

Montana Weather/Precipitation Summary

July 1-15 2012 by NOAA's National Weather Service Great Falls Montana

July temperatures have averaged mostly above normal. Areas of warmest anomalies have been in the Miles City and Little Rockys areas (Fig. 3). For the first one-half of July, statewide composite temperatures are running a 3.4°F positive anomaly, ranking at the 91st percentile (1=coldest). This has been warmest July to-date since 2007. There has been only one day on which high temperatures averaged below normal (Fig. 1). Precipitation has been below normal over much of the state, with exceptional pockets of wetter than normal (Fig. 4). The composite precipitation for July so-far ranked at the 44th percentile for the state (1=driest). This is the driest water-year-to-date since 2004. The past two-months have provided less than 70% of normal precipitation across much of central and southern Montana (Fig. 5). This is in an area and during a period in which temperatures have averaged above normal (Fig. 6). The strongest winds in the state came on the third (Fig. 1). Gusts to 86 mph were recorded at Logan Pass. Otherwise, thunderstorm gusts to 69 mph were recorded at South Sawmill (Garfield County). Soil moisture continued its climatological drying out. Statewide, soil moisture conditions are the driest since 2007, with some areas having the driest soil conditions since their records began in 2006. Montana has been under a broad ridge of high pressure during July (Fig. 2). Upper level heights were slightly above normal, with general westerly flow aloft.

July 1-5

With near seasonal temperatures, thunderstorms were widely scattered across the state during this period. On the first, thunderstorms produced gusts to 69 mph along Fort Peck Reservoir in northern Garfield County. On the third, scattered thunderstorms brought gusty winds and hail up to one-inch over portions of northeast Montana. Very warm air over eastern Montana produced temperatures of 106°F at Jordan and Forsyth on the third. Billings set a new record high for the date. Windy conditions along the east slopes of the continental divide on the third caused gusts in the mid-60 mph range on the adjacent plains, with a gust to 86 mph at Logan Pass. A few more thunderstorms broke out across southeast Montana on the fifth. Cooler air on the fourth and fifth caused low temperatures to fall into the 30s across north central Montana, with Cut Bank tying their record low on the fifth, falling to 37 degrees, which was first set in 1911. Gates Park was the coolest in the state with lows of 27° on the fourth and sixth.

July 6-13

The warmest period of the month was during this period. Many areas remained dry, but scattered thunderstorms did occur. Bozeman and Great Falls set new record high temperatures on the ninth. Great Falls reached 98F, the old record was 97F set in 1939. On the 11th, high-based thunderstorms produced gusts to 66 mph near Lake View (Beaverhead). On the 13th, thunderstorms in northwest Montana produced heavy rain. Near Yaak (Lincoln), over two-inches of rain fell, and a downburst caused a tree blow down south of Kootenai Falls.

July 14-15

Very humid conditions over the weekend contributed to thunderstorms with heavy rainfall. Cut Bank reached a dew-point temperature of 65F on the 14th, which was their highest since July 2002, and their second highest of record. Great Falls' dew-point was 64°F on the 14th, which tied the highest value for 2012, and is the highest dew-point reading since July 2002. Also at Great Falls, the upper air sounding showed a very moist profile on the morning of the 14th. This was one of the wettest atmospheric profiles of record at Great Falls (since 1948) (Fig. 7). Lightning injured three persons attending a rodeo at Darby (Ravalli) on the 14th. Heavy rain produced localized flooding in central and southwest Montana. Up to 2.20-inches of rain fell in a short period near Sand Coulee (Cascade) on the 15th. Havre set a daily precipitation record on the 15th, measuring 0.98-inches. The old record was 0.75-inches in 1923.

Precipitation/convection

Severe convective weather has occurred on eight days so far in July, this is slightly ahead of normal. The severe thunderstorms have produced up to 69 mph winds (Garfield County), one-

inch hail (scattered throughout northeast Montana), a severe downburst (near Kootenai Falls), funnel clouds and heavy rainfall.

