

Montana Weather/Precipitation Summary

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

November 2008 temperatures in Montana averaged as much as 10 degrees above normal. Few below normal days occurred. It was so warm that even the cooler days felt chilly, rather than normal for the time of year. The month's average flow pattern showed a ridge of high pressure dominating for the month (Fig. 1). Precipitation fell over the west, with above normal precipitation through the early part of the month. The coolest period early in the month caused temperatures to drop to -7 at Elk Park on the 6th. Scattered snow showers occurred at lower elevations, with the greatest storm affecting the Little Belts on the 13th, when up to a foot and one-half of snow fell. This was preceded by strong winds, when Logan Pass peaked at 114 mph on the 12th. After the snow over the Little Belts, and a few showers at lower elevations, temperatures again warmed on the 15th, with high winds over portions of the state once again. Logan Pass peaked at 75 mph during this windy period.

Mild temperatures continued through the 18th, with windy conditions along the Rocky Mountain front again. Winds peaked at 73 mph near East Glacier Park on the 18th. Very warm temperatures spread over the state, with record high temperatures set almost statewide. Flatwillow topped out at 74F. This exceeded the statewide record high temperature on the 18th, set in 1999. At many locations, this was the latest so late in the season for temperatures exceeding 70F.

Cooler air spread across the state after this very warm period. By the morning of the 20th, temperatures were near zero in northeastern Montana. Another storm system around the 20th brought heavy snow to southeast Montana. Up to 8 inches of snow fell around Ekalaka with this storm. Warmer air returned by the 22nd with high winds along the Rocky Mountain front once again. Winds peaked at 71 mph at Babb, and 80 mph at Logan Pass. The rest of the month brought continued above normal temperatures with a period of precipitation near the end of the month.

The statewide mean temperature at 18 cities in November was 37.2F, much warmer than the normal of 30.4F (Fig. 2). At Bozeman and Helena, it was the 3rd warmest November of record. The precipitation average was 0.90 inches or 110 percent of normal. The normal value is 0.66 inches. Precipitation was above normal through the central and north central portions of the state, surrounded by areas of below normal (Fig. 3). At Havre, it was the 5th wettest November of record. The wind average of 9.0 mph was slightly below the long-term average of 9.2 mph. At Kalispell, this was the 2nd calmest November of record (2.9 mph), and at Missoula, it was the 6th calmest November of record.

November summary information:

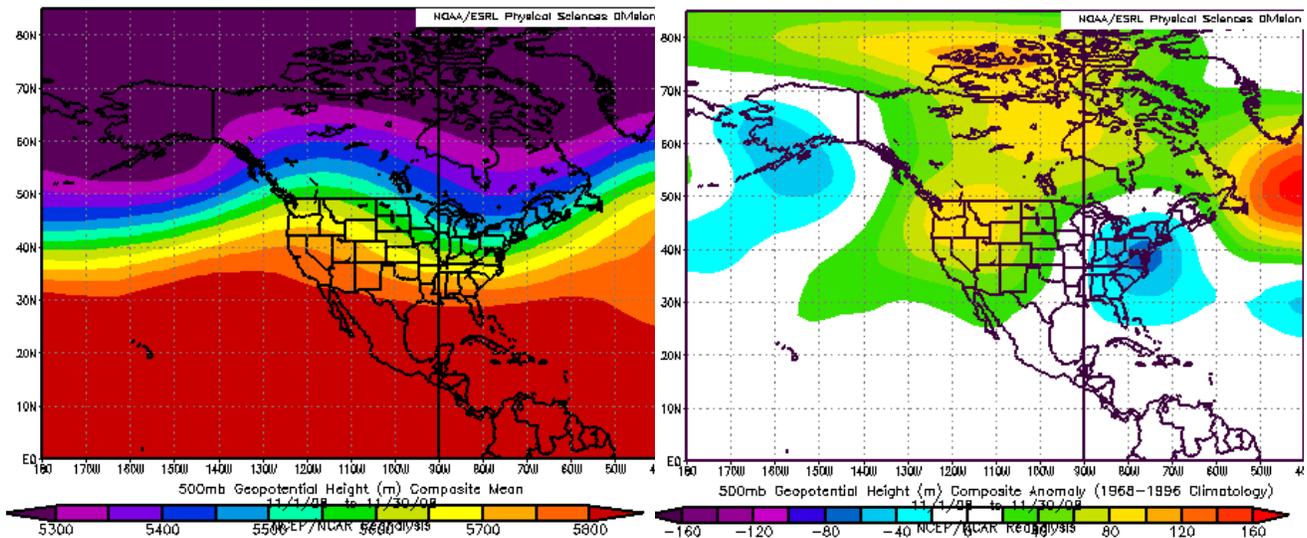
High Temperature	77°F at Broadus (2 nd)	Greatest Precip	3.20" at West Glacier
Low Temperature	-7F at Elk Park (6 th)		9.4" at North Fork Jocko and Twin Lakes SNOTEL
Warmest Ave Temp	42.2°F at Billings	Peak Wind Gust	106 mph at Logan Pass (14 th) & 83 mph at Cut Bank (7 th)
Coolest Ave Temp	28.6°F at Westby		
Range of Temp departures	+3.5°F at Mullan Pass to +10.2°F at Bozeman	Highest Ave Wind	18.3 at Livingston and Harlowton and 19.9 mph at Deep Creek
18 city mean monthly Temperature/Normal	37.2/30.4	18 city mean monthly wind speed/Normal	9.0 mph/9.2 mph
18 city mean monthly precipitation/Normal	0.90"/0.66" – 110% of normal		

