

Montana Weather/Precipitation Summary

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

Temperature

In June, temperatures averaged below normal across most of eastern Montana, with small areas of near to slightly above normal over the far west (Fig. 1). Mullan Pass recorded temperatures averaging 1.4F above normal, while temperatures averaged 6.9F below normal at Jordan.

The upper air pattern showed a trough of low pressure over the Pacific Northwest during June. This pattern generally provides below normal temperatures in the regions near the trough, and contributed to the below normal temperatures recorded in Montana (Fig. 2). The coolest period of the month was during the first week. This period was one of the 10 coldest of record over southeast Montana. Temperatures averaged as much as 22 degrees below normal on the 6th and 7th. High temperatures did not exceed the 40s over much of eastern Montana on these two days. Cut Bank reached only 42F on the 6th, and Red Lodge climbed to 37F on the 7th. The coldest lows of the month also occurred during this period. Gold Butte recorded 22F on the morning of the 8th. Warmer conditions returned from the 11th through 20th. Temperatures reached 94F at Poplar on the 20th, before cooler conditions returned for the next week. A rainy period caused high temperatures to remain in the 50s over north central Montana on the 22nd. Cold air pooling overnight produced a nighttime low of 26F at Wisdom on the 23rd. A sharp warm-up ahead of a cold front on the 25th produced very warm morning lows, and a record high temperature of 102F at Glasgow. This was also the warmest temperature for the month. This period also saw scattered afternoon thunderstorms. A cool-down to near normal temperatures followed, with temperatures again above 90F on the 28th and 29th.

With the cold temperatures through June, many locations recorded their last frost a full two to three weeks later than normal. Great Falls had their last freezing temperature on June 8 (normal average last frost is May 14); Havre recorded their last frost on June 10 (normal is May 13); and Butte recorded their last frost on June 23 (average is June 9).

New Temperature Records for June

Station	Record Type	New Record	Date	Previous Record	Year of Previous Record
Cut Bank	Low Daily Min	28	2	28	1951
Shelby	Low Daily Min	31	2	33	1951
Cut Bank	Low Daily Min	30	3	30	1920
Glasgow	Low Daily Max	48	6	56	1982
Great Falls	Low Daily Max	42	6	44	1951
Great Falls	Low Daily Min	32	6	33	1951
Cut Bank	Low Daily Min	30	6	30	1979
Great Falls	Low Daily Min	31	8	31	1950
Havre	Low Daily Min	31	8	32	1950
Lewistown	Low Daily Min	28	8	29	1950
Cut Bank	Low Daily Min	29	9	31	1937
Kalispell	Low Daily Min	32	9	34	1988
Havre	Low Daily Min	31	10	36	1999
Glasgow	High Daily Max	102	25	99	1936

Precipitation

Severe weather was reported on 8 days in June, the normal is 10 days. This was the fewest number of severe weather days in June since 2000. Again, precipitation was highly variable across the state. Much of northern and eastern Montana had below average precipitation. Some of the driest areas included the Lincoln and Choteau areas (50% of normal), and the northeast

(Glasgow 25% of normal and Westby 6% of normal). The wettest areas were portions of the southwest (Boulder 210% of normal; Wisdom 180% of normal; Townsend 165% of normal; Rapelje 146% of normal; and Miles City 132% of normal). (Fig. 3).

Though few severe thunderstorms occurred, thunderstorms occurred throughout the month on 8 days. On the 5th, associated with a cold front, small hail fell over portions of southwest Montana. This system continued into eastern Montana and produced heavy rainfall near Glendive. Snow fell over portions of central Montana on the 6th and 7th. Basin reported 3 inches, four inches fell at Red Lodge and Mystic Lake, five inches fell at Gold Butte, and six inches at Forest Grove. After a dry period, thunderstorms returned over western Montana on the 14th, ½ inch hail reported near Ronan, and amounts of up to one inch of rain reported. Again, as this system moved into eastern Montana, 1.25 inch hail was reported in Carter County, with flooding in Fallon County as up to 4 inches of rain fell. Isolated storms occurred from the 17th to 21, with mostly reports of small hail. A larger storm settled over the area on the 21st and 22nd. Cool temperatures accompanied the rain, but three inches fell near Cut Bank, and 3.6 inches at Stahl Peak in northwest Montana. Strong storms continued during the afternoons of the 24th and 25th in eastern Montana. One inch hailstones fell near Fairview on the 24th, with a larger area affected on the 25th. Estimated 70 mph winds downed power lines in the Pryor area, with gusts over 60 mph across much of the hi-line. Again, one inch hail fell in the Malta area. Instability persisted in the southwest through the rest of the month, with nearly daily afternoon thunderstorms. Some of these spread to southeast Montana, with gusty winds the primary hazard. On the 30th, severe thunderstorms were scattered from south central through northeastern Montana. The worst weather occurred from near Wibaux to Sidney. A tornado was reported near Carlyle, with nearly four inches of rain reported in the Sidney area. An automated station just north of Sidney reported 2.10" of rain in one hour.

