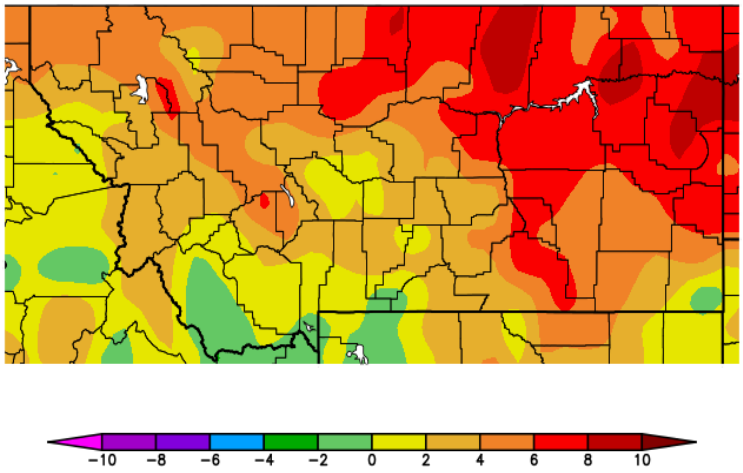
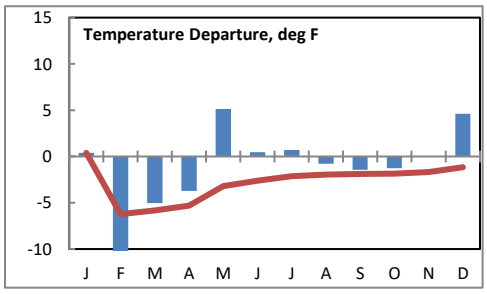
Montana Weather/Precipitation Summary

December 2018 NOAA's National Weather Service Great Falls Montana

In December, upper level flow was from the northwest (Fig. 1). For Montana, temperatures averaged from a range of below to above normal in a fairly random pattern. Precipitation amounts were mostly above normal, with the largest are of below normal over the northwest. Winds averaged below normal most areas.

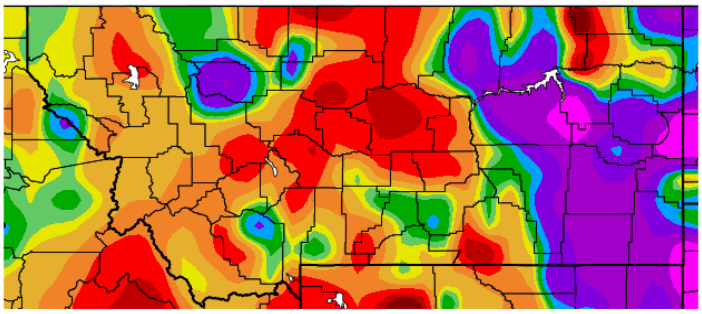
December temperature anomalies ranged from slightly below normal southwest to 8°F above normal over northeastern portions. The map below shows the variation. The warmest average temperatures were in the south central portion – near Billings. The warmest, Norris Madison had an average temperature of 32.8°F, while the coolest was 13.6°F at Yellow Mule. The highest temperature was 62°F at Little Bighorn on the 18th. The coldest temperature was -29°F at Whiskey Creek on the 6th. The state wide temperature average of 24.9° was 4.6°F above normal and warmest since 2014. The red line on the graph shows the cumulative 12-month departure from normal, which is 1.2°F below normal. See the state summary and temperature tables below for more details.

