

# Montana Weather/Precipitation Summary

April 2009 by NOAA's National Weather Service Great Falls Montana

## Temperature

Temperatures averaged near to slightly below normal during the month of April. The warmest anomalies were in the Circle area. The coolest anomalies were in the southeast, but overall temperatures were close to the long-term average. Average monthly mean temperatures ranged from 5.9F below normal at Albion to 1.8F above normal at Kalispell (Fig. 1). The upper air pattern showed general west-northwest flow with a weak trough of low pressure over the western United States during the month (Fig. 2). The coolest period of the month was during the first week, when the temperature fell to -13F at Placer Basin on the 5th. The warmest period during the month was from the 20<sup>th</sup>-22<sup>nd</sup>, when a temperature of 84F was reported near Rudyard on the 21<sup>st</sup>. Another cold period followed when a low of 1F was reported at Rogers Pass on the 24<sup>th</sup>. A new daily high temperature record was set at Bozeman on the 22<sup>nd</sup>, when they reached 80F. The old record was 79 in 1969. Once the cold air settled in, daily low temperature records were set along the east slopes of the Rockies. Cut Bank fell to 5F on the 24<sup>th</sup> and Great Falls fell to 11F. This was the coldest so late in the season at Great Falls and surpassed the previous record for the date by 6 degrees. Cut Bank surpassed their previous record low by 8 degrees. The last week of the month was cold as a major storm affected the state. Temperatures were as much as 20 degrees below normal during the last week. Cold air continued into the 1<sup>st</sup> of May. As the skies cleared, Great Falls fell to 12 degrees. This set a new all-time low temperature record for May at Great Falls.

## New Temperature Records for April

Station	Record Type	New Record	Date	Previous Record	Year of Previous Record
Great Falls	Low Daily Minimum	11	24	17	2002
Cut Bank	Low Daily Minimum	16	24	20	1958
Helena	Low Daily Minimum	5	24	13	1967

## Precipitation

Until the last few days of the month, April precipitation was below normal across much of the state. The last few days of the month brought a major spring snow storm to the east slopes of the Rockies, and heavy rainfall to central Montana. Up to five feet of snow fell in the St. Mary area, with over two feet in the Great Falls area. In central Montana, over two inches of rain fell from this storm. For the month, the driest area was across the northwest where some locations received less than 35% of the normal monthly amount. This was strongly contrasted with an amount of 4.48 inches at Bozeman MSU, which was 223% of normal. Figure 3 shows the percentage of normal precipitation for April. A monthly total precipitation record was set at Bozeman MSU this month. Bozeman MSU also set a new all-time monthly snowfall record in April. The old record was 44.3 inches in November 1941. At Great Falls, the month's snowfall tied the all-time record for April snow *and* the all-time for any month.

## New Precipitation Records for April 2009

Station	Record Type	New Record	Previous Record	Year of Previous Record
Bozeman MSU	High Monthly Total Precip	4.48 inches	3.59 inches	1912 and 2003
Bozeman MSU	High Monthly	50.2 inches	37.0 inches	1955

	Total Snowfall <b>**All time high</b>			
Great Falls	High Monthly Total Snowfall <b>** All time high</b>	35.4 inches	35.4 inches	1967
Cut Bank	High Monthly Snow on Ground	12 inches on April 30	10 inches	April 30,1967

Station	Record Type	New Record	Date	Previous Record	Year of Previous Record
Dillon	High Daily Total Precip	0.26"	8	0.17"	1950
Dillon	High Daily Total Precip	0.46"	14	0.40"	1977
Bozeman	High Daily Total Precip	0.47"	14	0.38"	1941
Valier	High Daily Snowfall <b>** All time April Record</b>	8.0"	27	6.0" <b>** Old all-time record</b>	1970
Valier	High Daily Snowfall	3.0	28	3.0"	1970
Great Falls	High Daily Snowfall	8.1"	28	7.7"	1970
Choteau	High Daily Snowfall <b>** All-time April record</b>	12.5"	28	5.0	1967
Rogers Pass	High Daily Snowfall	21.6"	28	8.0"	1970
Great Falls	High Daily Snowfall	16.1"	29	4.3"	1892
Choteau	High Daily Snowfall	6.3"	29	2.0"	1967
Millegan	High Daily Snowfall	8.0"	29	4.0"	1991
Stanford	High Daily Snowfall	4.0"	29	2.9"	1970

## Significant Storms

### April 3-4

A storm moved through Montana during a two day period in early April dropping heavy snow over the southern Mountains. Cole Creek SNOTEL received three feet of snow, with Red Lodge measuring 15". Up to seven inches fell around Simms.

