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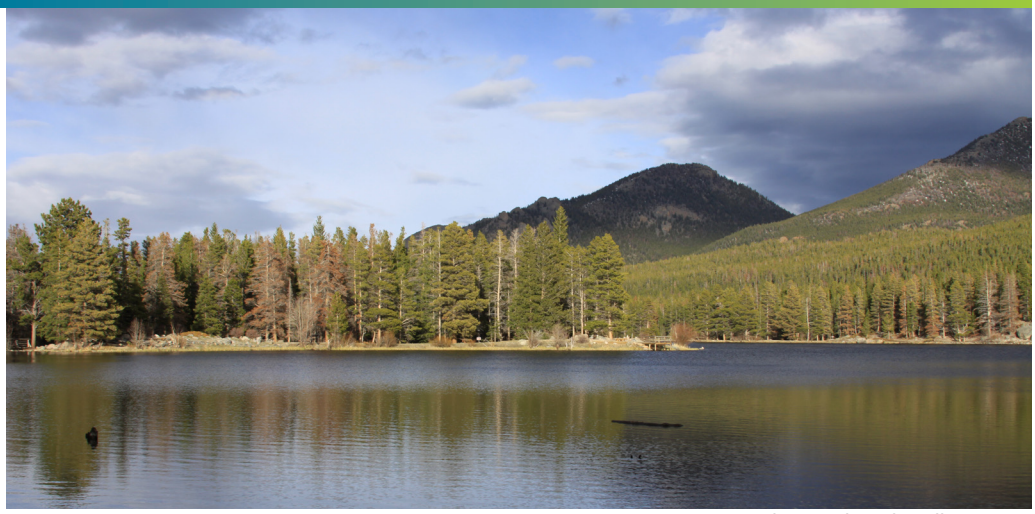

Estes Park, CO - Photo by Bill Sorensen
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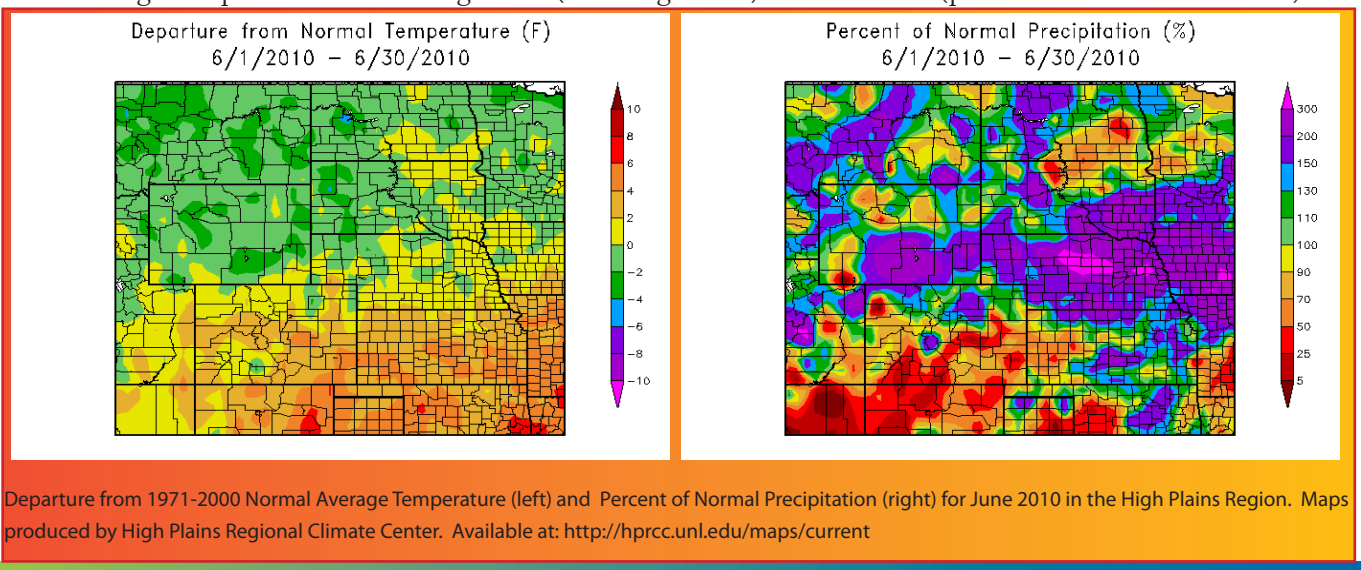
June 2010 Climate Summary

Region Breakdown

June 2010 temperatures were near normal for most locations across the High Plains Region. Colorado and Kansas were the exceptions with both states having temperature departures of 2-4 degrees F (1.1-2.2 degrees C) above normal with pockets of temperature departures of 4-6 degrees F (2.2-3.3 degrees C) above normal. Only small areas of Wyoming and the Dakotas had temperature departures of 2-4 degrees F (1.1-2.2 degrees C) below normal.

