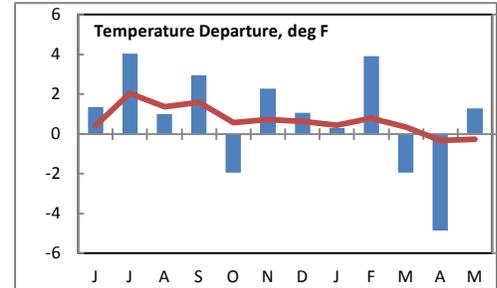


Montana Weather/Precipitation Summary

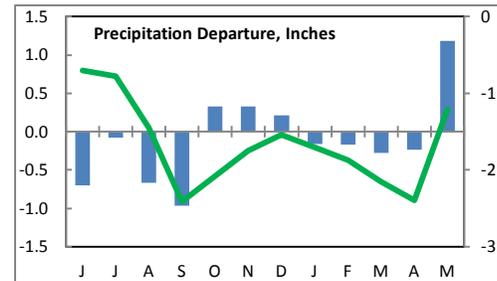
May 2013 by NOAA's National Weather Service Great Falls Montana

Overall, May had above normal temperatures and below normal precipitation. A ridge of high pressure was centered over Montana during the month, with a trough of low pressure along the west coast (Fig. 1). The trough was not quite as deep for the month. Ample amounts of moisture flowed across the state.

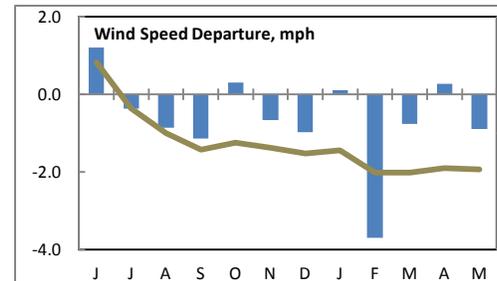
Statewide composite temperatures averaged 1.3°F above normal for the month. This was the first month since February to record above average temperatures. From the map in Figure 2, it is clear that there were no large areas of above or below normal departures. The largest warm area was in the Miles City and Jordan areas, with no large-scale cooler areas. Albion, in the far southeast, had the coolest departure from normal, 1.9°F below normal, while Jordan was 3.4°F above normal. The warmest average May temperature was 58.6°F at Miles City, and the coolest was 43.7°F at Benchmark. For the past 12-months, the statewide composite average temperature is 0.8°F above normal.



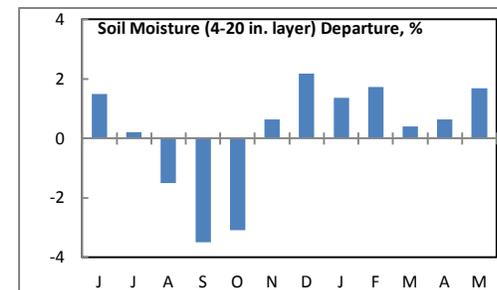
The monthly departure from normal for precipitation across Montana is shown in Figure 3. This figure shows above normal precipitation across most areas east of the divide, and scattered areas in the west. There was a swath in west-central Montana with below normal precipitation. The greatest positive anomaly was over east central Montana, with more than three-times the normal monthly precipitation. The heaviest precipitation fell over the higher elevations in central Montana, with amounts exceeding 16-inches in the Big Snowy Mountains. The precipitation figure to the right shows that May has the first month since December to record above normal precipitation. With the tendency for below normal precipitation over the past 12-months, the statewide composite is 1.21-inches below normal.



Snowfall was on the light-side during May. Though some areas recorded heavy snowfall around the 22nd and 23rd, most areas recorded no snowfall. The statewide average was 0.7-inches, 1.4-inches below normal. For the past 12-months, there has been an average negative departure of 8.3-inches of snow.



On a statewide average, winds were below normal in May. For the past 12-months, winds are running 0.6-mph below average (brown line on wind graphic).



Soil moisture remained above normal at the end of May. This has been the seventh consecutive month with above normal composite soil moisture conditions. This May ranks as the 4th 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/>.

May 1-5

After a very cold start to May, temperatures rebounded to near normal. On the first, temperatures dropped to 8°F at several locations, and as low as 1°F at Placer Basin (Sweet

Grass). Many locations in central Montana recorded their coldest May temperature of record on the first.

