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: PRESTON, MN **COOP ID: 216654**

Climate Division: MN 9 **NWS Call Sign:** **Elevation: 930 Feet** **Lat: 43˚40N** **Lon: 92˚04W**

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	23.3	2.1	12.7	55+	1981	25	26.0	1990	-39+	1996	31	-.1	1977	1621	0	.0	.0	.2	22.3	30.8	13.1
Feb	29.9	8.4	19.2	65	1981	17	31.0	1998	-45	1996	3	7.4	1978	1284	0	.0	.0	1.4	15.0	27.1	8.3
Mar	41.6	21.4	31.5	82	1986	30	39.7	1973	-35	1962	1	22.3	1975	1039	0	.0	.0	7.7	5.5	25.4	2.1
Apr	56.7	33.2	45.0	91+	1980	22	52.6	1977	-8	1982	6	39.3	1975	602	0	.0	.1	21.9	.4	14.1	@
May	69.1	44.3	56.7	91+	1998	29	64.4	1977	18	1966	10	50.8	1997	285	27	.0	.3	30.4	.0	3.9	.0
Jun	78.9	53.8	66.4	100+	1988	22	71.2	1991	31+	1987	5	59.5	1982	60	100	.1	2.2	30.0	.0	.1	.0
Jul	82.5	58.3	70.4	101+	1995	14	74.1	1999	35	1988	1	65.1	1992	17	184	@	4.9	31.0	.0	.0	.0
Aug	80.4	56.0	68.2	101	1964	2	74.3	1995	30	1967	31	63.7	1985	48	146	.1	2.5	31.0	.0	@	.0
Sep	72.3	46.8	59.6	98	1955	9	64.7	1978	19	1967	29	54.3	1993	190	27	.0	.8	29.7	.0	2.3	.0
Oct	60.5	35.4	48.0	92+	1997	4	54.4	1971	8	1988	30	42.7	1976	529	0	.0	.1	26.6	.1	12.4	.0
Nov	42.2	22.7	32.5	76	1999	9	40.2	1999	-19	1977	26	24.6	1985	977	0	.0	.0	8.7	5.9	24.4	1.1
Dec	28.0	9.0	18.5	63+	2001	6	26.6	1987	-35	1983	19	5.2	1983	1443	0	.0	.0	.6	18.5	30.4	8.3
Ann	55.5	32.6	44.1	101+	Jul 1995	14	74.3	Aug 1995	-45	Feb 1996	3	-.1	Jan 1977	8095	484	.2	10.9	219.2	67.7	170.9	32.9

\+ 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: 1952-2001

(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	1.01	1.02	1.76	1988	20	3.10	1996	.00	1986
Feb	.86	.76	1.15	1981	22	3.07	1971	.00	1986
Mar	1.93	2.01	1.52	1992	9	3.99	1976	.11	1994
Apr	3.24	3.52	2.12	1975	28	7.54	1999	.87	2000
May	3.92	3.85	5.63	1980	30	8.72	1982	.88	1985
Jun	4.59	4.17	4.23	2000	1	11.85	2000	.80	1988
Jul	4.70	4.03	7.30	1981	11	12.42	1999	.68	1996
Aug	4.70	4.18	4.70	1983	25	11.14	1980	1.61	1971
Sep	3.57	2.73	4.76	1983	20	8.17	1985	.43	1975
Oct	2.34	2.28	2.96	1982	20	4.97	1982	.14	1975
Nov	2.14	1.63	3.00	1991	1	6.71	1991	.10	1976
Dec	1.29	1.21	1.72	1982	28	3.97	1982	.23	1986
Ann	34.29	33.54	7.30	Jul 1981	11	12.42	Jul 1999	.00+	Feb 1986

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.1	3.1	.4	.1
Feb	5.3	2.6	.4	.1
Mar	7.8	4.5	1.1	.4
Apr	10.1	6.9	2.2	.6
May	11.4	7.1	2.7	.7
Jun	11.2	7.4	2.9	1.2
Jul	10.1	7.1	3.2	1.3
Aug	10.5	7.5	3.2	1.4
Sep	9.1	5.7	2.2	1.0
Oct	8.0	5.1	1.4	.3
Nov	7.8	4.7	1.6	.4
Dec	7.3	4.0	.8	@
Ann	105.7	65.7	22.1	7.5

