

# Montana Weather/Precipitation Summary

**September 2006** By NOAA's National Weather Service Great Falls Montana

After a very cool start, with record low temperatures across much of western Montana on the 1<sup>st</sup>, the first two weeks of September continued the hot and dry weather of the summer. Temperatures were as much as 8°F above normal during the second week across central and eastern Montana. During the first two weeks, the warmest temperatures were recorded across the state. Troy and St. Regis topped out at 97°F on the 5<sup>th</sup>. Precipitation totals were variable, with much above normal over most of the east, and below normal in the central and southwest (Figure 2). Billings saw their 5<sup>th</sup> wettest September of record.

The weekend of the 15<sup>th</sup>-17<sup>th</sup> brought a big change in the weather -- and precipitation. Over 2 inches of rain fell from south central to central Montana, including the Red Lodge, Joliet, Rapelje and Nye areas. Higher elevation locations also saw high moisture values, with Galena (near Boulder) recording 2.62", Crystal Lake at 3.70", and Rocky Boy receiving 4.00". Heavy snow accompanied this weekend storm, along with strong and gusty winds across eastern Montana. A foot of snow fell around Rocky Boy and northeast of Lewistown. MacDonald Pass and Gibson Dam saw 7 inches fall, with Opheim recording 3". Great Falls received 1.3", a record high amount for the day. Even Glasgow received a trace of snow from this storm. Figure 3 shows the snow over the island ranges of central Montana. This could be considered the storm that put out the large fires that were burning in Montana. The Derby Mountain fire area received over 2 inches of rain, which effectively snuffed out the fire. The third week of the month saw temperatures 5 to 10°F below normal. During this cool spell, Wisdom fell to 14°F on the 18<sup>th</sup>, for the state's lowest temperature.

The summer ended on a dry note across northeast Montana. Glasgow recorded their driest summer of record (June-August). The statewide average temperature for the summer was among the 15 warmest, with precipitation among the 15 driest.

Winds were not a major issue during the month. They averaged below normal over most areas. Havre was again an exception with above average wind speeds. Great Falls saw their 3<sup>rd</sup> calmest September of record, while Cut Bank had their 4<sup>th</sup> calmest summer of record. Winds there were about 2 mph below average for the summer. Winds did pick up somewhat at month's end. Deep Creek recorded 66 mph gusts on the 28<sup>th</sup>.

Convective severe weather occurred on only 1 day. The average for September is 1 day. On the 26<sup>th</sup>, a thunderstorm produced 58 mph gusts at the Sidney airport.

Temperatures averaged near normal for the state, ranging from nearly 2°F above normal over portions of western and central Montana, to 3.5°F below average along the eastern border. Precipitation tallies were above the norm for September. Wibaux recorded 3.37" for the month.

Figure 1 shows the average flow pattern during September. In the first half, an upper level ridge continued a dry and warm pattern, while the last half was dominated by more changeable conditions. A mean low pressure trough over central North America brought a series of weather disturbances and cooler air – until the last few days.

For the water year, there are still areas that remain dry. Havre and Livingston areas remain around 80% or less of normal precipitation for the water year.

## **Month's summary information (to date):**

<b>High Temperature</b>	97°F at Troy & St. Regis (5 <sup>th</sup> )	<b>Greatest Precip</b>	3.37" at Wibaux
<b>Low Temperature</b>	14°F at Wisdom (18 <sup>th</sup> )		7.20" at Crystal Lake (C Montana)
<b>Warmest Ave Temp</b>	61.3°F at Thompson Falls	<b>Peak Wind Gust</b>	66 mph at East Glacier 11SSE (28 <sup>th</sup> )
<b>Coollest Ave Temp</b>	47.2°F at West Yellowstone		
<b>Range of Temp Departures</b>	-3.5°F at Ekalaka to +1.8°F at Helena	<b>Highest Ave Wind</b>	13.2 mph at Hillside (Rosebud county)

