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: GRAND PORTAGE RNG STN, MN **COOP ID: 213296**

Climate Division: MN 3 **NWS Call Sign:** **Elevation: 730 Feet** **Lat: 47˚58N** **Lon: 89˚41W**

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	18.7	-3.1	7.8	45	2001	11	17.2	1990	-39	1996	31	-2.8	1994	1775	0	.0	.0	.1	26.2	31.0	15.5
Feb	24.2	1.4	12.8	55	1991	8	26.2	1998	-43	1996	2	2.7	1994	1462	0	.0	.0	.3	20.3	28.0	11.9
Mar	34.5	14.5	24.5	63	1963	29	33.0	2000	-25	1989	2	18.0	1996	1256	0	.0	.0	1.4	12.9	29.5	4.9
Apr	47.3	26.9	37.1	82	1965	29	43.1	1987	-4	1995	4	31.5	1975	838	0	.0	.0	10.1	1.4	23.8	.3
May	61.4	37.6	49.5	88	1977	12	54.5	1977	18	1967	3	43.5	1997	484	2	.0	@	27.4	@	8.1	.0
Jun	69.1	45.6	57.4	95	1995	18	61.3	1976	28+	1998	3	52.2	1982	238	8	.0	@	23.3	1.1	11.5	.0
Jul	75.5	51.3	63.4	94	1966	12	67.4	1983	38+	1969	6	56.9	1992	101	51	.0	.2	31.0	.0	.0	.0
Aug	73.2	51.7	62.5	94	2001	7	67.3	1983	34	1976	29	56.9	1977	130	51	.0	.1	29.0	.1	2.6	.0
Sep	64.0	43.3	53.7	86+	1978	5	59.0	1998	24	1965	26	48.6	1993	343	2	.0	.0	28.9	.0	1.7	.0
Oct	52.1	33.8	43.0	75+	1963	1	49.2	1973	13	1976	26	38.5	1988	683	0	.0	.0	16.5	.4	14.0	.0
Nov	37.2	20.4	28.8	71	1999	9	36.4	1999	-17	1976	30	20.8	1995	1087	0	.0	.0	2.5	10.0	26.9	1.3
Dec	23.7	3.8	13.8	52	1962	4	24.3	1997	-28	1967	31	2.0	1983	1588	0	.0	.0	@	24.0	30.7	10.9
Ann	48.4	27.3	37.9	95	Jun 1995	18	67.4	Jul 1983	-43	Feb 1996	2	-2.8	Jan 1994	9985	114	.0	.3	170.5	96.4	207.8	44.8

\+ 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: 1950-2001

(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	1.33	1.13	1.61	1996	19	3.76	1996	.29	1985
Feb	.80	.68	1.28	2001	26	2.23	1996	.07	1993
Mar	1.55	1.61	2.23	1966	5	3.27	1979	.16	1995
Apr	2.22	2.34	2.25	2001	7	3.98+	1994	.91	1988
May	2.86	2.70	2.00	1971	23	5.61	1971	.73	1976
Jun	3.19	2.98	2.43	1989	13	5.56	2000	.39	1995
Jul	3.45	3.24	2.85	1999	5	6.75	1993	1.30	1998
Aug	3.10	3.13	3.04	1959	19	6.33	1977	.62	1976
Sep	3.68	3.28	3.38	1977	9	12.21	1977	1.00	1976
Oct	3.25	3.01	2.60	1998	17	7.31	1971	.62	1976
Nov	2.37	2.25	2.85	1998	19	5.64	1998	.29	1976
Dec	1.56	1.68	.97	1970	1	3.16	1977	.55	1997
Ann	29.36	28.85	3.38	Sep 1977	9	12.21	Sep 1977	.07	Feb 1993

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	12.2	3.8	.3	@
Feb	8.3	2.2	.3	.1
Mar	8.5	3.4	.4	.1
Apr	8.8	4.4	.8	.1
May	9.6	6.4	1.7	.5
Jun	12.9	8.0	2.2	.8
Jul	11.9	7.4	2.4	.9
Aug	11.3	6.5	1.9	.5
Sep	13.2	7.0	1.9	.6
Oct	10.3	5.8	1.7	.6
Nov	8.2	4.5	1.3	.4
Dec	7.8	3.5	.3	@
Ann	123.0	62.9	15.2	4.6

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	.31	.43	.63	.80	.98	1.16	1.37	1.61	1.94	2.45	2.93
Feb	.13	.20	.32	.43	.54	.66	.80	.97	1.20	1.56	1.91
Mar	.41	.56	.78	.98	1.17	1.38	1.60	1.87	2.22	2.77	3.28
Apr	.90	1.11	1.39	1.63	1.85	2.08	2.32	2.61	2.96	3.51	4.01
May	1.12	1.39	1.76	2.08	2.37	2.67	3.00	3.38	3.85	4.59	5.26
Jun	1.11	1.41	1.85	2.22	2.57	2.93	3.33	3.79	4.38	5.29	6.13
Jul	1.33	1.65	2.11	2.49	2.85	3.21	3.61	4.07	4.66	5.55	6.37
Aug	1.03	1.33	1.76	2.12	2.48	2.84	3.24	3.70	4.30	5.23	6.08
Sep	1.32	1.66	2.16	2.58	2.98	3.39	3.84	4.36	5.03	6.05	6.99
Oct	1.02	1.33	1.79	2.18	2.56	2.95	3.38	3.88	4.53	5.54	6.48
Nov	.72	.95	1.28	1.57	1.85	2.14	2.46	2.83	3.32	4.07	4.77
Dec	.61	.75	.96	1.13	1.29	1.46	1.64	1.84	2.11	2.51	2.87
Ann	21.57	23.09	25.04	26.51	27.81	29.06	30.35	31.77	33.49	35.97	38.11

