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: MILBANK 2 SSW, SD **COOP ID: 395536**

Climate Division: SD 3 **NWS Call Sign:** **Elevation: 1,160 Feet** **Lat: 45˚12N** **Lon: 96˚38W**

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	21.6	-.3	10.7	70	1981	25	26.2	1990	-32+	1977	9	-3.8	1982	1687	0	.0	.0	.4	23.3	31.0	16.4
Feb	27.6	7.3	17.5	66	1976	25	32.0	1987	-44	1994	9	1.9	1979	1332	0	.0	.0	1.6	16.8	27.7	9.9
Mar	39.1	20.1	29.6	81	1963	31	37.7	2000	-31	1962	1	21.4	1996	1097	0	.0	.0	6.0	8.2	27.6	2.8
Apr	55.7	32.9	44.3	97	1980	22	51.8	1987	1+	1975	3	35.6	1975	624	2	.0	.1	20.4	.5	16.5	.0
May	70.1	45.3	57.7	97+	1969	27	65.3	1977	22	1981	10	51.1	1979	261	35	.0	.5	30.1	.0	2.3	.0
Jun	79.2	55.0	67.1	106	1988	25	74.6	1988	33	1964	2	62.4	1982	61	124	.2	3.6	30.0	.0	.0	.0
Jul	84.2	59.2	71.7	108	1966	10	76.6	1974	41	1967	4	64.2	1992	19	226	.6	7.2	31.0	.0	.0	.0
Aug	82.0	57.1	69.6	105	1988	1	76.3	1983	37+	1982	27	64.3	1977	40	182	.4	5.4	31.0	.0	.0	.0
Sep	72.9	46.8	59.9	101	1959	8	66.1	1998	22	1965	26	54.5	1993	183	29	.0	1.8	29.6	.0	1.5	.0
Oct	59.7	34.1	46.9	95	1963	5	52.3	1973	11+	1993	31	42.2	1976	561	0	.0	.1	25.1	.2	13.0	.0
Nov	39.5	19.6	29.6	80	1999	9	40.0	1999	-19	1964	30	18.1	1996	1065	0	.0	.0	7.3	9.0	27.0	1.7
Dec	26.3	5.8	16.1	61	1969	1	27.2	1997	-29	1990	26	-.3	1983	1518	0	.0	.0	1.1	19.8	30.8	10.0
Ann	54.8	31.9	43.4	108	Jul 1966	10	76.6	Jul 1974	-44	Feb 1994	9	-3.8	Jan 1982	8448	598	1.2	18.7	213.6	77.8	177.4	40.8

\+ 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	.53	.38	.96	1949	4	1.69	1975	.00+	1990
Feb	.43	.42	.84	1958	27	1.11	1977	.05	1982
Mar	1.36	1.28	2.70	1985	4	6.04	1977	.03	1982
Apr	2.16	2.36	2.15	2001	23	6.24	1986	.08	1996
May	2.47	2.30	2.81	1954	31	5.86	1972	.16	1976
Jun	3.46	3.07	3.49	1957	14	7.89	1984	.34	1987
Jul	3.44	3.11	5.80	1994	7	7.58	1994	.25	1975
Aug	2.64	2.44	2.09+	1966	21	6.07	1995	.71	2000
Sep	1.91	1.79	2.14	1963	19	4.23	1986	.08	1972
Oct	2.15	1.55	2.48	1984	19	6.23	1998	.13	1999
Nov	1.10	1.01	2.52	1977	9	3.86	2000	.00	1976
Dec	.40	.27	1.45	1959	28	1.05	1984	.00+	1989
Ann	22.05	20.95	5.80	Jul 1994	7	7.89	Jun 1984	.00+	Jan 1990

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.4	2.1	.2	@
Feb	4.7	1.8	@	.0
Mar	6.1	3.6	.9	.1
Apr	7.6	4.8	1.5	.4
May	9.8	6.1	1.6	.3
Jun	9.9	6.1	2.3	.8
Jul	9.6	6.0	2.2	.9
Aug	8.8	5.5	1.8	.6
Sep	7.2	3.7	1.2	.4
Oct	6.4	3.5	1.5	.6
Nov	4.9	2.8	.6	.2
Dec	4.1	1.0	.1	.0
Ann	85.5	47.0	13.9	4.3

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	.00	.06	.16	.24	.33	.42	.53	.66	.83	1.12	1.40
Feb	.10	.14	.20	.26	.31	.37	.44	.52	.62	.78	.94
Mar	.11	.19	.37	.56	.77	1.01	1.29	1.65	2.15	2.99	3.82
Apr	.18	.32	.61	.90	1.23	1.61	2.06	2.62	3.40	4.71	6.00
May	.55	.78	1.14	1.46	1.79	2.14	2.53	2.99	3.61	4.59	5.51
Jun	.65	.96	1.47	1.94	2.42	2.93	3.52	4.22	5.16	6.66	8.09
Jul	.75	1.07	1.57	2.03	2.48	2.97	3.52	4.17	5.04	6.42	7.72
Aug	.80	1.05	1.43	1.75	2.06	2.39	2.75	3.17	3.71	4.56	5.35
Sep	.37	.54	.82	1.08	1.34	1.62	1.94	2.32	2.83	3.64	4.42
Oct	.13	.25	.51	.80	1.13	1.52	1.99	2.60	3.44	4.88	6.32
Nov	.02	.07	.20	.35	.52	.73	.99	1.32	1.79	2.60	3.41
Dec	.00	.02	.08	.14	.21	.28	.37	.49	.65	.91	1.18
Ann	12.96	14.59	16.75	18.43	19.96	21.46	23.03	24.79	26.97	30.20	33.04

