

# Montana Weather/Precipitation Summary

**September 2008** by NOAA's National Weather Service Great Falls Montana

After a very cold and wet start, September 2008 averaged close to normal for temperature. The first two weeks of the month saw temperatures as much as 20 degrees below normal. The upper air pattern (Fig. 1) showed a trough of low pressure over the central portion of North America. This kept the region in a cool, northwesterly flow. First frosts were recorded in many areas during this period. At many locations in eastern Montana, this was the coldest first two weeks of September of record. The last half of the month was almost a complete turnaround. With the sustained unseasonable warmth, temperatures for the month averaged near normal. For the month, the upper flow averaged westerly, or near the seasonal normal (Fig. 2). Precipitation was variable again, with wide swaths of above normal precipitation along the continental divide, and through central Montana (Fig. 4). These areas were bounded by areas of below normal precipitation.

The month started with the big storm over the Labor Day weekend that dropped over two inches of rain over portions of central and south central Montana. Some mountain areas of the west received as much as six inches of snow. Temperatures were very cool during this period. This coolness persisted for the first 10 days, resulting in one of the coolest starts to September on record in Montana. Just as the pattern was changing, one more storm brought up to 1.50" of precipitation to south central Montana, and six inches of snow to the Beartooth Mountains on the 10<sup>th</sup> and 11<sup>th</sup>. After another shot of cool air, temperatures finally warmed. By the 17<sup>th</sup>, temperatures reached 94F at Turner, for the month's highest temperature. Kalispell set a daily record high temperature on the 19<sup>th</sup>. After a 5-day period of temperatures reaching the 80s, a cold front on the 20<sup>th</sup> ushered in cooler air, accompanied by thunderstorms. Scattered rains fell across the state as this front moved through. The colder period, lasting through the 24<sup>th</sup>, was also accompanied by windy conditions. Snowslip recorded a wind gust of 60 mph on the 22<sup>nd</sup>, and the highest wind gust for the month on the 27<sup>th</sup> at 64 mph.

The statewide mean temperature at 18 cities in September was 55.2F, slightly cooler than the normal of 55.6F. The precipitation average was 1.15 inches or 93 percent of normal. The normal value is 1.23 inches. The wind average of 6.4 mph was much below the long-term average of 8.7 mph. At many locations, this month was the calmest, or among the top 5 calmest September's of record.

## September summary information:

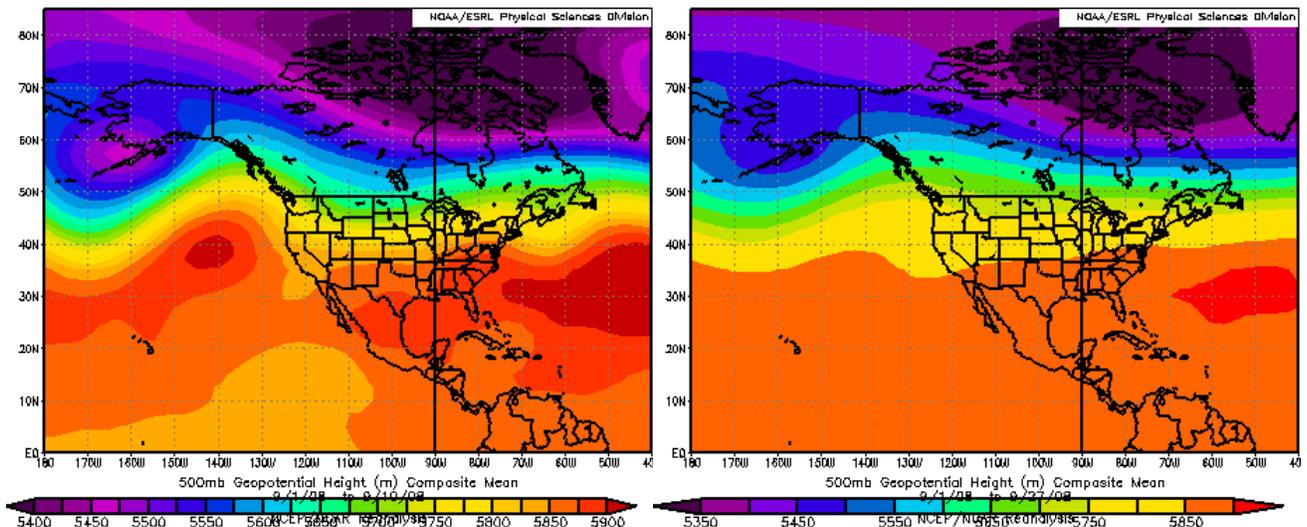
<b>High Temperature</b>	94°F at Turner (17 <sup>th</sup> )	<b>Greatest Precip</b>	4.23" at Pryor Mountain
<b>Low Temperature</b>	17°F at Elk Park (27 <sup>th</sup> )		5.2" at Noisy Basin SNOTEL
<b>Warmest Ave Temp</b>	59.8°F at Miles City	<b>Peak Wind Gust</b>	64 mph at Snowslip (27 <sup>th</sup> )
<b>Coollest Ave Temp</b>	45.9°F at Wisdom		
<b>Range of Temp departures</b>	-2.6°F at Ennis to +1.8°F at Kalispell	<b>Highest Ave Wind</b>	11.6 at McDonalds and 12.2 mph at Deep Creek
<b>18 city mean monthly Temperature/Normal</b>	55.2/55.6	<b>18 city mean monthly wind speed/Normal</b>	6.4 mph/8.7 mph
<b>18 city mean monthly precipitation/Normal</b>	1.15"/1.23" – 93% of normal		

