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: ITASCA UNIV OF MINNESOTA, MN **COOP ID: 214106**

Climate Division: MN 1 **NWS Call Sign:** **Elevation: 1,490 Feet** **Lat: 47˚13N** **Lon: 95˚12W**

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	14.7	-9.0	2.9	62	1942	23	16.0	1990	-51	1922	22	-10.4	1982	1927	0	.0	.0	.2	27.4	31.0	20.1
Feb	23.1	-2.6	10.3	63	1976	24	27.5	1998	-52+	1996	3	-1.5	1979	1535	0	.0	.0	.7	19.4	28.0	14.4
Mar	34.6	11.0	22.8	81	1946	28	32.1	2000	-44	1948	10	12.7	1996	1308	0	.0	.0	4.6	10.5	29.3	6.4
Apr	50.8	25.0	37.9	96	1980	21	45.8	1987	-17	1954	3	30.0	1975	814	0	.0	.1	17.9	1.0	22.6	.4
May	65.8	39.1	52.5	98+	1939	30	61.4	1977	11	1966	1	44.4	1979	406	17	.0	.2	29.0	.0	7.3	.0
Jun	74.0	49.4	61.7	98	1912	29	68.2	1988	24	1964	1	54.2	1982	155	55	.0	.9	30.0	.0	.3	.0
Jul	78.4	53.7	66.1	105+	1936	12	70.4	1989	32	1926	12	59.0	1992	68	100	@	2.6	31.0	.0	.0	.0
Aug	76.9	51.6	64.3	101+	1976	19	68.4	1983	26	1915	26	58.2	1977	104	82	@	1.7	31.0	.0	.0	.0
Sep	65.7	40.9	53.3	99	1931	8	58.9	1998	16	1965	26	48.4	1993	358	6	.0	.3	28.7	.0	4.1	.0
Oct	52.6	30.1	41.4	92	1963	5	47.0	1973	-14	1919	26	36.0	1976	733	0	.0	.0	19.6	.7	16.8	.0
Nov	33.0	15.3	24.2	74	1975	4	34.5	1999	-30	1964	30	15.0	1985	1225	0	.0	.0	3.7	14.0	28.0	2.7
Dec	19.2	-.5	9.4	59	1939	6	23.0	1997	-47	1917	29	-4.4	1983	1726	0	.0	.0	.1	25.5	31.0	14.6
Ann	49.1	25.3	37.2	105+	Jul 1936	12	70.4	Jul 1989	-52+	Feb 1996	3	-10.4	Jan 1982	10359	260	.0	5.8	196.5	98.5	198.4	58.6

\+ 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: 1912-2001

(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	.90	.89	2.25	1921	14	2.34	1975	.09	1973
Feb	.63	.55	1.14	1930	25	1.88	1979	.08	1988
Mar	1.34	1.30	2.91	1933	31	2.68	1990	.22	1986
Apr	1.74	1.64	2.88	1993	24	4.71	1986	.07	1980
May	2.81	2.29	2.98	1985	31	8.70	1985	.21	1980
Jun	4.30	4.13	5.42	1957	22	8.15	1986	.57	1987
Jul	3.92	3.53	4.61	1983	3	9.32	1993	1.41	1989
Aug	3.71	3.57	3.69	1984	8	9.90	1988	.53	1976
Sep	2.98	2.80	2.52	1971	4	7.06	1973	.46	1974
Oct	2.55	2.13	3.00	1924	11	6.67	1971	.27	1992
Nov	1.41	1.34	1.96	1977	9	4.24	2000	.00	1999
Dec	.75	.84	1.40	1927	14	1.57	1988	.04	1982
Ann	27.04	27.60	5.42	Jun 1957	22	9.90	Aug 1988	.00	Nov 1999

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	8.1	3.0	.4	.0
Feb	6.6	2.1	@	.0
Mar	7.7	3.6	.8	.1
Apr	7.8	4.3	1.0	.2
May	11.3	6.6	1.5	.4
Jun	12.6	7.6	2.5	1.1
Jul	11.4	7.0	2.4	1.0
Aug	10.7	6.6	2.1	.8
Sep	10.5	6.2	2.1	.6
Oct	9.5	4.8	1.6	.6
Nov	7.8	3.8	.7	.1
Dec	7.8	2.7	.1	.0
Ann	111.8	58.3	15.2	4.9

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	.16	.24	.37	.49	.62	.75	.91	1.10	1.36	1.76	2.16
Feb	.13	.19	.28	.37	.45	.54	.64	.76	.93	1.18	1.42
Mar	.40	.52	.71	.88	1.04	1.21	1.39	1.61	1.89	2.33	2.73
Apr	.25	.40	.65	.89	1.14	1.42	1.74	2.13	2.65	3.50	4.33
May	.52	.76	1.18	1.56	1.95	2.37	2.85	3.42	4.19	5.43	6.61
Jun	1.37	1.78	2.38	2.90	3.40	3.91	4.48	5.14	5.99	7.32	8.55
Jul	1.24	1.61	2.17	2.64	3.09	3.56	4.08	4.69	5.47	6.68	7.81
Aug	.83	1.17	1.71	2.20	2.69	3.21	3.80	4.50	5.42	6.89	8.27
Sep	.78	1.06	1.49	1.87	2.25	2.64	3.08	3.60	4.27	5.34	6.33
Oct	.31	.51	.87	1.23	1.61	2.02	2.51	3.11	3.93	5.28	6.58
Nov	.14	.31	.54	.75	.96	1.18	1.43	1.74	2.15	2.80	3.43
Dec	.15	.21	.32	.42	.53	.64	.76	.91	1.11	1.44	1.74
Ann	18.64	20.24	22.31	23.89	25.29	26.66	28.07	29.63	31.53	34.30	36.70

