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: COLDWATER STATE SCHOOL, MI **COOP ID: 201675**

Climate Division: MI 9 **NWS Call Sign:** **Elevation: 984 Feet** **Lat: 41˚57N** **Lon: 85˚00W**

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	28.9	14.3	21.6	70	1906	21	32.3	1990	-23	1981	4	9.9	1977	1346	0	.0	.0	1.3	18.3	29.4	4.5
Feb	33.0	16.9	25.0	67+	1930	21	34.2	1998	-22	1929	20	13.0	1978	1121	0	.0	.0	2.2	13.0	26.0	3.4
Mar	43.8	25.7	34.8	83	1910	24	42.3	2000	-13	1967	1	27.0	1984	938	0	.0	.0	10.2	4.3	23.8	.2
Apr	56.3	35.6	46.0	89	1915	26	52.6	1985	6+	1982	7	40.3	1975	572	1	.0	.0	22.2	.2	11.6	.0
May	68.9	46.7	57.8	96+	1911	27	65.0	1991	20	1900	6	50.5	1997	268	46	.0	.1	30.3	.0	1.4	.0
Jun	78.0	55.9	67.0	102+	1934	1	71.5	1971	34+	1928	3	62.6	1982	53	112	.1	1.9	30.0	.0	.0	.0
Jul	81.4	59.9	70.7	108	1934	24	74.6	1999	40+	1941	20	66.8	2000	10	185	@	3.9	31.0	.0	.0	.0
Aug	79.2	57.8	68.5	103	1918	6	74.4	1995	36+	1976	30	64.9	1992	33	141	@	2.0	31.0	.0	.0	.0
Sep	71.7	50.2	61.0	99+	1913	2	65.7	1978	27+	1942	29	56.4	1975	152	31	.0	.5	30.0	.0	.4	.0
Oct	59.5	39.6	49.6	89+	1922	3	57.5	1971	16+	1974	21	43.1	1988	481	4	.0	.0	26.7	.0	7.2	.0
Nov	45.3	30.3	37.8	78+	1930	20	43.7	1975	-4	1950	24	30.5	1976	815	0	.0	.0	11.6	2.4	19.0	.0
Dec	33.4	20.1	26.8	67+	1932	25	33.9	1982	-17	1917	15	15.9	2000	1186	0	.0	.0	2.5	12.0	28.5	2.2
Ann	56.6	37.8	47.2	108	Jul 1934	24	74.6	Jul 1999	-23	Jan 1981	4	9.9	Jan 1977	6975	520	.1	8.4	229.0	50.2	147.3	10.3

\+ 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: 1898-2001

(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	1.82	1.70	2.12	1960	12	4.78	1999	.41	1971
Feb	1.70	1.37	2.52	1954	16	5.33	1985	.45	1978
Mar	2.46	2.31	1.83	1949	31	4.59	1997	.65	1981
Apr	3.12	3.00	3.07	1950	24	6.71	1999	.48	1971
May	3.79	3.68	4.48	1989	30	10.90	1989	1.04+	1994
Jun	3.72	3.27	5.37	1978	26	7.45	1975	.70	1988
Jul	3.80	3.06	4.75	1959	29	9.57	1992	.73	1974
Aug	3.94	3.29	3.60	1942	2	10.06	1975	.40	1976
Sep	3.44	3.22	3.90	1960	19	6.24	1981	.05	1979
Oct	2.75	2.49	5.30	1901	12	6.34	1991	.84	1982
Nov	2.60	2.57	2.00+	1909	22	5.63	1985	.33	1998
Dec	2.52	2.45	2.64	1965	24	4.56	1987	1.01	1995
Ann	35.66	34.88	5.37	Jun 1978	26	10.90	May 1989	.05	Sep 1979

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	13.3	5.2	.6	.1
Feb	10.8	4.5	.8	.2
Mar	11.4	6.3	1.3	.3
Apr	13.4	7.5	2.0	.5
May	12.4	7.3	2.4	.9
Jun	10.9	7.1	2.6	.9
Jul	10.6	6.5	2.4	1.0
Aug	10.7	6.8	2.6	.9
Sep	10.9	6.7	2.3	.8
Oct	11.1	6.1	1.7	.5
Nov	12.3	6.2	1.7	.4
Dec	14.3	6.8	1.0	.3
Ann	142.1	77.0	21.4	6.8

