

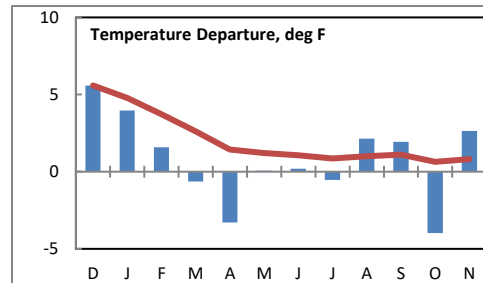
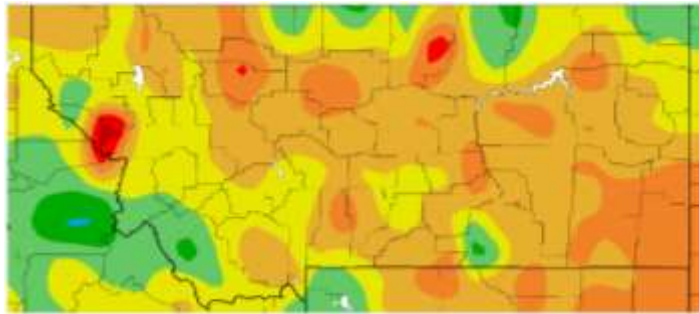
# Montana Weather/Precipitation Summary

**November 2020** NOAA's National Weather Service Great Falls Montana

The upper level flow averaged from a westerly direction over the state for much of November (Fig. 1). This is normal for November. After a cool pattern mid-month, this pattern produced above normal temperatures for the month. Precipitation was above normal over the hi-line and northwest, with below normal amounts elsewhere. Winds averaged above normal.

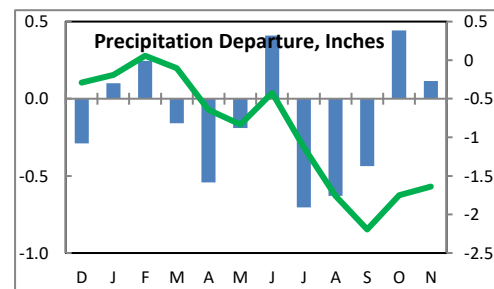
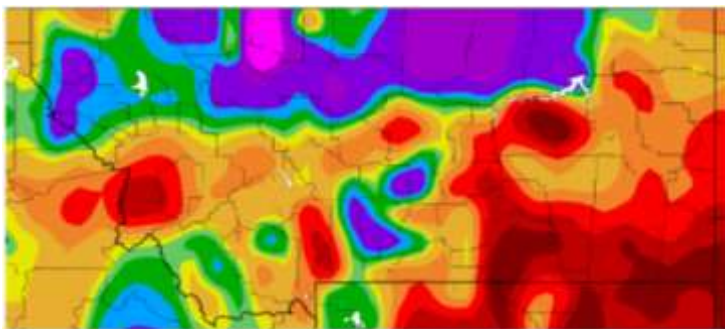
November temperature anomalies ranged from 0.9°F above normal at West Yellowstone to 5.1°F above normal at Baker and Livingston. The map below shows the variation in departures. The warmest average temperatures were in central and southeast Montana. The warmest average temperature was at Badger Peak (Rosebud), with an average of 40.8°F, while the coolest was 21.8°F at West Yellowstone. The highest temperature was 81°F at Armells Creek (Fergus) on the 2<sup>nd</sup>. The coldest temperature was -19°F at West Yellowstone on the 29<sup>th</sup>. This range of 100°F is near the November average range of 97°F. The statewide temperature average of 33.3°F was 2.6°F above normal and the 27<sup>th</sup> warmest of record. This was the warmest November since 2016. The red line on the graph shows the cumulative 12-month departure from normal, which was 0.8°F above normal. See the state summary and temperature tables below for more details.

