011 precipitation as a percentage of historical averages (vs. 1971-2000 normal period) for Wyoming. Courtesy HPRCC.

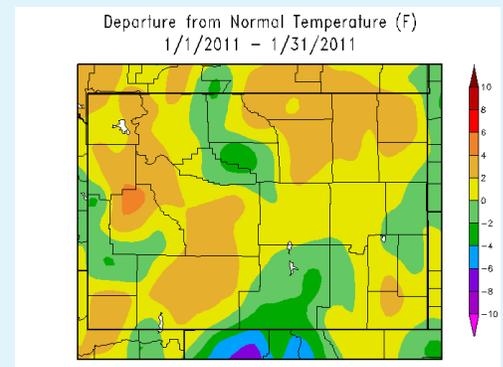


Figure 2. Map showing mean January 2011 temperatures from historical averages (vs. 1971-2000 normal period) for Wyoming. Courtesy HPRCC.

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

Author Information

For questions, comments, or suggestions, please contact:

Natalie Umphlett - Regional Climatologist - High Plains Regional Climate Center

(402) 472-6764 - numphlett2@unl.edu

712 Hardin Hall

3310 Holdrege Street

Lincoln, NE 68583-0997

