

Montana Weather/Precipitation Summary

July 2006 By NOAA's National Weather Service Great Falls Montana

The main highlight for July was continued hot and dry! Temperatures ranged as high as 8 degrees above normal for the month. This was one of the warmest Julys since 1936. Several new daily high temperatures were set from the 12th through 30th. The warmest was 108°F at Albion on the 28th. Some locations recorded the greatest number of days over 90°F in July since 1936. Helena, Bozeman and Lewistown all had their 2nd warmest Julys of record. The persistent warmth this summer has produced the warmest June through July period of record at Helena. The old record occurred during the warm summer of 2003. Also, the first 7 months of 2006 have averaged the warmest of record at Helena. The old record was in 1934.

The average daily July high temperature in 2006 was the warmest of record at Helena and Bozeman. These conditions were representative of hot conditions across the state. Missoula topped 100°F four times this month. This is the 4th time since 1893 that there have been 4 or more days over 100°F at Missoula. Glasgow went over 100°F seven times this month. This is the most in July since 17 times in July 1936. Many other locations had their 2nd or 3rd warmest Julys of record.

During one very warm period on the 12th, Pine Hill, near Glendive, recorded 105°F. Winds gusted up to 35 mph during this heat. Many new record high temperatures were set across the state on the 12th and 13th. Then, a cold front brought cooler air and some scattered precipitation to the state. Clover Meadow (in the southwest) fell to 26°F on the 13th. Heat soon returned. Over the weekend of the 15th and 16th, temperatures soared into the 100 degree range again. Fort Howes reached 107°F on the 15th, with Glendive at 105°F on both the 15th and 16th. As noted earlier, the heat persisted through month's end with many more records falling. A cold front moved through the state on the 30th, bringing an end to the lengthy record-setting heat wave. Wind gusts over 40 mph were common across the state after the front passed with areas of blowing dust, but it did bring cooler air for the last day of the month. The cooler air brought overnight lows in the 30s to northwestern Montana on the morning of the 31st. Kalispell set a new record low temperature on the final day of the month.

Severe weather occurred on 14 days. The average for July is 10 days. Severe thunderstorms brought hail, heavy rain and strong winds to northwest Montana on the 6th and 10th. Thunderstorms along a cold front on the 12th and 13th brought high winds and hail to portions of central and south central Montana. Winds reached 79 mph at Bighorn Mountain as thunderstorms passed early in the morning on the 13th. Thunderstorms moving through north central Montana produced 73 mph winds at Loma on the 24th. Though the month was dry, only a few sites ranked among their 10 driest Julys. Havre had but 0.07", for their 3rd driest July of record. Most areas had less than one-half their normal monthly precipitation. Exceptions were along southern tier in the Madison, Absarokee and Bridger ranges, and in the northwest (Figure 2). The increased dryness has brought on the wildfire season, with several fires burning across the state at month's end (Figure 3).

Figure 1 shows the average flow pattern during July. An upper level ridge has continued to dominate the weather over the western US during July. It brought very warm and drier conditions to most of Montana. It has been a stronger-than-normal ridge for July. Above normal heights associated with the upper air ridge have contributed to the above normal temperatures across the state.

Preliminary numbers show that the statewide average temperature for July 2006 is about 71.1F. This is the 5th warmest July of record for Montana (since 1866). Warmer Julys include 1936 (74.7°F), 1886 (73.1°F), 1874 (72.7°F), and 2003 (71.3°F). This warmth is coupled with a statewide average precipitation that ranks 12th driest. 1936 is the 32nd driest, 1886 is the 23rd driest, 1874 is the 9th driest, and 2003 is the 5th driest.

Month's summary information (to date):

| | | | |
|---------------------------------|--|-------------------------|--|
| High Temperature | 108°F at Albion (28 th) (se Montana) | Greatest Precip | 2.26" at Jette (nw Montana) |
| Low Temperature | 26°F at Clover Meadow (13 th) (sw Montana) | | 3.20" at Monument Pk (SC Montana) |
| Warmest Ave Temp | 80.6°F at Glendive | Peak Wind Gust | 79 mph at Bighorn Mtn (13 th) |
| Coollest Ave Temp | 58.3°F at Cooke City | | |
| Range of Temp Departures | +2.9°F at Cooke City to +8.3°F at Albion | Highest Ave Wind | 13.8 mph near East Glacier and Logan Pass 11.5 mph near Lame Deer |

