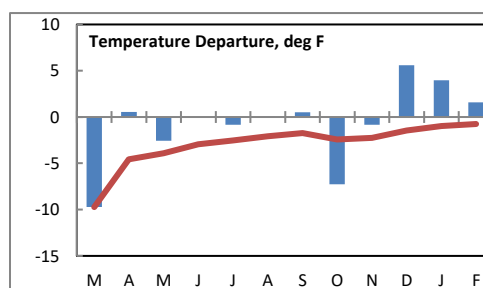
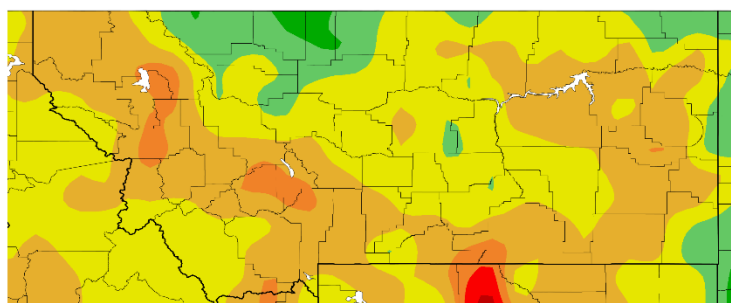


Montana Weather/Precipitation Summary

February 2020 NOAA's National Weather Service Great Falls Montana

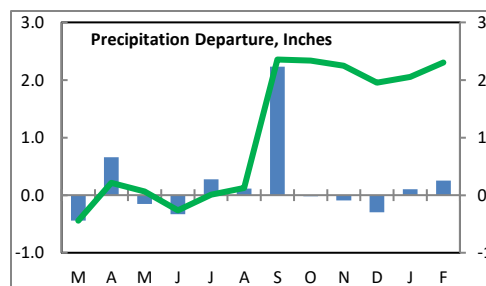
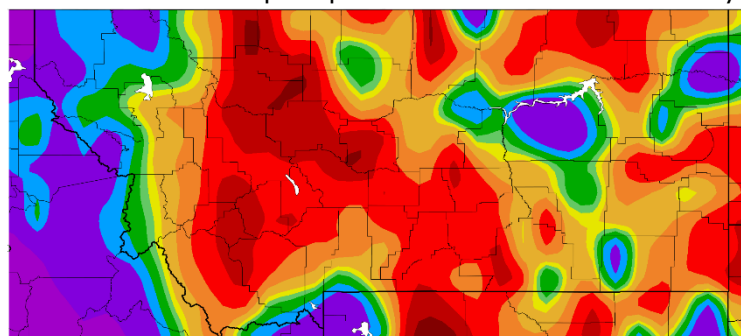
For February, the upper level flow over Montana was generally from the northwest. There was a ridge over the western United States, which is normal and brought the northwesterly flow to the state (Fig. 1). February's average temperatures were slightly below to above normal. Precipitation amounts were variable, with large areas of dry conditions over all but far western Montana. Winds averaged above normal.

February temperature anomalies ranged from 7.3°F below normal at West Yellowstone to 5.9°F above normal at Havre. The map below shows the variation. The warmest average temperatures were in west and south central Montana. The warmest average temperature was at Yellowtail Dam, with an average of 35.4°F, while the coolest was 10.5°F at West Yellowstone. The highest temperature was 70°F at Billings and Huntley on the 1st. The coldest temperature was -33°F at West Yellowstone on the 4th. The absolute range of 103°F was below February's average of 104°F. The statewide temperature average of 25.8°F was the 42nd warmest of record, and warmest average since 2015. The red line on the graph shows the cumulative 12-month departure from normal, which is 0.8°F below normal. See the state summary and temperature tables below for more details.



