

Montana Weather/Precipitation Summary

August 2011 by NOAA's National Weather Service Great Falls Montana

Very warm and generally dry conditions prevailed throughout August, until the last day. With the warm temperatures, thunderstorms were widely scattered across the state. Some damage and flooding did occur with the localized thunderstorms.

Temperatures across the state (Fig. 1) averaged 58.5F; about 1.5 degrees above normal. This was the 29th warmest August, and was the warmest since 2003. Temperatures averaged warmest over central and portions of western Montana (Fig. 3). The statewide average temperature for the past 12 months is about 2F below normal.

Precipitation averaged below normal in August (Fig. 1). Pockets of above average rainfall were widely scattered across the state. The statewide average of 0.59 inches is a 0.58-inch deficit or 50 percent of average for the month. Even so, the precipitation excess over the average in the past 12 months is 4.60 inches. Negative precipitation anomalies were greatest over the northwestern quarter of the state (Fig. 4).

Wind speeds were below the monthly normal in August. The windiest area was in the normally windy areas near the Rockies. August's average of 7.2 mph was 1.0 mph below the normal for August, and the third calmest August of record. The summer period winds averaged the second calmest of record.

Soil moisture conditions fell to below average conditions in August. The composite of 18 stations across the state show the driest average August conditions since 2007, and the second driest August conditions since 1995.

August 1-6

During this warm period with above normal temperatures, isolated thunderstorms produced severe weather across the state. Hail to 1.5 inches in size fell near Outlook (Sheridan) and Bloomfield (Dawson), while wind gusts to 58 mph occurred at Dillon, and 60 mph near Billings. A thunderstorm dumped heavy rain in Prairie County, with 4.8" falling in a short period of time near McCloud, causing flooding.

August 7-15

Thunderstorms became more scarce during this period, but a tornado touched down near Worden (Yellowstone), and high winds and hail caused damage to a sugar beet field and home near Hardin (Big Horn) on the 11th. Also on the 11th, heavy rain fell near Gildford (Hill). Thunderstorm winds gusted to 65 mph near Townsend (Broadwater) and hail to two inches fell near Opheim (Valley) on the 14th. Otherwise, a bit cooler weather occurred during the second week of the month.

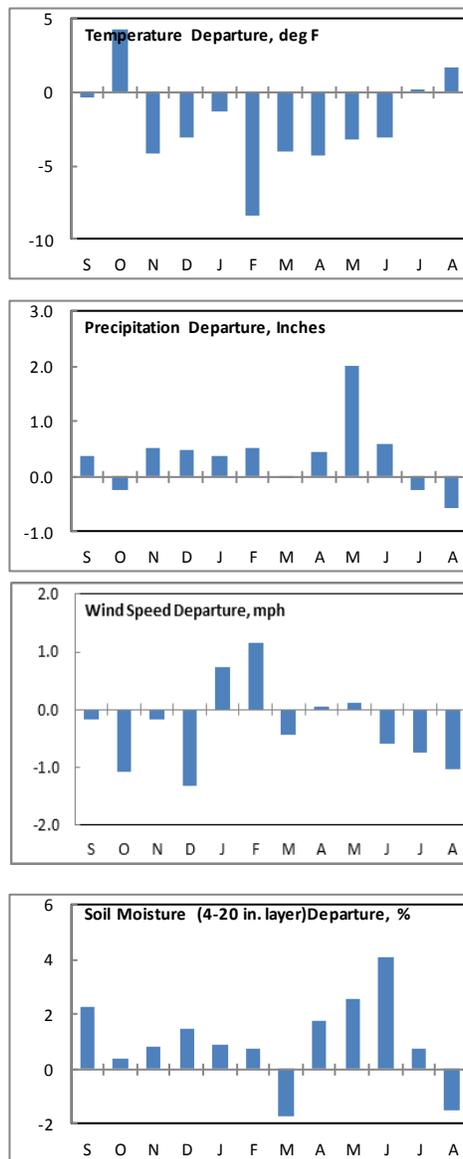


Figure 1. Statewide departures from normal for 18 locations.

August 16-20

The coolest period of the month brought temperatures below freezing to some of the higher mountain valleys. West Yellowstone fell to 27F on the 17th, while Gates Park reached 23F on the 20th.

