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: FOREST LAKE 5 NE, MN **COOP ID: 212881**

Climate Division: MN 6 **NWS Call Sign:** **Elevation: 960 Feet** **Lat: 45˚21N** **Lon: 92˚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	22.7	2.7	12.7	51	1981	23	26.6	1990	-38	1977	9	-.2	1977	1623	0	.0	.0	.1	23.0	30.9	13.9
Feb	29.8	9.6	19.7	65	2000	29	32.9	1998	-37	1996	2	9.1	1979	1268	0	.0	.0	1.0	15.2	27.0	8.5
Mar	41.5	21.3	31.4	76	1986	29	41.3	2000	-32	1962	1	22.5	1975	1041	0	.0	.0	6.5	6.5	25.9	2.1
Apr	57.9	34.5	46.2	91	1962	26	54.4	1987	2	1975	1	38.0	1975	568	3	.0	.0	22.7	.4	12.6	.0
May	71.3	47.3	59.3	92+	2001	16	66.5	1998	21	1967	3	53.0	1979	238	61	.0	.5	30.6	.0	1.2	.0
Jun	78.7	56.0	67.4	99+	1988	24	74.1	1988	33	1960	7	61.5	1982	65	137	.0	2.2	30.0	.0	.0	.0
Jul	82.4	60.8	71.6	104	1988	15	77.1	1988	42+	1960	1	66.1	1971	16	220	.2	3.6	31.0	.0	.0	.0
Aug	80.0	59.0	69.5	102	1988	1	74.5	1995	41+	1987	31	64.7	1986	37	177	.1	2.1	31.0	.0	.0	.0
Sep	71.3	50.1	60.7	93	1961	2	68.2	1998	25	1965	26	55.4	1974	175	46	.0	.4	29.8	.0	.4	.0
Oct	59.4	39.1	49.3	86+	2000	19	54.7	2000	13	1996	31	43.0	1976	491	3	.0	.0	25.8	.0	7.0	.0
Nov	40.7	24.7	32.7	75+	1999	9	42.8	1999	-20	1964	30	24.9	1985	969	0	.0	.0	6.4	7.4	23.8	1.0
Dec	26.7	9.8	18.3	65+	1998	2	28.0	1997	-37	1983	19	3.7	1983	1450	0	.0	.0	.6	20.8	30.7	8.5
Ann	55.2	34.6	44.9	104	Jul 1988	15	77.1	Jul 1988	-38	Jan 1977	9	-.2	Jan 1977	7941	647	.3	8.8	215.5	73.3	159.5	34.0

\+ 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: 1958-2001

(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	.98	.90	1.28	1996	18	2.76	1975	.15	1990
Feb	.80	.60	1.40	1984	12	2.25	1981	.08	1997
Mar	1.60	1.45	1.46	1965	1	4.20	1977	.07	1987
Apr	2.40	2.27	2.84	2001	23	5.99	1994	.26	1987
May	3.46	3.48	2.76	1996	19	6.62	1991	.77	1976
Jun	4.61	4.08	6.50	1965	1	10.86	1975	.49	1988
Jul	4.55	4.10	4.06	1978	1	9.65	1997	1.62	1975
Aug	4.58	4.01	3.50	1960	27	10.12	1980	1.42	1976
Sep	3.31	2.90	2.72	1988	20	7.19	1986	.88	2000
Oct	2.51	2.30	2.70	1973	9	5.43	1984	.47	1976
Nov	1.99	1.57	1.84	1991	1	5.64	1991	.18	1976
Dec	.97	.89	1.65	1982	28	3.42	1982	.00	1980
Ann	31.76	32.27	6.50	Jun 1965	1	10.86	Jun 1975	.00	Dec 1980

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.5	3.2	.2	.1
Feb	5.1	2.9	.2	@
Mar	6.0	3.9	1.0	.2
Apr	8.3	5.7	1.4	.4
May	10.3	7.2	2.1	.7
Jun	11.5	7.7	2.8	1.1
Jul	10.7	7.5	2.8	1.1
Aug	10.5	6.9	2.9	1.5
Sep	9.7	6.6	2.3	.7
Oct	8.5	5.5	1.5	.5
Nov	6.9	4.6	1.2	.4
Dec	6.3	2.7	.4	.1
Ann	100.3	64.4	18.8	6.8

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	.29	.43	.57	.70	.84	1.00	1.19	1.45	1.85	2.24
Feb	.12	.19	.31	.42	.53	.66	.80	.98	1.21	1.60	1.97
Mar	.27	.41	.65	.87	1.09	1.33	1.61	1.95	2.40	3.12	3.82
Apr	.46	.68	1.03	1.35	1.68	2.04	2.44	2.93	3.57	4.60	5.59
May	1.26	1.58	2.05	2.44	2.82	3.20	3.62	4.10	4.72	5.67	6.55
Jun	1.46	1.90	2.54	3.10	3.63	4.19	4.80	5.51	6.43	7.87	9.19
Jul	1.59	2.02	2.64	3.17	3.67	4.19	4.76	5.41	6.26	7.56	8.75
Aug	1.68	2.11	2.73	3.25	3.74	4.24	4.79	5.42	6.23	7.48	8.62
Sep	1.06	1.37	1.84	2.24	2.62	3.01	3.45	3.95	4.61	5.63	6.57
Oct	.47	.69	1.06	1.40	1.75	2.12	2.54	3.05	3.73	4.82	5.86
Nov	.28	.44	.73	1.00	1.29	1.61	1.98	2.43	3.04	4.03	4.98
Dec	.10	.21	.38	.52	.66	.82	.99	1.20	1.48	1.94	2.37
Ann	21.06	23.08	25.69	27.69	29.48	31.23	33.04	35.05	37.51	41.10	44.23

