

Montana Weather/Precipitation Summary

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

Temperatures averaged above normal across most of the state in August, while a mean ridge of high pressure dominated. Overall, August had near to above normal temperatures and nearly equal areas of above and below normal precipitation. The ridge of high pressure over the western United States was stronger than normal. The strong ridge, which extended into the arctic regions, contributed to warmer and generally drier conditions.

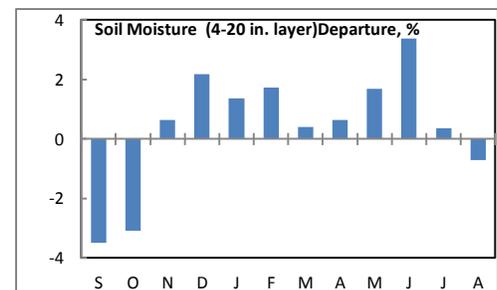
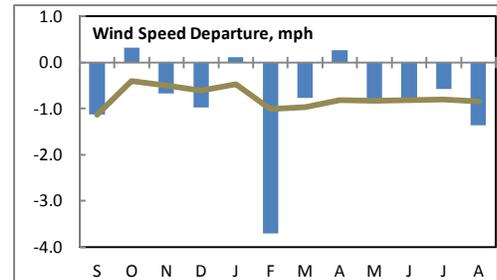
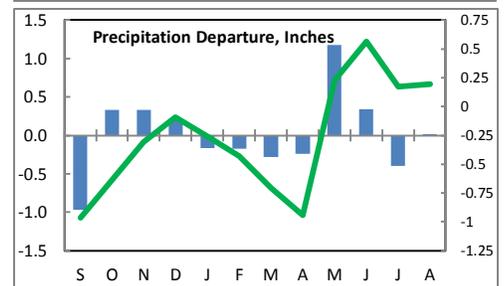
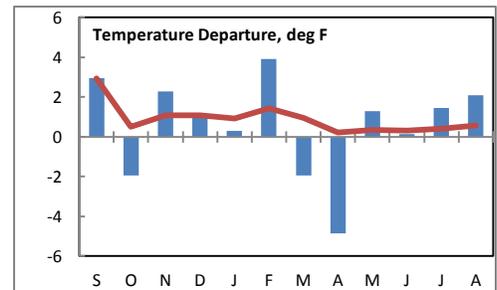
Statewide composite temperatures averaged 2.1°F above normal for the month. Figure 2 shows that all but the extreme northeast was above normal, as much as 6°F. The below normal area in the northeast was as much as 1.5°F below normal. Livingston had the largest warm departure from normal (5.7°F). Sidney had the greatest negative departure, 1.3°F below normal. The warmest average August temperature was 75.5°F at Nye, and the coolest was 52.5°F at Placer Basin. For the past 12-months, the statewide composite average temperature is 0.6°F above normal. The figure to the right shows that this is the fourth consecutive month with composite above normal temperatures in Montana. Figure 3 shows that Montana was part of a much larger portion of western and northern North America with above normal temperatures in August.

The monthly departure from normal for precipitation across Montana is shown in Figure 4. This figure shows above normal precipitation across the northern and eastern tier, along with pockets of above normal precipitation scattered throughout the state. The driest areas were over portions of southwest and south central Montana. The heaviest precipitation fell over Richland County. This area received over four inches of rain. The precipitation figure to the right shows that August was very close to normal for the state. The statewide composite precipitation for the past 12 months is 0.19-inches above normal.

