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Huge snow drifts along I-80 in Nebraska - Photo by Ken Dewey
<http://www.nebraskaweatherphotos.org>

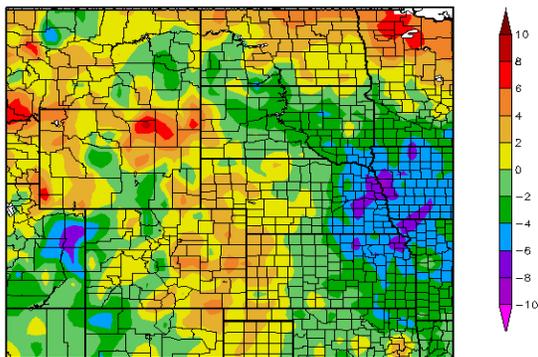
January 2010 Climate Summary

Region Breakdown

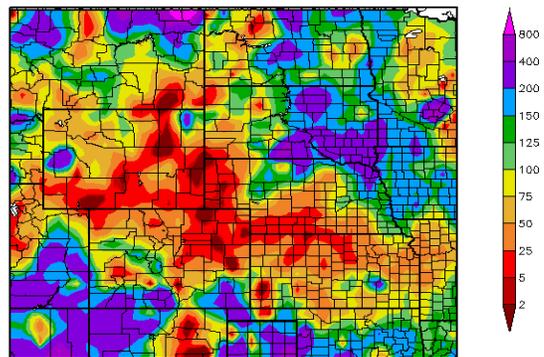
January 2010 started off with record cold, but most areas of the Region were between 2°F (1.1°C) above normal and 2°F (1.1°C) below normal by the end of the month. Exceptions were eastern sections of Kansas, South Dakota, and Nebraska which had temperature departures from 4°F (2.2°C) to 8°F (4.4°C) below normal. Meanwhile, northern North Dakota, portions of Wyoming, and pockets of Colorado had temperature departures up to 6°F (3.3°C) above normal and pockets of Wyoming had temperature departures of up to 8°F (4.4°C) above normal. Despite these large departures, temperature records were not broken this month.

In many places, snow cover had quite an effect on the average temperatures this month. For instance, western Nebraska was free of snow and had temperature departures up to 4°F (2.2°C) above normal. Meanwhile, eastern Nebraska, where record snow depths occurred, had temperature departures up to 8°F (4.4°C) below normal. Similarly, while the majority of South Dakota had average temperatures which were below normal, the southwestern portion of the state had minimal snow cover and average temperatures of 2°F (1.1°C) to 4°F (2.2°C) above normal.

