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: BRAINERD, MN **COOP ID: 210939**

Climate Division: MN 6 **NWS Call Sign:** **Elevation: 1,180 Feet** **Lat: 46˚22N** **Lon: 94˚12W**

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	18.5	-7.5	5.5	56	1981	25	19.0	1990	-48	1972	15	-7.7	1982	1846	0	.0	.0	.1	26.8	31.0	19.6
Feb	26.0	-1.0	12.5	57+	1981	18	28.3	1998	-54	1996	2	.4	1989	1472	0	.0	.0	.5	18.9	27.9	13.6
Mar	37.5	13.6	25.6	75	1987	8	35.3	2000	-33	1980	1	15.2	1975	1223	0	.0	.0	4.3	9.2	29.1	5.2
Apr	54.0	29.3	41.7	94	1980	22	48.3	1987	-12	1975	1	33.2	1975	700	0	.0	@	18.6	.7	19.4	.3
May	68.6	42.3	55.5	95+	1969	28	63.5	1977	16+	1967	4	49.7	1974	322	25	.0	.2	29.8	.0	3.7	.0
Jun	76.5	51.4	64.0	100	1988	19	69.6	1988	32	1978	8	58.7	1982	107	75	@	1.3	30.0	.0	@	.0
Jul	81.0	56.2	68.6	102	1988	6	73.1	1988	36	1978	23	61.6	1992	34	145	.1	2.7	31.0	.0	.0	.0
Aug	78.8	53.4	66.1	100	1976	19	71.6	1983	29	1976	15	59.0	1977	73	107	@	1.9	31.0	.0	.1	.0
Sep	68.8	42.4	55.6	96+	1983	3	61.6	1998	18	1974	22	50.0	1974	294	12	.0	.3	29.2	.0	3.7	.0
Oct	56.2	31.4	43.8	88	1992	2	49.7	1973	4	1976	27	37.9	1976	657	0	.0	.0	21.6	.4	16.9	.0
Nov	37.4	17.7	27.6	73	1975	4	36.9	1999	-24	1964	30	20.5	1985	1124	0	.0	.0	4.4	11.2	28.2	2.3
Dec	23.3	1.9	12.6	60	1962	2	23.1	1997	-43	1983	19	-1.0	1983	1624	0	.0	.0	.3	24.5	31.0	14.2
Ann	52.2	27.6	39.9	102	Jul 1988	6	73.1	Jul 1988	-54	Feb 1996	2	-7.7	Jan 1982	9476	364	.1	6.4	200.8	91.7	191.0	55.2

\+ 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: 1908-2001

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

Issue Date: February 2004

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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	.80	.79	.97	1997	5	2.16	1997	.04+	1981
Feb	.63	.55	.92	1971	27	1.88	1981	.00	1973
Mar	1.47	1.44	1.32	1979	23	2.91	1995	.17	1974
Apr	2.00	1.97	3.04	1986	28	6.58	1986	.16	1987
May	3.33	2.98	3.04	1954	31	8.38	1999	.91	1976
Jun	4.18	4.36	3.92	2001	14	7.55	1975	.87	1995
Jul	4.08	3.83	4.20	1963	27	8.41	1972	.84	1989
Aug	3.56	3.38	3.46	1953	1	6.94	1978	.66	1976
Sep	2.83	2.79	2.75+	1964	7	8.04	1986	.34	1974
Oct	2.51	1.98	2.90	1995	1	7.06	1984	.22	1976
Nov	1.64	1.36	2.53	1971	1	4.45	1971	.17	1984
Dec	.68	.65	.88	1970	4	1.71	1987	.11	1975
Ann	27.71	27.41	4.20	Jul 1963	27	8.41	Jul 1972	.00	Feb 1973

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.4	2.8	.2	.0
Feb	4.3	1.9	.2	.0
Mar	6.0	4.0	.8	.2
Apr	7.1	4.6	1.3	.2
May	10.0	6.5	2.2	.7
Jun	11.3	7.9	2.7	.8
Jul	10.4	7.0	2.8	.9
Aug	9.4	6.6	2.4	.7
Sep	8.7	5.7	2.0	.8
Oct	7.6	4.5	1.5	.7
Nov	6.2	3.9	1.0	.2
Dec	5.6	2.3	.3	.0
Ann	93.0	57.7	17.4	5.2

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	.06	.12	.22	.33	.46	.60	.76	.98	1.27	1.76	2.24
Feb	.01	.05	.13	.22	.32	.43	.58	.76	1.01	1.45	1.88
Mar	.44	.58	.79	.97	1.14	1.33	1.53	1.76	2.07	2.55	2.99
Apr	.30	.47	.76	1.03	1.32	1.63	2.00	2.44	3.03	4.00	4.93
May	1.21	1.52	1.97	2.35	2.71	3.08	3.48	3.95	4.54	5.46	6.30
Jun	1.57	1.96	2.52	2.98	3.43	3.88	4.37	4.94	5.67	6.79	7.82
Jul	1.63	2.01	2.54	2.98	3.39	3.82	4.27	4.79	5.46	6.48	7.41
Aug	.94	1.27	1.79	2.24	2.69	3.16	3.68	4.30	5.10	6.37	7.56
Sep	.66	.93	1.34	1.71	2.08	2.47	2.91	3.43	4.11	5.20	6.22
Oct	.26	.45	.80	1.15	1.52	1.94	2.44	3.06	3.90	5.30	6.66
Nov	.23	.37	.60	.83	1.07	1.33	1.63	2.00	2.51	3.32	4.11
Dec	.15	.21	.31	.40	.49	.59	.69	.82	.99	1.26	1.51
Ann	18.92	20.60	22.75	24.40	25.87	27.29	28.77	30.41	32.40	35.30	37.83

