Montana Weather/Precipitation Summary

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

The La Nina-influenced weather pattern of this winter has brought heavy snowfalls to western Montana. At the same time, central and eastern Montana have been largely dry during December. Several storm systems brought repeated snowfall to western Montana during the month. As these systems crossed the divide, they largely dried out and brought wind, but there were a few exceptions. With no major cold air outbreaks during the month, temperatures averaged above normal across much of the state (Fig. 3).

December began with a storm system that affected mostly the south central and southeast. Alzada picked up 6 inches during this storm, with 1-3 inches common. At the same time, another storm affected northwestern Montana, with the Libby and Troy areas reporting up to three feet of snow. After these storms passed, winds picked up, with 80 mph winds reported in the Livingston, Nye and Babb areas. Strong winds continued into the 3rd, when the month's highest wind gust of 88 mph was recorded at Deep Creek, southeast of East Glacier Park. These winds caused semis to be blown over in the Browning area. Just ahead of a cooler period, the month's highest temperature occurred at Fort Benton on the 4th (63 degrees).

A fairly tranquil period occurred between the 5th and 19th. During this period, the coldest temperatures were recorded in brief cold spells. Culbertson dropped to -23 on the 8th, while Whiskey Creek (southwest) fell to -30 on the 11th. During this period, temperatures ranged from slightly below normal to a bit above normal, but precipitation was generally lacking.

After this tranquil period, the westerly winds cranked up again bringing a series of storms to the state. On the 20th and 21st, a storm affected the central, southern and southeast portions. Two to 10 inches of snow fell from roughly the Snowys to the Wyoming border. Crystal Lake, in the Snowys, recorded 15 inches of snow. Storm after storm continued to affect western Montana through the end of the month. Along with these storms, came strong wind gusts to the Rocky Mountain Front and Livingston Valley. On the 23rd, Babb reported a gust to 76 mph, and on the 24th, Livingston recorded 79 mph winds. Some of the Snotel reporting stations in the central Rockies and southwest picked up 30 or more inches of snow from mid-month through the end of December. By the end of the month, Hoodoo Basin Snotel and Copper Camp Snotel had nearly 100 inches of snow on the ground. Kalispell broke a daily snowfall record on the 29th, when 10 inches fell and they had a foot of snow on the ground at the end of the month.

With a westerly flow for most of the month (Fig. 1), winds averaged a bit above normal. The statewide average of 14 cities was 9.9 mph, just above the normal of 9.8 mph for December. This mean westerly flow also caused temperatures to remain at or a few degrees above normal across much of the state. Temperatures averaged 4.3 degrees above normal. Precipitation was below average at most locations, but Mullan Pass collected 11.80 inches, and Poorman Creek Snotel received over 15 inches of precipitation. The statewide average precipitation was 0.29 inches, or 67 percent of normal. Much of eastern Montana saw below normal precipitation (Fig. 2).

Other record or notable information for December:

- Glasgow had their calmest December of record (7.7 mph) and their 9th driest December (0.06 inches).
- Great Falls recorded their 9th driest December (0.12 inches).
- Helena had their 3rd driest December (0.01 inches).
- Lewistown recorded their 8th driest December (0.10 inches).
- Sidney had their 4th driest December (0.06 inches)

For 2007, some areas of the state experienced their warmest year of record. At Missoula, Helena and Bozeman, it was the warmest year of record. This was a unique occurrence at Helena, as this is the second year in a row with this distinction. The year 2006 was then the warmest year of record. At Dillon, 2007 ranked as the 7th wettest year of record.

December summary information:

High Temperature	63°F at Fort Benton (4th)	**Greatest Precip**	11.80" at Mullan Pass 7.88" at Haugen
Low Temperature	-30°F at Whiskey Ck Snotel (11th)		15.2" at Poorman Ck Snotel
Warmest Ave Temp	30.5°F at Thompson Falls	**Peak Wind Gust**	88 mph near East Glacier (3rd)
Coolest Ave Temp	13.7°F at Westby		
Range of Temp departures	-2.8°F at Big Sky to 5.9°F at Helena	**Highest Ave Wind**	24.9 mph near East Glacier 21.5 mph at Livingston
14 city mean monthly Temperature/Normal	24.2/19.9	**14 city mean monthly wind speed/Normal**	9.9mph/9.8mph
14 city mean monthly precipitation/Normal	0.29"/0.43" – 67% of normal		

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

Location	Dec	% of Norm	Rank	Pcntl	Oct 1 – Dec 31	% of norm	Rank	Pcntl	Years
Baker	0.12	51%			0.72	37%			10
Billings	0.28	42%	36	36	3.15	118%	79	80	99
Belgrade	0.23	40%	11	15	3.09	124%	52	79	66
Butte	0.22	42%	23	20	1.62	84%	45	39	114
Cut Bank	0.01	3%	4	4	0.82	67%	41	41	101
Dillon	0.44	191%	58	85	2.27	185%	63	93	68
Glasgow	0.05	14%	8	7	1.70	116%	65	59	110
Great Falls	0.12	18%	9	8	1.56	71%	32	28	114
Havre	0.22	43%	36	28	0.53	34%	4	3	128
Helena	0.01	2%	3	2	1.60	100%	50	38	130
Jordan	0.14	130%			2.84	188%			9
Kalispell	1.33	81%	51	45	2.76	68%	43	38	114
Lewistown	0.10	12%	8	7	2.09	79%	36	32	112
Livingston	0.21	37%	18	17	2.81	93%	69	66	104
Miles City	0.10	22%	22	17	0.51	24%	6	5	131
Missoula	0.51	44%	31	24	2.17	74%	35	27	128
Mullan Pass	11.69	274%	68	100	20.58	171%	65	96	68
Wolf Point	0.02	11%			1.08	82%			10
Glendive	0.07	18%	12	11	1.12	60%	35	32	108
Sidney	0.06	12%	4	6	1.32	62%	27	41	66
BZN-MSU	0.93	118%	80	63	5.50	157%	121	94	129

