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: PINE RIVER DAM, MN **COOP ID: 216547**

Climate Division: MN 6 **NWS Call Sign:** **Elevation: 1,250 Feet** **Lat: 46˚40N** **Lon: 94˚07W**

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	17.3	-5.5	5.9	57+	1981	24	16.6	1990	-53	1912	12	-5.9	1982	1833	0	.0	.0	.2	26.5	31.0	18.7
Feb	25.6	2.3	14.0	59	1907	9	28.5	1998	-51	1907	4	.7	1989	1430	0	.0	.0	.6	17.6	28.0	12.2
Mar	37.1	15.7	26.4	82	1910	23	34.5	1973	-41+	1962	1	16.2	1996	1197	0	.0	.0	5.4	8.4	29.2	4.8
Apr	52.8	29.2	41.0	96	1980	21	49.0	1987	-8	1954	3	33.8	1975	720	0	.0	.1	20.2	.6	20.2	.3
May	66.6	42.8	54.7	103	1934	31	63.7	1977	4+	1909	2	48.3	1997	342	23	.0	.4	29.9	.0	4.0	.0
Jun	75.1	52.3	63.7	100	1921	30	68.9	1988	24	1925	30	59.2	1982	106	68	.0	1.5	30.0	.0	@	.0
Jul	79.5	57.4	68.5	104	1917	28	73.0	1983	32	1925	23	60.9	1992	41	148	.1	4.1	31.0	.0	.0	.0
Aug	77.2	55.0	66.1	101	1976	18	72.7	1983	29+	1934	28	60.2	1977	78	113	.1	1.9	31.0	.0	@	.0
Sep	67.0	45.4	56.2	99	1931	10	62.3	1998	17	1934	21	50.5	1993	276	12	.0	.4	29.5	.0	2.0	.0
Oct	54.7	33.8	44.3	88	1953	2	50.4	1973	0	1925	30	39.2	1988	643	0	.0	.0	23.0	.2	13.7	.0
Nov	36.1	19.7	27.9	76+	1975	4	37.2	1999	-26	1905	30	19.0	1985	1112	0	.0	.0	5.2	10.7	27.5	1.8
Dec	21.5	3.0	12.3	66	1919	24	23.9	1997	-47	1933	25	-.9	1983	1635	0	.0	.0	.2	23.8	30.8	12.7
Ann	50.9	29.3	40.1	104	Jul 1917	28	73.0	Jul 1983	-53	Jan 1912	12	-5.9	Jan 1982	9413	364	.2	8.4	206.2	87.8	186.4	50.5

\+ 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: 1901-2001

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

Issue Date: February 2004

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Precipitation (inches)

Precipitation Totals

Means/Medians(1)

Month	Mean	Median
Jan	1.04	.83
Feb	.69	.57
Mar	1.66	1.49
Apr	2.06	2.19
May	3.29	2.99
Jun	4.23	3.92
Jul	4.28	3.51
Aug	3.57	3.37
Sep	2.83	2.70
Oct	2.66	2.05
Nov	1.79	1.56
Dec	.77	.80
Ann	28.87	28.55

Extremes

Month	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year
Jan	1.75	1975	11	4.09	1975	.19	1981
Feb	1.80	2001	26	1.94	1979	.03	1988
Mar	2.20	1985	4	3.24	1979	.67	1984
Apr	2.00	2001	7	5.80	1986	.06	1987
May	4.45	1902	20	7.26	1999	.58	1976
Jun	3.34	1997	29	7.95	1998	.90	1987
Jul	5.01	1972	28	12.35	1972	1.10	1989
Aug	2.81	1944	8	6.88	1972	.73	1976
Sep	3.38	1941	14	6.95	1986	.31	1974
Oct	4.50	1903	3	7.70	1984	.36	1992
Nov	2.75	1988	27	5.65	1988	.25	1999
Dec	.97	1902	16	1.31	1996	.15	1989
Ann	5.01	Jul 1972	28	12.35	Jul 1972	.03	Feb 1988

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	8.7	3.1	.3	@
Feb	6.5	1.9	.2	.0
Mar	7.9	4.4	1.0	.1
Apr	8.2	5.2	1.3	.1
May	11.2	6.8	2.1	.8
Jun	12.5	8.1	2.8	1.0
Jul	11.1	7.1	2.9	1.0
Aug	10.4	6.5	2.3	.8
Sep	10.8	5.5	2.0	.5
Oct	9.5	4.8	1.6	.7
Nov	8.4	4.3	.9	.2
Dec	7.6	2.5	.3	.0
Ann	112.8	60.2	17.7	5.2

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	.21	.30	.45	.59	.74	.89	1.06	1.27	1.54	1.98	2.40
Feb	.07	.12	.21	.31	.41	.53	.66	.84	1.07	1.46	1.84
Mar	.63	.78	1.01	1.19	1.36	1.54	1.74	1.96	2.25	2.68	3.08
Apr	.39	.57	.87	1.15	1.43	1.74	2.09	2.51	3.06	3.96	4.81
May	.98	1.30	1.76	2.17	2.56	2.97	3.42	3.94	4.63	5.70	6.69
Jun	1.74	2.13	2.67	3.12	3.55	3.97	4.44	4.97	5.65	6.68	7.62
Jul	1.37	1.78	2.38	2.89	3.39	3.90	4.46	5.11	5.96	7.27	8.49
Aug	1.08	1.42	1.93	2.37	2.79	3.23	3.71	4.28	5.02	6.17	7.24
Sep	.73	1.00	1.41	1.77	2.13	2.51	2.93	3.42	4.07	5.09	6.05
Oct	.35	.56	.94	1.31	1.70	2.14	2.64	3.25	4.09	5.45	6.77
Nov	.33	.49	.75	1.00	1.24	1.51	1.82	2.18	2.67	3.46	4.21
Dec	.21	.28	.40	.49	.59	.69	.80	.93	1.10	1.37	1.62
Ann	20.15	21.83	23.98	25.62	27.08	28.50	29.96	31.58	33.55	36.41	38.89