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	.44	.61	.88	1.12	1.35	1.60	1.87	2.20	2.63	3.32	3.96
Feb	.37	.53	.78	1.01	1.23	1.47	1.74	2.07	2.49	3.17	3.81
Mar	.96	1.18	1.51	1.78	2.03	2.29	2.57	2.90	3.31	3.95	4.53
Apr	1.33	1.61	2.01	2.33	2.64	2.94	3.28	3.66	4.14	4.87	5.53
May	1.20	1.57	2.10	2.55	2.99	3.45	3.95	4.54	5.29	6.47	7.56
Jun	1.20	1.55	2.07	2.51	2.94	3.39	3.87	4.44	5.17	6.31	7.36
Jul	1.02	1.38	1.93	2.41	2.89	3.38	3.93	4.59	5.44	6.77	8.02
Aug	.91	1.27	1.85	2.37	2.88	3.43	4.04	4.78	5.74	7.27	8.71
Sep	.83	1.15	1.65	2.10	2.54	3.01	3.54	4.16	4.98	6.27	7.49
Oct	1.05	1.31	1.67	1.97	2.26	2.55	2.87	3.24	3.71	4.43	5.09
Nov	.70	.94	1.32	1.65	1.97	2.31	2.69	3.13	3.72	4.63	5.48
Dec	1.10	1.33	1.64	1.90	2.14	2.38	2.64	2.94	3.32	3.89	4.41
Ann	28.25	29.74	31.62	33.03	34.27	35.45	36.65	37.98	39.56	41.84	43.78

\+ 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

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(2) Derived from station's available digital record: 1898-2001
(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	15.0	13.3	4	3	17.0	1978	26	50.7	1978	30	1978	30	12	1978	9.5	5.7	1.4	.6	.1	20.0	14.4	10.0	3.2
Feb	10.2	9.8	4	2	7.0	1990	24	20.5	1985	28	1978	1	21	1978	7.2	4.3	1.1	.2	.0	16.3	11.6	6.5	3.9
Mar	7.5	7.0	1	1	6.2	1992	22	19.4	1992	16	1978	5	8	1978	4.4	2.8	.8	.2	.0	6.5	3.1	1.7	.8
Apr	1.7	1.1	#	#	7.0	1982	5	10.1	1982	7	1982	5	1	1982	1.5	.7	.1	@	.0	.8	.2	.1	.0
May	#	.0	0	0	#	1974	8	#+	1974	0	0	0	0	0	.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	#	1995	22	#	1995	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.7	.0	#	0	5.0	1980	27	6.1	1989	2	1980	27	#+	1989	.3	.2	.1	@	.0	.1	.0	.0	.0
Nov	4.6	4.5	#	#	4.5	1974	13	13.0	1972	5	1972	16	2	1972	3.1	1.9	.5	.0	.0	3.0	1.0	.1	.0
Dec	13.0	14.1	2	1	12.0	1973	19	24.1	1976	15	1973	23	6	1973	8.7	5.3	1.4	.4	@	13.1	6.6	3.8	.5
Ann	52.7	49.8	N/A	N/A	17.0	Jan 1978	26	50.7	Jan 1978	30	Jan 1978	30	21	Feb 1978	34.7	20.9	5.4	1.4	.1	59.8	36.9	22.2	8.4

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

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	154	147	142	137	133	129	125	119	112
32	172	166	161	157	154	150	147	142	136
28	206	199	193	188	183	179	174	168	160
24	234	225	218	212	206	201	195	188	179
20	258	247	240	233	227	221	215	208	197
16	275	266	260	254	249	244	238	232	223

***** 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	1346	1121	938	572	268	53	10	33	152	481	815	1186	6975
60	1191	981	783	426	167	15	0	6	66	339	665	1031	5670
57	1098	897	690	341	119	6	0	1	35	262	575	938	4962
55	1036	841	628	288	92	3	0	0	21	216	516	876	4517
50	881	701	480	172	42	0	0	0	4	122	372	721	3495
32	373	259	94	3	0	0	0	0	0	2	42	255	1028

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	51	62	179	422	801	1050	1199	1132	869	547	217	92	6621
55	0	0	0	17	179	363	486	419	200	48	1	0	1713
57	0	0	0	10	145	306	424	358	154	32	0	0	1429
60	0	0	0	4	100	225	331	270	95	16	0	0	1041
65	0	0	0	1	46	112	185	141	31	4	0	0	520
70	0	0	0	0	17	39	76	56	5	0	0	0	193

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	5	10	78	246	574	831	975	906	659	334	99	18	5	15	93	339	913	1744	2719	3625	4284	4618	4717	4735
45	0	1	39	143	421	681	820	751	509	213	48	4	0	1	40	183	604	1285	2105	2856	3365	3578	3626	3630
50	0	0	19	77	285	531	665	596	366	119	21	0	0	0	19	96	381	912	1577	2173	2539	2658	2679	2679
55	0	0	7	39	174	384	510	443	231	54	6	0	0	0	7	46	220	604	1114	1557	1788	1842	1848	1848
60	0	0	1	13	91	249	355	292	133	21	0	0	0	0	1	14	105	354	709	1001	1134	1155	1155	1155
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	6	53	150	353	540	658	597	407	196	55	5	0	6	59	209	562	1102	1760	2357	2764	2960	3015	3020

(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