

Montana Weather/Precipitation Summary

May 2014 by NOAA's National Weather Service Great Falls Montana

Temperatures averaged a degree or two above or below normal across the state in May. Flat westerly flow persisted for the month (Figure 1). This is a normal flow pattern for May and brought mostly drier than normal conditions to the state as well.

Statewide composite temperatures averaged 0.5°F above normal for the month. Figure 2 shows the areas of temperature anomalies. The greatest negative anomaly, around 2°F, was in over the hi-line in north central Montana. The greatest positive departure was in the southwest. The warmest average monthly temperature was 57.5°F at Glendive, and the coolest was 42.2°F at Elk Park. For the past 12-months, the statewide composite average temperature is 0.5°F below normal. Five of the past 12 months have had temperature averages below normal.

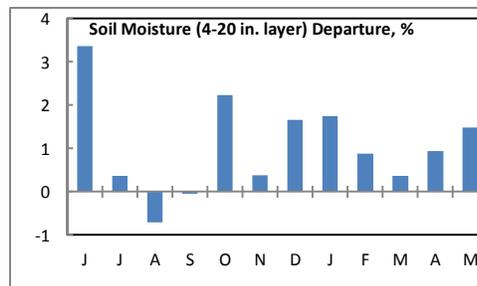
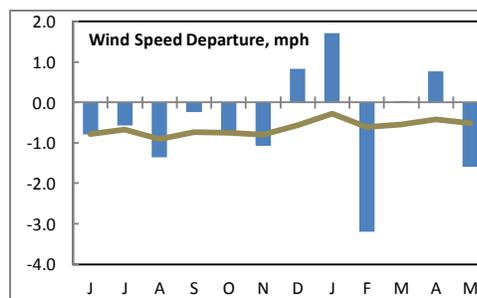
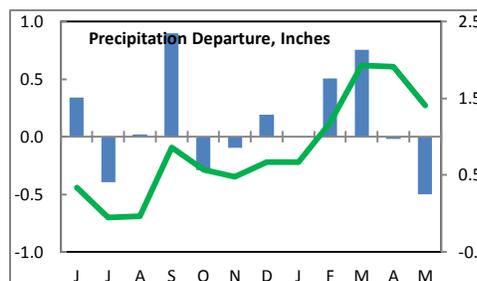
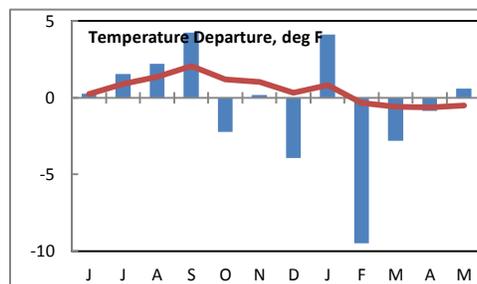
The monthly departure from normal for precipitation across Montana is shown in Figure 3. This figure shows that above normal precipitation amounts were in an area from Billings to Wolf Point to Plentywood. Other than small areas of southeast and central Montana, other locations recorded below normal precipitation. The highest precipitation amounts fell over southern Rosebud County, where Brandenburg picked up over five inches of rain. The Madison Range also picked up over five inches of precipitation. Overall, May was ½-inch below normal. The statewide composite precipitation for the past 12 months is 1.41-inches above normal. While some portions of the state continue to see precipitation deficits, the statewide average for the first five months of 2014 is the 29th highest of record, and the highest since 2011.

Snowfall was generally below average statewide. There were pockets with above normal values, especially along the northern Rocky Mountain Front, but overall, the statewide average was 0.9 inches, or 1.2 inches below normal. This was the snowiest water-year since 2011, and the snowiest year (Jan-May) since 2011.

On a statewide average, winds were below normal this month. This turned out to be the second calmest May of record. Only May 1940 had a lower average speed. The statewide composite average was 8.1 mph (1.6-mph below normal), with the 12-month average running 0.5 mph below average. The fastest average speed was 14.8 mph at Logan Pass, while Ekalaka recorded an average of 12.2 mph. The fastest measured gust of the month, 80 mph, occurred at Bloomfield during a thunderstorm. Billings recorded a thunderstorm gust of 75 mph on the 26th. This is one of the highest May gusts of record at Billings. Bloomfield (Dawson) had a gust to 80 mph on the 28th. This was the strongest May gust from a thunderstorm in Montana since 2006.

The statewide soil moisture values for May were the second highest of record for the month. These are the highest average values since 2011. See the soil moisture plot to the right. The values are about 1.5 points above normal.

Refer to NCDL's State of the Climate report for the latest monthly discussion:
<http://www.ncdc.noaa.gov/sotc/>.



