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: REMER NO 2, MN **COOP ID: 216849**

Climate Division: MN 2 **NWS Call Sign:** **Elevation: 1,345 Feet** **Lat: 47˚04N** **Lon: 93˚55W**

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	16.2	-6.5	4.9	54	1973	25	17.2	1990	-48	1972	15	-7.5	1982	1866	0	.0	.0	.1	29.1	31.0	23.9
Feb	25.0	1.1	13.1	59	1961	22	28.2	1998	-51	1996	2	.9	1989	1454	0	.0	.0	.3	22.3	28.1	14.0
Mar	37.0	14.6	25.8	72+	1968	30	35.4	1973	-44	1962	1	16.8	1996	1215	0	.0	.0	2.8	10.2	29.2	5.3
Apr	53.1	27.9	40.5	93	1980	22	48.6	1987	-12	1975	4	34.4	1996	735	0	.0	@	18.0	.6	21.3	.4
May	67.4	41.0	54.2	92	1964	22	62.6	1977	13	1966	1	47.6	1974	357	22	.0	.1	29.4	.0	6.2	.0
Jun	75.2	49.5	62.4	94+	1995	18	67.9	1988	18+	1985	5	56.5	1982	131	50	.0	.3	29.9	.0	.8	.0
Jul	79.2	54.7	67.0	98	1980	11	70.9	1975	33	1969	1	60.0	1992	55	115	.0	1.7	31.0	.0	.0	.0
Aug	76.4	52.2	64.3	95	1961	14	69.8	1983	30	1977	24	59.8	1977	97	74	.0	.5	31.0	.0	@	.0
Sep	66.7	42.6	54.7	93	1983	3	60.7	1998	16	1965	26	48.5	1993	316	5	.0	.2	29.5	.0	4.7	.0
Oct	54.0	33.0	43.5	86	1963	5	49.2	1973	5	1976	27	36.9	1976	667	0	.0	.0	21.6	.3	16.0	.0
Nov	35.3	18.5	26.9	72	1975	4	36.3	1999	-29	1964	30	19.1	1985	1144	0	.0	.0	3.0	11.3	28.8	1.7
Dec	21.3	1.2	11.3	59	1962	1	22.3	1997	-42+	1983	20	-1.4	1983	1666	0	.0	.0	.2	26.2	31.0	14.8
Ann	50.6	27.5	39.1	98	Jul 1980	11	70.9	Jul 1975	-51	Feb 1996	2	-7.5	Jan 1982	9703	266	.0	2.8	196.8	100.0	197.1	60.1

\+ 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: 1957-2000

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

Issue Date: February 2004

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Climate Division: MN 2 **NWS Call Sign:** **Elevation: 1,345 Feet** **Lat: 47˚04N** **Lon: 93˚55W**

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	.90	.73	.86	1996	18	2.86	1975	.06	1981
Feb	.55	.51	.86	1971	27	1.66	1979	.00	1973
Mar	1.39	1.18	1.08	2000	9	2.99	1979	.56	1984
Apr	1.77	1.39	3.75	1960	24	4.31	1986	.21	1987
May	3.09	2.87	2.50	1985	11	7.76	1999	.57	1980
Jun	4.28	4.09	3.04	1985	26	8.26	1994	.87	1995
Jul	4.54	4.06	3.70	1957	19	8.78	1999	.72	1984
Aug	3.63	3.39	5.82	1978	23	10.99	1978	1.07	1997
Sep	2.98	2.70	4.65	1991	7	6.89	1991	.38	1974
Oct	2.70	2.03	5.49	1973	10	8.00	1973	.12	1976
Nov	1.60	1.53	1.63	1977	9	3.89	1977	.04+	1999
Dec	.73	.70	.77	1968	13	1.37	1977	.18	1997
Ann	28.16	28.80	5.82	Aug 1978	23	10.99	Aug 1978	.00	Feb 1973

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	8.4	2.6	.1	.0
Feb	4.4	1.4	.1	.0
Mar	7.2	3.6	.7	.1
Apr	8.0	4.6	.6	.2
May	10.6	5.9	1.7	.6
Jun	11.5	7.2	2.6	1.0
Jul	10.9	7.2	2.6	.9
Aug	10.0	6.0	2.3	1.0
Sep	7.3	4.1	1.4	.3
Oct	8.2	4.4	1.5	.6
Nov	7.2	3.4	.8	.1
Dec	6.3	2.1	.1	.0
Ann	100.0	52.5	14.5	4.8

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	.20	.28	.41	.53	.65	.78	.92	1.10	1.32	1.69	2.03
Feb	.05	.11	.20	.28	.36	.45	.55	.68	.84	1.12	1.38
Mar	.59	.72	.89	1.04	1.17	1.31	1.46	1.62	1.84	2.16	2.46
Apr	.43	.60	.86	1.09	1.31	1.56	1.82	2.14	2.56	3.23	3.85
May	.82	1.11	1.56	1.95	2.34	2.74	3.19	3.73	4.42	5.51	6.53
Jun	1.57	1.97	2.55	3.03	3.49	3.97	4.48	5.07	5.83	7.00	8.07
Jul	1.65	2.08	2.69	3.21	3.70	4.20	4.74	5.38	6.18	7.43	8.57
Aug	1.26	1.60	2.10	2.52	2.93	3.34	3.79	4.32	5.00	6.05	7.01
Sep	.98	1.26	1.67	2.03	2.37	2.72	3.10	3.55	4.13	5.03	5.86
Oct	.29	.50	.87	1.25	1.65	2.10	2.63	3.29	4.20	5.69	7.14
Nov	.17	.29	.51	.74	.98	1.24	1.56	1.95	2.49	3.37	4.23
Dec	.21	.28	.39	.48	.56	.66	.76	.88	1.03	1.27	1.50
Ann	20.50	22.00	23.91	25.35	26.63	27.86	29.13	30.53	32.22	34.68	36.79

