Montana Weather/Precipitation Summary

September 2007 by NOAA's National Weather Service Great Falls Montana

Temperatures and precipitation were much closer to normal values during September. Though the month had its normal ups and downs, overall it was a more normal month. Some areas actually had above normal precipitation for the first month since spring. The upper air flow pattern during September was close to normal for the month (Fig. 1). There were a few days of severe weather, with the first snows falling over the higher elevations during the month. The east remained relatively dry, but heavy precipitation event, with snows, during the third week extinguished some of the fires in the northern Rockies.

Warm conditions prevailed during the first few days of September, with temperatures reaching 103 at Miles City on the 4th. A cold front produced severe thunderstorms that caused quarter size hail in the Vida area on the 4th. A cooler spell with rain in many areas settled in for the next week. Temperatures dropped to as low as 16 at Wisdom on the 10th. The roller coaster continued with temperatures warming again. A warm period mid-month brought readings as high as 95 at Sidney on the 16th. This was ahead of a cold front, where cold air collected in western valleys and dropped temperatures to 15 at Gates Park on the 14th. Up-and-down temperatures continued through the rest of the month. Rains, with mountain snows prevailed over the west on the 20th through 23rd. Nearly 2 inches of rain fell during this period in the west, with nearly a foot of snow at some of the higher elevations. With warmer conditions moving in from the west, strong winds arrived along the Rocky Mountain Front. Deep Creek, near East Glacier Park, recorded the month's highest wind gust at 75 mph on the 21st.

Warmer conditions returned to most areas by the end of the month. Miles City reached 86 on the 28th, but another cold front brought winds and precipitation to the state again on the 29th. Some areas recorded over ½ inch of rain, with up to 6 inches of snow in the higher western mountains. Wisdom dropped to 15 on the 30th, tying the lowest temperature for the month.

Precipitation totals were variable across the state. The northwest and much of the east were below normal for the month. A swath from the southwest through north central had above normal amounts. (Figure 2). The heavy precipitation along the Rocky Mountain Front produced the 5th wettest September of record at Cut Bank. Temperature averages varied across the state. The northwest and east recorded temperatures near to slightly below normal, with temperatures as high as 3F above normal in the south central (Figure 3).

Severe weather has occurred on 4 days. The average for all of September is 2 days. Quarter-size hail fell near Vida on the 4th, with more widespread hail on the 7th. On the 7th, 1 inch hail fell near Melstone, Winnett and Winnifred; on the 19th and 20th, ¾ inch hail and strong winds occurred in the Lindsay and Glendive areas.

Winds averaged near normal. The statewide average of 14 cities was 8.0 mph, with the normal of 8.7 mph. The statewide temperature average of 14 cities was 56.6, where the normal is 55.6. Soil moisture conditions still show dry to very dry conditions at most reporting locations across the state.

September summary information:

High Temperature	103°F at Miles City (4th)	**Greatest Precip**	3.89" at Heart Butte
Low Temperature	15°F at Gates Park (14th) & Wisdom (30th)		
Warmest Ave Temp	63.7°F at Glendive	**Peak Wind Gust**	75 mph at Deep Creek RAWS (21st)
Coolest Ave Temp	46.5°F at Wisdom		
Range of Temp departures	-1.4°F at Sweet Grass to 3.4°F at Belgrade Field	**Highest Ave Wind**	14.0 mph near Livingston

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	1.22	107%			15.78	136%			9
Billings	1.73	129%	78	79	16.87	114%	82	84	98
Belgrade	1.19	83%	33	46	14.02	95%	36	55	66
Butte	2.56	235%	109	96	13.87	109%	73	66	111
Cut Bank	2.95	250%	97	96	4.93	39%			99
Dillon	1.26	130%	47	69	12.66	127%	59	88	67
Glasgow	0.96	98%	72	65	15.30	136%	86	80	107
Great Falls	1.72	140%	79	69	12.82	86%	38	33	114
Havre	1.73	168%	106	83	12.97	113%	77	61	127
Helena	1.69	161%	96	74	11.01	97%	60	47	129
Jordan	0.67	114%			14.45	129%			6
Kalispell	1.07	89%	57	50	12.32	72%	75	66	113
Lewistown	1.11	80%	45	40	17.98	101%	63	57	111
Livingston	0.75	42%	29	27	15.75	99%	61	62	99
Miles City	0.37	31%	33	25	11.81	88%	52	40	130
Missoula	1.54	143%	92	72	12.70	92%	45	37	121
Mullan Pass	0.88	51%	16	24	42.77	121%	50	77	65
Wolf Point	0.85	181%			13.62	121%			9
Glendive	0.66	44%	43	38	12.21	89%	32	31	103
Sidney	0.78	52%	29	43	9.87	69%	11	17	66
BZN-MSU	1.68	93%	75	58	24.10	125%	114	95	120