May 1-18

After a warm start, a cool period persisted from the third through 18th. While five inches of snow fell at Plentywood on the fourth, strong thunderstorms brought golf-ball size hail to the Sun River/Vaughn areas. Thunderstorms re-developed in southeast Montana on the fifth, and hail fell in the Laurel area. A large low pressure area brought heavy precipitation to southeast Montana on the sixth and seventh. Widespread rainfall amounts over one inch were seen in the southeast, with up to 2.37 inches at Hardin. Six inches of snow fell at Red Lodge, with up to a foot in the area mountains. After this system passed, Kalispell set a new record low of 25 on the eighth. Another weather system brought snow to the Rocky Mountain Front on the ninth. Bynum picked up four inches of snow. While this system pushed into the southeast, strong thunderstorms developed in that area. Cooler air and yet another weather system brought snow to areas east of the Rocky Mountain front on the 11th. Seven inches of snow fell at Bynum, four inches at Choteau and Cut Bank and near Butte, and 3.6 inches at Great Falls. The lowest temperatures of the month were recorded in the wake of this storm. Elk Park dropped to 7°F and Placer Basin fell to 5°F on the morning of the 12th. With a brief warm-up, more thunderstorms developed. Strong thunderstorms brought golf-ball size hail to the Ulm area on the 15th, with severe thunderstorms in the southeast on the 18th. Hail to 2.75 inches fell at Colstrip and near Billings. Winds gusted to 70 mph at Broadus, and a tornado was sighted near Belle Creek (Powder River).

May 19-31

Strong to severe thunderstorms continued on the 19th, 22nd and 23rd. These were mainly confined to southeast Montana. Very warm air on the 23rd brought strong thunderstorms to central Montana. Loma reached 91°F on this day. Another active day with thunderstorms brought golf ball size hail to Circle (McCone) on the 24th. On the 26th, severe thunderstorms produced golf ball size hail at Redstone (Sheridan), and wind gusts to 76 mph at Billings. The warmest day of the month in the state was the 28th. Brandenburg (Rosebud) hit 94°F. Areas to the west were much cooler. This caused a round of severe thunderstorms. Severe thunderstorms began in the Helena area, spread across Great Falls, then moved towards Chinook and Malta and eventually through eastern Montana. Two inch hail fell at Geraldine, with up to 2.5" hail in the Rocky Boy and Chinook areas. Winds gusted to 76 mph near Chinook and 80 mph at Bloomfield. In the wake of this system, high winds blew over the northern Rocky Mountain Front on the 29th. Gusts reached 60 mph at Two Medicine and 58 mph at Cut Bank.

Precipitation/convection

Severe convective weather occurred on eight days in May. Normal for May is 5 days. A tornado was spotted near Belle Creek on the 18th. Otherwise, there were many reports of large hail. Hail to 2.75 inches was reported at Colstrip and near Billings on the 18th, while hail to 2.5 inches was reported near Chinook on the 28th.

May summary information:

High Temperature	94°F at Brandenburg (28 th)	Greatest Precip	5.21" at Brandenburg (Rosebud)
Low Temperature	5°F at Placer Basin (12 th) 7°F at Elk Park (12 th)		5.30" at Carrot Basin SNOTEL (Gallatin)
Warmest Ave Temp	57.5°F at Glendive	Peak Wind Gust	80 mph at Bloomfield (28 th)
Coollest Ave Temp	42.2°F at Elk Park		
Range of Temp departures	-1.6°F at Gold Butte to 2.0°F at Dillon	Highest Ave Wind	14.8 mph at Logan Pass 12.2 mph at Ekalaka
21 city mean monthly Temperature/Normal	52.5/52.0F 0.5F above normal. 63 rd coldest of record (since 1880). 45 th percentile. Mar-May 41.6/42.7 1.1F below normal. 55 th coolest of record.	20 city mean monthly wind speed/Normal	8.1 mph/9.7 mph; 2 nd calmest of record (since 1936). 3 rd percentile. Mar-May 9.4mph/9.7 0.3-mph below normal. 13 th calmest of record.
22 city mean monthly precipitation/Normal	1.73/2.23" – 78% of normal. 34 th driest of record (since 1880). 34 th percentile Mar-May 4.78"/4.54" 0.24" above normal. 43 rd wettest of record.	20 city mean monthly snowfall and normal	0.9/2.1" – 1.3" below normal. 42 nd lowest. 31 st percentile. Mar-May 16.6"/18.8" 2.2" below normal. 67 th lowest.

