

## Montana Weather/Precipitation Summary

**November 2015** NOAA's National Weather Service Great Falls Montana

Generally west to northwest flow dominated November's weather in Montana (Fig. 1). Temperatures were above normal in the east and below normal in the southwest. Again, precipitation was widely variable precipitation. The month averaged windier than average, the first since March.

Statewide composite temperatures averaged 0.7°F below normal for the month. The temperature anomalies ranged from -7.3°F at Wisdom to +4.2°F at Wolf Point (Fig. 2). The warmest average monthly temperature was 38.1°F at Dry Blood Creek (Petroleum Co), and the coolest was 16.5°F at Wisdom. This was the 50<sup>th</sup> coolest November of record. At Wisdom, it was their third coolest of record. For the past 12-months, the statewide composite average temperature is 2.7°F above normal. Nine of the last 12 months and 14 of the past 24 months have had warmer than normal temperatures.

The monthly departure from normal for precipitation across Montana is shown in Figure 3. Above normal precipitation fell across most of southwest and central Montana. There was a dry pocket around Kalispell, along with general dryness along the eastern border. The highest amount recorded was 8.66-inches at Goat Haunt (Glacier Co) Statewide, this month averaged 0.92-inches, or 0.04-inches above normal. Although slightly above normal precipitation has fallen since September, the statewide composite precipitation for the past 12 months is 1.16-inches below normal.

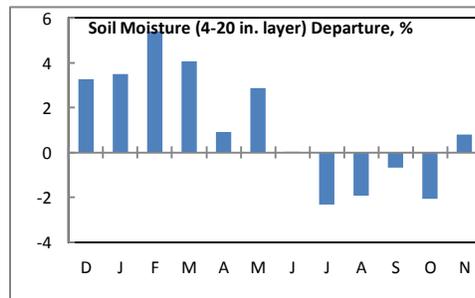
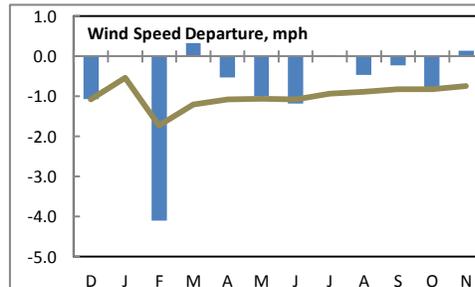
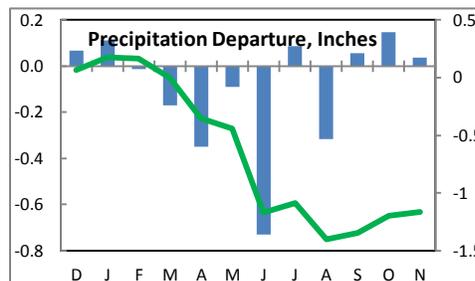
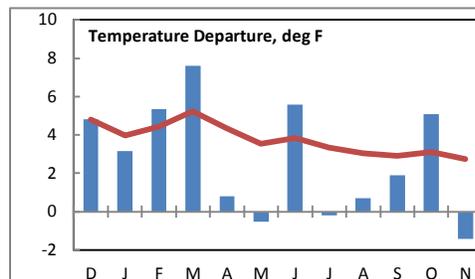
With little snowfall in September and October, snowfall totals remain on the lighter side. The statewide monthly composite was 9.7-inches, or 0.5-inches above normal. This is the 50<sup>th</sup> snowiest November of record.

The statewide average winds were slightly above normal this month, ranking as the 35<sup>th</sup> calmest November of record. The statewide composite average was 9.3 mph, 0.1 mph above normal. The 12-month average is running 0.7-mph below average. The fastest average speed was 18.5 mph at Livingston, with a higher elevation location, Deep Creek, recording 22.1 mph. The fastest measured gust of the month, 108-mph, occurred at Fred & George in northern Toole County on the 17<sup>th</sup>. Cut Bank had a gust of 76 mph on the 17<sup>th</sup>, while Lewistown recorded a gust of 74-mph on the 18<sup>th</sup>. Additionally, there were gusts to 87-mph near Denton on the 18<sup>th</sup>.

Precipitation over much of the state brought soil moisture departures from normal above normal for the first time since June. The November average is 0.8 points above normal. This ranked as the 6<sup>th</sup> wettest of record. Records began in 1996.