July 1-15 summary information:

High Temperature	106°F at Jordan & Forsyth (3 rd); Powderville (14 th)	Greatest Precip	3.32" at Troy (Lincoln) 6.2" at Stahl Peak SNOTEL (Lincoln)
Low Temperature	27°F at Gates Park (4 th and 6 th) (Lewis and Clark)		
Warmest Ave Temp	81.1°F at Miles City	Peak Wind Gust	69 mph at South Sawmill Creek (Garfield) (1 st) 86 mph at Logan Pass (3 rd)
Coollest Ave Temp	59.7°F at Cooke City		
Range of Temp departures	0.0°F at Polson to +8.5°F at Miles City	Highest Ave Wind	12.5 mph at Glasgow
21 city mean monthly Temperature/Normal	71.5/68.1F; 12 th warmest of record (since 1880) 91 st percentile, warmest since 2007	20 city mean monthly wind speed/Normal	7.9 mph/8.4 mph; 16th calmest of record. (since 1936) 22 nd percentile
22 city mean monthly precipitation/Normal	0.66/0.83" – 79% of normal; 61 st driest of record. (since 1880) 45 th percentile	26 location mean soil moisture/normal	20.9/22.0%; 5 th driest of record (since 1995). 32 nd percentile

**Historical Rank of Precipitation (inches)
for the Current Month and Water Year to Date**

Location	Jul 1-15	% of Norm	Rank	Pcntl	Oct 1 – Jul 15	% of norm	Years
Baker	0.80	137%			7.24	66%	14
Billings	0.16	23%	21	25	6.88	63%	111
Belgrade	0.29	40%	28	37	8.06	71%	75
Butte	1.42	200%	103	86	7.63	78%	118
Cut Bank	0.43	57%	50	46	8.44	108%	104
Dillon	0.72	171%	54	76	5.44	68%	72
Glasgow	0.53	51%	49	41	10.39	121%	112
Great Falls	1.75	184%	106	86	11.95	109%	120
Havre	1.02	99%	88	66	10.39	127%	132
Helena	0.34	55%	49	36	6.93	83%	134
Jordan	0.32	65%			6.78	72%	14
Kalispell	0.68	76%	69	60	16.79	121%	118
Lewistown	0.58	50%	37	32	14.69	115%	116
Livingston	0.08	9%	10	9	8.44	72%	107
Miles City	0.28	38%	36	30	4.46	46%	135
Missoula	0.15	25%	31	25	13.21	116%	130
Mullan Pass	1.49	311%	8	88	44.98	130%	71
Wolf Point	1.02	126%			8.51	96%	14
Glendive	2.14	194%	103	85	9.29	93%	109
Sidney	1.00	65%	36	58	5.18	49%	71
BZN-MSU	0.58	71%	8	38	13.83	86%	132

Rankings and Percentiles are 1=driest, higher numbers=wetter.

