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: ARGYLE 4 E, MN **COOP ID: 210252**

Climate Division: MN 1 **NWS Call Sign:** **Elevation: 870 Feet** **Lat: 48˚20N** **Lon: 96˚44W**

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	13.3	-8.1	2.6	45	1990	11	15.0	1990	-43	1996	20	-10.3	1979	1935	0	.0	.0	.0	28.3	31.0	21.5
Feb	21.3	-1.0	10.2	62	1958	26	26.0	1998	-48+	1996	3	-5.2	1979	1537	0	.0	.0	.1	21.9	28.0	15.7
Mar	34.0	13.4	23.7	71+	1967	31	35.7	1973	-38+	1972	3	11.7	1996	1280	0	.0	.0	2.5	13.1	29.4	6.7
Apr	53.5	28.4	41.0	98	1980	22	50.1	1987	-18	1979	6	31.5	1996	725	2	.0	.1	17.4	1.6	20.4	.6
May	69.8	40.8	55.3	98	1987	16	66.2	1977	18+	1967	2	47.6	1979	335	34	.0	1.1	29.2	.0	6.7	.0
Jun	77.0	50.3	63.7	100	1995	18	72.6	1988	26	1964	1	56.4	1982	128	87	@	1.7	30.0	.0	@	.0
Jul	81.3	54.1	67.7	105	1988	6	72.0+	1989	37+	2001	2	60.4	1992	52	136	.1	2.9	31.0	.0	.0	.0
Aug	80.8	51.6	66.2	104	1983	8	71.0	1983	30+	1982	28	60.6	1977	83	120	.4	3.8	31.0	.0	.1	.0
Sep	69.6	41.9	55.8	100	1983	3	60.9	1978	19	1974	22	51.4	1993	288	10	@	.9	29.0	.0	4.0	.0
Oct	55.7	31.0	43.4	92	1992	2	49.9	1973	4	1976	23	38.4	1991	671	0	.0	@	20.9	.5	17.1	.0
Nov	34.3	15.7	25.0	75	1999	1	35.3	1981	-34	1985	28	13.8	1985	1201	0	.0	.0	3.4	14.3	28.5	3.5
Dec	19.3	.0	9.7	54	1982	3	23.9	1997	-36+	1967	31	-1.6	1983	1716	0	.0	.0	.1	25.5	31.0	15.8
Ann	50.8	26.5	38.7	105	Jul 1988	6	72.6	Jun 1988	-48+	Feb 1996	3	-10.3	Jan 1979	9951	389	.5	10.5	194.6	105.2	196.2	63.8

\+ 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: 1890-2001

(3) Derived from 1971-2000 serially complete daily data

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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	.76	.75	.70	1956	28	1.96	1989	.04	1973
Feb	.59	.58	.97	2000	26	1.56	1987	.00	1993
Mar	.86	.78	1.45	1950	27	2.13	1979	.12	1998
Apr	1.11	.91	1.38	1974	21	3.94	1979	.00+	1988
May	2.16	2.03	3.06	1996	18	5.25	1996	.22	1980
Jun	3.23	3.00	2.70	1963	9	7.52	1998	.93	1988
Jul	3.01	2.69	4.72	1975	2	6.23	1994	.71	1989
Aug	2.56	2.30	4.69	1951	31	7.07	1985	.59	1988
Sep	2.28	2.27	2.73	1957	2	5.18	1981	.33	1998
Oct	1.58	1.30	1.97	1997	9	4.62	1998	.15	1999
Nov	1.02	.85	1.43	1998	19	3.24	1977	.00+	1999
Dec	.63	.54	.63	1972	31	1.76	1996	.00	1979
Ann	19.79	20.59	4.72	Jul 1975	2	7.52	Jun 1998	.00+	Nov 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.6	2.6	.0	.0
Feb	4.9	2.0	.1	.0
Mar	4.8	2.9	.2	@
Apr	4.5	2.8	.5	.2
May	7.2	4.8	1.2	.4
Jun	9.3	6.8	2.0	.6
Jul	8.9	6.3	1.6	.6
Aug	8.0	5.4	1.3	.4
Sep	7.4	4.8	1.4	.5
Oct	5.6	3.9	.8	.3
Nov	5.4	3.1	.4	.1
Dec	5.6	2.2	@	.0
Ann	78.2	47.6	9.5	3.1

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	.14	.21	.32	.43	.53	.64	.77	.93	1.13	1.47	1.78
Feb	.08	.16	.26	.34	.42	.51	.61	.73	.88	1.13	1.36
Mar	.15	.22	.35	.47	.59	.72	.87	1.05	1.29	1.67	2.04
Apr	.00	.00	.30	.49	.68	.89	1.12	1.41	1.78	2.40	2.99
May	.46	.66	.98	1.26	1.55	1.86	2.21	2.63	3.18	4.05	4.89
Jun	1.06	1.37	1.82	2.20	2.57	2.95	3.37	3.85	4.48	5.45	6.35
Jul	.76	1.04	1.48	1.87	2.25	2.66	3.11	3.64	4.35	5.45	6.49
Aug	.55	.79	1.16	1.50	1.84	2.21	2.62	3.11	3.76	4.79	5.77
Sep	.35	.55	.88	1.19	1.52	1.88	2.29	2.79	3.46	4.56	5.61
Oct	.13	.23	.44	.65	.90	1.17	1.50	1.92	2.50	3.47	4.43
Nov	.00	.00	.35	.53	.70	.88	1.07	1.30	1.60	2.07	2.53
Dec	.04	.11	.21	.30	.40	.51	.63	.78	.98	1.31	1.63
Ann	13.51	14.71	16.25	17.43	18.49	19.51	20.57	21.75	23.18	25.26	27.07