Temperature departure from normal

Precipitation was heaviest over the northern Rockies and Bitterroots. The highest amount (9.20-inches) fell at Twin Lakes SNOTEL (Ravalli). Red Lodge recorded the most at a lower elevation location (4.92"). The statewide composite of 0.81-inches was 0.25" above normal. This ranks as the 44th wettest February of record for Montana. The green line on the precipitation graph shows the cumulative 12-month departure from normal, which is 2.92" above normal. See state summary and precipitation tables below for more details. Snowfall was above normal in areas with above normal precipitation. The heaviest monthly snowfall was 69.4-inches at Red Lodge.



Percent of normal precipitation

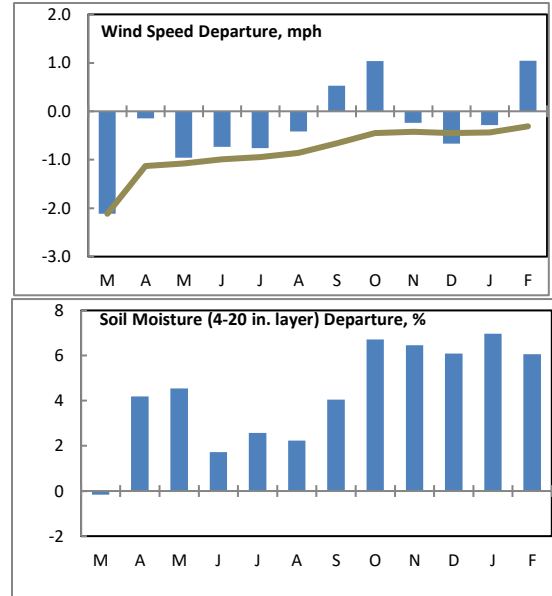
Wind speed averages were above normal. Statewide, the month ranked as the 39th windiest February, with an average speed of 9.8-mph. The strongest averages were in along the Rocky

Mountain Front and Livingston areas. The composite statewide average was 1.0-mph above normal. The brown line of the wind graph to the right shows the 12-month cumulative statewide wind departure from normal. The 12-month average is running 0.3-mph below normal.

Statewide soil moisture averages continued above normal for February (right). This data is from 33 NRCS SCAN and SNOTEL, NOAA CRN and MT Mesonet stations. For February, this was the wettest of record, replacing 2015. The record began in 1995.

Refer to NCEI's State of the Climate report for the latest monthly discussion:

<http://www.ncdc.noaa.gov/sotc/>



February started warm and windy, with the highest temperatures of the month. While 60s were common, it did hit 70°F at Billings and Huntley. A gust of 82 mph at Great Falls was their highest gust in February since 1972, and their highest gust since August 2002. A daily average of 33.4-mph on the 1st was their windiest day since November 23, 1990. Other areas reported high gusts as well. Gusts of 106-mph were reported at Deep Creek RAWS, 92-mph at Babb, and 82 mph in the Crazy Mtns. Record high temperatures were set at Billings, Great Falls and Missoula. Temperatures dropped so that by the 3rd, lows dropped to near or below zero. Snow fell over much of the state, too. Twenty-inches fell at Red Lodge and 10-inches at Fort Smith. Cold air in southwest valleys caused temperatures as low as -33°F at West Yellowstone on the morning of the 4th. Snow fell again from the 6th-8th. Red lodge picked up another 13", Nye measured 12", 26-inches fell in the Bridgers while 6-inches fell at Jordan. Heavy snow hit the south again from the 11th-13th. Red Lodge picked up another 15.5-inches, Judith Gap received 6-inches, while 28-inches fell at Showdown. Gusty winds returned on the 11th, with peaks reaching 88-mph at Deep Creek RAWS and 62-mph near ledger. The period from the 20th-23rd brought windy conditions. Gusts were 62 mph near East Glacier on the 20th and 66-mph near Virginia City on the 23rd. Peaks of 79 mph occurred at Deep Creek RAWS on the 20th and 76-mph at Point Six on the 23rd. Snow returned from the 24th-26th. Red Lodge measured 14-inches, while Ridge got 8-inches. Hinsdale reported 6.5-inches, while gusty winds piled the snow into 2-3-foot drifts. Winds returned at the end of the month with a gust of 63-mph reported at Conrad.