These temperature departures caused many locations across Kansas and eastern Colorado to be ranked in the top 10 warmest Junes on record. Topeka, Kansas recorded its 7th warmest June with an average temperature of 78.7 degrees F (25.9 degrees C). This could not beat out the warmest June on record which occurred in 1934 with an average temperature of 82.3 degrees F (27.9 degrees C) (period of record 1887-2010). Meanwhile, Colorado Springs, Colorado recorded its 5th warmest June with an average temperature of 69.6 degrees F (20.9 degrees C) which was 5.2 degrees F (2.9 degrees C) above normal. The warmest June in Colorado Springs occurred in 2002 when an average temperature of 70.8 degrees F (21.6 degrees C) was recorded (period of record 1894-2010).



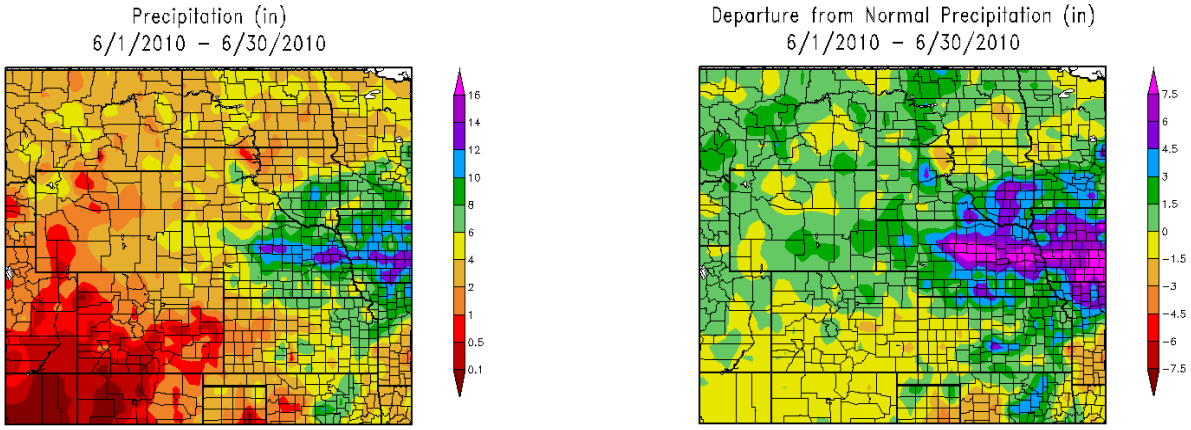
Departure from 1971-2000 Normal Average Temperature (left) and Percent of Normal Precipitation (right) for June 2010 in the High Plains Region. Maps produced by High Plains Regional Climate Center. Available at: http://hprcc.unl.edu/maps/current

Precipitation Summary

June 2010 was a wet month for much of the High Plains Region as a large swath extending from Wyoming, into Nebraska, and South Dakota received over 200 percent of normal precipitation. Areas of central and eastern Nebraska received over 300 percent of normal precipitation. The heavy rains led to flooding along many rivers and also in fields. Record flooding occurred on the Elkhorn River at Norfolk, Nebraska when the river crested at 16.85 feet on June 16th. The heavy rains also slowed crop progress and delayed field work. In addition to heavy rains, severe weather was reported almost every day of the month in the Region. A major tornado outbreak occurred on June 17th and at least 20 tornadoes were confirmed in eastern North Dakota and northwestern Minnesota.

Above: Flooding in Norfolk, NE. Photo courtesy Bernie Auten.

Numerous locations throughout Nebraska, South Dakota, Kansas, and Wyoming ranked in the top 10 wettest Junes on record and many recorded their wettest June on record (see below). This month's wet spot was Ericson 6 WNW, Nebraska which is located in central Nebraska. Ericson 6 WNW received 12.93 inches (328.42 mm) of precipitation which was 363 percent of normal precipitation. This crushed the old record of 9.32 inches (236.73 mm) which was set in June 1908 (period of record 1893-2010). 4.26 inches (108.20 mm) of the monthly total fell in one day, June 13th, which beat the old record for the most one-day precipitation received during the month of June. The old record was set June 14, 1920 with 3.50 inches (88.90 mm).