New Precipitation Records for June 2009

Station	Record Type	New Record	Date	Previous Record	Year of Previous Record
Kalispell	Daily Maximum Rainfall	0.62 inches	22	0.55 inches	1963

Significant Storms

July 2

Storms se 1.5"H nr roundup with heavy rain and local flash flooding Harlowton and ryegate
 Hail hell creek rec area ¾"; 60 mph hinsdale'
 7/8"h boulder, golfball hail Geraldine, se big sandy; ¾" maudlow; 1" lennep

Jul 3

Funnel cloud nr billings; nr Lloyd, nr hogeland
 Hail 1" h peerless, Scobey; 69mph Glasgow; 58mh poplar

4

Flash flood ryegate
 .75"h Utica, canyon creek; funnel cloud browning; 7/8" h Dutton; golfball hail e ftbenton

5

Hail golf ball luster, olf, intake, 8ne gdv; tornado 5sw glendive, tornado 8w wibaux

June 6-7

A large low pressure area settled over Montana and produced a couple of days of precipitation. Very cool air on the 6th and 7th held high temperatures in the upper 30s at a few locations in the higher elevations of south central Montana. Snow fell over a broad area from north central through south central Montana. The highest amount reported was 6 inches at Forest Grove. Six inch amounts were also reported in many of the mountains through central and south central Montana.

June 15

A small cluster of thunderstorms produced large hail (1.25 inch) and flooding conditions in Fallon County. Four inches of rain in two hours was reported northwest of Baker, with water over roads and bridges.

June 22

Another large low pressure system brought a period of rainfall to central and western Montana. Steady rain fell most of the day on the 21st and parts of the 22nd. Thunderstorms produced three inches of rain west of Cut Bank on the 22nd, with over three inches of rain at Stahl Peak in northwest Montana.

June 30

Thunderstorms developed over southwest Montana early in the afternoon, with severe thunderstorms over south central and northeast Montana by later in the afternoon. Wind gusts to 81 mph occurred near Columbus, with 80 mph gusts recorded near Reed Point. A large severe thunderstorm produced a tornado near Carlyle, with very heavy rain in the Sidney area. Three to four inches of rain fell on the north side of Sidney.

Other information

The statewide mean temperature at 18 cities in June was 55.2F, slightly cooler than the normal of 57.2 (Fig. 1). The range was from 5 degrees below average in the southeast, to 1 degree above normal along the western Montana border.

The precipitation average was 1.81 inches or 78 percent of normal. This is the 40th driest June of record as a composite for these locations. The normal value is 2.32 inches. Much of the state recorded below average precipitation (Fig. 3). For the state, this was also the driest June and Water-year-to-date since 2004.

Winds were below average for the month. The state-wide wind average was 7.4 mph, below the normal of 9.3 mph. This average was the lightest winds of record for June. The previous record was 7.7 mph in 1977. June 1982 was the most recent year with light June winds – the average was 8.1 mph. Though precipitation was limited, the combination of cooler temperatures and lighter winds combined to give the lowest potential evaporation conditions in June at Great Falls since 2005.

Soil moisture conditions were dryer than average for the end of June. The continued shortage of precipitation has produced abnormal dryness at the six and 12 inch levels. The rate of dryness at these levels is about one week ahead of normal (Fig. 4). At deeper profiles, the soil moisture is slightly wetter than normal for the end of June (not shown in the figure).

June summary information:

High Temperature	102°F at Glasgow (25 th)	Greatest Precip	5.62" at Brenner
Low Temperature	22°F at Gold Butte (8 th)		5.70" at Shower Falls SNOTEL
Warmest Ave Temp	63.9°F at Hardin	Peak Wind Gust	81 mph near Columbus (30 th)
Coollest Ave Temp	48.7°F at West Yellowstone		
Range of Temp departures	-5.4°F at Ekalaka to +1.4°F at Mullan Pass and Creston	Highest Ave Wind	11.2 mph at Norris Hill 15.2 mph at Deep Creek
18 city mean monthly Temperature/Normal	June: 55.2/57.2 WY: 34.3/34.7 52 nd warmest	18 city mean monthly wind speed/Normal	Jun: 7.5 mph/9.3 mph calmest WY: 8.9/9.5 9 th calmest
18 city mean monthly precipitation/Normal	1.81"/2.32" – 78% of normal 40 th driest WY: 8.92/10.37 23 rd driest		

