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: ST JAMES FILT PLANT, MN **COOP ID: 217326**

Climate Division: MN 8 **NWS Call Sign:** **Elevation: 1,100 Feet** **Lat: 44˚00N** **Lon: 94˚37W**

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	21.2	3.8	12.5	64	1981	24	25.0	1989	-30	1970	21	-.8	1979	1629	0	.0	.0	.4	23.2	30.9	13.1
Feb	27.8	10.4	19.1	63+	2000	23	30.9	1987	-30	1996	2	4.6	1979	1285	0	.0	.0	1.7	15.7	27.3	7.3
Mar	39.7	22.3	31.0	84+	1986	31	39.9	2000	-26	1962	1	21.1	1975	1055	0	.0	.0	8.1	6.7	24.9	1.7
Apr	55.5	34.4	45.0	93+	1985	18	53.3	1977	6	1995	5	36.7	1975	605	3	.0	.1	21.7	.6	11.9	.0
May	69.9	48.0	59.0	96	1967	25	67.1	1988	19	1961	1	52.4	1997	243	54	.0	.9	30.5	.0	.8	.0
Jun	79.3	58.0	68.7	104	1988	21	76.7	1988	36	1995	11	64.3	1982	37	147	.3	4.6	30.0	.0	.0	.0
Jul	82.7	62.1	72.4	105	1988	31	78.4	1983	40	1995	1	64.8	1992	17	247	.4	6.9	31.0	.0	.0	.0
Aug	80.2	59.7	70.0	104	1988	1	77.1	1983	38	1985	30	65.2	1992	33	186	.1	3.8	31.0	.0	.0	.0
Sep	72.4	49.4	60.9	98	1976	7	66.9	1998	25	1974	22	55.9	1993	164	41	.0	1.4	29.8	.0	.7	.0
Oct	59.9	36.9	48.4	92	1963	5	53.7	1973	13+	1988	30	42.6	1976	515	0	.0	@	26.5	.1	9.4	.0
Nov	40.2	23.5	31.9	81	1999	14	41.9	1999	-13	1977	26	22.6	1985	995	0	.0	.0	8.1	7.9	24.1	1.0
Dec	25.6	9.9	17.8	68	1998	2	26.3	1997	-27+	1983	20	2.1	1983	1465	0	.0	.0	.7	19.4	30.8	7.8
Ann	54.5	34.9	44.7	105	Jul 1988	31	78.4	Jul 1983	-30+	Feb 1996	2	-.8	Jan 1979	8043	678	.8	17.7	219.5	73.6	160.8	30.9

\+ 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: 1948-2001

(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	.52	.38	1.20	1996	18	1.57	1979	.00+	1991
Feb	.41	.35	1.04	1971	19	1.93	1971	.00+	1999
Mar	1.77	1.45	1.73	1975	27	4.27	1985	.12	1994
Apr	2.72	2.67	2.32	1967	2	6.43	1991	.65	1976
May	3.46	3.53	4.32	1953	25	6.25	1993	1.06	1976
Jun	4.45	4.77	6.10	1953	8	10.64	1993	.99	1982
Jul	3.80	3.57	3.50	1986	8	8.93	1986	.40	1980
Aug	3.64	3.62	4.42	1996	22	7.97	1996	.89	1990
Sep	2.73	2.23	2.59	1960	8	6.11	1991	.53	1999
Oct	2.06	1.88	1.78	1979	19	4.76	1971	.06	1988
Nov	1.48	1.28	2.97	1973	20	4.40	1975	.04	1976
Dec	.65	.50	1.34	1982	25	2.44	1982	.00+	1995
Ann	27.69	26.54	6.10	Jun 1953	8	10.64	Jun 1993	.00+	Feb 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.0	2.2	.2	@
Feb	4.4	1.7	.2	@
Mar	7.4	4.1	1.2	.3
Apr	9.6	6.1	1.8	.5
May	11.0	7.4	2.4	.7
Jun	10.9	7.2	2.7	1.1
Jul	9.5	6.5	2.8	1.0
Aug	9.3	5.7	2.6	.9
Sep	7.9	4.9	1.9	.7
Oct	6.6	4.1	1.5	.5
Nov	5.9	3.6	1.1	.4
Dec	5.1	1.4	.3	.1
Ann	93.6	54.9	18.7	6.2

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	.00	.08	.18	.27	.35	.44	.54	.65	.81	1.06	1.30
Feb	.00	.00	.00	.10	.20	.29	.40	.54	.71	1.00	1.28
Mar	.23	.38	.63	.87	1.13	1.42	1.75	2.16	2.72	3.63	4.51
Apr	.73	.99	1.38	1.72	2.06	2.42	2.81	3.28	3.89	4.84	5.73
May	1.42	1.73	2.18	2.55	2.89	3.25	3.62	4.06	4.61	5.46	6.23
Jun	1.17	1.59	2.23	2.80	3.36	3.94	4.60	5.37	6.37	7.96	9.44
Jul	.83	1.18	1.74	2.24	2.75	3.29	3.89	4.61	5.56	7.08	8.51
Aug	1.31	1.65	2.15	2.56	2.95	3.36	3.80	4.31	4.97	5.97	6.90
Sep	.74	1.00	1.40	1.74	2.08	2.44	2.83	3.30	3.90	4.85	5.74
Oct	.18	.32	.60	.88	1.20	1.55	1.98	2.51	3.25	4.48	5.68
Nov	.17	.28	.48	.69	.91	1.16	1.45	1.81	2.29	3.10	3.88
Dec	.00	.00	.10	.20	.32	.45	.60	.80	1.07	1.54	2.00
Ann	17.66	19.52	21.95	23.82	25.50	27.14	28.85	30.76	33.10	36.53	39.53

