U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data,
and Information Service

Climatography of the United States No. 20 1971-2000

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801
www.ncdc.noaa.gov

Station: WHITEFISH, MT **COOP ID: 248902**

Climate Division: MT 1 **NWS Call Sign:** **Elevation: 3,100 Feet** **Lat: 48˚25N** **Lon: 114˚22W**

Temperature (˚F)

Mean (1)				Extremes										Degree Days (1) Base Temp 65		Mean Number of Days (3)					
Month	Daily Max	Daily Min	Mean	Highest Daily(2)	Year	Day	Highest Month(1) Mean	Year	Lowest Daily(2)	Year	Day	Lowest Month(1) Mean	Year	Heating	Cooling	Max >= 100	Max >= 90	Max >= 50	Max <= 32	Min <= 32	Min <= 0
Jan	29.4	12.9	21.2	50	1989	31	30.5	1994	-26	1996	30	4.6	1979	1359	0	.0	.0	@	16.6	30.6	5.2
Feb	35.8	15.4	25.6	63	1995	25	33.0	1991	-27+	1989	5	12.6	1989	1103	0	.0	.0	.8	7.9	27.8	3.3
Mar	44.2	22.3	33.3	65+	1999	22	40.0	1992	-15	1989	3	27.9	1976	985	0	.0	.0	8.4	1.9	29.1	.5
Apr	55.9	29.3	42.6	79+	1994	18	48.2	1987	11+	2001	4	36.1	1975	672	0	.0	.0	21.5	@	19.5	.0
May	64.9	37.4	51.2	89	1993	13	56.5	1993	25+	1999	8	46.8	1974	429	0	.0	@	29.5	.0	5.3	.0
Jun	71.7	44.4	58.1	95	1992	24	63.4	1986	28	1965	7	53.7	1981	222	14	.0	.5	29.8	.0	.2	.0
Jul	80.1	48.7	64.4	99	1994	26	69.4	1985	32	1999	3	57.0	1993	100	82	.0	3.7	31.0	.0	@	.0
Aug	80.3	47.8	64.1	98	1997	5	68.8	1971	30	1992	24	58.6	1980	112	83	.0	3.8	30.9	.0	.1	.0
Sep	68.7	38.1	53.4	94+	1998	5	60.2	1998	19	2000	23	47.7	1985	359	10	.0	.4	29.0	.0	5.3	.0
Oct	55.2	29.6	42.4	79+	1992	3	46.9	1988	2	1991	30	39.5	1984	701	0	.0	.0	22.1	.2	20.6	.0
Nov	37.8	22.9	30.4	69	1999	13	36.9	1999	-13	1993	24	18.2	1985	1039	0	.0	.0	1.6	7.9	27.6	.8
Dec	30.3	15.8	23.1	47	1995	1	30.1	1979	-33	1990	29	13.0	1983	1301	0	.0	.0	.2	16.4	30.1	3.1
Ann	54.5	30.4	42.5	99	Jul 1994	26	69.4	Jul 1985	-33	Dec 1990	29	4.6	Jan 1979	8382	189	.0	8.4	204.8	50.9	196.2	12.9

\+ Also occurred on an earlier date(s)

@ Denotes mean number of days greater than 0 but less than .05

Complete documentation available from: www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1948-2001

(3) Derived from 1971-2000 serially complete daily data

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Precipitation (inches)

Precipitation Totals

Month	Means/ Medians(1) Mean	Means/ Medians(1) Median	Extremes Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year
Jan	1.87	1.68	1.72	1982	23	4.08	1982	.49	1985
Feb	1.44	1.21	1.26	1968	21	3.34	1986	.10	1998
Mar	1.23	1.11	.89	1950	17	2.14	1983	.27	1976
Apr	1.43	1.34	1.15	1974	27	2.90	1993	.07	1999
May	2.48	2.08	1.73	1958	12	5.90	1980	.80	1999
Jun	2.87	2.22	3.11	1964	8	6.20	1995	.81	1977
Jul	1.97	1.70	1.70	1978	3	7.68	1993	.07	1973
Aug	1.49	1.20	1.31	1965	23	4.11	1989	.08	1994
Sep	1.21	1.13	1.02	1959	15	2.72	1986	.05	1990
Oct	1.03	.88	1.05	1967	11	2.89	1995	.06	1987
Nov	2.00	1.97	1.39	1989	12	4.50	1973	.49	2000
Dec	2.10	1.92	1.76	1964	22	5.05	1977	.69	1986
Ann	21.12	21.64	3.11	Jun 1964	8	7.68	Jul 1993	.05	Sep 1990