For an automated version of this chart, updated daily, go to

<http://www.wrh.noaa.gov/tfx/dx.php?wfo=tfx&type=&loc=products&fx=PCPNTOTALS>

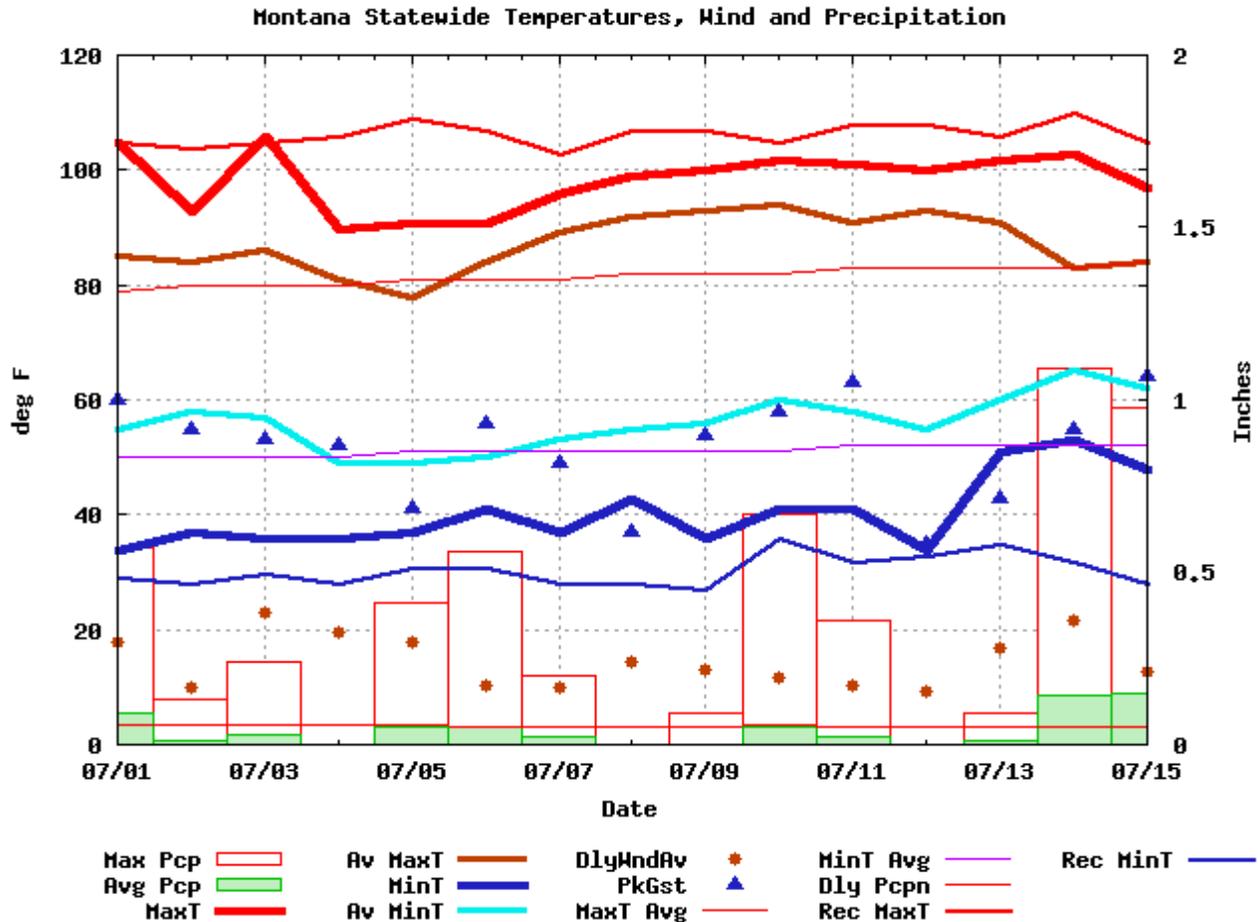
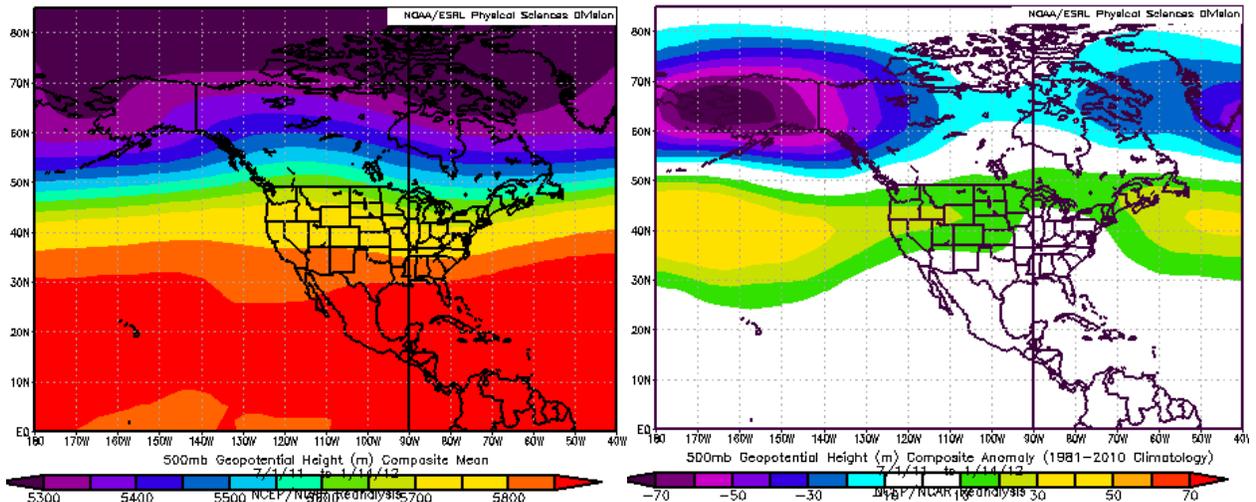


Figure 1. Composite Daily Highest and Lowest Temperature, Averages, Daily Maximum Precipitation and Averages, Daily average wind speed and gusts from 43 Airport stations from across Montana.



Figures 2a (left); 2b (right). Mean flow at 500 millibars (~18,000 ft) for July 1-15 2012 (left) and anomaly (right). Heights across Montana have been slightly above normal. This has contributed to the warmer than normal conditions across the state.

