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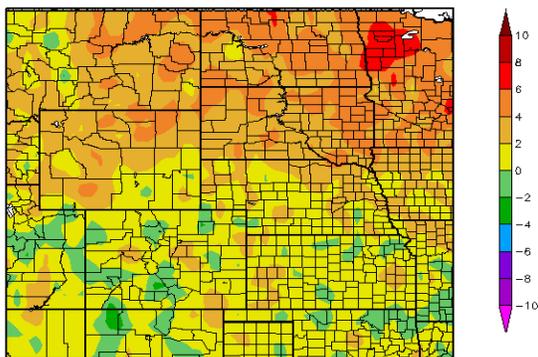
Near Longmont, Colorado - Photo by Holly Lussenden
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October 2011 Climate Summary

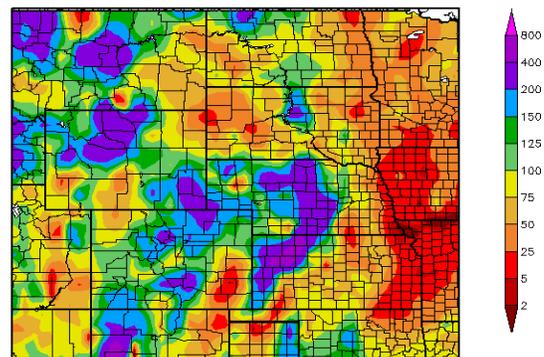
Region Breakdown

The High Plains Region experienced a wide range of weather conditions this October including record warmth, record cold, severe storms, and snow. Overall, temperature departures generally ranged from near normal in the south up to 8.0 degrees F (4.4 degrees C) above normal in the north. Many locations across North Dakota ranked in the top 10 warmest Octobers on record. Fargo, North Dakota's average temperature was 52.6 degrees F (11.4 degrees C) this month which was 7.3 degrees F (4.1 degrees C) above normal. That was warm enough to be ranked as the 6th warmest October on record (period of record 1881-2011). The warmest October on record, which was set in 1963, held firmly at 57.2 degrees F (14.0 degrees C). The hot, dry, and windy start to the month contributed to the warm average temperatures and also created dangerous fire weather conditions. Temperatures reached the mid to upper 90s throughout the Region and new daily temperature records were set in the Dakotas. One impressive record occurred at Dunn Center 1E, North Dakota, which is located north of Dickinson. The high temperature on October 4 was 98.0 degrees F (36.7 degrees C) which smashed the old record of 87.0 degrees (30.6 degrees C) set in 1963 (period of record 1919-2011). On the other end of the spectrum, Laramie, Wyoming set a new daily low temperature record of -16.0 degrees F (-26.7 degrees C) on October 27 after receiving some fresh snow. The old record of 0.0 degrees F (-17.8 degrees C) was set in 1996 (period of record 1948-2011).

Departure from Normal Temperature (F)
10/1/2011 - 10/31/2011



Percent of Normal Precipitation (%)
10/1/2011 - 10/31/2011



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

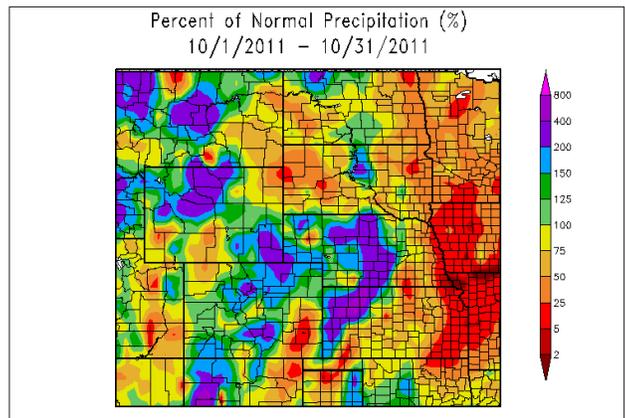
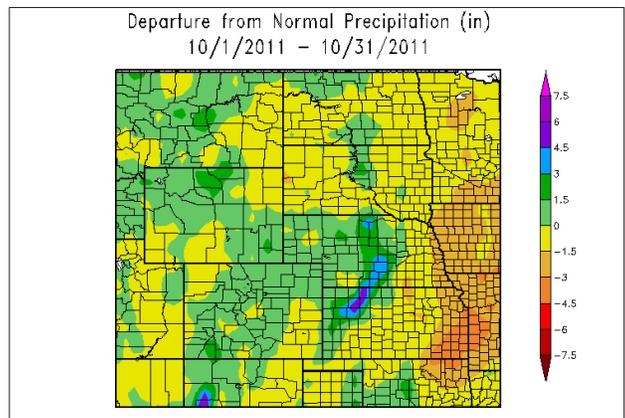
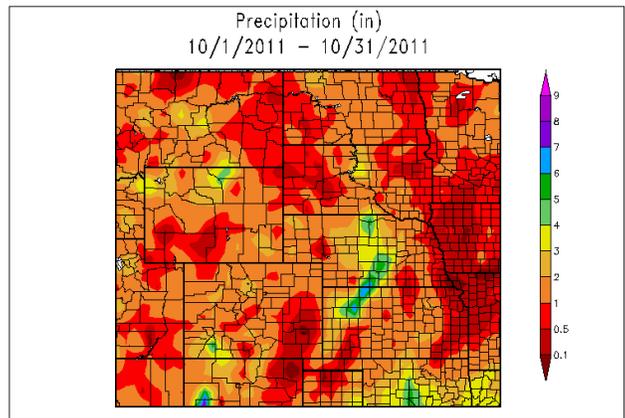
Precipitation Summary

