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: SWAN LAKE, MT **COOP ID: 248087**

Climate Division: MT 1 **NWS Call Sign:** **Elevation: 3,100 Feet** **Lat: 47˚55N** **Lon: 113˚50W**

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	28.3	12.2	20.3	53	1973	15	29.5	1999	-36	1979	1	1.9	1979	1386	0	.0	.0	.2	14.8	30.4	5.0
Feb	35.5	16.0	25.8	57	1968	29	31.8	1999	-28	1985	3	12.9	1989	1099	0	.0	.0	1.7	6.3	27.6	2.8
Mar	44.5	22.1	33.3	73	1964	31	39.0	1986	-19	1965	24	28.4	1996	983	0	.0	.0	9.2	1.5	29.1	.4
Apr	55.0	28.7	41.9	86	1987	28	46.9	1987	5	1975	2	36.5	1975	695	0	.0	.0	22.9	.1	21.6	.0
May	64.5	35.8	50.2	92	1986	30	54.5	1993	18+	1973	1	46.4	1974	460	0	.0	.2	29.9	.0	9.5	.0
Jun	70.9	41.4	56.2	93	1970	26	61.2	1986	24	1969	13	51.2	1981	273	6	.0	.5	29.9	.0	1.6	.0
Jul	78.2	44.2	61.2	98	2001	5	69.2	1998	28+	1979	3	54.6	1993	165	48	.0	2.9	31.0	.0	.4	.0
Aug	77.7	42.8	60.3	103	1969	24	66.4	1998	27	1992	25	54.4	1980	191	43	.0	3.1	31.0	.0	.9	.0
Sep	67.1	35.6	51.4	98+	1998	3	58.3	1998	17+	2000	24	47.5	1985	412	2	.0	.4	29.4	.0	9.4	.0
Oct	54.0	27.8	40.9	83	2001	2	44.3	1988	-2	1971	29	36.9	1984	747	0	.0	.0	22.2	.3	22.1	.1
Nov	36.5	21.1	28.8	70	1999	13	36.8+	1999	-10+	1985	28	15.7	1985	1087	0	.0	.0	2.9	6.2	27.0	1.0
Dec	29.0	15.0	22.0	55	1965	4	28.6	1999	-40	1968	30	9.8	1983	1333	0	.0	.0	.3	16.9	30.5	3.1
Ann	53.4	28.6	41.0	103	Aug 1969	24	69.2	Jul 1998	-40	Dec 1968	30	1.9	Jan 1979	8831	99	.0	7.1	210.6	46.1	210.1	12.4

\+ 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: 1950-2001

(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	2.98	3.14	1.24+	1992	23	5.86	1971	.32	1985
Feb	2.38	2.11	2.20	1986	15	4.95	1982	.25	1993
Mar	1.94	1.77	1.09	1987	4	4.01	1997	.64	1993
Apr	1.65	1.49	1.00	1990	29	3.77	1981	.04	1977
May	2.60	2.27	3.07	1951	3	5.75	1981	1.20	1982
Jun	2.75	2.72	3.40	1964	8	6.90	1981	.68	1977
Jul	1.53	1.45	2.92	1987	23	4.87	1987	.00	1973
Aug	1.73	1.41	2.43	1968	15	3.73	1978	.12	1991
Sep	1.96	1.65	2.30	1985	5	6.83	1985	.12	1990
Oct	2.15	2.09	1.12	1990	21	6.07	1990	.36	1978
Nov	3.53	3.45	2.00	1991	26	7.32	1973	1.26	1972
Dec	3.54	3.53	1.90	1981	2	7.85	1996	.66	1985
Ann	28.74	28.62	3.40	Jun 1964	8	7.85	Dec 1996	.00	Jul 1973

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	12.9	7.9	1.4	.2
Feb	9.5	5.6	1.0	.1
Mar	10.4	5.2	.6	.1
Apr	9.2	4.5	.9	@
May	9.9	6.1	1.3	.3
Jun	10.3	6.2	1.5	.3
Jul	6.4	3.6	.8	.2
Aug	6.7	3.8	.9	.3
Sep	7.9	4.8	.8	.2
Oct	8.3	4.8	1.0	.1
Nov	13.5	8.1	1.8	.4
Dec	12.8	7.9	1.7	.1
Ann	117.8	68.5	13.7	2.3

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	1.00	1.28	1.69	2.04	2.38	2.73	3.11	3.56	4.13	5.02	5.83
Feb	.68	.90	1.25	1.54	1.83	2.14	2.47	2.87	3.38	4.18	4.93
Mar	.78	.96	1.21	1.42	1.62	1.82	2.03	2.28	2.60	3.09	3.53
Apr	.41	.57	.81	1.02	1.23	1.45	1.70	2.00	2.38	2.99	3.56
May	1.03	1.27	1.61	1.89	2.16	2.43	2.72	3.06	3.49	4.14	4.74
Jun	.90	1.16	1.55	1.87	2.19	2.51	2.87	3.29	3.82	4.66	5.42
Jul	.17	.36	.62	.84	1.06	1.30	1.57	1.89	2.31	3.00	3.65
Aug	.24	.38	.62	.86	1.12	1.39	1.71	2.11	2.64	3.51	4.35
Sep	.36	.53	.82	1.08	1.36	1.65	1.98	2.39	2.92	3.79	4.61
Oct	.38	.57	.89	1.18	1.48	1.80	2.17	2.62	3.21	4.17	5.09
Nov	1.29	1.62	2.10	2.50	2.88	3.27	3.69	4.18	4.81	5.77	6.66
Dec	1.41	1.74	2.20	2.58	2.94	3.31	3.71	4.16	4.74	5.63	6.44
Ann	22.50	23.75	25.33	26.51	27.55	28.55	29.57	30.69	32.03	33.96	35.60

