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: GAYLORD, MN **COOP ID: 213076**

Climate Division: MN 5 **NWS Call Sign:** **Elevation: 1,018 Feet** **Lat: 44˚33N** **Lon: 94˚13W**

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	20.3	1.1	10.7	53+	1981	25	26.9	1990	-32+	1977	9	-2.7	1977	1683	0	.0	.0	.2	23.7	30.9	13.9
Feb	27.2	8.1	17.7	61	1981	16	30.0	1987	-34+	1996	3	4.3	1979	1326	0	.0	.0	1.0	15.8	27.3	7.9
Mar	39.2	20.8	30.0	84	1968	30	39.3	2000	-25	1962	1	20.7	1975	1084	0	.0	.0	6.7	7.6	25.6	2.4
Apr	55.3	33.5	44.4	93	1980	21	52.5	1987	5	1975	1	35.7	1975	621	2	.0	@	21.7	.5	11.6	.0
May	70.0	47.4	58.7	97+	2001	15	65.6	1998	21	1967	3	52.7	1997	242	46	.0	.9	30.3	.0	.9	.0
Jun	79.5	57.0	68.3	103	1988	25	74.9	1988	38+	1990	3	63.0	1982	45	142	.2	3.8	30.0	.0	.0	.0
Jul	83.4	61.5	72.5	105	1988	31	77.5	1983	44+	1971	30	65.3	1992	18	249	.5	7.0	31.0	.0	.0	.0
Aug	80.3	58.7	69.5	104	1988	1	76.1	1983	41	1965	28	65.2	1992	32	173	.1	3.3	31.0	.0	.0	.0
Sep	71.5	47.9	59.7	98+	1978	8	65.8	1998	23	1984	26	54.4	1993	188	28	.0	1.0	29.7	.0	.8	.0
Oct	58.8	35.9	47.4	89	1963	5	53.1	1973	14	1972	19	41.7	1976	549	0	.0	.0	25.6	.2	9.4	.0
Nov	39.4	22.2	30.8	77	1999	9	41.0	1999	-16	1977	26	22.1	1996	1026	0	.0	.0	6.8	8.3	24.2	.8
Dec	25.1	7.8	16.5	65	1998	2	26.5	1997	-34	1983	19	-.8	1983	1505	0	.0	.0	.4	20.6	30.7	8.7
Ann	54.2	33.5	43.9	105	Jul 1988	31	77.5	Jul 1983	-34+	Feb 1996	3	-2.7	Jan 1977	8319	640	.8	16.0	214.4	76.7	161.4	33.7

\+ 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: 1956-2001

(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	.66	.59	1.24	1996	17	1.95	1975	.00+	2000
Feb	.60	.52	1.07	1981	27	1.77	1981	.00+	2000
Mar	1.58	1.29	1.54	1968	27	4.89	1985	.00+	1999
Apr	2.48	2.29	3.24	1968	23	7.20	1975	.10	1987
May	3.44	3.33	3.12	1964	6	7.97	1993	.83	1976
Jun	4.71	4.48	4.60+	1997	29	10.85	1993	.96	1982
Jul	3.62	3.32	4.20	1997	25	7.42	1997	.49	1975
Aug	4.41	3.83	5.29	1981	14	13.60	1981	1.57	1972
Sep	2.93	2.72	4.15	1992	16	6.57	1986	.30	2000
Oct	2.05	1.43	2.33	1984	15	7.29	1971	.00	1993
Nov	1.71	1.61	2.60	1996	16	4.56	1975	.00+	1997
Dec	.69	.41	1.93	1982	28	3.30	1982	.00+	2000
Ann	28.88	28.08	5.29	Aug 1981	14	13.60	Aug 1981	.00+	Dec 2000

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.8	2.5	.2	.1
Feb	3.7	2.0	.3	.1
Mar	6.5	4.0	1.3	.1
Apr	7.7	5.2	1.6	.5
May	9.4	6.7	2.6	.7
Jun	9.7	7.2	3.3	1.3
Jul	7.8	5.5	2.3	.9
Aug	8.7	6.5	3.2	1.3
Sep	7.5	4.9	2.1	.7
Oct	6.2	4.2	1.3	.6
Nov	5.0	3.3	1.1	.5
Dec	4.5	2.1	.3	.1
Ann	81.5	54.1	19.6	6.9

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	.00	.11	.26	.40	.53	.68	.86	1.10	1.48	1.86
Feb	.00	.00	.00	.21	.36	.50	.64	.81	1.03	1.38	1.70
Mar	.00	.00	.51	.83	1.11	1.39	1.69	2.05	2.52	3.22	3.90
Apr	.41	.62	.99	1.33	1.68	2.06	2.50	3.03	3.74	4.89	5.99
May	1.27	1.59	2.05	2.44	2.81	3.19	3.60	4.08	4.69	5.62	6.48
Jun	1.77	2.21	2.84	3.37	3.87	4.37	4.93	5.57	6.38	7.63	8.78
Jul	1.00	1.34	1.86	2.32	2.76	3.23	3.75	4.36	5.15	6.40	7.56
Aug	1.51	1.93	2.54	3.05	3.54	4.05	4.60	5.25	6.07	7.35	8.52
Sep	.60	.87	1.30	1.69	2.09	2.51	2.99	3.57	4.33	5.54	6.70
Oct	.10	.28	.59	.89	1.21	1.57	1.99	2.52	3.24	4.42	5.58
Nov	.00	.00	.39	.68	.98	1.31	1.69	2.16	2.78	3.82	4.84
Dec	.00	.00	.00	.00	.27	.47	.67	.92	1.24	1.76	2.25
Ann	18.07	20.06	22.67	24.68	26.50	28.28	30.14	32.21	34.75	38.49	41.77