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

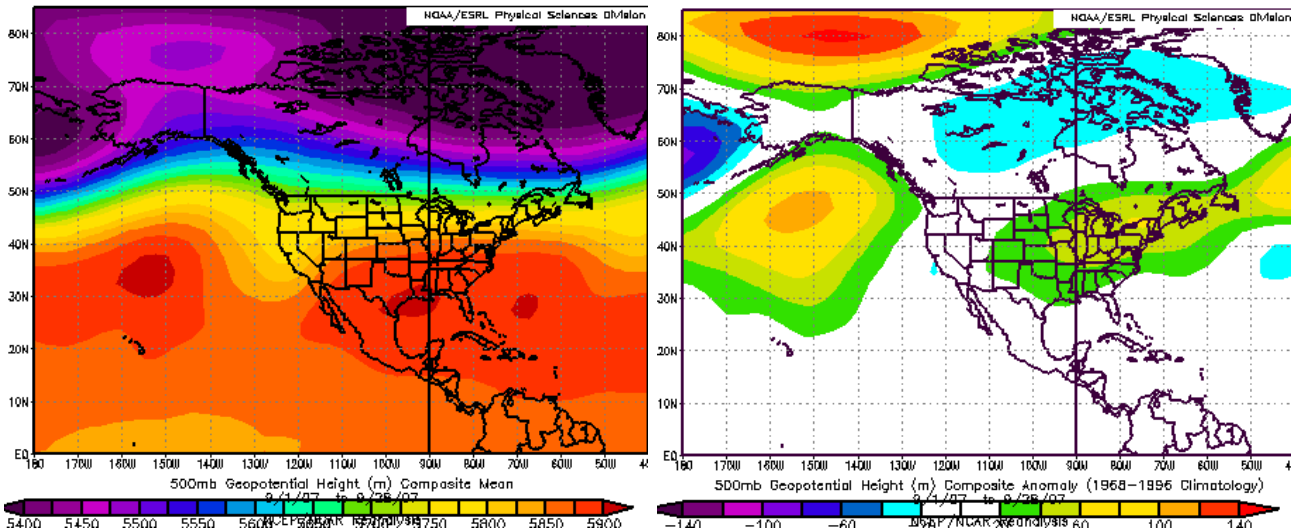


Figure 1. Mean flow at 500 millibars (~18,000 ft) September 2007. Zonal, or westerly flow (left) over the area produced a nearly "normal" flow pattern for the month (right).

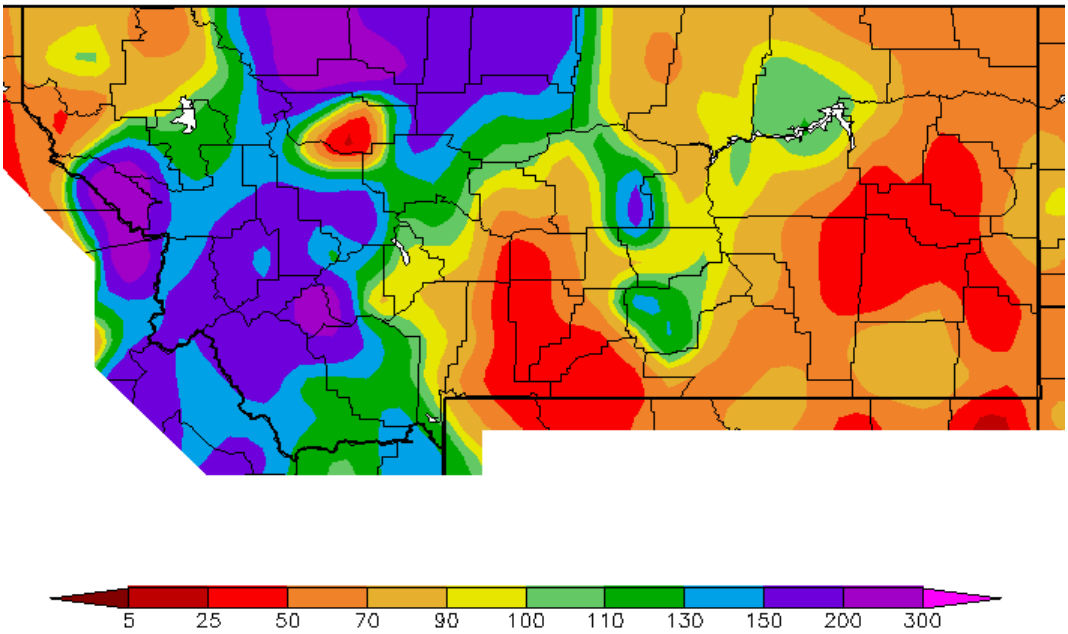


Figure 2. Precipitation anomaly (% of normal) for September. A swath from the southwest through north central had above normal precipitation. The east was mostly below to much below average (courtesy Western Region Climate Center).

