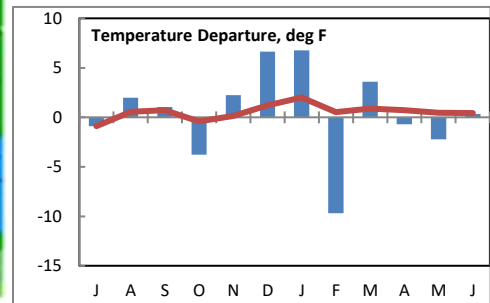
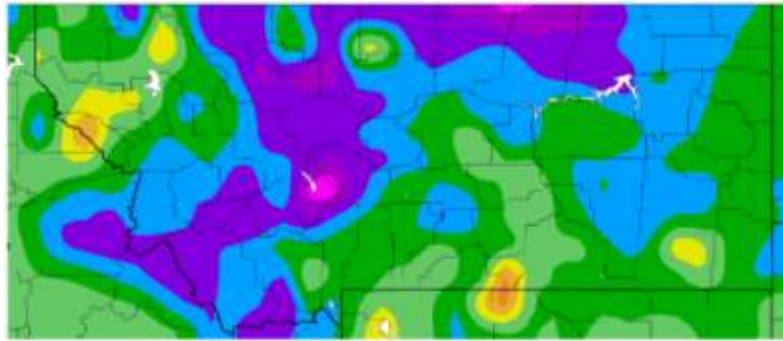


# Montana Weather/Precipitation Summary

May 2021 NOAA's National Weather Service Great Falls Montana

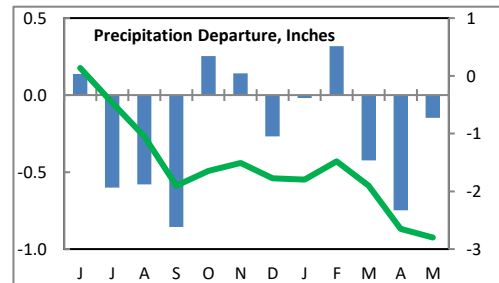
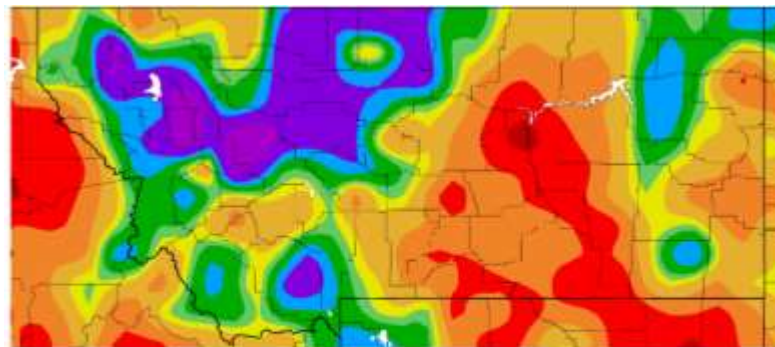
Average upper level flow was from the west during May (Fig. 1). Typically a weak ridge of high pressure dominates during May. In Montana temperatures averaged below normal and with a wide mix of much above, to much below normal precipitation. Winds averaged below normal.

May temperature anomalies ranged from 3.5°F below normal at Butte to 0.7°F below normal at Mullan Pass. The map below shows the variation in departures. The warmest average temperatures were in southeast Montana. The warmest average of 56.8°F was at Broadus, while the coolest was 35.2°F at Yellow Mule (Gallatin). The highest temperature was 93°F at Jordan on the 18<sup>th</sup>. The coldest was 13°F at several spots including Clover Meadow, Carrot Basin and West Yellowstone on the 9<sup>th</sup>. This range of 80°F is below the May average range of 89°F. The statewide temperature average of 49.7°F was 2.2°F below normal and the 46<sup>th</sup> coolest of record. The red line on the graph shows the cumulative 12-month departure from normal, which was 0.4°F above normal. See the state summary and temperature tables below for more details.



Temperature departure from normal (HPRCC)

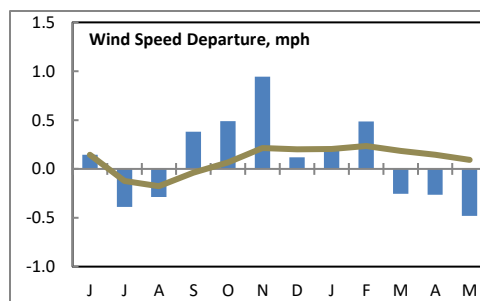
Precipitation was heaviest over the Rocky Mountain range. An area centered along a line from Billings to Malta was the driest for the month. The highest amount (10.80-inches) fell at North Fork Jocko SNOTEL (Missoula), with the highest amount at a lower elevation at Lindburgh Lake (6.10-in) (Missoula). The month's statewide composite of 2.14" was 0.15" below normal. This ranks as the 15<sup>th</sup> wettest May of record for Montana, and the wettest since 2018. Portions of central Montana were very dry, recording one-half of an inch or less. The green line on the precipitation graph (right) shows the cumulative 12-month departure from normal, which is now 2.80" below normal, and the driest 12-month period since 2001.



