

# Climate of Glacier National Park



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PUBLISHED BY THE GLACIER NATURAL HISTORY ASSOCIATION



IN COOPERATION WITH THE NATIONAL PARK SERVICE

TEXT BY

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U. S. WEATHER BUREAU, HELENA, MONTANA

BULLETIN NUMBER 7

MARCH, 1961

NO 5294

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WEST GLACIER, MONTANA

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COVER  LAKE McDONALD, GLACIER NATIONAL PARK

## CLIMATE OF GLACIER NATIONAL PARK, MONTANA

by R. A. Dightman, State Climatologist,  
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Within the boundaries of Glacier National Park, which is located along both sides of the Northern Montana Rocky Mountains, lies some of the most spectacularly rugged mountain country to be found anywhere in North America. The mountainous character of the area has marked effects on its climate, which varies widely within short distances. Elevations within Park boundaries range from about 3,100 ft. along the shores of Lake McDonald to well over 10,000 ft. above sea level on a number of the higher mountain peaks. The valley-ridge configurations have marked effects on day-to-day weather, which show up in climate records as large differences between higher and lower elevations, and between lee and windward sides of mountains and ridges. In a popular sense the climate may be classed as Alpine, but a more strict climate classification would be continental, with decided Pacific maritime modifications, particularly on western slopes, during all seasons except summer.

Actually the area is subject to such a wide variation in weather that exceptions to the climate classification are frequent and large. In some of the glacier cirques precipitation may average well over 100 inches a year, most of it falling as snow, while along some parts of the Park's eastern border (at Babb 6NE, for example), annual totals average less than 20 inches a year. In this comparison, the Park boundary near Babb would be classed as semi-arid, while the mountain ridges would be classed as very wet -- even though horizontal distances between some of the wetter and drier areas of the Park are only a few miles. It would obviously be impossible, because of the many such variations and the lack of data for most of them, to cover all such cases. The few examples that are available, most of which are mentioned below, serve to emphasize the marked character of these intra-Park climate differences.

Average monthly and annual precipitation for three stations on the Park boundary are listed in tables on Pages 7-9. These stations were selected on the basis of location adjacent to the Park and length and quality of record (both temperature and precipitation). It should be noted that Summit, at an elevation of 5,213 ft. at the top of Marias Pass, is the highest of the three, and is high enough to represent to some degree the mountain precipitation pattern in general. However, almost all of the Park's mountain country is not only higher than Summit, but also is more rugged than the area around Summit. Precipitation measurements for eleven years near Grinnell Glacier, for example, have showed an estimated annual average of 108.4 inches. At a second gage in the Grinnell Basin the average for five years has been 151.4 inches. Annual precipitation therefore may be said to vary from around 20 inches a year in some of the drier locations, mostly along the northeast Park Boundary south of the Canadian Border, to well over 100 inches a year (perhaps nearly 200 inches on some of the more favored mountain slopes) in most of the mountains above about 6,000 or 7,000 ft.

Over and west of the mountain ranges winter is the wettest season by quite a margin (cf. West Glacier, Polebridge, Summit tables), but along the eastern border winter snows are much lighter, and May and June are the wettest months. Noteworthy to the tourist is the fact that the driest months of the year for the Park as a whole are July, August, and September. In the northeastern fringes of the Park, June rainfall usually is 4 inches or more, but July averages less than 2. Snowfall is very heavy at times most winters, but is of course heaviest over the mountain ridges. Summit has averaged 256 inches of snowfall a year since 1935, but there are other sites (Walton Ranger Station, for example) at even lower elevations which receive more, and it seems likely that higher elevations receive much more. In fact, to support an annual precipitation of 150 inches a year, assumed as a reasonable estimate for much of the higher Park area, it is further estimated that snowfall for such areas may exceed 1,000 inches in most years. Snow doesn't occur during the late June-September tourist season, except over some of the higher country (above about 7,500 ft.) in June or September. July and August snow is rare, except on the higher peaks and ridges (above about 9,000 ft.).

The entire Park is snow covered almost continuously during every winter, and most mountain slopes accumulate depths of 8 to 10 feet or more most winters before spring melting begins. Several years of snow depths are tabulated on Page 11 for Summit (Marias Pass) and West Glacier for the first day of each winter and early spring month.

Snow is generally gone from the lower elevations, such as the shores of Lake McDonald, by about May 1, but may linger in drifts on some higher Park trails until mid-August. It is fairly common for some of the glaciers to remain under snow all summer, and several higher peaks are permanently snow covered. It is from this abundance of winter snow that Park streams and lakes mostly are supplied with their clear, cold water. By quite a margin, most of the Park's moisture is derived from snowfall.

Temperatures average quite cold during most winters, as reference to the general data tables will indicate. Too, none of the Park area escapes subzero temperatures for at least a few days every winter. These severely cold spells, which result from movement of Arctic air masses from the north, generally last only a few days. Along the Park's eastern slopes, from about East Glacier northward to the Canadian Border, the so-called "Chinook" wind is a common feature of a winter season, and it can blow for days at a time, accompanied by temperatures as much as 20°F. or more warmer than on the west side. These winds can develop very high speeds, on occasion having been estimated at over 100 m.p.h.

Of most importance to most persons, however, is the fact that summer heat in the Park is never oppressive, even though most summertime afternoons produce highs in the 65-to-85-degree range. The warmest areas, of course, are those at lowest elevations. At Sperry Chalets, for example, the warmest temperatures in July and August 1960 were 84 and 76, respectively, while at West Glacier highs for both months were 93 and 87. Sperry Chalets are over 4,000 ft. higher than West Glacier. After sunset, temperatures cool quite quickly, and in most valley bottoms frost can occur on an occasional night even in mid-summer. In these situations, when the valleys cool under clear skies, it is often warmer at night on the mountain slopes and ridges. It should be remembered that the area has to be cool and wet, as a whole, to support glacial activity, and even though summers are relatively dry and warm for the area, rainy and cool days can occur during the June-September season, and are more likely in June and September.

All seasons except summer experience persistent cloudiness, as one would expect from the precipitation and other records, with the area of most persistent cloudiness being along the western slopes of the Continental Divide. Some of the western valleys, Lake McDonald, forks of the Flathead River, etc., also experience considerable late autumn and early winter fog. However, sunshine is frequent during summer, periods of successive sunny days occurring several times throughout the Park most June-September periods. Relative humidity can be high during winter storms and fogs, and on some of the cooler summer mornings. On the warmer summer days, however, relative humidity is seldom higher than 40 or 50 per cent, and never reaches an oppressive level. In fact, oppressive combinations of heat and humidity simply do not occur in Glacier National Park, and one might classify summer weather for the area in general as cool and pleasant.

#### STATION HISTORIES

West Glacier The longest record of climate used in this report dates from December, 1913, at a point 3-1/2 miles north of Belton, as West Glacier then was known. On October 27, 1918 it was moved to the present Park Headquarters site where it has remained since, with only a small move of the rain gage in 1931 to obtain a better exposure. The last 30 years of record have been used in this report. The National Park Service has maintained this station from the beginning.

Polebridge This station dates from August, 1933, when observations began at Polebridge Park Ranger Station. However, the earlier records were kept intermittently because of frequent absences on other business of Ranger Station personnel, and reasonable continuity started when Ben and Annette Rover at the Post Office took over on June 1, 1947. They continued until June 1, 1955, and Theodore Ross has handled the station since. Although not a long record, its quality is excellent, particularly since 1947.

Summit (Marias Pass) This station dates from February 1, 1935, when E. Ross, an employee of the Great Northern Railroad started observations. He was followed on 10/20/45 by H. J. Dupros; on 12/20/45 by the Upper Columbia Snow Lab.; on 6/24/47 by J. Henry DeGroot (Lab. closed); on 10/17/53 by F. S. June; on 3/24/54 by J. T. Hinds; on 10/21/55 by R. Sinclair; by W. J. Gee on 3/20/56; by J. A. Gregg on 8/16/56; W. A. Molgard on 12/11/57; E. E. Clott on 4/1/58; and W. O. Gulbranson on 4/17/59. All except the Upper Columbia Snow Laboratory were employees of the Great Northern Railway cooperating with the Weather Bureau. Equipment is located, rent free, on railroad land with company permission.