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

Location	Nov	% of Norm	Rank	Pcntl	Oct 1 – Nov 30	% of norm	Rank	Pcntl	Years
Baker	0.87	166%	10		2.00	116%	8		10
Billings	0.27	36%	28	27	2.09	104%	69	69	100
Belgrade	0.96	119%	53	73	1.29	67%	21	30	67
Butte	0.99	165%	94	82	1.41	101%	65	56	115
Cut Bank	0.19	45%	48	47	0.30	34%	21	20	102
Dillon	0.37	103%	39	56	0.53	53%	15	21	69
Glasgow	0.32	82%	54	48	1.61	146%	87	78	111
Great Falls	0.74	125%	72	61	1.27	84%	50	43	114
Havre	1.28	284%	124	97	1.31	122%	87	68	128
Helena	0.86	179%	102	79	1.24	109%	66	51	129
Jordan	1.17	257%	9		2.42	172%	9		10
Kalispell	1.30	90%	26	22	1.72	71%	50	43	115
Lewistown	1.16	157%	95	84	1.98	110%	66	59	112
Livingston	0.45	45%	43	40	1.04	42%	18	17	104
Miles City	0.61	117%	97	74	2.29	139%	112	85	131
Missoula	1.94	202%	115	88	2.58	144%	94	73	129
Mullan Pass	2.73	57%	14	19	4.33	55%	11	15	69
Wolf Point	0.18	80%	6		1.17	103%	10		10
Glendive	0.55	112%	75	65	1.89	128%	87	80	109
Sidney	0.58	92%	49	72	1.46	88%	41	62	66
BZN-MSU	1.39	126%	98	75	2.03	75%	52	40	130

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 1a (left) and 1b (right). Mean flow at 500 millibars (~18,000 ft) for November (left). An unseasonal strong ridge of high pressure prevailed over western North America. This produced higher than normal heights (right) over most of North America. This also contributed to the above normal temperatures across the state.

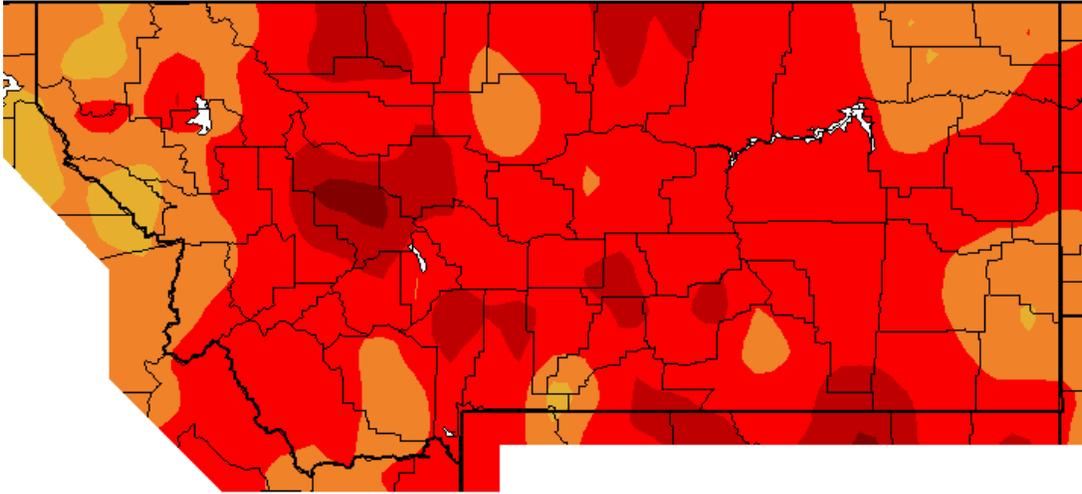


Figure 2. Temperature anomaly for November. Temperatures averaged up to 10 degree above average in the darkest red areas. (Western Region Climate Center).

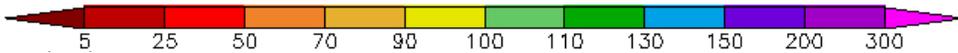
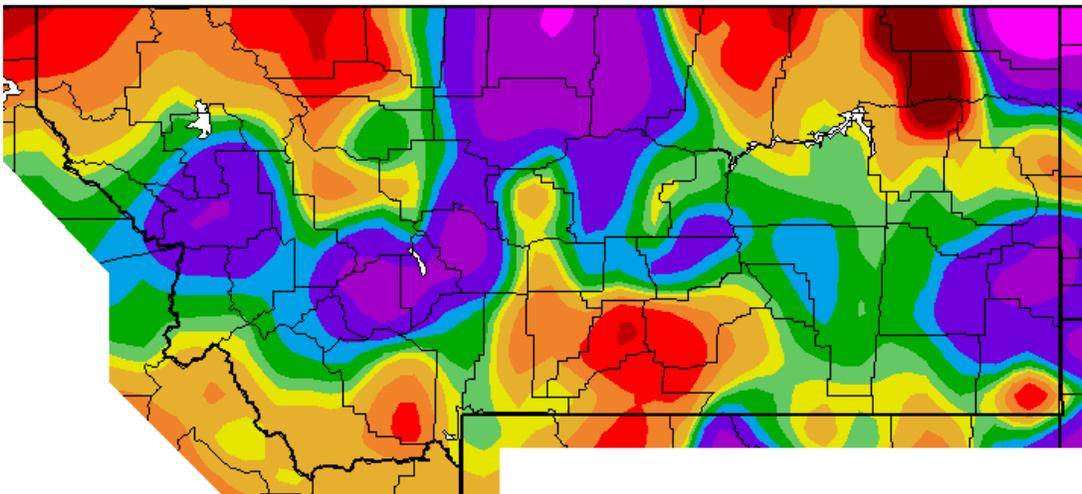


Figure 3. Precipitation anomaly (% of normal) for November. (Western Region Climate Center).

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=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>