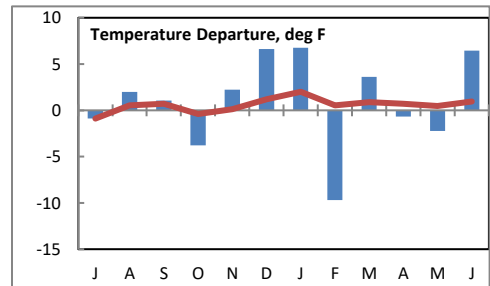
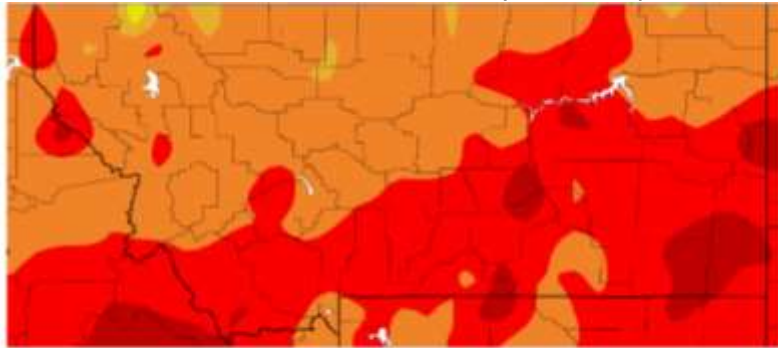


Montana Weather/Precipitation Summary

June 2021 NOAA's National Weather Service Great Falls Montana

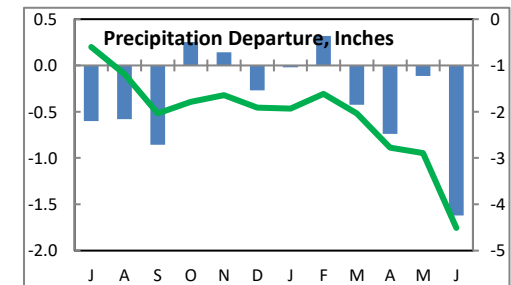
Average upper level flow was from the northwest during June with a large ridge of high pressure along the west coast (Fig. 1). Typically a ridge of high pressure dominates during, but this year's was much stronger. In Montana temperatures averaged well above normal, with several records for extreme heat and monthly averages set. Precipitation was below normal, at record dryness at several locations. Winds averaged near to below normal.

June temperature anomalies ranged from 4.2°F above normal at West Yellowstone to 8.4°F above normal at Billings. The map below shows the variation in departures. The warmest average temperatures were in southeast Montana. The warmest average of 75.5°F was at Broadus, while the coolest was 51.0°F at Placer Basin (Sweet Grass). The highest temperature was 112°F at Sweeney Creek on the 15th. This tied the warmest of record for June in Montana. This was last set on June 26, 1988 at Wolf Point. This was the warmest temperature in the state since 2003. On the 30th, temperatures reached 111°F near Troy (Lincoln). The coldest was 21°F at Red Rock and Yellow Mule on the 11th. This range of 91°F is above the June average range of 81°F and 7th largest of record. The record of 97°F was last set in 2013. The statewide temperature average of 66.7°F was 6.5°F above normal and the 7th warmest of record. The red line on the graph shows the cumulative 12-month departure from normal, which was 1.0°F above normal. See the state summary and temperature tables below for more details.