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

June 2010 Records - Highlights

Monthly Records

Precipitation in inches

Wettest	New Record	Old Record	Period of Record
Blue Hill 4 SW, NE	10.07	8.41/1957	1956-2010
Elgin, NE	10.95	10.51/1967	1911-2010
Ericson 6 WNW, NE	12.93	9.32/1908	1893-2010
Purdum, NE	11.59	10.98/1951	1902-2010
Rawlins, WY	2.46	2.40/1998	1951-2010
Schuyler, NE	14.52	13.79/1967	1905-2010
Taylor, NE	12.46	9.67/1947	1921-2010
Wessington Springs, SD	10.43	8.30/1901	1893-2010

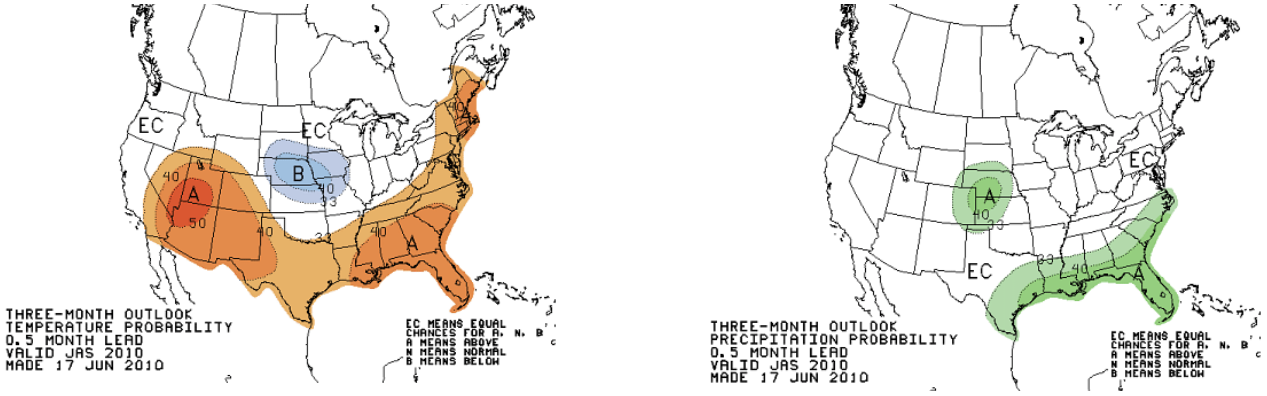
All Data are Preliminary and Subject to Change.
* indicates multiple records, latest year is listed
Source: National Weather Service Cooperative Observation Network Data

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.

ACIS
Applied Climate Information System - NOAA Regional Climate Centers

Climate Outlook

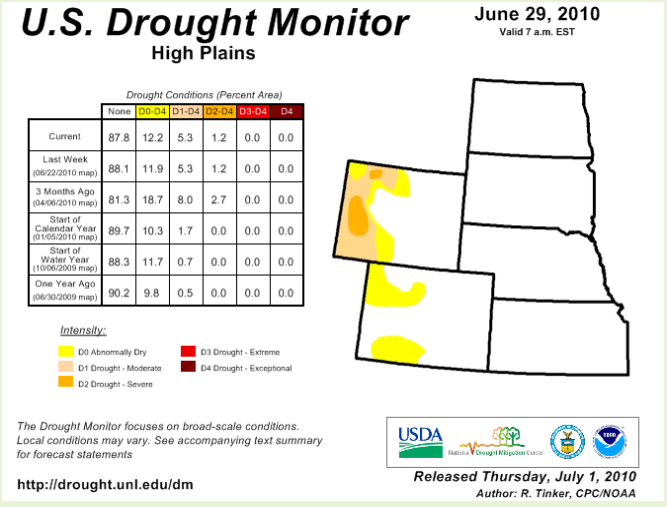
El Niño Southern Oscillation (ENSO) neutral conditions were present this month. However, a transition to La Niña conditions is expected sometime during Summer 2010 as sea surface temperatures across the equatorial Pacific Ocean have continued to decrease. The temperature outlook indicates a higher probability of below normal temperatures for Nebraska, the southern half of South Dakota, and the northern half of Kansas. Southwestern Wyoming and all but the northeastern corner of Colorado have a higher probability for above 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 Nebraska, the eastern half of Colorado, southern South Dakota, the western half of Kansas, and the southeast corner of Wyoming. Equal chances of above, near, or below normal precipitation are predicted elsewhere in the Region. More information about these forecasts can be found here: http://www.cpc.ncep.noaa.gov/.