### April 8-14

Another series of storms affected the state around mid-month. Daily precipitation records were set at some stations in the southwest on the 8<sup>th</sup> and 14<sup>th</sup>. These are listed in the table above. Major snows again affected large portions of the south and east. Bozeman picked up nearly a foot of snow, with 6-10 inches falling over central Montana.

The warmest period of the month was also highlighted with the windiest period. With temperatures in the 70s and 80s from the 20<sup>th</sup> through 22<sup>nd</sup>, winds gusted to 87 mph at Logan Pass on the 22<sup>nd</sup>. Temperatures were also up to 20 degrees above normal during this period.

## Apr 23-30

The last week of the month was the stormiest for most of the state. A strong storm moved through much of the state on the 23<sup>rd</sup> and 24<sup>th</sup> producing heavy snows across the south and east again. The greatest amounts again fell in the Bozeman, Wilsall and Melville areas, measuring around a foot of snow. This snow extended across eastern Montana, with 4-5 inches falling from Jordan to Sidney.

On the 26<sup>th</sup>, a low pressure area moved through Wyoming and affected south central Montana with heavy snow. Livingston collected a foot of snow from this storm.

The biggest event of the month occurred from the 27<sup>th</sup>-30<sup>th</sup>. Up to five feet of snow fell along the northern Rocky Mountain Front, with close to two feet of snow as far east as Great Falls (Fig. 4). Many records fell as the heavy snow accumulated over the east slopes. Strong winds pushed snow into drifts as high as 10 to 12 feet over the Blackfeet Indian Reservation. Central Montana had heavy rain during this storm, with up to two inches of rain over Fergus County. A visible satellite image from the morning of May 1<sup>st</sup> shows the distribution of the snow cover (Fig. 5). The heavy snow pushed snow-on-the-ground amounts at some of the SNOTEL stations in the Rockies to over 100 inches at the end of the month.

## Other information

The statewide mean temperature at 18 cities in April was 41.4F, colder than the normal of 42.9 (Fig. 1). The precipitation average was 1.51 inches or 126 percent of normal. The normal value is 1.20 inches. Much of the state recorded below average precipitation (Fig. 3). Winds were below average for the month. The state-wide wind average was 9.0 mph, below the normal of 10.1 mph. Soil moisture conditions are near the average for the end of April (Fig. 6).

Some other items of note for April 2009:

Helena recorded their calmest April of record at 5.7 mph. The old record was 6.3 mph in 1952. The long-term average wind speed for April is 8.7 mph.

Butte and Missoula both recorded their 2<sup>nd</sup> calmest April of record.

Livingston and Bozeman recorded their 4<sup>th</sup> calmest April of record.

For the season, several snowfall records have been broken, or are close to being broken.

## Seasonal Snowfall Records

Station	2008-09 Snowfall	New Record	Previous Record	Year of Previous Record
Chinook	103.1 inches	4.48 inches	66.0 inches	1995-96
Choteau	65.6 – 3 <sup>rd</sup> snowiest	50.2 inches	Record is 90 inches	1966-67
Gold Butte	91.4 – 5 <sup>th</sup> snowiest		Record is 127 inches	2006-07
Great Falls	108.7 – 2 <sup>nd</sup> snowiest		Record is 120.2 inches	1988-89
Millegan	188.3		186.0	2003-04