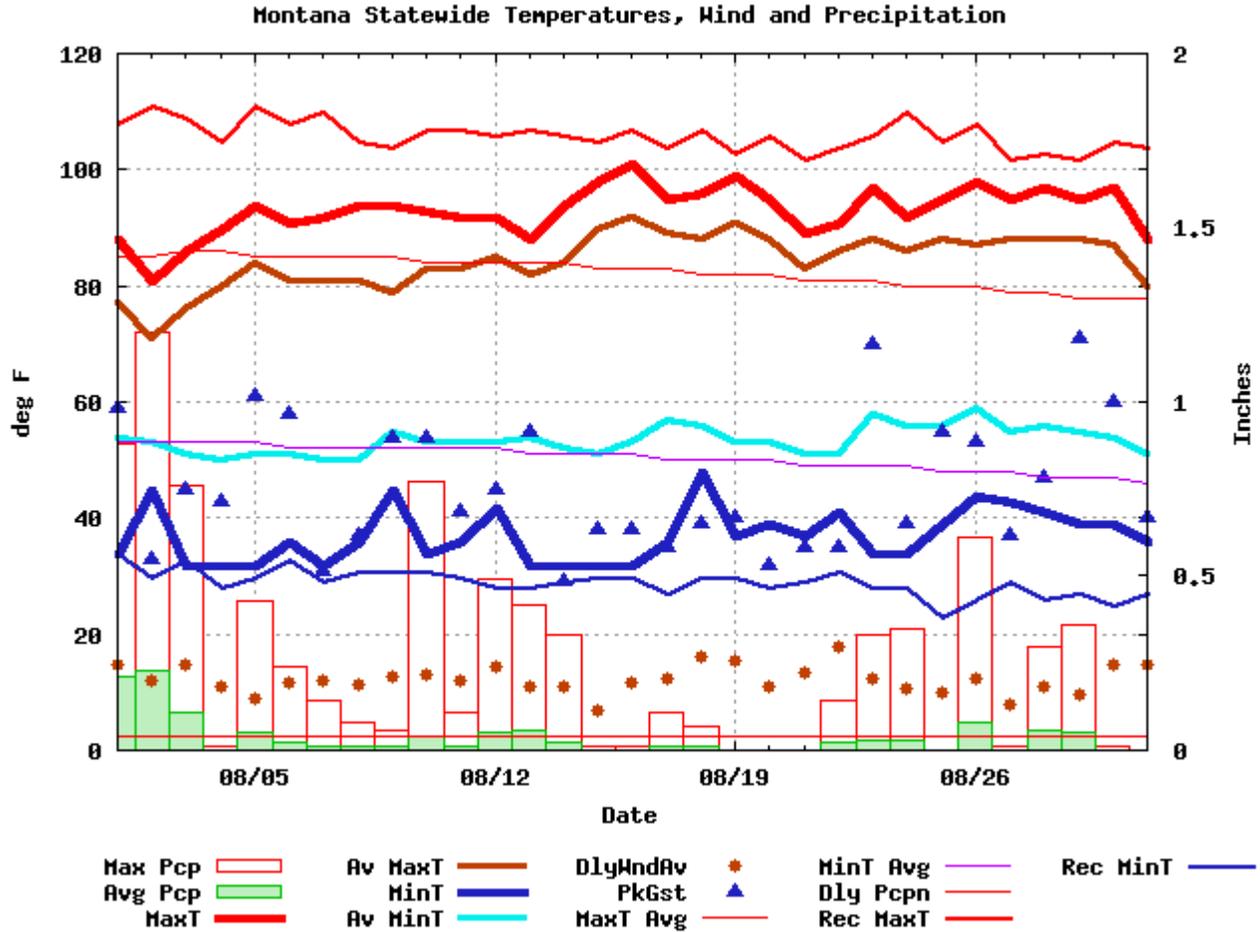
On a statewide average, winds continued below normal in August. This August was the calmest of record, with an average speed of 6.7-mph. The previous record low was 7.0-mph in 1941. Only three of the past 12-months have had wind speeds averaging above normal. The fastest measured gust of the month, 104 mph, occurred near Polaris in Beaverhead County. Severe thunderstorms produced very strong winds and damaging hail across Beaverhead, Madison and Gallatin Counties on the first. For the past 12-months, winds are running 0.8-mph below average.

Statewide composite soil moisture conditions were slightly below normal in August. This is the first month since October to have below normal soil moisture, but only slightly. This August ranks as the ninth driest 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/>.



Montana Statewide Composite Temperature, Wind and Precipitation. Data is a composite of 40 airport locations across the state.



August 1 – 3

Temperatures started out below normal in August (figure above). There were some areas that picked up heavy rain on these days, including 1.20 inches at Lewistown. Butte and Kalispell set daily rainfall records on the first and second. Thunderstorms scattered throughout the state produced a variety of severe weather. On the first, a gust to 104 mph was recorded near Polaris. Gusts to 90 mph occurred at Twin Bridges. Large hail caused widespread crop damage in Gallatin County. The gust at Polaris was a new gust record for Montana for the month of August. On the third two small tornadoes were sighted near Broadus. Up to golf-ball size hail fell at Grass Range.

August 4 - 13

Temperatures remained near to slightly below normal during this period. Severe weather occurred on several days. Wind gusts to 68 mph occurred at Galata and Pollar on the fifth. A severe thunderstorm caused major tree and powerline damage in Missoula on the ninth. One-inch hail fell at several spots from the Rocky Mountain Front to the eastern border on the tenth. Baker measured three-quarters inch of rain on the 11th. Hail to two inches and strong winds raked north central Montana on the 12th.

