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 LAKE FALLS, MN **COOP ID: 216787**

Climate Division: MN 1 **NWS Call Sign:** **Elevation: 1,075 Feet** **Lat: 47˚53N** **Lon: 96˚17W**

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	12.9	-8.0	2.5	48	1981	24	17.0	1990	-50	1954	21	-11.4	1982	1941	0	.0	.0	.0	27.7	31.0	19.6
Feb	20.3	-.5	9.9	62	1958	25	24.4	1998	-46+	1996	1	-4.5	1979	1544	0	.0	.0	.1	20.6	28.0	13.3
Mar	33.7	13.6	23.7	76	1963	31	35.0	2000	-36	1955	6	13.3	1996	1282	0	.0	.0	3.5	11.0	27.7	5.2
Apr	52.9	29.1	41.0	97	1980	21	49.6	1987	-10	1979	6	32.3	1979	721	1	.0	@	18.9	1.2	16.8	.2
May	68.2	42.9	55.6	96	1964	21	64.2	1977	15	1967	3	47.6	1979	323	30	.0	.7	29.7	.0	4.2	.0
Jun	76.4	52.4	64.4	97	1995	18	71.4	1988	25	1964	1	58.3	1982	99	81	.0	1.6	30.0	.0	@	.0
Jul	80.6	56.0	68.3	104	1988	5	73.3	1989	38	1983	5	61.7	1992	38	140	.1	3.1	31.0	.0	.0	.0
Aug	79.5	54.0	66.8	102	1983	7	72.7	1983	28	1982	27	59.9	1977	80	134	.1	2.9	31.0	.0	@	.0
Sep	68.2	43.0	55.6	96+	1983	2	61.3	1998	18	1974	22	51.3	1993	294	12	.0	.8	29.2	.0	2.7	.0
Oct	54.4	31.1	42.8	87	1955	10	48.6	1973	5+	1988	29	37.2	1976	690	0	.0	.0	21.1	.5	14.3	.0
Nov	32.9	15.9	24.4	71	1999	1	36.0	1999	-29	1985	29	14.3	1985	1218	0	.0	.0	3.3	13.7	27.4	3.0
Dec	18.3	-.3	9.0	56	1962	1	21.0	1997	-43	1955	19	-3.6	1983	1737	0	.0	.0	.1	25.5	30.9	14.6
Ann	49.9	27.4	38.7	104	Jul 1988	5	73.3	Jul 1989	-50	Jan 1954	21	-11.4	Jan 1982	9967	398	.2	9.1	197.9	100.2	183.0	55.9

\+ 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

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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	.66	.62	.80	1980	6	1.67	1989	.09	2000
Feb	.55	.46	.80	1977	24	1.64	1977	.05	1993
Mar	.92	.90	1.58	1970	3	2.09	1995	.02	1978
Apr	1.33	.93	1.71	1979	24	4.81	1986	.00	1988
May	2.50	2.19	2.17	1987	21	6.75	1987	.28	1980
Jun	3.79	3.25	3.16	1984	8	10.89	1981	.80	1988
Jul	3.54	3.54	4.25	1997	2	7.74	1979	.50	1990
Aug	3.69	3.64	4.54	1980	29	8.41	1980	.83	1996
Sep	2.60	2.12	3.71	1983	17	6.17	1983	.07	1976
Oct	1.89	1.81	2.47	1961	11	6.18	1998	.12	1976
Nov	1.08	.79	1.30	1986	8	3.57	2000	.00	1999
Dec	.50	.44	.65	1960	5	1.14	1996	.07	1986
Ann	23.05	22.98	4.54	Aug 1980	29	10.89	Jun 1981	.00+	Nov 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.4	1.9	.1	.0
Feb	5.5	1.9	.2	@
Mar	6.9	2.7	.2	.1
Apr	6.8	3.5	.6	.3
May	9.4	5.5	1.5	.4
Jun	10.8	6.9	2.6	.9
Jul	10.5	6.2	2.4	.7
Aug	9.6	6.8	2.1	1.0
Sep	8.6	5.0	1.5	.7
Oct	8.0	4.3	1.3	.3
Nov	6.5	3.1	.5	.1
Dec	6.9	1.6	.1	.0
Ann	96.9	49.4	13.1	4.5

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	.15	.21	.31	.39	.48	.57	.68	.80	.97	1.23	1.48
Feb	.07	.11	.19	.27	.35	.44	.55	.67	.85	1.14	1.41
Mar	.10	.17	.29	.42	.56	.72	.90	1.13	1.44	1.96	2.46
Apr	.05	.16	.36	.55	.76	1.00	1.28	1.63	2.12	2.92	3.71
May	.46	.68	1.05	1.39	1.73	2.11	2.53	3.05	3.73	4.83	5.88
Jun	.98	1.34	1.89	2.37	2.85	3.35	3.91	4.57	5.44	6.80	8.08
Jul	.90	1.23	1.75	2.20	2.65	3.12	3.65	4.28	5.09	6.38	7.59
Aug	1.23	1.58	2.09	2.52	2.94	3.37	3.84	4.40	5.10	6.20	7.21
Sep	.33	.53	.90	1.26	1.64	2.07	2.56	3.17	4.00	5.36	6.68
Oct	.15	.28	.53	.79	1.08	1.41	1.80	2.30	2.98	4.13	5.26
Nov	.03	.11	.26	.41	.58	.78	1.02	1.32	1.73	2.43	3.12
Dec	.11	.16	.23	.30	.36	.43	.51	.60	.73	.92	1.11
Ann	15.23	16.70	18.60	20.06	21.37	22.65	23.97	25.44	27.24	29.86	32.15