\+ 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: 1908-2001
(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	13.6	13.0	11	11
Feb	5.9	4.6	11	10
Mar	9.7	9.5	6	3
Apr	2.1	.2	#	#
May	#	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.4	.0	#	0
Nov	6.7	3.2	2	2
Dec	7.1	7.1	5	4
Ann	45.5	37.6	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	15.0	1983	10	28.9	1997	34	1997	5	25	1997
Feb	10.0	1971	27	19.5	1971	26+	1996	1	25	1975
Mar	10.0	1982	20	20.6	1997	32	1997	17	26	1997
Apr	8.0	1998	1	8.0	1998	14	1997	1	3	1982
May	#	1976	2	#	1976	0	0	0	0	0
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	3.0	1972	31	3.0+	1987	3	1988	21	#+	2000
Nov	10.0	1988	27	27.0	1988	15	1988	29	8	1988
Dec	7.0	1985	1	15.0	1978	20	1996	31	14	1983
Ann	15.0	Jan 1983	10	28.9	Jan 1997	34	Jan 1997	5	26	Mar 1997

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	5.9	4.1	1.6	.6	.2
Feb	3.3	2.2	.8	.4	.1
Mar	3.5	2.8	1.3	.6	@
Apr	.8	.7	.3	.1	.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	.3	.3	.1	.0	.0
Nov	3.4	2.3	1.0	.4	@
Dec	5.1	3.4	.9	.3	.0
Ann	22.3	15.8	6.0	2.4	.3

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	12.1	8.6	5.7	3.0
Apr	.8	.5	.1	.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	.3	.0	.0	.0
Nov	9.1	5.1	3.7	.7
Dec	24.1	19.9	15.9	4.6
Ann	-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	6/18	6/12	6/07	6/03	5/30	5/26	5/21	5/17	5/10
32	5/27	5/22	5/18	5/15	5/13	5/10	5/07	5/03	4/29
28	5/15	5/11	5/08	5/05	5/02	4/30	4/27	4/24	4/19
24	5/06	5/01	4/27	4/24	4/22	4/19	4/16	4/12	4/07
20	4/21	4/17	4/15	4/12	4/10	4/08	4/06	4/04	3/31
16	4/16	4/12	4/09	4/07	4/05	4/03	4/01	3/29	3/26

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	8/27	9/01	9/04	9/07	9/10	9/13	9/16	9/20	9/25
32	9/01	9/07	9/11	9/15	9/18	9/22	9/25	9/29	10/05
28	9/16	9/20	9/24	9/26	9/29	10/01	10/04	10/07	10/11
24	9/21	9/27	10/02	10/05	10/09	10/12	10/16	10/20	10/26
20	10/10	10/15	10/18	10/21	10/24	10/27	10/30	11/02	11/07
16	10/17	10/22	10/26	10/30	11/02	11/05	11/09	11/13	11/19

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	124	117	112	107	103	99	94	89	81
32	150	142	137	132	128	124	119	114	106
28	167	161	156	152	149	145	141	136	130
24	195	186	180	175	169	164	159	152	143
20	214	208	203	200	196	193	189	184	178
16	232	225	219	215	210	206	201	196	188

***** 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	1846	1472	1223	700	322	107	34	73	294	657	1124	1624	9476
60	1691	1332	1068	553	207	43	7	23	175	504	974	1469	8046
57	1598	1248	975	468	151	21	1	10	117	414	884	1376	7263
55	1536	1192	913	413	118	12	0	5	86	356	824	1314	6769
50	1381	1052	760	287	57	2	0	0	32	227	674	1159	5631
32	838	585	294	31	0	0	0	0	0	11	221	628	2608

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	16	37	94	321	727	959	1134	1057	708	377	87	27	5544
55	0	0	0	13	132	281	421	349	104	9	0	0	1309
57	0	0	0	7	102	230	360	292	75	4	0	0	1070
60	0	0	0	3	65	161	273	212	42	1	0	0	757
65	0	0	0	0	25	75	145	107	12	0	0	0	364
70	0	0	0	0	8	23	60	39	2	0	0	0	132

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	13	152	495	721	889	810	483	185	15	0	0	0	13	165	660	1381	2270	3080	3563	3748	3763	3763
45	0	0	0	81	349	571	734	655	340	101	3	0	0	0	0	81	430	1001	1735	2390	2730	2831	2834	2834
50	0	0	0	36	224	422	579	500	212	44	1	0	0	0	0	36	260	682	1261	1761	1973	2017	2018	2018
55	0	0	0	17	125	279	424	350	118	13	0	0	0	0	0	17	142	421	845	1195	1313	1326	1326	1326
60	0	0	0	3	56	159	273	214	54	2	0	0	0	0	0	3	59	218	491	705	759	761	761	761
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	11	115	311	449	578	521	301	130	12	0	0	0	11	126	437	886	1464	1985	2286	2416	2428	2428

(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