(Continued on Pg. 11)

U. S. DEPARTMENT OF COMMERCE, WEATHER BUREAU  
IN COOPERATION WITH NATIONAL PARK SERVICE  
CLIMATOGRAPHY OF THE UNITED STATES NO. 20 - 24

LATITUDE 48° 30'  
LONGITUDE 113° 59'  
ELEV. (GROUND) 3154

STATION WEST GLACIER, MONTANA

CLIMATOLOGICAL SUMMARY

MEANS AND EXTREMES FOR PERIOD 1931-1960

| Month | Temperature (°F) |               |         |                |          |               | **<br>Mean degree days | Precipitation Totals (Inches) |                |      |               |       |                 |          |                         |                |      | Mean number of days |      |    |    |     |    |    |    |    |
|-------|------------------|---------------|---------|----------------|----------|---------------|------------------------|-------------------------------|----------------|------|---------------|-------|-----------------|----------|-------------------------|----------------|------|---------------------|------|----|----|-----|----|----|----|----|
|       | Means            |               |         | Extremes       |          |               |                        | Mean                          | Greatest daily | Year | # Snow, Sleet |       |                 |          | Precip. 10 inch or more | Temperatures   |      |                     |      |    |    |     |    |    |    |    |
|       | Daily maximum    | Daily minimum | Monthly | Record highest | Year     | Record lowest |                        |                               |                |      | Year          | Mean  | Maximum monthly | Year     |                         | Greatest daily | Year |                     |      |    |    |     |    |    |    |    |
|       |                  |               |         |                |          |               |                        |                               |                |      |               |       |                 |          |                         |                |      | Max.                | Min. |    |    |     |    |    |    |    |
| (a)   | 30               | 30            | 30      | 30             | 30       | 30            | 30                     | 30                            | 30             | 30   | 30            | 30    | 30              | 30       | 30                      | 30             | 30   | 30                  | 30   | 30 | 30 | 30  | 30 | 30 | 30 |    |
| JAN   | 28.0             | 14.1          | 21.1    | 52             | 1931     | -37           | 1937                   | 1360                          | 3.13           | 1.24 | 1951+         | 36.4  | 74.5            | 1954     | 19.0                    | 1954+          | 10   | 1954+               | 0    | 0  | 17 | 30  | 30 | 30 | 30 | 6  |
| FEB   | 32.9             | 15.8          | 24.3    | 58             | 1950     | -40           | 1933                   | 1140                          | 2.42           | 2.09 | 1951          | 26.5  | 57.5            | 1937     | 16.0                    | 1957           | 7    | 1957                | 0    | 0  | 11 | 27  | 30 | 30 | 30 | 4  |
| MAR   | 41.3             | 21.4          | 31.4    | 64             | 1941     | -30           | 1960                   | 1040                          | 1.81           | 0.95 | 1947          | 16.2  | 35.5            | 1951     | 15.0                    | 1954+          | 6    | 1954+               | 0    | 0  | 4  | 28  | 30 | 30 | 30 | 2  |
| APR   | 54.2             | 29.4          | 41.8    | 80             | 1939     | -8            | 1936+                  | 700                           | 1.87           | 1.29 | 1951          | 4.3   | 24.0            | 1948     | 8.5                     | 1953           | 6    | 1953                | 0    | 0  | *  | 21  | *  | *  | *  | *  |
| MAY   | 64.9             | 37.2          | 51.1    | 91             | 1936     | 13            | 1954                   | 430                           | 2.36           | 1.22 | 1938          | 0.4   | 5.0             | 1956+    | 5.0                     | 1951           | 7    | 1951                | *    | *  | 0  | 7   | 0  | 0  | 0  | 0  |
| JUN   | 70.3             | 43.6          | 57.0    | 92             | 1941+    | 24            | 1959                   | 260                           | 3.02           | 1.87 | 1947          | T     | T               | 1955+    | 5.0                     | 1952+          | 8    | 1952+               | *    | *  | 0  | 0   | 1  | 0  | 0  | 0  |
| JUL   | 80.6             | 47.3          | 64.0    | 101            | 1934     | 34            | 1959+                  | 80                            | 1.27           | 1.22 | 1932          | T     | T               | 1954+    | T                       | 1952+          | 4    | 1952+               | 3    | 3  | 0  | 0   | 0  | 0  | 0  | 0  |
| AUG   | 78.5             | 45.5          | 62.0    | 95             | 1941     | 31            | 1937+                  | 120                           | 1.33           | 2.08 | 1947          | 0.0   | 0.0             | 1949     | 0.0                     | 1949           | 3    | 1949                | 1    | 1  | 0  | 0   | *  | 0  | 0  | 0  |
| SEP   | 67.2             | 39.4          | 53.3    | 88             | 1944+    | 16            | 1934                   | 350                           | 1.89           | 1.59 | 1952          | T     | 1.0             | 1951     | 1.0                     | 1951           | 5    | 1951                | 0    | 0  | 0  | 0   | 5  | 0  | 0  | 0  |
| OCT   | 53.6             | 32.5          | 43.1    | 79             | 1942     | -9            | 1935                   | 680                           | 2.64           | 1.76 | 1955          | 2.3   | 28.0            | 1951     | 12.0                    | 1951           | 7    | 1951                | 0    | 0  | *  | 17  | *  | *  | *  | *  |
| NOV   | 37.6             | 24.2          | 30.9    | 67             | 1948     | -29           | 1959                   | 1020                          | 3.06           | 1.50 | 1932          | 15.8  | 58.3            | 1959     | 12.0                    | 1959+          | 8    | 1959+               | 0    | 0  | 7  | 26  | 1  | 1  | 1  | 1  |
| DEC   | 31.6             | 19.7          | 25.7    | 57             | 1931     | -22           | 1932                   | 1220                          | 3.26           | 1.02 | 1937          | 31.4  | 74.2            | 1951     | 20.0                    | 1938           | 10   | 1938                | 0    | 0  | 15 | 29  | 2  | 2  | 2  | 2  |
| Year  | 53.4             | 30.8          | 42.1    | 101            | JUL 1934 | -40           | FEB 1933               | 8400                          | 28.06          | 2.09 | 1951          | 133.3 | 74.5            | JAN 1954 | 20.0                    | DEC 1938       | 81   | DEC 1938            | 4    | 4  | 54 | 191 | 15 | 15 | 15 | 15 |

(a) Average length of record, years.

T Trace, an amount too small to measure.

\*\* Base 65°F (estimated)

+ Also on earlier dates, months, or years.

\* Less than one half.

# Hail was included in these values from July 1948 through December 1955.

LATITUDE 48° 19'  
LONGITUDE 113° 21'  
ELEV. (GROUND) 5213

U. S. DEPARTMENT OF COMMERCE, WEATHER BUREAU  
IN COOPERATION WITH NATIONAL PARK SERVICE  
CLIMATOGRAPHY OF THE UNITED STATES NO. 20 - 24  
**CLIMATOLOGICAL SUMMARY**

STATION SUMMIT, MONTANA  
(MARTIN PASS)