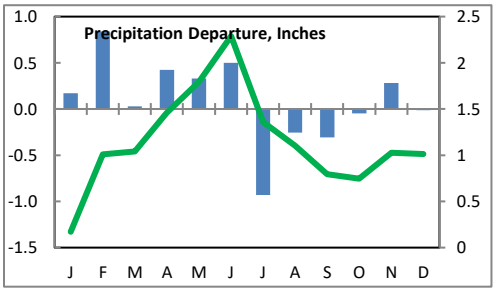




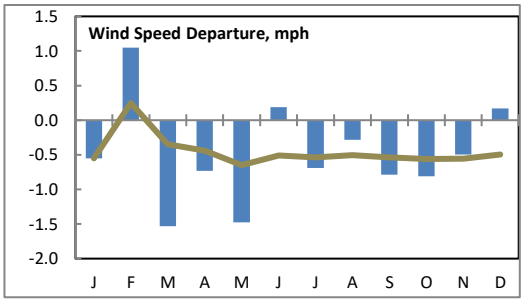
Precipitation was heaviest along the western border of Montana. The highest amount (8.90-inches) fell at Flattop Mountain (Flathead). The highest amount elsewhere was 5.66-inches at Haugen. The statewide composite average of 0.78-inches was normal. The green line on the precipitation graph shows the cumulative 12-month departure from normal, which is 1.01-inches above normal. See state summary and precipitation tables below for more details. The heaviest monthly snow amounts were 32-inches at Haugen and 18.4-inches at West Yellowstone.

Percent of Normal Precipitation (%)
12/1/2018 – 12/31/2018

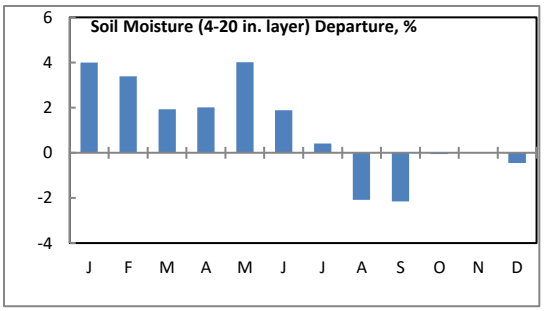




Winds averaged stronger than normal over the state. Statewide, December ranked as the 19th calmest December of record, with an average speed of 9.4-mph. The strongest averages were along the northern Rocky Mountain Front. The composite statewide average was 0.5-mph below normal. The brown line of the wind graph to the right shows the 12-month cumulative statewide wind departure from normal. The 12-month average is running 0.5-mph below normal. Only three of the last 12 months have had wind averages above normal.



Statewide soil moisture averages are the 10th driest of record, and slightly below average for December. The graph to the right shows the trends in departures from normal over the past 12 months.



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

The first seven days had temperatures averaging below normal. Snow fell on the first and second, with amounts up to six inches south of Great Falls and 6-9 inches in eastern Montana. Ridge (Carter) had 8.5-inches. A relatively dry and colder period followed. The coldest temperatures of the month occurred between the 5th and 7th, with the southwest valleys having temperatures as low as -29°F. Milder and windier conditions prevailed from the 10th through 23rd. Winds gusts of over 70 mph were reported on seven of eleven days from the 11th to 21st. The highest gust was 84 mph at Deep Creek (Glacier) on the 11th. Gusts reached 74 mph at Browning. Periods of snow, rain and freezing rain occurred west of the divide during this time. On the 12th, Lookout Pass reported a 24-hr snowfall of 23-inches. Some freezing rain was reported at Superior (Mineral) and Greenough (Missoula). Freezing rain again fell on the 17th over large portions of western Montana, with minor accumulations. Heavy precipitation fell over higher elevations of the west, with Mullan Pass reporting 1.74-inches.

On the 24th, a transition to cooler temperatures began. Up to a foot of snow fell near Garnet (Granite), with another 6-inches reported in the Circle (McCone) area on the 26th. A slight warm-up on the 29th brought very windy conditions again. A gust of 102 mph at Deep Creek was their highest since January 2012; the highest non-convective gust in the state in 2018; and the highest non-thunderstorm gust in the state since November 2015. Snow fell over much of the state on the 30th. The heaviest amounts were in central Montana, with 8 inches reported at Choteau (Teton), 7 inches near Raynesford (Judith Basin) and 6 inches at Rocky Boy (Hill). Cold conditions on the 31st were highlighted with wind chills near -20°F over portions of central and northeast Montana.
During the month, Great Falls had seven days with gusts of 50 mph or higher. This is the highest in any month since December 1991, when 8 days had gusts of 50 mph or higher.

Precipitation/convection

Severe convective weather occurred on 0 days in December, which is normal.