August 21-30

Very warm and generally dry conditions prevailed for the rest of the month. Hardin warmed to 100F on the 22nd and Billings reached 100F on the 27th, for the warmest readings of the month. A period of wind on the 22nd and 23rd brought very warm and windy conditions to the Rocky Mountain Front and adjacent plains. Winds gusted to 81 mph at Logan Pass. Sustained wind speeds were only around 15 mph during these days at Cut Bank, with peak gusts around 40 mph. Record warm temperatures were recorded from the 22nd through 28th at locations across the state (see temperature record table later). On the 29th, severe thunderstorms occurred in south central Montana. One thunderstorm produced heavy rain and winds to 64 mph at Laurel. The school roof in Laurel failed due to the heavy rain.

August 31

A cold front brought much cooler air, some thunderstorms, and a touch of snow to Glacier National Park's highest peaks. Temperatures cooled as much as 30 degrees from the 80s and 90s on the 30th, to the 40s and 50s across northwest Montana on the 31st. Wind gusts to 70 mph and hail to one-inch from thunderstorms occurred in northeast Montana.

At Great Falls in August, there were 13 days of 90F or higher. This is the highest number in August since 2003. The year has had 24 days, which is the highest annual number since 36 in 2007.

New Temperature Records for the current month

Station	Record Type	New Record	Date	Previous Record	Year of Previous Record
Livingston	High Daily Max	97	22	96	2006
Helena	High Daily Min	67	23	67	1882
Missoula	High Daily Min	63	25	60	1939
Billings	High Daily Max	100	27	96	1984
Bozeman	High Daily Max	95	27	95	1971
Dillon	High Daily Max	90	27	90	2001
Livingston	High Daily Max	98	27	95	1997
Billings	High Daily Min	68	28	64	1996
Dillon	High Daily Min	59	28	57	1982

Precipitation/convection

Severe convective weather occurred on fourteen days in August (the average is 8 days). One tornado was spotted near Worden, in Yellowstone County. There have been 45 days of severe weather this season, which is above the average of 36 days, and below the total at this time in 2010 of 55 days.

New Precipitation Records for the current month

No records were set.

August summary information:

High Temperature	100°F at Hardin (22 nd) and Billings (27 th)	Greatest Precip	3.30" near Townsend
Low Temperature	23°F at Gates Park (20 th) (Lewis and Clark)		
Warmest Ave Temp	73.9°F at Miles City (Custer)	Peak Wind Gust	71 mph near Lustre (31 st) (Valley) 81 mph at Logan Pass (23 rd)
Coollest Ave Temp	57.4°F at Wisdom and West Yellowstone		
Range of Temp departures	-0.5°F at West Yellowstone to 3.5°F at Mullan Pass	Highest Ave Wind	15.0 mph at Logan Pass; 10.6 mph at Badger Peak (Rosebud)
18 city mean monthly Temperature/Normal	68.5/66.8; 29 th warmest of record (since 1880) Summer: 64.6/65.0 57 th coolest	18 city mean monthly wind speed/Normal	7.2 mph/8.2 mph; 3 rd calmest of record (since 1936) Summer: 7.7/8.5 2 nd calmest
18 city mean monthly precipitation/Normal	0.59/1.17" – 50% normal; 29 th driest of record (since 1880) Summer: 5.18/5.29"	19 city mean monthly snow/Normal	0/0

