

Montana Weather/Precipitation Summary

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

A ridge of high pressure aloft along the west coast continued to dominate the weather across much of Montana during March (Fig. 1). The ridge was shifted somewhat westward from normal and this contributed to below normal temperatures across much of eastern Montana.

Statewide composite temperatures averaged below normal in March. An area of slightly above normal temperatures ranged through central Montana just east of the Rockies. Otherwise, temperatures were as much as 13°F below normal in northeastern Montana. The warmest anomaly was at Holter Dam, where temperatures averaged 1.9° above normal (Fig. 2). After a run of four months with above normal temperatures, this was the first month since October to record below normal temperatures. For the past 12-months, the statewide composite average temperature is 1.2°F above normal (red line on graph to right).

The monthly departure from normal for precipitation across Montana is shown in Figure 3. This figure shows above normal precipitation across northeastern Montana, with generally below normal precipitation across the rest of the state. There are small areas in the northern Rockies and the northern Rocky Mountain Front with above normal precipitation. The wettest areas were over the extreme northeast and portions of the northern Rockies and extreme northwestern portion of the state. Overall, with the below average precipitation in most areas, the composite precipitation for March was below normal. This was the third consecutive month with below normal precipitation and the eighth of the past 12 months to record below normal precipitation. For the past 12-months, there is a 2.10-inch negative anomaly for the state (green line on precipitation graphic to right).

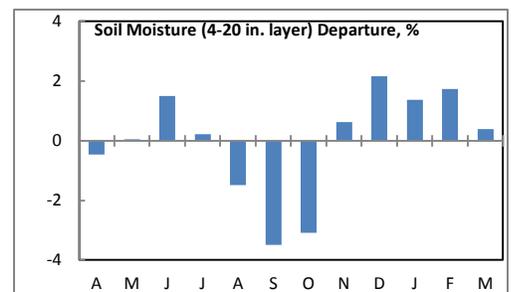
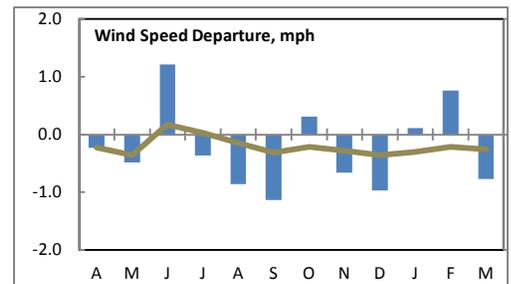
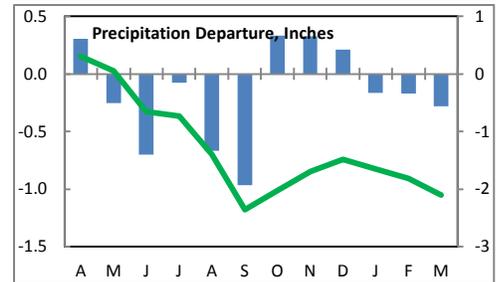
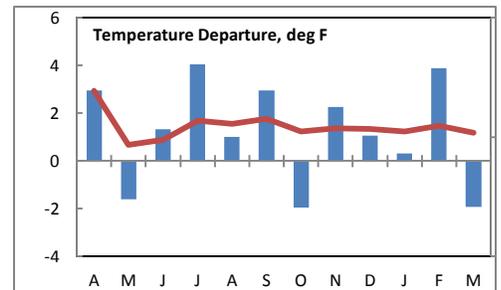
Snowfall remained on the light side in March. Besides the northeast recording near to above normal snowfall, most other areas were below to much below normal. The statewide average of 5.7-inches was 4.3-inches below average. This was the lowest composite March snowfall since 4.0-inches in 2010. For the water-year, snowfall has averaged 44.1-inches, about 10-inches below normal.

On a statewide average, winds backed off to below average in March. Scattered areas of the state recorded slightly above average winds, but overall winds were lighter than normal. For the past 12-months, winds are running 0.3-mph below average (brown line on wind graphic).

Soil moisture was still a bit above normal at the end of March. The trend has been drying, especially with the dryness of March (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/>.

March 1-3

March began mild and dry across the state. Winds along the Rocky Mountain Front gusted to 83 mph on the first. Temperatures were as much as 20 degrees above normal on the second. By the third, thunderstorms spread across portions of the southeast with gusts to 58 mph at Billings. A semi trailer was blown over near Hardin during a thunderstorm.