\+ 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: 1956-2001
(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	6.5	5	5
Feb	6.6	6.6	6	5
Mar	10.5	9.0	3	2
Apr	2.3	1.0	#	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	.3	.0	#	0
Nov	6.4	5.7	1	#
Dec	9.2	8.1	4	2
Ann	44.2	36.9	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	9.0	1988	20	23.0	1975	29	1982	24	20	1982
Feb	7.5	1983	3	15.0	1979	24+	1982	2	21	1979
Mar	10.1	1985	4	29.0	1989	20	1979	4	11	1984
Apr	6.0	1974	4	8.5	1982	10	1975	1	2	1975
May	#	1992	25	#+	1992	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	2.5	1981	24	3.0	1976	2+	1999	1	#+	1999
Nov	15.0	1983	28	22.6	1983	22	1991	10	7	1991
Dec	16.9	1982	28	20.7	1982	34	1996	23	20	1996
Ann	16.9	Dec 1982	28	29.0	Mar 1989	34	Dec 1996	23	21	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.8	3.3	.9	.1	.0
Feb	2.7	2.4	.5	.2	.0
Mar	2.6	2.5	1.0	.4	.1
Apr	.7	.7	.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	.2	.2	.0	.0	.0
Nov	1.6	1.4	.6	.1	.1
Dec	2.8	2.2	.6	.2	.1
Ann	14.4	12.7	3.9	1.1	.3

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	23.2	17.9	14.7	6.4
Feb	21.5	18.1	13.5	7.3
Mar	14.2	11.9	9.4	4.1
Apr	1.3	.5	.2	@
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	.1	.0	.0	.0
Nov	5.2	2.6	.8	.2
Dec	18.0	12.1	9.3	4.2
Ann	83.5	63.1	47.9	22.2

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

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	9/14	9/18	9/21	9/23	9/25	9/28	9/30	10/03	10/07
32	9/20	9/25	9/28	9/30	10/03	10/05	10/08	10/11	10/15
28	10/01	10/06	10/10	10/13	10/15	10/18	10/21	10/25	10/30
24	10/06	10/12	10/16	10/20	10/24	10/27	10/31	11/04	11/10
20	10/17	10/23	10/27	10/31	11/03	11/06	11/10	11/14	11/20
16	10/30	11/04	11/07	11/10	11/13	11/16	11/18	11/22	11/26

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	159	152	148	144	140	136	132	127	120
32	177	170	165	161	157	153	149	144	137
28	203	196	191	186	182	178	174	168	161
24	217	211	206	202	198	195	191	186	179
20	242	234	228	223	219	214	209	204	196
16	256	249	244	239	235	231	227	222	215

***** 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	1683	1326	1084	621	242	45	18	32	188	549	1026	1505	8319
60	1528	1186	929	478	145	12	4	7	91	399	876	1350	7005
57	1435	1102	836	398	100	4	0	2	52	315	786	1257	6287
55	1373	1046	775	347	76	2	0	0	33	263	726	1195	5836
50	1218	906	629	234	33	0	0	0	8	154	583	1040	4805
32	692	456	200	21	0	0	0	0	0	6	176	528	2079

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	32	54	139	392	827	1087	1254	1163	831	480	140	46	6445
55	0	0	1	28	189	399	541	451	174	25	1	0	1809
57	0	0	0	19	152	341	479	390	133	14	0	0	1528
60	0	0	0	10	104	259	391	303	82	5	0	0	1154
65	0	0	0	2	46	142	249	173	28	0	0	0	640
70	0	0	0	0	16	61	137	80	6	0	0	0	300

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	42	242	625	878	1030	941	635	300	42	1	0	2	44	286	911	1789	2819	3760	4395	4695	4737	4738
45	0	0	15	145	472	728	875	786	487	185	15	0	0	0	15	160	632	1360	2235	3021	3508	3693	3708	3708
50	0	0	3	80	333	578	720	631	344	99	5	0	0	0	3	83	416	994	1714	2345	2689	2788	2793	2793
55	0	0	0	39	207	428	565	477	219	46	0	0	0	0	0	39	246	674	1239	1716	1935	1981	1981	1981
60	0	0	0	15	114	284	411	325	122	15	0	0	0	0	0	15	129	413	824	1149	1271	1286	1286	1286
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	30	151	381	570	691	621	386	184	27	0	0	0	30	181	562	1132	1823	2444	2830	3014	3041	3041

(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