MEANS AND EXTREMES FOR PERIOD 1935-1960

| Temperature (°F) |               |               |         |                |          |               |                  |       |                | Precipitation Totals (Inches) |               |       |                 |                          |              |                |      |      |      | Mean number of days |    |  |  |  |
|------------------|---------------|---------------|---------|----------------|----------|---------------|------------------|-------|----------------|-------------------------------|---------------|-------|-----------------|--------------------------|--------------|----------------|------|------|------|---------------------|----|--|--|--|
| Month            | Means         |               |         | Extremes       |          |               | Mean degree days | Mean  | Greatest daily | Year                          | # Snow, Sleet |       |                 | Precip. .10 inch or more | Temperatures |                |      |      |      |                     |    |  |  |  |
|                  | Daily maximum | Daily minimum | Monthly | Record highest | Year     | Record lowest |                  |       |                |                               | Year          | Mean  | Maximum monthly |                          | Year         | Greatest daily | Year | Max. | Min. |                     |    |  |  |  |
| (a)              | 26            | 26            | 26      | 26             | 26       | 26            | 26               | 26    | 26             | 26                            | 22            | 22    | 22              | 22                       | 25           | 26             | 25   | 25   | 26   |                     |    |  |  |  |
| JAN              | 23.6          | 7.2           | 15.4    | 47             | 1940     | -55           | 1959             | 1540  | 4.26           | 2.95                          | 1953          | 48.0  | 123.0           | 1954                     | 22.0         | 1953           | 11   | 0    | 23   | 31                  | 10 |  |  |  |
| FEB              | 27.2          | 8.8           | 18.0    | 56             | 1958     | -53           | 1936             | 1320  | 3.54           | 1.28                          | 1949          | 40.4  | 81.4            | 1940                     | 17.0         | 1940           | 10   | 0    | 19   | 28                  | 8  |  |  |  |
| MAR              | 33.5          | 13.7          | 23.6    | 62             | 1960     | -42           | 1960+            | 1280  | 3.08           | 1.45                          | 1945          | 39.3  | 72.7            | 1956                     | 26.5         | 1947           | 11   | 0    | 13   | 30                  | 6  |  |  |  |
| APR              | 44.7          | 22.9          | 33.8    | 75             | 1936     | -30           | 1940+            | 940   | 2.78           | 1.96                          | 1951          | 25.8  | 87.0            | 1954                     | 18.0         | 1954+          | 8    | 0    | 3    | 26                  | 1  |  |  |  |
| MAY              | 56.3          | 30.8          | 43.6    | 81             | 1936     | 0             | 1935             | 660   | 2.86           | 1.85                          | 1938          | 7.9   | 28.5            | 1938                     | 15.0         | 1938           | 8    | 0    | *    | 20                  | *  |  |  |  |
| JUN              | 61.8          | 37.2          | 49.5    | 90             | 1936     | 15            | 1951             | 470   | 3.70           | 2.26                          | 1943          | 1.4   | 16.5            | 1943                     | 16.5         | 1943           | 9    | *    | 0    | 7                   | 0  |  |  |  |
| JUL              | 73.7          | 40.4          | 57.0    | 93             | 1960     | 25            | 1936+            | 240   | 1.24           | 0.90                          | 1958          | T     | 0.5             | 1955+                    | T            | 1950+          | 4    | *    | 0    | 4                   | 0  |  |  |  |
| AUG              | 71.5          | 38.5          | 54.9    | 94             | 1940     | 19            | 1939             | 310   | 1.52           | 1.71                          | 1946          | T     | 0.5             | 1952                     | 0.5          | 1952           | 4    | *    | 0    | 8                   | 0  |  |  |  |
| SEP              | 61.7          | 33.8          | 47.8    | 91             | 1950     | 6             | 1957             | 520   | 2.52           | 1.60                          | 1940          | 4.6   | 17.0            | 1947                     | 10.0         | 1954+          | 7    | *    | *    | 14                  | 0  |  |  |  |
| OCT              | 49.4          | 28.7          | 39.1    | 82             | 1957     | -30           | 1935             | 800   | 3.10           | 1.55                          | 1951          | 11.0  | 61.0            | 1951                     | 30.0         | 1951           | 8    | 0    | 2    | 20                  | *  |  |  |  |
| NOV              | 33.5          | 18.3          | 25.9    | 61             | 1947     | -42           | 1959             | 1170  | 3.96           | 1.79                          | 1942          | 37.0  | 76.9            | 1946                     | 23.0         | 1951           | 10   | 0    | 13   | 27                  | 3  |  |  |  |
| DEC              | 28.5          | 13.7          | 21.1    | 57             | 1939     | -38           | 1937             | 1360  | 4.31           | 1.45                          | 1939          | 40.9  | 94.1            | 1949                     | 18.5         | 1938           | 12   | 0    | 20   | 30                  | 5  |  |  |  |
| Year             | 47.1          | 24.5          | 35.8    | 94             | AUG 1940 | -55           | JAN 1959         | 10610 | 36.87          | 2.95                          | JAN 1953      | 256.3 | 123.0           | JAN 1954                 | 30.0         | OCT 1951       | 102  | *    | 93   | 245                 | 33 |  |  |  |
|                  |               |               |         |                |          |               |                  |       |                |                               |               |       |                 |                          |              |                |      |      |      | Year                |    |  |  |  |

(a) Average length of record, years.

T Trace, an amount too small to measure.

\*\* Base 65°F

+ Also on earlier dates, months, or years.

\* Less than one half.

# Hail was included in these values from July 1948 through December 1955.

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IN COOPERATION WITH NATIONAL PARK SERVICE  
CLIMATOGRAPHY OF THE UNITED STATES NO. 20 - 24  
**CLIMATOLOGICAL SUMMARY**

LATITUDE  
LONGITUDE  
ELEV. (GROUND)

STATION POLEBRIDGE, MONTANA

MEANS AND EXTREMES FOR PERIOD 1933-1960

| Month | Temperature (°F) |               |         |                | **        | Precipitation Totals (Inches) |           |                |       |               |               |          |                         |              |                 | Mean number of days |      |      |       |
|-------|------------------|---------------|---------|----------------|-----------|-------------------------------|-----------|----------------|-------|---------------|---------------|----------|-------------------------|--------------|-----------------|---------------------|------|------|-------|
|       | Extremes         |               |         |                |           | Mean degree days              | Mean      | Greatest daily | Year  | # Snow, Sleet |               |          | Precip. 10 inch or more | Temperatures |                 |                     |      |      |       |
|       | Daily maximum    | Daily minimum | Monthly | Record highest |           |                               |           |                |       | Year          | Record lowest | Year     |                         | Mean         | Maximum monthly | Greatest daily      | Year |      |       |
|       |                  |               |         |                |           |                               |           |                |       |               |               |          |                         |              |                 |                     |      | Max. | Min.  |
| (a)   | 20               | 20            | 20      | 20             | 11        | 24                            | 24        | 24             | 1953  | 18            | 18            | 18       | 18                      | 24           | 20              | 17                  | 17   | 17   | Month |
| JAN   | 27.1             | 5.9           | 16.5    | 51             | 1954      | -46                           | 1957+     | 1197           | 2.73  | 1.53          | 1953          | 1953     | 24                      | 18           | 18              | 18                  | 18   | 17   | JAN   |
| FEB   | 33.4             | 8.3           | 20.9    | 55             | 1958+     | -45                           | 1936      | 1188           | 1.93  | 1.06          | 1951          | 1951     | 24                      | 18           | 18              | 18                  | 18   | 17   | FEB   |
| MAR   | 41.3             | 14.9          | 28.1    | 63             | 1960      | -38                           | 1960      | 1162           | 1.64  | 1.50          | 1954          | 1954     | 24                      | 18           | 18              | 18                  | 18   | 17   | MAR   |
| APR   | 53.0             | 24.7          | 38.9    | 86             | 1936      | -12                           | 1936      | 807            | 1.56  | 0.85          | 1934          | 1934     | 24                      | 18           | 18              | 18                  | 18   | 17   | APR   |
| MAY   | 64.7             | 32.8          | 48.8    | 92             | 1936      | -5                            | 1954      | 521            | 1.70  | 0.73          | 1959          | 1959     | 24                      | 18           | 18              | 18                  | 18   | 17   | MAY   |
| JUN   | 70.2             | 39.0          | 54.6    | 96             | 1937      | 21                            | 1951      | 321            | 2.17  | 1.75          | 1951          | 1951     | 24                      | 18           | 18              | 18                  | 18   | 17   | JUN   |
| JUL   | 81.2             | 41.1          | 61.2    | 101            | 1936+     | 28                            | 1959+     | 150            | 1.16  | 1.33          | 1948          | 1948     | 24                      | 18           | 18              | 18                  | 18   | 17   | JUL   |
| AUG   | 79.0             | 38.7          | 58.8    | 96             | 1959+     | 25                            | 1937      | 200            | 1.31  | 1.34          | 1954          | 1954     | 24                      | 18           | 18              | 18                  | 18   | 17   | AUG   |
| SEP   | 69.1             | 32.8          | 51.0    | 94             | 1950      | 5                             | 1934      | 117            | 1.28  | 1.03          | 1959          | 1959     | 24                      | 18           | 18              | 18                  | 18   | 17   | SEP   |
| OCT   | 54.6             | 27.1          | 40.8    | 85             | 1955      | -21                           | 1935      | 746            | 1.87  | 1.50          | 1934          | 1934     | 24                      | 18           | 18              | 18                  | 18   | 17   | OCT   |
| NOV   | 37.9             | 18.8          | 28.3    | 63             | 1936      | -38                           | 1959      | 1116           | 2.30  | 1.56          | 1946          | 1946     | 24                      | 18           | 18              | 18                  | 18   | 17   | NOV   |
| DEC   | 30.6             | 13.3          | 22.0    | 52             | 1957      | -32                           | 1955      | 1319           | 2.77  | 1.11          | 1955          | 1955     | 24                      | 18           | 18              | 18                  | 18   | 17   | DEC   |
| Year  | 53.5             | 24.8          | 39.2    | 101            | JUL 1936+ | -46                           | JAN 1957+ | 9444           | 22.42 | 1.75          | JUN 1951      | JUN 1951 | 24                      | 18           | 18              | 18                  | 18   | 17   | Year  |

(a) Average length of record, years.

