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: TWO HARBORS, MN **COOP ID: 218419**

Climate Division: MN 3 **NWS Call Sign:** **Elevation: 625 Feet** **Lat: 47˚02N** **Lon: 91˚40W**

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	22.5	5.0	13.8	49	1990	9	22.8	1990	-34	1972	15	2.7	1982	1590	0	.0	.0	.0	25.0	30.7	12.6
Feb	27.7	10.1	18.9	59	2000	29	31.4	1998	-36	1996	2	7.4	1979	1291	0	.0	.0	.4	18.0	27.1	7.9
Mar	36.3	20.7	28.5	69	1986	29	34.7	2000	-28	1962	1	21.6	1972	1132	0	.0	.0	1.9	9.5	27.4	2.1
Apr	48.0	30.8	39.4	88	1965	29	45.7	1987	-15	1975	1	33.2	1975	767	0	.0	.0	11.9	.9	16.5	@
May	58.0	38.8	48.4	90	1964	22	52.6	1998	12	1967	3	43.4	1983	515	0	.0	.0	25.6	.0	3.5	.0
Jun	66.5	45.3	55.9	98	1961	28	63.9	1987	31+	1972	10	52.8	1983	280	6	.0	.1	29.5	.0	.1	.0
Jul	73.5	53.4	63.5	99	1948	5	69.8	1988	27	1964	30	58.2	1996	125	76	.0	.5	31.0	.0	.0	.0
Aug	72.9	55.7	64.3	99	1961	14	70.2	1983	37	1965	28	58.9	1977	106	85	.0	.2	31.0	.0	.0	.0
Sep	64.7	47.7	56.2	92	1953	1	62.0	1998	22	1976	19	50.7	1974	274	11	.0	.0	29.6	.0	1.0	.0
Oct	53.3	37.5	45.4	86	1992	3	50.0	1971	0	1976	28	39.2	1976	607	0	.0	.0	21.9	.1	8.4	@
Nov	38.4	25.6	32.0	71	1990	1	38.6	1999	-13	1985	29	24.9	1995	990	0	.0	.0	3.7	7.2	22.1	.6
Dec	26.9	11.6	19.3	57	1998	3	29.1	1997	-26+	1983	19	9.1	1983	1419	0	.0	.0	.2	20.2	29.9	7.2
Ann	49.1	31.9	40.5	99+	Aug 1961	14	70.2	Aug 1983	-36	Feb 1996	2	2.7	Jan 1982	9096	178	.0	.8	186.7	80.9	166.7	30.4

\+ 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: 1948-2001

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

Issue Date: February 2004

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: TWO HARBORS, MN **COOP ID: 218419**

Climate Division: MN 3 **NWS Call Sign:** **Elevation: 625 Feet** **Lat: 47˚02N** **Lon: 91˚40W**

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	.99	.83	1.36	1982	23	2.91	1975	.02	1981
Feb	.74	.49	1.84	1998	27	3.88	1998	.10	1973
Mar	1.63	1.46	2.73	1977	12	5.10	1977	.25	1993
Apr	2.11	2.00	2.76	2001	23	4.63	1981	.45	1976
May	2.93	2.99	4.38	1950	5	7.37	1979	.08	1976
Jun	4.11	3.80	4.80	1981	3	8.93	1981	.43	1995
Jul	4.29	3.65	4.13	1999	5	10.16	1999	1.38	1994
Aug	3.97	4.04	3.82	1995	25	9.29	1988	1.19	1991
Sep	4.06	3.70	4.02	1955	17	7.12	1977	.72	1974
Oct	2.48	2.05	3.45	1973	10	6.29	1971	.60	1993
Nov	2.14	1.84	1.90	2000	7	6.25	1991	.08	1976
Dec	1.06	1.03	2.12	1985	1	2.59	1985	.06	1979
Ann	30.51	30.26	4.80	Jun 1981	3	10.16	Jul 1999	.02	Jan 1981

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	9.9	3.2	.3	.1
Feb	7.0	2.1	.3	.1
Mar	8.0	3.8	1.0	.2
Apr	8.8	5.1	1.1	.3
May	11.2	6.2	1.7	.6
Jun	13.2	7.9	2.8	.8
Jul	12.5	7.1	2.9	1.0
Aug	11.4	6.8	2.6	1.1
Sep	12.7	7.1	2.7	1.0
Oct	10.6	5.4	1.7	.5
Nov	8.8	4.6	1.3	.5
Dec	8.7	3.1	.4	.1
Ann	122.8	62.4	18.8	6.3

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	.13	.21	.36	.49	.64	.80	.98	1.21	1.51	2.01	2.50
Feb	.08	.14	.24	.35	.46	.58	.73	.91	1.15	1.55	1.95
Mar	.31	.45	.69	.91	1.13	1.38	1.65	1.98	2.42	3.12	3.80
Apr	.51	.70	1.01	1.29	1.56	1.85	2.17	2.55	3.06	3.86	4.61
May	.56	.83	1.26	1.65	2.06	2.49	2.98	3.57	4.35	5.61	6.81
Jun	1.44	1.83	2.39	2.86	3.32	3.79	4.30	4.89	5.65	6.83	7.91
Jul	1.17	1.58	2.20	2.74	3.27	3.83	4.44	5.17	6.13	7.62	9.01
Aug	1.28	1.66	2.21	2.69	3.14	3.62	4.13	4.74	5.52	6.73	7.85
Sep	1.40	1.78	2.34	2.81	3.27	3.73	4.24	4.83	5.59	6.77	7.85
Oct	.48	.70	1.07	1.40	1.74	2.11	2.52	3.02	3.68	4.74	5.75
Nov	.36	.54	.85	1.15	1.45	1.77	2.15	2.61	3.22	4.20	5.15
Dec	.17	.26	.41	.55	.70	.87	1.06	1.29	1.60	2.10	2.58
Ann	21.67	23.38	25.57	27.23	28.71	30.14	31.61	33.24	35.22	38.09	40.57

