

Montana Weather/Precipitation Summary

August 2008 by NOAA's National Weather Service Great Falls Montana

For much of the state, August 2008 turned out slightly warmer than normal, and dry. The exception to the dryness was over the west. In some areas of the central and west, more precipitation fell on the last day of the month than over the rest of the month. An upper level ridge prevailed for most of the month, which contributed to the above normal temperatures and below normal precipitation (Fig. 1). High temperatures were above normal, while low temperatures were a bit below normal across the state. This caused the average temperatures to be only slightly above normal across Montana (Fig. 2). As in July, high temperatures were above normal, with low temperatures below normal (Fig. 3). At the same time, precipitation was mostly below average (Fig. 4).

The above normal temperatures during the month were broken up by sporadic periods of below normal temperatures. The warmest temperature of the month occurred on the 1st and 25th. Roundup reached 105F on the 1st and Hardin also peaked at 105 on the 25th. There were 6 other days on which the temperature reached or exceeded 100F at some location in Montana. The low temperature dropped to lower than freezing on 12 days at some location in the state. The lowest occurred at Mystic Lake; they fell to 22F on the 27th. August was similar to July in that the low temperatures averaged below normal, and the high temperatures generally 2-4F above normal. Record high temperatures were set at Bozeman on the 1st, and again over portions of southwest and central Montana on the 25th.

Severe weather occurred on 12 days during August, which was 5 days above normal. The thunderstorms were concentrated during the first 10 days of the month, culminating in a large outbreak on the 9th and 10th. A tornado was spotted near Alzada on the 10th. The total number of tornados in Montana per year has been at a low point not seen since the mid-1980s (Fig. 5). Severe thunderstorms produced a peak wind gust of 82 mph at Elkhorn, in the Elkhorn Mountains, on the 10th. The windy season began late in the month, with strong flow producing strong downslope winds along the Rockies and northern Rocky Mountain front from the 26th-29th. Logan Pass reported winds to 84 mph during this period. Also, during this cooler, windy period, some snow fell in Glacier National Park.

Precipitation continued to avoid large portions of the state. Much of the state reported below average precipitation for the month. During the period from August 30th-September 1st, a storm system brought heavy precipitation – over 2 inches of rain in some portions of central Montana. This storm ended with snow at higher elevations by the morning of September 1. One to three inches fell at the pass level of western and southwestern Montana, with snow mixing with rain outside the Great Falls vicinity. Figure 6 shows a Montana Department of Transportation webcam that shows the snow at Rogers Pass on the morning of September 1, 2008.

The statewide mean temperature at 18 cities in August was 67.2F, with the normal of 66.3. The precipitation average was 1.02 inches or 77 percent of normal, with a normal value of 1.33. The wind average of 8.1 mph was below the long-term average of 8.4 mph.

Other record or notable information for August:

- Bozeman recorded their 5th calmest August of record with an average of 5.9 mph – normal is 6.4 mph. They also had their 3rd calmest summer period of record with an average of 5.7 mph – normal is 6.4 mph.
- Butte recorded their 4th calmest January-August period of record with an average of 5.8 mph. They also had their 3rd calmest summer period of record with an average of 6.2 mph – normal is 6.9 mph.
- Missoula recorded their 5th calmest summer period of record with an average of 5.7 mph – normal is 7.0 mph.

For the water-year-to-date, the western 2/3 of the state is experiencing some of the best precipitation totals seen in recent years. An exception is over the southwest, where Dillon is 88% of normal and ranks as 25th driest after the 6th driest August of record. The eastern counties are very dry this year. Sidney and Glendive are in the top 10 driest years' category. Even at Miles

City, they rank in the 11th percentile, collecting less than 8.5 inches of precipitation since October.

August summary information:

High Temperature	105°F at Roundup (1 st) & Hardin and Flatwillow (25 th)	Greatest Precip	2.99" at Mullan Pass
Low Temperature	22°F at Mystic Lake (27 th)		4.3" at North Fork Jocko SNOTEL
Warmest Ave Temp	74.0°F at Miles City	Peak Wind Gust	82 mph at Elkhorn (10 th) and 84 mph at Logan Pass (27 th)
Coollest Ave Temp	56.9°F at Wisdom		
Range of Temp departures	-1.0°F at Libby 32SSE to +3.1°F at Glendive	Highest Ave Wind	12.7 at Fort Belknap and 17.0 mph at Deep Creek
18 city mean monthly Temperature/Normal	67.2/66.3	18 city mean monthly wind speed/Normal	8.1 mph/8.4 mph
18 city mean monthly precipitation/Normal	1.02"/1.33" – 77% of normal		