\+ 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: 1950-2001
(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	6.0	-99.9	15	14	15.0	1996	29	29.9	1972	41	1972	25	26	1971	5.6	4.1	1.7	.4	.0	-9.9	-9.9	-9.9	-9.9
Feb	6.2	3.3	15	14	8.3	1971	5	17.8	1971	50	1972	29	40	1972	2.6	2.0	.7	.4	.0	-9.9	-9.9	-9.9	-9.9
Mar	8.2	4.3	13	11	8.7	1971	15	21.3	1994	56	1972	6	44	1972	2.9	2.1	.7	.3	.0	-9.9	-9.9	-9.9	-9.9
Apr	4.7	2.7	3	#	9.0	1994	29	14.4	1972	30	1972	1	23	1972	1.9	1.4	.9	.3	.0	-9.9	-9.9	-9.9	-9.9
May	.3	.0	#	0	3.0	1996	1	3.0	1996	#+	1997	16	#+	1997	.1	.1	.1	.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	#	1991	19	#	1991	#	1991	19	#	1991	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.3	#	#	#	2.2	1997	21	2.7	1997	4	1990	18	#+	1999	.1	.1	.0	.0	.0	.0	.0	.0	.0
Nov	8.3	8.4	2	1	10.0	1994	28	11.5	1988	10+	1995	30	6	1991	3.2	2.1	1.1	.3	.1	8.2	3.3	1.2	.3
Dec	13.7	16.0	7	6	12.5	1989	14	21.2	1976	18	1996	30	14	1977	5.9	4.2	1.5	.8	.1	-9.9	-9.9	-9.9	-9.9
Ann	47.7	-9.9	N/A	N/A	15.0	Jan 1996	29	29.9	Jan 1972	56	Mar 1972	6	44	Mar 1972	22.3	16.1	6.7	2.5	.2	-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	7/08	7/02	6/28	6/25	6/21	6/18	6/14	6/10	6/04
32	7/08	6/30	6/24	6/19	6/15	6/10	6/05	5/30	5/22
28	7/10	6/29	6/20	6/13	6/07	5/31	5/24	5/15	5/04
24	7/05	6/21	6/11	6/02	5/25	5/17	5/08	4/28	4/14
20	6/23	6/08	5/29	5/20	5/11	5/03	4/24	4/14	3/30
16	5/28	5/16	5/06	4/28	4/21	4/14	4/06	3/27	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	7/27	8/05	8/11	8/17	8/22	8/28	9/02	9/09	9/18
32	7/29	8/07	8/14	8/20	8/26	9/01	9/07	9/15	9/25
28	8/03	8/16	8/26	9/03	9/11	9/18	9/26	10/06	10/19
24	8/27	9/10	9/21	9/30	10/08	10/16	10/25	11/05	11/19
20	10/21	10/26	10/29	11/01	11/04	11/06	11/09	11/12	11/17
16	10/27	10/31	11/03	11/05	11/07	11/10	11/12	11/15	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	102	88	78	69	61	53	45	35	21
32	121	104	92	81	72	62	52	40	23
28	158	137	121	108	95	83	70	54	32
24	207	183	165	150	135	121	106	88	63
20	223	206	195	185	175	166	156	144	128
16	240	226	216	208	200	192	183	173	159

***** 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	1775	1462	1256	838	484	238	101	130	343	683	1087	1588	9985
60	1620	1322	1101	688	339	121	30	52	207	528	937	1433	8378
57	1527	1238	1008	599	260	71	11	24	139	437	847	1340	7501
55	1465	1182	946	540	213	46	5	13	101	378	787	1278	6954
50	1310	1042	791	397	118	11	0	1	36	241	637	1123	5707
32	755	557	279	53	2	0	0	0	0	10	178	589	2423

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	4	20	46	206	543	760	974	944	649	349	82	24	4601
55	0	0	0	2	41	116	266	244	60	5	0	0	734
57	0	0	0	1	26	81	209	193	38	2	0	0	550
60	0	0	0	0	12	41	135	128	17	0	0	0	333
65	0	0	0	0	2	8	51	51	2	0	0	0	114
70	0	0	0	0	0	0	11	13	0	0	0	0	24

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	1	45	317	299	706	604	414	125	11	0	0	0	1	46	363	662	1368	1972	2386	2511	2522	2522
45	0	0	1	14	192	196	551	461	269	48	1	0	0	0	1	15	207	403	954	1415	1684	1732	1733	1733
50	0	0	0	1	103	117	396	322	144	10	0	0	0	0	0	1	104	221	617	939	1083	1093	1093	1093
55	0	0	0	0	47	58	244	193	58	0	0	0	0	0	0	0	47	105	349	542	600	600	600	600
60	0	0	0	0	16	19	113	83	19	0	0	0	0	0	0	0	16	35	148	231	250	250	250	250
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	1	36	196	176	422	359	221	59	6	0	0	0	1	37	233	409	831	1190	1411	1470	1476	1476

(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