**April summary information:**

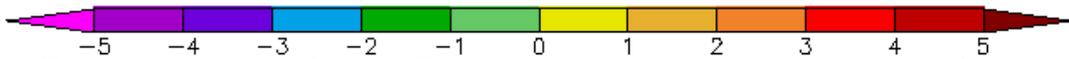
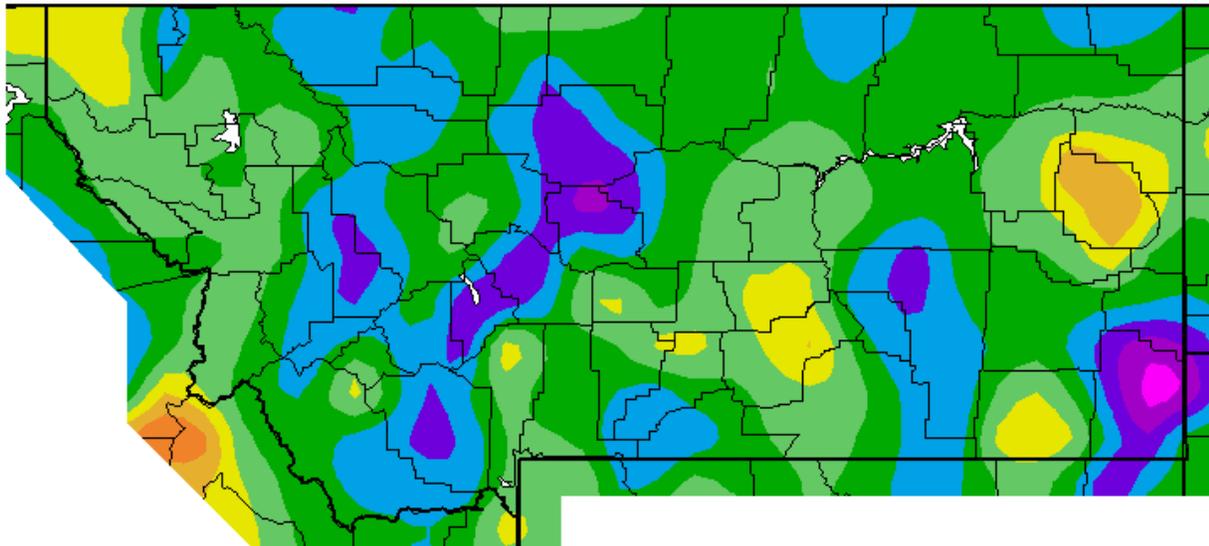
<b>High Temperature</b>	84°F at Rudyard 19S (21 <sup>st</sup> )	<b>Greatest Precip</b>	5.94" at Shenango
<b>Low Temperature</b>	-13F at Placer Basin SNOTEL (5th)		
<b>Warmest Ave Temp</b>	47.4°F at Thompson Falls	<b>Peak Wind Gust</b>	87 mph at Logan Pass (22 <sup>nd</sup> )
<b>Coollest Ave Temp</b>	32.5°F at Big Sky		
<b>Range of Temp departures</b>	-5.9°F at Albion to +1.8°F at Kalispell	<b>Highest Ave Wind</b>	13.3 mph at Inverness
<b>18 city mean monthly Temperature/Normal</b>	41.4/42.9	<b>18 city mean monthly wind speed/Normal</b>	9.0 mph/10.1 mph
<b>18 city mean monthly precipitation/Normal</b>	1.51"/1.20" – 126% of normal		

