

Montana Weather/Precipitation Summary

November 2006 By NOAA's National Weather Service Great Falls Montana

November was a month of extremes, but as a whole had near to below normal precipitation and near normal temperatures. Most of the month was on the windy side. The month started out cold with temperatures up to 25 degrees below normal and lows near zero. A sharp turn-around to warmer conditions on the 3rd and 4th brought typical November windiness for several days to eastern Montana. Temperatures topped out in the lower 70s at several locations, with record high temperatures set on the 6th through 8th over portions of the state. This period also brought one of the heaviest November precipitation events to Montana. A strong westerly flow brought copious amounts of moisture from the Pacific and strong winds to higher elevations. Heavy rain fell across much of western Montana, bringing flooding and severe damage, especially to the Glacier National Park area. One weather station in the park recorded 11.5 inches of precipitation (mostly rain) between the 3rd and 8th. Many other higher elevation stations in western Montana recorded between 5 and 9 inches of rain. Valley locations received from ½ to ¾ inches of rain. In a 24-hour period on the 6th and 7th, Flattop Mountain recorded 6" of rain. This set a new November daily precipitation record for Montana. The old record was 3.80" at Deborgia in 1986. As this system was winding down, some thunderstorm activity with light rain was observed in the St. Mary vicinity.

The period from the 11th through Thanksgiving was generally on the mild side statewide. This brought the usual windy conditions along the east slopes. Near 70 mph winds blew in the Great Falls area on the 13th, with the strongest wind period on the 15th and 16th. Measured wind gusts of 124 mph occurred at Choteau, with gusts to 117 mph in the Swift Dam area. This was the highest wind gust in Montana since February 2002 when a gust to 143 mph was recorded near Choteau. This was also the highest wind gust of record for Montana in November. Relatively high gusts continued along the Rocky Mountain Front through the 23rd, with 56 mph gusts at Heart Butte on the 23rd. As a result of the persistently strong winds, November's average wind speed ranked among the top 10 windiest at some locations. There were 4 days during the month that some location in Montana recorded wind gusts over 100 mph. Refer to figure 1 for a plot of the average November wind speed for 2006. West of the divide had a period of precipitation which produced 2 to 4 feet of snow at the higher elevations on the 12th through 14th. Refer to Figure 2 for average flow patterns during November.

After a long stretch of mild and mostly dry conditions, a strong cold front brought the coldest air of the season to the state after Thanksgiving. After dumping up to 6 inches of snow at lower elevations, and up to 3 feet at higher points, bitterly cold air settled in across the state. Scobey fell to -25°F on the 26th, with temperatures remaining below zero through the morning of the 29th over much of eastern Montana. Though cold, Cascade 20 SSE fell to -29°F on the 29th, this was far from a state record. The daily record low for the 29th is -51°F at Havre set in 1896. Temperatures averaged more than 30 degrees below normal during this period.

Winds returning with a warming trend on the 29th and 30th brought gusts over 70 mph to Livingston and blizzard conditions to the northern Rocky Mountain Front. The highest wind gust during this period was 106 mph at Logan Pass. Temperatures rebounded into the 30s over much of the state on the 30th. Temperature averages varied from above normal over much of the state, with areas of below normal along the northern tier. The range in temperature anomaly was from +6°F at Alzada, to -4.2°F at Valier. Precipitation amounts varied from much above normal west, to below normal east of the divide. Refer to figure 3 for a precipitation departure from normal map. West of the divide recorded the highest amounts. Poorman Creek received 25.5", while Mullan Pass collected 14.82". This was the wettest November of record at Mullan Pass. The total at Poorman Creek of 25.5" established a new November record in Montana. This is also the second wettest month of record at one location. The record is held by Flattop Mountain, when in December 1996 they recorded 28.8" of precipitation. Some areas west of the divide recorded three times their normal November precipitation.

Month's summary information (to date):

High Temperature	76°F at Billings (7 th)	Greatest Precip	14.82" Mullan Pass 7.19" at Libby 32SSE
Low Temperature	-29°F at Cascade 20SSE (29 th)		25.5" Poorman Creek (nw)
Warmest Ave Temp	36.5°F at Thompson Falls	Peak Wind Gust	124 mph at Choteau (15 th)
Coollest Ave Temp	25.2°F at W Yellowstone		
Range of Temp departures	-4.2°F at Valier to +6°F at Alzada	Highest Ave Wind	24.4 mph SE of East Glacier 18.3 mph at Livingston

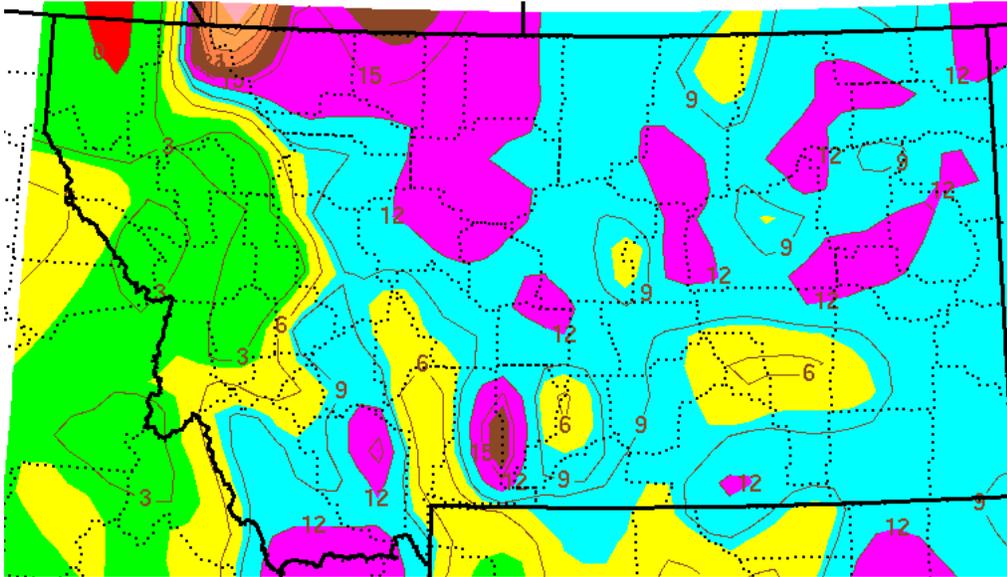
**Historical Rank of Precipitation (inches)
for the Current Month and Water Year to Date**