March 4-12

A period of cooler temperatures and storminess set in during this period. Snowfall from a system on the fourth dropped up to a foot of snow in northeast Montana. Accompanying winds caused blizzard conditions and blew the snow into five foot drifts. Meanwhile, heavy snow in the Bears Paws accumulated to 3-feet.

March 13-15

A brief warm up pushed temperatures 20-25 degrees above normal and produced a high temperature of 74F at Forsyth on the 14th. Most of the warmest temperatures of the month across the state occurred during this period. Naturally, winds accompanied the warmer temperatures. On the 15th, gusts reached 80 mph west of Choteau.

March 16-27

Another period of below normal temperatures and snowfall occurred. On the 17th and 18th, snow fell across most of the state. Amounts of 4-6 inches were common in the west and northeast. Glasgow set a new daily snowfall record on the 17th, when 5.3-inches fell. Temperatures settled to below zero lows in the northeast on the 17th-20th. Another storm brought snow to most areas on the 20th-22nd. Amounts ranged up to seven inches in the Red Lodge area, and six inches along the eastern border. Thunderstorms pushed across western Montana on the 20th, causing some tree damage with gusts over 50 mph. Point Six recorded a gust to 79 mph with thunderstorms in the vicinity on the 20th. Temperatures cooled again on the 23rd through 26th. The coldest temperature in the state occurred on the 25th when Scobey recorded a low temperature of -22°F.

March 28-31

Mild temperatures returned for the last few days of the month. Temperatures pushed into the upper 50s and lower 60s in many areas. Cooler air kept temperatures in the 20s in extreme northeast Montana on the 31st, with some light snow falling.

Precipitation/convection

Severe convective weather occurred on two days in March. The normal for the month is less than one day.

Snow depths at lower elevations were near normal at the end of the month. At higher elevations, Flattop Mountain had 124 inches on the ground (121), Badger Pass 79 inches (83), Spur Park 60 inches (62), Black Bear 89 inches (109), and Noisy Basin 101 inches (112). Normal values for each location are in parentheses.

For the water-year-to-date (October through March), the statewide mean temperature was 29.5°F, 0.6°F above normal. This is the 46th warmest of record. Statewide precipitation has averaged 5.32-inches, 0.17-inches above normal. This is the 59th wettest of record. Mean wind speeds were 8.8-mph, or 0.2-mph below normal. This has been the 12th calmest season. Statewide snowfall for the winter season averaged 44.1-inches, 7.3-inches below normal. This has been the 44th least snowiest period of record.

March summary information:

High Temperature	74°F at Forsyth (14 th) (Rosebud)	Greatest Precip	3.74" at Troy
Low Temperature	-22°F at Scobey (25 th)		9.10" at Flattop Mountain (Flathead)
Warmest Ave Temp	39.7°F at Holter Dam	Peak Wind Gust	83 mph at Deep Creek RAWS (1 st) (Glacier) 82 mph at Millegan (3 rd) (Cascade)
Coollest Ave Temp	12.7°F at Westby		
Range of Temp departures	-13.3°F at Westby to +1.9°F at Holter Dam	Highest Ave Wind	14.5 mph at Livingston (Park) 18.3 mph at Deep Creek (Glacier)
21 city mean monthly Temperature/Normal	31.4/33.3F 1.9F below normal. 66 th warmest of record (since 1880). 50 th percentile.	20 city mean monthly wind speed/Normal	9.3 mph/9.0 mph; 37 th calmest of record (since 1936). 48 th percentile
22 city mean monthly precipitation/Normal	0.64/0.92" – 70% of normal. 32 nd of record (since 1880). 23 rd percentile	19 city mean monthly snowfall/Normal	5.7-in/10.0-in; 23 rd lowest of record (since 1880). 17 th percentile