Refer to NEIC's State of the Climate report for the latest monthly discussion:

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



### **November 1-6**

Starting out on the warm side, temperatures dropped to more seasonal values by the third. Heavy rain fell over portions of western Montana on the first, with up to five-inches reported at a couple of locations. A weather system ushered in cooler temperatures on the third. Along with this system, heavy snow fell over much of southern Montana. Eight inches were reported at Cooke City, 6.5-inches at Dillon and Butte, and 19-inches near Pray (Park Co). Another system brought five inches of snow to Butte on the sixth, but windy downslope conditions prevailed along the Rocky Mountain Front. Wind gusts reached 71 mph at Babb on the sixth.

### **November 7-18**

The mid-month period brought generally above normal temperatures...and windy conditions. Another seven inches of snow fell in the Butte area on the 10<sup>th</sup>, but then much warmer conditions prevailed. Temperatures in the 60s and lower 70s were felt over much of eastern Montana on the 14<sup>th</sup>. Very windy conditions were felt on the 13<sup>th</sup>. Gusts reached 91 mph at Babb, with a semi-trailer blown over near Livingston. A very windy and mild period affected the state on the 17<sup>th</sup> and 18<sup>th</sup>. Gusts reached 79 mph at Livingston, Huntley and Browning. A site near Denton (Fergus Co) reported a gust of 87 mph on the 18<sup>th</sup>. The highest gust was 108 mph in the Sweet Grass Hills. Power lines were snapped and several semis and trailers were blown over.

### **November 19-30**

More unsettled and cooler conditions closed out the month. Seven to nine inches of snow fell in the Cooke City and Red Lodge areas on the 19<sup>th</sup> and 20<sup>th</sup>. Trees snapped due to heavy snow over portions of western Montana. Heavy snow fell over western and southern Montana in a pre-Thanksgiving storm. Seven inches fell at Missoula, while 8-9 inches fell in the Great Falls area. Afterwards, cold air settled across the state. Red Rock dropped to -26°F on the 27<sup>th</sup>.

### **Precipitation/convection**

Severe convective weather occurred on zero days in November, which is normal.

### **Calendar year to-date**

The fall season (September-November) averaged 2.3°F above normal. This was the 32<sup>nd</sup> warmest of record, and the warmest such period since 2001. September was 2.6°F above normal and October was 5.2°F above normal. Precipitation was about one-quarter inch above normal for this period. Snowfall averaged 10.2-inches, about 3.5-inches below normal, and the 47<sup>th</sup> least amount of record, for this period. averaged the second warmest of record. Precipitation is running about one and one-quarter inches below normal, with the winds continuing below the long-term average.

**November summary information:**

<b>High Temperature</b>	71°F at Busby and Powederville (14 <sup>th</sup> )	<b>Greatest Precip</b>	8.66" at Goat Haunt (Glacier)
<b>Low Temperature</b>	-26°F at Red Rock (Beaverhead) (27 <sup>th</sup> )		
<b>Warmest Ave Temp</b>	38.1°F at Dry Blood Creek (Petroleum)	<b>Peak Wind Gust</b>	108 mph in Sweet Grass Hills (Fred & George) (18 <sup>th</sup> )
<b>Coollest Ave Temp</b>	16.5°F at Wisdom		
<b>Range of Temp departures</b>	-7.3°F at Wisdom to +4.2° at Wolf Point	<b>Highest Ave Wind</b>	12.6 mph at Sweet Grass 17.6 mph at Deep Creek
<b>21 city mean monthly Temperature/Normal</b>	29.9/30.6F 0.7F below normal. 50 <sup>th</sup> coolest of record (since 1880). 36 <sup>th</sup> percentile. Sep-Nov 45.8/43.5 2.3F above normal. 32 <sup>nd</sup> warmest of record.	<b>20 city mean monthly wind speed/Normal</b>	8.1 mph/8.7 mph; 16 <sup>th</sup> calmest of record (since 1936). 20 <sup>th</sup> percentile. Jan-Oct 8.6 mph/9.3 0.7-mph below normal. 12 <sup>th</sup> calmest of record.
<b>22 city mean monthly precipitation/Normal</b>	0.92/0.88" – 104% of normal. 60 <sup>th</sup> wettest of record (since 1880). 56 <sup>th</sup> percentile. Sep-Nov 3.39"/3.15" – 0.24" above normal. 54 <sup>th</sup> wettest of record.		