T Trace, an amount too small to measure.

\*\* Base 65°F

+ Also on earlier dates, months, or years.

\* Less than one half.

# Hail was included in these values from July 1948 through December 1955.

## WEST GLACIER, MONTANA

## Average Temperature (°F)

| Year | Jan. | Feb. | Mar. | Apr. | May  | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Ann'l |
|------|------|------|------|------|------|------|------|------|-------|------|------|------|-------|
| 1931 | 28.0 | 27.0 | 32.9 | 42.8 | 52.0 | 59.0 | 63.6 | 62.7 | 52.8  | 42.6 | 27.6 | 25.2 | 43.0  |
| 1932 | 20.3 | 23.8 | 27.0 | 41.3 | 50.8 | 58.6 | 63.0 | 63.2 | 52.2  | 41.4 | 34.0 | 18.6 | 41.2  |
| 1933 | 25.1 | 18.6 | 34.0 | 40.8 | 47.9 | 59.0 | 63.8 | 62.1 | 50.2  | 43.4 | 36.4 | 29.1 | 42.5  |
| 1934 | 30.5 | 29.8 | 36.7 | 48.2 | 55.4 | 57.6 | 65.0 | 64.0 | 50.3  | 44.8 | 37.2 | 27.6 | 45.6  |
| 1935 | 20.5 | 24.8 | 30.0 | 35.7 | 48.6 | 56.2 | 63.6 | 60.6 | 54.8  | 41.4 | 27.2 | 26.9 | 40.9  |
| 1936 | 25.4 | 3.8  | 30.5 | 40.6 | 56.1 | 60.8 | 68.6 | 65.6 | 53.1  | 44.4 | 26.2 | 26.2 | 41.7  |
| 1937 | 1.1  | 20.8 | 32.6 | 41.2 | 52.0 | 57.8 | 65.0 | 59.9 | 55.2  | 44.7 | 32.3 | 25.8 | 40.7  |
| 1938 | 24.0 | 22.2 | 33.7 | 42.2 | 49.3 | 58.4 | 63.8 | 60.5 | 59.1  | 45.8 | 29.6 | 26.3 | 42.9  |
| 1939 | 29.2 | 19.8 | 33.0 | 45.1 | 53.2 | 55.0 | 65.2 | 63.4 | 55.4  | 44.6 | 34.1 | 30.6 | 44.0  |
| 1940 | 21.1 | 29.4 | 38.6 | 43.8 | 54.4 | 60.9 | 66.6 | 64.1 | 59.8  | 46.4 | 24.8 | 27.8 | 44.8  |
| 1941 | 24.9 | 28.6 | 36.8 | 46.1 | 52.2 | 59.5 | 67.4 | 63.8 | 49.0  | 41.6 | 35.0 | 27.8 | 44.4  |
| 1942 | 19.4 | 24.1 | 34.4 | 44.9 | 49.6 | 55.2 | 65.0 | 63.8 | 54.9  | 44.8 | 29.0 | 28.2 | 42.8  |
| 1943 | 14.4 | 27.2 | 24.6 | 45.4 | 47.8 | 53.1 | 63.0 | 62.0 | 54.8  | 45.2 | 33.0 | 24.6 | 42.3  |
| 1944 | 24.0 | 26.2 | 28.8 | 44.6 | 52.8 | 58.2 | 63.5 | 61.0 | 55.2  | 46.6 | 33.9 | 22.8 | 43.1  |
| 1945 | 27.3 | 28.4 | 32.8 | 38.9 | 51.4 | 55.8 | 65.4 | 65.2 | 51.0  | 44.4 | 30.2 | 26.1 | 43.1  |
| 1946 | 27.3 | 29.4 | 36.5 | 43.6 | 50.3 | 55.6 | 64.4 | 62.4 | 52.2  | 38.5 | 26.5 | 23.8 | 42.5  |
| 1947 | 20.5 | 25.1 | 32.8 | 45.9 | 53.1 | 54.8 | 65.2 | 61.2 | 53.2  | 46.0 | 30.4 | 27.6 | 43.0  |
| 1948 | 24.0 | 22.2 | 26.8 | 40.6 | 51.4 | 59.8 | 60.0 | 60.8 | 53.2  | 40.8 | 32.8 | 17.8 | 40.9  |
| 1949 | 5.6  | 19.0 | 29.1 | 44.3 | 52.5 | 56.3 | 62.5 | 63.1 | 52.7  | 39.9 | 36.1 | 23.3 | 40.4  |
| 1950 | 4.9  | 26.1 | 29.7 | 38.7 | 47.9 | 55.1 | 63.0 | 61.4 | 52.7  | 43.6 | 30.1 | 28.5 | 40.2  |
| 1951 | 18.7 | 23.4 | 24.5 | 39.5 | 49.1 | 52.6 | 63.4 | 60.1 | 48.9  | 38.8 | 29.7 | 16.7 | 38.8  |
| 1952 | 18.3 | 27.4 | 31.0 | 44.0 | 51.4 | 56.4 | 61.4 | 61.9 | 55.7  | 45.7 | 31.3 | 27.2 | 42.6  |
| 1953 | 32.1 | 30.1 | 34.9 | 38.8 | 48.9 | 55.1 | 63.9 | 62.4 | 54.9  | 45.4 | 35.3 | 29.5 | 44.3  |
| 1954 | 19.6 | 31.8 | 26.9 | 35.8 | 50.4 | 53.3 | 62.4 | 59.5 | 51.7  | 40.0 | 37.0 | 27.8 | 41.3  |
| 1955 | 25.7 | 21.7 | 23.5 | 37.4 | 46.1 | 57.8 | 61.3 | 61.4 | 52.1  | 42.7 | 22.1 | 21.7 | 39.5  |
| 1956 | 22.7 | 21.1 | 30.8 | 39.9 | 51.1 | 57.0 | 64.2 | 61.2 | 53.8  | 42.4 | 30.5 | 26.0 | 41.7  |
| 1957 | 9.3  | 22.8 | 31.3 | 40.7 | 54.0 | 57.5 | 62.9 | 60.8 | 54.0  | 39.6 | 31.0 | 30.0 | 41.2  |
| 1958 | 27.5 | 28.8 | 31.9 | 41.4 | 57.5 | 59.1 | 63.0 | 66.5 | 53.3  | 42.4 | 30.0 | 27.4 | 44.1  |
| 1959 | 22.3 | 22.2 | 34.1 | 41.5 | 46.4 | 57.0 | 62.8 | 58.7 | 50.4  | 40.8 | 24.1 | 25.9 | 40.5  |
| 1960 | 18.3 | 24.0 | 30.5 | 40.6 | 48.0 | 56.8 | 66.1 | 57.9 | 52.9  | 42.8 | 30.2 | 22.9 | 40.9  |