\+ 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: 1901-2001
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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	13.0	11.6	11	11
Feb	7.3	5.7	13	13
Mar	7.6	7.1	9	7
Apr	2.9	1.3	1	#
May	.3	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	#	.0	0	0
Oct	.5	.0	#	0
Nov	5.0	4.0	2	1
Dec	7.7	7.8	6	5
Ann	44.3	37.5	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	17.0	1975	11	29.9	1975	27	1997	24	27	1997
Feb	9.0	1971	27	22.9	1979	29+	1979	24	27	1975
Mar	15.0	1985	4	22.4	1975	31	1975	28	24	1975
Apr	7.0	1974	1	14.1	1971	16	1979	12	15	1974
May	6.0	1971	19	6.8	1971	2	1971	19	#+	1979
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	#	1972	29	#	1972	0	0	0	0	0
Oct	3.0	1971	28	4.5+	1976	3	1981	26	#+	1983
Nov	7.0	1993	5	11.5	1975	14	1988	28	6	1991
Dec	11.0	1985	1	12.4	1974	17	1985	2	14	1988
Ann	17.0	Jan 1975	11	29.9	Jan 1975	31	Mar 1975	28	27+	Jan 1997

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	5.3	3.7	1.4	.5	.1
Feb	4.1	2.3	.7	.2	.0
Mar	4.0	2.5	.8	.4	@
Apr	1.0	.7	.4	.2	.0
May	.2	.1	@	@	.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	.4	.2	@	.0	.0
Nov	3.1	2.3	.7	.3	.0
Dec	5.4	2.7	.7	.2	@
Ann	23.5	14.5	4.7	1.8	.1

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	1.8	1.4	1.1	.1
May	.1	.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	-9.9	-9.9	-9.9	-9.9
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	6/12	6/06	6/02	5/30	5/26	5/23	5/20	5/16	5/10
32	5/27	5/22	5/19	5/16	5/14	5/11	5/09	5/05	5/01
28	5/16	5/12	5/09	5/06	5/03	5/01	4/28	4/24	4/20
24	5/08	5/03	4/29	4/26	4/22	4/19	4/16	4/12	4/06
20	4/21	4/18	4/15	4/13	4/11	4/09	4/06	4/04	3/31
16	4/18	4/14	4/10	4/08	4/05	4/02	3/30	3/27	3/22

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	8/29	9/03	9/07	9/10	9/13	9/16	9/19	9/23	9/28
32	9/09	9/14	9/18	9/20	9/23	9/26	9/29	10/02	10/07
28	9/19	9/24	9/27	9/30	10/03	10/05	10/08	10/11	10/16
24	9/30	10/05	10/10	10/13	10/17	10/20	10/24	10/28	11/03
20	10/11	10/17	10/21	10/25	10/28	10/31	11/04	11/08	11/14
16	10/18	10/24	10/29	11/02	11/05	11/09	11/13	11/18	11/24

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	130	123	118	113	109	105	100	95	87
32	149	143	139	135	132	128	124	120	114
28	173	165	160	156	152	148	143	138	131
24	204	195	188	182	177	171	165	159	149
20	220	213	208	204	199	195	191	186	179
16	240	231	224	219	214	209	203	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	1833	1430	1197	720	342	106	41	78	276	643	1112	1635	9413
60	1678	1290	1042	574	225	41	10	26	158	489	962	1480	7975
57	1585	1206	949	489	167	19	4	12	103	399	872	1387	7192
55	1523	1150	887	434	134	11	0	6	73	341	812	1325	6696
50	1368	1010	732	308	69	2	0	0	24	213	664	1170	5560
32	819	542	254	37	1	0	0	0	0	10	223	642	2528

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	9	35	80	308	704	952	1130	1058	726	389	101	31	5523
55	0	0	0	14	124	273	417	350	109	8	0	0	1295
57	0	0	0	9	95	222	358	294	79	4	0	0	1061
60	0	0	0	4	60	153	272	216	45	1	0	0	751
65	0	0	0	0	23	68	148	113	12	0	0	0	364
70	0	0	0	0	7	20	65	45	2	0	0	0	139

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	16	152	510	750	920	843	524	220	21	0	0	0	16	168	678	1428	2348	3191	3715	3935	3956	3956
45	0	0	3	78	366	600	765	688	382	118	7	0	0	0	3	81	447	1047	1812	2500	2882	3000	3007	3007
50	0	0	0	36	236	450	610	533	248	51	0	0	0	0	0	36	272	722	1332	1865	2113	2164	2164	2164
55	0	0	0	12	133	306	456	380	139	17	0	0	0	0	0	12	145	451	907	1287	1426	1443	1443	1443
60	0	0	0	3	67	178	307	234	64	2	0	0	0	0	0	3	70	248	555	789	853	855	855	855
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	13	126	329	477	600	543	319	142	14	0	0	0	13	139	468	945	1545	2088	2407	2549	2563	2563

(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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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