**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	0.12	23%			1.02	59%			18
Billings	0.48	64%	48	41	2.28	113%	83	72	115
Belgrade	1.02	132%	61	77	2.28	122%	60	76	79
Butte	1.20	200%	107	88	2.07	150%	101	83	122
Cut Bank	0.48	133%	78	71	0.78	98%	62	56	109
Dillon	1.04	267%	73	96	1.67	155%	63	83	76
Glasgow	0.60	150%	87	73	2.27	197%	112	95	118
Great Falls	1.55	263%	115	93	4.03	278%	123	99	124
Havre	0.45	105%	72	53	1.51	150%	106	78	136
Helena	0.83	169%	101	74	0.96	82%	52	38	137
Jordan	0.90	231%			2.94	230%			19
Kalispell	0.47	33%	13	10	1.61	66%	37	30	122
Lewistown	0.51	72%	43	35	1.40	76%	40	33	120
Livingston	1.03	175%	83	73	2.73	148%	92	81	113
Miles City	0.23	59%	40	28	1.24	95%	72	51	139
Missoula	1.13	107%	91	66	2.01	103%	75	55	136
Mullan Pass	3.90	81%	28	36	7.16	91%	29	37	76
Wolf Point	0.31	79%			1.46	122%			18
Glendive	0.33	73%	54	44	0.79	52%	38	32	118
Sidney	0.49	89%	52	66	1.03	62%	31	40	76
BZN-MSU	1.50	126%	104	76	3.24	111%	104	76	136

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>

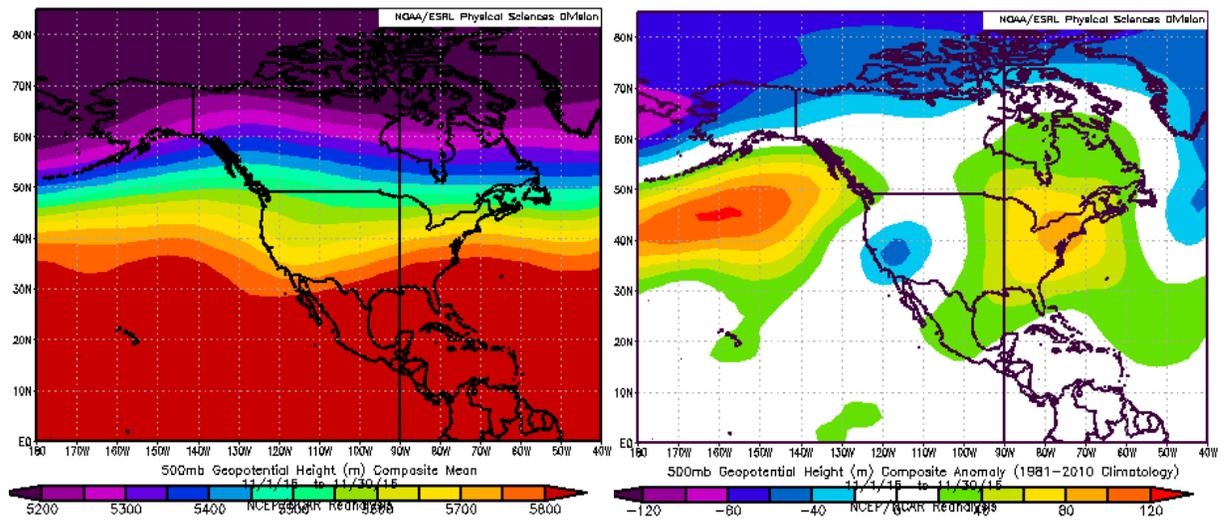


Figure 1. Mean flow at 500 millibars (~18,000 ft) for this month (left) and departure from normal (right).