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	.18	.34	.49	.64	.81	1.01	1.25	1.57	2.10	2.60
Feb	.03	.09	.21	.33	.47	.62	.81	1.05	1.39	1.94	2.50
Mar	.43	.60	.89	1.14	1.40	1.67	1.98	2.35	2.83	3.61	4.33
Apr	1.05	1.36	1.81	2.20	2.57	2.96	3.38	3.87	4.51	5.50	6.41
May	1.16	1.53	2.09	2.57	3.04	3.53	4.07	4.70	5.52	6.81	8.00
Jun	1.22	1.66	2.32	2.91	3.48	4.08	4.75	5.54	6.58	8.20	9.71
Jul	1.23	1.67	2.35	2.95	3.54	4.16	4.85	5.67	6.73	8.41	9.98
Aug	1.70	2.14	2.78	3.31	3.82	4.35	4.91	5.58	6.42	7.72	8.92
Sep	.60	.91	1.43	1.92	2.42	2.97	3.59	4.35	5.37	7.01	8.58
Oct	.40	.61	.95	1.27	1.60	1.96	2.36	2.86	3.52	4.59	5.61
Nov	.29	.46	.77	1.07	1.38	1.73	2.12	2.62	3.28	4.36	5.41
Dec	.28	.40	.59	.76	.93	1.12	1.32	1.57	1.89	2.41	2.90
Ann	24.00	25.98	28.53	30.46	32.19	33.85	35.58	37.49	39.81	43.18	46.10

\+ 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: 1952-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
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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	9.9	8.1	5	5
Feb	6.2	4.9	6	5
Mar	6.9	8.2	2	1
Apr	2.2	.3	#	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	.1	.0	#	0
Nov	4.0	3.2	1	#
Dec	10.5	8.7	3	3
Ann	39.8	33.4	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	14.0	1982	22	33.0	1996	24	1996	28	15	1991
Feb	8.8	1994	23	13.7+	1997	20+	1996	1	15	1979
Mar	9.5	1995	7	14.7+	1997	14+	1993	22	10	1993
Apr	6.5	1995	10	14.5	1973	8	1973	9	1	1982
May	#	1976	2	#	1976	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	1.0	1976	24	1.0+	1981	#	1995	31	#	1995
Nov	10.0	1991	23	19.0	1991	14	1991	24	4	1991
Dec	9.0	1981	1	33.1	2000	18+	2000	29	11	1983
Ann	14.0	Jan 1982	22	33.1	Dec 2000	24	Jan 1996	28	15+	Jan 1991

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	6.0	3.4	1.2	.4	@
Feb	4.0	2.1	.7	.2	.0
Mar	3.2	2.0	1.0	.4	.0
Apr	.9	.6	.3	.1	.0
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	.0
Nov	2.3	1.3	.6	.2	@
Dec	6.0	3.6	1.1	.3	.0
Ann	22.5	13.1	4.9	1.6	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	25.8	19.9	15.4	4.7
Feb	22.9	18.4	14.6	6.2
Mar	11.9	8.9	6.0	2.0
Apr	1.4	.6	.2	.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	4.2	2.2	1.1	.2
Dec	23.3	17.2	9.0	2.2
Ann	89.5	67.2	46.3	15.3

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

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	132	123	116	111	106	101	95	89	80
32	148	141	135	131	126	122	117	112	104
28	172	165	161	157	153	149	145	141	134
24	199	191	186	181	177	173	168	163	155
20	218	211	206	201	197	193	189	184	177
16	240	233	228	224	220	216	212	207	200

***** 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	1621	1284	1039	602	285	60	17	48	190	529	977	1443	8095
60	1466	1144	884	456	175	17	2	13	93	380	827	1288	6745
57	1373	1060	791	372	122	7	0	4	53	297	737	1195	6011
55	1311	1004	729	320	93	3	0	2	34	246	677	1133	5552
50	1156	864	582	203	41	0	0	0	8	140	532	978	4504
32	626	409	163	9	0	0	0	0	0	4	136	470	1817

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	28	49	147	397	765	1030	1190	1121	827	498	150	50	6252
55	0	0	0	18	145	343	477	410	171	27	0	0	1591
57	0	0	0	10	112	287	415	350	130	16	0	0	1320
60	0	0	0	4	71	207	324	266	80	6	0	0	958
65	0	0	0	0	27	100	184	146	27	0	0	0	484
70	0	0	0	0	7	33	84	64	6	0	0	0	194

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	2	49	217	540	805	961	889	605	284	47	3	0	2	51	268	808	1613	2574	3463	4068	4352	4399	4402
45	0	0	21	125	390	655	806	734	457	178	20	0	0	0	21	146	536	1191	1997	2731	3188	3366	3386	3386
50	0	0	9	63	253	506	651	579	318	94	4	0	0	0	9	72	325	831	1482	2061	2379	2473	2477	2477
55	0	0	3	31	146	361	496	426	201	42	1	0	0	0	3	34	180	541	1037	1463	1664	1706	1707	1707
60	0	0	0	12	75	225	344	276	109	12	0	0	0	0	0	12	87	312	656	932	1041	1053	1053	1053
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	35	154	342	525	634	584	389	194	33	0	0	0	35	189	531	1056	1690	2274	2663	2857	2890	2890

(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