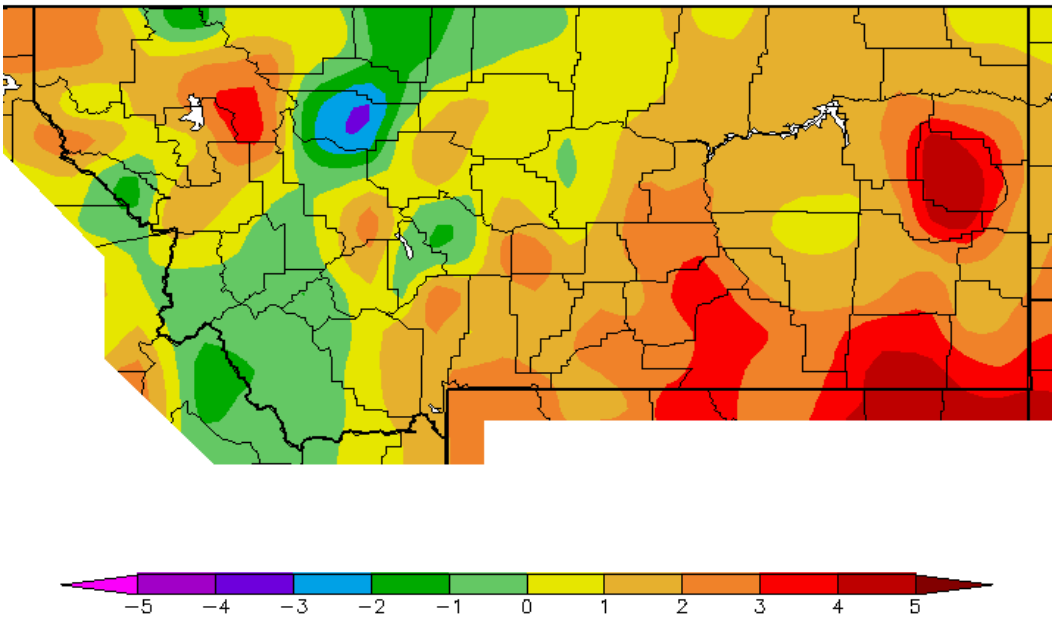
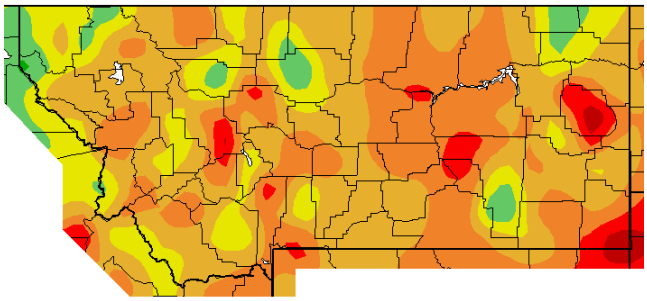
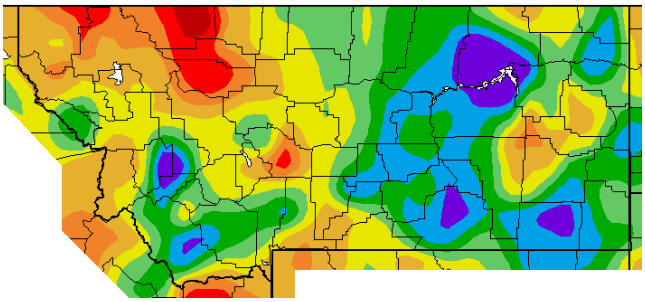
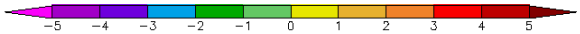
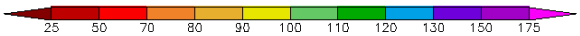


Figure 3. Temperature anomaly for September. Most areas were close to normal. The largest area of warmer than normal was across the eastern half. Below normal areas corresponded to areas of greater precipitation. (courtesy Western Region Climate Center).









For the water year just ended (October 2006-September 2007), here are graphics for the temperature and precipitation departures from normal. Temperatures (left) were relatively close to normal, with pockets of 3-5°F above normal in the east and southeast. For precipitation (right) [percentage of normal], parts of the southwest, and a large part of eastern Montana received above normal precipitation. The northwest continued below average.

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_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

All reported data is preliminary. 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