\+ 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: 1957-2000
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
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Climate Division: MN 2 **NWS Call Sign:** **Elevation: 1,345 Feet** **Lat: 47°04N** **Lon: 93°55W**

Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	10.6	10.7	13	13
Feb	8.3	6.5	16	15
Mar	8.5	8.1	12	10
Apr	3.0	3.5	3	1
May	.1	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	#	.0	#	0
Oct	.3	.0	#	0
Nov	7.9	8.8	2	3
Dec	8.9	8.5	6	5
Ann	47.6	46.1	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	10.0	1982	23	21.3	1972	32	1997	5	23	1997
Feb	12.0	1971	27	20.9	1971	33	1971	28	26	1996
Mar	7.0	1980	13	19.0	1982	33	1971	1	28	1997
Apr	6.0	1994	29	7.2	1972	25	1971	3	12	1979
May	1.0	1997	15	1.0	1997	1	1997	15	#+	1997
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	#	1991	18	#	1991	#	1979	28	#	1979
Oct	2.0	1995	24	2.0	1992	2	1995	24	#+	1997
Nov	8.0	1983	24	22.0	1983	18	1991	8	8	1991
Dec	6.0	1995	9	17.0	1983	20	1983	31	16	1983
Ann	12.0	Feb 1971	27	22.0	Nov 1983	33+	Mar 1971	1	28	Mar 1997

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	6.7	4.3	1.2	.3	.1
Feb	4.1	2.8	.6	.2	.1
Mar	4.0	2.7	1.0	.4	.0
Apr	2.0	1.3	.4	.1	.0
May	.1	.1	.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	.4	.3	.0	.0	.0
Nov	3.6	2.7	1.0	.2	.0
Dec	5.3	3.3	.9	.3	.0
Ann	26.2	17.5	5.1	1.5	.2

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	-9.9	-9.9	-9.9	-9.9
Apr	7.2	5.9	4.9	3.9
May	.1	.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	.0
Nov	8.4	6.0	3.9	.6
Dec	-9.9	-9.9	-9.9	-9.9
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

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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	6/25	6/19	6/14	6/11	6/07	6/03	5/31	5/26	5/20
32	6/08	6/02	5/29	5/25	5/22	5/19	5/16	5/11	5/06
28	5/26	5/21	5/16	5/13	5/10	5/06	5/03	4/28	4/23
24	5/17	5/11	5/06	5/02	4/28	4/24	4/20	4/15	4/08
20	5/07	4/29	4/24	4/20	4/16	4/11	4/07	4/02	3/26
16	4/15	4/12	4/09	4/07	4/05	4/02	3/31	3/28	3/25

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	8/18	8/24	8/29	9/02	9/06	9/09	9/13	9/18	9/24
32	9/06	9/10	9/12	9/14	9/16	9/18	9/20	9/23	9/26
28	9/14	9/18	9/21	9/24	9/26	9/28	10/01	10/04	10/08
24	9/23	9/28	10/02	10/06	10/09	10/12	10/16	10/20	10/25
20	10/11	10/17	10/21	10/24	10/27	10/31	11/03	11/07	11/13
16	10/20	10/26	10/30	11/02	11/05	11/09	11/12	11/16	11/22

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	114	105	100	95	90	85	80	74	66
32	135	128	124	120	116	113	109	104	98
28	161	153	148	143	139	135	130	124	117
24	190	181	174	169	163	158	152	146	136
20	223	213	206	200	194	188	182	175	165
16	233	227	222	218	214	210	206	201	195

***** 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	1866	1454	1215	735	357	131	55	97	316	667	1144	1666	9703
60	1711	1314	1060	588	237	56	13	33	188	512	994	1511	8217
57	1618	1230	967	501	177	28	5	14	125	422	904	1418	7409
55	1556	1174	905	445	143	17	1	7	91	364	844	1356	6903
50	1401	1034	751	315	75	3	0	0	33	233	694	1201	5740
32	852	564	280	37	1	0	0	0	0	12	238	667	2651

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	9	34	87	291	689	909	1083	1000	679	369	84	24	5258
55	0	0	0	10	118	236	371	294	80	7	0	0	1116
57	0	0	0	6	90	187	313	239	54	3	0	0	892
60	0	0	0	2	57	125	228	165	27	1	0	0	605
65	0	0	0	0	22	50	115	74	5	0	0	0	266
70	0	0	0	0	7	12	41	22	0	0	0	0	82

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	7	113	450	666	836	755	435	161	9	0	0	0	7	120	570	1236	2072	2827	3262	3423	3432	3432
45	0	0	0	51	304	516	681	600	291	75	1	0	0	0	0	51	355	871	1552	2152	2443	2518	2519	2519
50	0	0	0	21	182	370	526	445	171	27	0	0	0	0	0	21	203	573	1099	1544	1715	1742	1742	1742
55	0	0	0	7	90	234	371	291	89	6	0	0	0	0	0	7	97	331	702	993	1082	1088	1088	1088
60	0	0	0	1	40	121	223	154	35	0	0	0	0	0	0	1	41	162	385	539	574	574	574	574
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	7	91	291	417	530	466	271	101	11	0	0	0	7	98	389	806	1336	1802	2073	2174	2185	2185

(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