

# Montana Weather/Precipitation Summary

October 2011 by NOAA's National Weather Service Great Falls Montana

October started out very warm. Several all-time October warm temperatures were established on the 1<sup>st</sup>. General westerly flow dominated most of the month, bringing mostly above normal temperatures. (Figs. 1, 2 and 3). Some areas of the state did have below normal precipitation, with much above normal precipitation through central Montana (Figs. 1 and 4).

**Temperatures** across the state averaged 47.0F; about 3.6 degrees above normal (Fig. 1). This was the 42<sup>nd</sup> warmest October, and the fourth consecutive month with above normal temperatures. Temperatures averaged warmest over eastern Montana (Fig. 3). This was the third consecutive month of above normal temperatures. The statewide average temperature for the past 12 months is 1.4F below normal.

**Precipitation** averaged above normal most areas in October (Fig. 1). After three-consecutive months with below normal precipitation, October averaged 0.18-inches above normal. This was 116% of normal, and the 31<sup>st</sup> wettest October of record. The precipitation excess over the average in the past 12 months is 3.43 inches. Small areas of north central and eastern Montana recorded below average precipitation (Fig. 4). Snowfall was mostly limited to higher elevations for the month. The average of 19 lower elevation stations was a 0.1 inches. This was the lowest October average since 1987.

**Wind speeds** continued to average below monthly averages in October (Fig. 1). This was the 5<sup>th</sup> consecutive month with below average wind speeds. The windiest area was in the normally windy areas near the Rockies. October's average of 8.2 mph was 1.1 mph below the monthly normal, and the 17<sup>th</sup> calmest October of record.

**Soil moisture** conditions recovered a bit after a couple of heavier precipitation events (Fig. 1). After the very dry September, the composite of 19 stations across the state show the driest average October conditions since 2008, but 0.7 percentage points above the 1995-2011 average.

## October 1-6

Above normal temperatures prevailed across the state. Temperatures on the 1<sup>st</sup> reached 97F at Powderville. This tied the all-time high temperature recorded in October in Montana, and was last set at Miles City on October 1, 1953. Several locations set new October all-time high temperature records. Temperatures gradually cooled over western portions, while remained warm east. A cold front on the 5<sup>th</sup> and 6<sup>th</sup> brought thunderstorms, some hail and much cooler air to the state. Even so, temperatures still peaked at 90F at Wolf Point on the 6<sup>th</sup>, before the cold front passed.

## October 7-18

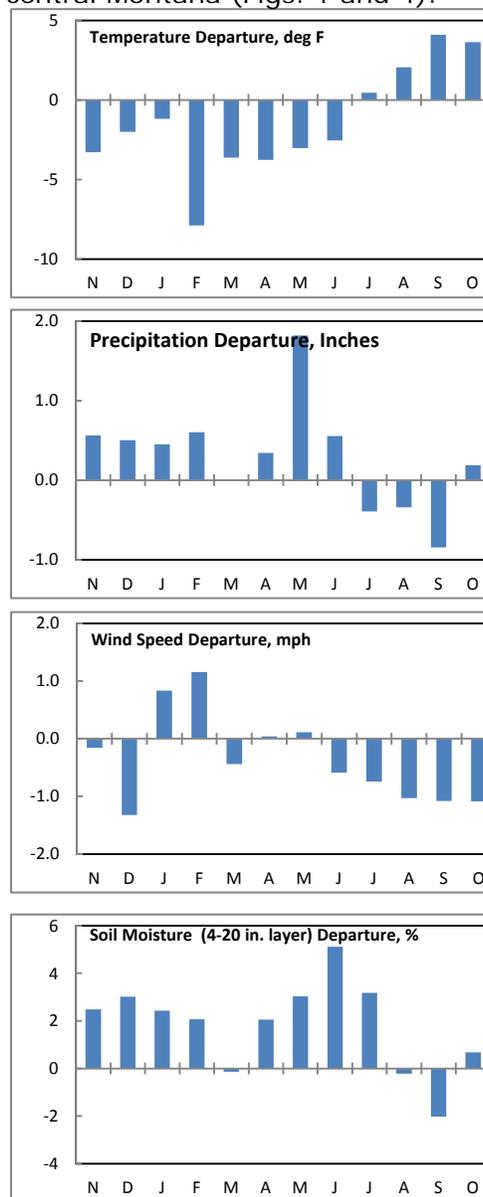


Figure 1. Statewide departures from normal for 18 locations.

