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: CHEBOYGAN, MI **COOP ID: 201492**

Climate Division: MI 4 **NWS Call Sign:** **Elevation: 590 Feet** **Lat: 45˚39N** **Lon: 84˚28W**

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	26.3	8.2	17.3	59	1950	14	26.3	1990	-27	1994	30	6.0	1994	1482	0	.0	.0	.1	22.8	30.7	7.7
Feb	28.3	7.6	18.0	62	2000	27	30.8	1998	-28	1985	1	8.4	1994	1317	0	.0	.0	.6	18.0	27.7	7.9
Mar	36.6	16.7	26.7	74	1990	16	35.7	2000	-20+	1967	1	20.8+	1989	1188	0	.0	.0	3.1	9.3	28.8	2.6
Apr	48.7	29.5	39.1	86	1986	28	43.9+	1998	3	1992	13	32.7	1972	778	0	.0	.0	13.5	1.2	18.5	.0
May	62.1	40.4	51.3	90	1962	15	58.2	1998	17	1999	14	45.0	1997	431	5	.0	.0	28.7	.0	4.0	.0
Jun	71.5	50.7	61.1	96	1991	28	66.0	1991	30+	1978	3	56.4	1982	149	33	.0	.5	30.0	.0	.1	.0
Jul	77.4	57.1	67.3	98+	1955	26	72.0	1983	39	1960	1	60.1	1992	46	114	.0	1.2	31.0	.0	.0	.0
Aug	75.5	55.6	65.6	98+	1955	19	69.7	1995	29	1950	22	61.0	1982	74	92	.0	.7	31.0	.0	.0	.0
Sep	67.6	48.0	57.8	97	1953	3	61.1	1998	26+	1949	29	54.4	1975	221	5	.0	.2	29.7	.0	.4	.0
Oct	55.8	37.1	46.5	86	1971	3	53.0	1971	19+	1969	23	41.8	1980	576	0	.0	.0	22.9	.0	7.1	.0
Nov	42.5	27.9	35.2	74	1964	4	40.2	1975	-3	1950	24	29.2	1995	894	0	.0	.0	7.4	3.8	21.4	.0
Dec	31.5	17.0	24.3	64+	1982	2	31.1	1994	-15+	1967	29	13.3	1989	1263	0	.0	.0	1.0	15.4	29.6	2.2
Ann	52.0	33.0	42.5	98+	Aug 1955	19	72.0	Jul 1983	-28	Feb 1985	1	6.0	Jan 1994	8419	249	.0	2.6	199.0	70.5	168.3	20.4

\+ 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

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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	1.75	1.72	2.20	1997	5	3.91	1997	.26	1981
Feb	1.20	1.21	1.16	1968	2	4.09	1985	.19	1982
Mar	1.86	1.56	1.64	1998	31	5.24	1991	.28	1993
Apr	2.48	2.20	2.88	1980	9	6.12	1980	.26	1997
May	2.60	2.63	1.78	1997	1	7.29	1983	.26	1992
Jun	2.58	2.65	2.25	1992	18	7.46	1990	.41	1997
Jul	3.14	3.43	3.21	1988	15	5.84	1979	.26	1989
Aug	3.03	2.78	4.48	2001	2	7.55	1994	.71	1991
Sep	3.61	3.12	2.49	1961	13	7.57	1977	1.18	1979
Oct	2.87	2.42	2.09	1991	25	6.03	1991	.90	2000
Nov	2.39	2.37	1.51	1988	5	4.65	1988	.56	1980
Dec	2.05	1.83	3.18	1970	4	5.27	1971	.28	1994
Ann	29.56	29.73	4.48	Aug 2001	2	7.57	Sep 1977	.19	Feb 1982

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	15.2	5.3	.5	.1
Feb	9.9	3.4	.6	.0
Mar	9.7	4.6	.9	.2
Apr	10.1	6.1	1.5	.5
May	10.2	6.2	1.5	.4
Jun	9.0	5.5	1.7	.5
Jul	9.4	5.0	2.1	.7
Aug	10.1	6.1	2.2	.8
Sep	11.8	7.4	2.3	.8
Oct	12.7	7.2	1.7	.4
Nov	13.1	6.2	1.0	.3
Dec	15.2	5.5	.7	.3
Ann	136.4	68.5	16.7	5.0

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	.56	.73	.97	1.18	1.38	1.59	1.82	2.09	2.43	2.97	3.46
Feb	.27	.38	.55	.71	.87	1.04	1.23	1.46	1.76	2.23	2.68
Mar	.29	.45	.72	.97	1.24	1.53	1.86	2.27	2.82	3.71	4.56
Apr	.70	.93	1.29	1.60	1.90	2.22	2.57	2.99	3.53	4.38	5.17
May	.74	.99	1.36	1.69	2.00	2.33	2.70	3.13	3.69	4.57	5.38
Jun	.63	.87	1.25	1.58	1.91	2.26	2.65	3.12	3.73	4.69	5.59
Jul	.71	1.00	1.46	1.87	2.29	2.72	3.22	3.80	4.58	5.80	6.96
Aug	1.02	1.31	1.72	2.08	2.42	2.77	3.16	3.61	4.19	5.08	5.90
Sep	1.20	1.54	2.04	2.47	2.88	3.30	3.76	4.30	4.99	6.06	7.05
Oct	.89	1.17	1.57	1.92	2.25	2.60	2.98	3.43	4.01	4.91	5.74
Nov	.77	.99	1.33	1.62	1.89	2.18	2.49	2.86	3.33	4.06	4.74
Dec	.46	.65	.96	1.22	1.49	1.78	2.10	2.49	2.99	3.80	4.55
Ann	21.70	23.23	25.19	26.68	27.99	29.25	30.55	31.98	33.72	36.22	38.38