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

Location	Aug	% of Norm	Rank	Pcntl	Oct 1 – Aug 31	% of norm	Rank	Pcntl	Years
Baker	0.70	72%			10.10	96%			10
Billings	1.18	139%	83	83	11.28	84%	56	56	99
Belgrade	0.54	47%	18	24	13.25	100%	46	68	67
Butte	0.71	52%	47	40	9.18	79%	26	23	112
Cut Bank	1.19	70%	54	52	11.93	105%	75	75	100
Dillon	0.13	12%	6	7	7.87	88%	25	36	68
Glasgow	0.71	57%	44	39	12.96	126%	72	66	108
Great Falls	1.31	79%	75	65	14.15	104%	71	62	114
Havre	1.13	94%	76	59	9.55	92%	51	39	128
Helena	0.45	35%	35	27	8.18	80%	25	19	130
Jordan	1.42	95%			12.57	119%			9
Kalispell	0.94	75%	60	52	11.98	75%	54	47	114
Lewistown	1.72	91%	74	66	14.67	89%	43	38	112
Livingston	0.86	64%	45	42	12.10	85%	40	39	101
Miles City	0.75	65%	64	49	8.43	69%	15	11	131
Missoula	1.35	117%	100	77	10.71	84%	34	27	122
Mullan Pass	2.99	197%	63	91	36.31	108%	32	48	66
Wolf Point	0.81	58%			8.35	78%			10
Glendive	0.85	60%	49	43	8.33	68%	9	8	104
Sidney	0.53	40%	16	23	6.40	50%	2	2	66
BZN-MSU	0.91	61%	57	43	21.78	125%	112	91	123

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>

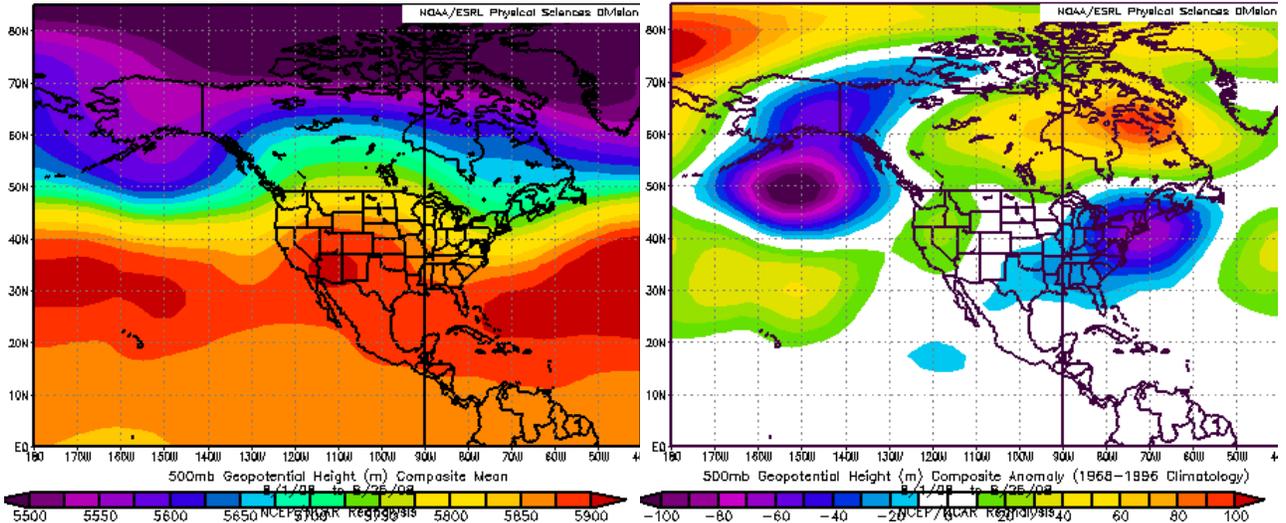


Figure 1. Mean flow at 500 millibars (~18,000 ft) August 2008 (left). A ridge continued over the Rocky Mountain region. The strength of the ridge was slightly above normal for the month. This contributed to the slightly above normal temperatures across the state.