Location	Nov	% of Norm	Rank	Pcntl	Oct 1 – Nov 30	% of norm	Rank	Pcntl	Years
Baker	0.17	32%			1.97	114%			9
Billings	0.86	115%	71	72	2.95	147%	89	91	98
Belgrade	0.21	26%	6	9	3.07	160%	64	97	66
Butte	0.32	53%	37	33	2.44	176%	100	88	113
Cut Bank	0.11	26%	31	31					100
Dillon	0.21	58%	22	33	1.87	187%	58	87	67
Glasgow	0.40	103%	61	55	1.66	151%	89	82	109
Great Falls	0.43	73%	51	45	1.91	126%	86	75	114
Havre	0.45	100%	69	54	1.14	107%	69	54	127
Helena	0.55	115%	78	61	1.87	164%	99	77	128
Jordan	0.09	20%			1.30	93%			9
Kalispell	1.60	110%	25	22	2.29	95%	48	42	113
Lewistown	0.24	32%	23	21	3.00	167%	98	88	111
Livingston	0.48	48%	47	45	3.69	150%	102	98	104
Miles City	0.07	13%	9	7	0.96	58%	44	34	130
Missoula	2.06	215%	116	90	3.66	204%	122	96	127
Mullan Pass	14.82	307%	68	100	16.68	214%	66	100	66
Wolf Point	0.10	44%			0.69	61%			9
Glendive	0.03	6%	12	11	1.11	75%	52	48	109
Sidney	0.04	6%	4	6	0.61	37%	14	21	66
BZN-MSU	0.83	75%	57	45	4.99	184%	123	96	128

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>



Nov 2006 Preliminary Average Wind Speed (mph)

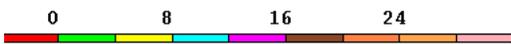


Figure 1. Average November 2006 wind speed.

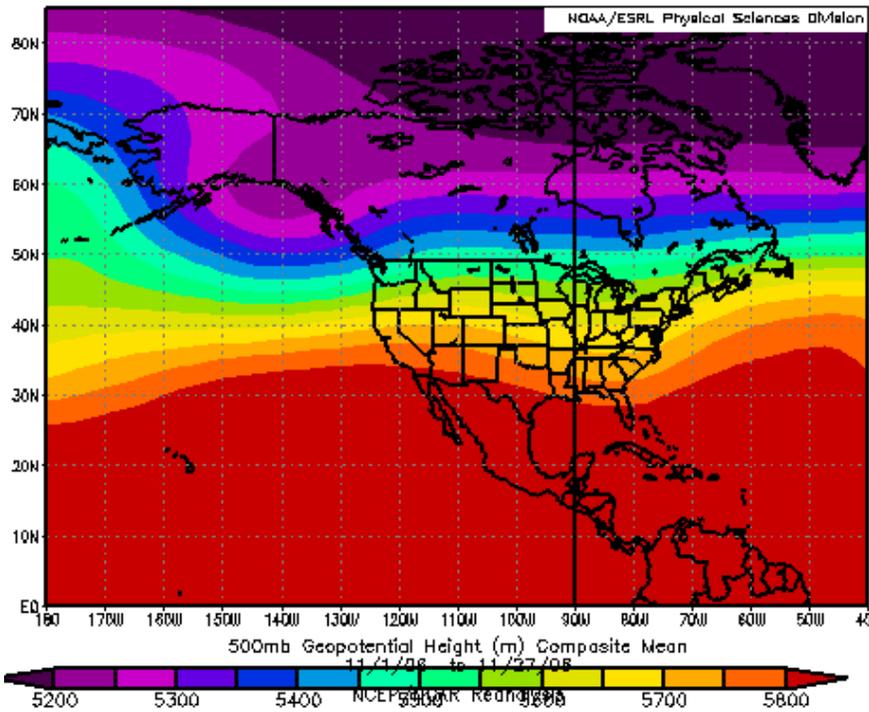


Figure 2. Mean flow at 500 millibars (~18,000 ft) November 2006. The heights were below normal over the eastern Pacific and slightly above normal over the central plains. This contributed to the above normal temperatures east and pockets of below normal in northern Montana.

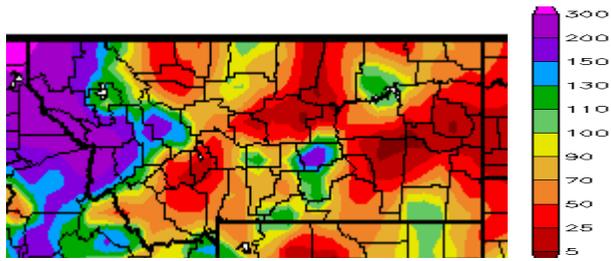


Figure 3. Precipitation anomaly (% of normal) for November (courtesy High Plains Climate Center).

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=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>