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: LITCHFIELD, MN **COOP ID: 214778**

Climate Division: MN 5 **NWS Call Sign:** **Elevation: 1,132 Feet** **Lat: 45˚08N** **Lon: 94˚32W**

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	18.6	-1.1	8.8	60	1981	24	24.2	1990	-37	1977	9	-5.5	1977	1746	0	.0	.0	.2	24.2	30.9	14.7
Feb	25.7	6.6	16.2	58	1990	12	29.2	1987	-37	1996	2	4.9	1979	1368	0	.0	.0	.9	16.4	27.6	9.0
Mar	37.4	19.0	28.2	81	1968	30	38.4	2000	-32	1962	1	18.5	1975	1140	0	.0	.0	6.2	7.2	26.0	2.6
Apr	54.6	33.6	44.1	93	1980	21	52.5	1987	-1	1975	1	34.8	1975	630	2	.0	.1	22.1	.4	13.1	@
May	68.7	46.7	57.7	97+	2001	15	65.2	1988	19	1967	3	51.3	1997	270	44	.0	.7	30.5	.0	1.7	.0
Jun	77.7	56.1	66.9	101+	1988	25	74.5	1988	30	2000	5	61.8	1982	67	125	.1	3.3	30.0	.0	@	.0
Jul	81.8	60.6	71.2	104	1988	31	76.5	1988	41	1967	4	64.4	1992	19	212	.2	5.5	31.0	.0	.0	.0
Aug	79.0	58.2	68.6	104	1988	1	74.1	1983	38	1964	14	64.3	1977	39	152	@	3.5	31.0	.0	.0	.0
Sep	70.0	47.9	59.0	98	1978	7	64.9	1998	23	1965	26	53.7	1984	206	25	.0	.8	29.7	.0	1.1	.0
Oct	57.5	35.5	46.5	90	1953	2	51.6	1973	11	1976	27	39.7	1976	573	0	.0	.0	24.9	.2	9.3	.0
Nov	37.7	21.3	29.5	78	1999	9	39.8	1999	-17	1964	30	20.8	1985	1065	0	.0	.0	6.1	9.2	25.4	1.5
Dec	22.9	5.8	14.4	62	1998	2	24.5	1997	-34	1983	19	-.6	1983	1570	0	.0	.0	.4	21.8	30.9	9.7
Ann	52.6	32.5	42.6	104+	Aug 1988	1	76.5	Jul 1988	-37+	Feb 1996	2	-5.5	Jan 1977	8693	560	.3	13.9	213.0	79.4	166.0	37.5

\+ 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

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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	.79	.64	1.15	1997	6	2.24	1975	.00	1974
Feb	.67	.55	1.50	1975	18	2.28	1975	.00	1987
Mar	1.55	1.40	1.65	1981	29	4.15	1977	.25	1971
Apr	2.35	1.71	1.75	1977	15	5.48	1986	.23	1987
May	3.37	3.44	3.28	1950	5	5.89	1998	1.15	1976
Jun	4.89	5.03	6.08	1957	17	9.28	1984	.39	1988
Jul	4.02	3.76	4.06	1955	8	9.84	1986	.57	1975
Aug	3.67	3.37	6.00	1960	28	7.00	1993	.20	1976
Sep	2.92	2.60	3.42	1991	8	8.18	1991	.81	1998
Oct	2.15	1.98	3.28	1983	11	5.38	1983	.07	1978
Nov	1.50	1.11	1.73	1977	9	3.92	1977	.05	1980
Dec	.68	.54	1.31	1984	16	1.82	1982	.05	1986
Ann	28.56	29.69	6.08	Jun 1957	17	9.84	Jul 1986	.00+	Feb 1987

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.7	2.6	.2	@
Feb	4.4	2.1	.3	.1
Mar	5.9	3.5	1.1	.1
Apr	7.5	4.9	1.4	.4
May	9.4	6.6	2.3	.7
Jun	9.7	7.4	3.1	1.3
Jul	9.3	6.5	2.8	1.3
Aug	8.5	6.1	2.5	.8
Sep	7.5	5.2	1.7	.7
Oct	5.9	4.0	1.4	.5
Nov	5.8	3.6	.9	.3
Dec	4.9	2.3	.1	.1
Ann	84.5	54.8	17.8	6.3

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	.07	.16	.28	.40	.52	.65	.79	.97	1.21	1.60	1.97
Feb	.03	.09	.18	.28	.39	.51	.65	.82	1.06	1.46	1.85
Mar	.39	.54	.77	.97	1.16	1.37	1.60	1.88	2.24	2.81	3.34
Apr	.42	.62	.97	1.29	1.61	1.97	2.37	2.86	3.51	4.56	5.57
May	1.25	1.56	2.01	2.39	2.75	3.12	3.52	3.99	4.58	5.49	6.32
Jun	1.34	1.80	2.51	3.12	3.73	4.36	5.06	5.89	6.97	8.67	10.26
Jul	1.23	1.61	2.18	2.67	3.14	3.63	4.18	4.81	5.63	6.91	8.10
Aug	1.20	1.55	2.06	2.50	2.92	3.35	3.83	4.38	5.10	6.21	7.23
Sep	.73	1.00	1.43	1.80	2.18	2.57	3.01	3.53	4.21	5.28	6.29
Oct	.23	.39	.69	.99	1.31	1.67	2.10	2.62	3.34	4.54	5.70
Nov	.12	.22	.42	.63	.86	1.12	1.43	1.82	2.37	3.28	4.17
Dec	.10	.16	.26	.35	.45	.56	.68	.83	1.03	1.36	1.68
Ann	18.29	20.20	22.68	24.60	26.32	28.00	29.74	31.69	34.08	37.58	40.65