## WEST GLACIER, MONTANA

## Total Precipitation (Inches)

| Year | Jan. | Feb. | Mar. | Apr. | May  | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Ann'l |
|------|------|------|------|------|------|------|------|------|-------|------|------|------|-------|
| 1931 | 1.29 | 1.15 | 2.70 | 0.98 | 2.44 | 2.52 | 1.94 | T    | 3.47  | 1.44 | 1.65 | 3.14 | 22.72 |
| 1932 | 3.29 | 3.71 | 4.43 | 2.22 | 2.45 | 1.53 | 1.60 | 2.16 | 0.56  | 2.44 | 6.03 | 3.91 | 34.33 |
| 1933 | 4.16 | 2.76 | 1.41 | 1.34 | 1.56 | 3.48 | 0.05 | 2.91 | 3.21  | 5.96 | 2.60 | 7.53 | 36.97 |
| 1934 | 3.60 | 0.21 | 3.17 | 1.08 | 1.86 | 2.19 | 0.34 | 0.32 | 1.00  | 2.75 | 3.26 | 2.93 | 22.71 |
| 1935 | 4.59 | 0.44 | 1.64 | 1.09 | 1.15 | 1.61 | 1.12 | 0.82 | 0.52  | 1.00 | 2.38 | 1.07 | 17.43 |
| 1936 | 4.76 | 2.48 | 1.85 | 1.19 | 3.36 | 2.40 | 0.38 | 0.17 | 1.25  | 0.91 | 0.27 | 4.02 | 23.04 |
| 1937 | 2.40 | 2.99 | 0.64 | 3.25 | 2.03 | 3.10 | 0.72 | 0.99 | 1.53  | 2.61 | 3.89 | 3.82 | 27.97 |
| 1938 | 2.30 | 1.95 | 0.68 | 1.67 | 3.73 | 2.07 | 1.59 | 1.90 | 0.79  | 2.71 | 2.41 | 4.68 | 26.48 |
| 1939 | 3.49 | 2.08 | 1.32 | 0.99 | 1.88 | 4.15 | 0.79 | 0.29 | 1.39  | 0.81 | 1.57 | 3.37 | 22.13 |
| 1940 | 1.32 | 5.87 | 2.00 | 2.62 | 1.65 | 1.72 | 1.56 | 0.06 | 1.99  | 2.01 | 3.53 | 2.92 | 27.25 |
| 1941 | 2.91 | 0.46 | 0.51 | 0.39 | 3.50 | 1.71 | 0.75 | 0.48 | 3.78  | 1.53 | 3.19 | 3.01 | 22.22 |
| 1942 | 0.74 | 1.46 | 0.94 | 2.10 | 4.29 | 3.87 | 2.33 | 0.62 | 1.73  | 2.29 | 3.71 | 3.36 | 27.44 |
| 1943 | 2.61 | 2.66 | 1.62 | 1.21 | 2.38 | 3.69 | 0.50 | 0.36 | 0.74  | 3.65 | 0.94 | 1.48 | 21.84 |
| 1944 | 0.67 | 0.88 | 1.36 | 1.32 | 2.62 | 2.00 | 0.70 | 1.98 | 2.74  | 0.27 | 2.55 | 1.50 | 18.59 |
| 1945 | 2.62 | 1.86 | 2.58 | 2.59 | 2.12 | 3.16 | 0.20 | 0.45 | 4.19  | 4.18 | 4.22 | 2.11 | 30.28 |
| 1946 | 3.96 | 1.78 | 1.33 | 2.05 | 3.12 | 3.77 | 1.78 | 1.15 | 2.09  | 5.43 | 6.75 | 3.98 | 37.19 |
| 1947 | 4.01 | 1.89 | 2.54 | 1.45 | 0.76 | 6.00 | 0.95 | 4.73 | 1.54  | 4.08 | 1.94 | 1.69 | 31.58 |
| 1948 | 2.27 | 3.05 | 1.47 | 4.50 | 2.86 | 3.90 | 3.79 | 0.67 | 0.39  | 0.94 | 3.70 | 3.53 | 31.07 |
| 1949 | 1.29 | 4.20 | 1.56 | 1.08 | 2.27 | 2.12 | 1.93 | 0.55 | 1.61  | 3.45 | 2.73 | 3.86 | 26.65 |
| 1950 | 4.71 | 2.32 | 3.46 | 1.63 | 0.91 | 3.52 | 1.02 | 1.78 | 1.10  | 5.87 | 2.35 | 5.17 | 33.84 |
| 1951 | 4.77 | 4.88 | 1.89 | 1.67 | 3.08 | 2.92 | 1.75 | 2.59 | 4.00  | 4.92 | 2.25 | 4.25 | 38.97 |
| 1952 | 2.51 | 1.29 | 1.13 | 0.27 | 3.17 | 4.56 | 1.56 | 1.44 | 1.94  | 0.08 | 0.68 | 2.43 | 21.06 |
| 1953 | 7.07 | 3.24 | 1.62 | 3.19 | 2.99 | 3.95 | 0.09 | 1.17 | 0.60  | 0.89 | 2.73 | 4.78 | 32.32 |
| 1954 | 4.98 | 2.69 | 2.47 | 2.91 | 2.13 | 3.60 | 3.15 | 5.14 | 1.64  | 1.70 | 2.94 | 1.79 | 35.14 |
| 1955 | 1.58 | 2.33 | 1.55 | 1.49 | 1.82 | 2.75 | 4.10 | 0.00 | 2.25  | 5.08 | 3.55 | 2.80 | 29.30 |
| 1956 | 2.50 | 2.50 | 1.94 | 1.89 | 1.09 | 2.66 | 1.53 | 1.67 | 1.77  | 3.27 | 1.05 | 4.78 | 26.65 |
| 1957 | 2.60 | 3.67 | 1.60 | 1.58 | 1.62 | 3.99 | 0.73 | 0.69 | 0.35  | 2.68 | 1.36 | 3.57 | 24.44 |
| 1958 | 3.04 | 3.29 | 1.41 | 3.45 | 1.40 | 3.36 | 0.97 | 0.62 | 3.87  | 1.80 | 5.64 | 3.38 | 32.23 |
| 1959 | 5.31 | 2.29 | 1.49 | 2.62 | 3.05 | 2.33 | 0.05 | 1.55 | 4.08  | 2.69 | 7.52 | 1.15 | 34.13 |
| 1960 | 2.63 | 2.33 | 2.06 | 2.14 | 3.65 | 1.96 | 0.00 | 2.75 | 0.59  | 1.70 | 4.52 | 1.84 | 26.17 |