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

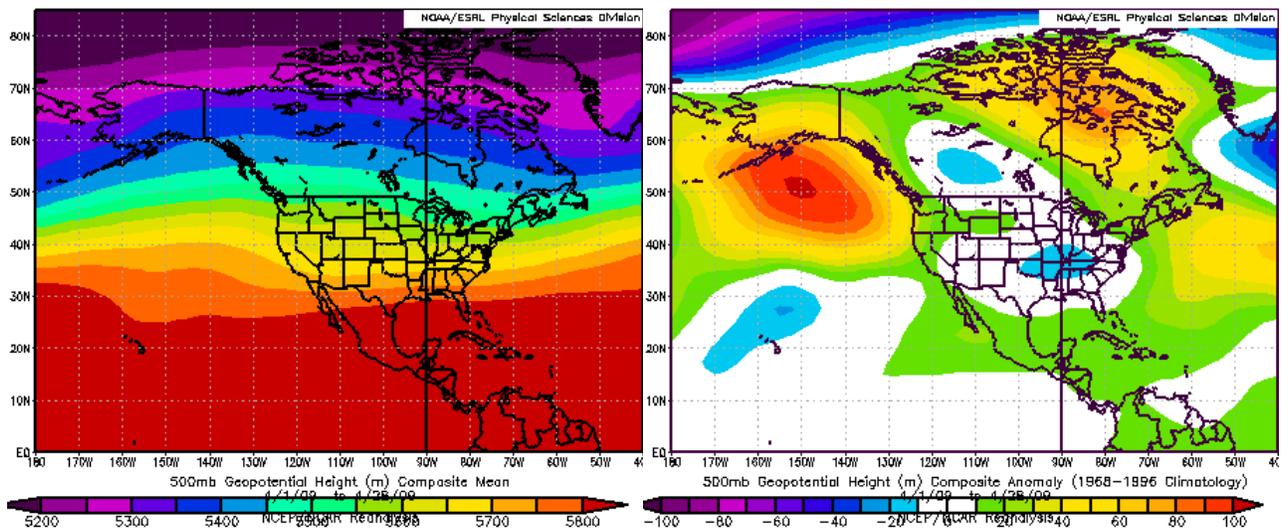
Location	Apr	% of Norm	Rank	Pcntl	Oct 1 – Apr 30	% of norm	Rank	Pcntl	Years
Baker	0.81	90%			3.94	99%			11
Billings	1.83	105%	74	74	7.31	105%	79	79	100
Belgrade	1.27	91%	35	48	5.21	86%	33	48	68
Butte	0.88	86%	48	41	4.94	104%	61	53	115
Cut Bank	0.34	38%	22	21	1.48	44%	13	12	102
Dillon	1.61	169%	61	88	4.00	126%	51	74	69
Glasgow	1.49	199%	97	87	5.01	152%	92	84	109
Great Falls	2.35	168%	105	89	6.92	120%	94	82	114
Havre	1.27	146%	97	76	3.63	91%	44	34	128
Helena	0.60	66%	38	29	4.40	109%	60	46	130
Jordan	1.90	192%			5.50	158%			10
Kalispell	0.82	67%	47	40	8.53	95%	16	13	115
Lewistown	2.00	145%	93	81	5.33	80%	42	37	113
Livingston	2.26	158%	97	89	4.90	74%	33	30	106
Miles City	1.26	90%	81	61	4.25	86%	59	44	132
Missoula	0.49	45%	23	17	7.29	107%	81	63	128
Mullan Pass	1.09	40%	7	9	19.45	78%	7	9	68
Wolf Point	1.59	186%			3.40	125%			11
Glendive	1.75	143%	89	77	5.06	114%	79	72	109
Sidney	0.83	78%	34	47	3.60	79%	28	40	68
BZN-MSU	4.48	217%	134	100	10.63	125%	113	87	130

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

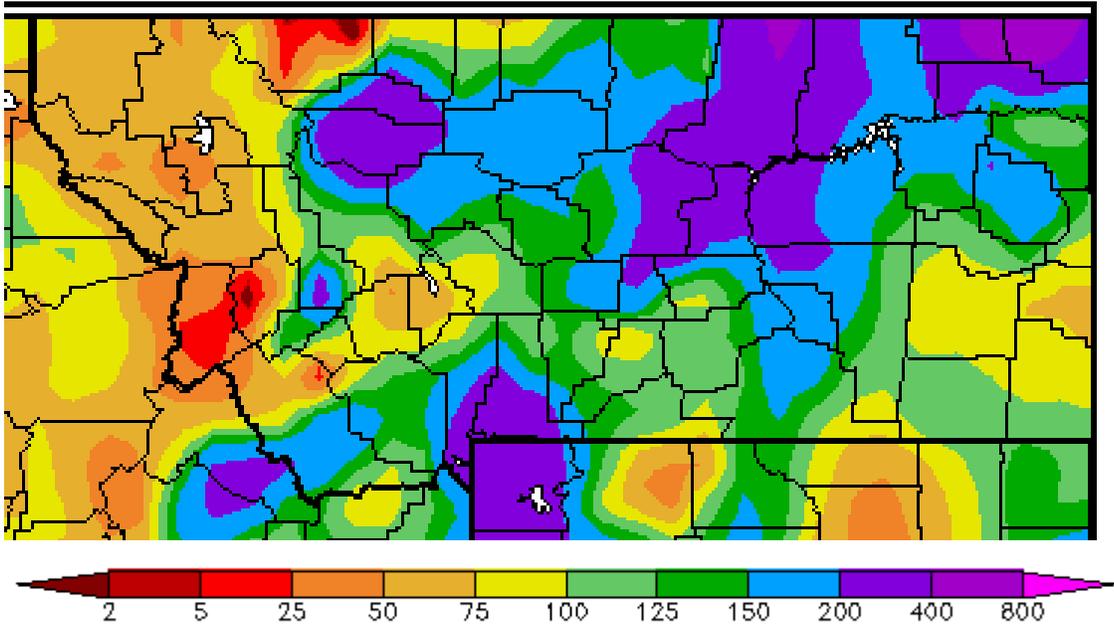
For an automated version of this chart, updated daily, go to <http://www.wrh.noaa.gov/tfx/dx.php?wfo=tfx&type=&loc=products&fx=PCPNTOTALS>