\+ 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)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	8.9	6.9	10	9
Feb	6.6	5.1	10	9
Mar	8.5	9.0	5	3
Apr	2.3	.8	#	0
May	#	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.2	.0	0	0
Nov	9.3	8.2	1	#
Dec	6.9	5.8	5	2
Ann	42.7	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	8.0	1976	2	21.5	1994	36	1982	25	20	1982
Feb	8.0	1971	27	17.0	1971	28	1982	3	23	1975
Mar	12.0	1985	3	18.1	1989	23	1979	7	14	1979
Apr	10.0	1985	1	10.0	1985	9	1975	2	2	1975
May	#	1979	6	#	1979	0	0	0	0	0
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	.0	0	0	.0	0	0	0	0	0	0
Oct	3.0	1992	16	3.0	1992	0	0	0	0	0
Nov	18.0	1991	1	26.0	1991	18	1983	30	4	1975
Dec	12.0	1982	28	18.2	1981	25	1985	2	21	1983
Ann	18.0	Nov 1991	1	26.0	Nov 1991	36	Jan 1982	25	23	Feb 1975

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	4.7	3.5	1.1	.3	.0
Feb	3.3	2.4	.9	.3	.0
Mar	3.2	2.6	1.2	.4	.1
Apr	.8	.6	.3	.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	.1	.1	@	.0	.0
Nov	3.1	2.5	1.2	.6	.1
Dec	4.0	2.8	.8	.2	@
Ann	19.2	14.5	5.5	1.9	.2

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	-9.9	-9.9	-9.9	-9.9
Mar	-9.9	-9.9	-9.9	-9.9
Apr	1.7	.7	.3	.0
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	.0	.0	.0	.0
Nov	5.6	4.8	3.3	1.5
Dec	-9.9	-9.9	-9.9	-9.9
Ann	-9.9	-9.9	-9.9	-9.9

+ 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	5/31	5/26	5/23	5/20	5/17	5/15	5/12	5/08	5/04
32	5/20	5/14	5/10	5/07	5/04	5/01	4/28	4/24	4/18
28	5/05	4/30	4/27	4/24	4/21	4/18	4/15	4/11	4/06
24	4/19	4/15	4/12	4/10	4/08	4/06	4/03	4/01	3/28
20	4/14	4/10	4/07	4/05	4/02	3/31	3/29	3/26	3/22
16	4/10	4/05	4/01	3/29	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	9/11	9/15	9/18	9/20	9/22	9/24	9/27	9/30	10/03
32	9/17	9/21	9/25	9/27	9/30	10/03	10/06	10/09	10/14
28	9/20	9/27	10/01	10/05	10/08	10/12	10/16	10/20	10/27
24	10/05	10/11	10/15	10/18	10/22	10/25	10/28	11/01	11/07
20	10/17	10/23	10/27	10/30	11/03	11/06	11/09	11/13	11/19
16	10/25	10/30	11/02	11/05	11/08	11/11	11/14	11/17	11/22

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	146	139	135	131	127	123	120	115	109
32	170	162	157	153	148	144	140	135	127
28	197	188	181	175	170	165	159	152	143
24	216	209	204	200	196	192	188	183	177
20	234	227	222	217	213	209	205	200	193
16	249	241	235	230	226	221	217	211	203

***** 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)

Base — Heating Degree Days (1)

Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1746	1368	1140	630	270	67	19	39	206	573	1065	1570	8693
60	1591	1228	985	487	169	22	4	9	105	420	915	1415	7350
57	1498	1144	892	407	121	10	0	3	61	332	825	1322	6615
55	1436	1088	831	356	93	5	0	1	40	278	765	1260	6153
50	1281	948	683	242	43	1	0	0	10	162	619	1105	5094
32	750	488	241	24	0	0	0	0	0	5	193	582	2283

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	27	43	124	386	796	1048	1215	1136	809	455	118	35	6192
55	0	0	0	28	177	364	502	424	159	15	0	0	1669
57	0	0	0	18	142	308	440	363	120	8	0	0	1399
60	0	0	0	9	97	231	352	277	73	2	0	0	1041
65	0	0	0	2	44	125	212	152	25	0	0	0	560
70	0	0	0	0	16	52	107	66	5	0	0	0	246

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	1	35	232	608	856	1011	933	627	299	41	1	0	1	36	268	876	1732	2743	3676	4303	4602	4643	4644
45	0	0	14	142	457	706	856	778	479	185	15	0	0	0	14	156	613	1319	2175	2953	3432	3617	3632	3632
50	0	0	4	72	316	556	701	623	338	101	4	0	0	0	4	76	392	948	1649	2272	2610	2711	2715	2715
55	0	0	0	35	197	408	546	468	211	44	1	0	0	0	0	35	232	640	1186	1654	1865	1909	1910	1910
60	0	0	0	13	106	269	391	319	116	14	0	0	0	0	0	13	119	388	779	1098	1214	1228	1228	1228
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	26	153	377	550	678	617	387	180	25	0	0	0	26	179	556	1106	1784	2401	2788	2968	2993	2993

(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