Precipitation was highly variable this month across the High Plains Region. Little precipitation fell in the eastern part of the Region, along the eastern sides of North Dakota, South Dakota, Nebraska, and Kansas. Some locations in these areas were ranked in the top 10 driest Octobers on record. Although the dryness led to the development of abnormally dry and moderate drought conditions, the dry weather did help harvesting activities progress as many days were suitable for fieldwork. By the end of the month, the harvesting of most row crops was either completed or nearing completion. Extremely dry conditions were present early in the month and numerous fires were reported in Nebraska and South Dakota. These fires destroyed crops, combines, center pivots, and even homes. One fire in Stapleton, Nebraska, which is north of North Platte, burned over 25,000 acres and caused around \$4 million in damages.

Meanwhile, other areas of the Region received over 200 percent of normal precipitation. These areas included central Nebraska, northwestern Kansas, pockets of Colorado, and southeastern and northwestern Wyoming. October 6-8 was an eventful time frame for many parts of the Region. Severe weather, including tornadoes, high winds, and hail were reported across southwestern Kansas on the 7th. Meanwhile, northwestern Kansas received high precipitation, most of which fell during the October 6-8 time frame as a slow moving system passed through the area. By the end of the month, a few locations had even surpassed 300 percent of normal precipitation. An extreme example was Hoxie, Kansas which received 6.95 inches (177 mm) of precipitation, most of which fell during the October 6-8 time period. Despite the monthly total for Hoxie being 5.81 inches (148 mm) above normal, or an impressive 610 percent above normal precipitation, this was only the 3rd wettest October on record (period of record 1897-2011). The wettest October on record occurred in 1946 with 7.55 inches (192 mm).

Parts of Wyoming were also wetter than normal this month. North central and southeastern Wyoming both had precipitation totals which were at least 200 percent of normal. Several locations ranked in the top 10 wettest Octobers on record and with 3.72 inches (94 mm) of precipitation, Sheridan, Wyoming had its wettest October on record (period of record 1907-2011). This monthly total was 2.31 inches (59 mm) above normal or 264 percent of normal precipitation. 1.79 inches (45 mm) fell in one day, October 7, and a new daily precipitation record was set as well. The old record occurred in 1993 with only 0.59 inches (15 mm).

