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: GREENVILLE 2 NNE, MI **COOP ID: 203429**

Climate Division: MI 6 **NWS Call Sign:** **Elevation: 882 Feet** **Lat: 43˚12N** **Lon: 85˚15W**

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	29.0	12.9	21.0	64	1950	26	31.8	1990	-26	1994	19	11.2	1977	1366	0	.0	.0	.8	19.9	30.3	5.0
Feb	32.9	14.8	23.9	70	1999	11	33.3	1998	-23	1996	3	13.6	1979	1152	0	.0	.0	1.7	14.7	27.2	4.1
Mar	43.7	23.1	33.4	80+	1963	29	42.8	2000	-11	1980	1	26.2	1984	980	0	.0	.0	9.1	5.0	25.5	.7
Apr	57.7	33.4	45.6	86	1960	23	51.0	1977	5	1982	7	39.6	1975	585	1	.0	.0	22.8	.2	14.0	.0
May	70.1	44.2	57.2	92+	1962	18	64.0	1998	20+	1966	10	48.0	1997	290	47	.0	.5	30.7	.0	3.3	.0
Jun	78.8	53.2	66.0	100	1953	20	70.6	1995	30+	1980	10	61.8	1982	69	99	.0	2.4	30.0	.0	.2	.0
Jul	82.8	57.3	70.1	101	1988	6	74.5	1999	38	2001	2	65.0	1996	21	178	.1	4.8	31.0	.0	.0	.0
Aug	80.4	56.0	68.2	104	1955	19	75.1	1995	35	1986	28	63.0	1992	46	145	.1	2.6	31.0	.0	.0	.0
Sep	72.7	48.1	60.4	101	1953	1	66.7	1998	24	1991	28	55.2	1975	166	28	.0	.8	30.0	.0	1.0	.0
Oct	60.7	37.9	49.3	87+	1971	1	55.6	1971	16	1976	27	43.3	1988	490	3	.0	.0	27.3	@	8.9	.0
Nov	45.9	28.6	37.3	80	1950	1	44.7	1999	-3	1950	25	29.9	1996	833	0	.0	.0	10.8	2.8	20.6	.0
Dec	33.7	18.5	26.1	70	2001	5	34.6	1982	-13	1983	19	17.0	1976	1206	0	.0	.0	2.1	14.0	29.4	1.7
Ann	57.4	35.7	46.5	104	Aug 1955	19	75.1	Aug 1995	-26	Jan 1994	19	11.2	Jan 1977	7204	501	.2	11.1	227.3	56.6	160.4	11.5

\+ 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	1.83	1.62	1.40	1975	10	4.56	1998	.33	1981
Feb	1.48	1.37	2.84	1997	21	4.92	1997	.04	1987
Mar	2.28	2.11	2.65	1976	2	6.88	1976	.69	1994
Apr	3.00	2.96	2.70	1967	17	5.51	1999	1.41	1971
May	3.44	3.19	3.25	2000	18	8.14	2000	.69	1992
Jun	3.37	3.32	4.58	1994	24	7.13	1994	.44	1988
Jul	2.88	2.85	3.30	1949	9	4.77	1994	.56	1998
Aug	4.21	3.45	3.48	1975	29	12.54	1975	1.33	1976
Sep	3.70	3.55	4.82	1986	11	13.37	1986	.02	1979
Oct	2.93	2.61	5.80	1981	1	7.90	1981	.89	1999
Nov	3.14	2.93	2.62	1990	5	6.56	1990	.62	1986
Dec	2.45	2.18	2.10	1971	10	6.81	1971	.66	1976
Ann	34.71	34.47	5.80	Oct 1981	1	13.37	Sep 1986	.02	Sep 1979

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	15.1	5.1	.8	.1
Feb	10.8	4.3	.7	.1
Mar	12.1	5.6	1.4	.1
Apr	12.8	6.9	1.8	.4
May	11.7	6.7	2.1	.7
Jun	10.1	6.3	2.2	.6
Jul	9.1	5.8	1.9	.7
Aug	10.4	6.6	2.9	1.4
Sep	11.1	6.7	2.4	.8
Oct	12.0	6.3	1.7	.4
Nov	13.7	6.8	1.9	.7
Dec	14.5	6.1	1.2	.4
Ann	143.4	73.2	21.0	6.4

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	.47	.64	.91	1.14	1.38	1.62	1.89	2.21	2.63	3.29	3.91
Feb	.28	.41	.62	.82	1.03	1.25	1.50	1.80	2.20	2.84	3.46
Mar	.58	.79	1.12	1.42	1.71	2.01	2.36	2.76	3.29	4.13	4.91
Apr	1.43	1.69	2.04	2.33	2.59	2.86	3.14	3.46	3.87	4.48	5.02
May	.90	1.23	1.73	2.16	2.60	3.05	3.55	4.15	4.92	6.15	7.29
Jun	1.11	1.43	1.90	2.30	2.69	3.08	3.52	4.03	4.68	5.70	6.64
Jul	.89	1.17	1.58	1.92	2.26	2.61	3.00	3.45	4.04	4.95	5.79
Aug	1.24	1.64	2.24	2.76	3.27	3.79	4.38	5.06	5.95	7.34	8.63
Sep	.58	.89	1.43	1.94	2.47	3.04	3.71	4.52	5.60	7.37	9.06
Oct	.82	1.09	1.52	1.88	2.24	2.62	3.04	3.53	4.17	5.17	6.11
Nov	.96	1.26	1.70	2.09	2.46	2.84	3.27	3.77	4.41	5.41	6.34
Dec	.61	.84	1.19	1.51	1.82	2.15	2.52	2.96	3.54	4.44	5.30
Ann	28.06	29.41	31.11	32.37	33.48	34.54	35.62	36.80	38.22	40.24	41.96