\+ 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)

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	8.0	5.4	6	4	9.0	1979	19	24.5	1982	33	1979	31	20	1979	3.9	2.9	.8	.3	.0	23.6	20.0	16.9	9.5
Feb	5.8	6.4	7	4	5.0	1971	26	11.0	1971	42	1979	26	36	1979	2.1	1.6	.7	.1	.0	20.1	18.4	14.9	11.7
Mar	8.6	7.0	3	#	10.0	1985	3	25.8	1989	44	1979	5	25	1979	2.2	1.9	1.0	.4	@	11.2	8.7	6.4	3.4
Apr	2.4	.5	#	#	6.0	1988	26	11.5	1983	4	1985	1	1	1982	.8	.6	.2	.2	.0	.9	.3	.0	.0
May	.0	.0	#	0	.0	0	0	.0	0	#	1994	7	#	1994	.0	.0	.0	.0	.0	.0	.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	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.4	.0	#	0	2.0	1976	24	4.0	1976	4	1995	31	#+	1999	.3	.3	.0	.0	.0	.2	.0	.0	.0
Nov	5.3	4.0	#	#	10.0	1983	28	17.2	1983	12	1983	30	2	1983	2.1	1.5	.6	.1	@	4.2	2.8	.3	.2
Dec	8.1	8.5	3	2	11.5	1982	28	15.0	1983	26	1983	31	21	1983	2.9	2.1	.7	.4	.1	20.2	14.4	10.2	3.8
Ann	38.6	31.8	N/A	N/A	11.5	Dec 1982	28	25.8	Mar 1989	44	Mar 1979	5	36	Feb 1979	14.3	10.9	4.0	1.5	.1	80.4	64.6	48.7	28.6

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

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	9/12	9/16	9/18	9/21	9/23	9/25	9/27	9/30	10/04
32	9/17	9/23	9/26	9/30	10/03	10/06	10/09	10/13	10/18
28	9/27	10/02	10/06	10/09	10/11	10/14	10/17	10/21	10/26
24	10/09	10/14	10/18	10/21	10/23	10/26	10/29	11/02	11/07
20	10/16	10/21	10/25	10/29	11/01	11/04	11/07	11/11	11/17
16	10/27	11/01	11/06	11/09	11/12	11/16	11/19	11/23	11/29

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	152	146	141	137	134	130	126	122	116
32	176	169	164	160	156	152	148	143	136
28	196	188	182	178	173	169	164	158	150
24	218	211	207	203	199	196	192	187	181
20	233	227	222	218	215	211	207	202	196
16	256	248	243	238	233	229	224	218	211

***** 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	1629	1285	1055	605	243	37	17	33	164	515	995	1465	8043
60	1474	1145	900	463	148	9	4	8	76	365	845	1310	6747
57	1381	1061	807	384	104	3	0	2	42	281	755	1217	6037
55	1319	1005	746	334	80	1	0	0	26	231	696	1155	5593
50	1164	867	601	223	36	0	0	0	5	126	556	1000	4578
32	639	420	182	19	0	0	0	0	0	3	163	494	1920

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	33	59	151	407	834	1100	1252	1177	867	512	158	51	6601
55	0	0	1	32	201	411	539	464	202	26	1	0	1877
57	0	0	0	22	163	353	477	403	158	15	0	0	1591
60	0	0	0	12	114	269	388	317	103	5	0	0	1208
65	0	0	0	3	54	147	247	186	41	0	0	0	678
70	0	0	0	0	20	62	135	92	11	0	0	0	320

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	5	53	245	622	883	1021	943	661	321	51	2	0	5	58	303	925	1808	2829	3772	4433	4754	4805	4807
45	0	1	20	149	469	733	866	788	514	201	21	1	0	1	21	170	639	1372	2238	3026	3540	3741	3762	3763
50	0	0	7	81	328	583	711	633	368	110	6	0	0	0	7	88	416	999	1710	2343	2711	2821	2827	2827
55	0	0	1	40	205	434	556	479	239	51	0	0	0	0	1	41	246	680	1236	1715	1954	2005	2005	2005
60	0	0	0	12	111	297	402	327	136	19	0	0	0	0	0	12	123	420	822	1149	1285	1304	1304	1304
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	2	37	162	381	575	679	623	412	200	30	1	0	2	39	201	582	1157	1836	2459	2871	3071	3101	3102

(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