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: MILAN 1 NW, MN **COOP ID: 215400**

Climate Division: MN 4 **NWS Call Sign:** **Elevation: 1,020 Feet** **Lat: 45˚08N** **Lon: 95˚56W**

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	22.0	.3	11.2	66	1981	24	24.7	1990	-38	1970	19	-1.4	1982	1670	0	.0	.0	.3	23.2	31.0	16.1
Feb	28.9	8.2	18.6	61+	1991	2	32.0	1987	-35+	1994	9	4.1	1979	1301	0	.0	.0	1.4	16.0	27.7	9.4
Mar	41.0	21.0	31.0	80	1968	30	41.4	2000	-27	1962	1	22.2	1975	1055	0	.0	.0	6.3	7.3	26.7	2.8
Apr	58.7	33.9	46.3	97	1980	21	55.0	1987	-3	1975	3	38.2	1975	565	4	.0	.2	22.2	.4	14.3	.1
May	72.7	46.3	59.5	99	2001	14	67.7	1977	16	1997	13	53.5	1997	223	54	.0	.9	30.6	.0	2.4	.0
Jun	81.0	55.4	68.2	105	1988	24	74.6	1988	33	1964	2	61.9	1982	44	140	.2	4.0	30.0	.0	.0	.0
Jul	85.1	59.3	72.2	107	1988	31	76.4	1974	37	1971	30	64.5	1992	16	238	.6	7.5	31.0	.0	.0	.0
Aug	82.8	56.6	69.7	107	1988	15	75.7	1976	34+	1988	29	65.0	1992	33	180	.5	4.6	31.0	.0	.0	.0
Sep	73.9	46.5	60.2	101	1978	7	67.0	1978	19	1974	22	55.3	1993	181	37	@	1.6	29.8	.0	2.0	.0
Oct	60.9	35.0	48.0	93	1993	6	53.1	1973	9	1988	29	42.6	1988	530	0	.0	.1	25.8	.1	12.6	.0
Nov	40.4	20.3	30.4	80	1999	8	41.1	1999	-21	1964	30	21.2	1996	1039	0	.0	.0	7.0	9.0	26.8	2.0
Dec	26.5	6.3	16.4	63	1998	1	26.6	1997	-35	1983	19	-1.6	1983	1507	0	.0	.0	.6	20.8	30.9	11.2
Ann	56.2	32.4	44.3	107+	Aug 1988	15	76.4	Jul 1974	-38	Jan 1970	19	-1.6	Dec 1983	8164	653	1.3	18.9	216.0	76.8	174.4	41.6

\+ 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	.73	.57	1.60	2001	14	2.77	1996	.00	1974
Feb	.64	.48	1.70	1977	23	1.96	1977	.05	1999
Mar	1.49	1.37	2.39	1977	12	4.33	1977	.26	1971
Apr	2.09	1.79	2.38	1997	5	5.55	1986	.25	1980
May	2.77	2.53	2.52	1981	23	5.48	1972	.12	1976
Jun	3.80	3.24	4.33	1971	29	8.16	1971	.53	1988
Jul	3.96	3.34	9.78	1995	4	13.35	1995	.75	1976
Aug	3.06	2.88	3.26	1953	3	5.80	1990	.61+	2000
Sep	2.31	2.16	2.61	1948	6	5.58	1985	.13	1979
Oct	2.26	1.75	2.53	1996	17	7.03+	1984	.04	1978
Nov	1.14	.89	1.65	1970	8	3.80	2000	.02	1990
Dec	.46	.32	1.56	1951	3	1.77	1977	.00	1986
Ann	24.71	24.30	9.78	Jul 1995	4	13.35	Jul 1995	.00+	Dec 1986

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.8	2.5	.2	.1
Feb	5.1	2.3	.2	.1
Mar	6.7	3.9	.7	.2
Apr	8.5	5.1	1.3	.2
May	9.7	6.4	1.8	.5
Jun	10.6	7.0	2.4	.8
Jul	9.4	5.9	2.6	1.1
Aug	8.7	5.7	2.1	.6
Sep	7.6	4.9	1.4	.5
Oct	6.5	4.0	1.5	.6
Nov	5.7	3.0	.7	.1
Dec	4.6	1.4	.1	.0
Ann	88.9	52.1	15.0	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	.02	.06	.16	.26	.38	.52	.68	.89	1.18	1.68	2.17
Feb	.09	.14	.23	.32	.41	.51	.63	.78	.97	1.29	1.60
Mar	.44	.58	.79	.98	1.16	1.34	1.55	1.79	2.10	2.60	3.05
Apr	.46	.66	.96	1.24	1.52	1.81	2.14	2.54	3.06	3.89	4.67
May	.82	1.08	1.48	1.82	2.15	2.50	2.88	3.33	3.91	4.81	5.66
Jun	.74	1.08	1.64	2.15	2.67	3.23	3.86	4.62	5.63	7.26	8.80
Jul	.95	1.32	1.90	2.42	2.93	3.47	4.08	4.80	5.74	7.24	8.65
Aug	1.10	1.39	1.81	2.15	2.48	2.82	3.19	3.62	4.17	5.02	5.80
Sep	.36	.55	.89	1.21	1.54	1.90	2.31	2.82	3.50	4.61	5.67
Oct	.13	.26	.53	.83	1.18	1.59	2.09	2.73	3.63	5.16	6.68
Nov	.06	.12	.25	.40	.58	.79	1.04	1.37	1.84	2.63	3.43
Dec	.02	.06	.13	.20	.27	.35	.45	.57	.74	1.01	1.28
Ann	14.50	16.34	18.76	20.66	22.37	24.07	25.84	27.83	30.29	33.92	37.13