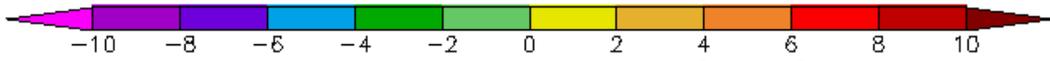
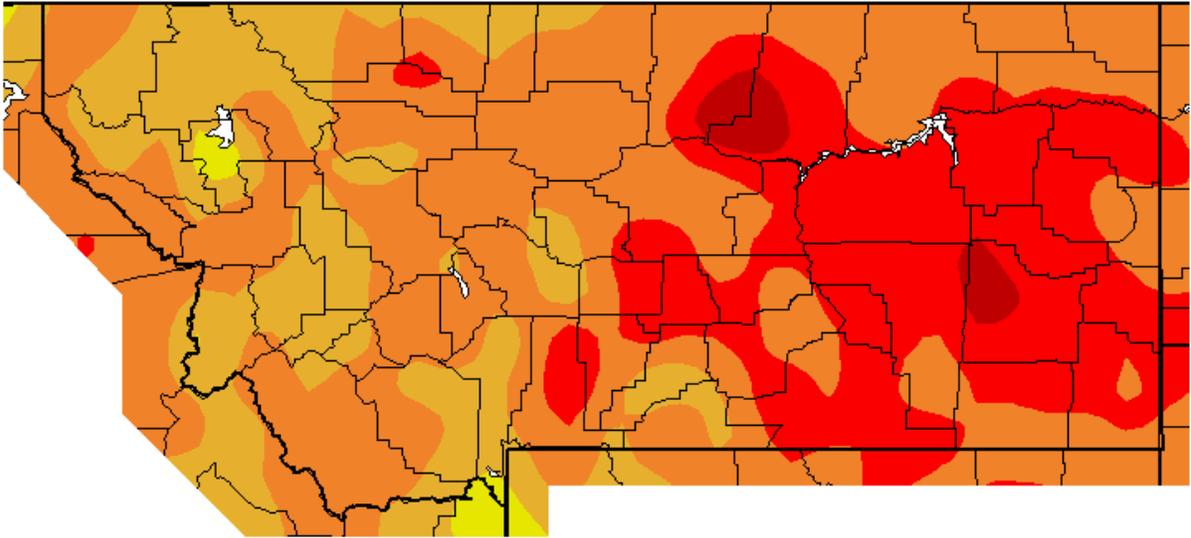


Figure 3. Temperature anomaly for July 1-15, 2012 (Western Region Climate Center).

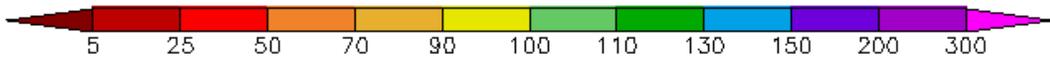
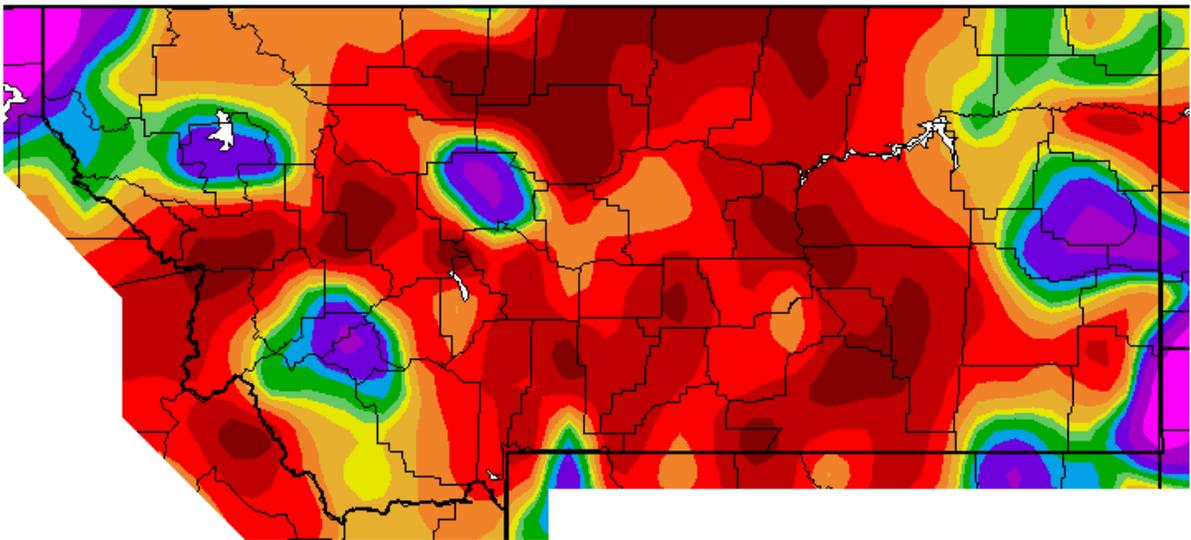


Figure 4. Precipitation anomaly (% of normal) for July 1-15 2012.

