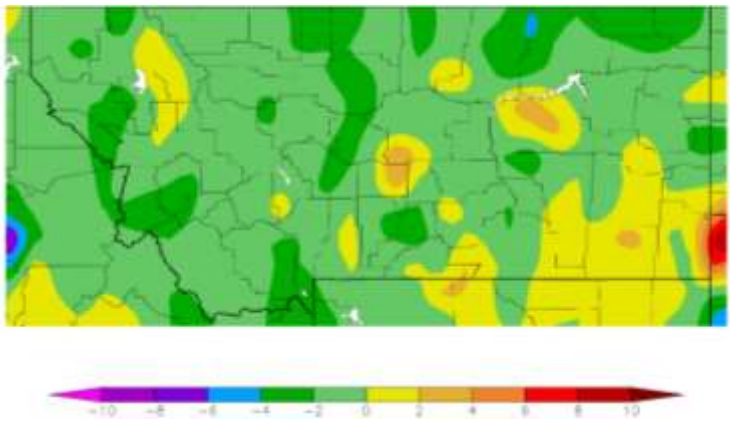
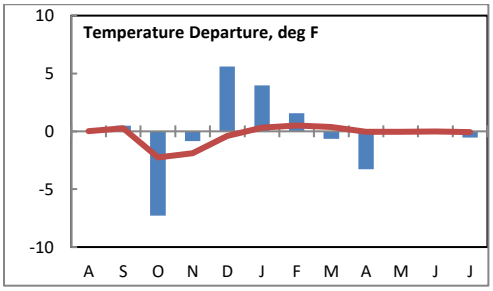
Montana Weather/Precipitation Summary

July 2020 NOAA's National Weather Service Great Falls Montana

Westerly aloft dominated for much of July over Montana, which was close to normal (Fig. 1). This produced near normal temperatures and below normal precipitation for the month. Winds averaged near normal.

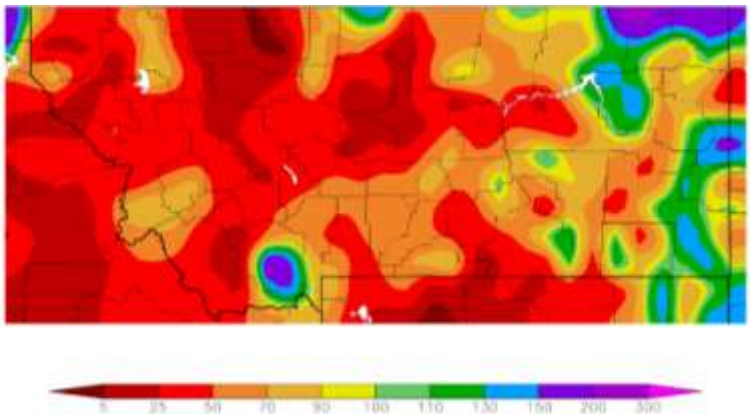
July temperature anomalies ranged from 1.7°F below normal at Missoula to 1.9°F above normal at Jordan. The map below shows the variation in departures. The warmest average temperatures were in southeast Montana. The warmest average temperature was at Broadus, with an average of 75.5°F, while the coolest was 51.1°F at Placer Basin. The highest temperature was 106°F at Troy on the 31st. The coldest temperature was 27°F near Sula on the 14th and Gates Park on the 26th. The statewide temperature average of 67.6°F was the 43rd coolest of record. The red line on the graph shows the cumulative 12-month departure from normal, which was 0.1°F below normal. See the state summary and temperature tables below for more details.