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

Location	June	% of Norm	Rank	Pcntl	Oct 1 – Jun 30	% of norm	Rank	Pcntl	Years
Baker	3.01	119%			9.84	121%			11
Billings	1.55	82%	45	44	9.50	84%	52	52	100
Belgrade	2.27	94%	28	38	8.80	80%	17	24	68
Butte	2.48	120%	75	65	8.79	99%	59	51	115
Cut Bank	1.66	67%	35	34	3.57	44%	5	4	101
Dillon	2.51	142%	51	72	7.00	104%	39	56	69
Glasgow	0.56	25%	5	4	6.44	89%	29	26	109
Great Falls	1.49	67%	28	23	9.36	89%	40	35	114
Havre	1.39	73%	30	23	5.70	74%	19	14	128
Helena	1.45	80%	43	33	6.28	82%	16	12	130
Jordan	1.92	75%			8.55	115%			10
Kalispell	1.53	67%	41	35	11.18	84%	78	68	114
Lewistown	2.09	71%	31	27	8.51	68%	7	5	113
Livingston	2.35	105%	64	59	9.28	81%	35	33	104
Miles City	3.10	128%	90	68	8.39	88%	53	40	132
Missoula	1.37	79%	42	32	9.44	90%	39	30	127
Mullan Pass	1.97	72%	24	33	25.65	84%	10	13	68
Wolf Point	0.50	18%			4.66	63%			11
Glendive	2.75	107%	51	44	8.76	97%	47	44	106
BZN-MSU	2.55	89%	53	40	14.63	100%	76	59	129

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>

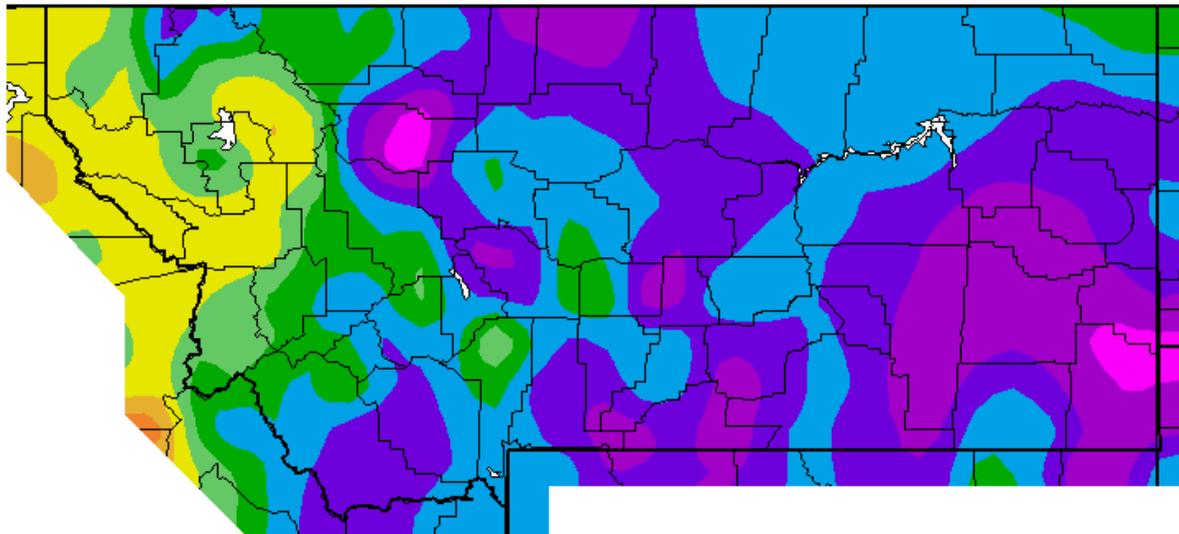
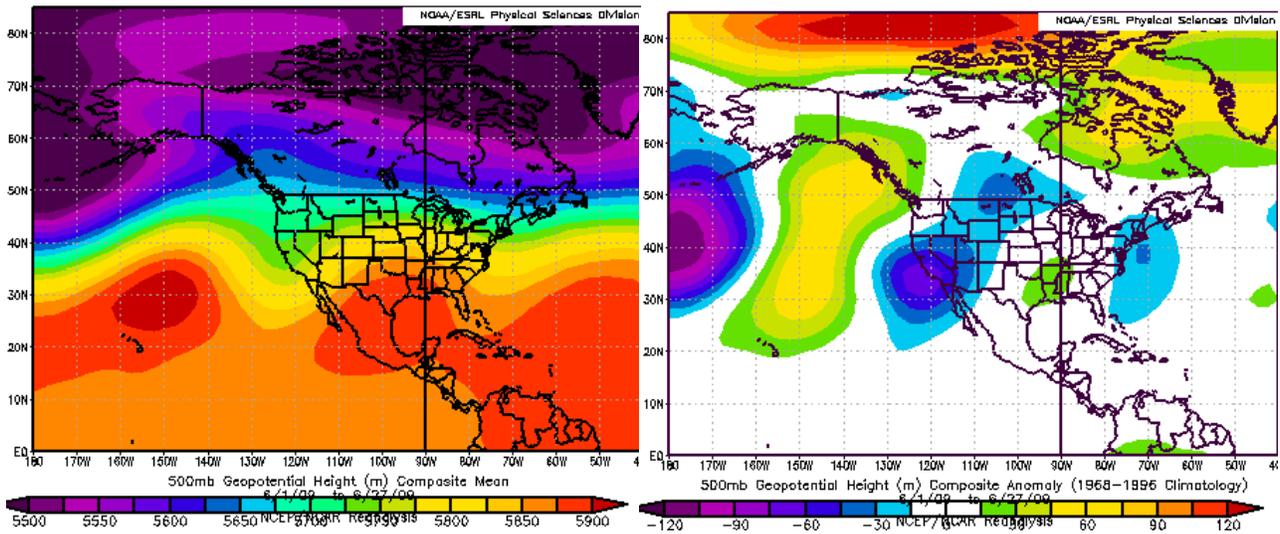