Departure from Normal Temperature (F)
 1/1/2010 – 1/31/2010



Percent of Normal Precipitation (%)
 1/1/2010 – 1/31/2010

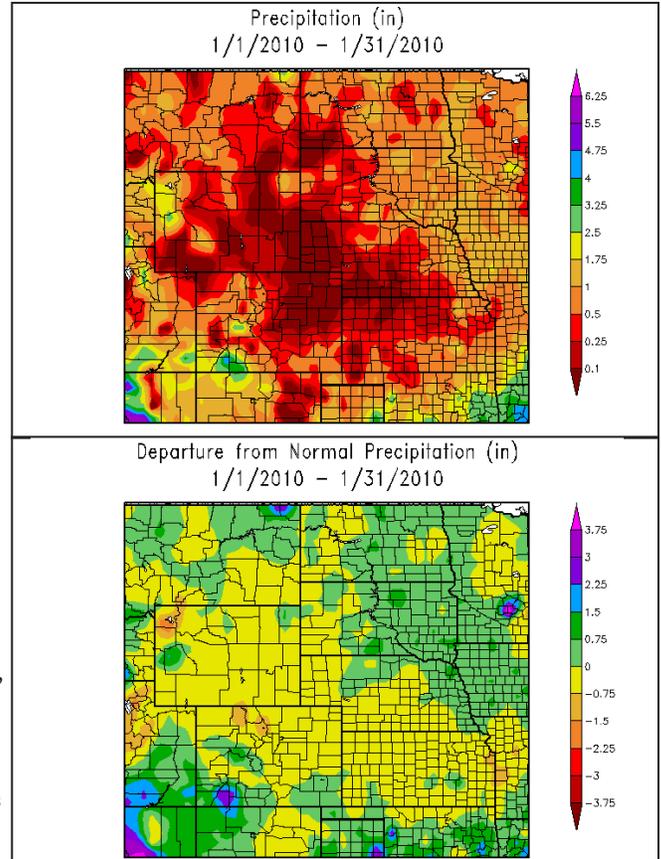


Departure from 1971-2000 Normal Average Temperature (left) and Percent of Normal Precipitation (right) for January 2010 in the High Plains Region. Maps produced by High Plains Regional Climate Center. Available at: <http://hprcc.unl.edu/maps/current>

Precipitation Summary

Precipitation varied widely across the Region this month. Many locations across the Dakotas had precipitation totals which were up to 400% of normal, whereas a large swath of Wyoming, Nebraska, Colorado, and Kansas received less than 25% of normal precipitation. Certain pockets of these states received less than 5% of normal precipitation. This month's wet location was Mission, South Dakota which received 1.57 inches (39.88 mm) of precipitation, or 476% of normal, which beat the old record of 1.13 inches (28.70 mm) recorded in 2001. While no snowfall records were broken this month, several snow depth records were broken across eastern Nebraska. A few light snows combined with several December 2009 snow storms resulted in new January snow depth records. Norfolk, Nebraska crushed the old record of 17.0 inches (43.18 cm) recorded in 1969. The record was initially broken on the first day of the month with 19.0 inches (48.26 cm) but snow continued to fall and the record 25.0 inches (63.50 cm) of snow on the ground was reached on January 10. For more precipitation records, please see the table below.

The big story this month was a winter storm which brought rain, freezing rain, snow, and blizzard conditions to portions of the Region. The January 23-25 storm started off as a mixture of rain, snow, and sleet before changing over to all snow in parts of the Dakotas. Heavy snow fell in North Dakota and snow reports of 6-10 inches (15.24-25.40 cm) were common. Towards the end of the storm, additional snow and strong gusting winds produced blizzard conditions for the eastern portions of the Dakotas and far northeastern Nebraska. Due to the blizzard conditions, visibility was greatly reduced and sections of I-29, I-94, and I-90 were closed. In addition, at least 10,000 people lost power.



Above: Total precipitation (inches) (top) and Departure from Normal Precipitation (inches) (bottom) for January 2010 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 2010 Records - Highlights

Monthly Records			
Precipitation in inches			
Wettest	New Record	Old Record	Period of Record
Mission, SD	1.57	1.13/2001	1967-2010
Driest	New Record	Old Record/Year	Period of Record
Briggsdale, CO	0.00	tied/2008*	1948-2010
Bridgeport, NE	0.00	tied/2002*	1897-2010
Sidney Municipal AP, NE	0.00	tied/2008*	1948-2010
Snow Depth	New Record	Old Record	Period of Record
Lincoln, NE	18.0	tied/1974	1948-2010
Norfolk, NE	25.0	17.0/1969*	1899-2010
Omaha, NE	21.0	14.0/2005	1948-2010

All Data are Preliminary and Subject to Change.

* indicates multiple records, latest year is listed

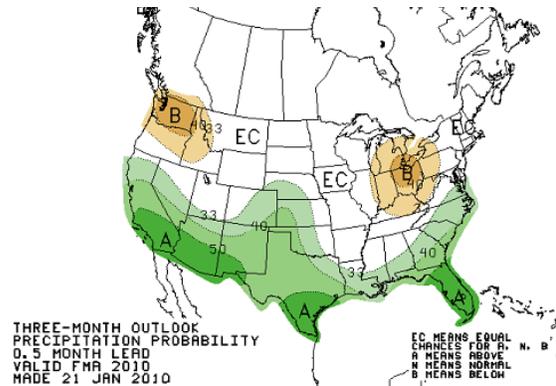
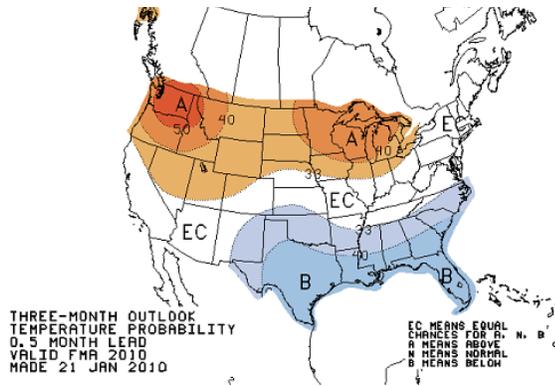
Source: National Weather Service Cooperative Observation Network Data