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

| Location | Jul | % of Norm | Rank | Pcntl | Oct 1 – Jul 31 | % of norm | Rank | Pcntl | Years |
|-------------|------|-----------|------|-------|----------------|-----------|------|-------|-------|
| Baker | 0.22 | 16% | | | 8.54 | 90% | | | 8 |
| Billings | 0.40 | 31% | 30 | 31 | 10.16 | 81% | 51 | 53 | 96 |
| Belgrade | 0.65 | 55% | 28 | 40 | 12.25 | 101% | 49 | 75 | 65 |
| Butte | 0.74 | 50% | 41 | 37 | 11.93 | 115% | 77 | 69 | 112 |
| Cut Bank | 0.40 | 25% | 22 | 22 | 3.77 | 39% | 2 | 2 | 98 |
| Dillon | 0.51 | 45% | 20 | 30 | 8.14 | 103% | 40 | 61 | 66 |
| Glasgow | 0.33 | 19% | 11 | 10 | 7.33 | 81% | 22 | 21 | 106 |
| Great Falls | 0.27 | 19% | 13 | 11 | 15.55 | 129% | 95 | 83 | 114 |
| Havre | 0.07 | 5% | 3 | 2 | 7.38 | 80% | 24 | 19 | 126 |
| Helena | 0.39 | 29% | 29 | 23 | 11.20 | 125% | 87 | 68 | 128 |
| Jordan | 0.46 | 27% | | | 9.09 | 100% | | | 7 |
| Kalispell | 1.25 | 89% | 75 | 66 | 15.85 | 107% | 64 | 57 | 112 |
| Lewistown | 0.59 | 28% | 10 | 9 | 15.01 | 103% | 69 | 63 | 110 |
| Livingston | 0.58 | 43% | 21 | 20 | 11.34 | 88% | 43 | 43 | 100 |
| Miles City | 0.67 | 42% | 35 | 27 | 10.35 | 93% | 60 | 47 | 129 |
| Missoula | 0.33 | 30% | 27 | 21 | 14.20 | 123% | 102 | 84 | 121 |
| Mullan Pass | 1.37 | 85% | 44 | 66 | 43.17 | 135% | 56 | 88 | 64 |
| Wolf Point | 0.35 | 17% | | | 7.34 | 78% | | | 8 |
| Glendive | 0.34 | 19% | 7 | 6 | 10.85 | 100% | 49 | 48 | 103 |
| Sidney | 0.32 | 15% | 3 | 5 | 11.40 | 99% | 36 | 55 | 65 |
| BZN-MSU | 1.24 | 86% | 69 | 55 | 17.58 | 110% | 98 | 80 | 123 |

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>

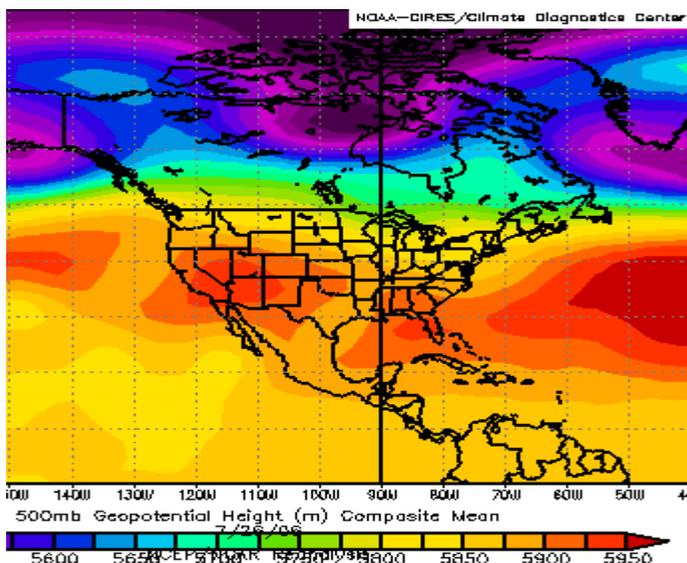


Figure 1. Mean flow at 500 millibars (~18,000 ft) in July 2006. The strength of the ridge over the western U.S. was somewhat above the normal for July.