## Temperature departure from normal

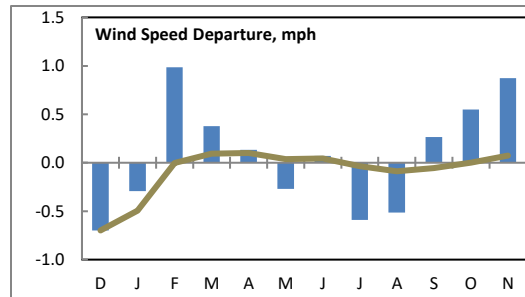


Precipitation was heaviest over the northern Rockies and along the northwest along the Idaho border. The highest amount (12.20-inches) fell over higher elevations in Lincoln County, with the highest amount at a lower elevation at Philipsburg (6.54-inches) (Granite). The month's statewide composite of 0.97" was 0.11" above normal. This ranks as the 51<sup>st</sup> wettest November of record for Montana. As in the past two months, some areas were very dry and some ranked wetter. Cut Bank and Mullan Pass had their 9<sup>th</sup> wettest November, while Jordan had its second driest. The green line on the precipitation graph shows the cumulative 12-month departure from normal, which is now 1.86" below normal. See state summary and precipitation tables below for more details.

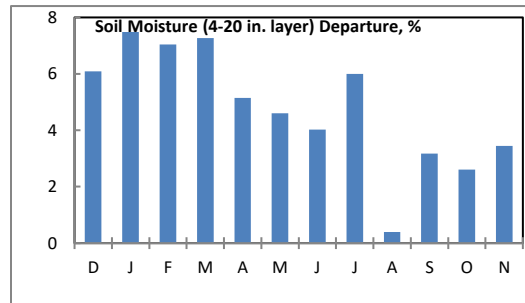
## Precipitation percent of normal (gauge only)



Wind speed averages were near to above normal. Statewide, the month ranked as the 24<sup>th</sup> windiest November, with an average speed of 9.9-mph. This was the strongest November average since 2006. The strongest averages were along the Rocky Mountain Front and Livingston areas. The composite statewide average was 0.1-mph above normal. The brown line of the wind graph to the right shows the 12-month cumulative statewide wind departure from normal.



After a storm from the 7<sup>th</sup>-9<sup>th</sup>, the month was mostly dry. See map later in document for coverage of snowfall). At lower elevations, the snow largely melted by the end of the month, with most soaking into the dry ground. Statewide soil moisture departures from normal ended up above normal, ranking 4<sup>th</sup> wettest of a 25-year record. This data is from 33 NRCS SCAN and SNOTEL, NOAA CRN and MT Mesonet stations.



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

November started out very warm with a few high temperatures in the 80s. This was the first instance of 80-degree temperatures in November in the state since 2010, and an 80°F temperature has only occurred in 17 of the last 131 years. Armells Creek had the highest temperature for the month, reaching 81°F on the 2<sup>nd</sup>. Very warm and windy conditions preceded a cold front sweeping across the state on the 5<sup>th</sup>. High temperatures were in the 60s and 70s, with wind gusts in the lower 70-mph range over north central Montana. The highest gust was 75-mph in the Augusta and Sunburst areas. A strong low-pressure area brought heavy snow to the state, with blizzard conditions in northcentral Montana on the 7<sup>th</sup> and 8<sup>th</sup>. Snow amounts of a foot fell over the hi-line, with 6-8-inches over western Montana and 10 to 16-inches in southcentral Montana. Wind gusts reached 65-mph with power outages over portions of the state. Ice coated lines were whipped by the strong winds, snapping poles in some locations. Outages lasted up to a week in the Ennis and Vaughn areas. Another system affected mainly western Montana on the 11<sup>th</sup>, producing 7-10-inches of snow from the Kalispell through the Missoula areas. Conditions warmed to near to above normal temperature values through the end of the month. This was also a very windy period. There were several days where wind gusts of more than 60-mph were reported at some location in the state. The Livingston area had gusts to 83-mph on the 13<sup>th</sup>, with 84-mph reported near Nye. The month’s highest gust of 92-mph occurred at Deep Creek RAWS on the 27<sup>th</sup>. High pressure caused strong temperature inversions over the high southwest valleys at the end of the month. West Yellowstone reported a low of -19°F on the 29<sup>th</sup>.