The High Plains Regional Climate Center is one of the NOAA 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

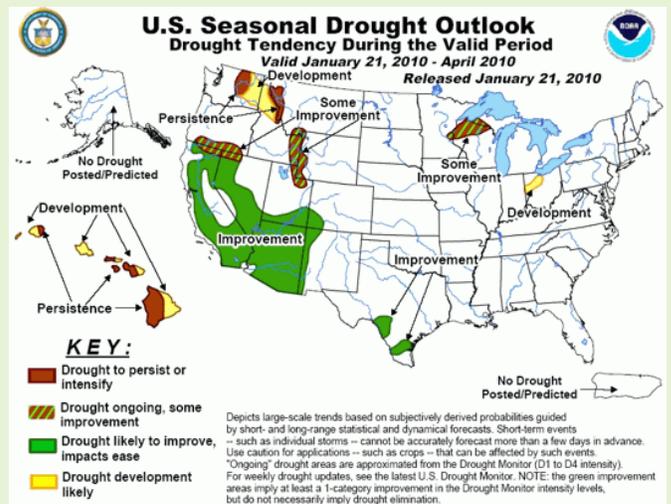
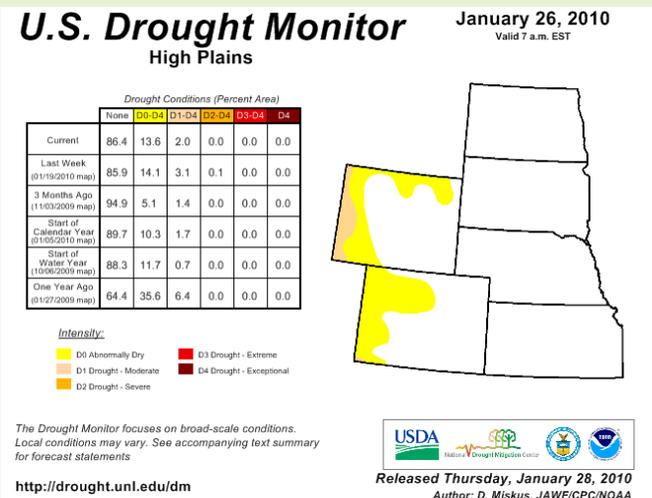
El Niño conditions were present this month and are expected to continue into Spring 2010. The temperature outlook indicates a higher probability of above normal temperatures for the Dakotas, Wyoming, northern Nebraska, and the northwestern Colorado. Only southern Kansas and far southeastern Colorado have a higher probability for below normal temperatures. Equal chances of above, near, or below normal temperatures are predicted elsewhere. The precipitation outlook indicates a higher probability of above normal precipitation for most of Kansas, the majority of Colorado, southwestern Nebraska, and a very small portion of southeast Wyoming. 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 (ENSO) cycle. 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

There were big changes to the U.S. Drought Monitor for the High Plains Region this month. North Dakota joined South Dakota, Nebraska, and Kansas as the drought free states in the Region. After heavy rains, a large portion of southwestern Colorado was downgraded from moderate drought (D1) to abnormally dry (D0) conditions. However, abnormally dry conditions spread through northwest and north-central Colorado and also western Wyoming. In addition, far western Wyoming slipped from D0 to D1. According to the U.S. Seasonal Drought Outlook released January 21st, the drought conditions in the southwest corner of Colorado and western Wyoming are expected to improve through April 2010.