Precipitation/convection

Severe convective weather occurred on zero days in February, which is normal.

New Snowfall Records established this season...

Although December, January and February have had below to much below normal snowfall, several locations have exceeded their seasonal average snowfall. Snowfall in September, October and November was heavy. Following is a table showing several sites with their snowfall through February, along with their seasonal normal snowfall. If they have already exceeded their seasonal normal, the amount in the current season is denoted with an *. If they have set a new seasonal record, it is denoted with ^^.

| Location | Current Season Snow (in) | Normal for whole season | Record for season (inches) |
|-----------------|---------------------------------|--------------------------------|-----------------------------------|
| Bozeman | 41.6 | 40.2" | 97.8 (1947-48) |
| Bozeman MSU | 74.0 | 91.0" | 158.5 (1996-97) |
| Chinook | 35.5* | 31.2" | 66.0 (2010-11) |
| Choteau | 73.4* | 39.8" | 92.9 (2017-18) |
| Cut Bank | 78.5^^ | 33.6" | 76.2 (1946-47) |
| Dillon | 43.1* | 37.9" | 90.8 (1988-89) |
| East Glacier | 187.8* | 176.6" | 319.0 (1971-72) |
| Gold Butte | 59.5 | 82.5" | 130.0 (2010-11) |
| Great Falls | 69.8* | 63.5" | 117.5 (1988-89) |
| Havre | 51.3* | 39.5" | 93.3 (1981-82) |
| Helena | 23.5 | 38.1" | 112.8 (1880-81) |
| Lewistown | 60.1 | 63.1" | 111.1 (1927-28) |
| Loma | 49.2* | 38.4" | 91.0 (1977-78) |
| Sun River | 61.4* | 23.5" | 93.8 (1966-67) |
| Turner | 72.1* | 24.6" | 74.2 (2010-11) |
| W Yellowstone | 107.3 | 162.7" | 316.6 (1994-95) |

Winter Season (Dec-Feb)

The water-year average temperature for Montana was 25.4°F, 3.7°F above normal. This was the 18th warmest of record and warmest since 2015-16.

This season's composite precipitation was 2.14-inches and 0.06-inches above normal. This was the driest such period since 2012-13 and the 44th driest of record.

Seasonal snowfall was 24.6-inches and 4.5-inches below normal. This was the 38th lowest amount for the season and least since 2004-05.

Winds averaged 9.0-mph, which was normal. This was the 22nd calmest such period.

Water-year-to-Date (Oct-Feb)

The water-year average temperature for Montana was 28.5°F and 0.6°F above normal. This was the 60th warmest of record and warmest since 2016.

This season's composite precipitation was 3.97-inches and 0.04-inches below normal. This was the driest such period since 2010 and the 55th driest of record.

Seasonal snowfall was 42.8-inches and 6.4-inches above normal. This was the 47th highest amount for the season and snowiest since last year.

Winds averaged 9.1-mph, which was 0.2-mph above normal. This was the 23rd calmest such period.

February information:

| | | | |
|--|---|---|---|
| High Temperature | 70°F at Billings and Huntley (1 st) | Greatest Precip | 4.92" at Red Lodge |
| Low Temperature | -33°F at West Yellowstone (4 th) | | 9.20" at Twin Lakes SNOTEL (Ravalli) |
| Warmest Ave Temp | 35.4°F at Yellowtail Dam | Peak Wind Gust | 106 mph at Deep Creek RAWS and 89 mph at Browning (1 st) |
| Coollest Ave Temp | 10.5°F at West Yellowstone | | |
| Range of Temp departures | -7.3°F at West Yellowstone to +5.9°F at Havre | Highest Ave Wind | 24.0 mph at Deep Creek RAWS 20.7 mph at Livingston |
| 21 city mean monthly Temperature/Normal | 25.8/24.2F normal. 42 nd warmest of record (since 1880). 70 th percentile. | 20 city mean monthly wind speed/Normal | 9.8 mph/8.7 mph; 39 th windiest of record (since 1936). 55 th percentile. |
| 22 city mean monthly precipitation/Normal | 0.81"/0.56" - 144% of normal. 44 th wettest of record (since 1880). 68 th percentile. | 20 city mean monthly snowfall/Normal | 11.2"/7.8" - 30 th highest of record (since 1880). 78 th percentile |