## SUMMIT (MARIAS PASS), MONTANA

## Average Temperature (°F)

| Year | Jan. | Feb. | Mar. | Apr. | May  | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Ann'l |
|------|------|------|------|------|------|------|------|------|-------|------|------|------|-------|
| 1935 |      | 25.6 | 21.1 | 24.8 | 40.2 | 49.0 | 56.8 | 53.9 | 49.0  | 35.4 | 23.4 | 23.8 |       |
| 1936 | 18.2 | -5.2 | 21.7 | 34.2 | 48.5 | 53.0 | 60.8 | 57.0 | 48.2  | 41.8 | 28.2 | 18.9 | 35.4  |
| 1937 | -3.3 | 14.6 | 22.6 | 32.9 | 44.0 | 49.4 | 56.8 | 54.2 | 46.8  | 42.2 | 27.2 | 19.8 | 33.9  |
| 1938 | 20.4 | 13.6 | 26.0 | 35.1 | 41.8 | 51.5 | 58.6 | 53.9 | 53.6  | 41.0 | 23.1 | 20.3 | 36.6  |
| 1939 | 23.4 | 12.4 | 26.8 | 36.2 | 46.2 | 46.2 | 57.4 | 55.4 | 49.7  | 40.0 | 36.8 | 28.1 | 38.2  |
| 1940 | 15.8 | 20.2 | 31.1 | 33.0 | 46.3 | 52.2 | 57.8 | 56.2 | 52.0  | 42.3 | 18.4 | 23.0 | 37.4  |
| 1941 | 21.4 | 19.8 | 28.7 | 37.4 | 44.2 | 50.5 | 57.6 | 54.5 | 42.2  | 37.2 | 32.0 | 21.5 | 37.2  |
| 1942 | 18.4 | 15.8 | 25.8 | 37.6 | 41.3 | 47.0 | 55.5 | 54.2 | 48.3  | 41.0 | 23.8 | 24.0 | 36.1  |
| 1943 | 7.0  | 23.9 | 17.8 | 38.2 | 39.3 | 45.0 | 56.8 | 55.2 | 49.3  | 40.7 | 31.2 | 21.2 | 35.5  |
| 1944 | 22.8 | 16.5 | 19.4 | 36.3 | 45.4 | 49.0 | 54.6 | 52.2 | 47.6  | 45.0 | 26.4 | 17.7 | 36.1  |
| 1945 | 21.1 | 20.0 | 25.7 | 28.2 |      |      | 57.0 | 56.0 | 44.1  | 43.0 | 25.9 | 20.4 |       |
| 1946 | 24.4 | 25.0 | 30.8 | 38.4 | 43.9 | 49.1 | 58.5 | 55.4 | 46.9  | 32.3 | 21.5 | 22.0 | 37.4  |
| 1947 | 16.0 | 19.3 | 25.3 | 37.2 | 46.0 | 48.6 | 58.9 | 53.8 | 47.2  | 40.6 | 23.0 | 23.9 | 36.6  |
| 1948 | 20.2 | 12.4 | 18.4 | 32.6 | 42.6 | 53.3 | 53.6 | 55.4 | 48.6  | 40.2 | 25.7 | 12.9 | 34.7  |
| 1949 | 1.2  | 14.5 | 23.0 | 40.3 | 46.1 | 50.4 | 55.6 | 56.6 | 46.3  | 33.9 | 37.4 | 12.7 | 34.9  |
| 1950 | -5.3 | 23.4 | 20.1 | 30.0 | 39.6 | 47.5 | 55.0 | 54.3 | 47.2  | 39.1 | 24.1 | 26.0 | 33.4  |
| 1951 | 13.3 | 17.4 | 17.5 | 31.5 | 42.6 | 44.3 | 56.5 | 53.2 | 43.5  | 33.6 | 25.7 | 11.3 | 32.5  |
| 1952 | 14.1 | 22.5 | 21.9 | 37.9 | 45.0 | 49.3 | 54.6 | 54.7 | 51.2  | 43.7 | 25.2 | 24.3 | 37.4  |
| 1953 | 26.0 | 23.7 | 28.6 | 28.8 | 41.1 | 48.4 | 56.8 | 56.1 | 50.1  |      |      |      |       |
| 1954 | 9.5  | 29.6 | 18.3 | 28.9 | 40.8 | 47.7 | 56.4 | 53.1 | 46.0  | 36.2 | 35.8 | 24.1 | 35.6  |
| 1955 | 19.8 | 15.8 | 15.6 | 34.1 | 41.3 | 51.4 | 58.0 | 57.3 | 45.5  | 40.4 | 12.9 | 15.9 | 34.0  |
| 1956 | 16.7 | 15.2 | 25.5 | 32.9 |      | 50.7 | 57.3 | 54.2 | 47.9  | 36.6 |      |      |       |
| 1957 | 6.6  | 18.1 | 25.9 | 31.5 | 46.0 | 50.4 | 57.4 | 55.2 | 49.7  | 34.1 | 26.2 | 26.8 | 35.7  |
| 1958 | 26.4 | 22.8 | 23.2 | 33.8 | 50.1 | 49.2 | 53.4 | 59.5 | 46.4  | 41.4 | 22.6 | 22.1 | 37.6  |
| 1959 | 16.1 | 14.2 | 28.3 | 34.2 | 40.4 | 53.2 | 59.5 | 52.8 | 44.4  | 35.5 | 20.9 | 34.8 | 35.3  |

## SUMMIT (MARIAS PASS), MONTANA

## Total Precipitation (Inches)

| Year | Jan.  | Feb. | Mar. | Apr. | May  | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Ann'l |
|------|-------|------|------|------|------|------|------|------|-------|------|------|------|-------|
| 1935 |       | 0.59 | 4.48 | 3.69 | 1.49 | 1.44 | 0.84 | 0.54 | 1.21  | 1.36 | 1.23 | 0.95 |       |
| 1936 | 6.28  | 3.96 | 3.92 | 1.23 | 1.21 | 2.60 | 0.59 | 1.34 | 1.73  | 2.10 | 0.64 | 5.34 | 30.94 |
| 1937 | 2.24  | 4.78 | 1.15 | 2.75 | 1.82 | 5.52 | 0.27 | 1.09 | 2.23  | 2.48 | 2.96 | 5.20 | 32.49 |
| 1938 | 3.19  | 2.95 | 3.73 | 2.78 | 5.27 | 2.94 | 2.23 | 1.54 | 1.24  | 3.78 | 4.27 | 5.96 | 39.88 |
| 1939 | 4.01  | 1.94 | 2.40 | 2.40 | 1.78 | 3.41 | 0.41 | 0.78 | 1.95  | 2.06 | 0.86 | 3.30 | 25.30 |
| 1940 | 0.94  | 5.51 | 1.62 | 3.75 | 1.16 | 1.36 | 1.18 | 0.67 | 4.50  | 1.68 | 2.95 | 1.74 | 27.06 |
| 1941 | 2.03  | 0.67 | 0.98 | 1.02 | 3.92 | 5.47 | 1.31 | 1.07 | 4.37  | 2.03 | 3.29 | 5.10 | 31.26 |
| 1942 | 0.45  | 1.32 | 2.69 | 1.07 | 5.13 | 4.38 | 2.09 | 1.42 | 3.60  | 1.87 | 7.43 | 3.42 | 34.87 |
| 1943 | 4.86  | 3.70 | 3.50 | 2.69 | 3.86 | 6.81 | 0.44 | 0.70 | 1.97  | 2.89 | 1.12 | 1.63 | 34.17 |
| 1944 | 1.68  | 1.86 | 2.58 | 0.60 | 4.37 | 3.00 | 0.45 | 2.58 | 3.28  | 0.84 | 2.36 | 1.86 | 25.46 |
| 1945 | 3.15  | 2.98 | 3.62 | 4.15 | 2.12 | 4.79 | 0.88 | 0.92 | 3.28  | 2.77 | 4.45 | 3.03 | 36.14 |
| 1946 | 4.23  | 2.77 | 2.05 | 0.85 | 1.49 | 2.80 | 1.25 | 2.85 | 1.98  | 7.16 | 7.28 | 5.34 | 40.05 |
| 1947 | 3.43  | 2.38 | 3.17 | 1.21 | 1.12 | 3.69 | 0.45 | 3.05 | 1.95  | 4.51 | 2.36 | 2.32 | 29.64 |
| 1948 | 5.04  | 5.69 | 4.26 | 3.34 | 3.81 | 6.68 | 1.78 | 0.60 | 0.78  | 1.23 | 5.54 | 5.30 | 44.05 |
| 1949 | 2.29  | 6.27 | 2.40 | 2.04 | 4.18 | 1.40 | 1.59 | 0.62 | 3.17  | 3.06 | 5.13 | 8.73 | 40.88 |
| 1950 | 9.35  | 3.55 | 4.94 | 3.12 | 1.87 | 5.44 | 2.02 | 1.89 | 1.69  | 7.53 | 5.92 | 5.95 | 53.27 |
| 1951 | 5.51  | 6.58 | 3.93 | 3.01 | 3.21 | 4.32 | 2.31 | 2.95 | 4.36  | 6.20 | 3.20 | 4.65 | 50.23 |
| 1952 | 4.35  | 2.15 | 2.55 | 0.65 | 2.30 | 4.05 | 1.05 | 2.00 | 1.55  | 0.75 | 1.63 | 3.12 | 26.15 |
| 1953 | 14.00 | 4.50 | 3.20 | 5.78 | 6.29 | 5.10 | 0.21 | 1.03 | 2.38  | 2.58 | 3.91 | 6.53 | 55.51 |
| 1954 | 8.52  | 5.24 | 3.27 | 4.45 | 2.04 | 3.03 | 1.52 | 2.52 | 3.42  | 3.32 | 3.57 | 3.71 | 44.61 |
| 1955 | 1.66  | 2.50 | 4.52 | 1.75 | 3.13 | 3.89 | 3.49 | 0.00 | 2.16  | 5.03 | 7.81 | 6.39 | 42.33 |
| 1956 | 3.76  | 5.56 | 4.73 | 2.55 | 2.95 | 1.77 | 1.60 | 3.23 | 2.19  | 3.48 | 2.58 | 6.85 | 41.25 |
| 1957 | 2.43  | 6.23 | 1.67 | 2.67 | 2.75 | 4.45 | 1.06 | 0.95 | 1.30  | 2.24 | 1.99 | 6.11 | 33.85 |
| 1958 | 3.33  | 2.80 | 1.38 | 4.75 | 1.25 | 5.50 | 2.81 | 0.81 | 4.03  | 2.47 | 8.21 | 4.20 | 41.54 |
| 1959 | 6.05  | 3.48 | 4.09 | 4.98 | 3.00 | 0.95 | 0.19 | 1.62 | 4.02  | 4.90 | 6.20 | 2.94 | 42.42 |
| 1960 | 3.64  | 2.02 | 3.26 | 4.91 | 2.82 | 1.49 | 0.12 | 2.71 | 1.05  | 2.20 | 6.08 | 2.50 | 32.80 |