\+ 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: 1958-2001
(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	8.8	8.4	8	8
Feb	6.8	5.0	9	9
Mar	8.6	7.0	5	3
Apr	3.1	1.2	#	#
May	#	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	#	.0	0	0
Oct	.3	.0	#	0
Nov	8.9	6.0	1	1
Dec	8.8	8.2	5	4
Ann	45.3	35.8	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	7.7	1994	6	20.0	1982	24	1997	30	21	1997
Feb	7.7	1990	16	15.5	2000	25	1979	22	21	1979
Mar	12.0	1999	9	28.0	1985	22+	1997	14	15	1997
Apr	12.0	1983	14	21.0	1983	11	1983	14	2	1975
May	#	1990	1	#+	1990	#+	1994	1	#+	1994
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	#	1985	24	#	1985	0	0	0	0	0
Oct	2.0	1987	22	3.3	1987	1	1995	24	#+	1997
Nov	16.2	1991	1	47.2	1991	21	1991	2	9	1991
Dec	16.0	1982	28	18.0	1982	20+	1996	27	16	1983
Ann	16.2	Nov 1991	1	47.2	Nov 1991	25	Feb 1979	22	21+	Jan 1997

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	6.8	4.0	1.0	.3	.0
Feb	4.4	2.8	.8	.1	.0
Mar	3.6	2.8	1.2	.5	.1
Apr	1.6	.9	.3	.2	.1
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	.5	.1	.0	.0	.0
Nov	4.1	3.0	.9	.4	.1
Dec	6.6	3.3	.9	.4	.1
Ann	27.6	16.9	5.1	1.9	.4

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	28.3	25.9	19.4	6.1
Feb	26.6	25.0	21.4	8.9
Mar	17.9	12.8	10.0	4.0
Apr	2.4	.6	.3	@
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	.1	.0	.0	.0
Nov	8.7	4.6	2.8	.6
Dec	23.8	17.5	10.5	5.1
Ann	107.8	86.4	64.4	24.7

+ 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	5/24	5/20	5/16	5/13	5/11	5/08	5/05	5/02	4/27
32	5/13	5/09	5/06	5/03	4/30	4/28	4/25	4/21	4/17
28	5/01	4/27	4/24	4/21	4/19	4/17	4/14	4/11	4/07
24	4/23	4/19	4/16	4/13	4/11	4/09	4/06	4/03	3/30
20	4/16	4/12	4/09	4/06	4/04	4/02	3/30	3/27	3/23
16	4/10	4/05	4/02	3/30	3/27	3/24	3/21	3/17	3/12

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	9/15	9/19	9/21	9/24	9/26	9/28	9/30	10/03	10/07
32	9/24	9/28	10/01	10/03	10/06	10/08	10/10	10/13	10/18
28	10/02	10/07	10/11	10/14	10/17	10/20	10/23	10/27	11/02
24	10/09	10/15	10/19	10/22	10/26	10/29	11/02	11/06	11/12
20	10/24	10/28	10/31	11/03	11/05	11/08	11/10	11/13	11/18
16	10/28	11/02	11/06	11/10	11/13	11/16	11/19	11/23	11/28

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	155	149	145	141	138	134	130	126	120
32	177	170	165	161	158	154	150	145	139
28	203	195	190	185	180	176	171	165	158
24	219	212	206	201	197	193	188	182	175
20	232	226	222	218	214	211	207	203	197
16	254	246	240	235	230	226	221	215	207

***** 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	1623	1268	1041	568	238	65	16	37	175	491	969	1450	7941
60	1468	1128	886	427	146	22	2	10	89	347	819	1295	6639
57	1375	1044	793	349	101	10	0	3	52	269	729	1202	5927
55	1313	988	732	300	77	6	0	1	35	222	670	1140	5484
50	1158	850	588	194	34	1	0	0	9	124	526	985	4469
32	629	403	176	12	0	0	0	0	0	3	136	481	1840

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	30	60	158	438	845	1061	1227	1163	861	537	157	54	6591
55	0	0	1	36	209	377	514	451	206	43	1	0	1838
57	0	0	0	25	172	322	452	391	163	28	0	0	1553
60	0	0	0	13	123	244	361	304	110	13	0	0	1168
65	0	0	0	3	61	137	220	177	46	3	0	0	647
70	0	0	0	0	24	61	111	85	14	0	0	0	295

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	2	38	238	605	833	996	927	629	309	43	1	0	2	40	278	883	1716	2712	3639	4268	4577	4620	4621
45	0	1	15	141	453	683	841	772	480	189	19	0	0	1	16	157	610	1293	2134	2906	3386	3575	3594	3594
50	0	0	4	74	309	533	686	617	338	102	3	0	0	0	4	78	387	920	1606	2223	2561	2663	2666	2666
55	0	0	0	34	189	385	531	463	213	42	1	0	0	0	0	34	223	608	1139	1602	1815	1857	1858	1858
60	0	0	0	13	102	247	377	311	115	16	0	0	0	0	0	13	115	362	739	1050	1165	1181	1181	1181
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	26	154	371	534	666	612	375	173	24	0	0	1	27	181	552	1086	1752	2364	2739	2912	2936	2936

(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