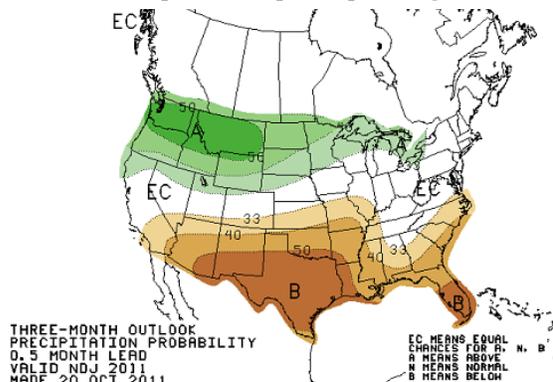
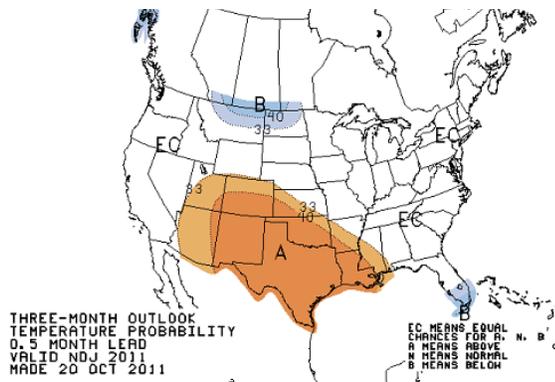
In addition to heavy precipitation and severe storms, some of the first snow of the season affected parts of the Region. An early snow storm caused problems in Colorado. Leaves were still on trees as heavy, wet snow fell on October 26. As a result, trees fell causing many power outages. Snow totals were highly variable across north central Colorado, but with 11.5 inches (29 cm) of snow, Boulder, Colorado set a new daily snow record for October 26 (period of record 1893-2011). This crushed the old daily record of 4.1 inches (10 cm) set in 2006.



Above: Total precipitation (inches) (top), Departure from Normal Precipitation (inches) (middle), and Percent of Normal Precipitation (bottom) for October 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>.

Climate Outlook

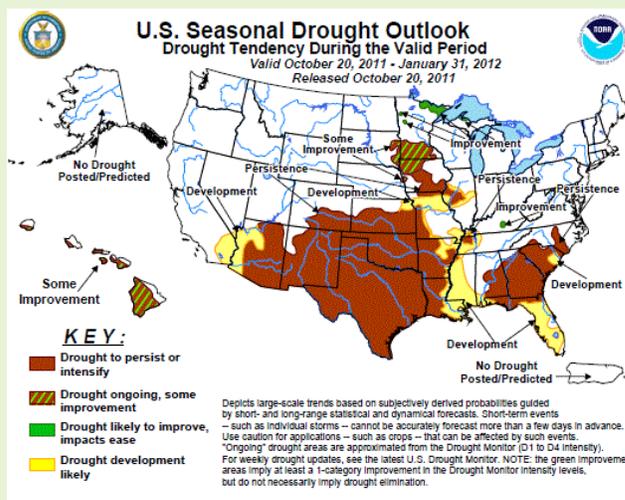
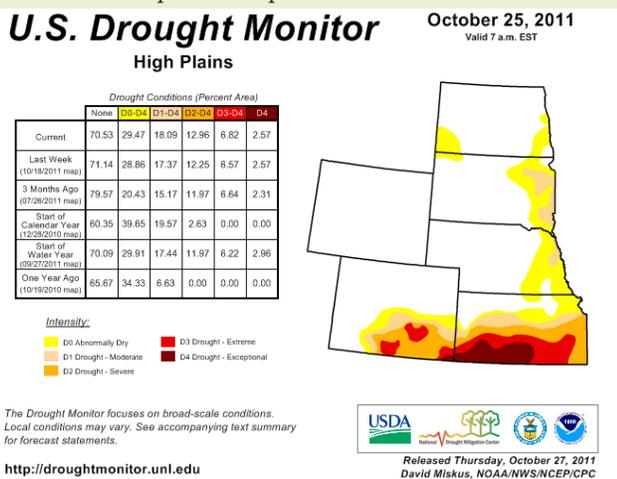
La Niña conditions are present in the equatorial Pacific and are expected to strengthen and continue through winter. The temperature outlook indicates a higher probability of above normal temperatures for most of Colorado, southwest Kansas, a small portion of southwest Nebraska, and extreme southern Wyoming. A higher probability for below normal temperature exists for much of North Dakota. 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 across the Dakotas, Wyoming, northern Nebraska, and northwest Colorado. Meanwhile, southern Colorado and much of Kansas 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 had improvements and degradations this month. Areas of improvement include the erasure of an area of abnormally dry conditions (D0) in the panhandle of Nebraska and western Wyoming, an area of D0 in central Nebraska, and a contraction of drought conditions in northern Kansas. While drought conditions in South Dakota remained about the same, both North Dakota, Nebraska, and Kansas had developed D0 conditions on their eastern border by the end of the month. An area of D0 also developed in western North Dakota and far northwestern South Dakota. Meanwhile, the ongoing drought in eastern Colorado and western Kansas improved only slightly and remained largely unchanged. According to the U.S. Seasonal Drought Outlook drought conditions in South Dakota were expected to improve, while drought conditions in other areas were expected to persist.