This period was dominated by periods of precipitation, winds and temperatures varying a little above to a little below normal. Some areas of the state picked up over an inch of precipitation on the 6<sup>th</sup> and 7<sup>th</sup>. Wolf Mountain (Big Horn) collected 2.25 inches, while Roundup (Musselshell) and Noisy Basin (Flathead) measured 3.0 inches. This was the most significant precipitation across the state since early June. After the precipitation moved out and clear skies prevailed, temperatures fell as low as 13F at Wisdom on the 9<sup>th</sup>. A windy period around the 12<sup>th</sup> produced gusty winds along the Rocky Mountain Front, with gusts to 80 mph at Logan Pass. Another round of precipitation fell most areas from the 14<sup>th</sup> through 16<sup>th</sup>. Cooler air across northern Montana caused temperatures as low as 12 at Simpson on the 16<sup>th</sup>.

### October 19-23

Warmer conditions again returned for a few days. Temperatures peaked near 70 over eastern portions of the state, with Huntley reaching 71F on the 20<sup>th</sup>. Windy and mostly dry conditions prevailed. Winds gusted to 85 mph at Logan Pass on the 22<sup>nd</sup>.

### October 24-31

Cooler temperatures with a little precipitation returned. Temperatures fell well below freezing on the 26<sup>th</sup>, for the first time of the fall over the entire state. Precipitation accompanying a weather system dropped snow over higher elevations on the 25<sup>th</sup> and 26<sup>th</sup>, with a little snow falling at Great Falls. Clearing skies caused temperatures as low as 8F at West Yellowstone on the 27<sup>th</sup>. The month ended with a cold front passing, bringing a cooler air mass to the state. Some snow and rain showers fell, with temperatures near seasonal normals.

### New Temperature Records for the current month

| Station    | Record Type      | New Record | Date | Previous Record | Year of Previous Record |
|------------|------------------|------------|------|-----------------|-------------------------|
| Billings   | High Daily Max   | 91         | 1    | 90              | 1992                    |
| Billings   | All-time Oct Max | 91         | 1    | 90              | Oct 1, 1992             |
| Bozeman    | High Daily Max   | 89         | 1    | 88              | 1992                    |
| Bozeman    | All-time Oct Max | 89         | 1    | 89 Tied         | Oct 3, 2010             |
| Dillon     | High Daily Max   | 83         | 1    | 83 Tied         | 1957                    |
| Lewistown  | High Daily Max   | 90         | 1    | 89              | 1957                    |
| Livingston | High Daily Max   | 91         | 1    | 87              | 1992                    |
| Livingston | All-time Oct Max | 91         | 1    | 91 Tied         | Oct 3, 2010             |
| Miles City | High Daily Max   | 95         | 1    | 95 Tied         | 2005                    |
| Miles City | All-time Oct Max | 95         | 1    | 95 Tied         | Oct 2, 1997             |
| Billings   | High Daily Min   | 57         | 2    | 55              | 1997                    |
| Dillon     | High Daily Min   | 47         | 2    | 47 Tied         | 1957                    |
| Helena     | High Daily Max   | 85         | 2    | 85 Tied         | 1963                    |
| Billings   | High Daily Min   | 52         | 3    | 52 Tied         | 1943                    |
| Bozeman    | High Daily Min   | 52         | 4    | 52 Tied         | 1963                    |
| Glasgow    | High Daily Min   | 56         | 4    | 52              | 2008                    |
| Billings   | High Daily Min   | 56         | 5    | 55              | 1980                    |
| Glasgow    | High Daily Min   | 52         | 5    | 51              | 1963                    |
| Miles City | High Daily Min   | 58         | 5    | 54              | 1905                    |
| Glasgow    | High Daily Min   | 56         | 6    | 53              | 1938/1986               |
| Dillon     | Low Daily Min    | 14         | 26   | 16              | 1954                    |

### Precipitation/convection

Severe convective weather occurred on zero days in October.

### New Precipitation Records for the current month

| Station     | Record Type       | New Record | Date | Previous Record | Year of Previous Record |
|-------------|-------------------|------------|------|-----------------|-------------------------|
| Cut Bank    | High Daily Precip | 0.61       | 5    | 0.54            | 2007                    |
| Lewistown   | High Daily Precip | 0.62       | 6    | 0.37            | 2007                    |
| Lewistown   | High Daily Precip | 1.13       | 7    | 1.05            | 2006                    |
| Great Falls | High Daily Precip | 0.81       | 8    | 0.65            | 1993                    |
| Kalispell   | High Daily Precip | 0.64       | 8    | 0.53            | 1975                    |