\+ 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: 1890-2001
(3) Derived from 1971-2000 serially complete daily data

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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	10.0	8.8	8	6
Feb	6.2	5.0	8	7
Mar	5.9	4.6	6	5
Apr	1.5	.9	2	#
May	.1	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.1	.0	#	0
Oct	.8	.0	#	#
Nov	7.3	6.4	1	1
Dec	7.1	6.4	4	3
Ann	39.0	32.1	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	11.1	1989	7	33.3	1989	31	1997	31	25	1997
Feb	8.3	1976	29	15.5	1987	31	1997	16	27	1997
Mar	7.2	1997	4	16.6	1979	32	1997	4	25	1997
Apr	4.2	1997	6	7.3	1992	18	1979	8	12	1996
May	1.3	1983	15	1.3	1983	1	1983	15	#+	1991
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	1.7	1972	26	1.7	1972	1	1972	26	#+	1984
Oct	4.4	1991	24	5.9	1991	4	1992	14	#+	2000
Nov	11.3	1998	19	19.2	1977	13	1998	20	5	1996
Dec	5.6	1972	31	19.6	1996	22	1996	31	13	1995
Ann	11.3	Nov 1998	19	33.3	Jan 1989	32	Mar 1997	4	27	Feb 1997

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	7.1	3.4	1.0	.1	@
Feb	5.1	2.1	.5	.1	.0
Mar	3.6	2.0	.6	.2	.0
Apr	1.1	.7	.1	.0	.0
May	.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
Oct	.5	.3	.1	.0	.0
Nov	4.4	2.7	.7	.2	@
Dec	5.8	3.0	.6	@	.0
Ann	27.7	14.2	3.6	.6	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	26.0	22.1	16.5	5.6
Feb	22.2	19.4	17.1	7.7
Mar	14.7	11.9	9.6	4.2
Apr	2.3	1.8	1.4	.6
May	@	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	@	.0	.0	.0
Oct	.4	.1	.0	.0
Nov	9.7	4.9	2.3	.6
Dec	19.4	12.6	7.6	2.3
Ann	94.7	72.8	54.5	21.0

+ 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	6/13	6/08	6/04	6/01	5/29	5/26	5/23	5/19	5/14
32	5/26	5/23	5/20	5/18	5/15	5/13	5/11	5/08	5/05
28	5/20	5/15	5/12	5/09	5/06	5/03	4/30	4/27	4/22
24	5/10	5/05	4/30	4/27	4/23	4/20	4/17	4/12	4/07
20	5/02	4/26	4/22	4/18	4/14	4/11	4/07	4/02	3/27
16	4/17	4/13	4/09	4/06	4/04	4/01	3/29	3/25	3/21

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	8/24	8/29	9/02	9/06	9/09	9/12	9/15	9/19	9/25
32	9/06	9/11	9/15	9/18	9/21	9/23	9/27	9/30	10/05
28	9/19	9/23	9/27	9/29	10/02	10/04	10/07	10/10	10/14
24	9/24	9/29	10/03	10/07	10/10	10/13	10/16	10/20	10/26
20	10/01	10/07	10/12	10/16	10/19	10/23	10/27	10/31	11/06
16	10/13	10/19	10/23	10/26	10/30	11/02	11/06	11/10	11/16

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	128	119	113	107	102	97	92	85	76
32	147	141	136	131	127	124	119	114	107
28	166	160	155	152	148	144	141	136	130
24	195	186	179	174	169	164	158	152	143
20	216	206	199	193	187	182	176	169	159
16	232	224	218	213	208	204	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	1935	1537	1280	725	335	128	52	83	288	671	1201	1716	9951
60	1780	1397	1125	581	224	59	14	30	166	516	1051	1561	8504
57	1687	1313	1032	500	169	33	6	14	106	425	961	1468	7714
55	1625	1257	971	447	137	21	1	8	75	366	901	1406	7215
50	1470	1117	822	327	73	6	0	0	23	233	752	1251	6074
32	926	646	356	59	2	0	0	0	0	15	297	721	3022

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	14	33	98	327	724	949	1107	1060	712	368	86	29	5507
55	0	0	1	25	146	280	395	355	96	5	0	0	1303
57	0	0	0	18	116	232	338	299	68	2	0	0	1073
60	0	0	0	9	78	169	253	222	37	0	0	0	768
65	0	0	0	2	34	87	136	120	10	0	0	0	389
70	0	0	0	0	13	32	57	51	2	0	0	0	155

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	9	139	481	716	866	819	479	172	13	0	0	0	9	148	629	1345	2211	3030	3509	3681	3694	3694
45	0	0	0	73	346	566	711	664	336	90	4	0	0	0	0	73	419	985	1696	2360	2696	2786	2790	2790
50	0	0	0	32	224	416	556	509	217	42	1	0	0	0	0	32	256	672	1228	1737	1954	1996	1997	1997
55	0	0	0	14	131	278	402	355	119	12	0	0	0	0	0	14	145	423	825	1180	1299	1311	1311	1311
60	0	0	0	4	64	153	253	215	55	2	0	0	0	0	0	4	68	221	474	689	744	746	746	746
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	3	106	319	446	557	522	307	123	10	0	0	0	3	109	428	874	1431	1953	2260	2383	2393	2393

(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