\+ 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	18.4	17.5	6	6	18.5	1978	26	43.8	1979	29	1979	27	23	1979	13.7	5.9	1.8	.7	.1	23.6	18.5	15.1	5.6
Feb	13.3	15.1	6	5	7.5	1981	10	27.4	1994	30	1985	18	27	1979	9.4	4.5	1.2	.5	.0	20.4	16.0	11.5	5.2
Mar	9.5	8.9	2	2	10.0	1998	9	20.7	1971	20	1978	8	13	1978	6.3	2.8	1.0	.3	@	11.3	7.9	5.3	1.2
Apr	2.9	2.0	#	0	8.5	1975	3	15.0	1975	12	1975	3	3	1975	2.1	.9	.3	.1	.0	1.0	.6	.3	.1
May	#	.0	0	0	#	1984	5	#+	1984	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	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.4	.0	#	0	5.2	1997	27	5.7	1997	2	1997	27	#+	1997	.3	.1	@	@	.0	@	.0	.0	.0
Nov	6.4	5.5	#	#	7.5	1975	27	18.7	1995	8	1975	27	2	1995	4.3	2.0	.7	.2	.0	3.5	1.7	.5	.0
Dec	16.7	15.5	3	2	10.5	1972	12	30.5	1972	18	2000	31	13	2000	11.6	5.7	1.7	.7	.1	17.7	10.2	5.5	1.5
Ann	67.6	64.5	N/A	N/A	18.5	Jan 1978	26	43.8	Jan 1979	30	Feb 1985	18	27	Feb 1979	47.7	21.9	6.7	2.5	.2	77.5	54.9	38.2	13.6

+ 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	6/14	6/07	6/03	5/30	5/26	5/22	5/18	5/14	5/08
32	6/04	5/28	5/23	5/19	5/15	5/11	5/06	5/01	4/24
28	5/13	5/08	5/05	5/02	4/29	4/26	4/23	4/20	4/15
24	4/29	4/24	4/21	4/18	4/15	4/13	4/10	4/06	4/02
20	4/20	4/16	4/13	4/10	4/07	4/05	4/02	3/30	3/25
16	4/09	4/05	4/03	3/31	3/29	3/26	3/24	3/21	3/17

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	9/04	9/09	9/12	9/15	9/18	9/20	9/23	9/27	10/01
32	9/17	9/21	9/24	9/27	9/29	10/01	10/04	10/07	10/11
28	9/22	9/29	10/03	10/07	10/10	10/14	10/17	10/22	10/28
24	10/08	10/15	10/19	10/23	10/27	10/30	11/03	11/08	11/14
20	10/21	10/27	10/31	11/04	11/07	11/11	11/14	11/19	11/24
16	11/07	11/13	11/17	11/21	11/25	11/28	12/02	12/06	12/12

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	133	126	122	118	114	110	106	101	95
32	160	152	146	141	137	132	127	121	113
28	189	180	174	168	163	158	153	146	138
24	220	211	204	199	194	188	183	176	167
20	237	229	223	218	213	208	203	197	189
16	264	256	250	245	240	236	231	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)

Heating Degree Days (1)

Base Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1366	1152	980	585	290	69	21	46	166	490	833	1206	7204
60	1211	1012	825	439	188	23	4	12	74	346	683	1051	5868
57	1118	928	732	356	138	10	0	4	40	268	594	958	5146
55	1056	872	670	303	109	6	0	1	24	222	535	896	4694
50	901	732	525	187	54	1	0	0	5	126	394	741	3666
32	379	284	128	5	0	0	0	0	0	3	56	259	1114

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	36	57	171	411	780	1020	1180	1122	852	539	213	76	6457
55	0	0	0	19	177	335	467	410	186	45	2	0	1641
57	0	0	0	11	143	280	405	351	141	30	1	0	1362
60	0	0	0	5	100	203	316	266	86	14	0	0	990
65	0	0	0	1	47	99	178	145	28	3	0	0	501
70	0	0	0	0	19	33	81	64	5	0	0	0	202

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	1	6	63	228	559	807	959	897	633	323	85	10	1	7	70	298	857	1664	2623	3520	4153	4476	4561	4571
45	0	0	33	138	407	657	804	742	483	199	42	3	0	0	33	171	578	1235	2039	2781	3264	3463	3505	3508
50	0	0	16	73	272	509	649	587	340	110	17	1	0	0	16	89	361	870	1519	2106	2446	2556	2573	2574
55	0	0	8	35	161	360	494	432	214	50	4	0	0	0	8	43	204	564	1058	1490	1704	1754	1758	1758
60	0	0	0	12	83	224	340	283	120	17	0	0	0	0	0	12	95	319	659	942	1062	1079	1079	1079
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	2	44	152	354	522	638	589	402	194	46	3	0	2	46	198	552	1074	1712	2301	2703	2897	2943	2946

(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