May 6-14

Warm and generally dry conditions prevailed during this period. Some record high temperatures were recorded on the 13th, as Roundup and Huntley reached 95°F. Several 90° temperatures were seen across central and southwest Montana. Windy conditions along the Rocky Mountain Front produced gusts of 80 mph west of Bynam and 89 mph at Logan Pass on the 13th.

May 15-31

Generally cooler than normal conditions prevailed during this period. A period of snow occurred on the 22nd-23rd, which produced around 8-inches at Anaconda, and 4-9-inches over the higher elevations of western and southwestern Montana. Warmer conditions across the east and southeast produced occasional thunderstorms and heavy rain. From the 16th-20th, 3-5-inches of rain fell in scattered areas of southeast Montana, from Red Lodge to Ekalaka. On the 25th and 26th, golf ball and larger hail fell over portions of eastern Montana. Up to three-inch hail was observed near Opheim on the 25th. Flooding and flash flooding was observed in Miles City on the 18th. Another wet round occurred at the end of the month. Three to nine inches of rain fell over wide portions of eastern Montana. Again, flooding was reported at several locations as the soil became saturated.

Precipitation/convection

Severe convective weather occurred on five days in May. The normal for the month is five days. Most of the severe reports were hail, with a few high wind gusts.

Snow had largely melted out at lower elevations across the state. At higher elevations, where snow cover persists longer, at the end of the month Flattop Mountain had 72 inches on the ground (80), Spur Park 30 inches (36), Black Bear 31 inches (64), and Noisy Basin 55 inches (67). Normal end-of-the-month values for each location are in parentheses.

For the water-year-to-date (October through April), the statewide mean temperature was 33.6°F, right at normal. This is the 58st warmest of record. Statewide precipitation has averaged 10.08-inches, 1.20-inches above normal. This is the 20th wettest of record. Mean wind speeds were 9.0-mph, or 0.8-mph below normal. This has been the 12th calmest season. Statewide snowfall for the winter season averaged 53.0-inches, 7.3-inches below normal. This has been the 52nd least snowiest period of record.

For the spring period (March through May), the statewide mean temperature was 41.0°F, 1.8°F below normal. This is the 40th coolest of record. Statewide precipitation has averaged 5.40-inches, 0.65-inches above normal. This is the 22nd wettest of record. Mean wind speeds were 9.2-mph, or 0.5-mph below normal. This has been the 6th calmest season. Statewide snowfall for the spring season averaged 14.5-inches, 4.3-inches below normal. This has been the 46th least snowiest period of record.

May summary information:

High Temperature	95°F at Roundup and Huntley (13 th)	Greatest Precip	9.91" near Volborg (Powder River)
Low Temperature	1°F at Placer Basin 8°F at Gold Butte (1 st)		16.40" at Crystal Lake SNOTEL (Fergus)
Warmest Ave Temp	58.6°F at Miles City	Peak Wind Gust	89 mph at Logan Pass (13 th) 80 mph near Bynum (13 th)
Coollest Ave Temp	43.7°F at Benchmark		
Range of Temp departures	-1.9°F at Albion to +3.4°F at Jordan	Highest Ave Wind	14.8 mph at Ekalaka 16.4 mph at Logan Pass (Glacier)
21 city mean monthly Temperature/Normal	53.4/52.1F 1.3F above normal. 47 th warmest of record (since 1880). 64 th percentile.	20 city mean monthly wind speed/Normal	8.8 mph/9.7 mph; 6 th calmest of record (since 1936). 7 th percentile
22 city mean monthly precipitation/Normal	3.65/2.47" – 148% of normal. 6 th wettest of record (since 1880). 93 rd percentile	19 city mean monthly snowfall/Normal	0.7-in/2.1-in; 41 st lowest of record (since 1880). 30 th percentile