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 NOAA 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	36.5	0.8	18.7	4.0	46	1/16+	-12	1/09	0.65	0.40	260
Akron Washington County Airport	40.4	18.7	29.5	2.4	55	1/16	-12	1/07	0.00	-0.33	0
Colorado Springs Municipal Airport	44.3	17.2	30.7	2.6	57	1/16+	-5	1/08	0.12	-0.16	43
Grand Junction Walker Field Airport	30.5	10.7	20.6	-5.5	41	1/22+	-7	1/09	0.55	-0.05	92
Pueblo Memorial Airport	49.0	11.8	30.4	1.1	64	1/16	-8	1/08	0.19	-0.14	58

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	29.7	16.3	23.0	-3.6	50	1/22	-10	1/09	0.14	-0.52	21
Dodge City Regional Airport	41.1	18.1	29.6	-0.5	63	1/22	-3	1/08	0.13	-0.49	21
Goodland Renner Field	43.0	16.8	29.9	2.3	63	1/12	-6	1/08+	0.18	-0.25	42
Topeka Municipal Airport	31.2	17.9	24.5	-2.7	57	1/23	-8	1/10	0.45	-0.50	47
Wichita Mid-Continent Airport	36.9	21.0	28.9	-1.3	59	1/22	0	1/09	0.42	-0.42	50

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	34.7	12.5	23.6	0.8	48	1/16	-20	1/08	0.01	-0.45	2
Grand Island Airport	27.2	12.7	20.0	-2.4	44	1/23+	-16	1/09	0.50	-0.04	93
Lincoln Municipal Airport	25.0	10.9	18.0	-4.4	43	1/23	-15	1/04	0.82	0.15	122
Omaha Eppley Airfield	22.9	10.5	16.7	-5.0	43	1/23	-20	1/04	1.12	0.35	145
Norfolk Karl Stefan Airport	23.5	9.4	16.4	-4.0	41	1/10	-19	1/09	0.77	0.20	135
North Platte Regional Airport	36.0	14.4	25.2	2.0	56	1/13	-12	1/08	0.15	-0.24	38
Valentine Miller Field	32.8	12.5	22.7	1.9	55	1/16	-21	1/08	0.27	-0.03	90

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismark Municipal Airport	18.3	0.4	9.3	-0.9	45	1/16	-33	1/08	0.70	0.25	156
Fargo International Airport	15.4	1.4	8.4	1.6	36	1/23+	-33	1/02	1.57	0.81	207
Grand Forks International Airport	14.8	-0.2	7.3	2.0	41	1/16	-35	1/02	0.69	0.01	101
Theodore Roosevelt Airport	19.0	6.0	12.5	-1.7	40	1/12	-27	1/08	0.06	-0.31	16
Williston International Airport	19.8	3.1	11.5	3.5	39	1/16+	-32	1/08	1.09	0.55	202

All Data are Preliminary and Subject to Change.

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 2010 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	17.4	0.5	9.0	-2.0	35	1/23+	-31	1/09	0.91	0.43	190
Huron Regional Airport	18.6	3.9	11.3	-2.9	37	1/16	-24	1/08+	0.73	0.24	149
Pierre Regional Airport	21.9	7.0	14.5	-3.4	40	1/13	-23	1/08	0.14	-0.38	27
Rapid City Regional Airport	30.7	12.3	21.5	-0.9	56	1/16	-18	1/08	0.20	-0.17	54
Sioux Falls Joe Foss Field Airport	18.9	2.2	10.5	-3.5	38	1/16	-30	1/02	1.25	0.74	245

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	36.1	16.8	26.4	4.1	46	1/17	-27	1/06	0.09	-0.49	16
Cheyenne Municipal Airport	41.2	18.5	29.8	3.9	58	1/12	-7	1/06	0.07	-0.38	16
Lander Hunt Field Airport	27.7	6.8	17.3	-3.0	43	1/19	-16	1/07	0.37	-0.15	71
Laramie Regional Airport	28.7	6.2	17.5	-2.9	43	1/12	-27	1/08+	0.01	-0.37	3
Rawlins Municipal Airport	33.3	10.0	21.6	-1.4	43	1/12	-27	1/7	0.05	-0.51	9
Sheridan County Airport	33.8	11.7	22.8	1.5	53	1/15	-18	1/07	0.08	-0.69	10

All Data are Preliminary and Subject to Change.