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
Alamosa San Luis Airport	62.8	23.6	43.2	0.4	76	10/16+	11	10/29+	0.48	-0.19	72
Akron Washington County Airport	64.0	37.7	50.9	-0.1	86	10/02+	13	10/27	1.17	0.27	130
Colorado Springs Municipal Airport	64.8	36.6	50.7	1.8	82	10/02	20	10/27	0.87	0.01	101
Grand Junction Walker Field Airport	66.6	39.9	53.3	0.6	84	10/01	28	10/30	0.97	-0.03	97
Pueblo Memorial Airport	70.4	37.3	53.8	1.5	88	10/02	25	10/27	1.18	0.54	184

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	71.7	43.7	57.7	1.7	90	10/04	22	10/20	0.39	-1.45	21
Dodge City Regional Airport	72.7	43.6	58.2	1.1	95	10/03	30	10/27	1.13	-0.32	78
Goodland Renner Field	69.6	38.8	54.2	2.4	90	10/03	22	10/27	2.16	1.11	206
Topeka Municipal Airport	73.9	43.1	58.5	1.9	90	10/04	26	10/28	0.43	-2.56	14
Wichita Mid-Continent Airport	73.9	46.6	60.2	1.6	90	10/04+	28	10/20	1.83	-0.62	75

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	66.7	34.2	50.5	1.5	92	10/02+	18	10/28	1.65	0.60	157
Grand Island Airport	68.7	41.1	54.9	2.9	90	10/04	22	10/20	2.20	0.69	146
Lincoln Municipal Airport	70.3	40.8	55.6	2.0	91	10/04	22	10/31+	0.93	-1.01	48
Omaha Eppley Airfield	69.3	44.8	57.1	3.9	89	10/04	30	10/31+	0.39	-1.82	18
Norfolk Karl Stefan Airport	68.6	40.4	54.5	3.5	91	10/04	21	10/31+	1.08	-0.64	63
North Platte Regional Airport	68.3	35.9	52.1	2.4	91	10/04	20	10/28+	2.17	0.93	175
Valentine Miller Field	66.2	36.4	51.3	3.0	92	10/04	18	10/27	1.71	0.49	140

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismark Municipal Airport	61.7	36.2	48.9	3.7	88	10/02	19	10/19	1.35	0.07	105
Fargo International Airport	63.5	41.6	52.6	7.3	89	10/05	22	10/20	0.94	-1.03	48
Grand Forks International Airport	62.6	37.7	50.1	5.9	89	10/05	19	10/29	0.30	-1.40	18
Theodore Roosevelt Airport	62.1	34.5	48.3	3.0	95	10/02	20	10/26	0.31	-1.03	23
Williston International Airport	62.0	35.5	48.8	5.1	89	10/01	22	10/26	0.85	-0.02	98

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>.

October 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	64.0	36.7	50.3	3.5	86	10/05+	18	10/27	0.80	-0.83	49
Huron Regional Airport	65.9	38.5	52.2	4.3	87	10/04	20	10/20	1.43	-0.16	90
Pierre Regional Airport	66.1	40.2	53.1	3.4	95	10/04	19	10/20	1.32	-0.32	80
Rapid City Regional Airport	64.7	36.7	50.7	2.5	96	10/02	16	10/27	1.38	0.01	101
Sioux Falls Joe Foss Field Airport	65.7	40.6	53.1	5.1	86	10/04	20	10/29	0.63	-1.30	33

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	62.2	34.9	48.5	2.8	86	10/01	17	10/28	1.44	0.30	126
Cheyenne Municipal Airport	60.1	33.8	47.0	1.6	84	10/01	7	10/27	1.72	0.97	229
Lander Hunt Field Airport	62.0	36.3	49.1	2.7	85	10/01	23	10/27	1.88	0.51	137
Laramie Regional Airport	56.4	29.4	42.9	1.0	79	10/01	-16	10/27	0.73	-0.07	91
Rawlins Municipal Airport	58.3	33.8	46.0	0.5	80	10/01	12	10/27	0.70	-0.16	81
Sheridan County Airport	63.9	36.0	49.9	4.8	93	10/01	21	10/26	3.72	2.31	264

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Snowfall Statistics

When does the first snowfall usually happen in your area? Check out the table below to find out!