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

| Location | Feb | % of Norm | Rank | Pcntl | Oct 1 - Feb | % of norm | Rank | Pcntl | Years |
|-------------|------|-----------|------|-------|-------------|-----------|------|-------|-------|
| Baker | 0.10 | 34% | | | 1.84 | 68% | | | 22 |
| Billings | 0.62 | 129% | 34 | 27 | 2.78 | 85% | 76 | 64 | 119 |
| Belgrade | 0.76 | 167% | 12 | 13 | 2.58 | 78% | 59 | 71 | 83 |
| Butte | 0.48 | 112% | 62 | 49 | 1.20 | 43% | 109 | 86 | 126 |
| Cut Bank | 0.40 | 190% | 36 | 31 | 2.74 | 194% | 20 | 17 | 113 |
| Dillon | 0.29 | 121% | 23 | 28 | 1.52 | 83% | 49 | 61 | 80 |
| Glasgow | 0.52 | 200% | 20 | 16 | 2.65 | 122% | 43 | 35 | 121 |
| Great Falls | 0.41 | 87% | 77 | 59 | 3.18 | 107% | 75 | 58 | 128 |
| Havre | 0.31 | 111% | 81 | 57 | 2.82 | 140% | 57 | 40 | 140 |
| Helena | 0.20 | 67% | 109 | 76 | 2.15 | 96% | 108 | 76 | 141 |
| Jordan | 0.77 | 308% | | | 3.42 | 167% | | | 22 |
| Kalispell | 0.52 | 54% | 100 | 79 | 5.14 | 82% | 98 | 78 | 126 |
| Lewistown | 0.79 | 180% | 39 | 31 | 3.86 | 110% | 66 | 53 | 124 |
| Livingston | 0.64 | 128% | 33 | 26 | 2.95 | 88% | 79 | 67 | 117 |
| Miles City | 0.38 | 165% | 59 | 41 | 1.06 | 49% | 136 | 95 | 143 |
| Missoula | 1.06 | 151% | 39 | 27 | 4.03 | 89% | 99 | 71 | 140 |
| Mullan Pass | 5.10 | 162% | 19 | 23 | 23.93 | 113% | 36 | 45 | 79 |
| Wolf Point | 0.19 | 90% | | | 1.14 | 56% | | | 22 |
| Glendive | 0.40 | 125% | 51 | 40 | 2.14 | 83% | 75 | 61 | 122 |
| Sidney | 0.38 | 115% | 27 | 33 | 2.13 | 73% | 49 | 61 | 80 |
| BZN MSU | 1.82 | 233% | 5 | 3 | 5.97 | 110% | 36 | 25 | 143 |
| W Yellowst | 1.64 | 104% | 49 | 43 | 7.99 | 82% | 65 | 61 | 106 |