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	14.4	6.4	.4	.1
Feb	10.4	4.9	.3	.0
Mar	11.2	4.4	.2	.0
Apr	11.1	4.6	.5	.1
May	13.1	6.8	1.0	.2
Jun	13.5	7.6	1.4	.3
Jul	8.8	4.7	1.1	.3
Aug	8.3	4.1	.5	.1
Sep	8.2	4.1	.4	.0
Oct	8.5	3.8	.2	@
Nov	13.1	6.5	.5	.1
Dec	14.4	7.2	.6	@
Ann	135.0	65.1	7.1	1.2

Precipitation Probabilities (1)

Probability that the monthly/annual precipitation will be equal to or less than the indicated amount

Monthly/Annual Precipitation vs Probability Levels
These values were determined from the incomplete gamma distribution

Month	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	.79	.96	1.20	1.40	1.58	1.77	1.96	2.19	2.49	2.93	3.33
Feb	.36	.50	.71	.89	1.08	1.27	1.48	1.74	2.07	2.59	3.09
Mar	.39	.51	.68	.83	.97	1.12	1.28	1.47	1.72	2.10	2.46
Apr	.34	.47	.68	.87	1.05	1.25	1.47	1.73	2.07	2.61	3.12
May	.78	1.02	1.37	1.66	1.95	2.25	2.58	2.96	3.46	4.23	4.94
Jun	.82	1.10	1.51	1.87	2.21	2.58	2.98	3.45	4.07	5.03	5.92
Jul	.25	.40	.68	.96	1.25	1.57	1.94	2.41	3.03	4.06	5.05
Aug	.26	.39	.61	.81	1.02	1.24	1.50	1.81	2.23	2.90	3.54
Sep	.19	.30	.47	.64	.81	1.00	1.22	1.48	1.83	2.41	2.96
Oct	.16	.25	.40	.54	.69	.85	1.03	1.26	1.56	2.05	2.52
Nov	.56	.75	1.04	1.29	1.53	1.79	2.07	2.41	2.84	3.52	4.16
Dec	.69	.89	1.18	1.43	1.67	1.92	2.18	2.50	2.91	3.53	4.12
Ann	14.21	15.52	17.21	18.50	19.66	20.78	21.95	23.24	24.82	27.12	29.13

\+ Also occurred on an earlier date(s)
\# Denotes amounts of a trace
@ Denotes mean number of days greater than 0 but less than .05
****** Statistics not computed because less than six years out of thirty had measurable precipitation

(1) From the 1971-2000 Monthly Normals
(2) Derived from station's available digital record: 1948-2001
(3) Derived from 1971-2000 serially complete daily data

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Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	18.7	16.1	12	11
Feb	9.5	8.5	12	11
Mar	5.2	4.3	6	5
Apr	1.3	.5	1	#
May	#	.0	#	0
Jun	.2	.0	#	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	#	.0	0	0
Oct	.7	.0	#	0
Nov	6.6	4.0	1	1
Dec	18.3	13.8	6	4
Ann	60.5	47.2	N/A	N/A

Extremes (2)