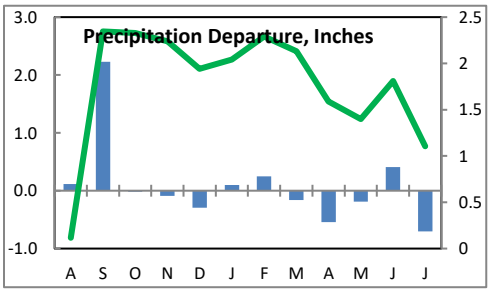




Temperature departure from normal

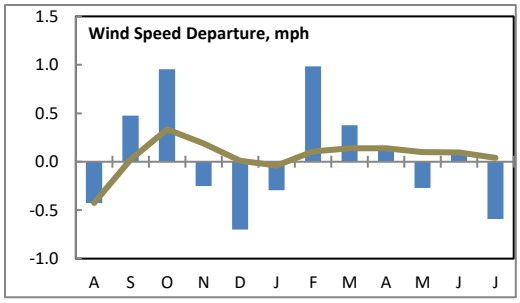
Precipitation was heaviest over extreme northeast and extreme southeast Montana. The highest amount (4.65-inches) fell near Plentywood. On the 29th, 4.00 to 4.50-inches of rain fell in about two hours near Alzada (Carter). In the southwest, near Ennis, amounts over two inches were reported on the 24th. Otherwise the state was dry. The statewide composite of 0.82-inches for July was 0.70" below normal. This ranks as the 31st driest July of record for Montana. Some areas were even drier. Cut Bank (0.10") was 10th driest of record and driest July since 2011. Dillon (0.18") had their 6th driest July. The green line on the precipitation graph shows the cumulative 12-month departure from normal, which is 1.10" above normal. See state summary and precipitation tables below for more details.



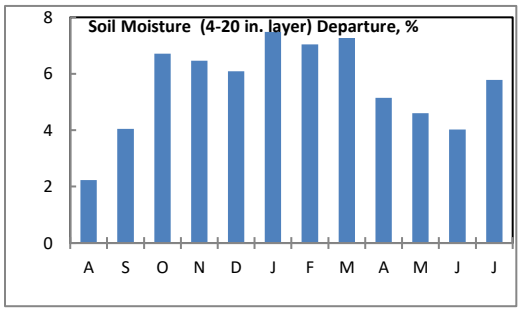


Percent of normal precipitation

Wind speed averages were near normal. Statewide, the month ranked as the 9th calmest July, with an average speed of 7.6-mph. The strongest averages were along the Rocky Mountain Front and northeast Montana. The composite statewide average is running normal. The brown line of the wind graph to the right shows the 12-month cumulative statewide wind departure from normal.



Even with normal drying and below normal precipitation in July, statewide soil moisture averages continued above normal (right). This data is from 33 NRCS SCAN and SNOTEL, NOAA CRN and MT Mesonet stations. For July, this was the wettest of record. 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/

July was fairly typical with thunderstorms throughout the month. Temperatures averaged near to below normal for the first 20 days of the month. Some record low temperatures were set. The most convectively active day was probably the 7th. Most of eastern Montana saw some type of severe weather. Golf-ball size hail fell in the Bozeman area, with 2.5-inch hail reported southwest of Roundup (Musselshell). Wind gusts of 89-mph were reported near Malta, 85-mph north of Winnett and 75-mph near Troy. Two tornados were sighted in the Winnett area. A cold front brought windy conditions to northern Montana on the 12th. Wind gusts reached 55-mph at Cut Bank and 62-mph at Porphory Peak. Ahead of cold front, temperatures pushed above 100°F at Biddle (103°F). Record lows were set at several locations in eastern Montana on the 14th and 15th. Warmer air returned and on the 22nd, temperatures were above 100°F over parts of southeast Montana. Brandenberg and Fort Howes reached 104°F. Severe thunderstorms returned, with gusts to 66-mph near Belgrade on the 23rd, 70-mph at Plentywood and 75-mph at Baker. Heavy rain fell from thunderstorms in the Ennis area on the 24th, with amounts over 2-inches in the Cameron (Madison) area. Thunderstorms in extreme southeast Montana produced 4 to 4.5-inches of rain in about two hours in the Alzada area on the 29th. Severe thunderstorms moved through northern Montana on the 30th, with 2-inch hail in the Lothair (Liberty) area. Much crop and other property damage was reported.