## POLEBRIDGE, MONTANA

## Average Temperature (°F)

| Year | Jan. | Feb. | Mar. | Apr. | May  | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Ann'l |
|------|------|------|------|------|------|------|------|------|-------|------|------|------|-------|
| 1933 |      |      |      |      |      |      |      | 60.4 | 48.6  |      |      | 24.4 |       |
| 1934 | 29.3 | 25.6 | 35.4 | 45.9 | 55.0 | 53.2 | 61.4 | 60.2 | 47.9  | 41.2 | 36.7 | 23.2 | 42.9  |
| 1935 | 19.0 |      |      |      | 42.3 | 52.1 |      | 56.7 | 50.9  | 38.2 | 24.4 | 23.9 |       |
| 1936 | 20.5 | -1.8 | 28.2 | 38.2 | 53.7 | 58.2 | 65.2 | 61.1 | 49.6  | 42.1 | 25.4 | 21.8 | 38.5  |
| 1937 | -3.0 | 19.1 |      | 40.2 | 50.0 | 55.8 | 63.6 | 59.1 | 54.1  | 44.8 | 33.1 | 21.0 |       |
| 1938 | 19.4 | 20.4 | 31.4 | 38.8 | 46.6 | 56.6 | 62.8 | 57.0 | 56.6  |      |      |      |       |
| 1945 |      |      |      |      |      |      |      |      |       |      |      | 24.1 |       |
| 1946 | 25.5 | 27.0 |      |      |      | 55.0 | 61.8 | 59.6 | 50.4  |      | 24.2 |      |       |
| 1947 | 18.3 |      | 31.2 |      | 51.4 | 53.6 | 63.6 | 58.6 | 51.0  | 44.0 | 27.6 | 24.8 |       |
| 1948 | 20.0 | 18.8 | 23.6 | 38.8 | 49.6 | 59.0 | 58.0 | 59.5 | 50.1  | 40.3 | 28.7 | 12.4 | 38.3  |
| 1949 | 1.3  | 15.8 | 27.9 | 42.6 | 50.9 | 53.8 | 59.6 | 59.4 | 50.8  | 37.7 | 35.4 | 19.0 | 37.9  |
| 1950 | 1.0  | 24.6 | 27.4 | 36.9 | 45.8 | 53.3 | 60.0 | 58.9 | 50.4  | 41.8 | 27.2 | 27.7 | 37.9  |
| 1951 | 15.1 | 21.2 | 22.2 | 37.4 | 48.1 | 50.5 | 60.5 | 57.0 | 48.5  | 38.3 | 27.1 | 11.3 | 36.4  |
| 1952 | 15.7 | 24.4 | 27.4 | 41.8 | 48.8 | 54.1 | 59.3 | 58.5 | 53.6  | 42.6 | 27.2 | 24.4 | 39.9  |
| 1953 | 30.4 | 26.5 | 32.1 | 36.6 | 47.2 | 52.8 | 60.4 | 59.9 | 52.4  | 43.8 | 34.0 | 25.1 | 41.7  |
| 1954 | 15.6 | 29.9 | 23.6 | 33.6 | 47.7 | 51.7 | 59.8 | 57.6 | 49.5  | 38.6 | 35.9 | 24.6 | 39.0  |
| 1955 | 21.3 | 18.8 | 20.7 | 35.8 | 44.6 | 54.9 | 59.8 | 57.9 | 49.3  | 42.8 | 19.7 | 16.6 | 36.9  |
| 1956 | 20.4 | 18.1 | 28.1 | 37.7 | 49.9 | 54.7 | 61.5 | 59.1 | 51.2  | 39.8 | 26.6 | 22.9 | 39.1  |
| 1957 | 3.7  | 20.7 | 28.9 | 38.6 | 51.5 | 55.9 | 59.6 | 56.7 | 51.7  | 37.3 | 28.0 | 26.3 | 38.3  |
| 1958 | 24.7 | 28.1 | 27.9 | 39.3 | 54.8 | 57.3 | 61.0 | 63.6 | 51.4  | 40.6 | 26.3 | 24.3 | 41.6  |
| 1959 | 19.6 | 18.3 | 32.2 | 39.5 | 44.4 | 55.7 | 60.5 | 56.8 | 50.9  | 39.9 | 21.6 | 21.2 | 38.4  |
| 1960 | 14.3 | 20.2 | 29.6 | 39.0 | 45.8 | 54.0 | 64.4 | 57.8 | 51.6  | 41.2 | 29.5 | 20.1 | 39.0  |

## POLEBRIDGE, MONTANA

## Total Precipitation (Inches)

| Year | Jan. | Feb. | Mar. | Apr. | May  | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Ann'l |
|------|------|------|------|------|------|------|------|------|-------|------|------|------|-------|
| 1933 |      |      |      |      |      |      |      | 2.02 | 2.50  |      |      | 9.47 |       |
| 1934 | 3.14 | 0.29 | 2.98 | 1.45 | 1.40 | 1.88 | 0.05 | 0.59 | 1.00  | 3.34 | 2.94 | 2.91 | 21.97 |
| 1935 | 6.21 | 0.17 |      |      | 0.52 | 1.48 | 1.10 | 0.80 | 0.43  | 1.32 | 1.40 | 0.64 |       |
| 1936 |      | 2.31 | 1.63 | 1.78 | 1.39 | 1.28 | 0.25 | 0.38 | 1.29  | 0.39 | 0.05 | 2.82 |       |
| 1937 | 1.25 | 2.97 |      | 2.40 | 1.31 | 1.87 | 0.59 | 0.89 | 1.47  | 1.45 | 2.50 | 3.55 |       |
| 1938 | 1.40 | 2.22 | 1.64 | 1.43 | 2.00 | 1.95 | 1.91 | 0.97 | 1.03  |      |      | 4.22 |       |
| 1939 |      | 2.07 |      |      |      |      |      |      |       |      |      |      |       |
| 1941 |      |      |      |      |      |      |      |      |       |      | 2.66 | 3.24 |       |
| 1942 | 0.58 | 0.99 |      |      | 3.79 |      | 1.81 | 1.16 | 1.67  | 1.09 | 3.47 | 1.35 |       |
| 1943 | 3.37 | 1.37 | 2.04 | 0.74 | 1.77 | 1.98 | 0.72 | 1.24 | 0.33  | 1.78 | 0.43 | 1.49 | 17.26 |
| 1944 | 0.81 | 0.89 | 0.86 | 0.68 | 2.01 | 1.98 | 0.41 | 1.45 | 1.18  | 0.25 | 1.11 |      |       |
| 1945 |      | 1.64 | 2.29 | 2.25 | 1.35 | 1.98 | 1.59 | 0.91 | 2.08  | 1.79 | 3.69 | 2.00 |       |
| 1946 | 2.14 | 1.49 | 1.44 | 0.63 | 1.50 | 2.19 | 1.03 | 1.11 | 1.28  | 2.92 | 5.31 | 2.06 | 23.10 |
| 1947 | 2.08 | 1.39 | 1.73 | 0.36 | 0.90 | 2.97 | 0.32 | 2.99 | 0.67  | 3.70 | 0.85 | 1.22 | 19.18 |
| 1948 | 1.54 | 2.69 | 1.74 | 2.24 | 1.88 | 3.44 | 3.74 | 1.16 | 0.09  | 0.52 | 2.58 | 2.06 | 23.68 |
| 1949 | 1.07 | 4.38 | 1.25 | 1.08 | 2.18 | 1.37 | 2.74 | 0.63 | 1.01  | 1.32 | 2.96 | 3.06 | 23.05 |
| 1950 | 4.28 | 1.74 | 2.73 | 0.88 | 0.70 | 1.61 | 1.02 | 0.96 | 0.70  | 3.51 | 2.07 | 2.34 | 22.54 |
| 1951 | 3.48 | 3.19 | 2.05 | 1.26 | 2.45 | 2.55 | 1.38 | 3.14 | 2.91  | 4.34 | 1.77 | 4.69 | 33.21 |
| 1952 | 2.19 | 0.99 | 0.59 | 0.48 | 1.40 | 3.35 | 0.90 | 0.72 | 0.39  | 0.07 | 0.49 | 1.50 | 13.07 |
| 1953 | 6.32 | 1.86 | 0.86 | 2.47 | 1.70 | 3.10 | 0.08 | 1.14 | 0.96  | 0.43 | 2.32 | 4.13 | 25.37 |
| 1954 | 6.92 | 3.04 | 2.93 | 3.39 | 0.97 | 1.65 | 1.96 | 4.81 | 0.91  | 1.16 | 1.55 | 0.96 | 30.25 |
| 1955 | 0.67 | 1.94 | 1.95 | 1.01 | 1.36 | 1.68 | 2.14 | T    | 1.37  | 2.77 | 2.86 | 4.47 | 22.22 |
| 1956 | 1.99 | 1.51 | 1.82 | 1.81 | 1.40 | 2.45 | 1.60 | 1.09 | 1.34  | 1.44 | 0.64 | 2.99 | 20.08 |
| 1957 | 1.54 | 3.27 | 0.71 | 1.52 | 1.89 | 3.44 | 1.58 | 0.54 | 0.43  | 3.31 | 0.53 | 2.75 | 21.51 |
| 1958 | 1.99 | 2.64 | 1.09 | 2.57 | 1.18 | 3.59 | 0.74 | 1.09 | 2.06  | 1.68 | 4.21 | 2.49 | 25.33 |
| 1959 | 5.54 | 1.97 | 0.52 | 2.71 | 3.38 | 1.40 | 0.11 | 1.21 | 4.45  | 3.22 | 4.79 | 1.57 | 30.87 |
| 1960 | 1.44 | 1.25 | 1.59 | 1.12 | 2.47 | 0.61 | 0.10 | 1.86 | 0.56  | 1.12 | 4.08 | 1.17 | 17.37 |

