

Chronology of the National Weather Service and observations in Montana.

- 1805** - Lewis and Clark Expedition take weather observations along their journey through present-day Montana.
- 1814** – The Surgeon General ordered surgeons to keep weather diaries.
- 1845** – Telegraph became operational. Visionaries saw the possibility of “forecasting” storms by telegraphing ahead what they observed.
- 1848** – First volunteer weather observers recruited through the Smithsonian Institution.
- 1867** – Weather observations started at Fort Shaw and continued through 1886.
- 1868** – After buying Fort Benton from fur traders, the Army begins weather observations at Fort Benton. Army begins weather observations near Bozeman, near the present-day campus of Montana State University.
- 1869** – Weather observations started at Deer Lodge.
- Prior to 1870** – Most observations taken at various forts required by government statute.
- 1870** – Weather observations started at Fort Logan and continued through 1908.
- 1870** – A joint resolution was passed authorizing “the Secretary of War to take observations at military stations and to warn of storms on the Great Lakes and on the Atlantic and Gulf coasts.”
- Within the Department of War, the Signal Service Corps existed. Since the new weather service was dependent upon a reliable communications system, the new weather service was placed under the Secretary of War because “military discipline would probably secure the greatest promptness, regularity and accuracy in the required observations.” It was assigned to the Signal Service Corps (organized in 1860) under the first name: The Division of Telegrams and Reports for the Benefit of Commerce.” The first storm warning was issued November 8, 1870, as a high wind warning for the Great Lakes.
- 1871** – Volunteer weather observations started at Virginia City.
- 1872** - Prior to June 10, 1872, the forecasts were only for the eastern United States, but on this date, Congress extended the service throughout the United States “for the benefit of commerce and agriculture.” There was still a significant lack of observational data west of the Mississippi River.
- Early forecasts were made for eight large districts (which covered the entire U.S.), three times daily. By October 1870, predictions were made for 24 hours for nine districts, and by 1886, forecasts were made for individual states. In 1888, forecast durations were extended to 36 hours and in 1898 extended to 48 hours.
- 1879** – Army begins regular weather observations at Ft. Keogh, near Miles City.
- 1883** – First tornado reported in Montana south of Butte in Silver Bow County. Six people injured.
- 1889** - Internal strife caused many problems in the Signal Service. By 1889, the problems had become so severe that President Benjamin Harrison recommended the transfer of the national weather service to the Department of Agriculture. On October 1, 1890, an act was signed into law effecting this transfer and the United States Weather Bureau was formed.
- 1891** – Weather Bureau becomes responsible for issuing flood warnings to the public.

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- 1897** – First “Inland storm warnings” issued in Montana, for cold, windy and snowy conditions.
- 1910** – Weather Bureau begins issuing generalized weekly forecasts for agricultural planning.
- 1912** – First fire weather forecast issued in the U.S.
- 1916** – Fire Weather Service established, with all district forecast offices authorized to issue fire weather forecasts. The first fire district forecast office was at Medford, Oregon.
- 1923** – First deaths due to tonadoes in Montana. A tree fell on two men at a copper mine near Rivulet in Mineral county.
- 1937** – Weather Bureau begins radiosonde observations. Weather Bureau opens Great Falls office.
- 1940** – Weather Bureau transferred to Department of Commerce – the first official daily forecasts are issued.
- 1941-53** – Billings started and continued at the state forecast office.
- 1943** – Upper air observations began at Glasgow in June. Weather Bureau office opened.
- 1948** – Upper air observations began at Great Falls in January.
- 1940s** – Other weather offices opened in Missoula, Kalispell, Havre, and Glasgow.
- 1948** – March 25 – The first tornado warning issued in the U.S., for Tinker AFB in Oklahoma.
- 1953-1996** – State forecast office moved to Great Falls, and continued there through 1996. Nine large forecast zones covered the state.
- 1960** – First weather satellite, TIROS I, launched.
- 1965** – Environmental Science Services Administration (ESSA) created in Department of Commerce. Weather Bureau is an agency within ESSA.
- Early 1960s** – Weather radar (WSR-57) installed on Point Six near Missoula as a network radar and continued to operate through the mid 1990s.
- 1970** – National Oceanic and Atmospheric Administration (NOAA) created with the weather bureau as an agency under NOAA.
- 1970** – Soil Conservation Service begins deployment of SNOTEL stations across Montana, to assist in snowfall monitoring at headwater regions in the mountains.
- 1971** – Weather Bureau renamed as the National Weather Service.
- Mid 1970s** – Weather radars (WSR-74C) installed at Billings and Williston as a local warning radar and continued to operate through the mid 1990s. FPS-77 installed at Malmstrom AFB with the weather office in Great Falls tapping off this radar.
- mid 1970s** – Weather radio deployed in Montana with transmitters at Glasgow, Billings, Miles City, Great Falls, Havre, Helena, Missoula, Butte, and Kalispell.
- 1975** – First geostationary satellite launched into orbit.
- 1978-late 1990s** – Automation of Field Operations (AFOS) deployed and serviced field offices.
- 1985** – Nested Grid Model (NGM) becomes operational.
- 1993** – Automatic Surface Observing System (ASOS) deployment at airports started in Montana.
- 1994** – Montana DOT begins deployment of RWIS (Remote Weather Information Systems) across Montana. Eventually places 59 sensors, some with cameras.
- 1994** – Modernization of the NWS first brings WSR-88D (Doppler) radar to Montana.