Libby and Troy each reported the highest daily temperature for the state on five days. Gates Park had the state's lowest temperature on 13 days. Although Havre's average wind speed for July was 1.0-mph above normal, their highest gust for the month was only 41-mph. This was their lowest peak gust in any July since 1997. With the relatively cool first part of July, temperatures did average below normal at many locations. For example, Great Falls had an average temperature that ranked as 22nd coolest, but with a record low and several near record lows, their average low temperature of 50.2°F ranked as 8th coolest of record.

Precipitation/convection

Severe convective weather occurred on ten days in July, which is two days below normal. This was the lowest number of days in July since 2015. The cumulative number of days this season is 24, which is eight days below normal. This is the lowest cumulative number since 21 days in 2015, and the second lowest since 1990. On the 1st, thunderstorm gusts reached 66-mph at Yellow Mule Saint Marie. Hail to 1.74-inches fell in McCone and Richland Counties on the 3rd and 4th. Gusts reached 81 mph at Enid (Richland) on the 4th. Hail to 1.25-inches fell near Culbertson on the 5th, and 2-inch hail fell near Sanders (Treasure) and Belle Creek (Powder River) on the 6th. Severe weather occurred over much of the east on the 7th. Hail to 1.75-inches fell near

Bozeman and 2.5-inches southwest of Roundup (Musselshell). Two tornados were spotted in central Montana in Petroleum County, while winds gusted to 89-mph at Malta. Weaker storms produced gusts to 58-mph in Dawson County on the 10th. After a break, severe storms occurred on the 23rd. Hail of 1.5-inches fell near Wibaux and Baker, with wind gusts to 66-mph near Belgrade, 70-mph at Plentywood and 75-mph at Baker. Near the end of the month, severe thunderstorms developed again with gusts to 68-mph at Miles City on the 30th. Storms over northern Montana dropped hail to 2-inches near Lothair (Liberty) and 1.75-inches near Landusky (Phillips) on the 31st.

Water-year-to-Date (Oct-Jul)
The water-year average temperature for Montana was 39.5°F, which was 0.1°F below normal. This was the 65th warmest of record.
This season's composite precipitation was 11.38-inches, 1.24-inches below normal. This was the driest such period since 2004 and the 42nd driest of record.
Winds averaged 9.1-mph, which was normal. This was the 27th calmest such period, but windiest since 2013.

Crop Season (Apr-Jul)
The average temperature for Montana was 54.9°F, which was 0.9°F below normal. This is the coolest such period since 2011 and the 31st coolest of record.
This year's composite precipitation was 6.63-inches, which was 1.02-inches below normal. This was the driest such period since 2017 and the 52nd driest of record.
Winds averaged 8.9-mph, which was 0.4-mph below normal. This was the 21st calmest such period, but windiest since 2011.

July information:

High Temperature	106°F at Troy (31st)	**Greatest Precip**	4.65" near Plentywood
Low Temperature	27°F near Sula (14th) and Gates Park (26th)		
Warmest Ave Temp	75.5°F at Broadus	**Peak Wind Gust**	89 mph at Malta (7th) (tstm)
Coolest Ave Temp	51.1°F at Placer Basin SNOTEL		
Range of Temp departures	-1.7°F at Missoula to +1.9°F at Jordan	**Highest Ave Wind**	15.6 mph at Deep Creek RAWS 11.1 mph at Cut Bank
21 city mean monthly Temperature/Normal	67.4/67.9F normal. 43rd coolest of record (since 1880). 31st percentile.	**20 city mean monthly wind speed/Normal**	7.6 mph/8.2 mph; 9th calmest of record (since 1936). 12th percentile.
22 city mean monthly precipitation/Normal	0.82"/1.52" – 54% of normal. 31st driest of record (since 1880). 22nd percentile.		