The highest daily temperatures in November occurred on four days at Little Bighorn RAWS (Treasure). West Yellowstone had the state’s lowest temperature on five days.

### Precipitation/convection

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

**November information:**

|  |   |   |   |
|--|---|---|---|
| <b>High Temperature</b>                        | 81°F at Armells Creek (2 <sup>nd</sup> )  | <b>Greatest Precip</b>                      | 6.54" at Philipsburg  |
| <b>Low Temperature</b>                         | -19°F West Yellowstone (29 <sup>th</sup> )  |   | 12.70" at Poorman Creek SNOTEL (Lincoln)  |
| <b>Warmest Ave Temp</b>                        | 40.5°F at Norris Madison (Madison)  | <b>Peak Wind Gust</b>                       | 84 mph at Nye (13 <sup>th</sup> )   |
| <b>Coollest Ave Temp</b>                       | 21.8°F at West Yellowstone  |   | 92 mph at Deep Creek RAWS (26 <sup>th</sup> )   |
| <b>Range of Temp departures</b>                | 0.5°F at Missoula to 5.1°F at Baker and Livingston  | <b>Highest Ave Wind</b>                     | 28.0 mph at Deep Creek RAWS<br>21.6 mph at Cut Bank   |
| <b>21 city mean monthly Temperature/Nrml</b>   | 33.3/30.6F normal. 47 <sup>th</sup> warmest of record (since 1880). 67 <sup>th</sup> percentile.            | <b>20 city mean monthly wind speed/Nrml</b> | 9.3 mph/8.7 mph; 34 <sup>th</sup> windiest of record (since 1936). 60 <sup>th</sup> percentile. |
| <b>22 city mean monthly precipitation/Nrml</b> | 0.97"/0.85" – 113% of normal. 51 <sup>st</sup> wettest of record (since 1880). 63 <sup>rd</sup> percentile. | <b>20 city mean monthly snowfall/Nrml</b>   | 12.3"/2.9" – 3 <sup>rd</sup> highest of record (since 1880). 97 <sup>th</sup> percentile        |

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

| Location    | Nov  | % of Norm | Rank | Pcntl | Oct 1 – Nov 30 | % of norm | Rank | Pcntl | Years |
|-------------|------|-----------|------|-------|----------------|-----------|------|-------|-------|
| Baker       | 0.22 | 45%       | 68   | 30    | 1.01           | 59%       | 54   | 44    | 96    |
| Billings    | 0.37 | 59%       | 79   | 65    | 2.53           | 140%      | 26   | 21    | 120   |
| Belgrade    | 0.27 | 36%       | 76   | 90    | 1.38           | 75%       | 57   | 67    | 84    |
| Butte       | 0.45 | 75%       | 66   | 52    | 1.29           | 93%       | 58   | 45    | 127   |
| Cut Bank    | 1.00 | 278%      | 9    | 7     | 2.47           | 309%      | 3    | 2     | 114   |
| Dillon      | 0.21 | 54%       | 54   | 66    | 0.25           | 23%       | 76   | 94    | 81    |
| Glasgow     | 0.82 | 205%      | 15   | 11    | 2.04           | 177%      | 13   | 10    | 123   |
| Great Falls | 0.93 | 158%      | 44   | 34    | 2.97           | 205%      | 9    | 6     | 129   |
| Havre       | 0.65 | 151%      | 41   | 29    | 1.49           | 148%      | 35   | 24    | 141   |
| Helena      | 0.36 | 73%       | 83   | 58    | 2.39           | 204%      | 15   | 10    | 142   |
| Jordan      | 0.01 | 3%        | 91   | 92    | 0.78           | 61%       | 65   | 67    | 97    |
| Kalispell   | 1.80 | 126%      | 30   | 23    | 4.48           | 184%      | 10   | 7     | 127   |
| Lewistown   | 0.35 | 49%       | 90   | 72    | 1.67           | 91%       | 68   | 54    | 125   |
| Livingston  | 0.59 | 100%      | 60   | 50    | 2.71           | 146%      | 25   | 21    | 118   |
| Miles City  | 0.28 | 72%       | 90   | 62    | 1.13           | 86%       | 78   | 54    | 144   |
| Missoula    | 0.62 | 58%       | 90   | 63    | 3.55           | 181%      | 10   | 6     | 141   |
| Mullan Pass | 8.58 | 177%      | 9    | 10    | 14.69          | 186%      | 6    | 6     | 83    |
| Wolf Point  | 0.22 | 56%       | 37   | 47    | 0.70           | 58%       | 51   | 65    | 78    |
| Glendive    | 0.26 | 58%       | 79   | 61    | 1.28           | 85%       | 57   | 45    | 125   |
| Sidney      | 0.18 | 33%       | 59   | 72    | 0.85           | 52%       | 57   | 70    | 81    |
| BZN MSU     | 0.39 | 33%       | 123  | 86    | 2.10           | 72%       | 87   | 60    | 144   |
| W Yellowst  | 2.70 | 131%      | 24   | 20    | 4.42           | 123%      | 29   | 25    | 112   |

