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: CAMBRIDGE STATE HOSP, MN **COOP ID: 211227**

Climate Division: MN 6 **NWS Call Sign:** **Elevation: 960 Feet** **Lat: 45˚34N** **Lon: 93˚15W**

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	19.5	.0	9.8	52+	1981	25	23.5	1990	-41	1977	9	-2.8	1977	1713	0	.0	.0	.1	25.7	31.0	16.4
Feb	26.7	7.4	17.1	58	1981	16	30.5	1987	-41	1996	2	6.4	1989	1343	0	.0	.0	.5	18.1	27.8	9.4
Mar	38.5	19.8	29.2	79	1968	30	37.9	1973	-33	1962	1	19.7	1975	1111	0	.0	.0	4.7	8.5	27.4	3.0
Apr	55.1	32.9	44.0	92	1980	21	51.7	1987	0+	1975	4	36.1	1975	631	1	.0	@	19.8	.5	14.8	.1
May	69.0	45.2	57.1	98	1972	17	64.1	1988	18	1967	3	50.7	1997	279	34	.0	.4	30.1	.0	2.3	.0
Jun	76.6	53.7	65.2	100	1963	30	72.2	1988	32	1993	1	60.6	1985	89	94	.0	1.4	30.0	.0	@	.0
Jul	80.9	59.0	70.0	102+	1988	31	76.3	1987	40	1958	8	62.9	1992	36	191	.2	3.4	31.0	.0	.0	.0
Aug	78.1	56.6	67.4	100	1988	16	73.7	1983	35	1950	20	61.4	1977	62	136	@	1.6	31.0	.0	.0	.0
Sep	68.4	46.9	57.7	97	1976	7	62.8	1978	23	1965	26	51.0	1993	237	18	.0	.3	29.3	.0	1.8	.0
Oct	56.1	35.3	45.7	87	1969	4	51.3	1973	8	1976	27	39.4	1976	598	0	.0	.0	22.7	.2	12.3	.0
Nov	37.7	21.3	29.5	72+	1999	8	36.8	1987	-22	1964	30	21.5+	1991	1066	0	.0	.0	4.9	10.2	26.4	1.5
Dec	24.1	6.7	15.4	60	1998	1	24.1	1987	-41	1983	19	1.7	1983	1538	0	.0	.0	.2	23.4	30.9	10.8
Ann	52.6	32.1	42.3	102+	Jul 1988	31	76.3	Jul 1987	-41+	Feb 1996	2	-2.8	Jan 1977	8703	474	.2	7.1	204.3	86.6	174.7	41.2

\+ 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	.96	.79	1.51	1997	4	2.99	1975	.00	1990
Feb	.63	.48	.78	1976	14	2.00	2000	.00	1987
Mar	1.40	1.12	1.40	1957	14	3.90	1977	.26	1981
Apr	2.10	1.70	3.76	1975	27	5.33	1975	.38	1987
May	3.18	3.03	3.20	1953	20	7.04	1991	1.24	1997
Jun	4.39	3.97	4.05	1984	12	9.25	1975	.68	1988
Jul	4.30	3.89	5.47	1972	22	11.37	1972	1.00	1976
Aug	4.08	3.49	3.80	1977	27	8.58	1989	.83	1976
Sep	2.95	3.00	4.84	1968	22	7.04	1985	.35	1976
Oct	2.37	2.27	2.66	1971	27	7.03	1971	.23	1976
Nov	1.89	1.58	2.24	1991	1	5.37	1991	.25	1980
Dec	.85	.76	1.08	1982	27	2.38	1982	.00+	1986
Ann	29.10	29.02	5.47	Jul 1972	22	11.37	Jul 1972	.00+	Jan 1990

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.5	3.2	.3	.1
Feb	4.0	2.2	.3	.0
Mar	5.6	3.9	.7	.2
Apr	7.1	4.6	1.3	.3
May	9.1	6.6	2.3	.6
Jun	9.8	8.1	2.6	1.0
Jul	8.8	6.5	3.0	1.3
Aug	8.5	6.6	2.6	1.2
Sep	8.3	6.3	2.1	.6
Oct	7.5	5.4	1.7	.5
Nov	5.8	4.0	1.2	.5
Dec	4.9	2.9	.3	.1
Ann	84.9	60.3	18.4	6.4

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	.10	.21	.37	.51	.65	.80	.97	1.18	1.46	1.90	2.33
Feb	.03	.08	.17	.27	.37	.48	.61	.77	1.00	1.37	1.74
Mar	.30	.43	.64	.82	1.01	1.21	1.43	1.70	2.05	2.61	3.14
Apr	.35	.53	.84	1.13	1.42	1.74	2.11	2.56	3.15	4.12	5.04
May	1.45	1.73	2.12	2.43	2.73	3.02	3.34	3.70	4.15	4.84	5.46
Jun	1.32	1.74	2.36	2.90	3.42	3.97	4.57	5.27	6.18	7.61	8.93
Jul	1.32	1.73	2.34	2.87	3.37	3.90	4.48	5.16	6.03	7.40	8.67
Aug	1.35	1.74	2.31	2.79	3.25	3.73	4.26	4.87	5.65	6.87	8.00
Sep	.69	.97	1.40	1.79	2.17	2.58	3.03	3.58	4.29	5.42	6.49
Oct	.37	.57	.92	1.24	1.58	1.95	2.38	2.89	3.59	4.72	5.80
Nov	.26	.42	.69	.95	1.22	1.53	1.87	2.30	2.88	3.82	4.73
Dec	.00	.15	.32	.46	.59	.73	.88	1.06	1.30	1.69	2.06
Ann	18.55	20.51	23.06	25.03	26.80	28.52	30.33	32.34	34.80	38.41	41.57