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

Location	Jul	% of Norm	Rank	Pcntl	Oct 1 - Jul	% of norm	Rank	Pcntl	Years
Baker	1.15	59%			8.02	67%			22
Billings	0.49	37%	76	63	10.23	88%	61	51	119
Belgrade	0.93	79%	37	43	9.58	81%	69	83	83
Butte	0.58	43%	94	74	8.73	84%	84	66	126
Cut Bank	0.10	8%	104	91	8.56	101%	70	62	112
Dillon	0.18	14%	75	93	4.75	55%	78	97	80
Glasgow	1.92	108%	38	30	10.81	114%	47	39	120
Great Falls	0.60	40%	96	74	13.47	115%	41	31	128
Havre	0.49	30%	107	76	8.30	93%	100	71	140
Helena	0.26	22%	125	88	8.80	99%	79	56	141
Jordan	0.79	42%			9.72	94%			22
Kalispell	0.37	26%	103	81	14.60	100%	44	34	126
Lewistown	0.46	24%	115	92	13.04	95%	80	64	124
Livingston	1.14	78%	55	47	9.80	78%	88	77	114
Miles City	0.92	56%	87	61	8.73	84%	110	77	143
Missoula	0.29	28%	114	81	11.47	96%	70	51	135
Mullan Pass	0.27	23%	59	73	36.40	104%	37	47	78
Wolf Point	1.98	100%			7.55	76%			22
Glendive	2.03	108%	39	31	9.73	89%	82	69	118
Sidney	1.18	47%	54	67	6.31	53%	73	91	80
BZN-MSU	0.63	43%	103	71	13.87	82%	105	74	141
W Yellowstone	1.18	68%	58	51	17.85	94%	53	55	95

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	Jul	Normal	Rank	Pcntl	Oct 1 - Jul	Normal	Rank	Pcntl	Years
Baker	71.0	67.0	61	57	39.5	38.9	49	46	106
Billings	73.0	72.8	41	47	44.2	44.5	42	48	86
Belgrade	65.9	67.0	57	67	39.3	39.2	34	39	85
Butte	62.5	63.2	81	63	36.6	36.5	62	49	126
Cut Bank	64.0	64.6	68	60	37.3	38.6	67	60	111
Dillon	64.1	65.7	64	82	37.9	39.4	62	81	76
Glasgow	71.6	71.1	59	47	39.9	39.0	36	28	124
Great Falls	66.5	67.4	105	83	40.5	41.2	90	73	123
Havre	68.8	69.2	84	59	39.1	39.6	68	48	140
Helena	69.5	70.0	48	34	42.5	41.8	23	16	140
Jordan	71.8	69.9	55	53	41.9	39.5	27	27	96
Kalispell	63.8	64.7	86	70	40.7	40.1	39	32	119
Lewistown	65.2	65.5	74	60	38.7	39.6	70	60	116
Livingston	67.8	66.9	67	57	42.4	41.5	53	46	114
Miles City	73.1	73.9	87	62	41.9	41.9	62	45	138
Missoula	66.9	68.6	81	63	42.4	42.6	36	28	126
Mullan Pass	59.7	60.4	22	50	34.3	34.5	23	52	43
Wolf Point	70.0	70.4			38.6	37.8			22
Glendive	71.2	73.8	107	85	41.5	42.3	55	46	119
Sidney	72.1	72.1	29	30	39.1	41.5	39	40	97
W Yellowstone	57.1	58.6	75	76	30.4	30.7	69	74	93