2018 summary

For the calendar year 2018, state temperatures averaged 42.1°F, or 1.2°F below normal. This was the coolest year since 2002 and 47th coolest of record (139 years).
Statewide precipitation averaged 16.50 inches, or 1.01" above normal. This was the wettest year since 2016 and 38th wettest of record (139 years). Snowfall averaged 66.1-inches, 12.5-inches above normal and the 21st highest year of record.

Winds averaged 8.3-mph, 0.6-mph below normal. This was the calmest year since 2010 and the 7th calmest of record.
Figure 2 shows a frequency distribution of locations of the highest and lowest temperatures recorded each day across the state in 2018.

December information:

High Temperature	62°F at Little Bighorn (Big Horn) (18th)	**Greatest Precip**	3.11" at Libby 28 SSW
Low Temperature	-29°F at Whiskey Creek SNOTEL (6th)		17.40" at Flattop Mountain SNOTEL
Warmest Ave Temp	32.8°F at Norris Madison	**Peak Wind Gust**	85 mph at Dellwo and Livingston (29th)
Coolest Ave Temp	13.6°F at Yellow Mule RAWS		102 mph at Deep Creek (29th)
Range of Temp departures	-3.7°F at West Yellowstone to +1.8°F at Havre	**Highest Ave Wind**	18.3 mph at Livingston 22.8 mph at Deep Creek RAWS
21 city mean monthly Temperature/Normal	30.6/30.6F normal. 56th warmest of record (since 1880). 41st percentile.	**20 city mean monthly wind speed/Normal**	8.5 mph/9.0 mph; 21st calmest of record (since 1936). 27th percentile.
22 city mean monthly precipitation/Normal	1.15"/0.87" – 132% of normal. 39th wettest of record (since 1880). 71st percentile.	**20 city mean monthly snowfall/Normal**	7.6"/-3.5" 35th percentile.

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

Location	Dec	% of Norm	Rank	Pcntl	Oct 1 - Dec	% of norm	Rank	Pcntl	Years
Baker	0.33	139%	6	73	2.32	118%	6	74	21
Billings	0.69	103%	35	29	1.85	69%	69	58	118
Belgrade	0.16	31%	74	90	2.25	95%	43	52	82
Butte	0.32	63%	85	68	1.62	86%	59	47	125
Cut Bank	0.40	200%	37	32	1.84	184%	24	21	112
Dillon	0.12	46%	58	73	0.99	74%	50	63	79
Glasgow	0.70	175%	25	20	2.59	167%	12	9	121
Great Falls	0.33	60%	88	69	1.68	84%	87	68	127
Havre	0.18	45%	108	78	0.97	69%	109	78	139
Helena	0.16	40%	122	86	0.91	58%	124	88	140
Jordan	0.75	259%	3	10	2.06	131%	12	52	22
Kalispell	0.78	50%	102	81	3.38	85%	78	62	125
Lewistown	0.16	24%	113	92	2.28	91%	76	61	123
Livingston	0.43	83%	66	56	2.87	121%	40	34	116
Miles City	0.67	231%	27	18	2.10	131%	49	34	142
Missoula	0.85	83%	82	57	4.70	158%	19	13	139
Mullan Pass	6.86	154%	20	24	15.84	128%	27	33	79
Wolf Point	0.27	90%	5	20	2.08	139%	2	5	21
Glendive	0.57	150%	36	28	2.04	108%	42	34	121
Sidney	0.47	90%	33	41	2.16	100%	25	31	79
BZN MSU	1.00	108%	52	36	4.75	124%	23	16	142
W Yellowst	1.04	41%	90	89	3.56	58%	82	77	106

