

Montana Weather/Precipitation Summary

November 2013 by NOAA's National Weather Service Great Falls Montana

Temperatures averaged near normal across the state in November. A ridge of high pressure continued along the west coast and brought the state in a northwest flow aloft. Above normal over the northern Rockies and portions of northeast Montana, and below normal most other areas.

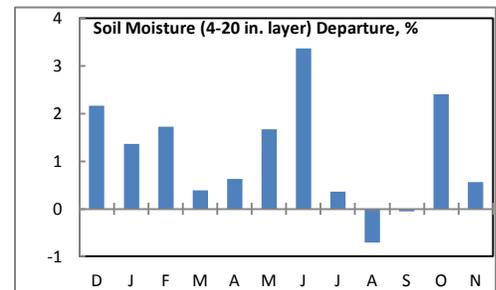
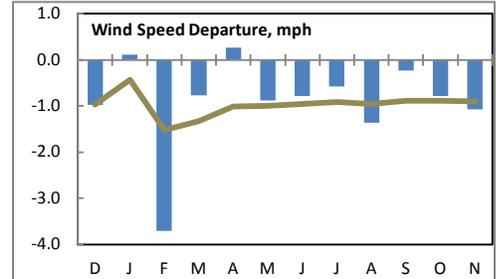
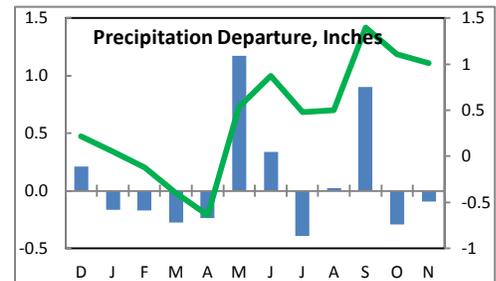
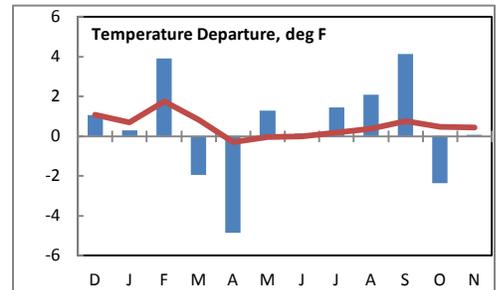
Statewide composite temperatures averaged 0.1°F above normal for the month. Figure 2 shows the areas of below and above normal conditions. Temperatures were as much as 3°F below normal over portions of southwest Montana, and 3°F above normal in north central Montana. The warmest average November temperature was 36.8°F at Biddle, and the coolest was 22.7°F at Whiskey Creek SNOTEL. For the past 12-months, the statewide composite average temperature is 0.4°F above normal.

The monthly departure from normal for precipitation across Montana is shown in Figure 3. This figure shows above normal precipitation in the northern Rockies and portions of northeast Montana. The driest areas were over most of the below normal portions. The heaviest precipitation fell in the Noxon area, with this area receiving over six inches of precipitation. The precipitation figure to the right shows that November had a 0.09" negative departure. The statewide composite precipitation for the past 12 months is 1.01-inches above normal.

On a statewide average, winds continued below normal in November. This November was the 12th calmest of record, with an average speed of 8.19-mph. Only two of the past 12-months have had wind speeds averaging above normal. The fastest measured gust of the month, 80 mph, occurred near East Glacier. For the past 12-months, winds are running 0.9-mph below average.

Even though much of the state received below normal precipitation in November, statewide composite soil moisture conditions were 0.6 percentage points above normal. Over the past 12 months, from a statewide composite perspective, only one month has recorded below normal soil moisture conditions. This November ranks as the fifth wettest of record (with records starting in 1995) (see soil moisture figure to right). Refer to NCDC's State of the Climate report for the latest monthly discussion:

<http://www.ncdc.noaa.gov/sotc/>.





Nov 4 2013 730 am Flathead Lake on the east shore at Woods Bay. The water spout lasted for about 8 minutes. courtesy NWS MSO.