\+ 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: 1950-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
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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	29.8	21.5	19	17
Feb	16.0	14.9	21	21
Mar	11.2	12.5	17	15
Apr	1.9	1.6	3	#
May	.1	.0	#	0
Jun	.0	.0	#	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.1	.0	0	0
Oct	1.6	.0	#	0
Nov	18.6	14.5	3	3
Dec	27.8	27.0	12	11
Ann	107.1	92.0	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	14.0	1979	13	54.5	1975	43+	1979	13	36	1978
Feb	18.0	1971	4	26.5+	1997	48	1978	2	37	1979
Mar	9.5	1997	3	33.1	1975	41	1997	6	33	1997
Apr	7.0	1982	3	7.0	1982	26	1975	7	15	1975
May	3.0	1975	20	3.0	1975	3	1975	20	#+	1999
Jun	.0	0	0	.0	0	1	1992	28	#	1992
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	3.0	1972	25	3.0	1972	0	0	0	0	0
Oct	10.5	1972	26	18.0	1975	12	1972	28	2	1984
Nov	17.0	1987	16	52.0	1973	25	1996	29	12	1996
Dec	15.0	1989	19	56.0	1971	47	1996	30	31	1996
Ann	18.0	Feb 1971	4	56.0	Dec 1971	48	Feb 1978	2	37	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	8.8	7.1	3.6	1.8	.2
Feb	6.2	4.4	2.3	.9	.1
Mar	4.6	3.3	1.4	.6	.0
Apr	1.9	.8	.4	.2	.0
May	.1	.1	@	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	@	@	@	.0	.0
Oct	.6	.6	.3	.1	@
Nov	6.3	4.7	2.0	1.0	.2
Dec	10.1	8.4	4.2	2.1	.2
Ann	38.6	29.4	14.2	6.7	.7

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	-9.9	-9.9	-9.9	-9.9
Mar	-9.9	-9.9	-9.9	-9.9
Apr	1.4	1.1	.8	.7
May	.1	@	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.1	.1	.0	.0
Nov	11.6	8.3	4.3	.6
Dec	-9.9	-9.9	-9.9	-9.9
Ann	-9.9	-9.9	-9.9	-9.9

+ 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	8/01	7/24	7/18	7/13	7/08	7/04	6/29	6/23	6/15
32	7/08	6/30	6/23	6/18	6/13	6/08	6/03	5/27	5/19
28	6/14	6/06	5/31	5/26	5/22	5/17	5/12	5/07	4/29
24	5/14	5/07	5/03	4/29	4/25	4/22	4/18	4/13	4/07
20	4/26	4/18	4/13	4/09	4/04	3/31	3/27	3/21	3/14
16	4/15	4/07	4/02	3/28	3/24	3/20	3/15	3/10	3/02

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	7/30	8/05	8/09	8/13	8/17	8/20	8/24	8/29	9/04
32	8/18	8/24	8/28	8/31	9/03	9/07	9/10	9/14	9/19
28	9/01	9/07	9/11	9/15	9/18	9/22	9/25	9/29	10/05
24	9/16	9/22	9/26	9/30	10/04	10/07	10/11	10/16	10/22
20	9/28	10/05	10/11	10/16	10/20	10/24	10/29	11/04	11/11
16	10/17	10/25	10/31	11/04	11/09	11/13	11/18	11/24	12/01

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	76	63	54	46	39	31	23	14	2
32	117	105	96	89	82	75	67	58	46
28	150	140	132	125	119	112	106	98	87
24	190	180	173	167	161	155	149	142	132
20	228	218	210	204	198	192	185	178	168
16	259	249	242	235	229	223	217	210	199

***** 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	1386	1099	983	695	460	273	165	191	412	747	1087	1333	8831
60	1231	959	828	545	307	147	80	100	272	592	937	1178	7176
57	1138	875	735	455	222	90	43	59	197	499	847	1085	6245
55	1076	819	673	396	171	60	26	38	152	437	787	1023	5658
50	921	679	518	254	73	14	7	11	65	284	637	868	4331
32	420	228	72	5	0	0	0	0	0	9	189	353	1276

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	57	53	112	300	564	723	906	875	580	285	92	44	4591
55	0	0	0	1	21	93	219	200	42	0	0	0	576
57	0	0	0	0	11	63	174	159	27	0	0	0	434
60	0	0	0	0	3	30	118	107	12	0	0	0	270
65	0	0	0	0	0	6	48	43	2	0	0	0	99
70	0	0	0	0	0	0	14	13	0	0	0	0	27

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	16	129	348	515	693	665	374	130	11	0	0	0	16	145	493	1008	1701	2366	2740	2870	2881	2881
45	0	0	1	53	202	365	538	510	238	50	0	0	0	0	1	54	256	621	1159	1669	1907	1957	1957	1957
50	0	0	0	17	96	228	383	359	120	9	0	0	0	0	0	17	113	341	724	1083	1203	1212	1212	1212
55	0	0	0	2	37	111	236	214	41	0	0	0	0	0	0	2	39	150	386	600	641	641	641	641
60	0	0	0	0	5	42	111	95	9	0	0	0	0	0	0	0	5	47	158	253	262	262	262	262
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	0	26	124	253	340	458	459	283	118	5	0	0	0	26	150	403	743	1201	1660	1943	2061	2066	2066

(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

Complete documentation available from:
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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