August 14 - 31

Temperatures averaged above normal statewide for the rest of the month. The warmest day occurred on the 16th, when Great Falls and several other locations reached 101°F. On the 23rd, Dillon set an all-time wind gust record for August, when a thunderstorm produced winds to 70 mph. Hail to 1.25-inches fell at Rock Springs on the 28th. Record warmth returned attain on the 29th, when Cut Bank reached 93°F. Thunderstorm on this day affected western and central Montana. Trees were blown over in Glacier National Park. Wind Gusts reached 71 mph at Havre and 74 mph near Zortman.

Precipitation/convection

Severe convective weather occurred on 15 days in August. The normal for the month is 8 days. Hail to 2.5 inches was reported, a wind gust measured to 104 mph in Beaverhead County. As many as two tornadoes were seen in Powder River County.

Water Year

For the water-year-to-date (October through August), the statewide mean temperature was 42.5°F, 0.3°F above normal. This is the 53rd warmest of record. Statewide precipitation has averaged 15.35-inches, 1.17-inches above normal. This is the 30th wettest of record. Mean wind speeds were 8.5-mph, or 0.9-mph below normal. This has been the 6th calmest season.

Summer Season (June – August)

This summer's statewide average temperature was 66.4°F, the 20th warmest of record. Precipitation has averaged 5.27-inches, or just 0.03-inches below normal. This is the 59th wettest of record. Mean wind speeds were 7.4-mph, or the calmest of record. The old record was 7.5-mph in 2009. Soil moisture conditions throughout the summer ranked 6th wettest of record (since 1995). For the warm season, severe convection has occurred on 51 days in the state. This is 14 days more than the normal, and the highest number of days since 2010.

August summary information:

High Temperature	101°F at Great Falls and Livingston	Greatest Precip	4.53" at Sidney
Low Temperature	24°F at Deer Lodge 3S		
Warmest Ave Temp	75.5°F at Nye	Peak Wind Gust	104 mph near Polaris (Beaverhead) (1 st)
Coollest Ave Temp	52.51°F at Placer Basin SNOTEL		
Range of Temp departures	-1.3°F at Sidney to +5.7° at Livingston	Highest Ave Wind	12.6 mph at Logan Pass
21 city mean monthly Temperature/Normal	69.0/66.9F 2.1F above normal. 23 rd warmest of record (since 1880). 81 st percentile.	20 city mean monthly wind speed/Normal	6.7 mph/8.1 mph; 1 st calmest of record (since 1936). 1 st percentile
22 city mean monthly precipitation/Normal	1.30/1.28" – 101% of normal. 50 th wettest of record (since 1880). 61 st percentile		

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

Location	Aug	% of Norm	Rank	Pcntl	Oct 1 – Aug 31	% of norm	Rank	Pcntl	Years
Baker	2.38	245%			19.55	186%			15
Billings	0.19	22%	18	15	10.23	76%	45	41	109
Belgrade	1.00	93%	39	50	10.61	82%	19	24	76
Butte	1.62	119%	87	72	8.92	76%	26	21	119
Cut Bank	1.52	131%	69	64	13.05	136%	87	83	105
Dillon	1.52	143%	61	82	8.05	83%	32	43	73
Glasgow	0.18	15%	14	11	14.79	138%	94	83	113
Great Falls	1.08	69%	66	54	12.23	92%	48	39	121
Havre	1.14	103%	80	59	17.58	174%	129	97	133
Helena	1.71	143%	111	83	11.42	113%	83	61	135
Jordan	1.44	121%			16.56	144%			15
Kalispell	1.30	131%	85	71	16.01	103%	82	69	119
Lewistown	2.20	127%	90	76	20.27	131%	98	84	117
Livingston	0.40	36%	16	14	9.82	72%	20	18	107
Miles City	1.72	189%	107	79	15.37	135%	113	83	136
Missoula	0.41	34%	45	33	11.10	85%	37	29	127
Mullan Pass	0.90	68%	38	51	42.56	117%	56	79	71
Wolf Point	1.63	127%			12.70	114%			15
Glendive	0.75	54%	44	37	17.16	140%	98	89	110
Sidney	4.53	391%	75	103	18.48	141%	69	96	72
BZN-MSU	0.71	50%	40	29	15.19	83%	35	27	128