Figure 1. Average temperature departure from normal for June. Temperatures were below normal across eastern Montana, with the coolest values in the southeast. Above normal temperatures were restricted to an area west of the continental divide (Western Region Climate Center).



Figures 2a (left) and 2b (right). Mean flow at 500 millibars (~18,000 ft) for June (left). A trough of low pressure prevailed over the Pacific Northwest. This trough produced below normal heights for western and north central US for June.

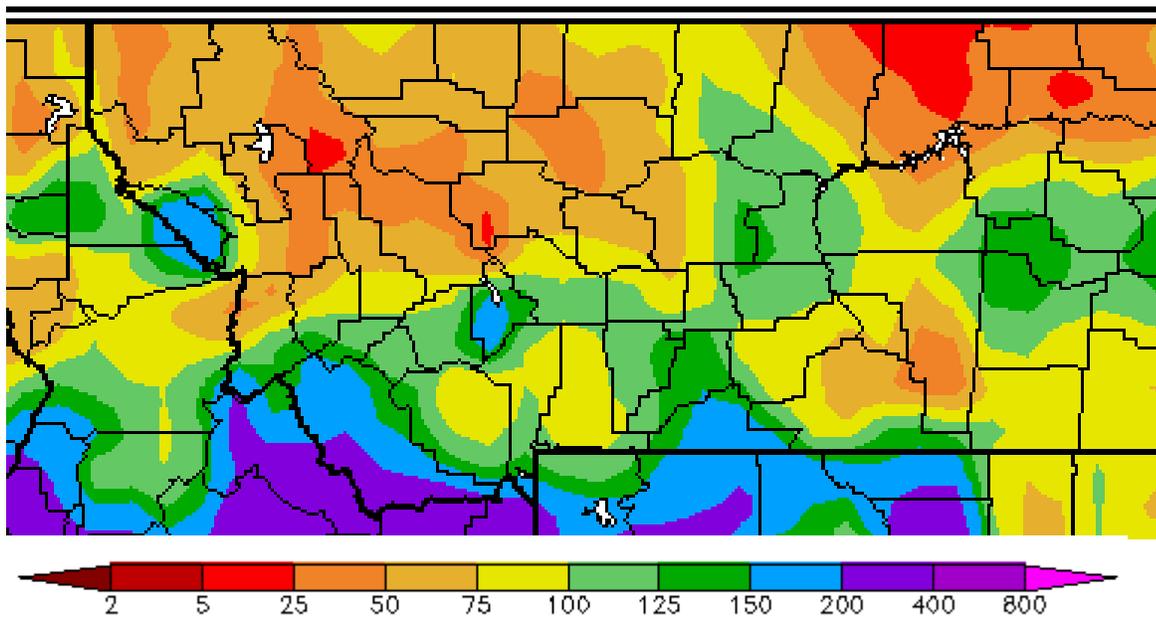


Figure 3. Precipitation anomaly (% of normal) for June. (High Plains Regional Climate Center).