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

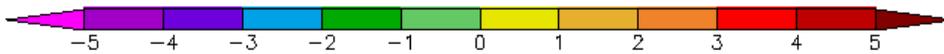
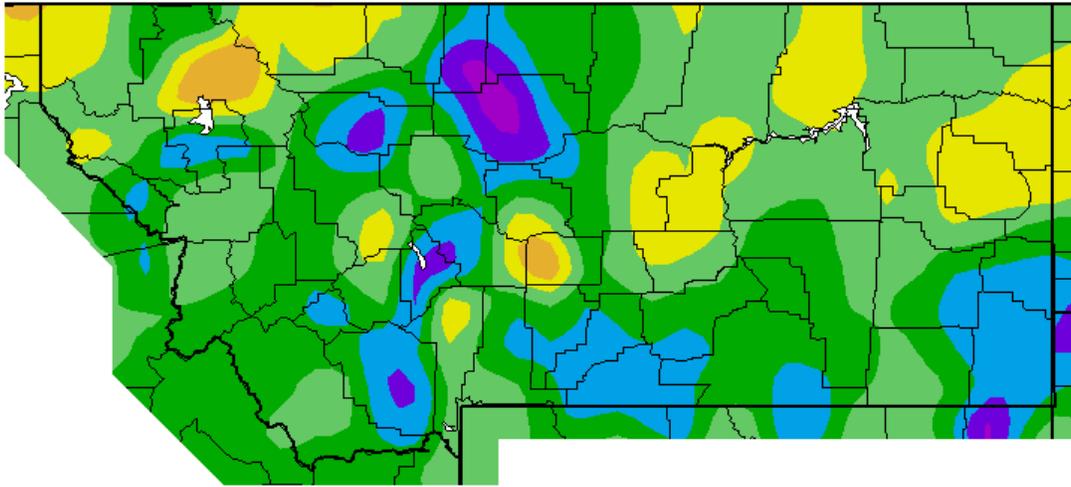
Location	Sep	% of Norm	Rank	Pcntl	Oct 1 – Sep 30	% of norm	Rank	Pcntl	Years
Baker	1.05	92%			11.15	96%			10
Billings	2.44	182%	94	94	13.72	93%	66	66	99
Belgrade	0.35	24%	9	11	13.60	92%	30	44	67
Butte	0.59	54%	40	34	9.77	76%	23	20	111
Cut Bank	1.29	109%	69	67	13.22	106%	73	73	100
Dillon	1.00	103%	41	59	8.87	89%	27	39	68
Glasgow	1.40	143%	88	78	14.36	128%	80	74	108
Great Falls	1.87	152%	85	72	16.02	108%	78	68	114
Havre	1.10	107%	77	60	10.65	93%	45	35	128
Helena	0.70	67%	53	41	8.88	78%	21	16	130
Jordan	1.00	169%			13.57	122%			9
Kalispell	1.26	105%	69	60	13.24	77%	76	66	114
Lewistown	1.51	109%	63	56	16.18	91%	43	38	112
Livingston	1.16	65%	49	45	13.26	83%	39	39	99
Miles City	0.99	83%	75	57	9.42	70%	15	11	131
Missoula	1.09	101%	71	55	11.80	85%	31	25	122
Mullan Pass	1.42	82%	30	43	37.73	107%	30	45	66
Wolf Point	1.46	311%			9.81	87%			10
Glendive	1.13	75%	66	58	9.46	69%	12	11	103
Sidney	0.29	19%	9	12	6.69	47%	1	1	66
BZN-MSU	0.95	53%	36	27	22.73	118%	107	88	121