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

Location	May	% of Norm	Rank	Pcntl	Oct 1 – May 31	% of norm	Rank	Pcntl	Years
Baker	2.18	139%			6.87	123%			16
Billings	2.25	91%	81	69	12.72	135%	107	95	113
Belgrade	1.54	63%	23	29	6.63	79%	22	28	77
Butte	0.82	39%	15	12	5.32	78%	32	26	120
Cut Bank	1.52	78%	50	46	5.78	125%	74	69	107
Dillon	1.51	78%	31	41	3.73	69%	9	11	74
Glasgow	1.40	73%	54	46	4.84	90%	43	37	114
Great Falls	1.62	67%	47	38	9.16	118%	87	71	122
Havre	0.97	56%	40	29	5.70	111%	66	49	134
Helena	0.28	15%	2	1	5.48	97%	41	30	136
Jordan	2.36	103%			6.37	107%			16
Kalispell	1.20	61%	46	38	11.70	110%	92	76	120
Lewistown	1.70	60%	33	27	7.54	86%	33	27	118
Livingston	1.78	67%	31	27	8.79	102%	63	57	109
Miles City	3.50	161%	113	82	7.07	112%	78	57	137
Missoula	1.00	50%	35	25	8.55	98%	67	50	133
Mullan Pass	2.14	80%	32	42	38.89	124%	62	85	73
Wolf Point	1.73	97%			3.69	71%			16
Glendive	3.52	158%	99	83	8.11	121%	90	79	113
Sidney	2.44	120%	53	70	5.90	90%	34	46	73
BZN-MSU	1.88	59%	30	21	12.81	104%	103	76	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>

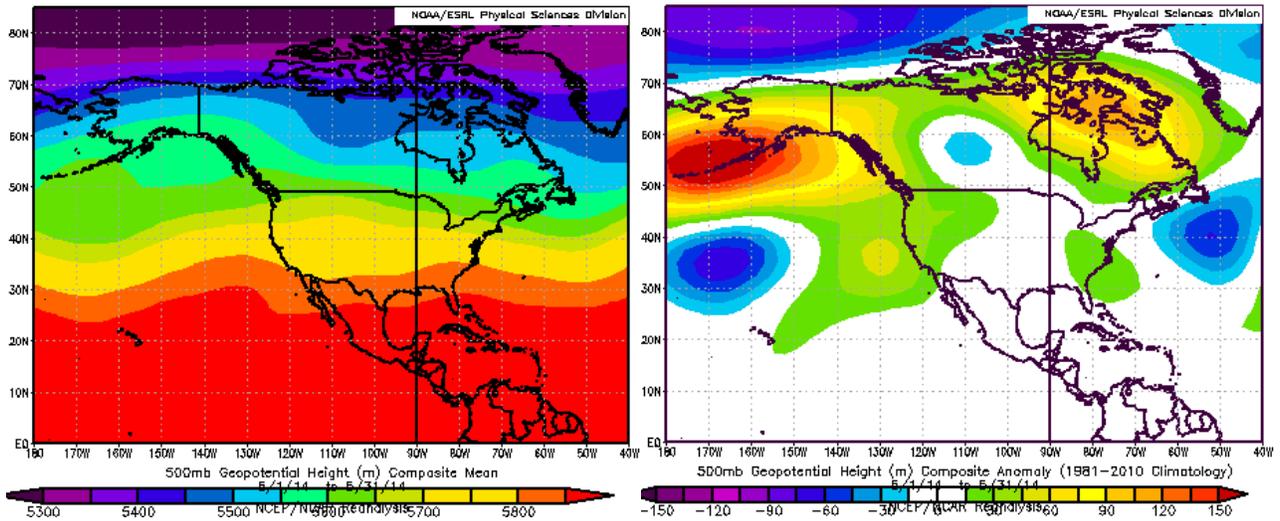


Figure 1. Mean flow at 500 millibars (~18,000 ft) for this month (left) and departure from normal (right). The flow pattern across North America was near normal for the month.