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    | Nov  | Normal | Rank | Pcntl | Oct 1 –<br>Nov 30 | Normal | Rank | Pcntl | Years |
|-------------|------|--------|------|-------|-------------------|--------|------|-------|-------|
| Baker       | 35.1 | 29.7   | 23   | 20    | 37.0              | 36.5   | 79   | 72    | 109   |
| Billings    | 39.3 | 35.8   | 32   | 25    | 41.7              | 42.0   | 75   | 61    | 123   |
| Belgrade    | 31.7 | 29.7   | 32   | 36    | 36.1              | 36.5   | 54   | 62    | 86    |
| Butte       | 29.0 | 27.7   | 65   | 51    | 34.1              | 34.3   | 83   | 65    | 127   |
| Cut Bank    | 34.8 | 30.3   | 26   | 23    | 36.0              | 36.6   | 68   | 60    | 112   |
| Dillon      | 31.5 | 30.5   | 39   | 50    | 36.8              | 37.0   | 53   | 68    | 77    |
| Glasgow     | 31.6 | 29.3   | 43   | 34    | 35.4              | 37.0   | 90   | 71    | 126   |
| Great Falls | 37.2 | 33.4   | 40   | 31    | 39.0              | 39.3   | 92   | 74    | 124   |
| Havre       | 32.7 | 30.2   | 50   | 35    | 36.0              | 37.3   | 105  | 74    | 141   |
| Helena      | 35.6 | 32.5   | 33   | 23    | 39.4              | 39.1   | 66   | 46    | 141   |
| Jordan      | 34.2 | 30.1   | 28   | 26    | 37.3              | 37.2   | 75   | 73    | 102   |
| Kalispell   | 33.8 | 31.8   | 53   | 43    | 36.9              | 37.0   | 59   | 48    | 122   |
| Lewistown   | 35.5 | 32.0   | 37   | 30    | 37.6              | 37.9   | 81   | 66    | 122   |
| Livingston  | 39.1 | 34.0   | 27   | 22    | 41.1              | 39.6   | 61   | 51    | 118   |
| Miles City  | 36.1 | 32.0   | 37   | 26    | 39.0              | 39.3   | 97   | 69    | 140   |
| Missoula    | 33.7 | 33.2   | 56   | 43    | 38.0              | 39.2   | 85   | 66    | 129   |
| Mullan Pass | 28.1 | 27.2   | 16   | 36    | 32.8              | 32.4   | 21   | 47    | 44    |
| Wolf Point  | 30.7 | 27.7   | 27   | 34    | 33.9              | 35.7   | 64   | 84    | 76    |
| Glendive    | 34.3 | 33.0   | 46   | 37    | 36.5              | 40.4   | 111  | 89    | 125   |
| Sidney      | 32.5 | 31.6   | 30   | 30    | 35.3              | 39.3   | 78   | 80    | 98    |
| W Yellowst  | 21.8 | 20.9   | 64   | 58    | 28.3              | 28.3   | 83   | 73    | 114   |