Month	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year
Jan	12.0	1991	1	46.5	1982	35	1982	23	27	1979
Feb	7.0	1979	3	20.3	1994	36	1979	3	25+	1997
Mar	5.0	1982	13	20.3	1997	33	1997	3	26	1997
Apr	8.0	1982	4	8.0	1982	15	1982	4	6	1997
May	#	1973	10	#	1973	#	1975	24	#	1975
Jun	4.0	1995	7	4.0	1995	4	1995	7	#	1995
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	#	1972	28	#	1972	0	0	0	0	0
Oct	4.0	1972	26	6.0	1972	4	1972	26	1	1991
Nov	7.0	1993	22	17.8	1973	18	1996	28	6	1996
Dec	11.5	1996	30	39.1	1977	38	1996	30	19	1996
Ann	12.0	Jan 1991	1	46.5	Jan 1982	38	Dec 1996	30	27	Jan 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	10.9	7.6	1.9	.6	.1
Feb	5.6	4.2	1.0	.2	.0
Mar	3.5	2.5	.6	@	.0
Apr	1.3	.7	.3	@	.0
May	.0	.0	.0	.0	.0
Jun	@	@	@	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.0	.0	.0	.0	.0
Oct	.3	.3	.1	.0	.0
Nov	5.0	3.2	1.0	.3	.0
Dec	9.6	7.6	2.3	.7	@
Ann	36.2	26.1	7.2	1.8	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	29.9	28.3	24.7	14.0
Feb	27.1	23.7	20.5	11.3
Mar	18.8	15.0	11.2	5.4
Apr	.8	.4	.1	.0
May	.0	.0	.0	.0
Jun	@	@	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.5	.2	.0	.0
Nov	8.5	4.0	1.8	.5
Dec	24.6	18.6	10.4	5.0
Ann	110.2	90.2	68.7	36.2

+ Also occurred on an earlier date(s) #Denotes trace amounts

@ Denotes mean number of days greater than 0 but less than .05

-9/-9.9 represents missing values
Annual statistics for Mean/Median snow depths are not appropriate

(1) Derived from Snow Climatology and 1971-2000 daily data

(2) Derived from 1971-2000 daily data

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Freeze Data

Spring Freeze Dates (Month/Day)

Temp (F)	Probability of later date in spring (thru Jul 31) than indicated(*)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	7/05	6/29	6/25	6/21	6/18	6/14	6/11	6/07	6/01
32	6/07	6/01	5/28	5/25	5/22	5/19	5/16	5/12	5/06
28	5/17	5/13	5/11	5/08	5/06	5/04	5/02	4/30	4/26
24	4/27	4/23	4/19	4/16	4/14	4/11	4/08	4/05	3/31
20	4/20	4/15	4/11	4/08	4/05	4/02	3/29	3/26	3/20
16	4/09	4/02	3/28	3/23	3/19	3/15	3/11	3/06	2/26

Fall Freeze Dates (Month/Day)

Temp (F)	Probability of earlier date in fall (beginning Aug 1) than indicated(*)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	8/22	8/27	8/31	9/03	9/06	9/08	9/11	9/15	9/20
32	9/03	9/07	9/10	9/13	9/16	9/18	9/21	9/24	9/28
28	9/13	9/18	9/22	9/25	9/27	9/30	10/03	10/07	10/12
24	9/20	9/27	10/02	10/07	10/11	10/15	10/20	10/25	11/01
20	10/11	10/18	10/22	10/26	10/30	11/02	11/06	11/11	11/17
16	10/23	10/30	11/04	11/09	11/13	11/17	11/22	11/27	12/04

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	101	93	88	83	79	75	70	65	57
32	136	129	124	120	116	112	107	102	95
28	164	157	152	148	143	139	135	130	123
24	205	196	190	185	179	174	169	163	154
20	230	222	217	212	207	203	198	193	185
16	270	259	251	244	238	232	225	217	206

***** Probability of observing a temperature as cold, or colder, later in the spring or earlier in the fall than the indicated date.

0/00 Indicates that the probability of occurrence of threshold temperature is less than the indicated probability.

Derived from 1971-2000 serially complete daily data

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Degree Days to Selected Base Temperatures (˚F)

Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1359	1103	985	672	429	222	100	112	359	701	1039	1301	8382
60	1204	963	830	522	281	112	35	45	232	546	889	1146	6805
57	1111	879	737	432	201	65	15	23	167	453	799	1053	5935
55	1049	823	675	374	155	41	9	14	129	391	739	991	5390
50	894	683	520	238	67	9	0	3	57	241	589	836	4137
32	386	231	88	6	0	0	0	0	0	3	149	325	1188