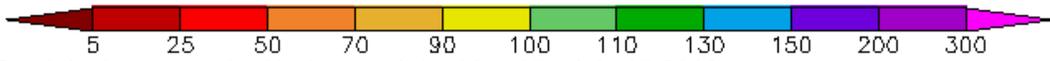
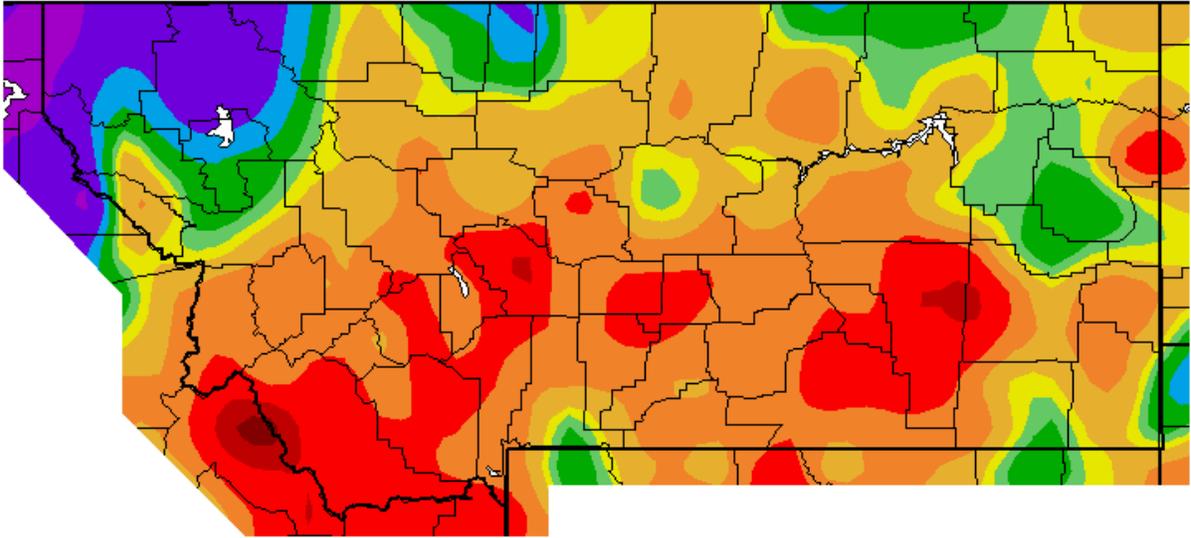


Figure 5. Precipitation anomaly (% of normal) for May 15 - July 15 2012.

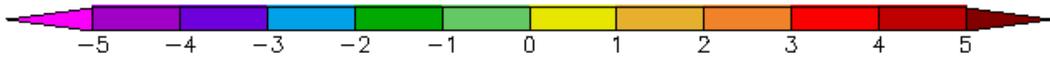
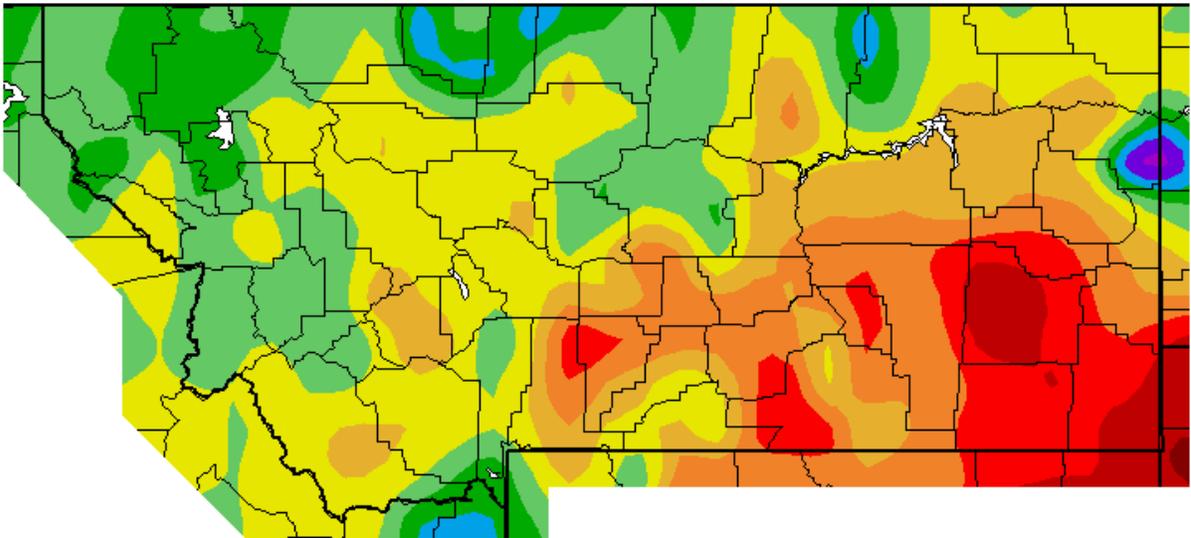