\+ 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

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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	9.4	8.3	9	6	11.0	1996	18	29.5	1975	39	1997	18	33	1997	5.7	4.2	1.3	.4	.1	24.5	20.7	16.3	7.2
Feb	7.7	7.1	10	6	7.6	1991	18	16.5	1994	46	1994	13	37	1994	4.4	3.2	.9	.2	.0	20.6	16.6	13.7	5.3
Mar	8.8	7.8	5	3	13.0	1984	4	19.2	1985	36	1994	1	24	1997	3.6	3.0	1.2	.4	.1	13.2	9.2	7.0	2.3
Apr	2.5	1.5	1	#	10.0	1994	28	14.0	1995	14	1975	1	7	1975	1.1	.9	.2	.1	@	1.9	.9	.6	.3
May	.0	.0	#	0	.5	1976	2	.5	1976	#	1997	1	#	1997	@	.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	#	1991	18	#+	1991	#	1991	18	#	1991	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.6	.0	#	0	3.0	1995	23	5.0	1995	1	1976	18	#+	1981	.4	.3	@	.0	.0	.1	.0	.0	.0
Nov	6.2	5.0	2	1	9.0	1975	20	16.1	1985	17	1996	28	7	1996	3.4	2.7	.8	.4	.0	8.3	5.5	3.7	.9
Dec	6.1	4.6	5	4	6.5	1995	8	16.5	1993	24	1985	20	21	1985	4.1	3.1	.7	.2	.0	20.0	16.6	11.4	2.7
Ann	41.3	34.3	N/A	N/A	13.0	Mar 1984	4	29.5	Jan 1975	46	Feb 1994	13	37	Feb 1994	22.7	17.4	5.1	1.7	.2	88.6	69.5	52.7	18.7

+ 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	6/03	5/29	5/25	5/22	5/19	5/15	5/12	5/08	5/03
32	5/23	5/18	5/14	5/11	5/07	5/04	5/01	4/27	4/22
28	5/13	5/07	5/03	4/30	4/27	4/24	4/21	4/17	4/11
24	4/29	4/24	4/20	4/16	4/13	4/10	4/06	4/02	3/28
20	4/24	4/18	4/14	4/10	4/07	4/04	3/31	3/27	3/22
16	4/17	4/11	4/06	4/02	3/30	3/26	3/22	3/17	3/11

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	9/04	9/08	9/10	9/13	9/15	9/17	9/19	9/22	9/26
32	9/11	9/15	9/18	9/20	9/22	9/25	9/27	9/30	10/04
28	9/18	9/23	9/27	9/30	10/02	10/05	10/08	10/12	10/17
24	9/28	10/03	10/07	10/10	10/14	10/17	10/20	10/24	10/29
20	10/05	10/11	10/16	10/19	10/23	10/26	10/30	11/03	11/09
16	10/14	10/20	10/24	10/28	11/01	11/04	11/08	11/13	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	139	132	127	123	119	115	110	105	98
32	158	151	146	141	137	133	129	123	116
28	178	171	166	162	158	154	149	144	137
24	204	197	192	187	183	179	174	169	162
20	224	215	209	203	198	192	187	180	171
16	243	234	227	221	215	210	204	197	188

***** 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	1670	1301	1055	565	223	44	16	33	181	530	1039	1507	8164
60	1515	1161	900	426	131	12	2	8	89	379	889	1352	6864
57	1422	1077	807	349	89	4	0	2	51	295	799	1259	6154
55	1360	1021	745	301	66	2	0	1	33	243	739	1197	5708
50	1205	888	601	196	27	0	0	0	8	135	594	1042	4696
32	679	444	184	14	0	0	0	0	0	3	179	541	2044

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	32	68	152	442	853	1086	1246	1169	847	496	130	57	6578
55	0	0	1	40	206	398	533	457	190	24	0	0	1849
57	0	0	0	28	167	340	471	396	148	13	0	0	1563
60	0	0	0	15	116	258	379	309	96	5	0	0	1178
65	0	0	0	4	54	140	238	180	37	0	0	0	653
70	0	0	0	0	19	59	127	86	10	0	0	0	301

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	3	35	225	603	843	995	920	606	277	32	0	0	3	38	263	866	1709	2704	3624	4230	4507	4539	4539
45	0	0	12	130	450	693	840	765	458	167	12	0	0	0	12	142	592	1285	2125	2890	3348	3515	3527	3527
50	0	0	2	69	312	545	685	610	319	87	3	0	0	0	2	71	383	928	1613	2223	2542	2629	2632	2632
55	0	0	0	33	190	398	530	456	199	39	0	0	0	0	0	33	223	621	1151	1607	1806	1845	1845	1845
60	0	0	0	15	98	257	377	303	108	11	0	0	0	0	0	15	113	370	747	1050	1158	1169	1169	1169
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	26	155	377	544	659	598	388	184	28	0	0	1	27	182	559	1103	1762	2360	2748	2932	2960	2960

(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

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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