**Figure 1.** Temperature anomaly for April. Temperatures were below normal most areas (Western Region Climate Center).

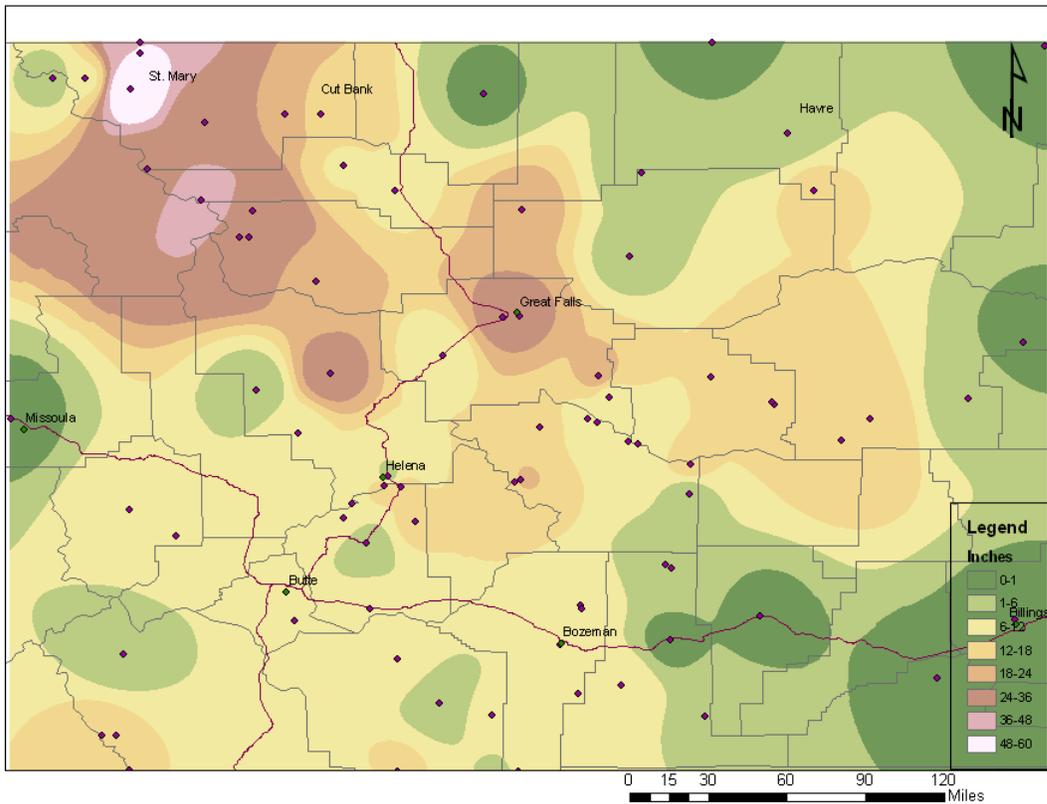


**Figures 2a (left) and 1b (right).** Mean flow at 500 millibars (~18,000 ft) for April (left). A weak trough of low pressure dominated western Montana. The ridge off of the west coast of North America was anomalous for this time of the year.