November 1-15

After a warm start, with temperatures rising into the 60s over portions of central Montana (on the second), a cold front brought snow and much cooler temperatures to the state by the fourth. Unstable conditions over Flathead Lake in Woods Bay caused a water spout to form early in the morning on November 4. It lasted about eight minutes. This could be the latest in the season-ever tornado or water spout observed in Montana. The previously latest tornado was observed near Hamilton on October 16, 1988. Since 2008, water spouts have been observed over Flathead Lake in September about every other year. A couple of windy periods caused gusts to 60 mph at Anaconda and 66 mph at Deep Creek on the seventh. Mild temperatures returned by the sixth, with near to above normal temperatures through the ninth. A couple of windy periods caused gusts to 60 mph at Anaconda and 66 mph at Deep Creek on the seventh. A brief cool period on the tenth and eleventh also brought some light snow to portions of the state. The warmest air of the month pushed temperatures to near 70 on the 12th. A cold front pushed temperatures back to near normal. Winds again on the 15th brought the highest gusts of the month. Deep Creek gusted to 80 mph, while Millegan gusted to 69 mph.

November 16-21

Some of the most significant snow fell on the 16th as a strong low pressure area brushed the state. Temperatures plummeted to near zero over northern Montana in its wake. Temperatures rapidly warmed into the 50s on the 18th and 19th, before another strong cold front pushed through during the afternoon and evening of the 19th. Temperatures fell sharply as this front moved through central Montana. Some of the greatest short-term temperature changes in Montana weather history occurred with this front. At Great Falls, the temperature fell 8 degrees in 1 minute, 17 degrees in two minutes, 19 degrees in three minutes and 20 degrees in 4 minutes. By the morning of the 20th, below zero temperatures were felt across north central Montana. The cold air pushed into the higher southwest valleys, keeping the valleys cold over the next few days. Low temperatures near -20F were seen in the West Yellowstone area. Livingston set a new record low on the 21st, dropping to -13F. Warmer air again moved across the state by the 22nd, with highs in the 50s by the 24th.

November 22 – 30

The rest of the month was generally dry and on the mild side. By the end of the month, temperatures reached the middle 50s in central Montana, with departures of nearly 20 degrees above normal. Cold air near the surface and some light precipitation caused some freezing rain over portions of western Montana on the 29th and 30th.

Precipitation/convection

Severe convective weather occurred on no days in November. This is normal for the month.

November summary information:

High Temperature	72°F at Moccasin (12 th)	Greatest Precip	6.10" near Noxon
Low Temperature	-27°F at Cow Creek MDT (21 st)		10.80" at Noisy Basin SNOTEL
Warmest Ave Temp	36.8°F at Biddle	Peak Wind Gust	80 mph at Deep Creek RAWS (Glacier) (15 th)
Coollest Ave Temp	22.7°F at Whiskey Creek SNOTEL		
Range of Temp departures	-3.0°F at Dunkirk to +3.4°F at Dillon	Highest Ave Wind	21.9 mph at Deep Creek RAWS 14.9 mph at Browning
21 city mean monthly Temperature/Normal	30.8/30.7F 0.1F above normal. 58 th coolest of record (since 1880). 43 rd percentile. Sep-Nov 44.3/43.6 0.7F above normal. 60 th coolest of record	20 city mean monthly wind speed/Normal	8.1 mph/9.2 mph; 12 th calmest of record (since 1936). 16 th percentile. Sep-Nov 7.9mph/8.6 0.7-mph below normal. Second calmest of record.
22 city mean monthly precipitation/Normal	0.74/0.83" – 89% of normal. 58 th driest of record (since 1880). 42 nd percentile Sep – Nov 3.67"/3.16" 0.49" above normal. 41 st wettest of record.	20 city mean monthly snowfall and normal	5.3/8.4" – 2.9" below normal. 45 th lowest. 34 th percentile. Sep-Nov 7.8"/12.7 4.9" below normal. 36 th lowest.

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	0.35	67%			2.03	118%			16
Billings	0.34	45%	38	33	2.91	145%	100	88	113
Belgrade	0.36	47%	18	22	0.72	39%	3	3	77
Butte	0.20	33%	22	18	0.82	59%	31	25	120
Cut Bank	0.36	100%	63	58	0.62	78%	46	42	107
Dillon	0.08	21%	9	11	0.35	32%	8	10	74
Glasgow	0.35	88%	60	51	0.59	51%	30	25	116
Great Falls	0.18	31%	19	15	1.11	77%	39	31	122
Havre	0.40	93%	65	48	0.72	71%	47	35	134
Helena	0.15	31%	16	11	0.71	61%	34	25	135
Jordan	0.37	95%			0.89	70%			17
Kalispell	2.54	178%	106	88	2.87	118%	78	65	120
Lewistown	0.35	49%	33	27	1.42	77%	40	33	118
Livingston	0.36	61%	37	33	1.51	82%	36	32	111
Miles City	0.10	26%	13	9	1.07	82%	57	41	137
Missoula	0.54	51%	37	27	0.60	31%	7	5	134
Mullan Pass	4.77	99%	37	49	5.55	70%	17	22	74
Wolf Point	0.20	51%			0.45	38%			16
Glendive	0.59	131%	83	69	1.57	104%	74	63	116
Sidney	0.64	116%	53	70	1.97	119%	55	75	73
BZN-MSU	0.93	78%	63	46	1.93	66%	43	31	135