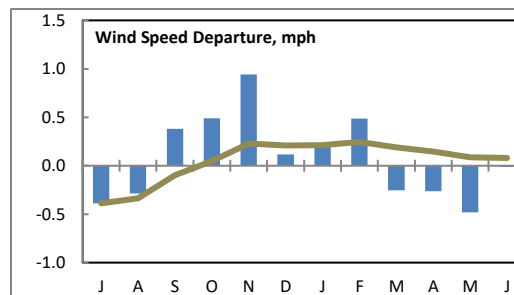
Temperature departure from normal (HPRCC)

Precipitation was heaviest over the northern Rockies and extreme northeast Montana. Much of north central and southern Montana were very dry. Some of these areas received less than one-quarter inch of rain. The highest amount (4.90-inches) fell at Dupuyer Creek (Teton), with the highest amount at a lower elevation at Outlook (Sheridan) (2.99-in). The month's statewide composite of 0.79" was 1.62" below normal. This ranks as the 4th driest June of record for Montana, and the driest since 1988. The green line on the precipitation graph (right) shows the cumulative 12-month departure from normal, which is now 4.51" below normal, and the driest 12-month period since 1934.



Precipitation percent of normal (gauge only)

Wind speed averages were generally below normal. Statewide, the month ranked as the 25th calmest June, with an average speed of 8.7-mph, or 0.1-mph below normal. The strongest averages were along the Rocky Mountain and portions of northeast Montana. The brown line of the wind graph to the right shows the 12-month cumulative statewide wind departure from normal, which is 0.1-mph above normal.



Persistent dryness and above normal temperatures have dried out soil moisture. June was the first month since September 2018 to record below normal soil moisture. June was the 5th driest of record for soil moisture. June 2021 had the driest composite statewide soil moisture since June 2002 (records since 1995).

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

Overall, June's temperatures averaged above normal. There were a couple of periods with below normal temperatures. The month started warm, with temperatures pushing into the 90s over much of eastern Montana. Thunderstorms on the 4th and 5th produced gusts to 74 mph at Crow Agency on the 4th and 67 mph at Baker on the 5th. Behind a cold front on the 5th, gusts reached 61 mph at West Yellowstone. This was their highest gust in June since records began in 2001. The coolest period of the month was from the 6th through 12th. Some areas had their last frost during this period. Thunderstorms developed over northeastern Montana on the 8th. Hail to 4-inches fell near Glendive on the 8th, with thunderstorm wind gusts reaching 86 mph at Wolf Point. A gust of 70 mph at Glasgow was their strongest of record for June. The previous record was set in 2002. Some roadway flooding was reported in Roosevelt County. More widespread thunderstorm activity occurred on the 9th. Hail to 3-inches fell near Zortman with 1-inch hail reported near Corvallis. Again on the 10th, thunderstorms developed across northeast Montana. Gusts reached 90 mph at Brorson (Richland) and 68 mph at Sidney. This gust at Sidney tied for their strongest of record for June and was their strongest gust since 2007. Meanwhile, hail to 3-inches fell near Lindsay (Dawson). Dillon also reported a gust of 62 mph, which was their strongest June gust since 2016. After all of the thunderstorms settled down, the state's low temperature of 21°F was recorded on the 11th.

Warmer air returned. Late night thunderstorms moved through the Rockies late on the 14th with a gust of 79 mph reported at Deep Creek and 73 mph at Cut Bank. This was Cut Bank's strongest June gust of record. The previous record was set in 1994. The warming was accompanied with drying. On the 14th, Helena recorded their 7th lowest relative humidity of record. A temperature of 102°F and dew point of 22°F resulted in a relative humidity of 5.8%. This was their lowest since July 20, 2017. While windy conditions prevailed over the Rocky Mountain Front, very hot temperatures were occurring over eastern Montana. Cut Bank had gusts to 68 mph, Libby reported hail to one inch with thunderstorms and a temperature of 112°F occurred at Sweeney Creek (Rosebud). Brandenburg reached 111°F. This tied for the record warmest for June in Montana last set at Wolf Point on June 26, 1988. Many record high temperatures were set across eastern Montana on the 15th, including 105°F at Billings. This tied their all-time high for June. Overnight lows dropped only as low as 75°F at Manning Corral Dogtown (Phillips). Relative humidity values in eastern Montana were very low. Billings set an all-time low record of 4.7%, with a temperature of 102°F and dew point of 17°F. Their previous lowest relative humidity was 5% set September 10, 1994. Jordan recorded their 3rd lowest relative humidity of 6.5%. This was their lowest since September 7, 2017. Temperatures were as much as 20°F above normal during this time. A storm system moved through central portions of Montana on the 19th and 20th. Up to one-inch of rain fell along the Rocky Mountains west of Choteau. Severe thunderstorms developed over eastern Montana on the 24th again. Gusts from thunderstorms reached 64 mph at Glendive. This was their strongest gust since June 2015. Dry and hot conditions returned to end the month. Temperatures reached 110°F at Libby on the 29th and 111°F near Troy on the 30th.