**October summary information:**

|  |   |   |  |
|--|---|---|--|
| <b>High Temperature</b>                          | 97°F at Powderville (1 <sup>st</sup> )                                    | <b>Greatest Precip</b>                        | 3.90" at West Glacier<br>9.30" at Poorman Creek (Lincoln)                        |
| <b>Low Temperature</b>                           | 4°F at Placer Basin (27 <sup>th</sup> ) (Sweet Grass)                     |   |  |
| <b>Warmest Ave Temp</b>                          | 52.9°F at Glendive (Dawson)   | <b>Peak Wind Gust</b>                         | 48 mph at Helena (22 <sup>nd</sup> )<br>85 mph at Logan Pass (22 <sup>nd</sup> ) |
| <b>Coollest Ave Temp</b>                         | 37.3°F at Mullan Pass   |   |  |
| <b>Range of Temp departures</b>                  | -2.0°F at Shelby to +5.0°F at Divide                                      | <b>Highest Ave Wind</b>                       | 18.7 mph at Deep Creek;<br>13.0 mph at Norris Hill                               |
| <b>21 city mean monthly Temperature/Normal</b>   | 47.0/43.4; 42 <sup>nd</sup> warmest of record (since 1880)                | <b>20 city mean monthly wind speed/Normal</b> | 8.2 mph/8.9 mph; 17 <sup>th</sup> calmest of record (since 1936)                 |
| <b>22 city mean monthly precipitation/Normal</b> | 1.26/1.08" – 116% normal; 31 <sup>st</sup> wettest of record (since 1880) | <b>19 city mean monthly snow/Normal</b>       | 0.1/2.7 – 2.5 inches below normal; 7 <sup>th</sup> lowest of record (since 1880) |

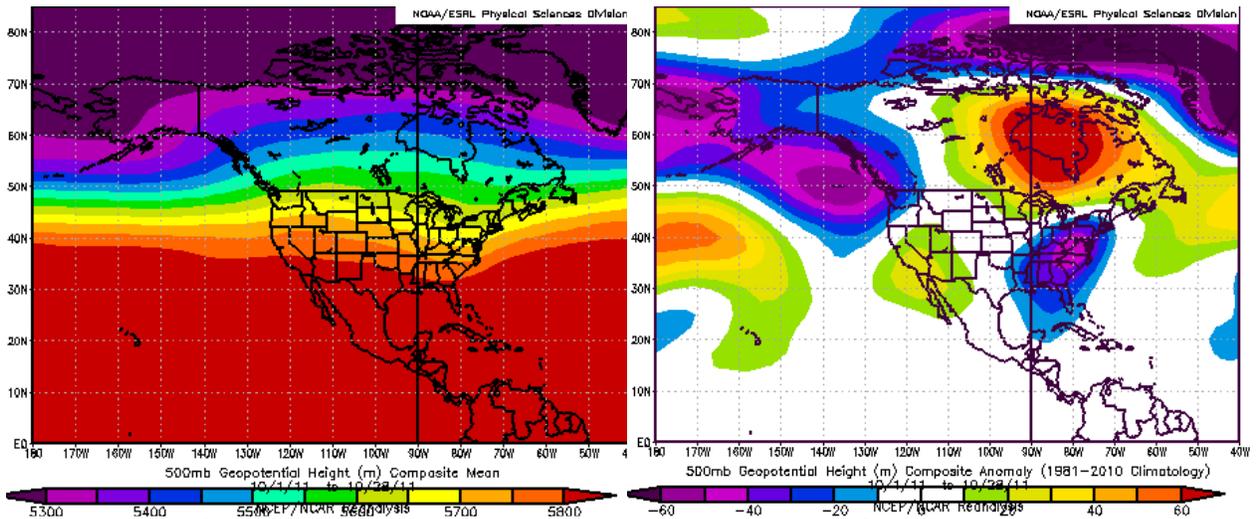
**Historical Rank of Precipitation (inches)  
for the Current Month and Water Year to Date**