**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	7.34	467%			10.51	189%			15
Billings	4.28	173%	107	92	8.49	90%	72	64	112
Belgrade	2.70	110%	55	71	6.20	74%	12	15	76
Butte	2.41	116%	88	73	4.94	73%	24	19	119
Cut Bank	2.39	123%	76	71	6.58	142%	90	85	106
Dillon	2.39	124%	57	77	4.04	75%	13	17	73
Glasgow	4.46	232%	107	92	9.47	176%	104	92	113
Great Falls	2.79	115%	83	68	8.42	109%	73	60	121
Havre	4.60	264%	130	97	9.80	191%	129	97	133
Helena	2.04	109%	85	63	6.88	121%	83	61	135
Jordan	4.12	180%			9.22	155%			15
Kalispell	2.95	149%	107	89	11.69	110%	91	76	119
Lewistown	6.27	220%	113	96	11.84	135%	98	84	117
Livingston	2.88	108%	73	66	6.41	74%	25	22	108
Miles City	6.69	307%	134	99	10.05	160%	123	90	136
Missoula	1.38	68%	56	41	8.91	102%	73	55	132
Mullan Pass	0.54	20%	2	1	38.54	123%	60	83	72
Wolf Point	4.58	257%			6.62	127%			15
Glendive	5.48	246%	117	99	10.90	165%	105	94	112
Sidney	2.93	144%	60	81	8.58	130%	61	85	72
BZN-MSU	4.31	136%	115	84	10.32	84%	48	35	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>

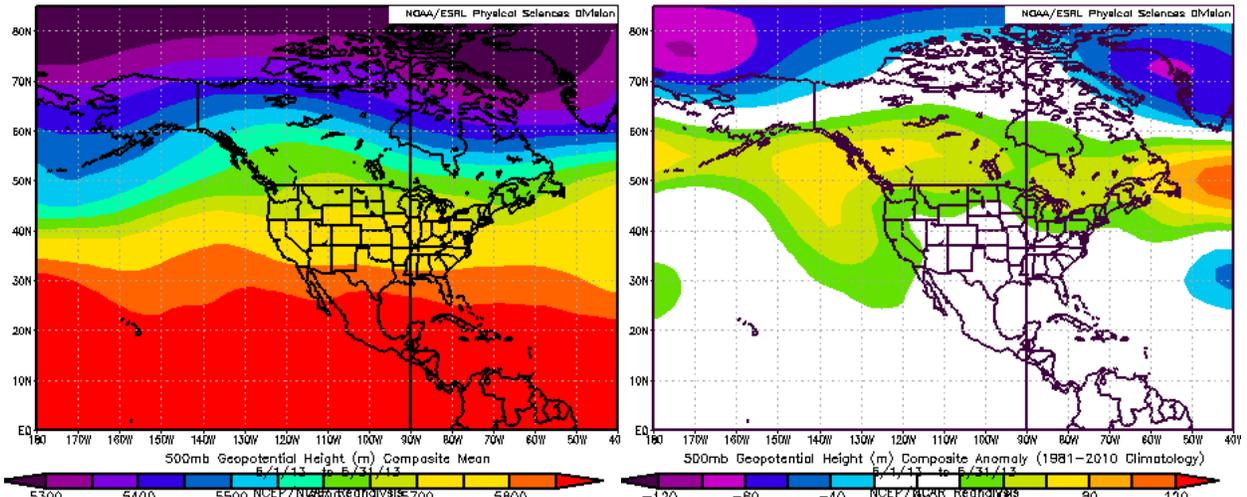


Figure 1a (left); 1b (right). Mean flow at 500 millibars (~18,000 ft) for this month (left) and departure from normal (right). The trough along the west coast was not as intense as normal.