Precipitation percent of normal (gauge only)

A late season snowfall caused May snow to be above normal. The statewide average of 3.2-inches was the 12<sup>th</sup> highest for May and highest since 2002. See state summary and precipitation tables below for more details.

Wind speed averages were generally below normal. Statewide, the month ranked as the 11<sup>th</sup> calmest May, with an average speed of 8.8-mph, or 0.5-mph below normal. The strongest averages were along the Rocky Mountain. 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.



Although precipitation was above normal over portions of the state, there has been a significant drying of soil moisture. Soil moisture values have dropped with the state soil moisture composite ranking tenth wettest, but driest since 2017 (records since 1995).

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

Overall, May's temperatures averaged below normal. There were a couple of periods with above normal temperatures, Mid-month, temperatures pushed into the 80s and low 90s in the state, otherwise, there were prolonged periods of below normal temperatures. The most notable was from the 19<sup>th</sup>-26<sup>th</sup>, when temperatures were as much as 25-degrees below normal. High temperatures failed to reach 30°F at a couple of locations on the 21<sup>st</sup>. A high temperature of 30°F at Great Falls was the latest of the season for a maximum temperature below freezing. Snowfall amounts of over a foot fell over portions of central Montana, with estimates of 3-feet in the Rockies west of Choteau. Windy conditions accompanied the snow along the Rocky Mountain Front, with blizzard conditions and closed roads on the 20<sup>th</sup>. A cold front swept across the state on the 23<sup>rd</sup>, with wind gusts of 70-mph reported in the Big Horns and Judith Mountains. Severe thunderstorms developed over southeast Montana on the 28<sup>th</sup>. Hail to 1.75-inches was reported near Broadus, with thunderstorm wind gusts to 63-mph near Lodge Grass.

The highest daily temperatures in May occurred on eight days at Troy. Placer Basin and Rocker Peak SNOTEL each had the state's lowest temperature on four days. For the year through May, Alberton has been the state's warmest on 24 days and West Yellowstone has been coolest on 31 days.

### Water Year-to-date

For the water-year through May, the state composite temperature averaged 33.8°F, which was 0.3°F above normal. This has been the warmest water year since 2017. Precipitation totaled 7.93-inches, which was 0.89" below normal. Much of the northeast continues dry. Sidney had their 6<sup>th</sup> driest such period and driest since 1984. Statewide average snowfall since July has been 53.2-inches or 3.6-inches below normal. This is the lowest seasonal value since 2016. Winds averaged 9.3-mph, which is 0.2-mph higher than normal.

### Calendar Year-to-date

The calendar year has produced a composite temperature average of 33.8°F, which was 0.5°F below normal. Precipitation totaled 4.95-inches, which was 1.02" below normal and driest since 2009. Glendive has recorded 2.79-inches so far this year, which is 2.63-inches below normal. This is their driest start of a year since 1988. Statewide winds averaged 9.2-mph, which is normal. This was the 22<sup>nd</sup> lowest of record.

### Spring season (Mar-May)

This season produced a composite temperature average of 42.6°F, which 0.2°F above normal. Precipitation totaled 3.28-inches, which was 1.32" below normal and driest since 2001. For this period, Mullan Pass has received about one-half of normal precipitation. This is their driest spring

since 2008. Statewide snowfall averaged almost 8-inches below normal, at 8.7-inches. Winds averaged 9.1-mph, which is 0.4-mph below normal. This was the 11<sup>th</sup> lowest of record.

**Precipitation/convection**

Severe convective weather occurred on one day in May, which is four below normal.