Location	Average, Earliest, and Latest First Snowfall			
	Average	Earliest	Latest	Period of Analysis
Denver, CO	October 19	09/03/1961	01/07/1932	1882-2011
Grand Junction, CO	November 17	09/18/1965	01/05/1981	1893-2011
Pueblo, CO	November 5	09/17/1971	12/10/1963	1948-2011
Dodge City, KS	November 20	09/21/1995	01/04/1957	1893-2011
Topeka, KS	November 28	10/09/1970	02/10/1923	1887-2011
Wichita, KS	December 3	10/22/1996	02/07/1980	1931-2011
Lincoln, NE	November 17	09/29/1985	12/31/2006	1948-2011
North Platte, NE	November 4	09/20/1995	12/23/1939	1893-2011
Omaha, NE	November 13	09/29/1985	12/31/2006	1885-2011
Bismarck, ND	October 28	09/12/1903	12/14/1999	1886-2011
Fargo, ND	November 1	09/25/1942+	12/14/1999	1893-2011
Williston, ND	October 26	09/02/1961	12/12/1923	1894-2011
Aberdeen, SD	November 4	09/21/1995	01/09/1963	1932-2011
Rapid City, SD	October 21	09/13/1970	12/01/2007	1951-2011
Sioux Falls, SD	November 7	09/25/1939	01/08/1945	1894-2011
Cheyenne, WY	October 8	09/08/1929	11/20/1900	1883-2011
Lander, WY	October 7	09/07/1941	12/07/1914	1911-2011
Moose, WY	October 17	09/15/1982	11/25/1999	1959-2011

+ indicates multiple dates, latest date listed.

Source: National Weather Service Cooperative Observation Network Data

Data are retrieved through the Applied Climate Information System (ACIS).

State Spotlight - North Dakota

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



Precipitation:

The North Dakota Agricultural Weather Network (NDAWN) October percent of normal rainfall ranged from approximately 10% to 160%. (Figure 1. North Dakota State Climate Office). Amounts of near-normal to above fell in the south central, central, and northwest regions. Most elsewhere had less than 50% of normal rainfall. NDAWN October totals ranged from 0.13 inches at Humboldt MN to 1.84 inches at Wishek. Most of the rain events happened from the 6th through the 12th and the 23rd through the 25th.

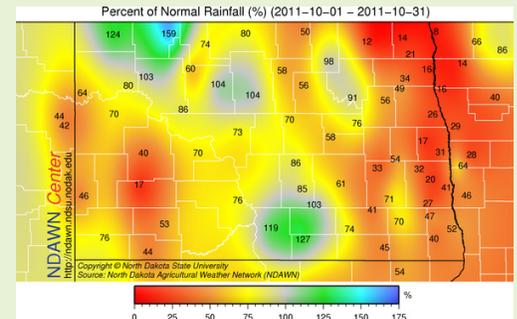


Figure 1. Percent of Normal Precipitation in October 2011 for North Dakota (North Dakota State Climate Office)

Temperature:

NDAWN October average air temperatures ranged from 47 °F to 52 °F. NDAWN departure from normal temperatures were above normal across the state and ranged from 3 °F to 8 °F (Figure 2. North Dakota State Climate Office). The first half of the month had temperatures far above normal to near normal on most days. The second half of the month had average air temperatures hovering at near normal for most areas. The first more wide spread hard freeze happened on the 17th and 18th. The mild temperatures and dry days made this an excellent year for harvesting. Harvesting activities for many crops concluded by the end of October. Fargo and Grand Forks had the 6th warmest October on record.

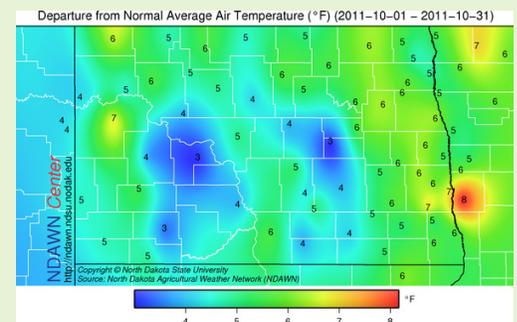


Figure 2. Temperature Departure from Normal in October 2011 for North Dakota (North Dakota State Climate Office)

State Spotlight - Wyoming

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



Streamflow

Streamflow conditions for October remained good with normal and often above normal flows being seen in all portions of the state.