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

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

Location	Dec	Normal	Rank	Pcntl	Oct 1 - Dec	Normal	Rank	Pcntl	Years
Baker	25.7	19.0	18	17	32.3	30.7	52	48	107
Billings	30.7	26.5	29	33	37.5	36.8	48	56	85
Belgrade	22.1	19.0	35	41	31.7	30.7	42	49	84
Butte	19.0	17.4	72	57	29.3	28.6	77	61	125
Cut Bank	26.7	22.2	29	26	32.8	31.8	44	39	110
Dillon	21.1	20.8	51	68	31.3	31.6	57	76	75
Glasgow	22.9	16.3	23	18	32.2	30.1	37	29	124
Great Falls	29.4	24.8	50	39	35.7	34.5	73	60	122
Havre	26.8	19.1	28	20	34.0	31.2	32	22	139
Helena	28.1	21.8	30	21	35.4	33.3	36	25	139
Jordan	25.9	18.8	24	25	33.1	31.0	51	51	100
Kalispell	27.5	22.7	14	11	33.6	32.2	30	24	120
Lewistown	26.9	23.3	51	43	33.3	33.0	81	68	119
Livingston	28.2	26.1	70	59	35.9	35.1	76	65	116
Miles City	25.1	20.3	49	35	33.6	32.9	83	60	137
Missoula	26.2	23.9	48	37	34.1	34.1	70	55	127
Mullan Pass	21.8	20.0	25	59	29.8	28.3	10	22	42
Wolf Point	23.0	15.0	2	5	31.1	28.8	7	30	21
Glendive	28.8	20.7	10	8	35.9	33.8	30	24	123
Sidney	24.5	19.2	20	21	30.9	32.6	56	58	96
W Yellowst	13.3	10.5	42	46	22.8	22.3	69	72	96

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

Location	Dec	Normal	Rank	Pcntl	Oct 1 Dec 31	Normal	Rank	Pcntl	Years
Baker	10.1	11.2	13	75	10.3	10.8	14	65	21
Billings	13.3	12.6	33	39	12.1	11.6	37	43	84
Belgrade	4.8	4.9	35	65	4.6	5.3	34	63	53
Butte	4.2	5.2	44	80	5.3	5.7	34	61	55
Cut Bank	15.4	14.2	27	35	14.0	13.7	38	49	76
Dillon	8.6	9.2	50	77	8.7	9.1	51	78	65
Glasgow	8.4	9.3	31	41	9.2	9.7	56	75	74
Great Falls	14.5	14.6	43	54	12.7	13.7	63	78	80
Havre	10.7	9.5	35	26	10.4	9.2	25	19	130
Helena	5.9	5.7	106	76	5.5	6.2	126	91	139
Jordan	6.9	7.2	19	53	7.3	7.4	20	56	35
Kalispell	3.8	4.1	78	65	3.9	4.5	112	93	120
Lewistown	10.0	10.3	48	64	9.1	9.9	63	83	76
Livingston	19.8	19.1	27	49	17.3	17.0	32	58	54
Miles City	8.7	9.6	57	44	9.0	9.8	58	45	128
Missoula	3.5	4.3	67	80	3.3	4.6	81	96	84
Mullan Pass	5.1	5.6	24	82	4.9	5.9	28	100	28
Wolf Point	6.5	7.1	16	125	7.2	7.4	12	55	21
Glendive	9.3	10.1	16	59	9.2	10.1	22	81	27
Sidney	8.8	9.0	18	59	8.53	9.0	23	74	31
W Yellowst	5.2	5.4			4.97	5.9	6		