**May information:**

<b>High Temperature</b>	93°F at Jordan (18 <sup>th</sup> )	<b>Greatest Precip</b>	6.10" at Lindbergh Lake (Missoula)
<b>Low Temperature</b>	13°F at Placer Basin (12 <sup>th</sup> ), Clover Meadow, West Yellowstone (9 <sup>th</sup> )		10.80" at NF Jocko SNOTEL (Missoula)
<b>Warmest Ave Temp</b>	56.8°F at Broadus	<b>Peak Wind Gust</b>	72 mph at Two Medicine (Glacier) (20 <sup>th</sup> )
<b>Coollest Ave Temp</b>	35.2°F at Yellow Mule (Gallatin)		70 mph at Big Horn Mtn (Big Horn) and Judith Peak (Fergus) (23 <sup>rd</sup> )
<b>Range of Temp departures</b>	-3.3°F at Sidney to 1.5°F at Mullan Pass	<b>Highest Ave Wind</b>	12.9 mph at Deep Creek RAWS 11.8 mph at Glasgow
<b>21 city mean monthly Temperature/Nrml</b>	49.7/51.9F normal. 24 <sup>th</sup> coolest of record (since 1880). 16 <sup>th</sup> percentile.	<b>20 city mean monthly wind speed/Nrml</b>	8.8 mph/9.2 mph; 11 <sup>th</sup> calmest of record (since 1936). 14 <sup>th</sup> percentile.
<b>22 city mean monthly precipitation/Nrml</b>	2.14"/2.28" – 94% of normal. 65 <sup>th</sup> driest of record (since 1880). 54 <sup>th</sup> percentile.	<b>20 city mean monthly snowfall/Nrml</b>	3.2"/1.8" – 12 <sup>th</sup> highest of record (since 1880). 91 <sup>st</sup> percentile

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

Location	May	% of Norm	Rank	Pcntl	Oct 1 - May	% of norm	Rank	Pcntl	Years
Baker	1.54	62%	54	24	3.25	45%	90	96	94
Billings	1.21	51%	85	68	7.40	86%	60	50	120
Belgrade	2.81	133%	18	20	6.84	87%	57	67	84
Butte	1.25	62%	93	72	4.25	63%	109	86	127
Cut Bank	1.44	87%	71	61	5.56	118%	47	41	114
Dillon WMU	2.70	138%	38	69	5.85	87%	81	66	121
Glasgow	1.55	70%	53	42	5.15	81%	70	58	121
Great Falls	4.30	177%	10	7	9.76	118%	29	22	129
Havre	2.69	145%	27	18	5.69	98%	73	51	141
Helena	2.26	116%	40	27	7.27	119%	47	33	142
Jordan	1.16	58%	70	68	3.30	50%	87	91	96
Kalispell	1.90	103%	41	31	11.18	103%	42	33	127
Lewistown	2.27	79%	81	64	6.48	72%	108	86	125
Livingston	1.85	70%	84	70	7.37	86%	76	65	116
Miles City	2.58	95%	47	32	4.84	70%	115	80	144
Missoula	2.61	147%	27	18	9.11	98%	62	44	140
Mullan Pass	1.38	52%	62	74	38.62	117%	16	19	82
Wolf Point	2.39	118%	23	22	3.57	74%	64	86	74
Glendive	2.29	86%	48	37	4.09	56%	109	89	122
Sidney	1.66	71%	41	49	3.42	49%	76	94	81
BZN-MSU	3.19	110%	50	34	11.13	90%	76	52	144
W Yellowstone	2.92	121%	22	19	15.93	100%	37	36	100

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	May	Normal	Rank	Pcntl	Oct 1 - May	Normal	Rank	Pcntl	Years
Baker	50.8	51.3	89	81	34.3	32.9	27	24	108
Billings	53.6	55.3	89	70	38.4	38.4	44	36	120
Belgrade	48.9	51.3	68	79	33.3	33.4	36	41	86
Butte	44.1	47.6	109	85	30.8	30.9	68	53	127
Cut Bank	46.3	49.6	102	90	32.7	32.7	45	40	112
Dillon	47.3	49.0	64	82	32.9	32.8	54	70	77
Glasgow	53.4	55.5	84	68	34.2	32.4	14	10	125
Great Falls	48.6	51.5	122	95	35.6	35.5	74	59	124
Havre	50.7	53.9	128	90	34.2	33.1	41	29	141
Helena	51.9	53.9	79	55	36.8	35.8	25	17	141
Jordan	52.2	53.5	83	80	34.9	33.5	33	33	98
Kalispell	50.7	51.6	81	66	35.7	34.6	28	23	121
Lewistown	47.5	50.0	99	80	33.6	34.0	62	52	118
Livingston	49.5	51.0	90	75	37.1	36.8	52	44	116
Miles City	53.4	55.5	114	80	35.7	35.0	51	36	139
Missoula	51.5	53.0	87	67	36.6	36.2	48	37	128
Mullan Pass	42.3	42.7	27	60	30.1	29.6	13	28	44
Wolf Point	52.4	54.9	59	76	32.4	31.5	22	30	72
Glendive	52.5	56.8	118	93	33.9	35.3	60	49	122
Sidney	52.6	56.4	80	82	33.0	33.6	33	34	98
W Yellowstone	42.5	44.0	65	57	24.5	25.5	80	72	111