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>

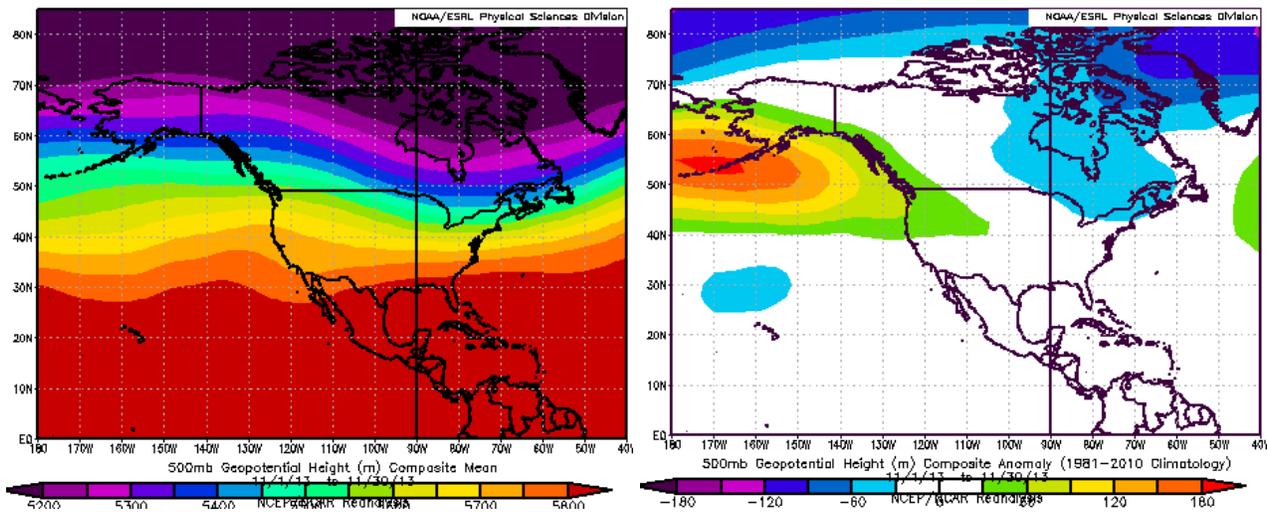


Figure 1. Mean flow at 500 millibars (~18,000 ft) for this month (left) and departure from normal (right). The flow aloft was near normal for this month.