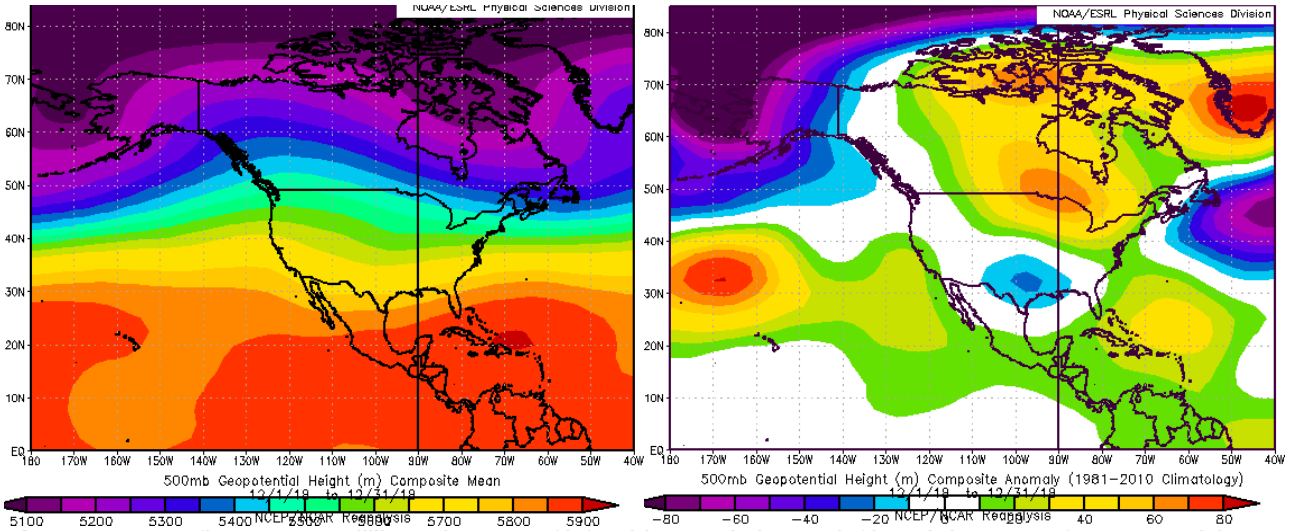
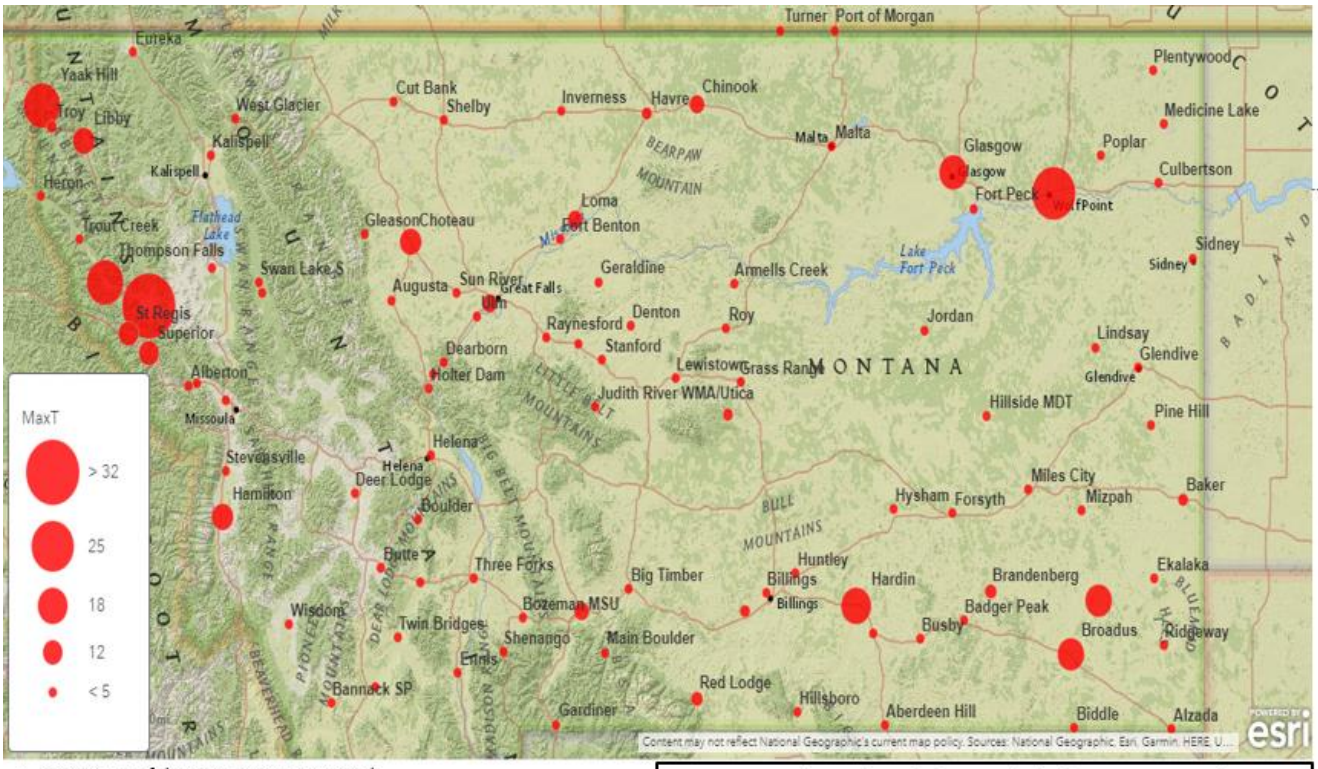
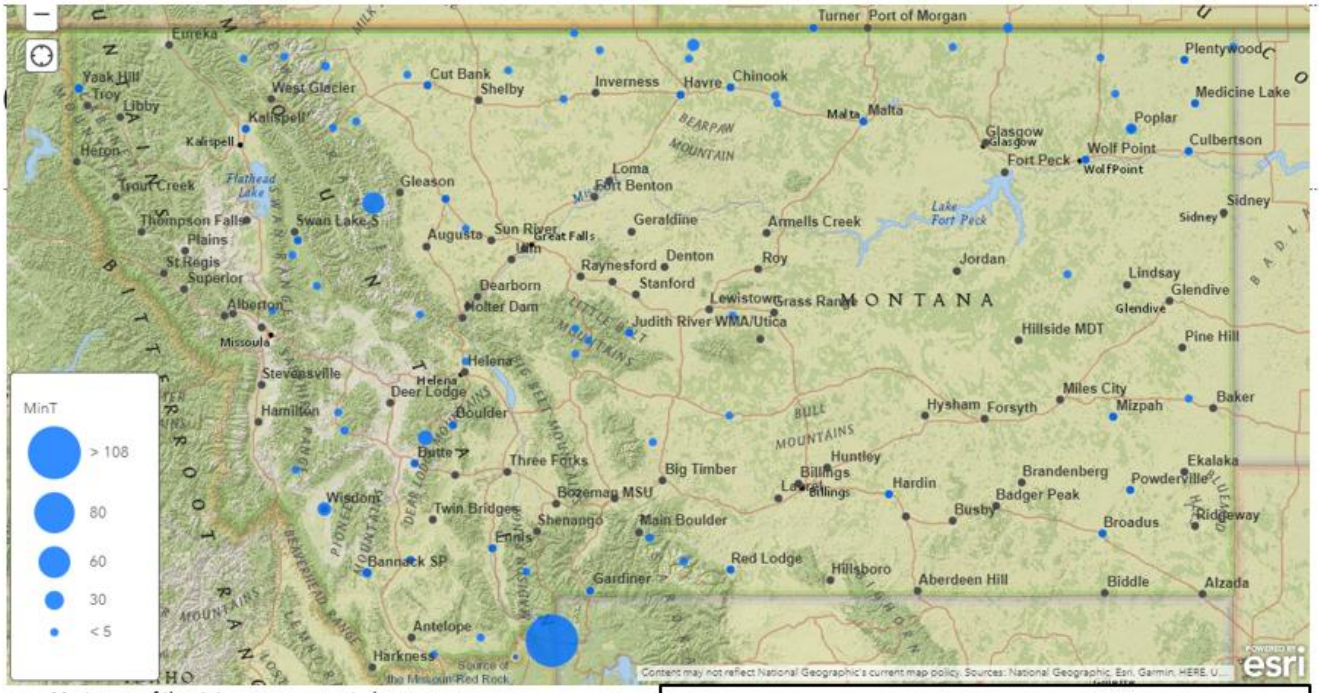


Figure 1. Mean flow at 500 millibars (~18,000 ft) for this month (upper left) and departure from normal (upper right).



- Most areas of the state were represented.
- Plains had 32 days with the highest temperature
- The next was Wolf Point with 26 days
- The next was a 22 day tie with Thompson Falls and Yaak Hill

Locations and number of days with the lowest reported temperature in Montana in 2018



Locations and number of days with the lowest reported temperature in Montana in 2018

- Most areas of the state were represented.
- West Yellowstone had 108 days with the lowest temperature
- The next was Gates Park with 37 days, and they report only about 5 months of the year
- The next was Elk Park with 21 days

Figure 2. The above maps show the frequency distribution of the highest and lowest daily temperatures recorded across Montana in 2018. Plains recorded the highest temperature in the state on 32 days while West Yellowstone had the lowest temperature on 108 days of the year.

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.