\+ 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	13.2	10.6	11	10	11.0	1982	22	34.0	1975	32	1982	23	28	1984	4.5	3.8	1.5	.5	@	28.7	27.6	25.3	16.3
Feb	7.7	6.1	11	7	9.0	1991	23	19.5	1979	45	1979	21	37	1979	2.6	2.2	.7	.2	.0	27.0	25.2	20.8	11.1
Mar	8.3	7.5	6	4	8.0	1979	3	19.0	1975	44	1979	4	26	1979	2.6	2.5	1.3	.5	.0	16.9	12.9	10.3	5.3
Apr	2.2	.0	#	#	6.0	1981	4	10.0	1983	17	1975	1	6	1975	.8	.7	.3	.1	.0	1.7	.8	.6	.3
May	#	.0	#	0	#	1976	2	#	1976	#+	1996	5	#+	1996	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jun	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.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	.5	.0	#	0	5.0	1987	22	5.0+	1991	5	1991	31	#+	1997	.2	.1	.1	.1	.0	.1	@	@	.0
Nov	5.7	2.2	2	1	17.0	1991	1	21.8	1983	28	1991	8	14	1991	2.1	1.8	.7	.4	.2	4.8	2.7	1.8	.6
Dec	10.6	10.5	6	4	8.0	1972	29	18.0+	1982	31	1983	31	26	1983	3.4	3.1	.9	.4	.0	24.0	19.5	15.7	7.6
Ann	48.2	36.9	N/A	N/A	17.0	Nov 1991	1	34.0	Jan 1975	45	Feb 1979	21	37	Feb 1979	16.2	14.2	5.5	2.2	.2	103.2	88.7	74.5	41.2

+ 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	6/10	6/04	5/31	5/28	5/25	5/21	5/18	5/14	5/08
32	5/22	5/17	5/14	5/11	5/09	5/06	5/03	4/30	4/25
28	5/13	5/08	5/04	5/01	4/28	4/25	4/22	4/18	4/13
24	4/26	4/21	4/18	4/15	4/12	4/10	4/07	4/04	3/30
20	4/16	4/12	4/09	4/07	4/04	4/02	3/31	3/28	3/24
16	4/13	4/08	4/04	4/01	3/29	3/26	3/23	3/19	3/14

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	9/11	9/14	9/16	9/18	9/19	9/22	9/24	9/27
32	9/14	9/17	9/20	9/23	9/25	9/27	9/29	10/02	10/06
28	9/19	9/24	9/28	10/01	10/04	10/07	10/10	10/14	10/19
24	10/01	10/07	10/11	10/15	10/18	10/22	10/25	10/29	11/04
20	10/10	10/15	10/19	10/22	10/25	10/28	11/01	11/04	11/10
16	10/18	10/24	10/28	10/31	11/03	11/07	11/10	11/14	11/20

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	134	128	123	119	115	111	107	103	96
32	155	149	145	142	139	135	132	128	122
28	180	173	167	163	158	154	149	144	136
24	212	204	198	193	188	184	178	173	164
20	224	217	212	207	203	199	195	189	182
16	242	234	228	223	219	214	209	203	196

***** 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	1713	1343	1111	631	279	89	36	62	237	598	1066	1538	8703
60	1558	1203	956	487	173	32	10	19	128	445	916	1383	7310
57	1465	1119	863	405	123	15	5	8	78	357	826	1290	6554
55	1403	1063	801	353	94	8	0	3	54	301	766	1228	6074
50	1248	923	649	237	43	1	0	0	15	181	618	1073	4988
32	711	459	205	19	0	0	0	0	0	6	187	551	2138

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	21	40	117	380	778	994	1177	1096	771	431	111	36	5952
55	0	0	0	23	160	312	464	387	134	13	0	0	1493
57	0	0	0	15	126	259	407	330	99	7	0	0	1243
60	0	0	0	7	84	186	319	247	58	2	0	0	903
65	0	0	0	1	34	94	191	136	18	0	0	0	474
70	0	0	0	0	11	33	99	60	3	0	0	0	206

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	21	190	541	763	934	857	537	227	27	0	0	1	22	212	753	1516	2450	3307	3844	4071	4098	4098
45	0	0	7	107	391	613	779	702	390	126	8	0	0	0	7	114	505	1118	1897	2599	2989	3115	3123	3123
50	0	0	0	55	254	464	624	547	260	55	1	0	0	0	0	55	309	773	1397	1944	2204	2259	2260	2260
55	0	0	0	25	145	321	471	393	149	21	0	0	0	0	0	25	170	491	962	1355	1504	1525	1525	1525
60	0	0	0	8	73	191	319	245	75	7	0	0	0	0	0	8	81	272	591	836	911	918	918	918
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	14	129	331	481	616	553	316	129	16	0	0	0	14	143	474	955	1571	2124	2440	2569	2585	2585

(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