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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:

January monthly precipitation ranged from 0.01 inches to 1.5 inches. Monthly precipitation totals of 0.1 and less were in the southwest. The northwest and eastern regions had monthly totals of between 0.3 and 0.7 inches. The greater monthly totals were along the central regions and south eastern edge. The percent of normal precipitation ranged from 5% to 300%. The areas with greater than 100% of normal precipitation were the central, southeast, northeast, and a small portion of the northwest. The remaining areas in the eastern, northwest, and southwest regions had less than 100% of normal precipitation (Figure 1. High Plains Regional Climate Center). A major storm system of rain, freezing rain, and snow traveled across North Dakota from the 22nd through the 25th. The freezing rain caused power outages for thousands in the southern parts of the state. The high winds and snow on the 25th causes white out conditions in the eastern part of the state. This in turn prompted the closing of a number of roads, schools and businesses. Bismarck had record precipitation on the 22nd of 0.25 inches. Fargo and Grand Forks airport had record precipitation on the 23rd of 0.9 inches and 0.25 inches, respectively.

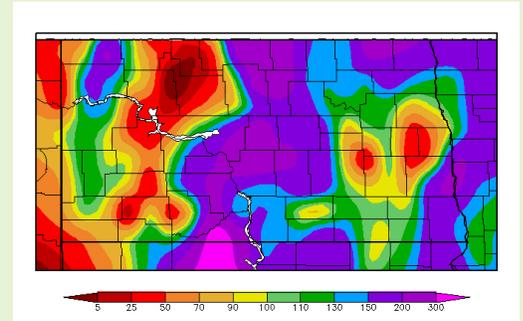


Figure 1. Precipitation Percent of Normal in January 2010 for North Dakota (High Plains Regional Climate Center)

Temperature:

January average monthly temperatures ranged from 6°F to 16°F. The monthly temperatures were coolest in the northeast and gradually progressed to the warmer temperatures in the southwest. The January monthly departure from normal temperatures ranged from -2°F to 6°F (Figure 2. North Dakota State Climate Office). Daily minimum air temperatures frequently dipped to -20°F and even -35°F across North Dakota during the first 10 days of January. Jamestown and Grand Forks airport had record low temperatures on the 1st of -28°F and -33°F, respectively and record low temperatures on the 2nd of -30°F and -35°F, respectively. Fargo had a record low on the 2nd of -33°F. Grand Forks airport also had a record low maximum temperature of -17°F on the 2nd. Following the cold spell, an unseasonably warm stretch occurred from the 11th through the 24th in which average air temperatures were around 10 to 20 degrees above normal. From the 25th through the end of the month, daily average air temperatures were much colder at around 10 degrees below normal.

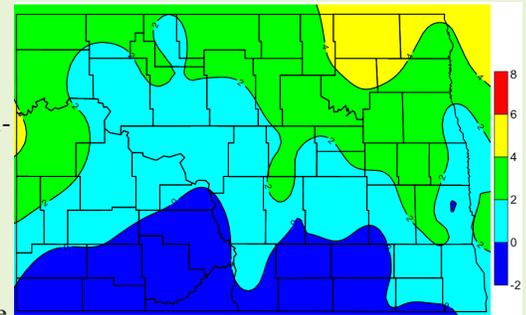


Figure 2. Temperature Departure from Normal in January 2010 for North Dakota (North Dakota Climate Office)

State Spotlight - Nebraska

Al Dutcher - State Climatologist
Nebraska State Climate Office, University of Nebraska - Lincoln

Overview

January 2010 brought a wide range of weather conditions across the state including brutal cold, a mid-month thaw, fog, rain, freezing rain, snow, and blizzard conditions. The first 10 days of the month brought bitter cold temperatures that saw the period average less than 5 F and daily average temperature departures of 20 to 25 F below normal. Two storm systems moved through the state during the January 3-4 and 5-6 time frames bringing light accumulations to eastern Nebraska.