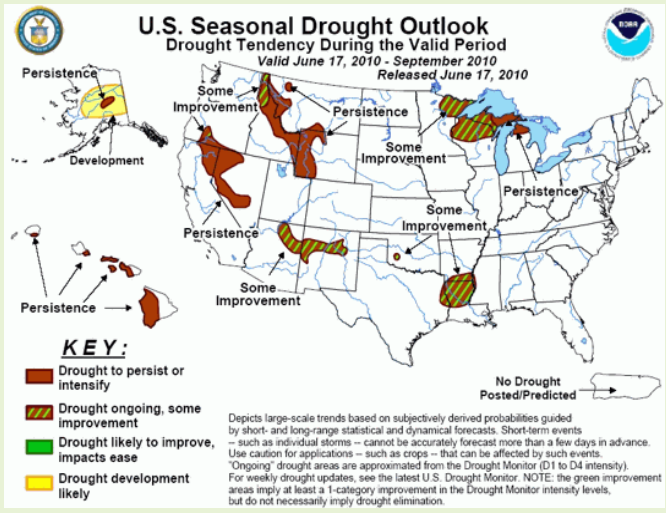


Above: 3-Month Outlook Maps Courtesy the NOAA Climate Prediction Center - http://www.cpc.ncep.noaa.gov
(left) The Three-Month Temperature Probability Outlook, (right) The Three-Month Precipitation Probability Outlook

Drought Watch

June brought only minor changes to the Drought Monitor. North Dakota, South Dakota, Nebraska, and Kansas remained drought free this month. However, little to no precipitation fell in southern Colorado which led to the development of abnormally dry conditions (D0). D0 in northern Colorado persisted and D0 and moderate drought conditions (D1) in western Wyoming remained largely unchanged this month. However, in the northwest corner of Wyoming, the severe drought conditions (D2) were downgraded to D1 and D0. Even with this improvement, according to the U.S. Seasonal Drought Outlook released June 17th, the drought conditions in western Wyoming are expected to persist through September 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	83.3	41.4	62.4	3.0	94	6/06	32	6/23+	0.11	-0.48	19
Akron Washington County Airport	82.0	55.0	68.5	0.7	97	6/25	42	6/14	3.19	0.87	138
Colorado Springs Municipal Airport	84.8	54.4	69.6	5.2	97	6/07	42	6/15	0.34	-2.00	15
Grand Junction Walker Field Airport	89.7	58.8	74.2	3.2	101	6/06	48	6/17	0.27	-0.14	66
Pueblo Memorial Airport	89.7	55.2	72.5	2.7	101	6/25+	44	6/15	0.90	-0.43	68

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	87.7	65.2	76.5	3.0	100	6/26	55	6/03	5.81	1.86	147
Dodge City Regional Airport	90.8	65.0	77.9	3.6	101	6/26	55	6/03	4.44	1.29	141
Goodland Renner Field	85.8	58.4	72.1	2.5	100	6/25	48	6/15	3.21	-0.09	97
Topeka Municipal Airport	88.7	68.6	78.7	4.8	96	6/22+	61	6/30+	9.54	4.66	195
Wichita Mid-Continent Airport	90.6	70.9	80.7	5.2	98	6/26	61	6/07	5.33	1.08	125

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	80.7	53.6	67.2	0.0	95	6/30	45	6/15	3.49	0.87	133
Grand Island Airport	83.9	61.8	72.8	1.7	95	6/26	52	6/03	8.77	5.05	236
Lincoln Municipal Airport	85.1	63.2	74.2	1.5	96	6/17	53	6/03	9.90	6.39	282
Omaha Eppley Airfield	84.4	64.1	74.2	2.0	94	6/26+	53	6/03	9.25	5.30	234
Norfolk Karl Stefan Airport	82.1	60.1	71.1	1.0	94	6/26	47	6/03	10.71	6.46	252
North Platte Regional Airport	81.9	57.1	69.5	1.1	95	6/26	47	6/15	4.99	1.82	157
Valentine Miller Field	80.3	55.7	68.0	0.4	97	6/30	47	6/09	3.91	0.90	130

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismark Municipal Airport	77.2	53.3	65.2	0.5	97	6/30	39	6/14+	2.48	-0.11	96
Fargo International Airport	76.9	56.4	66.6	0.6	86	6/24+	42	6/02	4.26	0.75	121
Grand Forks International Airport	74.3	55.0	64.7	-0.5	84	6/24	43	6/02	4.03	1.00	133
Theodore Roosevelt Airport	72.6	49.5	61.1	-2.3	88	6/30	39	6/15+	3.40	0.09	103
Williston International Airport	74.6	51.8	63.2	-0.5	91	6/30	41	6/14	2.70	0.34	114

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.