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>

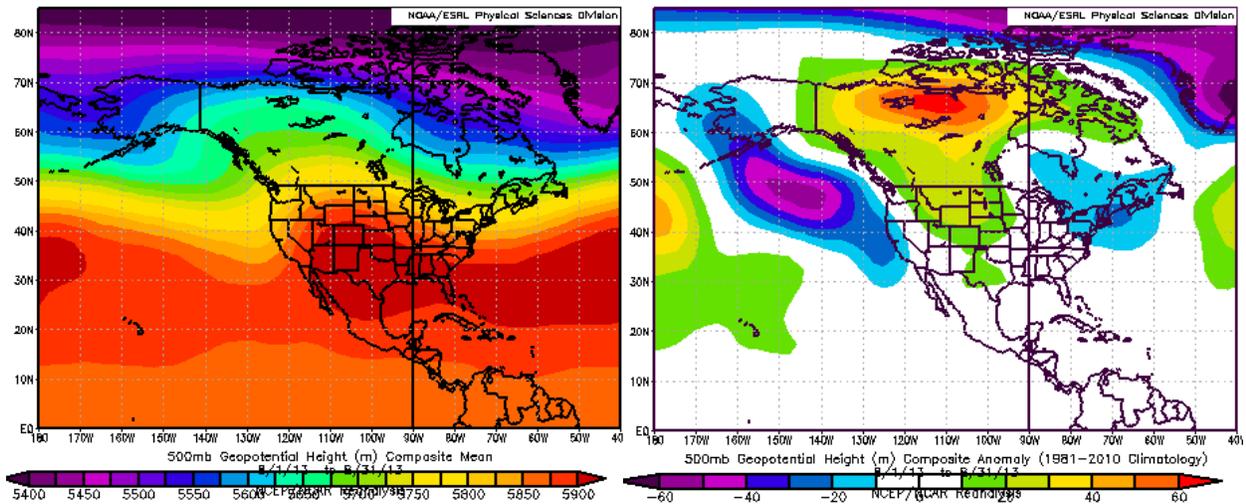


Figure 1a (left); 1b (right). Mean flow at 500 millibars (~18,000 ft) for this month (left) and departure from normal (right). Heights were above normal across Montana, extending into the arctic regions. This contributed to the warmer and generally drier pattern.

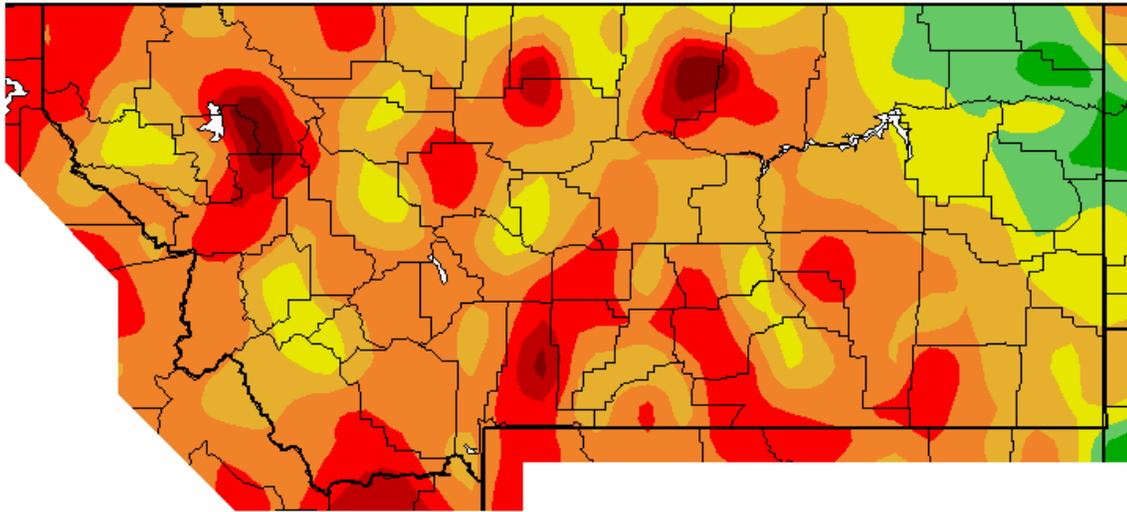


Figure 2. August 2013 temperature departures from normal (°F) (Western Region Climate Center).