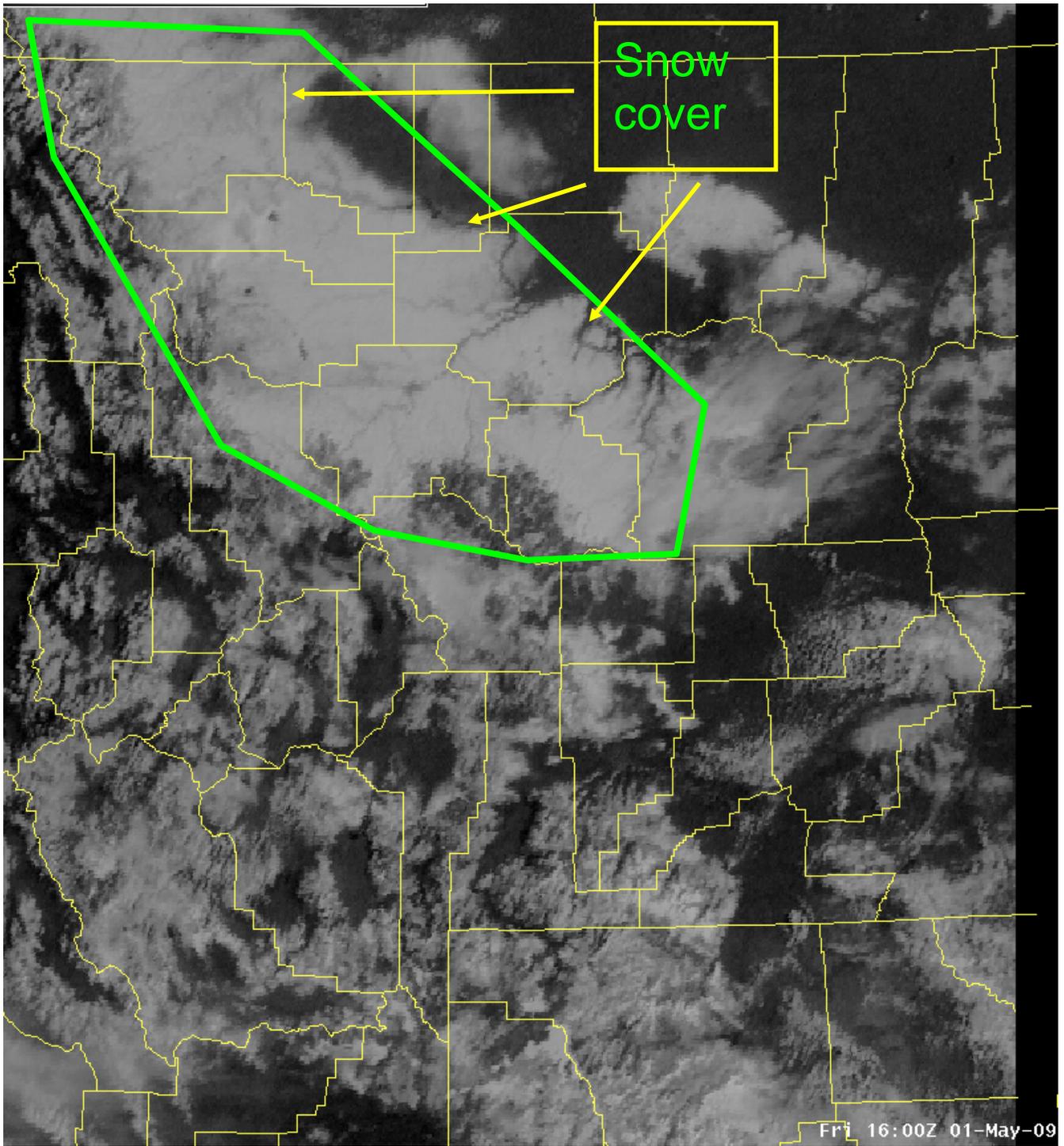


**Figure 3.** Precipitation anomaly (% of normal) for April. (High Plains Regional Region Climate Center).

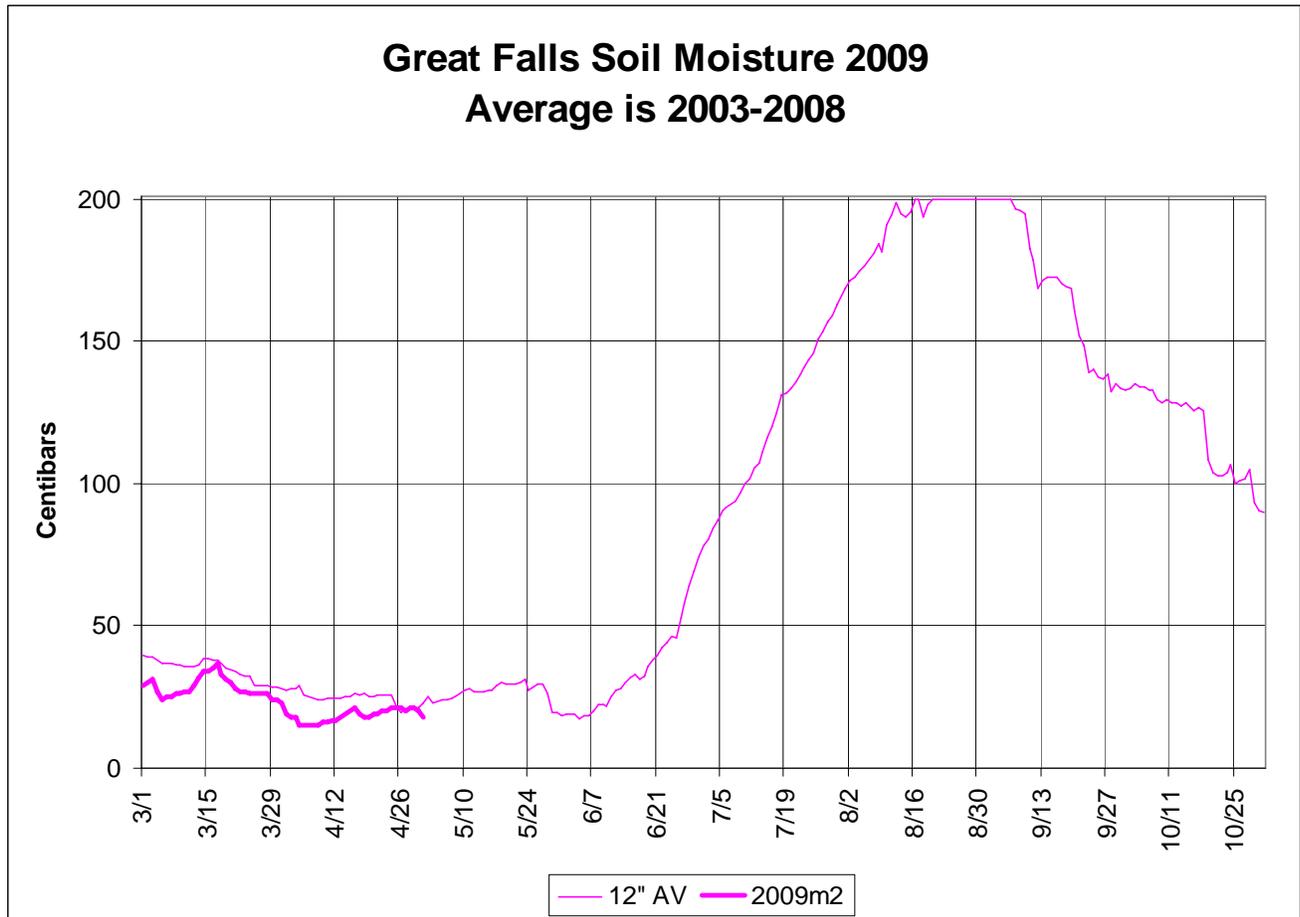
Snowfall Totals April 27-30 2009



**Figure 4.** Snowfall totals for April 27-30, 2009. The white area around St. Mary received four feet or more.



**Figure 5.** Visible satellite image showing the distribution of the snow cover. Image is from the morning of 1 May 2009.



**Figure 6.** Soil moisture at the 12 inch depth at Great Falls. 2009's values are in the bold line, with the average conditions in the lighter purple line. Values closer to zero centibars reflect wetter conditions. Values nearing 200 are dry.

For a state map of % of normal water year precipitation (updated around the 7<sup>th</sup> of each month), go to:  
[http://www.wrh.noaa.gov/tfx/image.php?wfo=tx&type=data&loc=hydro&fx=watyr\\_pcnorm.png](http://www.wrh.noaa.gov/tfx/image.php?wfo=tx&type=data&loc=hydro&fx=watyr_pcnorm.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=tx>