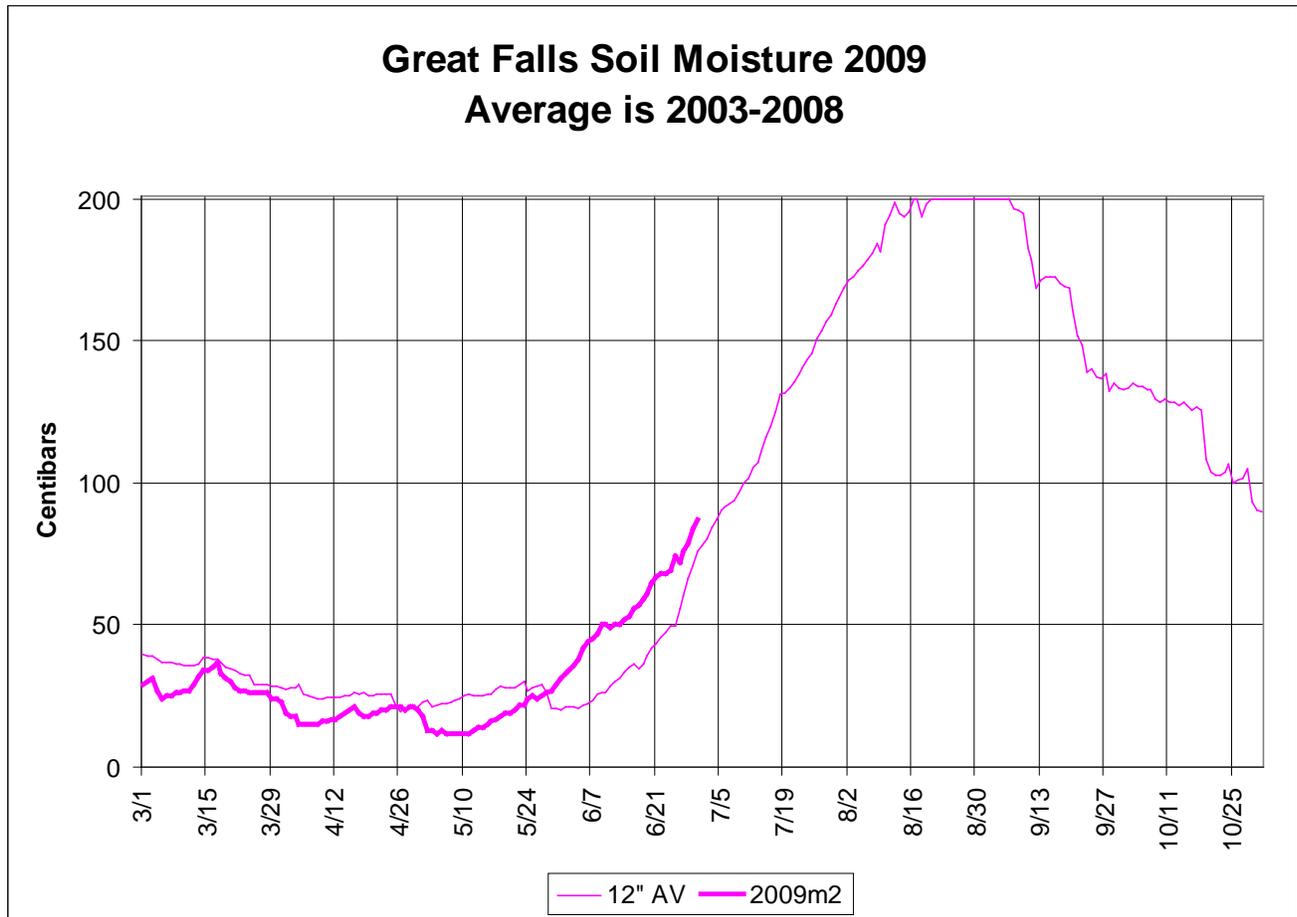


Figure 4. Soil moisture at the 12 inch depth at Great Falls. 2009's values are in the bold purple line, with the average conditions in the lighter purple line. Values closer to zero centibars reflect wetter conditions. Values nearing 200 are dry.

For a state map of % of normal water year precipitation (updated around the 7th of each month), go to: http://www.wrh.noaa.gov/tfx/image.php?wfo=tfx&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 accessed 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=tfx>