The highest daily temperatures in June occurred on five days at Billings and Troy. West Yellowstone had the state’s lowest temperature on eight days. For the year through June, Troy has been the state’s warmest on 26 days and West Yellowstone has been coolest on 39 days.

Water Year-to-date

For the water-year through June, the state composite temperature averaged 37.5°F, which was 1.1°F above normal. This has been the warmest water year since 2016. Precipitation totaled 8.76-inches, which was 2.48” below normal and 14th driest. This was the driest since 1988. Winds averaged 9.2-mph, which is 0.1-mph higher than normal, ranking 27th calmest.

Calendar Year-to-date

The calendar year has produced a composite temperature average of 39.3°F, which was 0.7°F above normal. Precipitation totaled 5.79-inches, which was 2.60” below normal and driest since 1985. This has been the 7th driest start to a year. Statewide winds averaged 9.2-mph, which is normal. This was the 19th lowest of record.

Precipitation/convection

Severe convective weather occurred on nine days in June, which is three below normal. Thunderstorm gusts reached 90 mph at Brorson (Richland) on the 19th, and 4-inch hail fell near Glendive on the 8th.

June information:

High Temperature	112°F at Sweeney Creek (Rosebud) (15 th)	Greatest Precip	2.99” at Outlook (Sheridan)
Low Temperature	21°F at Red Rock RAWs and Yellow Mule Raws (11 th)		4.90” at Dupuyer Creek SNOTEL (Teton)
Warmest Ave Temp	75.5°F at Broadus	Peak Wind Gust	90 mph at Brorson (Richland) (9 th)
Coolest Ave Temp	51.0°F at Placer Basin (Sweet Grass)		
Range of Temp departures	+4.2°F at West Yellowstone to +8.4°F at Billings	Highest Ave Wind	13.2 mph at Deep Creek RAWs 12.3 mph at Glasgow
21 city mean monthly Temperature/Nrml	66.7/60.7F normal. 7 th warmest of record (since 1880). 95 th percentile.	20 city mean monthly wind speed/Nrml	8.7 mph/8.8 mph; 27 th calmest of record (since 1936). 29 th percentile.
22 city mean monthly precipitation/Nrml	0.79”/2.42” – 33% of normal. 4 th driest of record (since 1880). 3 rd percentile.		

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

Location	Jun	% of Norm	Rank	Pcntl	Oct 1 - Jun	% of norm	Rank	Pcntl	Years
	Baker	0.12	4%	97	73	3.37	34%	93	99
Billings	0.29	13%	119	97	7.69	71%	79	66	120
Belgrade	0.23	9%	85	100	7.07	68%	82	98	84
Butte	0.36	15%	127	99	4.61	50%	114	90	127
Cut Bank	0.66	24%	109	95	7.23	97%	63	55	113
Dillon WMU	0.05	3%	123	101	5.90	69%	110	91	121
Glasgow	0.45	16%	113	91	5.60	61%	101	83	121
Great Falls	0.45	17%	129	98	10.21	93%	71	55	129
Havre	0.12	5%	142	100	5.81	70%	121	86	141
Helena	0.41	19%	137	96	7.68	92%	83	58	142
Jordan	0.99	39%	83	82	4.29	47%	89	93	96
Kalispell	1.98	70%	63	49	13.16	96%	49	38	127
Lewistown	1.08	32%	121	96	7.56	61%	123	98	125
Livingston	0.81	33%	110	92	8.18	75%	99	85	116
Miles City	0.48	19%	139	97	5.32	57%	134	93	144
Missoula	1.21	57%	103	72	10.32	90%	82	59	139
Mullan Pass	1.19	40%	72	86	39.81	111%	21	25	82
Wolf Point	2.80	92%	42	41	6.37	81%	53	71	74
Glendive	0.86	35%	120	94	4.95	51%	117	97	120
Sidney	2.38	89%	41	49	5.80	60%	69	85	81
BZN-MSU	1.12	35%	134	92	12.25	78%	111	77	143
W Yellowstone	0.10	5%	113	100	16.03	88%	63	64	98