June 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	77.7	56.7	67.2	0.4	88	6/30	44	6/02	5.40	1.91	155
Huron Regional Airport	78.4	58.5	68.4	0.5	88	6/22	47	6/02	7.52	4.24	229
Pierre Regional Airport	78.2	56.1	67.1	-1.6	97	6/30	46	6/02	4.35	0.86	125
Rapid City Regional Airport	74.7	52.1	63.4	-1.2	91	6/30	42	6/15	4.57	1.74	161
Sioux Falls Joe Foss Field Airport	77.5	57.6	67.6	0.1	89	6/25	48	6/03	7.83	4.34	224

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	76.4	45.7	61.0	-1.7	94	6/30+	38	6/15	2.44	1.01	171
Cheyenne Municipal Airport	75.1	49.3	62.2	0.7	91	6/25	40	6/14	2.42	0.30	114
Lander Hunt Field Airport	74.2	48.1	61.2	-2.5	93	6/29	37	6/12	1.92	0.77	167
Laramie Regional Airport	72.9	42.7	57.8	0.7	87	6/07	34	6/18	2.29	0.96	172
Rawlins Municipal Airport	74.2	43.0	58.6	-2.7	88	6/29+	35	6/17+	2.46	1.53	265
Sheridan County Airport	74.0	47.0	60.5	-1.1	86	6/29	39	6/18+	2.68	0.66	133

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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:

Monthly precipitation totals ranged from about 2 to 6 inches. The highest amounts of 4 to 6 inches fell primarily in the north central, northeast, and southwest regions. The lowest amounts of 2 to 4 inches fell in the northwest and southeast regions. Percent of normal precipitation ranged from approximately 30% to 200%. The northwest and southeast regions had less than 100% of normal with greater than 100% elsewhere (Figure 1. North Dakota State Climate Office). Daily rainfall events were scattered throughout the month. According to the USDA, National Agricultural Statistics Service, ND Field Office, the wet conditions hampered fieldwork for much of the month. A severe storm on the 17th produced high winds, hail, and tornadoes. Approximately 20 tornadoes were reported across the eastern part of North Dakota and northwestern Minnesota. The tornadoes reported from Holmes ND, Wadena MN, and Almora MN were rated EF4 (166 to 200 mph) by the National Weather Service (NWS). There were three fatalities in MN from the June 17th tornadoes that struck at Almora, Mentor, and Albert Lea. The NWS reported record rainfall on the 17th at Fargo with 1.89 inches, Grand Forks airport with 1.67 inches, and Minot with 3.75 inches.

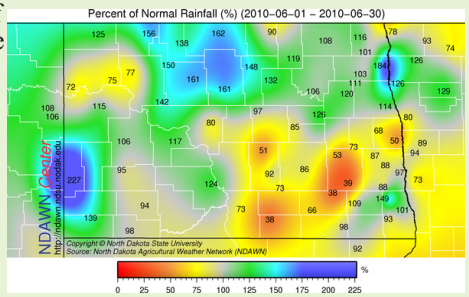

Figure 1. Precipitation Percent of Normal in June 2010 for North Dakota (NDSCO)

Temperature:

June average air temperatures ranged from 60°F to 67°F with the lower temperatures in the north and higher temperatures in the southeast. June average temperatures were near normal across the state. Departure from normal average air temperatures ranged of -3°F to 2°F (Figure 2. North Dakota State Climate Office). The temperatures that were slightly above normal fell in the southeast. Temperatures that were 3°F below normal fell in the northeast.

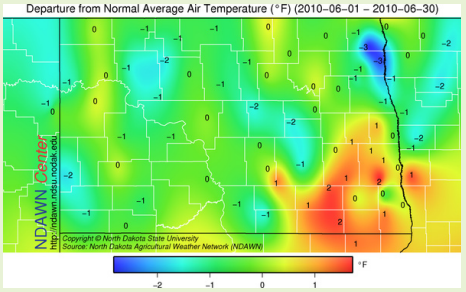

Figure 2. Temperature Departure from Normal in June 2010 for North Dakota (NDSCO)

For more information about the North Dakota State Climate Office: http://www.ndsu.edu/ndsco
For more information on the North Dakota Agricultural Network: http://www.ndawn.ndsu.nodak.edu
The North Dakota Agricultural Network is a part of the Automated Weather Data Network (AWDN).

About the High Plains Regional Climate Center

The High Plains Regional Climate Center (HPRCC) operates out of the University of Nebraska - Lincoln (UNL) in Lincoln, Nebraska. As one of 6 regional climate centers 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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