Precipitation

The first snows of the season fell across Wyoming this month and with them came some relief from the dryness of the previous months. With some early winter storms came some wet snowfalls which gave the southeast quarter of the state normal to well-above normal precipitation. The same held true for the northwest quarter, especially in the Bighorn basin which saw several stations at 300% or more of normal. The above normal precipitation extended over the Bighorns into Sheridan and Johnson counties where only a few stations had totals just under normal. Southwestern and northeastern Wyoming did not fare as well and precipitation relative to normal decreased towards the South Dakota border with Sundance receiving less than 50% of normal.

In the Southwest it was similar with places like Rawlins, the Bitter Creek area, and Rock Springs receiving in the range of 70% to 90% of normal. Green River was an exception and was in the 150% to 200% range. Areas such as Fontenelle and La Barge were on the dry end and totaled less than 50% of normal.

While snow fell in many parts of the state this month, the southeastern portion saw the heaviest falls with monthly snowfall totals from CoCoRaHS stations as high as 18" in the Cheyenne area. Albany and Carbon counties were also well-hit with totals generally from 6" to 14".

Temperature

Although October saw a change of the seasons and the introduction of a few heavy snow storms, temperatures for the most part remained above normal to well-above normal. The southeast portion of the state was generally normal to about 2°F above normal whereas the rest of the state saw average temperatures that were somewhat more, with several stations 3°F to 4°F above normal.

While still showing an above normal temperature for the month, Laramie was the cold spot in the nation on the 27th when the temperature dropped to -16F during an hour-long cold spell that started around 0600.

Winds were light at the time but a shift from a southerly direction to a more west wind caused the temperature to drop 17 degrees (F) in about 15 minutes. When the wind direction changed to coming from a bearing of ~260° it aligned to blow along the length of the Big Hollow which is a wind-scoured basin to the west of the airport. The surface elevations of two of the lakes that sit in its bottom about 3 miles to the west of the Laramie ASOS are about 150 feet lower than the ASOS. The wind pushed the cold air out of this sink and across the Airport station causing an hour-long deep cold. As the wind shifted again to come from a more southerly direction (and out of alignment with the Hollow) the temperature again started to rise.

The D0 (Abnormally Dry) category that had been introduced by the US Drought Monitor into the parts of Weston, Niobrara, Goshen, and Laramie counties was initially extended into converse, Natrona and the very northern part of Carbon counties during the first week of the month. Following the first snow storm of the season, it was removed and Wyoming was once again free of any D category for the remainder of October.

This report was prepared by the Wyoming State Climate Office, which is a division of the Wyoming Water Resources Data System at the University of Wyoming. More information can be found at: <http://www.wrds.uwyo.edu> and http://www.wrds.uwyo.edu/sco/climate_office.html. Special thanks to the National Weather Service's Riverton and Cheyenne Offices and the NRCS Casper Office for supplying much of the data used in this report.

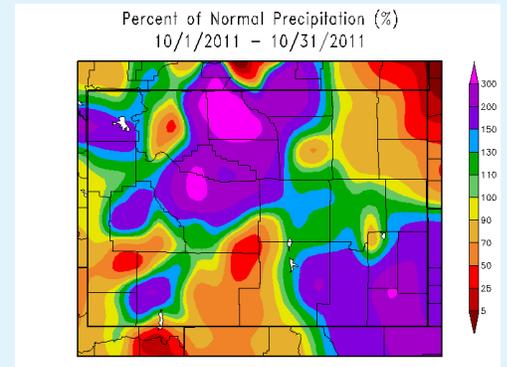


Figure 1. Map showing October 2011 precipitation as a percentage of historical averages (vs. 1971-2000 normal period) for Wyoming. Courtesy HPRCC.

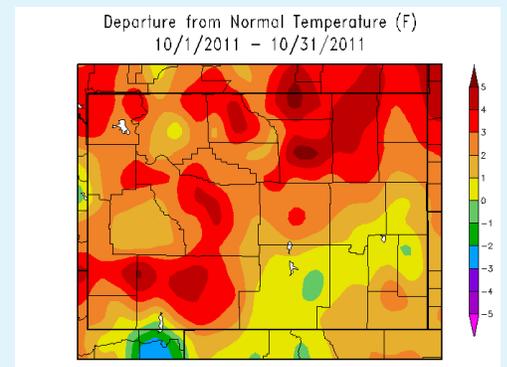


Figure 2. Map showing mean October 2011 temperatures from historical averages (vs. 1971-2000 normal period) for Wyoming. Courtesy HPRCC.

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

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