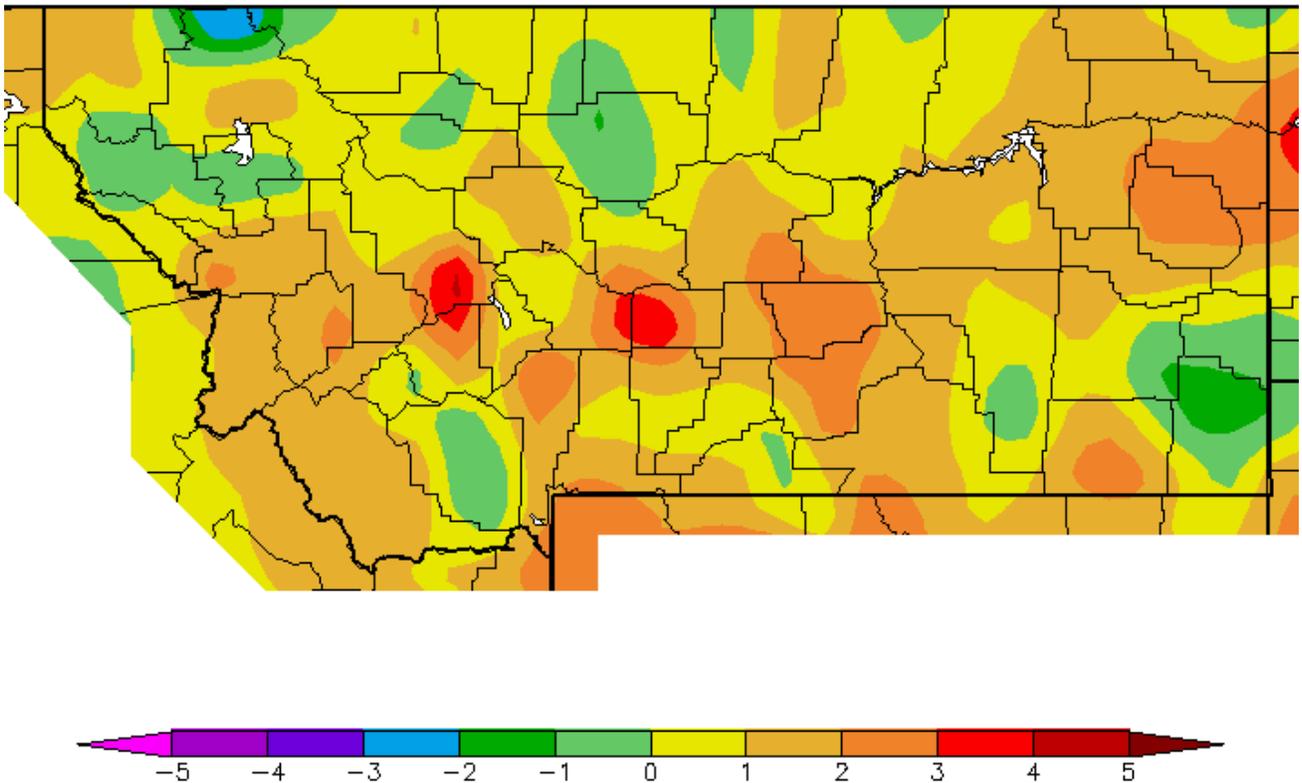


Figure 2. Temperature anomaly for August. Montana experienced temperatures slightly above normal across most of the state, with pockets of below normal temperatures. (Western Regional Climate Center).

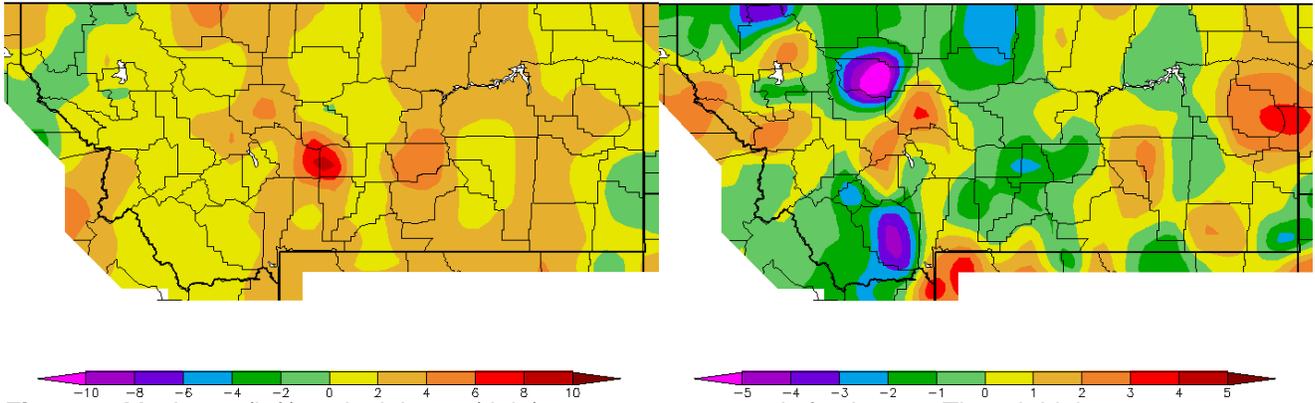


Figure 3. Maximum (left) and minimum (right) temperature anomaly for August. Though high temperatures were largely above normal, large portions of the state recorded low temperatures that averaged even more below normal . (Western Regional Climate Center).