\+ 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)

Extremes (2)

Mean Number of Days (1)

Snow Fall >= Thresholds

Snow Depth >= Thresholds

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year	0.1	1.0	3.0	5.0	10.0	1	3	5	10
Jan	7.9	5.5	6	6	7.0	1975	10	23.0	1975	19	1979	31	13+	1996	4.6	3.0	.9	.2	.0	-9.9	-9.9	-9.9	-9.9
Feb	5.6	5.5	6	4	9.0	1990	16	16.0	1971	27	1979	25	22	1979	3.6	2.4	.7	.2	.0	-9.9	-9.9	-9.9	-9.9
Mar	6.8	4.8	2	#	27.0	1985	4	33.8	1985	15	1977	5	7	1979	2.5	1.7	.7	.2	@	8.5	5.0	3.7	1.0
Apr	2.0	.2	#	0	8.0	1995	12	14.0	1995	9	1975	9	4	1975	1.0	.5	.2	.1	.0	1.4	.8	.7	.0
May	#	.0	#	0	#	1979	9	#+	1979	#	1976	2	#	1976	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jun	.0	.0	#	0	.0	0	0	.0	0	#	1972	2	#	1972	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jul	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Aug	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.4	.0	#	0	6.0	1995	24	8.0	1995	2	1971	29	#+	2000	.2	.1	@	@	.0	.1	.0	.0	.0
Nov	4.8	3.2	1	#	7.0	1996	20	15.2	1993	9	1993	25	9	1993	2.2	1.5	.6	.2	.0	5.0	3.0	2.0	.0
Dec	5.0	4.3	3	#	6.0	2000	1	14.0	1972	20	2000	31	14	2000	3.2	2.2	.5	@	.0	17.5	12.5	9.3	2.5
Ann	32.5	23.5	N/A	N/A	27.0	Mar 1985	4	33.8	Mar 1985	27	Feb 1979	25	22	Feb 1979	17.3	11.4	3.6	.9	@	-9.9	-9.9	-9.9	-9.9

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

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

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

(2) Derived from 1971-2000 daily data

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

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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	5/30	5/25	5/22	5/19	5/17	5/14	5/12	5/08	5/04
32	5/18	5/13	5/10	5/08	5/05	5/03	4/30	4/27	4/23
28	5/09	5/04	5/01	4/28	4/25	4/22	4/19	4/15	4/10
24	4/28	4/23	4/20	4/17	4/14	4/11	4/09	4/05	4/01
20	4/18	4/13	4/10	4/07	4/04	4/02	3/30	3/27	3/22
16	4/09	4/04	4/01	3/29	3/26	3/23	3/20	3/16	3/11

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	9/08	9/12	9/14	9/17	9/19	9/21	9/23	9/26	9/29
32	9/14	9/19	9/22	9/25	9/28	10/01	10/03	10/07	10/11
28	9/25	9/29	10/03	10/05	10/08	10/11	10/14	10/17	10/22
24	10/03	10/09	10/12	10/16	10/19	10/22	10/25	10/29	11/04
20	10/10	10/15	10/19	10/22	10/25	10/28	10/31	11/04	11/09
16	10/20	10/25	10/29	11/02	11/05	11/08	11/11	11/15	11/21

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	142	136	132	128	124	121	117	112	106
32	162	156	152	148	145	141	138	134	128
28	188	180	175	170	166	161	157	151	144
24	211	203	197	192	187	182	177	171	163
20	224	217	212	207	203	199	194	189	182
16	243	236	231	227	223	220	215	211	204

***** 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	1687	1332	1097	624	261	61	19	40	183	561	1065	1518	8448
60	1532	1192	942	480	157	19	5	11	85	407	915	1363	7108
57	1439	1108	849	399	109	7	0	4	46	318	825	1270	6374
55	1377	1052	787	348	82	4	0	1	28	263	765	1208	5915
50	1222	918	636	234	36	0	0	0	4	147	621	1053	4871
32	699	471	199	20	0	0	0	0	0	4	200	549	2142

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	36	64	125	388	796	1053	1229	1165	836	466	125	54	6337
55	0	0	0	26	166	367	516	453	173	12	0	0	1713
57	0	0	0	17	130	311	454	393	131	5	0	0	1441
60	0	0	0	9	86	232	366	308	81	1	0	0	1083
65	0	0	0	2	35	124	226	182	29	0	0	0	598
70	0	0	0	0	10	51	119	92	7	0	0	0	279

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	1	30	191	555	825	994	927	609	270	32	0	0	1	31	222	777	1602	2596	3523	4132	4402	4434	4434
45	0	0	6	105	405	675	839	772	461	164	13	0	0	0	6	111	516	1191	2030	2802	3263	3427	3440	3440
50	0	0	0	52	271	526	684	617	321	86	4	0	0	0	0	52	323	849	1533	2150	2471	2557	2561	2561
55	0	0	0	28	158	379	529	463	200	36	0	0	0	0	0	28	186	565	1094	1557	1757	1793	1793	1793
60	0	0	0	9	78	241	377	314	106	9	0	0	0	0	0	9	87	328	705	1019	1125	1134	1134	1134
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	24	137	345	523	658	604	380	184	32	0	0	1	25	162	507	1030	1688	2292	2672	2856	2888	2888

(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