**Summer (June 21-September 22) Temperature and Precipitation ranking of note:**

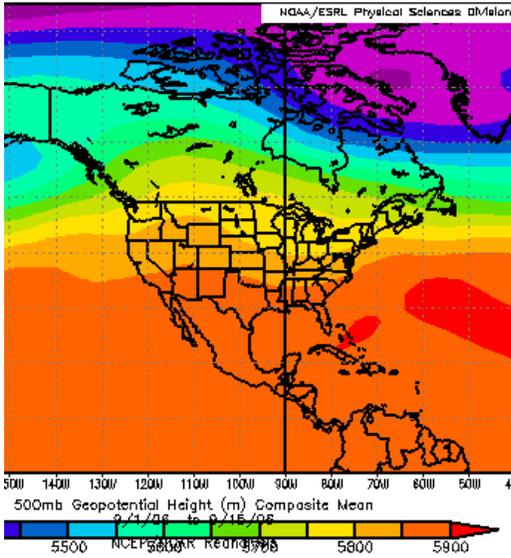
Temperature Ranking		Precipitation Ranking	
3 <sup>rd</sup> warmest	Helena	5 <sup>th</sup> driest	Cut Bank, Livingston
6 <sup>th</sup> warmest	Glasgow	10 <sup>th</sup> driest	Dillon, Lewistown
9 <sup>th</sup> warmest	Bozeman		
10 <sup>th</sup> warmest	Lewistown		

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

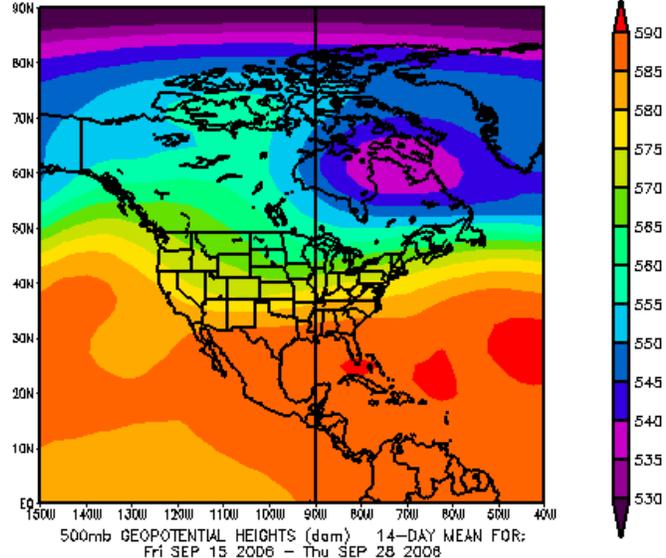
Location	Sep	% of Norm	Rank	Pcntl	Oct 1 – Sep 30	% of norm	Rank	Pcntl	Years
Baker	2.55	223%			12.65	109%			8
Billings	2.73	204%	94	96	13.31	90%	58	60	97
Belgrade	1.02	71%	28	40	13.99	95%	34	52	65
Butte	0.49	45%	29	26	12.51	98%	53	48	111
Cut Bank	0.59	50%	36	36	4.66	37%	1	1	98
Dillon	0.49	51%	25	37	9.16	92%	30	45	66
Glasgow	2.40	245%	100	91	10.21	91%	38	36	106
Great Falls	1.82	148%	82	72	18.70	126%	95	83	114
Havre	1.13	110%	77	61	9.31	81%	27	21	126
Helena	1.17	111%	78	61	12.62	111%	76	59	128
Jordan	1.45	246%			11.52	103%			6
Kalispell	1.18	98%	59	52	17.65	103%	74	66	112
Lewistown	1.79	130%	74	67	17.43	98%	56	51	110
Livingston	0.94	53%	42	40	12.58	79%	31	32	98
Miles City	1.70	143%	106	82	12.13	90%	54	42	129
Missoula	1.63	151%	98	77	16.57	120%	96	80	120
Mullan Pass	1.13	65%	24	36	45.17	128%	51	80	64
Wolf Point	1.94	413%			10.23	91%			8
Glendive	2.03	135%	92	83	13.81	100%	54	53	102
Sidney	1.28	85%	42	64	13.34	93%	34	52	65
BZN-MSU	1.41	78%	63	49	19.86	103%	83	70	119