Rankings and Percentiles are 1=wettest, higher numbers=drier.

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>

**Historical Rank of Average Temperature (°F)
for the Current Month and Water Year to Date**

Location	Jun	Normal	Rank	Pcntl	Oct 1 - Jun	Normal	Rank	Pcntl	Years
	Baker	69.6	58.9	7	6	38.2	35.8	19	17
Billings	73.1	64.7	3	2	42.3	41.3	19	15	120
Belgrade	66.0	58.9	1	1	36.9	36.2	25	28	86
Butte	62.0	55.5	4	2	34.2	33.7	57	44	127
Cut Bank	62.4	57.6	7	5	36.0	35.4	36	32	112
Dillon	64.6	56.6	3	3	36.4	35.4	42	54	77
Glasgow	72.4	64.5	2	1	38.4	36.0	11	8	125
Great Falls	64.9	59.4	20	15	38.8	38.1	65	52	124
Havre	67.4	62.1	7	4	37.9	36.3	35	24	141
Helena	69.4	61.7	2	1	40.4	38.7	13	9	141
Jordan	71.1	63.1	5	4	38.9	36.7	22	22	98
Kalispell	63.9	57.6	4	2	38.8	37.1	35	29	120
Lewistown	64.5	58.0	7	5	37.0	36.7	48	40	118
Livingston	65.8	59.3	8	6	40.3	39.3	36	30	116
Miles City	72.7	65.6	8	5	39.8	38.4	34	24	139
Missoula	66.6	59.7	2	1	39.9	38.8	25	19	127
Mullan Pass	58.9	50.4	3	5	33.3	31.9	5	9	44
Wolf Point	68.9	64.3	7	8	36.5	35.1	21	28	72
Glendive	70.6	66.3	17	13	38.0	38.7	55	45	121
Sidney	69.0	65.0	6	6	37.0	37.1	37	38	98
W Yellowstone	56.4	51.7	9	8	28.0	28.4	61	55	111

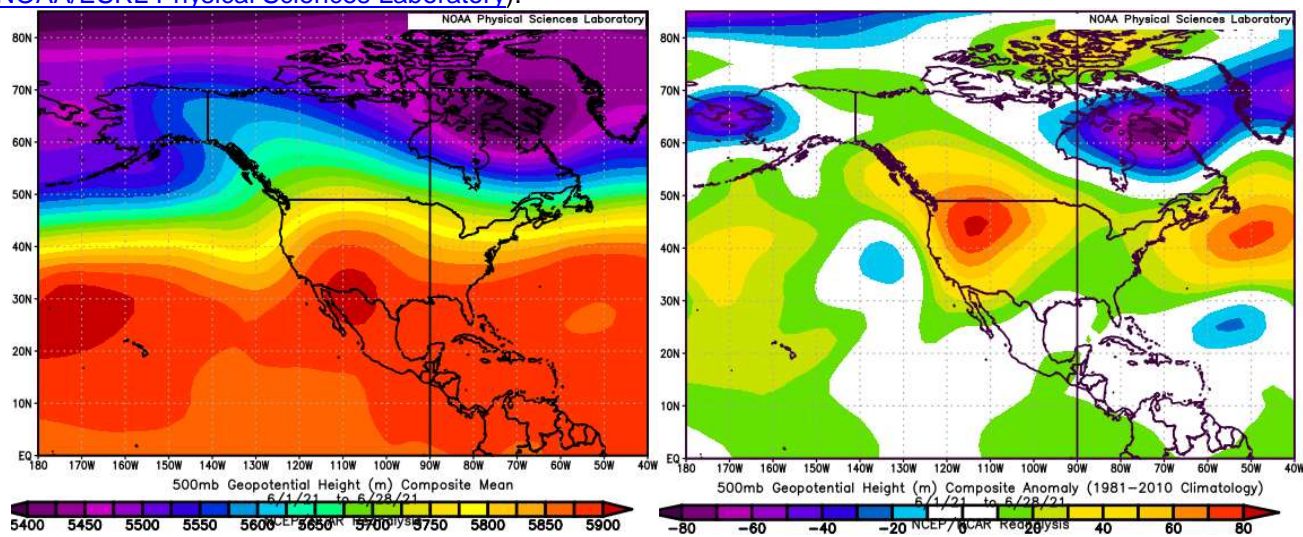
Rankings and Percentiles are 1=coldest, higher numbers=warmer.