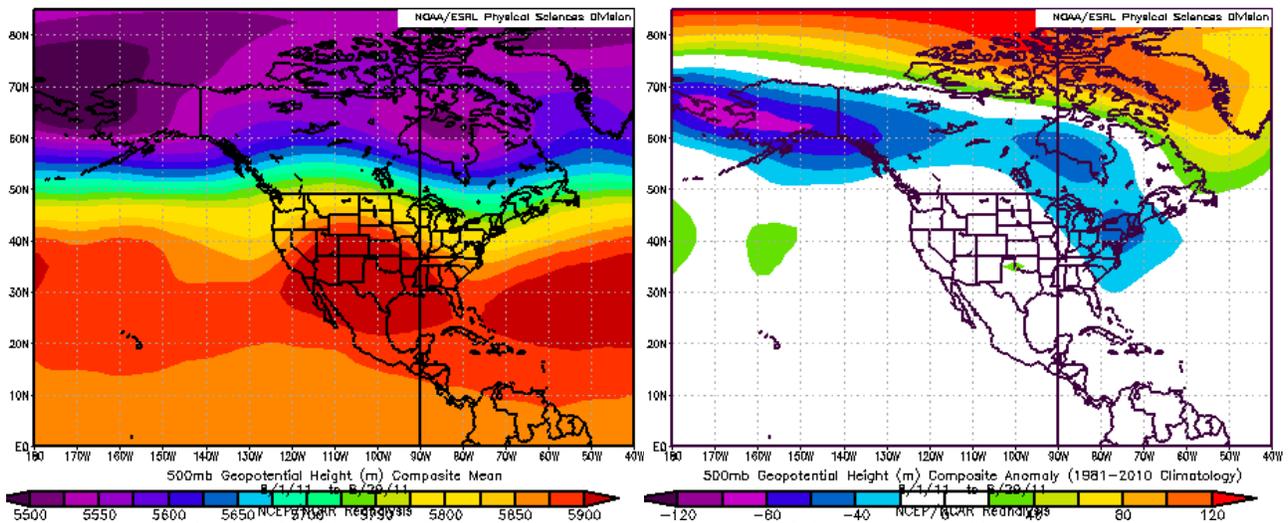
**Historical Rank of Precipitation (inches)
for the Current Month and Water Year to Date**

Location	Aug	% of Norm	Rank	Pcntl	Oct 1 – Aug 31	% of norm	Rank	Pcntl	Years
Baker	0.51	53%			14.90	142%			13
Billings	1.71	201%	93	90	20.57	153%	101	99	102
Belgrade	0.47	44%	15	19	11.74	90%	25	33	74
Butte	0.72	53%	49	41	11.97	102%	65	55	117
Cut Bank	0.32	28%	17	15	10.63	110%	61	59	103
Dillon	0.47	44%	21	28	9.31	96%	44	61	71
Glasgow	0.91	73%	59	51	23.16	216%	111	100	111
Great Falls	0.36	23%	22	18	17.17	129%	100	84	119
Havre	0.26	23%	20	15	13.60	135%	107	82	131
Helena	0.98	82%	83	63	14.40	142%	116	87	133
Jordan	0.28	24%			16.91	147%			13
Kalispell	0.47	47%	31	26	17.96	115%	97	83	117
Lewistown	1.22	71%	58	50	21.88	141%	107	93	115
Livingston	0.19	17%	6	5	13.02	96%	50	47	105
Miles City	0.55	60%	49	36	17.79	157%	127	95	134
Missoula	0.31	26%	30	22	14.55	111%	99	79	125
Mullan Pass	0.01	1%	3	3	52.61	144%	67	97	69
Wolf Point	0.55	43%			17.96	161%			13
Glendive	0.88	64%	50	43	21.54	175%	107	99	108
Sidney	0.69	59%	21	29	19.62	150%	68	97	70
BZN-MSU	0.90	63%	55	41	19.55	107%	103	82	126

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>



Figures 2a (left); 2b (right). Mean flow at 500 millibars (~18,000 ft) for August (left). A ridge of high-pressure dominated the western US (left). This was a normal condition for August, as noted by the large area of white on the right-hand image.