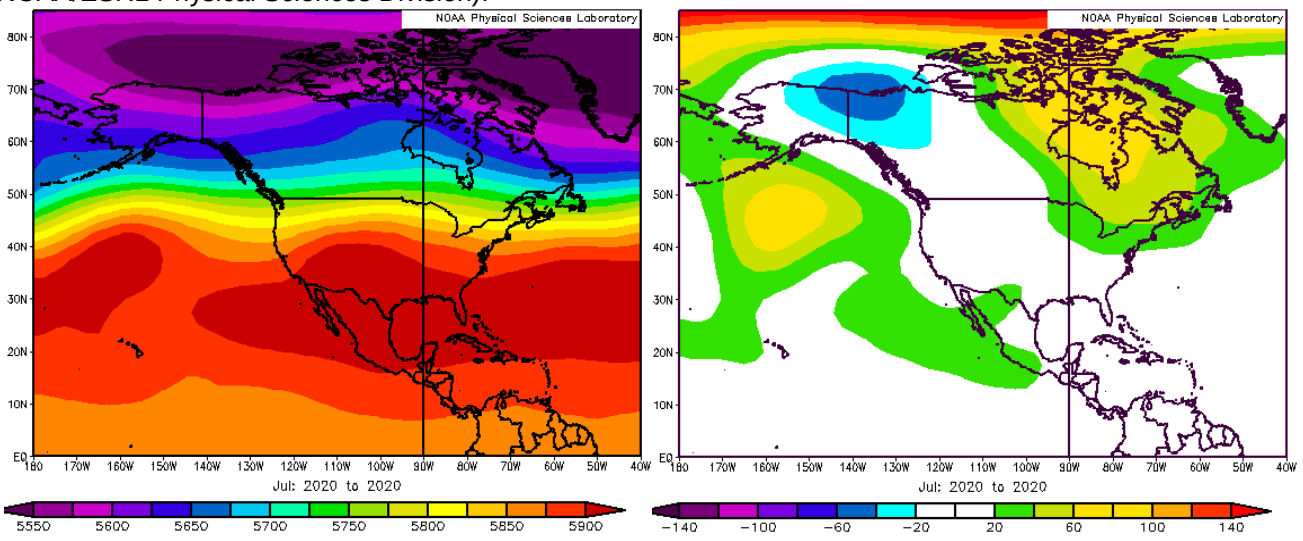
Rankings and Percentiles are 1=coldest, higher numbers=warmer.

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

Location	Jul	Normal	Rank	Pcntl	Oct 1 - Jul	Normal	Rank	Pcntl	Years
Baker	9.4	11.1			10.9	11.3			22
Billings	8.1	8.9	81	94	11.4	10.9	32	37	84
Belgrade	5.8	5.9	38	69	5.8	5.5	27	48	55
Butte	5.7	7.4	53	93	5.5	6.6	43	76	56
Cut Bank	11.1	10.3	30	38	14.2	13.0	15	18	78
Dillon	7.5	7.7	40	59	9.9	9.2	17	25	66
Glasgow	9.7	10.3	27	34	10.4	10.4	44	58	75
Great Falls	9.3	9.8	48	57	12.4	12.5	43	52	82
Havre	9.2	8.2	27	20	10.8	9.2	7	5	131
Helena	7.0	7.3	109	77	7.2	7.0	104	74	140
Jordan	7.6	7.9	23	61	8.7	8.1	8	20	36
Kalispell	5.2	5.7	104	85	5.8	5.5	109	90	121
Lewistown	7.5	7.9	44	56	9.7	9.5	34	43	78
Livingston	9.3	10.9	42	75	15.9	15.9	21	38	53
Miles City	8.5	9.7	68	53	9.8	10.2	53	41	129
Missoula	5.1	6.6	81	95	4.9	5.6	71	83	85
Mullan Pass	4.1	5.0	25	80	5.0	5.7	26	89	29
Wolf Point	6.8	7.7			7.9	8.2			22
Glendive	8.8	9.8	23	121	9.9	10.4	21	75	28
Sidney	7.8	8.0	12	52	8.9	9.2	22	71	31
W Yellowstone	5.5	5.5			6.3	6.5			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 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.