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: SACO 1 NNW, MT **COOP ID: 247265**

Climate Division: MT 3 **NWS Call Sign:** **Elevation: 2,170 Feet** **Lat: 48˚28N** **Lon: 107˚21W**

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	22.8	-2.7	10.1	62	1968	24	25.4	1992	-50	1969	25	-8.2	1982	1704	0	.0	.0	.8	20.7	30.8	15.1
Feb	31.4	5.2	18.3	72	1992	27	32.3	1991	-45+	1994	8	1.1	1979	1308	0	.0	.0	3.4	13.5	27.8	9.6
Mar	43.4	16.4	29.9	79	1993	23	38.0	1986	-34+	1996	7	20.9	1996	1088	0	.0	.0	10.7	6.2	29.4	2.9
Apr	59.0	28.2	43.6	92	1980	20	51.5	1987	-5	1975	1	33.8	1975	643	0	.0	@	23.4	.7	19.9	.1
May	69.5	39.9	54.7	100	1988	29	61.5	1988	14	1984	1	49.5	1974	325	7	@	.8	29.9	.0	5.3	.0
Jun	77.1	49.3	63.2	104	1988	26	73.8	1988	28	1979	8	59.3	1985	122	68	.2	2.7	30.0	.0	.1	.0
Jul	83.4	53.3	68.4	104	1968	29	72.2	1989	34	1972	3	60.8	1993	47	151	.2	7.5	31.0	.0	.0	.0
Aug	82.7	51.0	66.9	105+	1971	22	72.6	1998	31	1969	30	58.5	1977	100	157	.5	8.0	30.9	.0	.1	.0
Sep	71.0	38.9	55.0	100+	1991	1	64.1	1998	17+	1985	30	49.7	1985	326	25	.1	1.5	29.0	.0	4.8	.0
Oct	58.8	27.7	43.3	89+	1987	3	48.3	1979	-9	1991	30	38.6	1984	675	0	.0	.0	24.8	.7	20.6	.2
Nov	39.5	13.8	26.7	81	1999	13	39.9	1999	-37	1985	23	10.4	1985	1151	0	.0	.0	8.0	8.7	28.9	4.2
Dec	27.5	2.2	14.9	62	1980	16	28.4	1999	-48	1972	8	-4.8	1983	1554	0	.0	.0	1.9	17.0	30.7	11.8
Ann	55.5	26.9	41.3	105+	Aug 1971	22	73.8	Jun 1988	-50	Jan 1969	25	-8.2	Jan 1982	9043	408	1.0	20.5	223.8	67.5	198.4	43.9

\+ 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: 1966-2001

(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	.35	.21	.50	1989	6	1.27	1971	.00+	1995
Feb	.32	.26	.52	1999	26	.73	1999	.04	1990
Mar	.58	.60	1.00	1999	31	1.70	1975	.00	1994
Apr	.76	.64	.95	1994	24	2.13	1975	.06	1996
May	1.89	1.37	2.30	1982	28	5.00	1982	.24	1998
Jun	2.38	2.20	2.60	1972	9	5.82	1995	.03	1985
Jul	1.56	1.19	1.73	1989	13	3.76	1993	.00	1984
Aug	1.08	.87	1.76	1985	3	3.51	1975	.03	1994
Sep	1.15	.80	2.11	1986	25	5.99	1986	.03	1990
Oct	.68	.52	1.12	1981	12	2.37	1998	.02	1983
Nov	.55	.43	.71	1998	2	1.75	1996	.00+	1987
Dec	.41	.42	.46	1972	1	.95	1972	.00+	1997
Ann	11.71	11.82	2.60	Jun 1972	9	5.99	Sep 1986	.00+	Dec 1997

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.5	1.2	@	.0
Feb	3.7	1.3	@	.0
Mar	4.7	2.0	.1	@
Apr	5.1	2.4	.3	.0
May	8.4	4.5	.9	.3
Jun	8.2	5.2	1.2	.5
Jul	6.1	3.2	1.0	.3
Aug	6.1	2.8	.4	.1
Sep	5.3	2.6	.7	.2
Oct	3.5	1.6	.4	.1
Nov	4.0	2.2	.1	.0
Dec	4.5	1.6	.0	.0
Ann	64.1	30.6	5.1	1.5

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	.00	.03	.08	.14	.19	.26	.34	.44	.57	.80	1.02
Feb	.04	.06	.11	.15	.20	.26	.32	.40	.50	.67	.84
Mar	.03	.09	.18	.26	.36	.46	.57	.72	.91	1.24	1.55
Apr	.09	.15	.26	.36	.47	.60	.75	.93	1.18	1.59	1.99
May	.33	.50	.78	1.03	1.30	1.58	1.91	2.30	2.82	3.67	4.48
Jun	.34	.54	.88	1.21	1.56	1.94	2.37	2.91	3.63	4.80	5.93
Jul	.12	.28	.53	.76	1.00	1.26	1.56	1.92	2.41	3.21	3.99
Aug	.09	.16	.30	.45	.62	.81	1.03	1.32	1.71	2.37	3.02
Sep	.09	.17	.32	.47	.65	.85	1.09	1.39	1.81	2.51	3.21
Oct	.03	.07	.15	.24	.34	.47	.62	.81	1.09	1.56	2.03
Nov	.00	.08	.19	.28	.36	.46	.57	.69	.86	1.14	1.40
Dec	.00	.07	.15	.21	.28	.34	.42	.51	.63	.82	1.00
Ann	7.32	8.13	9.19	10.01	10.74	11.46	12.21	13.05	14.08	15.60	16.93