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- Radars installed at Glasgow, Billings, Great Falls, and Point Six near Missoula.
- 1995** – Modernization continues with the down-sizing of the forecast areas in Montana. In addition to Great Falls, new forecast offices open in Missoula, Glasgow, and Billings. Forty-two forecast zones (nearly one per county) covered the state. Weather offices closed at Kalispell, Helena and Havre.
- 1997** – Weather radio changes from a human voice to a computerized voice.
- 1998** – Another change in the forecast zone configuration changed the number of zones to 62. AWIPS deployed in Montana.
- 2002** – Weather radio expansion continues with new transmitters at Conrad, Browning, Lewistown, Bozeman, Baker, Circle, Glendive, Malta, Plentywood, Poplar, Scobey, and Jordan.
Montana Soil Moisture Environment Initiative begins in the state with local government purchase and deployment of weather stations to monitor air temperature, wind, and soil moisture and temperature conditions.
- 2003** – Gridded forecasts are released.
Weather radio installed at Dillon, Broadus and Livingston.

Montana Weather Extremes

Through April 2004

	Temperature	
	Maximum	Minimum
Jan	75 11/1919 Choteau	-70 24/1954 Rogers Pass
Feb	79 27/1932 Columbus	-66 9/1933 West Yellowstone
Mar	88 22/1910 Miles City 88 29/1910 Lewistown	-45 16/1906 Fort Logan
Apr	97 26/1952 Hysham 97 20/1980 Poplar	-30 1940 Summit -33 3/2002 Gates Park
May	105 22/1980 Nohly	-5 1/1954 Polebridge
Jun	112 26/1988 Wolf Point 112 28/2002 Baker	11 6/1943 Kings Hill
Jul	117 20/1893 Glendive 117 5/1937 Medicine Lake	19 8/1981 Lake View
Aug	113 6/1983 Glendive	5 24/1910 Grayling 5 25/1910 Bowen
Sep	107 1/1983 Poplar	-9 24/1926 West Yellowstone
Oct	97 1/1953 Miles City	-30 31/1935 Summit
Nov	85 5/1975 Grass Range	-53 16/1959 Lincoln 14NE
Dec	78 5/1939 Crow Agency	-59 19/1924 West Yellowstone

Other Temperature information

Greatest 24-hour temperature change

- 103°F (-54 to 49) at Loma on January 14-15, 1972
- 100°F (44 to -56) at Browning on January 23-24, 1916

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Greatest 12 hour temperature change

- 84°F (63 to -21) at Fairfield on December 24, 1924

Most Rapid temperature change

- 47°F (-32 to 15) in 15 minutes at Great Falls on January 11, 1980

Annual mean temperature extremes

Warmest

- 51.1°F Yellowtail Dam

Coolest

- 33.1°F Cooke City

Monthly mean temperature extremes

Warmest

- 74.1°F Miles City and Yellowtail Dam in July

Coolest

- 6.2°F Westby in January

Precipitation

	Precipitation (inches)		Snow
	Greatest Monthly	Greatest Daily precip	Greatest Monthly
Jan	14.00 1953 Summit 18.60 1997 Black Bear Sn	4.03 1954/31 East Glacier	131.1 1972 Summit
Feb	8.52 1979 Summit 12.80 1995 Black Bear Sn	3.60 1954/14 Essex	94.5 1976 Summit
Mar	7.42 1916 Heron 14.20 1997 Hoodoo Basin	4.47 1935/25 Haugen	86.4 1980 Heron
Apr	9.02 1958 Red Lodge 13.70 1993 Noisy Basin Sn	4.68 1941/17 BIL WTP	96.0 1958 Mystic Lake
May	12.63 1989 Red Lodge 15.30 1990 Noisy Basin S	5.91 1961/31 Big Sandy	74.0 1982 Shonkin
Jun	18.17 1906 Warrick	11.50 1951/20 Circle	31.0 2002 East Glacier
Jul	12.67 1993 Plentywood	6.55 1993/22 Plentywood	4.0 1972 Summit 4.0 1950 Kings Hill
Aug	8.01 1985 Lewistown 10S	5.70 1916/05 Glendive	12.0 1992 St Mary
Sep	9.39 1986 Content	5.80 1978/12 Shonkin	37.5 1968 Del Bonita
Oct	8.47 1950 Heron 12.20 1990 Many Glacier	4.40 1931/26 BIL WTP	61.0 1951 Summit
Nov	12.50 1909 Saltese 19.00 1995 Hoodoo Basin	4.18 1968/10 Summit	81.0 1900 Augusta
Dec	9.10 1912 Saltese 24.30 1996 Black Bear S	2.60 1971/18 East Glacier	125.0 1977 Cooke City