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

Location	Mar	% of Norm	Rank	Pcntl	Oct 1 – Mar 31	% of norm	Rank	Pcntl	Years
Baker	0.55	88%			2.38	77%			15
Billings	0.26	23%	17	14	3.19	61%	34	30	112
Belgrade	0.20	21%	2	1	2.82	66%	8	9	76
Butte	0.26	34%	13	10	2.29	65%	17	14	119
Cut Bank	0.57	114%	75	70	3.47	182%	93	88	106
Dillon	0.14	26%	5	5	1.51	63%	11	14	73
Glasgow	1.00	238%	99	85	3.86	148%	93	81	114
Great Falls	0.24	26%	9	7	4.62	119%	70	58	121
Havre	0.40	74%	58	43	4.40	172%	118	89	133
Helena	0.09	15%	6	4	4.06	144%	86	63	135
Jordan	0.74	142%			3.40	132%			15
Kalispell	0.90	83%	60	50	7.34	99%	64	53	119
Lewistown	0.33	33%	13	10	4.34	96%	45	38	117
Livingston	0.22	26%	11	9	3.08	73%	24	21	110
Miles City	0.37	62%	49	36	2.09	76%	26	19	136
Missoula	0.59	61%	42	30	6.85	125%	96	72	133
Mullan Pass	3.40	76%	29	41	32.63	127%	60	83	72
Wolf Point	0.53	115%			1.79	72%			15
Glendive	0.99	165%	100	85	4.12	132%	93	81	114
Sidney	0.39	65%	38	51	4.64	132%	62	86	72
BZN-MSU	0.69	50%	18	13	5.07	74%	32	23	134

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>

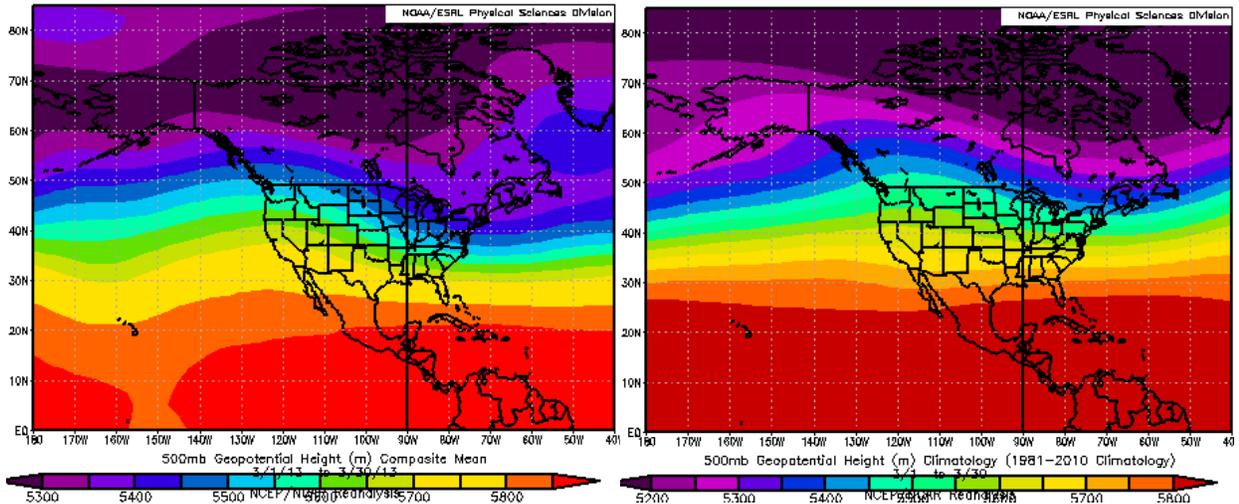


Figure 1a (left); 1b (right). Mean flow at 500 millibars (~18,000 ft) for this month (left) and normal (right). The ridge over the west coast was shifted somewhat westward than normal.