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 | | | | | Oct 1 - | | | | Years |
|-------------|------|--------|------|-------|---------|--------|------|-------|-------|
| | Feb | Normal | Rank | Pcntl | Feb | Normal | Rank | Pcntl | |
| Baker | 23.2 | 24.7 | 41 | 37 | 26.8 | 26.9 | 53 | 49 | 108 |
| Billings | 30.2 | 30.4 | 35 | 40 | 33.6 | 33.6 | 43 | 49 | 86 |
| Belgrade | 23.4 | 24.7 | 44 | 51 | 28.4 | 27.6 | 33 | 38 | 85 |
| Butte | 21.9 | 22.2 | 74 | 58 | 26.0 | 25.5 | 74 | 58 | 126 |
| Cut Bank | 27.3 | 24.2 | 31 | 27 | 27.1 | 28.3 | 59 | 53 | 111 |
| Dillon | 24.2 | 26.2 | 53 | 68 | 27.3 | 28.7 | 61 | 80 | 76 |
| Glasgow | 24.0 | 19.2 | 26 | 20 | 26.1 | 24.7 | 32 | 25 | 125 |
| Great Falls | 30.0 | 27.3 | 43 | 34 | 31.3 | 31.2 | 73 | 59 | 123 |
| Havre | 28.1 | 22.2 | 27 | 19 | 27.2 | 26.8 | 56 | 40 | 140 |
| Helena | 31.8 | 27.7 | 30 | 21 | 32.2 | 30.1 | 25 | 17 | 140 |
| Jordan | 29.5 | 22.6 | 19 | 18 | 29.4 | 26.6 | 34 | 33 | 100 |
| Kalispell | 30.1 | 27.1 | 31 | 25 | 31.4 | 29.5 | 27 | 22 | 120 |
| Lewistown | 25.9 | 25.7 | 51 | 41 | 29.1 | 29.7 | 72 | 61 | 118 |
| Livingston | 29.3 | 29.1 | 59 | 49 | 33.6 | 32.3 | 55 | 47 | 117 |
| Miles City | 27.6 | 24.4 | 35 | 24 | 29.7 | 28.5 | 47 | 34 | 138 |
| Missoula | 30.5 | 30.0 | 48 | 37 | 32.4 | 31.6 | 30 | 23 | 127 |
| Mullan Pass | 23.0 | 23.3 | 16 | 37 | 26.4 | 26.1 | 18 | 40 | 43 |
| Wolf Point | 22.3 | 17.8 | | | 25.0 | 23.2 | | | 22 |
| Glendive | 24.5 | 24.0 | 40 | 31 | 30.3 | 28.9 | 28 | 23 | 124 |
| Sidney | 23.6 | 22.7 | 27 | 28 | 26.0 | 27.5 | 41 | 42 | 97 |
| W Yellowst | 10.5 | 15.2 | 77 | 82 | 19.1 | 18.9 | 70 | 73 | 96 |

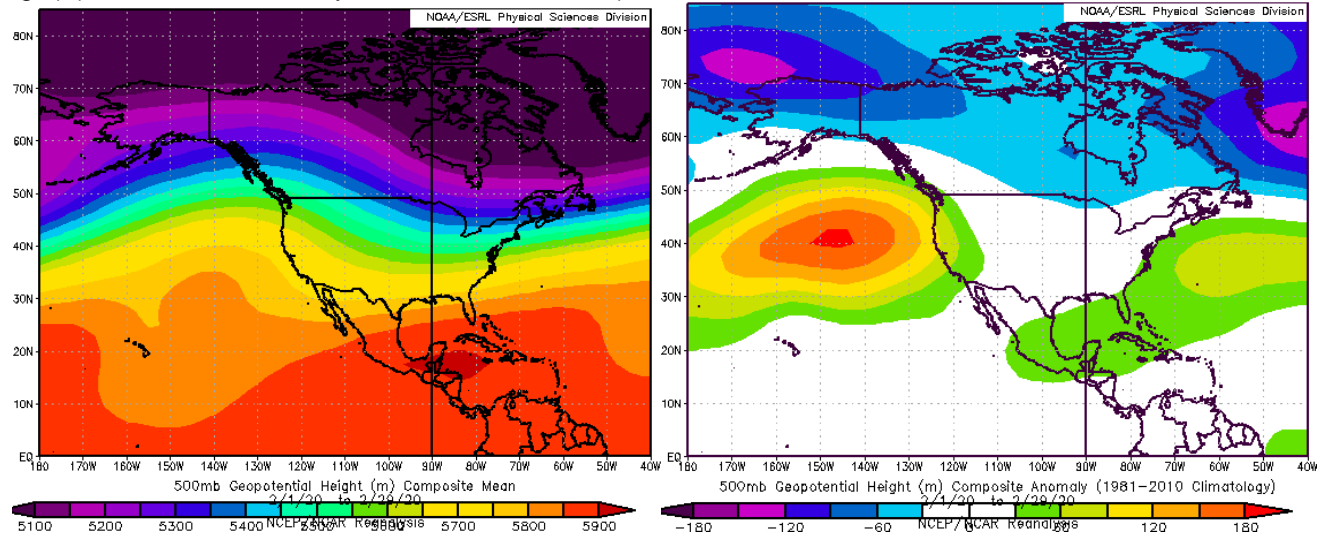
Rankings and Percentiles are 1=coldest, higher numbers=warmer.