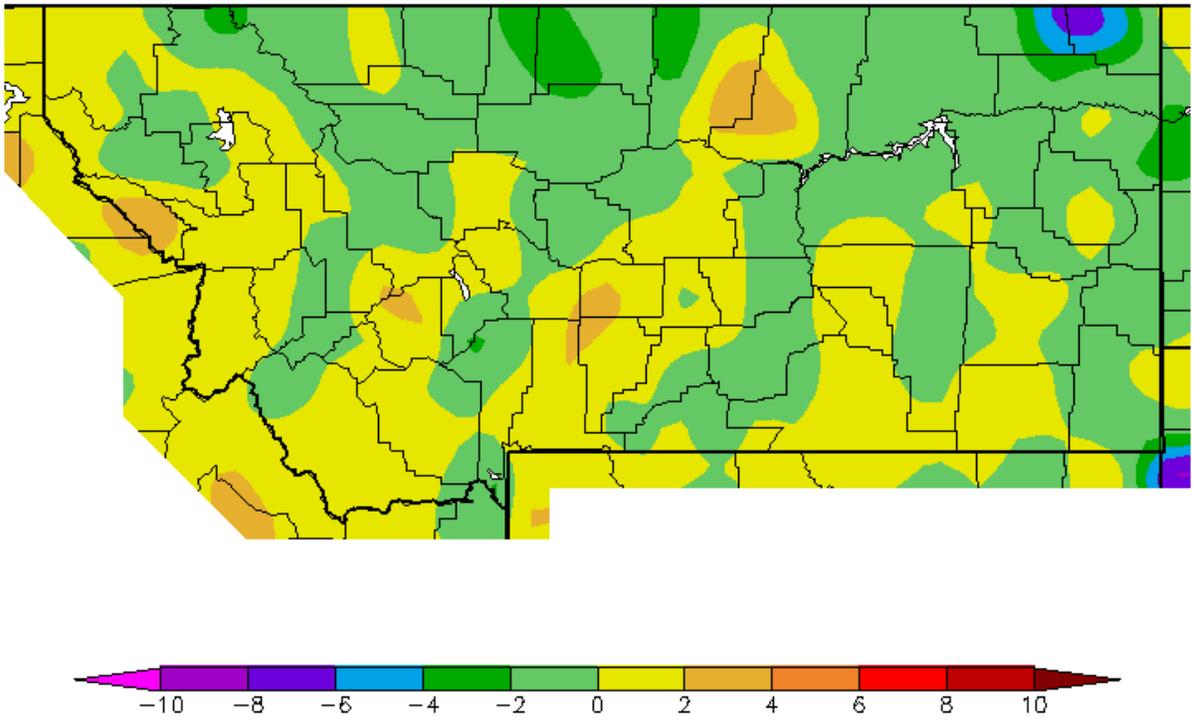


Figure 2. May 2014 temperature departures from normal (°F) (Western Region Climate Center).

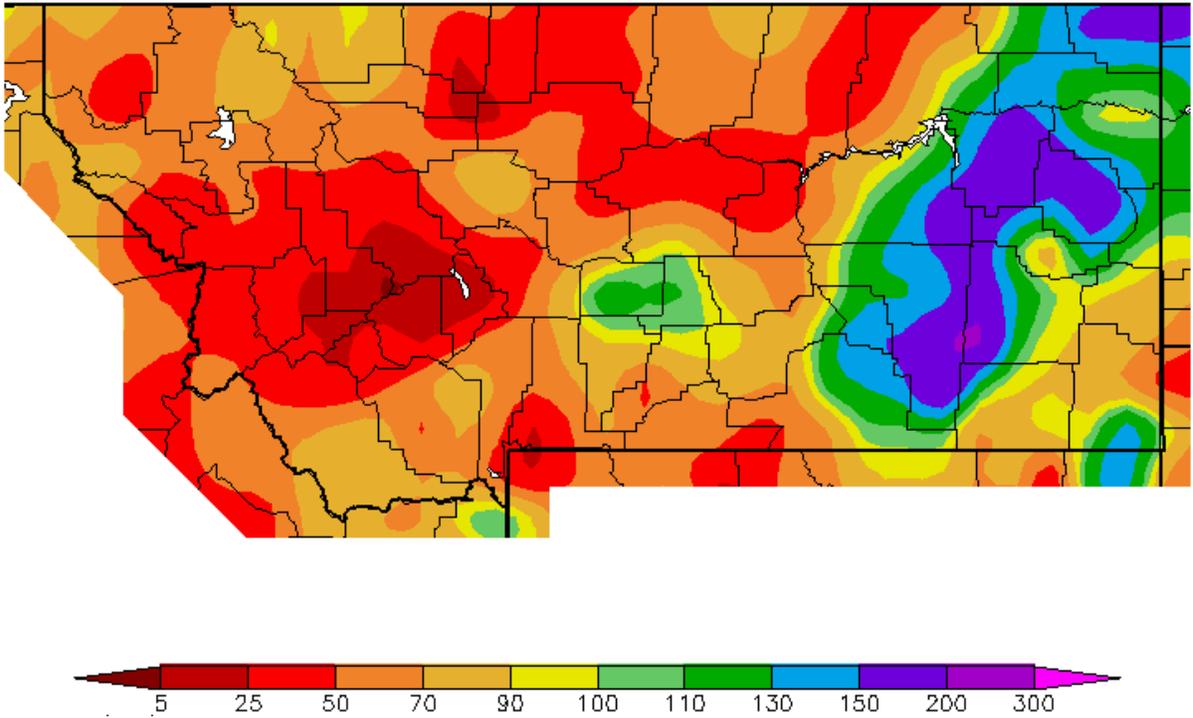


Figure 3. May 2014 precipitation departures from normal (percent) (Western Region Climate Center).

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=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.