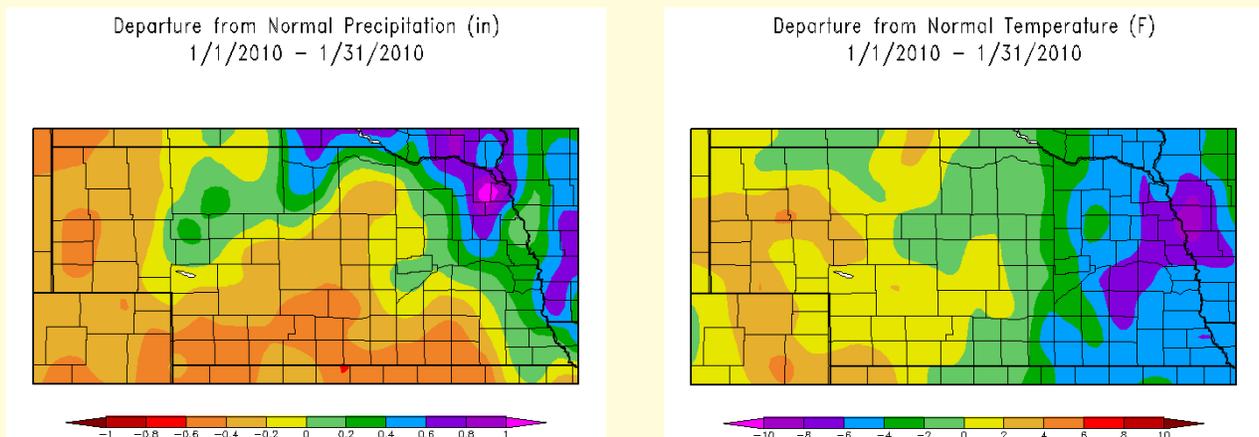
Combined with the wind and December snowfall, considerable blowing and drifting were observed across eastern Nebraska. Many counties lacked the equipment to move snow drifts that exceeded 20 feet, especially across the northeastern ¼ of the state. Several counties in the Sandhills, along with the Nebraska Department of Roads, lent snow blowing/cutting equipment to assist in the snow clearing process. Rural roads remained virtually impassable during much of the first ten days of the month.

A welcome thaw developed during the January 13-25 time frame. The deep snow pack across the eastern 1/3 of the state limited the degree of warming, with highs limited to the 30's to low 40's. Much of western Nebraska experienced more significant warming with highs reaching the 50's several times, and several low 60's readings were observed across the Panhandle and Southwest. During the thaw, at least 7 consecutive days of dense fog were observed over eastern Nebraska as winds were light and the upper air pattern (split flow) moved systems well to the north and south of the region.

The last week of the month brought a return to below normal temperatures to the state, as well as precipitation during the January 24-26 period. Freezing mist hit the eastern half of the state on the 24th, with freezing ice across northeast Nebraska. Some local power outages and road closures were noted, but the most significant ice damage was observed east of the Missouri River. Light snow swept through the state on the 26th, with accumulations generally less than two inches. High winds created blizzard conditions across extreme eastern Nebraska and all of western Iowa.

Precipitation

For most of the state, below normal precipitation was common. Most of the significant moisture accumulations were observed during the first week of the month across the eastern ¼ of the state. Two precipitation events (Jan 3-4 and 5-6) resulted in light to moderate snow accumulations and high winds. An area of the Sandhills extending from Hyannis northeast through the Ainsworth area also received measureable snowfall.



Above: Figure 1. Departure from 1971-2000 Normal Precipitation (left) and Figure 2. Departure from 1971-2000 Normal Temperature (right) for January 2010 for Nebraska (HPRCC).

State Spotlight - Nebraska, cont.



