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: RED WING DAM 3, MN **COOP ID: 216822**

Climate Division: MN 9 **NWS Call Sign:** **Elevation: 677 Feet** **Lat: 44˚37N** **Lon: 92˚37W**

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	21.5	2.5	12.0	49	1990	9	25.9	1990	-36+	1994	19	-1.0	1977	1644	0	.0	.0	.1	24.3	30.9	13.3
Feb	28.0	8.9	18.5	57	2000	26	31.1	1998	-36+	1996	3	5.6	1979	1304	0	.0	.0	.8	16.8	27.4	8.5
Mar	40.0	21.9	31.0	79	1968	30	39.3	2000	-8+	2001	1	22.8	1975	1057	0	.0	.0	6.5	7.0	26.6	2.2
Apr	55.6	36.0	45.8	86+	1991	7	52.4	1977	7	1995	5	39.2	1975	579	2	.0	.1	21.4	.4	11.7	.0
May	69.4	47.6	58.5	93+	2001	15	66.0	1977	29	1968	5	52.6	1997	243	41	.0	.4	30.6	.0	1.5	.0
Jun	78.6	56.6	67.6	96+	1995	18	73.1	1988	39+	1992	22	62.2	1982	51	130	@	2.3	30.0	.0	.0	.0
Jul	82.6	61.5	72.1	103	1995	14	75.9	1974	46+	1972	5	65.1	1992	13	231	.1	4.8	31.0	.0	.0	.0
Aug	80.2	59.5	69.9	98	2001	8	75.5	1983	45	1971	28	65.0	1992	27	178	.1	2.4	31.0	.0	.0	.0
Sep	71.1	50.1	60.6	91+	1999	3	65.9	1998	31+	1992	30	54.9	1993	166	34	.0	.7	29.7	.0	1.0	.0
Oct	58.5	38.0	48.3	92	1997	4	54.3	1973	17	1969	28	42.9	1987	522	1	.0	@	24.6	.1	8.8	.0
Nov	40.1	24.4	32.3	78	1999	9	40.8	1999	-10	1991	8	22.9	1991	983	0	.0	.0	7.0	7.3	24.7	.7
Dec	26.8	10.2	18.5	66	1998	2	26.6	1997	-25	2000	26	4.6	1983	1443	0	.0	.0	.4	20.6	30.7	8.0
Ann	54.4	34.8	44.6	103	Jul 1995	14	75.9	Jul 1974	-36+	Feb 1996	3	-1.0	Jan 1977	8032	617	.2	10.7	213.1	76.5	163.3	32.7

\+ 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: RED WING DAM 3, MN

COOP ID: 216822

Climate Division: MN 9 **NWS Call Sign:** **Elevation: 677 Feet** **Lat: 44˚37N** **Lon: 92˚37W**

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	.81	.74	1.30	1967	25	2.65	1975	.10	1981
Feb	.64	.60	.88	1981	28	2.62	1981	.00	1987
Mar	1.71	1.53	1.85	1990	14	4.23	1998	.23	1994
Apr	2.73	2.43	3.58	1975	28	6.62	1975	.37	1987
May	3.49	3.29	3.18	1968	16	6.17	1973	.70	1992
Jun	4.03	3.66	6.08	1950	13	8.07	1990	.63	1988
Jul	4.25	3.76	6.24	1978	1	10.87	1987	1.10	1980
Aug	3.97	3.54	3.60	1956	3	7.97	1979	.95	1971
Sep	3.48	2.75	7.07	1992	16	9.37	1992	.67	1987
Oct	2.17	1.96	1.96	1992	7	5.32	1995	.31	1975
Nov	1.81	1.44	2.65	1975	10	4.76	1975	.00	1976
Dec	.86	.83	1.35	1982	25	2.53	1982	.00	1986
Ann	29.95	30.14	7.07	Sep 1992	16	10.87	Jul 1987	.00+	Feb 1987

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.6	2.6	.2	@
Feb	5.8	2.3	.2	.0
Mar	8.2	4.5	1.0	.2
Apr	9.5	5.9	1.6	.5
May	11.4	7.7	2.5	.6
Jun	11.1	7.9	2.8	.9
Jul	9.5	6.5	2.7	1.1
Aug	9.9	6.8	3.0	1.0
Sep	8.9	6.0	2.2	.8
Oct	8.0	4.6	1.4	.4
Nov	7.3	4.2	1.2	.3
Dec	7.0	2.9	.3	.1
Ann	104.2	61.9	19.1	5.9

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	.17	.24	.36	.47	.58	.69	.82	.98	1.19	1.52	1.83
Feb	.07	.15	.26	.35	.44	.54	.65	.78	.96	1.24	1.51
Mar	.39	.54	.79	1.02	1.25	1.49	1.75	2.08	2.50	3.17	3.81
Apr	.66	.92	1.32	1.67	2.02	2.39	2.81	3.30	3.95	4.97	5.94
May	1.46	1.78	2.23	2.59	2.93	3.28	3.65	4.08	4.63	5.46	6.21
Jun	1.29	1.67	2.24	2.72	3.19	3.67	4.20	4.82	5.62	6.86	8.01
Jul	1.02	1.42	2.04	2.59	3.14	3.72	4.37	5.14	6.16	7.76	9.27
Aug	1.41	1.78	2.33	2.78	3.22	3.66	4.15	4.72	5.44	6.57	7.59
Sep	.64	.94	1.45	1.93	2.41	2.93	3.52	4.24	5.19	6.73	8.19
Oct	.39	.59	.90	1.20	1.50	1.83	2.20	2.65	3.24	4.20	5.12
Nov	.16	.36	.66	.93	1.20	1.49	1.83	2.24	2.79	3.67	4.52
Dec	.12	.23	.37	.50	.62	.75	.89	1.06	1.29	1.65	1.99
Ann	21.41	23.06	25.18	26.79	28.22	29.60	31.02	32.60	34.50	37.27	39.66