\+ 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:
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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	11.2	11.4	12	11
Feb	7.6	5.8	13	14
Mar	8.1	7.2	7	5
Apr	2.3	1.1	1	#
May	.1	.0	#	0
Jun	.0	.0	#	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	#	.0	0	0
Oct	.9	.0	#	0
Nov	8.7	7.5	3	2
Dec	8.8	8.2	7	5
Ann	47.7	41.2	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	8.5	1998	5	23.8	1989	39	1989	21	32	1989
Feb	10.0	1977	24	24.5	1977	34	1979	23	29	1979
Mar	10.5	1997	3	19.0+	1976	34	1997	3	26	1997
Apr	6.0	1991	14	10.0	1991	16	1996	5	6	1996
May	1.5	1983	15	1.5	1983	#+	1997	14	#+	1997
Jun	.0	0	0	.0	0	#	2000	9	#	2000
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	#	1984	26	#+	1984	0	0	0	0	0
Oct	4.0	1972	30	6.0	1987	3	1972	30	#+	1999
Nov	14.0	1998	18	33.5	1977	25	1977	28	11	1977
Dec	6.0	1988	27	20.7	1988	27	1977	12	23	1977
Ann	14.0	Nov 1998	18	33.5	Nov 1977	39	Jan 1989	21	32	Jan 1989

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	8.0	4.2	1.2	.4	.0
Feb	5.6	2.9	.9	.2	@
Mar	4.6	2.7	1.1	.3	@
Apr	1.5	1.0	.2	.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	.6	.4	.1	.0	.0
Nov	4.7	3.2	1.3	.3	@
Dec	7.2	3.8	.7	.2	.0
Ann	32.3	18.3	5.5	1.5	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	30.6	28.6	26.2	14.6
Feb	27.6	25.7	22.5	16.5
Mar	15.9	11.7	9.1	4.6
Apr	1.9	1.0	.6	.1
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
Nov	14.1	7.6	3.3	1.2
Dec	26.8	19.1	12.8	5.8
Ann	117.2	93.7	74.5	42.8

+ 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:
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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	6/07	6/02	5/30	5/27	5/24	5/21	5/18	5/14	5/09
32	5/25	5/21	5/18	5/16	5/13	5/11	5/08	5/06	5/02
28	5/15	5/10	5/07	5/04	5/01	4/28	4/25	4/22	4/17
24	5/03	4/28	4/25	4/21	4/19	4/16	4/12	4/09	4/04
20	4/25	4/19	4/16	4/13	4/10	4/07	4/03	3/31	3/26
16	4/17	4/12	4/08	4/06	4/03	3/31	3/28	3/25	3/20

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	8/31	9/04	9/07	9/09	9/11	9/14	9/16	9/19	9/23
32	9/07	9/12	9/15	9/18	9/21	9/23	9/26	9/30	10/05
28	9/14	9/19	9/23	9/27	9/30	10/03	10/06	10/10	10/15
24	9/25	9/30	10/04	10/08	10/11	10/14	10/18	10/22	10/28
20	10/01	10/08	10/12	10/17	10/20	10/24	10/28	11/02	11/08
16	10/11	10/18	10/22	10/26	10/30	11/03	11/07	11/12	11/18

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	129	122	118	114	110	106	102	98	91
32	150	143	138	134	130	126	121	116	109
28	173	165	160	155	151	147	142	137	129
24	198	190	184	179	175	170	165	160	152
20	217	209	203	198	193	188	183	177	169
16	235	226	220	215	210	205	199	193	185

***** 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	1941	1544	1282	721	323	99	38	80	294	690	1218	1737	9967
60	1786	1404	1127	575	210	38	8	29	173	535	1068	1582	8535
57	1693	1320	1034	491	155	18	1	14	115	445	978	1489	7753
55	1631	1264	972	437	124	11	0	8	83	386	918	1427	7261
50	1476	1124	822	314	63	2	0	1	29	254	769	1272	6126
32	932	648	352	48	0	0	0	0	0	20	304	741	3045

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	15	29	93	318	730	972	1126	1077	708	353	76	27	5524
55	0	0	0	17	141	292	413	372	101	6	0	0	1342
57	0	0	0	11	110	240	352	316	73	3	0	0	1105
60	0	0	0	5	72	170	266	238	41	1	0	0	793
65	0	0	0	1	30	81	140	134	12	0	0	0	398
70	0	0	0	0	10	26	58	61	2	0	0	0	157

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	12	172	530	753	909	854	513	200	15	0	0	0	12	184	714	1467	2376	3230	3743	3943	3958	3958
45	0	0	0	97	384	603	754	699	372	109	7	0	0	0	0	97	481	1084	1838	2537	2909	3018	3025	3025
50	0	0	0	45	261	453	599	544	244	51	1	0	0	0	0	45	306	759	1358	1902	2146	2197	2198	2198
55	0	0	0	20	156	309	444	391	141	18	0	0	0	0	0	20	176	485	929	1320	1461	1479	1479	1479
60	0	0	0	9	78	181	294	244	71	4	0	0	0	0	0	9	87	268	562	806	877	881	881	881
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	7	122	337	470	592	552	316	127	9	0	0	0	7	129	466	936	1528	2080	2396	2523	2532	2532

(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