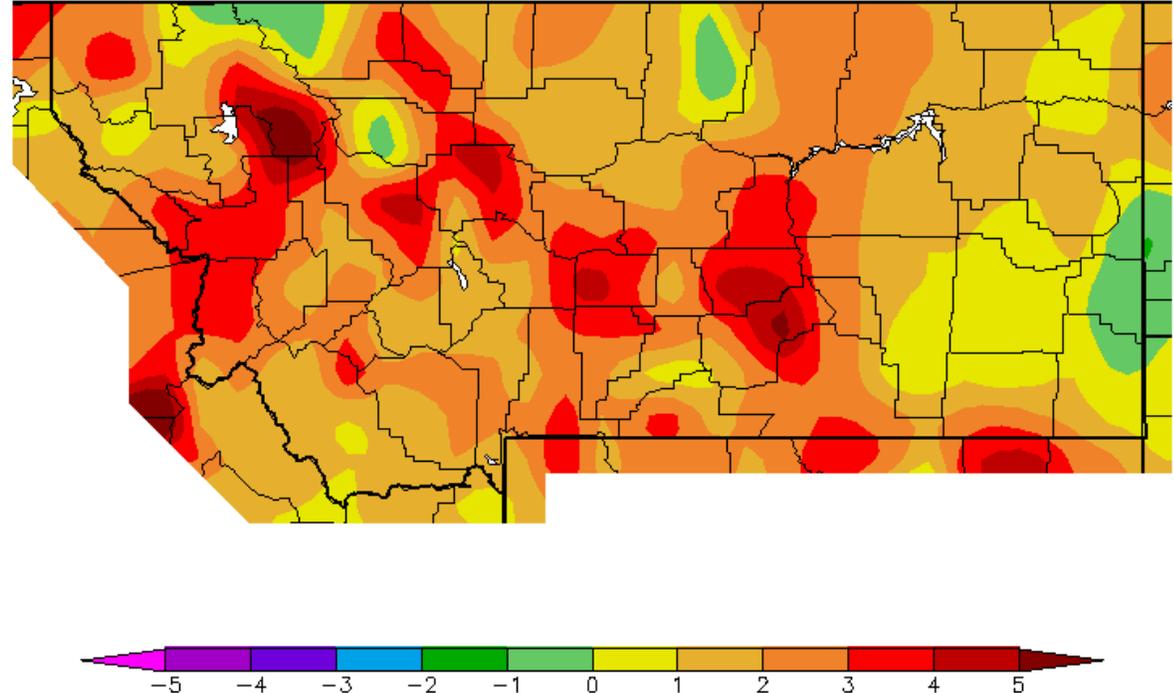


Figure 3. Temperature anomaly for August. Temperatures were above normal most areas. Small areas of slightly below normal were scattered across the north and east (Western Region Climate Center).

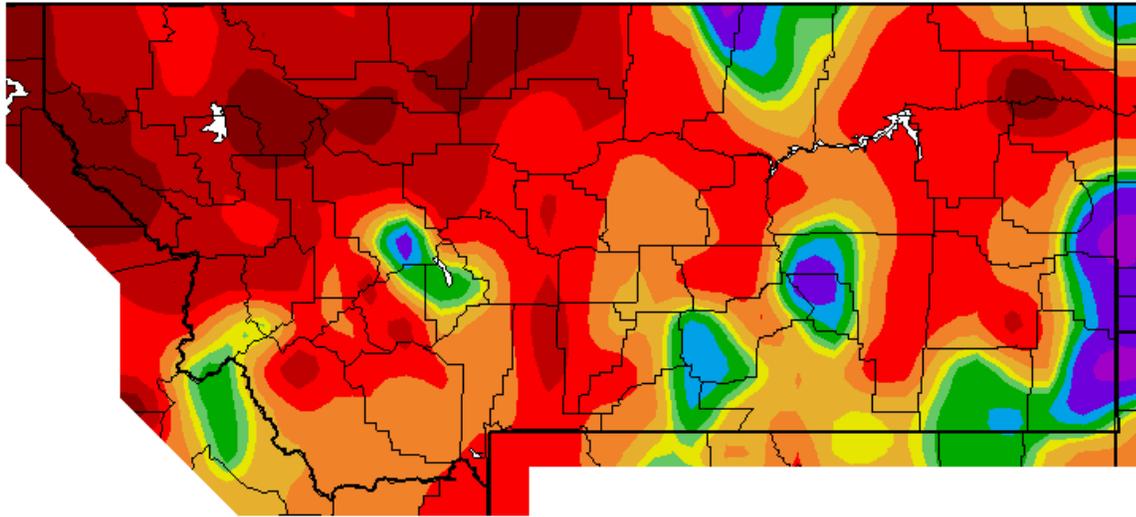


Figure 4. Precipitation anomaly (% of normal) for August.

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=tx&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=tx>. The climatological record for normals is 1971-2000. 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.