| Location    | Oct  | % of Norm | Rank | Pcntl | Oct 1 – Oct 31 | % of norm | Rank | Pcntl | Years |
|-------------|------|-----------|------|-------|----------------|-----------|------|-------|-------|
| Baker       | 0.81 | 67%       |      |       | 0.81           | 67%       |      |       | 14    |
| Billings    | 1.66 | 132%      | 89   | 80    | 1.66           | 132%      | 89   | 80    | 111   |
| Belgrade    | 0.84 | 76%       | 33   | 43    | 0.84           | 76%       | 33   | 43    | 75    |
| Butte       | 0.72 | 92%       | 67   | 56    | 0.72           | 92%       | 67   | 56    | 118   |
| Cut Bank    | 1.30 | 295%      | 101  | 96    | 1.30           | 295%      | 101  | 96    | 105   |
| Dillon      | 0.66 | 96%       | 47   | 65    | 0.66           | 96%       | 47   | 65    | 72    |
| Glasgow     | 0.71 | 95%       | 69   | 60    | 0.71           | 95%       | 69   | 60    | 115   |
| Great Falls | 2.24 | 260%      | 115  | 96    | 2.24           | 260%      | 114  | 95    | 120   |
| Havre       | 0.17 | 29%       | 24   | 18    | 0.17           | 29%       | 24   | 18    | 132   |
| Helena      | 0.55 | 81%       | 62   | 47    | 0.55           | 81%       | 62   | 47    | 132   |
| Jordan      | 1.23 | 138%      |      |       | 1.23           | 138%      |      |       | 15    |
| Kalispell   | 1.86 | 184%      | 105  | 89    | 1.86           | 184%      | 105  | 89    | 118   |
| Lewistown   | 2.58 | 228%      | 112  | 97    | 2.58           | 228%      | 112  | 97    | 116   |
| Livingston  | 1.08 | 86%       | 59   | 54    | 1.08           | 86%       | 59   | 54    | 109   |
| Miles City  | 0.66 | 72%       | 67   | 49    | 0.66           | 72%       | 67   | 49    | 135   |
| Missoula    | 2.40 | 267%      | 128  | 97    | 2.40           | 267%      | 126  | 95    | 132   |
| Mullan Pass | 3.66 | 119%      | 48   | 66    | 3.66           | 119%      | 46   | 63    | 72    |
| Wolf Point  | 1.00 | 123%      |      |       | 1.00           | 123%      |      |       | 14    |
| Glendive    | 0.83 | 78%       | 78   | 67    | 0.83           | 78%       | 78   | 68    | 115   |
| Sidney      | 0.43 | 39%       | 22   | 30    | 0.43           | 39%       | 22   | 30    | 72    |
| BZN-MSU     | 1.56 | 91%       | 79   | 59    | 1.56           | 91%       | 79   | 59    | 133   |

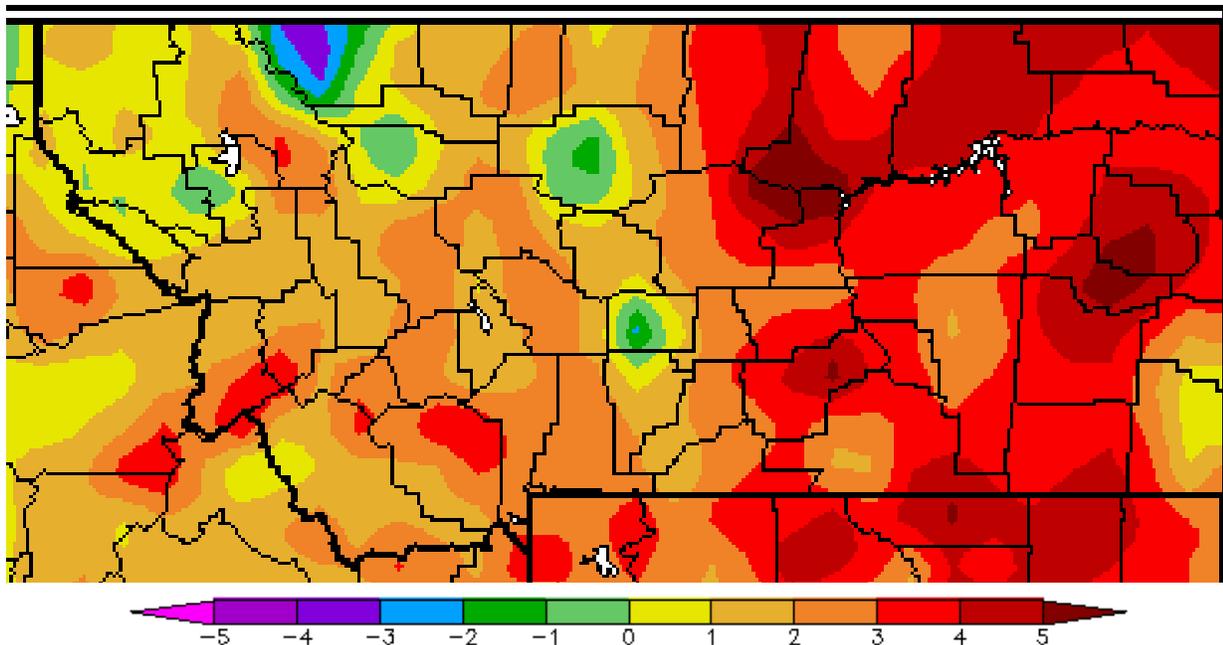
Rankings and Percentiles are 1=driest, higher numbers=wetter.