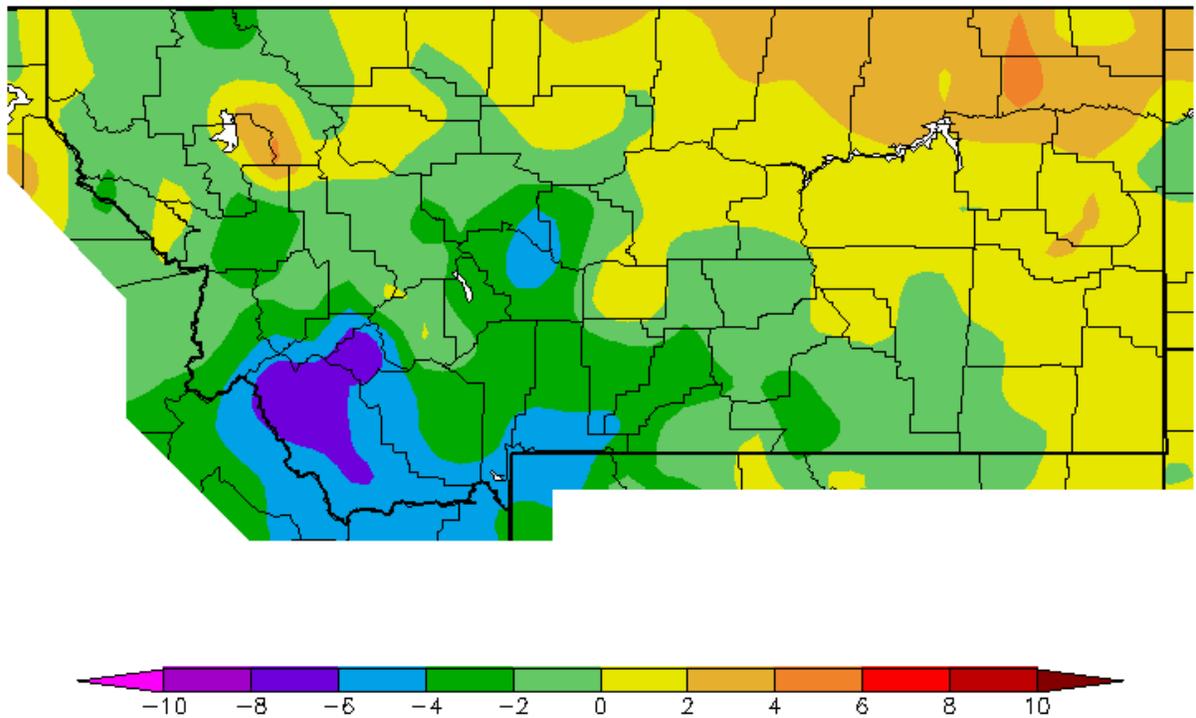
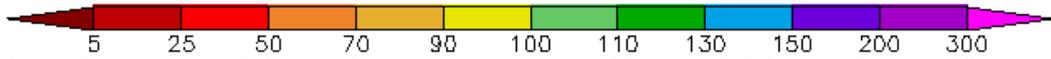
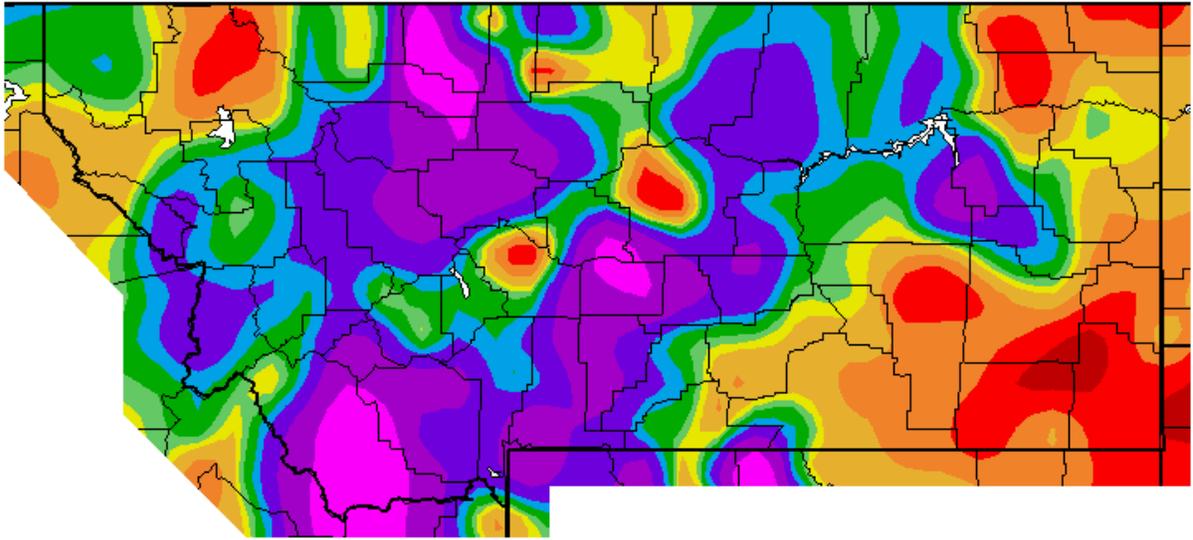


Figure 2. November 2015 temperature departures from normal (°F) (Western Region Climate Center).



**Figure 3.** November 2015 precipitation departures from normal (percent) (Western Region Climate Center).

For a state map of % of normal water year precipitation (updated around the 7<sup>th</sup> of each month), go to:  
<http://www.wrh.noaa.gov/tfx/climate/monthlysum/climatesum.php?wfo=txf>

For the latest information on mountain snowpack from the NRCS, go to: <http://www3.wcc.nrcs.usda.gov/snow/index.html>

For the latest U.S. Drought Monitor, issued weekly by the National Drought Mitigation Center, USDA and NOAA, go to:  
<http://droughtmonitor.unl.edu/>

These data are preliminary and have not undergone final QC by NEIC. Therefore, these data are subject to revision. Final and certified climate data can be access at the National Environmental Information Center (NEIC) <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=txf>. 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.