# SNOW TABLES

## WEST GLACIER

## SUMMIT

| Snow Depth (in.) 1st of Month |      |      |      |      |      | Snow Depth (in) About 1st of Mo.                                     |      |      |      |      |     |
|-------------------------------|------|------|------|------|------|----------------------------------------------------------------------|------|------|------|------|-----|
| Year                          | Dec. | Jan. | Feb. | Mar. | Apr. | Year                                                                 | Jan. | Feb. | Mar. | Apr. | May |
| 1931                          | 7    | 12   | 11   | 11   | 0    | 1935                                                                 | 35   | 32   | 36   | -    | 31  |
| 1932                          | 2    | 19   | 25   | 22   | 13   | 1936                                                                 | 24   | 26   | 51   | 61   | 8   |
| 1933                          | 0    | 21   | 27   | 41   | 18   | 1937                                                                 | 29   | 40   | 52   | 47   | 28  |
| 1934                          | 2    | 8    | 5    | 0    | 0    | 1938                                                                 | 34   | 40   | 44   | 51   | 19  |
| 1935                          | 4    | 15   | 23   | 22   | 27   | 1939                                                                 | 46   | 55   | 66   | 42   | 5   |
| 1936                          | 0    | 15   | 30   | 34   | 37   | 1940                                                                 | 6    | 12   | 40   | 29   | 11  |
| 1937                          | 3    | 7    | 35   | 28   | 8    | 1941                                                                 | 17   | 26   | 26   | 15   | T   |
| 1938                          | 0    | 6    | 19   | 17   | 2    | 1942                                                                 | 17   | 17   | 24   | 30   | 1   |
| 1939                          | 0    | 12   | 28   | 35   | T    | 1943                                                                 | 34   | 54   | 61   | 66   | 22  |
| 1940                          | 8    | 3    | 9    | 13   | 0    | 1944                                                                 | 20   | 19   | 27   | 29   | 4   |
| 1941                          | 0    | 14   | 21   | 16   | 0    | 1945                                                                 | 24   | 24   | 34   | 46   | 38  |
| 1942                          | 8    | 3    | 6    | 10   | 0    | 1946                                                                 | 30   | 50   | 48   | 45   | 19  |
| 1943                          | 0    | 17   | 31   | 32   | 17   | 1947                                                                 | 51   | 63   | 63   | 61   | ??  |
| 1944                          | 2    | 6    | 4    | 7    | T    | 1948                                                                 | 24   | 30   | 51   | 69   | 37  |
| 1945                          | 8    | 11   | 8    | 7    | 6    | 1949                                                                 | 36   | 45   | 63   | 63   | 27  |
| 1946                          | 23   | 16   | 41   | 24   | 4    | 1950                                                                 | 40   | 66   | 70   | 83   | 63  |
| 1947                          | 10   | 31   | 40   | 31   | 19   | 1951                                                                 | 28   | 45   | 58   | 67   | 46  |
| 1948                          | 13   | 6    | 9    | 19   | 16   | 1952                                                                 | 43   | 52   | 56   | 58   | 24  |
| 1949                          | T    | 25   | 29   | 29   | 24   | 1953                                                                 | 17   | 38   | 48   | 48   | 45  |
| 1950                          | 14   | 13   | 32   | 32   | 31   | 1954                                                                 | 49   | 67   | 75   | 82   | 91  |
| 1951                          | 1    | 8    | 20   | 23   | 18   | 1955                                                                 | 19   | 24   | 49   | 55   | 39  |
| 1952                          | -    | 25   | 22   | 25   | 18   | 1956                                                                 | 41   | 48   | 76   | 65   | 51  |
| 1953                          | 0    | 17   | 9    | 18   | T    | 1957                                                                 | 30   | 44   | 57   | 54   | 42  |
| 1954                          | T    | 7    | 30   | 24   | 35   | 1958                                                                 | 30   | 40   | 42   | 36   | 39  |
| 1955                          | 3    | 8    | 15   | 22   | 20   | 1959                                                                 | 31   | 52   | 61   | 59   | 50  |
| 1956                          | 0    | 18   | 28   | 35   | 19   | 1960                                                                 | 26   | 37   | 43   | 37   | 40  |
| 1957                          | 2    | 10   | 28   | 25   | 19   | Courtesy U. S. Geological Survey<br>from Summit Snow Course Readings |      |      |      |      |     |
| 1958                          | 6    | 13   | 18   | 16   | 5    |                                                                      |      |      |      |      |     |
| 1959                          | 14   | 11   | 22   | 24   | 13   |                                                                      |      |      |      |      |     |
| 1960                          | 2    | 10   | 21   | 27   | 8    |                                                                      |      |      |      |      |     |

# STATION HISTORIES

(Continued from Pg. 4)

There have been short records kept in many other places in and around the Park's periphery and some of these stations are still operating. However, it is beyond the scope or purpose of this report to list details of these records, most of which are of short duration or are seasonal in character. Stations now operating, with some details of their programs, are listed:

|                     |                                          |                                                                                                            |
|---------------------|------------------------------------------|------------------------------------------------------------------------------------------------------------|
| East Glacier        | National Park Service                    | Measures precipitation only.                                                                               |
| Essex (Walton R.S.) | National Park Service                    | Temperature and Precipitation, intermittent record since 1951.                                             |
| Babb 6NE            | U.S. Bur. Reclamation                    | Class A evaporation station, 1906 to date, not used in this report because of distance from Park boundary. |
| Grinnell Glacier    | National Park Service                    | Seasonal precipitation, summer temperatures, for glacier studies since 1949.                               |
| Sperry Chalets      | National Park Service (Mrs. Ross Ludwig) | Summer (July-August) data only. Started June 29, 1960.                                                     |

In addition partial, and in some cases, unofficial and substandard data have been observed for short periods at:

|                             |                                |
|-----------------------------|--------------------------------|
| St. Mary Ranger Station     | Sherburne Reservoir (dam site) |
| Many Glacier Ranger Station | Bear Creek                     |
| Inbec (east of Summit)      | Upper Columbia Snow Lab.       |
| Sherburne Ranger Station    | Upper Lake McDonald            |

The GLACIER NATURAL HISTORY ASSOCIATION is a non-profit organization pledged to aid in the preservation and interpretation of the scenic, scientific, and historic heritage of Glacier National Park for the enrichment and enjoyment of its visitors.

The Association aids the Park in developing its library and roadside exhibits; offers natural history books for sale; assists in the acquisition of non-federally owned lands within the Park; and cooperates fully with the United States Government in helping to make Glacier a better Park. Revenue derived from its activities is devoted entirely to these purposes. Any person interested in the furtherance of these purposes may become a member upon payment of the annual fee of one dollar. Tax-free gifts and donations may be made for land acquisition or general use.



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