\+ 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: 1966-2001
(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	1.5	-99.9	4	5
Feb	-99.9	-99.9	3	2
Mar	1.0	-99.9	1	1
Apr	.1	#	#	0
May	#	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	#	.0	#	0
Nov	-99.9	-99.9	1	1
Dec	-99.9	-99.9	3	2
Ann	-9.9	-9.9	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	3.0	1988	11	3.0	1988	13	1989	18	8+	1997
Feb	#	1992	23	#+	1992	13	1994	28	11	1994
Mar	3.0	1987	21	3.0	1987	11	1993	2	2	1993
Apr	.5	1990	30	.5	1990	8	1995	10	1	1995
May	#	1983	10	#	1983	1	1991	4	#	1991
Jun	.0	0	0	.0	0	0	0	0	0	0
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	.0	0	0	.0	0	0	0	0	0	0
Oct	#	1993	28	#+	1993	1+	1997	25	#+	1997
Nov	#	1987	17	#	1987	13	1996	30	7	1996
Dec	#	1987	99	#	1987	18	1996	31	13	1996
Ann	3.0+	Jan 1988	11	3.0+	Jan 1988	18	Dec 1996	31	13	Dec 1996

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	-9.9	-9.9	-9.9	-9.9	-9.9
Feb	-9.9	-9.9	-9.9	-9.9	-9.9
Mar	-9.9	-9.9	-9.9	-9.9	-9.9
Apr	.1	.0	.0	.0	.0
May	.0	.0	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.0	.0	.0	.0	.0
Oct	.0	.0	.0	.0	.0
Nov	-9.9	-9.9	-9.9	-9.9	-9.9
Dec	-9.9	-9.9	-9.9	-9.9	-9.9
Ann	-9.9	-9.9	-9.9	-9.9	-9.9

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	.0	.0	.0	.0
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.0	.0	.0	.0
Nov	-9.9	-9.9	-9.9	-9.9
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

Complete documentation available from:
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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	6/20	6/13	6/08	6/04	6/01	5/28	5/24	5/19	5/12
32	5/31	5/26	5/23	5/20	5/17	5/14	5/11	5/07	5/02
28	5/20	5/16	5/12	5/10	5/07	5/04	5/01	4/28	4/23
24	5/05	5/01	4/28	4/26	4/23	4/21	4/18	4/15	4/11
20	4/29	4/24	4/20	4/17	4/14	4/11	4/07	4/04	3/30
16	4/24	4/19	4/14	4/11	4/07	4/04	3/31	3/27	3/21

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	8/21	8/27	8/31	9/03	9/07	9/10	9/13	9/17	9/23
32	9/04	9/08	9/11	9/14	9/16	9/18	9/21	9/24	9/28
28	9/12	9/17	9/20	9/23	9/25	9/28	9/30	10/03	10/08
24	9/18	9/23	9/27	9/30	10/03	10/05	10/08	10/12	10/17
20	9/28	10/03	10/08	10/11	10/14	10/18	10/21	10/25	10/31
16	10/05	10/11	10/15	10/18	10/21	10/25	10/28	11/01	11/06

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	118	111	106	101	97	93	89	84	77
32	140	134	129	125	121	118	114	109	103
28	159	152	148	144	140	137	133	128	122
24	180	174	169	165	162	158	154	149	143
20	205	197	192	187	183	179	174	169	161
16	219	211	206	201	196	192	187	182	174

***** 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)

Heating Degree Days (1)

Base Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1704	1308	1088	643	325	122	47	100	326	675	1151	1554	9043
60	1549	1168	933	496	195	51	12	45	210	520	1001	1399	7579
57	1456	1094	840	412	133	25	5	26	152	428	911	1306	6788
55	1394	1041	780	358	98	15	1	18	118	367	851	1244	6285
50	1244	910	635	237	38	3	0	5	53	226	714	1093	5158
32	736	491	214	18	0	0	0	0	0	11	285	591	2346

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	55	107	150	366	705	936	1127	1080	689	358	124	60	5757
55	0	14	2	15	90	261	414	384	117	2	0	0	1299
57	0	10	1	9	62	211	357	331	91	1	0	0	1073
60	0	0	0	3	32	147	271	257	59	0	0	0	769
65	0	0	0	0	7	68	151	157	25	0	0	0	408
70	0	0	0	0	1	22	68	82	9	0	0	0	182

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	3	28	185	473	710	891	858	482	189	15	0	0	3	31	216	689	1399	2290	3148	3630	3819	3834	3834
45	0	0	7	95	326	560	736	703	345	99	4	0	0	0	7	102	428	988	1724	2427	2772	2871	2875	2875
50	0	0	0	41	197	410	581	548	219	36	0	0	0	0	0	41	238	648	1229	1777	1996	2032	2032	2032
55	0	0	0	13	100	267	427	395	115	13	0	0	0	0	0	13	113	380	807	1202	1317	1330	1330	1330
60	0	0	0	1	40	148	274	250	48	0	0	0	0	0	0	1	41	189	463	713	761	761	761	761
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	11	45	167	321	441	566	540	330	177	28	0	0	11	56	223	544	985	1551	2091	2421	2598	2626	2626

(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