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	50	53	127	325	595	782	1005	993	642	325	100	47	5044
55	0	0	0	3	37	133	301	294	81	0	0	0	849
57	0	0	0	1	21	97	246	241	58	0	0	0	664
60	0	0	0	0	8	54	172	171	33	0	0	0	438
65	0	0	0	0	0	14	82	83	10	0	0	0	189
70	0	0	0	0	0	2	26	27	2	0	0	0	57

Growing Degree Units (2)

Base	Growing Degree Units (Monthly)												Growing Degree Units (Accumulated Monthly)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
40	0	0	14	124	354	556	757	751	410	130	6	0	0	0	14	138	492	1048	1805	2556	2966	3096	3102	3102
45	0	0	0	51	212	407	602	596	272	50	0	0	0	0	0	51	263	670	1272	1868	2140	2190	2190	2190
50	0	0	0	15	109	265	448	441	156	15	0	0	0	0	0	15	124	389	837	1278	1434	1449	1449	1449
55	0	0	0	1	44	145	301	290	65	2	0	0	0	0	0	1	45	190	491	781	846	848	848	848
60	0	0	0	0	11	61	167	161	19	0	0	0	0	0	0	0	11	72	239	400	419	419	419	419
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	0	19	102	230	339	473	473	283	109	0	0	0	0	19	121	351	690	1163	1636	1919	2028	2028	2028

(1) Derived from the 1971-2000 Monthly Normals
(2) Derived from 1971-2000 serially complete daily data
Note: For corn, temperatures below 50 are set to 50, and temperatures above 86 are set to 86

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Notes

a. The monthly means are simple arithmetic averages computed by summing the monthly values for the period 1971-2000 and dividing by thirty. Prior to averaging, the data are adjusted if necessary to compensate for data quality issues, station moves or changes in station reporting practices. Missing months are replaced by estimates based on neighboring stations.

b. The median is defined as the middle value in an ordered set of values. The median is being provided for the snow and precipitation elements because the mean can be a misleading value for precipitation normals.

c. Only observed validated values were used to select the extreme daily values.

d. Extreme monthly temperature/precipitation means were selected from the monthly normals data.
Monthly snow extremes were calculated from daily values quality controlled to be consistent with the Snow Climatology.

e. Degree Days were derived using the same techniques as the 1971-2000 normals.
Compete documentation for the 1971-2000 Normals is available on the internet from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

f. Mean "number of days statistics" for temperature and precipitation were calculated from a serially complete daily data set .
Documentation of the serially complete data set is available from the link below:

g. Snowfall and snow depth statistics were derived from the Snow Climatology.
Documentation for the Snow Climatology project is available from the link under references.

Data Sources for Tables

Several different data sources were used to create the Clim20 climate summaries. In some cases the daily extremes appear inconsistent with the monthly extremes and or the mean number of days statistics. For example, a high daily extreme value may not be reflected in the highest monthly value or the mean number of days threshold that is less than and equal to the extreme value. Some of these difference are caused by different periods of record. Daily extremes are derived from the station's entire period of record while the serial data and normals data were are for the 1971-2000 period. Therefore extremes observed before 1971 would not be included in the 1971-2000 normals or the 1971-2000 serial daily data set. Inconsistencies can also occur when monthly values are adjusted to reflect the current observing conditions or were replaced during the 1971-2000 Monthly Normals processing and are not reconciled with the Summary of the Day data.

a. Temperature/ Precipitation Tables
   1. 1971-2000 Monthly Normals
   2. Cooperative Summary of the Day
   3. National Weather Service station records
   4. 1971-2000 serially complete daily data

b. Degree Day Table
   1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals
   2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data

c. Snow Tables
   1. Snow Climatology
   2. Cooperative Summary of the Day

d. Freeze Data Table
   1971-2000 serially complete daily data

References

U.S. Climate Normals 1971-2000, www.ncdc.noaa.gov/normals.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normals/usnormalsprods.html
Snow Climatology Project Description, www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html
Eischeid, J. K., P. Pasteris, H. F. Diaz, M. Plantico, and N. Lott, 2000: Creating a serially complete, national daily time series of temperature and precipitation for the Western United States. J. Appl. Meteorol., 39, 1580-1591,
www1.ncdc.noaa.gov/pub/data/special/ serialcomplete_jam_0900.pdf