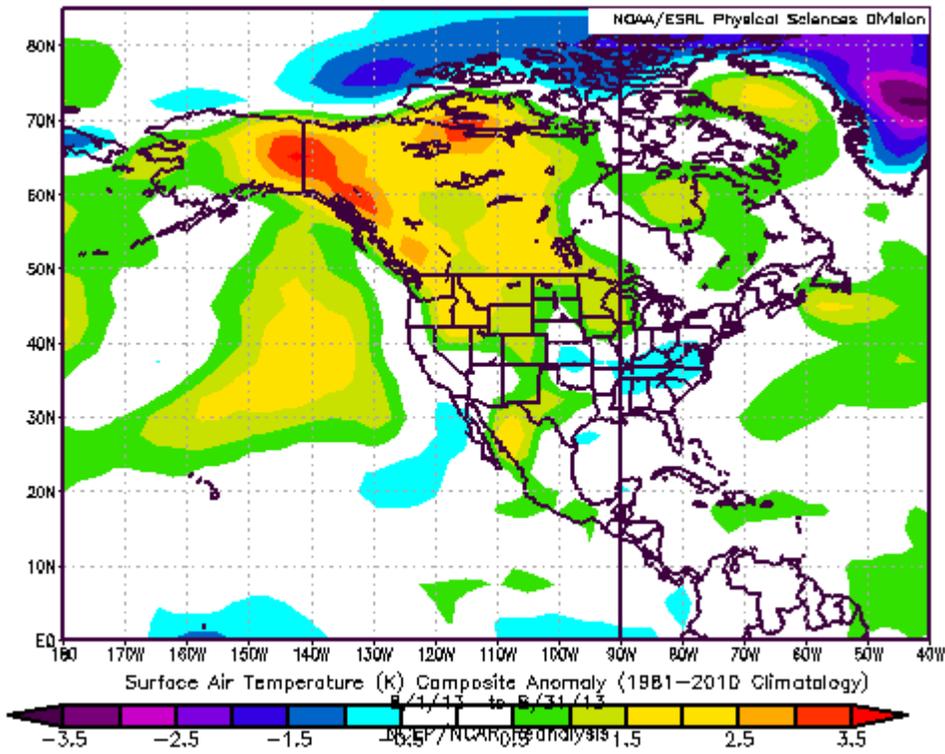


Figure 3. August 2013 temperature departures from normal (°C) (NOAA Earth System Research Laboratory).

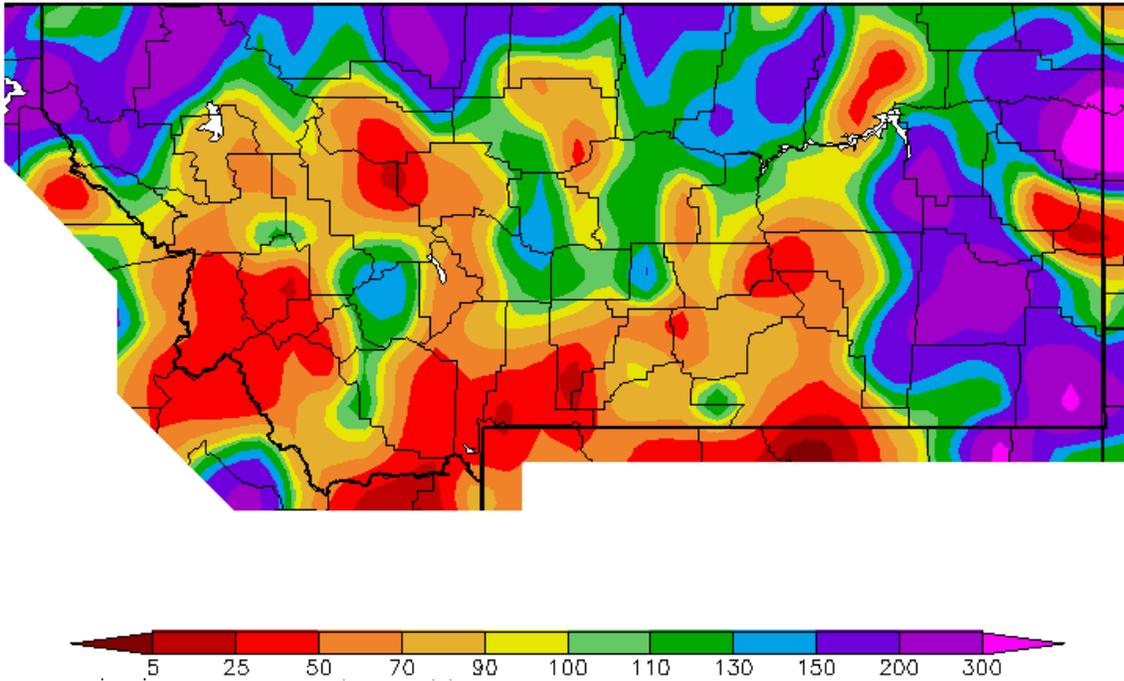


Figure 4. August 2013 precipitation departures from normal (percent) (Western Region Climate Center).

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.