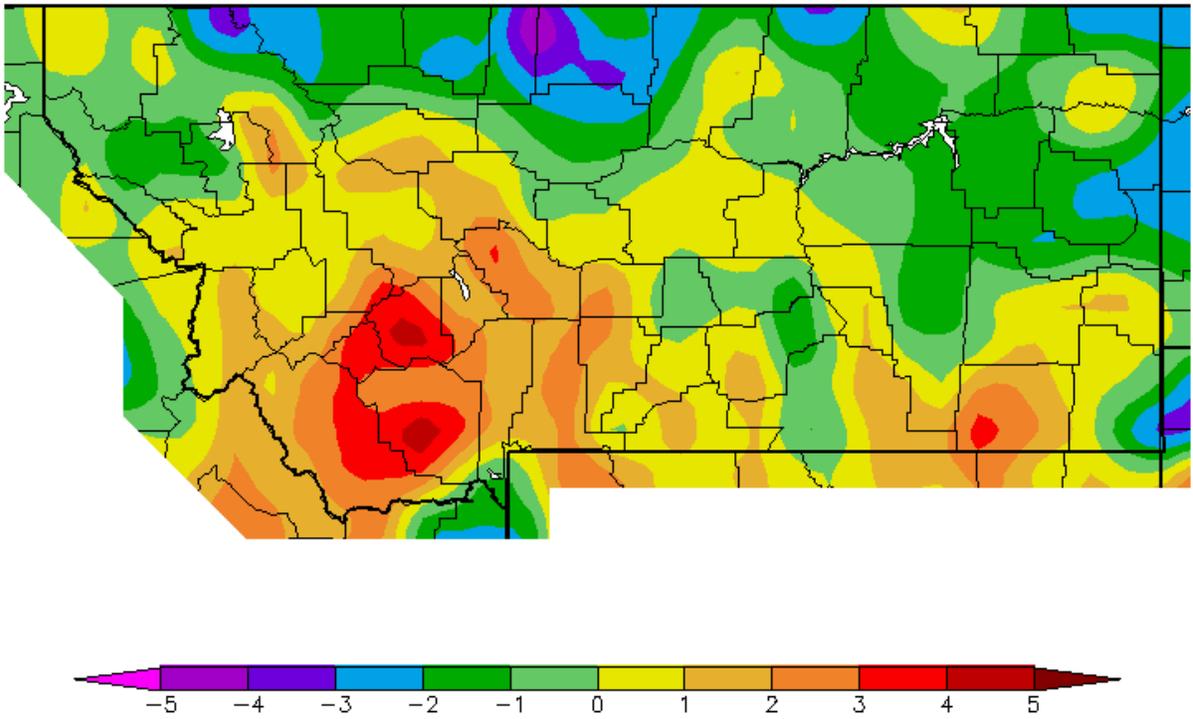


Figure 2. November 2013 temperature departures from normal (°F) (Western Region Climate Center).

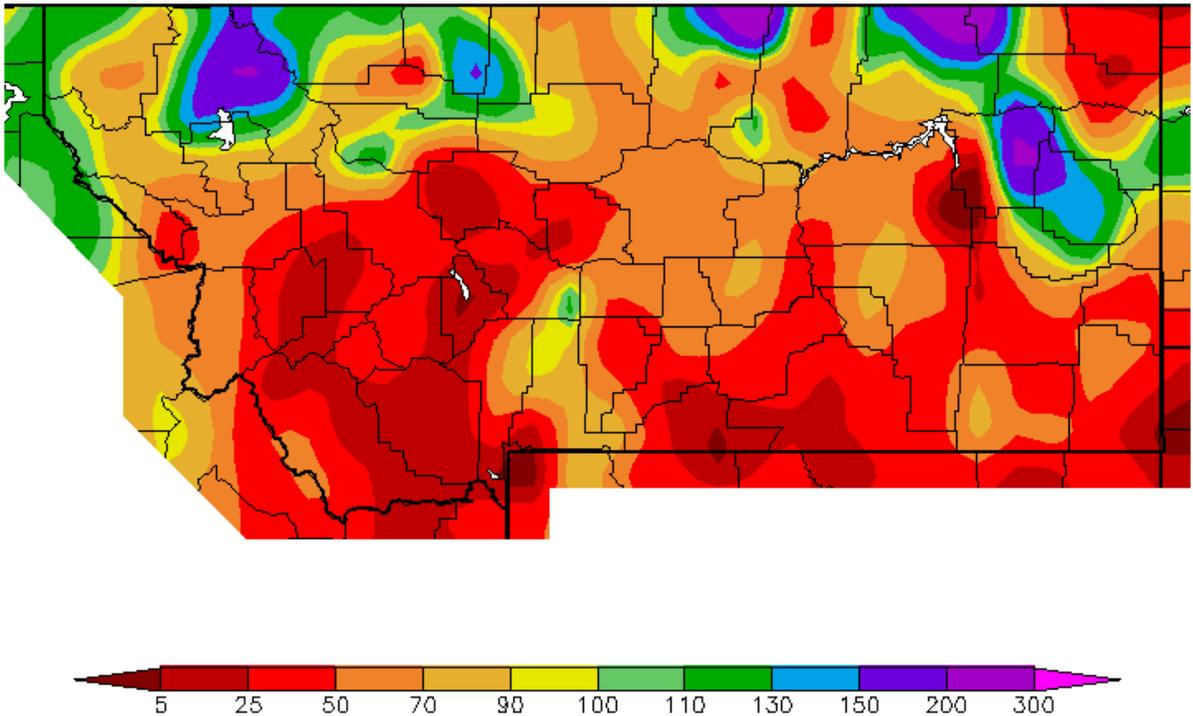


Figure 3. November 2013 precipitation departures from normal (percent) (Western Region Climate Center).

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_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>

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>. The climatological record for normals is 1981-2010. The ranking period for temperature, precipitation and snowfall is since 1880. The ranking period for wind speeds is since 1936. The ranking period for soil moisture is since 1995.