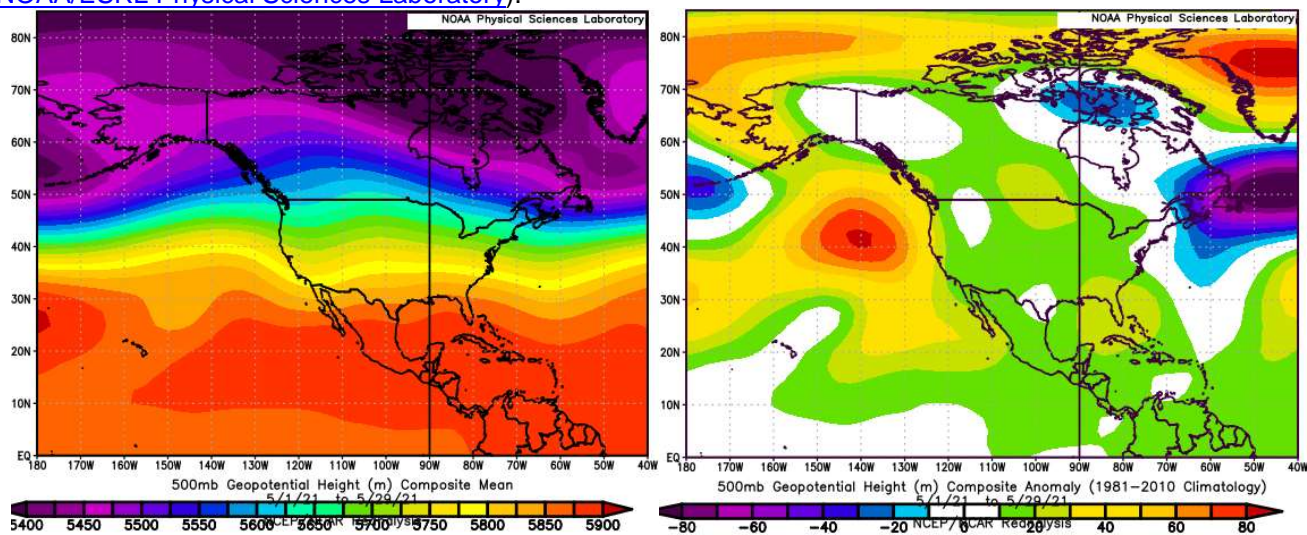
Rankings and Percentiles are 1=coldest, higher numbers=warmer.

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

Location	May	Normal	Rank	Pcntl	Oct 1 -				Years
					May	Normal	Rank	Pcntl	
Baker	11.5	12.1	14	54	11.0	11.2	16	68	23
Billings	9.2	9.8	80	92	11.6	11.5	52	61	85
Belgrade	6.3	6.6	45	79	5.4	5.6	37	65	56
Butte	6.4	7.2	48	82	5.4	5.7	43	75	57
Cut Bank	11.1	12.8	68	88	14.2	14.0	36	45	79
Dillon	8.9	9.1	52	77	10.1	9.6	31	45	67
Glasgow	11.8	11.9	34	43	10.3	10.5	51	67	76
Great Falls	9.5	10.3	71	84	13.0	12.3	36	43	83
Havre	9.9	10.3	52	39	11.0	10.2	20	15	131
Helena	7.6	7.8	95	67	6.9	6.6	92	65	141
Jordan	9.3	9.6	22	58	8.8	8.2	5	11	37
Kalispell	6.5	6.6	77	62	5.5	5.1	106	87	122
Lewistown	8.8	9.4	61	78	9.9	10.0	52	65	79
Livingston	11.6	12.3	42	75	17.0	16.8	22	40	54
Miles City	9.7	11.2	72	55	9.7	10.2	63	48	130
Missoula	6.6	6.3	54	62	4.9	4.8	68	79	86
Mullan Pass	4.1	5.2	29	90	5.2	5.7	26	86	30
Wolf Point	9.1	9.4	14	59	7.9	8.2	20	86	23
Glendive	10.6	11.1	22	76	10.2	10.3	16	55	29
Sidney	10.0	9.9	16	48	9.3	9.2	15	47	32
W Yellowstone	5.6	5.4	6	63					6

Rankings and Percentiles are 1=windiest, 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=tfx>. 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.