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

| Location | | | | | Oct 1 - | | | | Years |
|-------------|------|--------|------|-------|---------|--------|------|-------|-------|
| | Feb | Normal | Rank | Pcntl | Feb | Normal | Rank | Pcntl | |
| Baker | 10.6 | 10.2 | | | 10.7 | 10.7 | | | 22 |
| Billings | 14.4 | 11.6 | 10 | 11 | 13.0 | 11.9 | 12 | 13 | 84 |
| Belgrade | 5.3 | 5.2 | 32 | 56 | 5.0 | 5.2 | 30 | 54 | 55 |
| Butte | 5.4 | 5.8 | 30 | 53 | 4.6 | 5.6 | 47 | 84 | 56 |
| Cut Bank | 17.0 | 12.8 | 10 | 12 | 15.1 | 13.7 | 18 | 22 | 78 |
| Dillon | 11.9 | 9.6 | 13 | 18 | 10.1 | 9.4 | 22 | 32 | 66 |
| Glasgow | 9.6 | 9.6 | 19 | 24 | 9.7 | 9.6 | 36 | 47 | 75 |
| Great Falls | 14.7 | 13.0 | 26 | 30 | 13.7 | 13.7 | 47 | 57 | 82 |
| Havre | 11.8 | 8.9 | 10 | 7 | 11.0 | 9.2 | 9 | 6 | 131 |
| Helena | 8.4 | 6.4 | 30 | 21 | 6.2 | 6.2 | 104 | 74 | 140 |
| Jordan | 8.9 | 7.3 | 7 | 18 | 8.1 | 7.3 | 7 | 17 | 36 |
| Kalispell | 5.2 | 4.8 | 75 | 62 | 4.6 | 4.6 | 114 | 94 | 121 |
| Lewistown | 11.6 | 9.6 | 17 | 21 | 10.2 | 9.9 | 35 | 44 | 78 |
| Livingston | 19.2 | 16.3 | 21 | 37 | 19.2 | 17.5 | 14 | 25 | 53 |
| Miles City | 9.9 | 9.8 | 31 | 24 | 9.6 | 9.7 | 38 | 29 | 129 |
| Missoula | 4.0 | 4.9 | 68 | 80 | 3.8 | 4.6 | 73 | 86 | 85 |
| Mullan Pass | 5.6 | 5.8 | 20 | 63 | 5.1 | 5.8 | 27 | 93 | 29 |
| Wolf Point | 7.1 | 7.5 | | | 7.5 | 7.4 | | | 22 |
| Glendive | 9.8 | 9.5 | 12 | 43 | 9.7 | 10.0 | 15 | 54 | 28 |
| Sidney | 8.7 | 8.8 | 18 | 55 | 8.24 | 9.0 | 28 | 90 | 31 |
| W Yellowst | 6.3 | 6.4 | | | 5.88 | 6.2 | | | 6 |

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

Figure 1. Mean flow at 500 millibars (~18,000 ft) for this month (upper left) and departure from normal (upper right) (from NOAA/ESRL Physical Sciences Division).



For the latest information on mountain snowpack from the NRCS, go to: <https://www.wcc.nrcs.usda.gov/gis/snow.html>

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 NEIC. Therefore, these data are subject to revision. Final and certified climate data can be access at the National Environmental Information Center (NEIC) <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 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.