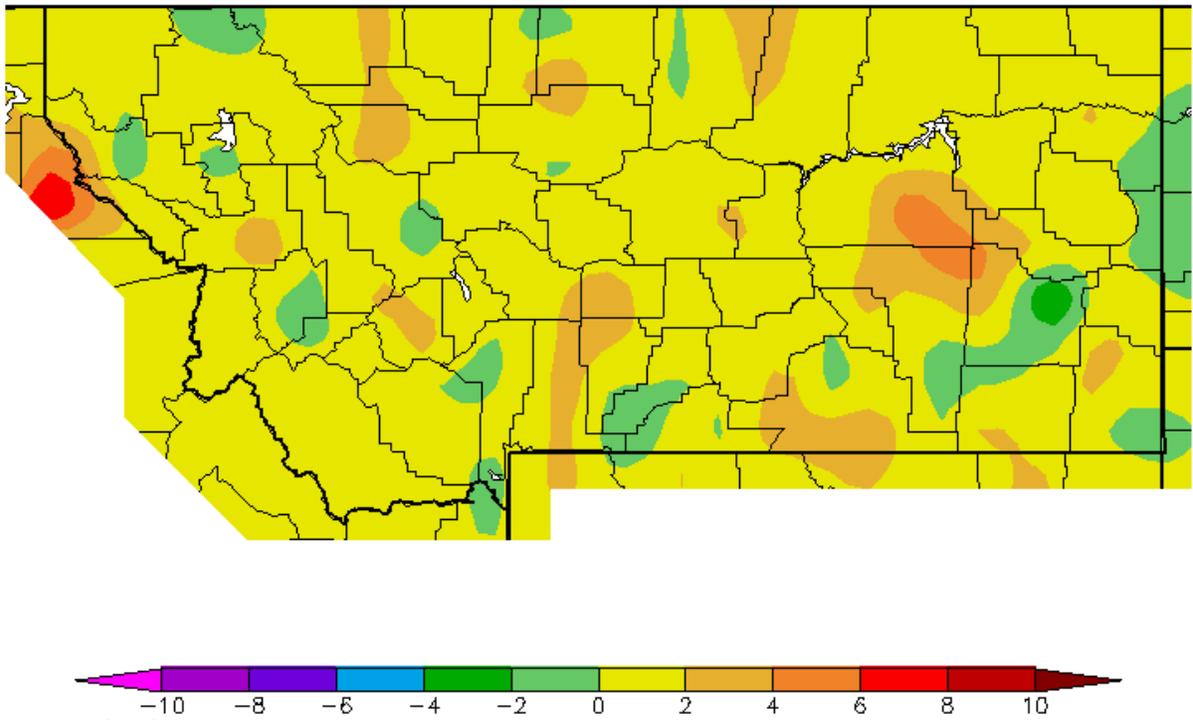


Figure 2. May 2013 temperature departures from normal (°F) (Western Region Climate Center).

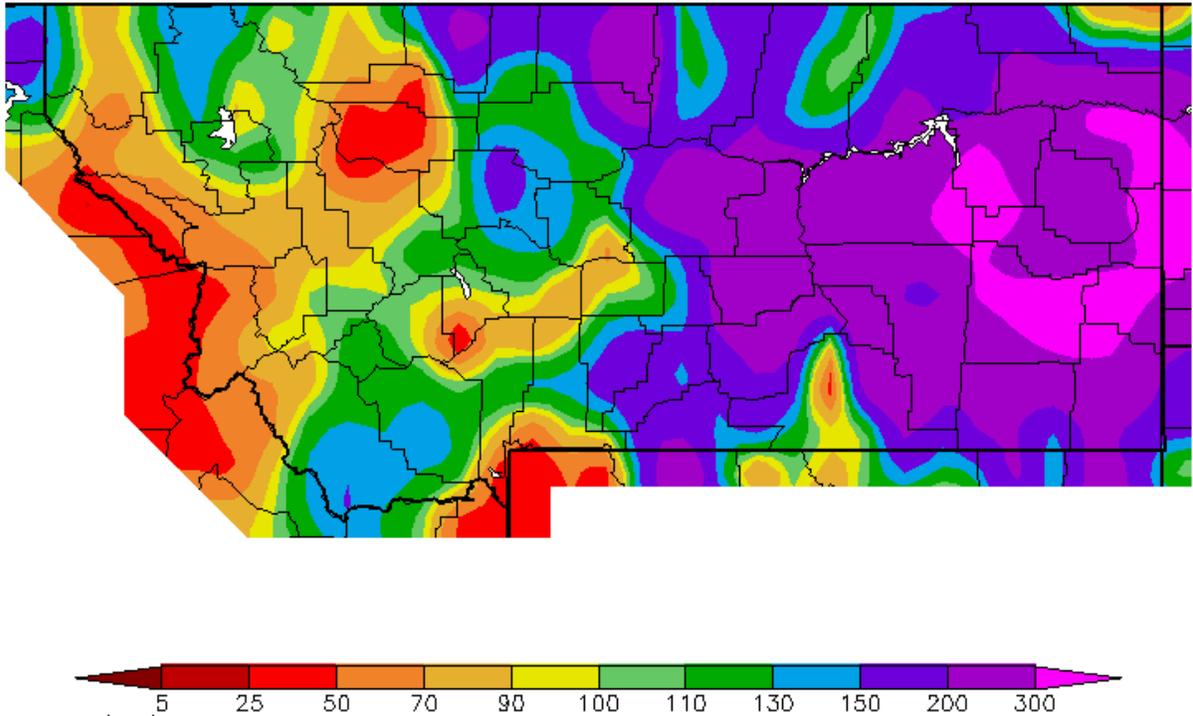


Figure 3. May 2013 precipitation departures from normal (percent) (Western Region Climate Center).

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=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.