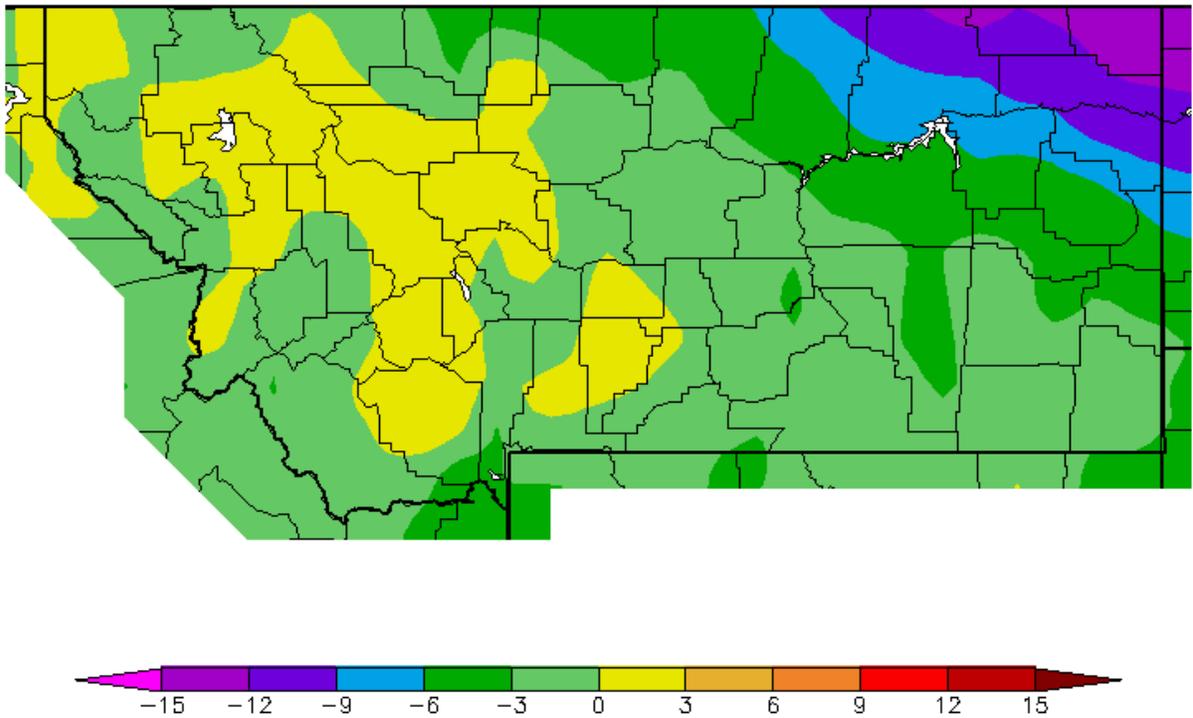


Figure 2. March 2013 temperature anomalies (Western Region Climate Center).

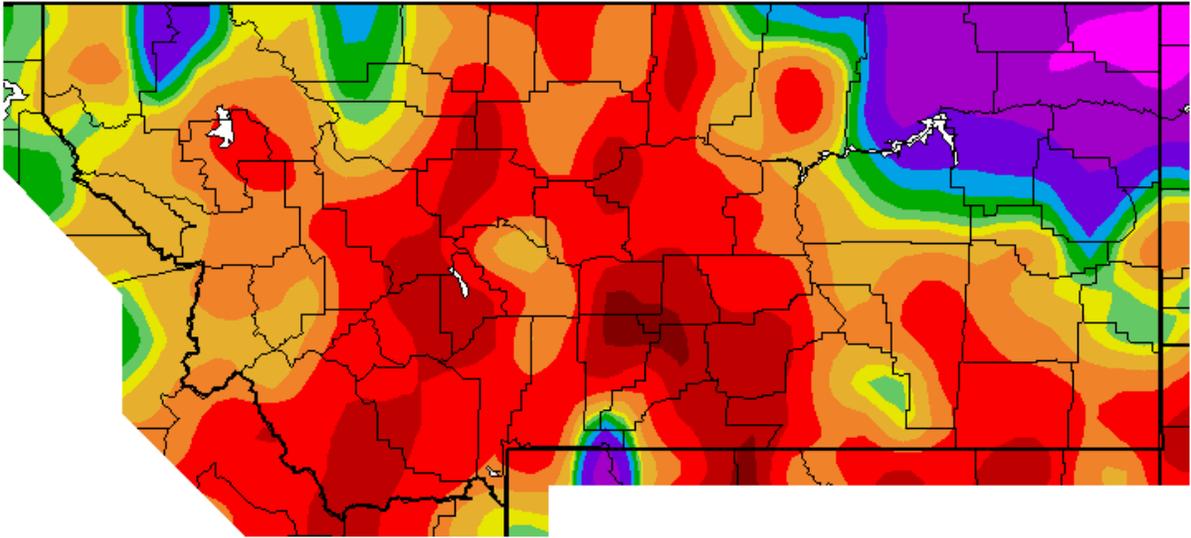


Figure 3. March 2013 precipitation anomalies (Western Region Climate Center). The positive anomaly in south central Montana is a result of erroneous data from Cooke City. Cooke City received 63 percent of normal precipitation for March.

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>

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.