\+ 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: 1912-2001
(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	11.2	10.8	12	12	9.0	1996	18	22.3	1975	29	1996	29	23	1997	6.4	4.5	1.1	.5	.0	30.5	29.1	26.4	16.9
Feb	7.1	5.2	14	14	7.0	1977	24	22.1	1979	30	1979	28	25+	1997	4.5	3.1	.7	.2	.0	27.5	27.3	25.7	17.3
Mar	9.6	9.0	10	8	15.0	1985	4	23.0	1985	31	1997	5	25	1997	4.3	3.3	1.1	.4	.1	24.2	20.2	17.6	12.1
Apr	2.5	2.0	2	#	9.0	1998	1	10.0	1994	21	1996	4	13	1979	1.4	1.0	.3	.1	.0	5.3	3.3	2.3	1.4
May	.0	.0	#	0	1.0	1991	1	1.0+	1991	1	1991	1	#+	2000	@	@	.0	.0	.0	.1	.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	#	1995	22	#+	1995	#+	1995	22	#+	1995	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.9	.0	#	#	4.0	1990	18	4.0+	1990	4	1990	18	#+	1999	.6	.4	.1	.0	.0	.4	.1	.0	.0
Nov	8.6	6.0	2	2	11.0	1977	9	28.5	1977	19	1977	29	9	1977	4.2	3.1	1.2	.6	@	13.1	8.6	5.9	1.1
Dec	8.4	8.5	7	6	8.0	1988	27	15.0+	1988	20	1988	27	16	1977	5.6	3.9	.9	.2	.0	28.0	23.5	17.3	7.8
Ann	48.3	41.5	N/A	N/A	15.0	Mar 1985	4	28.5	Nov 1977	31	Mar 1997	5	25+	Mar 1997	27.0	19.3	5.4	2.0	.1	129.1	112.1	95.2	56.6

+ 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	6/17	6/12	6/09	6/07	6/04	6/02	5/30	5/27	5/22
32	6/05	6/01	5/29	5/26	5/23	5/21	5/18	5/15	5/10
28	5/24	5/19	5/15	5/13	5/10	5/07	5/04	5/01	4/26
24	5/11	5/07	5/04	5/01	4/29	4/27	4/25	4/22	4/18
20	5/02	4/27	4/23	4/20	4/17	4/14	4/11	4/07	4/02
16	4/19	4/15	4/13	4/11	4/09	4/07	4/04	4/02	3/29

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	8/20	8/26	8/31	9/04	9/08	9/11	9/15	9/20	9/26
32	9/09	9/13	9/15	9/18	9/20	9/22	9/24	9/27	10/01
28	9/17	9/21	9/24	9/27	9/30	10/02	10/05	10/08	10/12
24	9/27	10/03	10/07	10/11	10/14	10/17	10/21	10/25	10/30
20	10/08	10/13	10/17	10/20	10/23	10/26	10/30	11/02	11/08
16	10/17	10/23	10/27	10/30	11/02	11/06	11/09	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	118	110	104	99	95	90	85	79	71
32	139	132	127	123	119	115	111	106	99
28	159	153	149	145	142	139	135	131	125
24	186	179	175	171	167	163	159	155	148
20	210	203	198	193	189	184	180	174	167
16	226	220	215	211	207	203	199	194	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	1927	1535	1308	814	406	155	68	104	358	733	1225	1726	10359
60	1772	1395	1153	666	279	77	18	40	228	578	1075	1571	8852
57	1679	1311	1060	578	215	44	7	19	161	486	985	1478	8023
55	1617	1255	998	521	177	28	2	11	123	426	925	1416	7499
50	1462	1115	843	385	99	8	0	2	53	284	775	1261	6287
32	914	641	343	63	2	0	0	0	0	19	298	729	3009

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	9	31	58	238	636	890	1055	1000	638	309	62	26	4952
55	0	0	0	6	97	229	345	298	72	3	0	0	1050
57	0	0	0	4	73	184	287	244	50	1	0	0	843
60	0	0	0	1	45	127	205	172	26	0	0	0	576
65	0	0	0	0	17	55	100	82	6	0	0	0	260
70	0	0	0	0	5	17	33	26	1	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	10	123	450	688	854	793	459	174	13	0	0	0	10	133	583	1271	2125	2918	3377	3551	3564	3564
45	0	0	0	64	313	538	699	638	318	90	5	0	0	0	0	64	377	915	1614	2252	2570	2660	2665	2665
50	0	0	0	27	194	392	544	483	199	40	0	0	0	0	0	27	221	613	1157	1640	1839	1879	1879	1879
55	0	0	0	11	107	253	391	332	105	13	0	0	0	0	0	11	118	371	762	1094	1199	1212	1212	1212
60	0	0	0	1	49	143	243	200	48	2	0	0	0	0	0	1	50	193	436	636	684	686	686	686
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	11	110	305	432	548	505	285	117	12	0	0	0	11	121	426	858	1406	1911	2196	2313	2325	2325

(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