\+ 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

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data,
and Information Services

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: TWO HARBORS, MN **COOP ID: 218419**

Climate Division: MN 3 **NWS Call Sign:** **Elevation: 625 Feet** **Lat: 47°02N** **Lon: 91°40W**

Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	16.6	12.8	11	10
Feb	7.1	4.8	12	9
Mar	6.2	4.0	7	4
Apr	3.2	1.5	1	#
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	#	0
Nov	8.1	3.1	1	#
Dec	10.7	8.5	6	3
Ann	51.9	34.7	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	12.0	1996	18	37.0	1996	38	1982	31	26	1994
Feb	10.0	1986	20	17.1	1992	39	1982	7	29	1982
Mar	20.0	1985	4	26.5	1985	33	1979	4	23	1997
Apr	8.0	1972	13	15.0	1996	37	1996	7	19	1996
May	#	1979	6	#	1979	1	1989	1	#	1989
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	1.0	1976	19	1.0	1976	2	1984	30	#+	1991
Nov	24.0	1991	2	51.5	1991	36	1991	3	17	1991
Dec	15.5	1983	11	37.5	1983	46	1983	22	32	1983
Ann	24.0	Nov 1991	2	51.5	Nov 1991	46	Dec 1983	22	32	Dec 1983

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	7.8	5.2	2.7	.8	.2
Feb	4.2	2.7	1.0	.2	.1
Mar	2.9	2.2	.9	.4	.1
Apr	1.0	.9	.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	@	@	.0	.0	.0
Nov	2.4	2.2	.7	.2	.2
Dec	6.5	4.5	1.5	.5	.1
Ann	24.8	17.7	7.1	2.2	.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	12.9	9.4	6.2	3.0
Apr	2.0	.9	.3	.0
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	.1	.0	.0	.0
Nov	6.2	4.9	3.2	2.3
Dec	17.2	9.3	4.2	2.3
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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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: TWO HARBORS, MN **COOP ID: 218419**

Climate Division: MN 3 **NWS Call Sign:** **Elevation: 625 Feet** **Lat: 47˚02N** **Lon: 91˚40W**

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	6/16	6/10	6/07	6/04	6/01	5/29	5/26	5/22	5/17
32	5/30	5/24	5/20	5/17	5/13	5/10	5/07	5/03	4/27
28	5/09	5/05	5/03	4/30	4/28	4/26	4/24	4/21	4/18
24	4/29	4/24	4/21	4/19	4/16	4/13	4/11	4/07	4/03
20	4/19	4/14	4/10	4/06	4/03	3/31	3/28	3/24	3/18
16	4/13	4/07	4/03	3/31	3/28	3/25	3/22	3/18	3/13

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	9/16	9/19	9/22	9/24	9/26	9/28	9/30	10/02	10/06
32	9/20	9/23	9/26	9/28	9/30	10/02	10/04	10/07	10/11
28	10/02	10/07	10/12	10/15	10/19	10/22	10/26	10/30	11/05
24	10/12	10/18	10/23	10/26	10/30	11/02	11/06	11/10	11/16
20	10/19	10/25	10/29	11/01	11/04	11/08	11/11	11/15	11/20
16	10/29	11/04	11/07	11/11	11/14	11/17	11/20	11/24	11/29

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	132	127	123	120	116	113	110	106	100
32	158	151	147	143	139	135	131	127	120
28	192	186	181	177	173	169	165	160	154
24	219	211	205	201	196	191	187	181	173
20	236	229	224	219	215	210	206	200	193
16	251	244	239	234	230	226	221	216	209

***** 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

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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: TWO HARBORS, MN **COOP ID: 218419**

Climate Division: MN 3 **NWS Call Sign:** **Elevation: 625 Feet** **Lat: 47˚02N** **Lon: 91˚40W**

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	1590	1291	1132	767	515	280	125	106	274	607	990	1419	9096
60	1435	1151	977	617	361	154	52	39	155	453	840	1264	7498
57	1342	1067	884	527	273	95	26	18	99	363	750	1171	6615
55	1280	1011	822	468	218	64	15	10	69	305	690	1109	6061
50	1125	871	667	326	106	16	2	0	21	179	541	954	4808
32	587	409	195	25	0	0	0	0	0	3	124	436	1779

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	21	42	86	248	508	716	974	1002	727	420	125	40	4909
55	0	0	0	1	13	90	276	299	106	9	0	0	794
57	0	0	0	0	6	61	224	245	75	4	0	0	615
60	0	0	0	0	1	30	158	173	41	1	0	0	404
65	0	0	0	0	0	6	76	85	11	0	0	0	178
70	0	0	0	0	0	1	25	28	2	0	0	0	56

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	4	79	277	492	742	768	501	208	26	0	0	1	5	84	361	853	1595	2363	2864	3072	3098	3098
45	0	0	1	29	149	342	587	613	355	100	5	0	0	0	1	30	179	521	1108	1721	2076	2176	2181	2181
50	0	0	0	8	63	201	433	458	217	38	0	0	0	0	0	8	71	272	705	1163	1380	1418	1418	1418
55	0	0	0	0	18	96	282	306	109	5	0	0	0	0	0	0	18	114	396	702	811	816	816	816
60	0	0	0	0	2	35	150	168	41	0	0	0	0	0	0	0	2	37	187	355	396	396	396	396
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	2	50	145	272	445	464	268	93	7	0	0	1	3	53	198	470	915	1379	1647	1740	1747	1747

(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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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