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

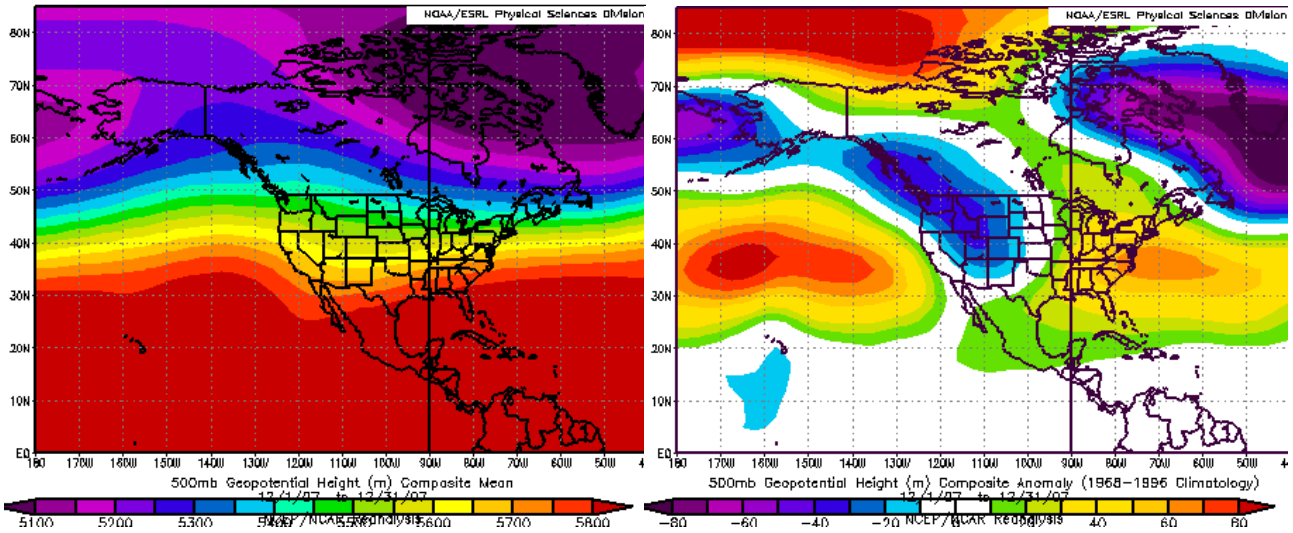

Figure 1. Mean flow at 500 millibars (~18,000 ft) December 2007. The weak high pressure ridge over western North America (left) contributed to the above normal temperatures over much of Montana. Even so, the ridge was not as strong as normal, as is shown by the below normal heights (blue) over Montana in the right-hand image.

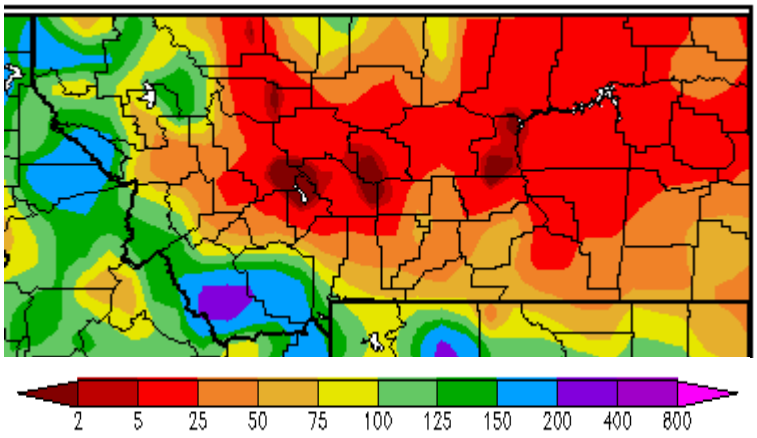

Figure 2. Precipitation anomaly (% of normal) for December. The state was mostly dry. Areas of the west and southwest recorded above normal precipitation. (High Plains Regional Climate Center)

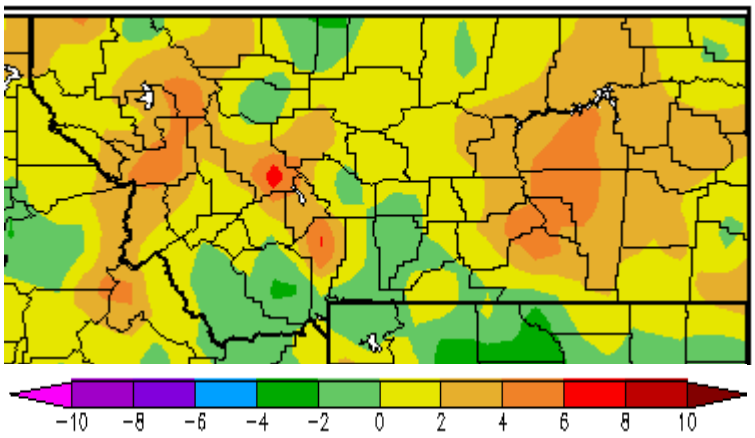

Figure 3. Temperature anomaly for December. The largest contiguous area of below normal temperatures was from the southwest through south central. Otherwise, isolated pockets of cooler than normal temperatures were observed. The general westerly flow aloft contributed to the positive temperature anomaly. (High Plains Regional 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_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