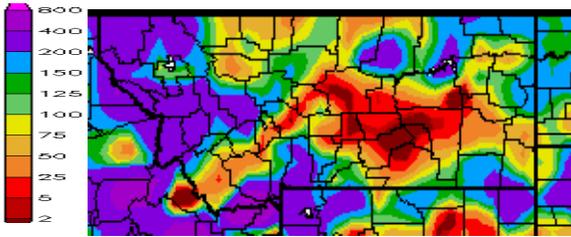


Figure 2. Precipitation anomaly (% of normal) for July. (courtesy High Plains Climate Center).

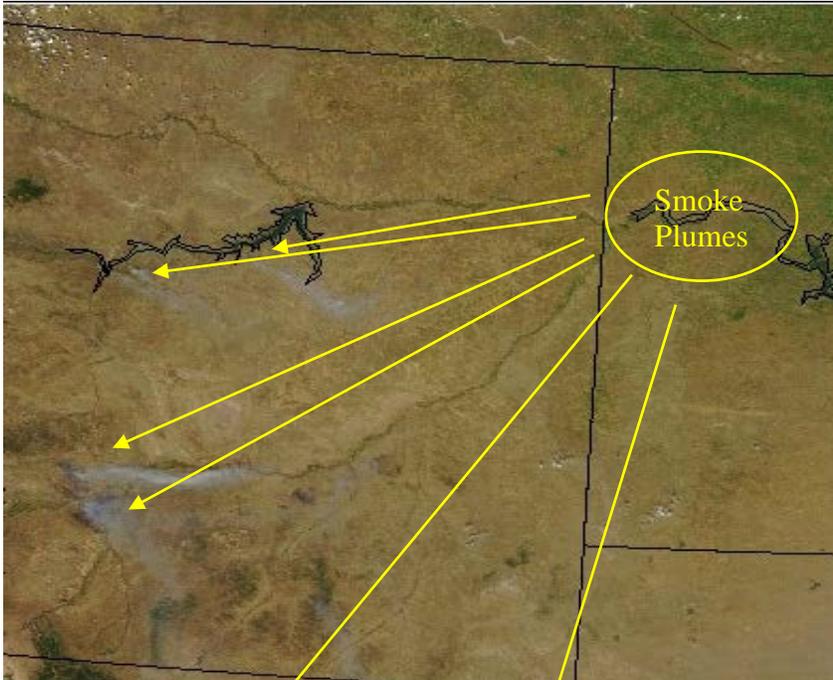
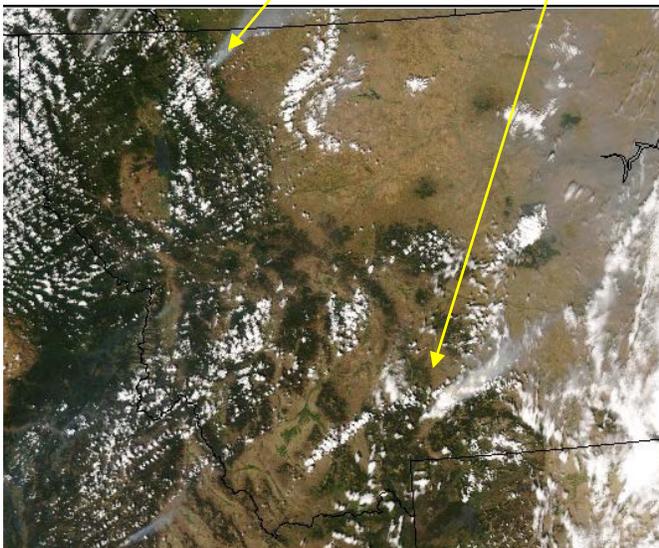


Figure 3. Smoke from fires over eastern Montana. Note the smoke plumes south of Fort Peck Lake and in south central Montana between the Bull Mountains and the Yellowstone River. MODIS satellite imagery from July 16 2006 (courtesy University of Wisconsin Space Science and Engineering Center).



Smoke from fires over western Montana. Note the smoke plumes in the St. Mary area, and the Paradise Valley. MODIS satellite imagery from July 30 2006 (courtesy University of Wisconsin Space Science and Engineering Center).

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

All reported data is preliminary. Further inquiries about the moisture conditions can be directed to Dave Bernhardt or Gina Loss at (406) 453-2081. Many more links can be found on the Drought Information Page of the NWS Great Falls web site at

<http://www.wrh.noaa.gov/tfx/main/drought.php?wfo=tx>