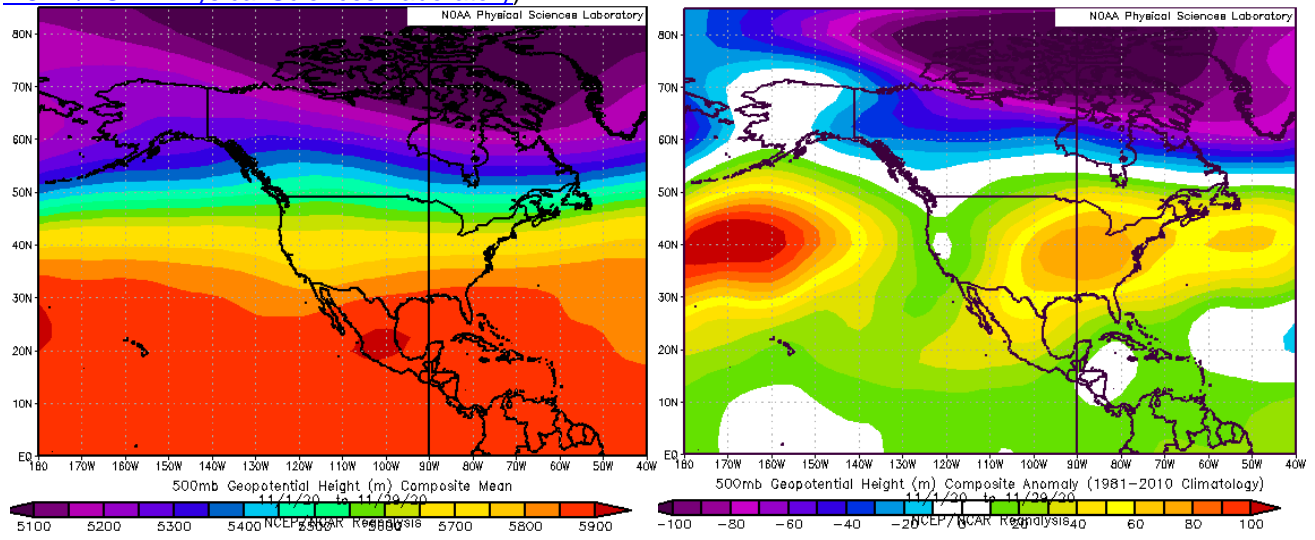
Rankings and Percentiles are 1=coldest, higher numbers=warmer.