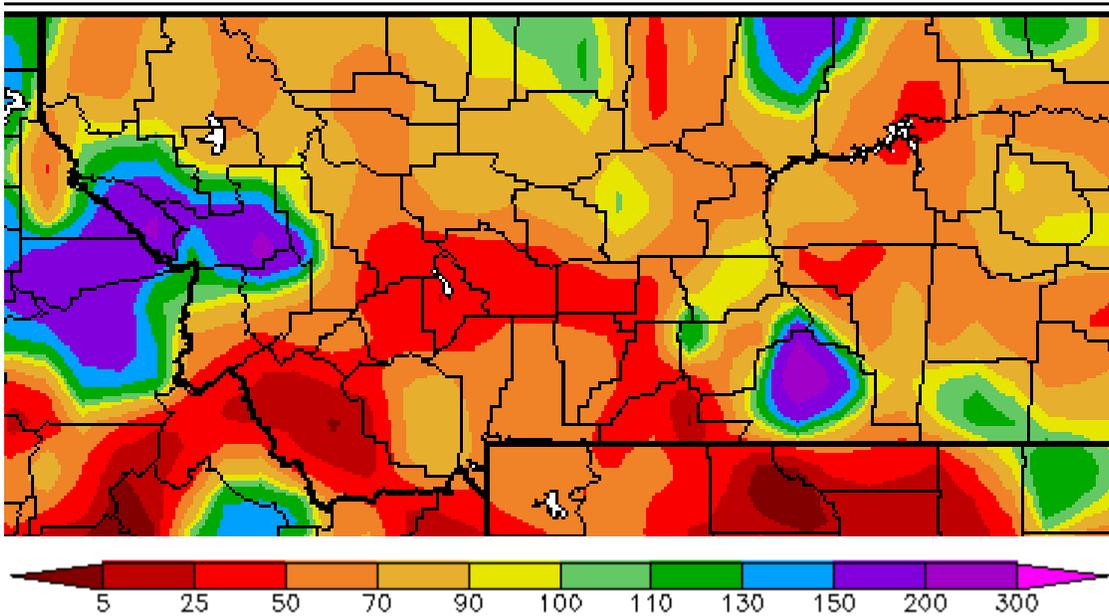


Figure 4. Precipitation anomaly (% of normal) for August. (High Plains Regional Climate Center).

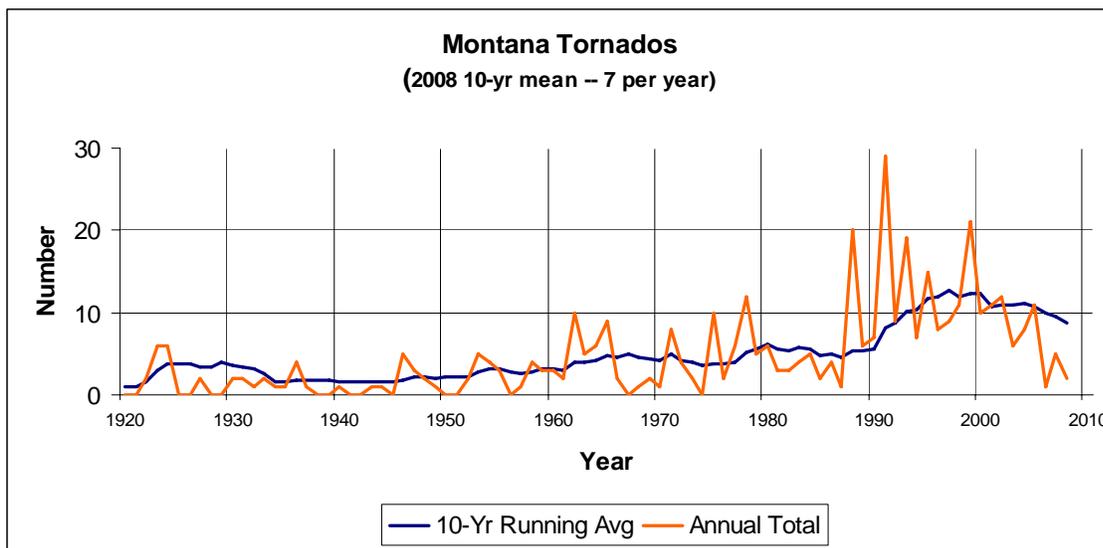


Figure 5. Average number of tornadoes per year in Montana, with a running mean (blue line).



Figure 6. Rogers Pass snow on the morning of September 1, 2008. Photo credit Montana Department of Transportation Rogers Pass webcam.

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>

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=tfx>