Historical Rank of Average Wind Speed (mph) for the Current Month and Water Year to Date

Location					Oct 1 -				
	Jun	Normal	Rank	Pcntl	Jun	Normal	Rank	Pcntl	Years
Baker	11.2	11.5	12	46	11.0	11.3	17	73	23
Billings	9.5	9.4	58	66	11.4	11.2	52	61	85
Belgrade	6.7	6.2	15	25	5.6	5.7	35	62	56
Butte	7.1	6.8	35	60	5.6	5.9	40	70	57
Cut Bank	12.0	12.5	49	63	14.0	13.9	40	50	79
Dillon	9.2	8.1	25	36	10.0	9.4	30	44	67
Glasgow	12.3	11.1	14	17	10.5	10.6	46	60	76
Great Falls	9.5	9.9	65	77	12.6	12.0	40	48	83
Havre	10.2	9.8	29	21	10.9	10.1	21	15	132
Helena	7.6	7.8	79	55	6.9	6.8	90	64	141
Jordan	10.2	8.9	5	11	8.9	8.3	4	8	37
Kalispell	5.7	5.8	87	70	5.5	5.2	107	88	122
Lewistown	7.4	8.7	70	90	9.7	9.8	56	71	79
Livingston	10.1	11.5	47	82	16.2	16.2	25	45	54
Miles City	10.0	10.2	50	38	9.7	10.2	62	47	130
Missoula	5.8	6.2	73	85	5.0	5.0	68	79	86
Mullan Pass	4.2	5.2	27	84	5.1	5.7	26	86	30
Wolf Point	8.9	8.5	9	36	8.0	8.2	19	82	23
Glendive	10.2	10.3	16	55	10.2	10.3	15	52	29
Sidney	8.9	9.0	16	50	9.3	9.2	14	44	32
W Yellowstone	7.0	6.7	6	50	6.5	6.2			6

Rankings and Percentiles are 1=winiest, higher numbers=calmer.

Figure 1. Mean flow at 500 millibars (~18,000 ft) for this month (left) and climatology for the month (right) (from [NOAA/ESRL Physical Sciences Laboratory](http://www.noaa.gov/esrl-physical-sciences-laboratory)).



For the latest information on mountain snowpack from the NRCS, go to: <https://www.nrcs.usda.gov/wps/portal/wcc/home/quicklinks/>

For the latest U.S. Drought Monitor, issued weekly by the National Drought Mitigation Center, USDA and NOAA, go to: <http://droughtmonitor.unl.edu/>

These data are preliminary and have not undergone final QC by NCEI. Therefore, these data are subject to revision. Final and certified climate data can be access at the National Centers for Environmental Information (NCEI) <http://www.ncei.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=txf>. The climatological record for normals is 1991-2020. 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.