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

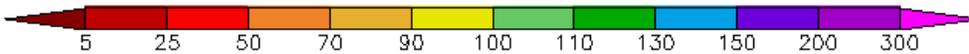
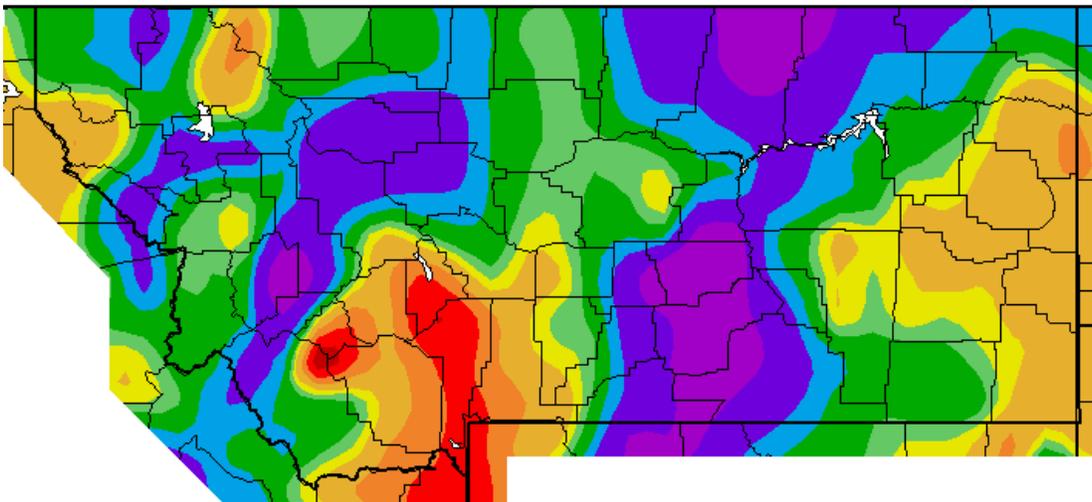
For an automated version of this chart, updated daily, go to <http://www.wrh.noaa.gov/tfx/dx.php?wfo=tfx&type=&loc=products&fx=PCPNTOTALS>



**Figures 1 (left) and 2 (right).** Mean flow at 500 millibars (~18,000 ft) for the first two weeks of September 2008 (left). A broad trough of low pressure was over central North America. This pattern reversed, with an average high pressure ridge along the west coast for the month (right).



**Figure 2.** Temperature anomaly for September. Montana experienced temperatures near normal across most of the state, with pockets of below normal temperatures in the central and southeast. (Western Regional Climate Center).



**Figure 4.** Precipitation anomaly (% of normal) for September. (Western Region Regional Climate Center).

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\\_pcntnorm.png](http://www.wrh.noaa.gov/tfx/image.php?wfo=tx&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=tx>