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

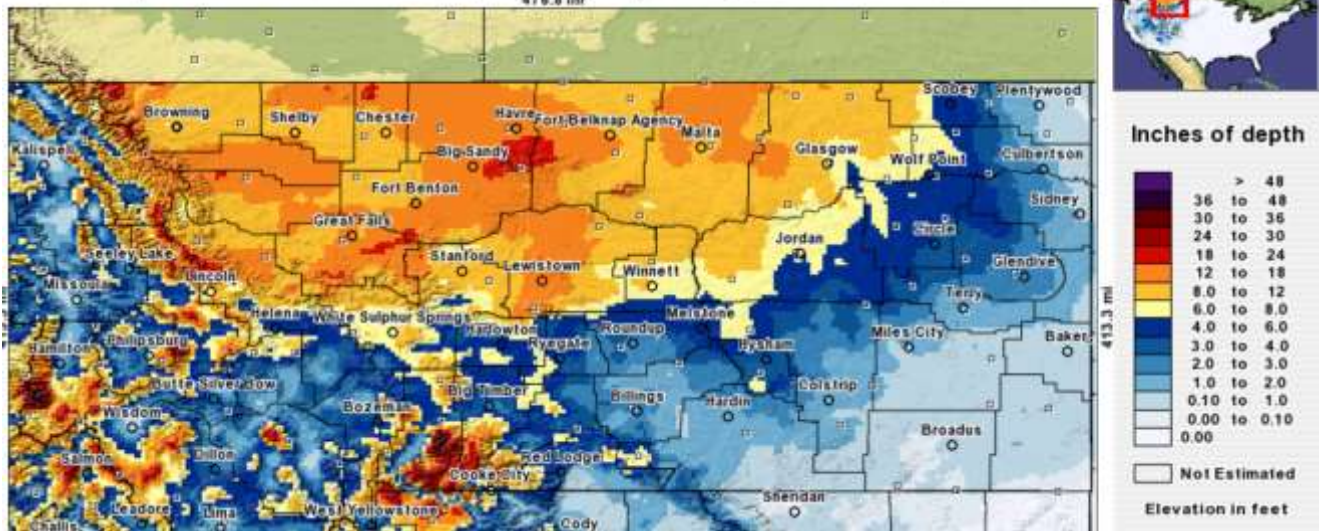
| Location    | Nov  | Normal | Rank | Pcntl | Oct 1 –<br>Nov 30 | Normal | Rank | Pcntl | Years |
|-------------|------|--------|------|-------|-------------------|--------|------|-------|-------|
| Baker       | 11.0 | 10.8   |      |       | 11.2              | 10.6   |      |       | 23    |
| Billings    | 13.1 | 11.6   | 20   | 22    | 12.7              | 11.0   | 10   | 11    | 86    |
| Belgrade    | 4.9  | 4.8    | 33   | 59    | 5.7               | 5.1    | 20   | 35    | 55    |
| Butte       | 4.8  | 5.6    | 38   | 66    | 5.4               | 6.0    | 39   | 68    | 57    |
| Cut Bank    | 18.4 | 14.3   | 6    | 7     | 15.9              | 13.8   | 9    | 11    | 77    |
| Dillon      | 10.4 | 9.2    | 18   | 26    | 10.6              | 9.0    | 10   | 14    | 67    |
| Glasgow     | 9.6  | 9.6    | 18   | 22    | 10.1              | 10.0   | 35   | 45    | 76    |
| Great Falls | 16.8 | 14.2   | 7    | 7     | 14.6              | 13.3   | 21   | 24    | 83    |
| Havre       | 13.2 | 9.3    | 2    | 1     | 11.8              | 9.1    | 4    | 2     | 132   |
| Helena      | 6.7  | 6.4    | 90   | 64    | 6.8               | 6.5    | 84   | 59    | 141   |
| Jordan      | 8.2  | 7.1    | 9    | 22    | 8.6               | 7.5    | 5    | 11    | 37    |
| Kalispell   | 5.6  | 4.8    | 119  | 98    | 5.4               | 4.7    | 116  | 95    | 122   |
| Lewistown   | 12.5 | 10.1   | 9    | 11    | 11.0              | 9.7    | 11   | 13    | 77    |
| Livingston  | 21.6 | 18.6   | 6    | 9     | 18.7              | 17.1   | 7    | 11    | 56    |
| Miles City  | 9.5  | 9.6    | 38   | 29    | 9.8               | 9.8    | 35   | 26    | 130   |
| Missoula    | 3.9  | 4.6    | 63   | 73    | 4.3               | 4.7    | 57   | 66    | 86    |
| Mullan Pass | 5.8  | 6.2    | 20   | 61    | 5.7               | 6.1    | 22   | 72    | 30    |
| Wolf Point  | 6.6  | 7.3    |      |       | 7.5               | 7.5    |      |       | 23    |
| Glendive    | 10.0 | 10.2   | 13   | 45    | 10.0              | 10.1   | 13   | 45    | 29    |
| Sidney      | 9.3  | 9.1    | 10   | 29    | 9.30              | 9.0    | 8    | 24    | 33    |
| W Yellowst  | 6.6  | 6.6    |      |       | 6.95              | 6.1    |      |       | 8     |

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://noaa.esrl.noaa.gov/physical_sciences_laboratory/)).



**Interpolated Observed Snowfall Analysis during 48h preceding 2020 November 9, 12:00 UTC**



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 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 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.