Figure 6. Temperature anomaly (F) for May 15 - July 15 2012.

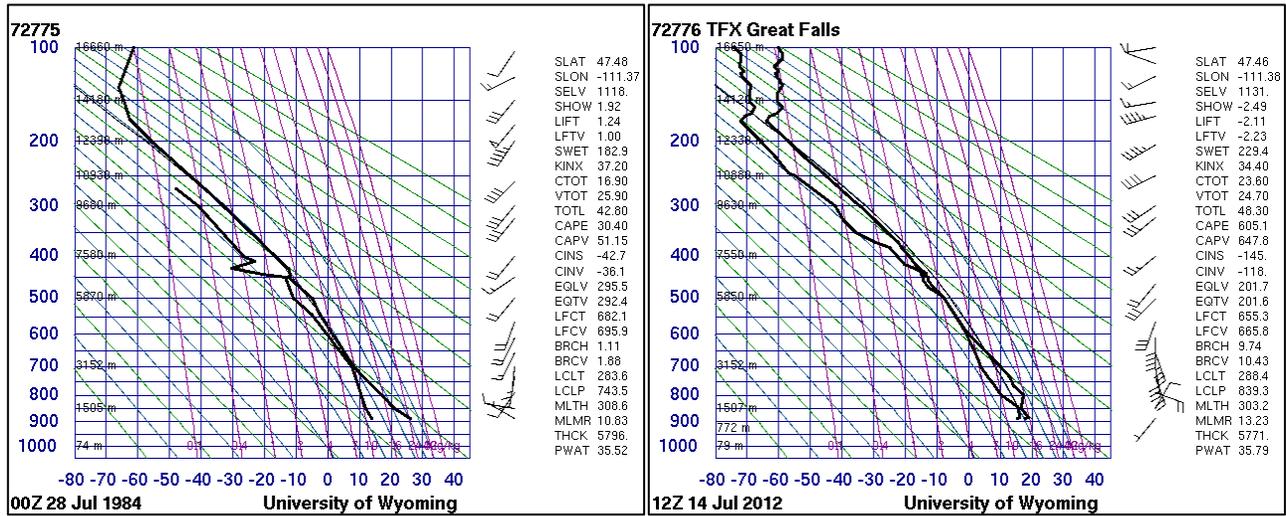


Figure 7. Upper air soundings at Great Falls from July 28 1984 (left) and July 14 2012 (right). The sounding on the right has one of the highest moisture values of record measured at Great Falls.

For a state map of % of normal water year precipitation (updated around the 7th of each month), go to:
http://www.wrh.noaa.gov/tfx/image.php?wfo=txf&type=data&loc=hydro&fx=watyr_pcntnorm.png

For the latest information on mountain snow pack from the NRCS, go to:
<http://www.mt.nrcs.usda.gov/snow/index.html>

For the latest U.S. Drought Monitor, issued weekly by the Climate Prediction Center (CPC), go to:
<http://www.drought.unl.edu/dm/monitor.html>

These data are preliminary and have not undergone final QC by NCDC. Therefore, these data are subject to revision. Final and certified climate data can be access at the National Climatic Data Center (NCDC) <http://www.ncdc.noaa.gov>. Many more links are on the Drought Information Page of the NWS Great Falls web site at <http://www.wrh.noaa.gov/tfx/main/drought.php?wfo=txf>. The climatological record for normals is 1981-2010. The ranking period for temperature, precipitation and snowfall is since 1880. The ranking period for wind speeds is since 1936. The ranking period for soil moisture is since 1995.