\+ 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	24.5	22.6	11	10	14.0	1990	25	40.2	1994	32	1994	30	23	1994	12.2	8.4	2.9	1.0	.1	26.9	23.6	20.6	9.4
Feb	15.8	15.0	11	9	10.0	1997	22	40.0	1985	41	1985	19	28	1985	8.2	5.4	1.6	.6	@	25.1	21.3	18.1	10.1
Mar	11.9	9.0	6	5	15.7	1991	2	31.7	1991	31	1971	8	21	1971	5.0	3.5	1.4	.7	.1	16.2	12.1	9.6	4.3
Apr	3.7	2.5	1	#	8.5	1977	5	13.2	1993	17+	1972	6	7	1972	1.8	1.3	.4	.2	.0	2.3	.6	.2	.0
May	.1	.0	#	0	2.0	1994	1	2.0	1994	2	1994	1	#	1994	@	@	.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	.1	.0	#	0	1.0	1981	22	1.0	1981	1	1981	22	#+	1997	.1	@	.0	.0	.0	@	.0	.0	.0
Nov	8.3	7.2	1	1	8.5	1974	15	25.6	1989	11+	1991	3	3	1989	4.8	3.4	.8	.2	.0	7.3	2.8	1.4	.2
Dec	18.7	20.8	5	4	18.0	1985	1	41.6	1996	30	1985	2	19	1985	11.5	7.5	2.3	.9	.2	18.8	13.3	9.6	3.6
Ann	83.1	77.1	N/A	N/A	18.0	Dec 1985	1	41.6	Dec 1996	41	Feb 1985	19	28	Feb 1985	43.6	29.5	9.4	3.6	.4	96.6	73.7	59.5	27.6

+ 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	6/12	6/07	6/04	6/01	5/29	5/27	5/24	5/21	5/16
32	6/01	5/27	5/24	5/21	5/18	5/15	5/12	5/08	5/03
28	5/18	5/13	5/09	5/06	5/03	4/30	4/27	4/24	4/19
24	5/02	4/28	4/24	4/22	4/19	4/16	4/14	4/10	4/06
20	4/25	4/20	4/16	4/13	4/10	4/08	4/04	4/01	3/27
16	4/14	4/10	4/07	4/04	4/02	3/30	3/27	3/24	3/20

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	9/18	9/21	9/24	9/27	9/30	10/03	10/08
32	9/22	9/28	10/02	10/06	10/10	10/13	10/17	10/21	10/27
28	10/01	10/07	10/11	10/15	10/19	10/22	10/26	10/30	11/05
24	10/20	10/25	10/29	11/01	11/04	11/07	11/10	11/14	11/19
20	10/28	11/03	11/07	11/10	11/13	11/17	11/20	11/24	11/30
16	11/09	11/16	11/20	11/24	11/27	12/01	12/05	12/09	12/15

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	138	131	126	121	117	113	108	103	96
32	167	159	153	149	144	139	134	129	121
28	193	184	178	173	168	163	157	151	143
24	220	212	207	203	199	194	190	185	177
20	239	231	226	221	216	212	207	201	193
16	261	253	248	243	239	235	230	225	217

***** 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	1482	1317	1188	778	431	149	46	74	221	576	894	1263	8419
60	1327	1177	1033	628	292	64	9	20	102	427	744	1108	6931
57	1234	1093	940	539	219	33	2	7	54	342	654	1015	6132
55	1172	1037	878	481	177	19	0	3	33	289	594	953	5636
50	1017	897	723	340	92	4	0	0	7	176	445	798	4499
32	483	417	226	32	1	0	0	0	0	6	55	304	1524

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	24	24	60	244	597	874	1092	1041	774	452	151	63	5396
55	0	0	0	3	61	203	379	331	118	23	0	0	1118
57	0	0	0	1	41	157	319	274	78	14	0	0	884
60	0	0	0	0	21	98	233	193	36	6	0	0	587
65	0	0	0	0	5	33	114	92	5	0	0	0	249
70	0	0	0	0	0	6	40	30	0	0	0	0	76

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	18	94	374	648	858	809	551	248	45	2	0	0	18	112	486	1134	1992	2801	3352	3600	3645	3647
45	0	0	3	39	234	498	703	654	402	134	15	0	0	0	3	42	276	774	1477	2131	2533	2667	2682	2682
50	0	0	0	17	126	351	548	500	262	66	3	0	0	0	0	17	143	494	1042	1542	1804	1870	1873	1873
55	0	0	0	4	53	212	393	346	146	26	0	0	0	0	0	4	57	269	662	1008	1154	1180	1180	1180
60	0	0	0	0	19	109	248	205	67	4	0	0	0	0	0	0	19	128	376	581	648	652	652	652
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	0	10	63	213	380	548	508	312	125	24	0	0	0	10	73	286	666	1214	1722	2034	2159	2183	2183

(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

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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