Al Dutcher - State Climatologist
Nebraska State Climate Office, University of Nebraska - Lincoln

Numerous locations across the Panhandle, southwest, and south central climate districts failed to receive measurable snowfall during January, reversing the trend of above normal moisture received during December 2009. Precipitation departures for January indicate above normal moisture across north central, northeast, east central, and the eastern half of southeast Nebraska (figure 1). Much of the Panhandle, southwest, and south central parts of the state received less than 0.10 of liquid equivalent moisture during the month.

Prior to the onset of the January thaw, the northeastern climate district had an average snow depth of 23 inches on the 10th, but it shrunk to 8 inches by the 31st. However, an area encompassing extreme northeast Nebraska still had snow depths ranging from 10 to 18 inches. However, a considerable amount of snow was blown into ditches and low lying areas in late December and early January. Even though snow packs declined significantly during the month, a considerable amount of liquid water remains in drifts that are still in the 6-10 foot range.

The slow pace of snow melt resulted in very few reports of low land flooding, but streams/rivers still had extensive and deep ice (> 10 inches) at months end. With significant ice remaining and large snow drifts yet to melt, flooding will remain a concern until the rivers can flush out the remaining ice. In addition, wet conditions in October 2009 led to wet surface soils, so rainfall events during the next few months are likely to have a higher runoff component and increase the spring flood potential.

Of the 124 stations reporting at least 80% of their data during January, 87 failed to receive normal moisture. The greatest monthly precipitation total was 1.98 inches at Wakefield, while the greatest 24-hour total was 0.70 inches at Ainsworth on the 23rd. Wakefield also had the greatest monthly snowfall total of 14.8 inches, while Columbus had the greatest 24-hour total of 6.4 inches on the 2nd. At least 25 locations obtained a snow depth in excess of 20 inches during the month, with unofficial snow depth of 41 inches at Humphrey on the 13th being the greatest snow depth reported during January.

Temperatures

Figure 2 indicates that the eastern half of the state was colder than normal with departures across the eastern ¼ of Nebraska running 4-8 F below normal. The greatest temperature departures generally fell over areas of the state with the deepest snow packs for much of the month. Across western Nebraska, temperatures were generally less than 2 F above normal. The exception was the central and southern Panhandle, along with extreme southwest Nebraska where departures approached 4 F above normal.

In terms of temperatures, the month of January could be split into 3 parts. Exceptionally cold temperatures during the first 12 days of the month led to record to near record cold across the state. Most locations failed to average over 5 F for the period. Norfolk, Lincoln, and Omaha all set their coldest first 12 days of January on record.

The cold air broke on the 13th and ushered in January thaw conditions. Temperatures in the 50's to low 60's were reached several times during the January 13-24 time frame across the western half of the state. Unfortunately, the eastern 1/3 of the state struggled to break the 40 F mark as deep snow cover limited the rebound in air temperatures. Extensive fog during the period limited diurnal temperature fluctuations. For example, Lincoln's diurnal temperature range was 3 F January 17-18, 7 F on January 19, and 2 F January 20-21.

A return to below normal temperatures was observed for much of the state during the January 25-31 period. A couple of systems ejected out of the southwestern U.S and brought extensive clouds and precipitation. As the systems passed east of Nebraska, enough cold air was drawn southward that daily temperatures ranged from normal to 10 F below normal. This was a far cry from departures approaching 25 F below normal during the first 10 days of the month.

The highest temperature recorded during January 2010 was 64 F at Bridgeport 18 WSW on the 13th, while the coldest reading was -30 F at Verdel 6 SSE on the 10th. At least 18 stations reached -20 F and another 67 reached -15 F. Most of the highest maximum temperatures recorded during the month occurred on the 16th or 23rd, while the lowest minimum temperatures were generally centered around January 8. The temperature spread between the highest and lowest temperature recorded during the month was an impressive 94 F.

The Nebraska State Climate Office is a part of the School of Natural Resources, University of Nebraska - Lincoln.

For more information about the School of Natural Resources at UNL: <http://www.snr.unl.edu>.

For more information on the University of Nebraska - Lincoln: <http://www.unl.edu>.

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 operated under the National Oceanic and Atmospheric Administration (NOAA), 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>

NOAA 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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