For an automated version of this chart, updated daily, go to

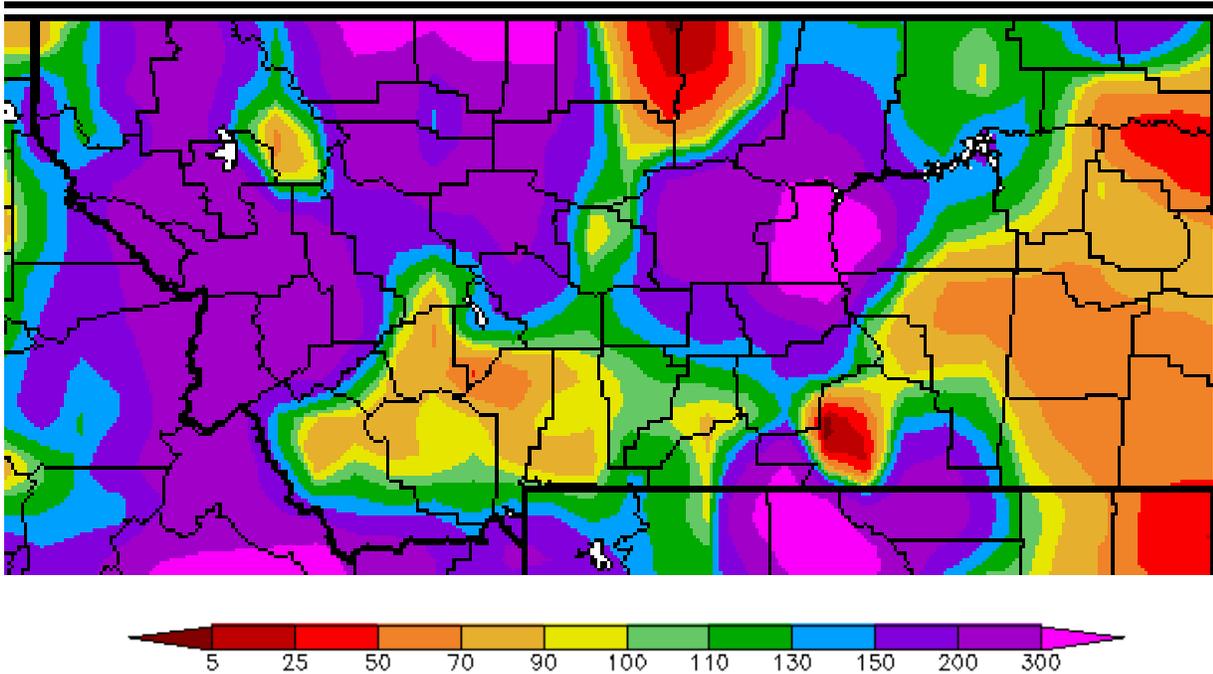
<http://www.wrh.noaa.gov/tfx/dx.php?wfo=tfx&type=&loc=products&fx=PCPNTOTALS>



**Figures 2a (left); 2b (right).** Mean flow at 500 millibars (~18,000 ft) for October (left). A trough of low pressure dominated the west coast (left). This was a below normal condition for October, as noted by the large area of blue on the right-hand image.



**Figure 3.** Temperature anomaly for October. Temperatures averaged above normal most areas. (Western Region Climate Center).



**Figure 4.** Precipitation anomaly (% of normal) for October.

For a state map of % of normal water year precipitation (updated around the 7<sup>th</sup> of each month), go to:  
[http://www.wrh.noaa.gov/tfx/image.php?wfo=tfx&type=data&loc=hydro&fx=watyr\\_pcbtnorm.png](http://www.wrh.noaa.gov/tfx/image.php?wfo=tfx&type=data&loc=hydro&fx=watyr_pcbtnorm.png)

For the latest information on mountain snow pack from the NRCS, go to:  
<http://www.mt.nrcs.usda.gov/snow/index.html>

For the latest U.S. Drought Monitor, issued weekly by the Climate Prediction Center (CPC), go to:  
<http://www.drought.unl.edu/dm/monitor.html>

These data are preliminary and have not undergone final QC by NCDC. Therefore, these data are subject to revision. Final and certified climate data can be access at the National Climatic Data Center (NCDC) <http://www.ncdc.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 1971-2000. 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.