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>

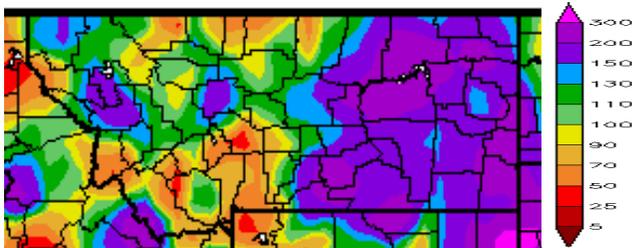


a. September 1-15 2006 mean flow

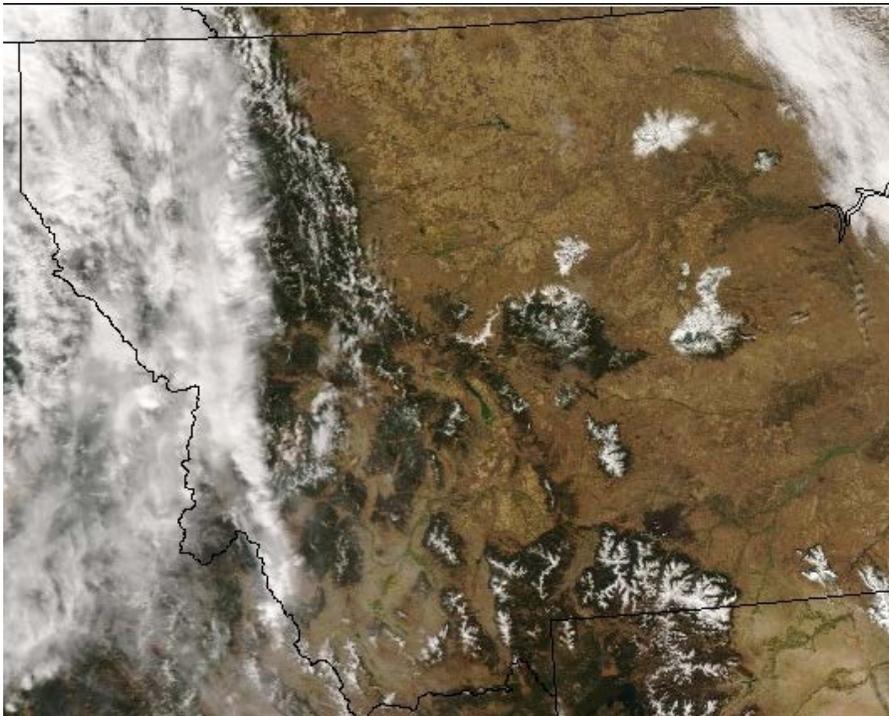


b. last half of September 2006 mean flow

**Figure 1.** Mean flow at 500 millibars (~18,000 ft), (a) Sept 1-15 2006. (b) rest of September 2006. Note the difference in the flow pattern over Montana. Warm and dry dominated the first half, with cooler and variable conditions during the last half.



**Figure 2.** Precipitation anomaly (% of normal) for September. (courtesy High Plains Climate Center).



**Figure 3.** September 18, 2006 MODIS satellite imagery showing the distribution of snow over the

mountains of western Montana. Note the snow over the island ranges (Bears Paw, Little Rockys, Highwoods, Snowys , Judiths, Moccasins, Castle and Crazys. (courtesy SSEC – U of Wisconsin)

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=tfx&type=data&loc=hydro&fx=watyr\\_pcbtnorm.png](http://www.wrh.noaa.gov/tfx/image.php?wfo=tfx&type=data&loc=hydro&fx=watyr_pcbtnorm.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>

All reported data is preliminary. Further inquiries about the moisture conditions can be directed to Dave Bernhardt or Gina Loss at (406) 453-2081. 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>