Greatest rainfall in one hour

- 2.57 inches at Kalispell on July 29, 1982

Greatest rainfall in one day

- 11.50 inches at Circle on June 20, 1921

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Greatest rainfall in one month

- 18.17 inches near Warrick in June 1906
- 16.79 inches at Circle in June 1921

Greatest precipitation in one year

- 55.51 inches at Summit in 1953
- 98.3 inches at Noisy Basin Snotel 1996-97
- 96.3 inches at Poorman Creek Snotel 2001-02
- 91.8 inches at Hoodoo Basin Snotel 1996-97
- 90.0 inches at Flattop Mountain Snotel 1995-96
- 90.0 inches at Black Bear Snotel 1996-97

Lowest precipitation in one year

- 2.97 at Belfry in 1960

Highest average annual precipitation

- 79.90 inches at Flattop Snotel
- 73.80 inches at North Fork Jocko Snotel
- 73.00 inches at Noisy Basin Snotel
- 49.40 inches at Many Glacier
- 34.82 inches at Hungry Horse

Lowest average annual precipitation

- 9.22 inches at Glen 4N
- 9.86 inches at Joplin

Greatest snowfall in one day

- 48 inches at Millegan 14SE on December 27, 2003
- 48 inches at Shonkin 7S on May 29, 1982

Greatest snowfall in one storm

- 77.5 inches at Summit on January 17-22, 1972
- estimated 100 inches at Badger Pass on June 7-10, 2002

Greatest snowfall in one month

- 131.1 inches at Summit in January 1972

Greatest snowfall in one season

- 426 inches at Kings Hill during the winter of 1964-65.

Highest average seasonal snowfall

- 305 inches at Kings Hill

Greatest Snowdepth

- 208 inches at Bald Eagle Peak on March 28, 1974
- 202 inches at Summit on February 24, 1979

Largest hailstones

- 5 inches in Rosebud county on July 11, 1955
- 5 inches in Powder River county on June 3, 1971
- 4.5 inches near Winifred in Fergus county on June 26, 1996
- 4.5 inches near Brady in Pondera county on August 13, 1991

Pressure

Highest barometric pressure

- 31.42 inches (1067.3 mb) at Miles City on December 24, 1983
- 31.40 inches (1066.5 mb) at Helena on January 9, 1962.

Lowest barometric pressure

- 28.62 inches (972 mb) at Sidney on September 25, 1986
- 28.80 inches (978.2 mb) at Havre on January 11, 1932

Wind

Highest wind gusts

- 143 mph at Miller Colony on February 21, 2002

Highest annual average wind speed

- 15.8 mph at Livingston
- 14.6 mph at East Glacier
- 14.6 mph at Norris

Lowest annual average wind speed

- 5.0 mph at Kalispell

Monthly highest average wind speed

- 27.5 mph at Heart Butte in January
- 20.9 mph at Livingston in December
- 20 mph at Norris in November and December
- 19 mph at Browning/East Glacier in January

Monthly lowest average wind speed

- 3.9 mph at Kalispell in December

Tornado

Tornado resulting in most deaths

- 2 deaths when a tree fell on two miners in Mineral county on June 10, 1923

Tornado resulting in most damage

- an F2 tornado at Lewistown on August 14, 1999

Earliest tornados

- March 2, 1991 near Arlee in Lake County (F0)
- March 23, 1988 near Bridger in Carbon County (F0)
- April 22, 2003 near Stanford in Judith Basin County (F0)

Latest tornados

- September 21, 1969 in Roosevelt County (F0)
- October 16, 1988 at Hamilton in Ravalli County (F0)

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Sources:

[Monthly State Maximum/Minimum Temperature Extremes - NCDC](#)

[History of the National Weather Service - NWS](#)

[Western Region Climate Center](#)

[Evolution of the National Weather Service - Gray/Portland, ME NWFO](#)

Storm Data

Climatological Data

Old weather records