\+ 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: RED WING DAM 3, MN **COOP ID: 216822**

Climate Division: MN 9 **NWS Call Sign:** **Elevation: 677 Feet** **Lat: 44°37N** **Lon: 92°37W**

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	10.4	9.4	7	7	11.0	1988	20	36.0	1982	40	1982	25	18	1979	5.1	3.4	1.0	.4	.1	-9.9	-9.9	-9.9	-9.9
Feb	6.7	6.5	9	9	7.0	1971	5	14.1	1981	27	1979	20	24	1979	3.6	2.2	.8	.1	.0	25.5	21.9	16.7	9.9
Mar	6.5	4.8	5	3	16.0	1999	9	17.0	1984	20+	1986	3	15	1979	2.5	2.0	.8	.4	.1	13.4	10.2	8.1	4.7
Apr	1.8	.0	#	#	9.0	1983	15	18.0	1983	11	1975	5	5	1975	.8	.6	.2	.1	.0	1.5	.4	.3	.0
May	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.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	.1	.0	#	0	2.5	1987	25	2.5	1987	1+	1992	20	#+	1992	.1	@	.0	.0	.0	@	.0	.0	.0
Nov	3.8	1.1	1	#	8.0	1983	24	20.0	1983	14	1983	28	7	1991	2.0	1.2	.5	.3	.0	4.0	2.4	1.4	.2
Dec	7.5	5.5	4	3	8.0	1985	1	23.5	1985	23	1983	20	17	1983	4.9	3.0	.8	.2	.0	20.8	13.8	7.8	3.4
Ann	36.8	27.3	N/A	N/A	16.0	Mar 1999	9	36.0	Jan 1982	40	Jan 1982	25	24	Feb 1979	19.0	12.4	4.1	1.5	.2	-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: RED WING DAM 3, MN **COOP ID: 216822**

Climate Division: MN 9 **NWS Call Sign:** **Elevation: 677 Feet** **Lat: 44˚37N** **Lon: 92˚37W**

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	5/29	5/23	5/18	5/14	5/11	5/07	5/03	4/29	4/22
32	5/22	5/15	5/10	5/05	5/01	4/27	4/22	4/17	4/10
28	5/04	4/28	4/24	4/20	4/17	4/13	4/10	4/05	3/30
24	4/23	4/18	4/15	4/12	4/10	4/07	4/04	4/01	3/27
20	4/13	4/08	4/05	4/02	3/31	3/28	3/25	3/22	3/18
16	4/08	4/02	3/30	3/26	3/23	3/20	3/17	3/13	3/08

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	9/14	9/18	9/21	9/23	9/26	9/28	9/30	10/03	10/08
32	9/18	9/23	9/26	9/30	10/03	10/05	10/09	10/12	10/17
28	9/27	10/02	10/06	10/10	10/13	10/17	10/20	10/24	10/30
24	10/09	10/15	10/19	10/23	10/26	10/29	11/02	11/06	11/12
20	10/20	10/25	10/30	11/02	11/05	11/08	11/12	11/16	11/22
16	10/27	11/02	11/07	11/10	11/14	11/17	11/21	11/25	12/01

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	162	153	147	142	137	132	127	121	113
32	180	171	165	159	154	149	143	137	128
28	203	195	189	184	179	174	169	163	154
24	223	215	208	203	199	194	189	182	174
20	242	234	228	223	219	214	209	203	195
16	260	251	245	239	235	230	224	218	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: RED WING DAM 3, MN **COOP ID: 216822**

Climate Division: MN 9 **NWS Call Sign:** **Elevation: 677 Feet** **Lat: 44˚37N** **Lon: 92˚37W**

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	1644	1304	1057	579	243	51	13	27	166	522	983	1443	8032
60	1489	1164	902	436	143	15	0	5	76	374	833	1288	6725
57	1396	1080	809	357	97	5	0	1	42	292	743	1195	6017
55	1334	1024	747	307	73	3	0	0	26	243	684	1133	5574
50	1179	884	601	199	30	0	0	0	5	140	540	978	4556
32	650	436	176	12	0	0	0	0	0	4	143	468	1889

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	29	56	142	426	821	1069	1241	1173	857	507	150	48	6519
55	0	0	0	31	180	381	528	460	193	33	1	0	1807
57	0	0	0	20	143	324	466	399	149	20	0	0	1521
60	0	0	0	10	96	243	373	310	94	8	0	0	1134
65	0	0	0	2	41	130	231	178	34	1	0	0	617
70	0	0	0	0	13	53	117	82	7	0	0	0	272

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	34	225	575	833	1006	946	622	298	38	1	0	1	35	260	835	1668	2674	3620	4242	4540	4578	4579
45	0	0	16	134	424	683	851	791	477	187	16	0	0	0	16	150	574	1257	2108	2899	3376	3563	3579	3579
50	0	0	3	66	281	533	696	636	331	99	2	0	0	0	3	69	350	883	1579	2215	2546	2645	2647	2647
55	0	0	0	33	167	387	541	481	210	45	0	0	0	0	0	33	200	587	1128	1609	1819	1864	1864	1864
60	0	0	0	11	86	246	387	327	112	17	0	0	0	0	0	11	97	343	730	1057	1169	1186	1186	1186
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	23	141	348	539	679	625	382	177	25	0	0	0	23	164	512	1051	1730	2355	2737	2914	2939	2939

(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