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: STAMBAUGH 2 SSE, MI **COOP ID: 207812**

Climate Division: MI 1 **NWS Call Sign:** **Elevation: 1,560 Feet** **Lat: 46˚03N** **Lon: 88˚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	19.8	-3.7	8.1	55	1981	25	18.9	1990	-42	1977	9	-1.1	1994	1767	0	.0	.0	.2	26.8	30.9	16.3
Feb	25.5	-1.1	12.2	62	1976	24	27.5	1998	-45+	1996	3	3.1	1979	1481	0	.0	.0	.8	19.6	27.9	13.4
Mar	35.7	10.9	23.3	73	2000	9	32.7	1973	-31+	1972	3	15.2	1984	1294	0	.0	.0	4.1	10.4	29.2	6.9
Apr	50.2	25.2	37.7	92	1980	22	43.4	1977	-12	1972	5	31.2	1975	819	0	.0	@	16.5	1.6	22.9	.6
May	64.6	37.2	50.9	90+	1964	22	59.6	1977	14+	1966	10	43.1	1997	451	13	.0	@	28.4	@	11.1	.0
Jun	72.7	46.3	59.5	97+	1963	30	64.8	1995	24	1964	2	53.4	1982	189	24	.0	.4	29.9	.0	2.1	.0
Jul	76.9	50.9	63.9	98	1977	19	68.9	1983	29	1972	4	56.8	1992	102	67	.0	1.2	31.0	.0	.2	.0
Aug	74.4	48.7	61.6	97	1948	24	66.4	1995	28+	1965	29	56.7	1992	150	43	.0	.4	31.0	.0	.7	.0
Sep	64.7	40.1	52.4	95+	1976	7	57.1	1998	18+	1965	27	47.6	1993	378	1	.0	.1	29.0	.0	6.8	.0
Oct	53.2	30.5	41.9	88	1976	1	50.7	1971	3	1969	23	35.1	1987	718	0	.0	.0	19.9	.4	18.2	.0
Nov	36.7	19.1	27.9	74	1978	3	35.8	1999	-15	1976	29	19.8	1995	1113	0	.0	.0	4.6	10.0	27.0	1.6
Dec	24.1	4.8	14.5	59+	1982	3	24.5	1997	-41+	1983	19	3.3	1983	1566	0	.0	.0	.3	23.4	30.9	10.4
Ann	49.9	25.7	37.8	98	Jul 1977	19	68.9	Jul 1983	-45+	Feb 1996	3	-1.1	Jan 1994	10028	148	.0	2.1	195.7	92.2	207.9	49.2

\+ 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	1.11	.89	1.22	1967	25	3.28	1996	.33	1981
Feb	.85	.68	1.05	1951	26	2.92	1971	.00	1993
Mar	1.69	1.61	1.74	1973	7	4.06	1979	.13	1999
Apr	2.17	1.99	1.78	1981	23	4.19	1981	.42	1998
May	3.14	2.99	2.75	1963	8	6.49	1983	.17	1986
Jun	3.74	3.34	3.70	1981	14	8.36	1981	1.70	1992
Jul	3.98	3.31	5.20	1999	15	11.40	1999	1.00	1989
Aug	3.79	3.56	4.35	1972	16	9.09	1972	1.44	1998
Sep	3.78	3.67	2.94	1983	20	7.34	1985	.63	1976
Oct	2.77	2.81	2.30	1966	15	5.77	1995	.49	1976
Nov	2.06	1.87	1.84	1985	2	4.81	1985	.44	1981
Dec	1.29	1.20	1.24+	1959	28	2.74	1996	.27	1994
Ann	30.37	30.26	5.20	Jul 1999	15	11.40	Jul 1999	.00	Feb 1993

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	10.1	4.1	.2	.0
Feb	7.0	2.6	.3	.0
Mar	8.8	4.5	1.0	.1
Apr	9.9	5.8	1.2	.2
May	11.4	6.8	2.1	.6
Jun	12.8	7.9	2.4	.7
Jul	12.4	8.1	2.7	.7
Aug	12.0	7.0	2.5	.9
Sep	12.7	7.7	2.6	.8
Oct	12.6	6.3	1.6	.5
Nov	10.9	5.2	1.1	.3
Dec	10.4	4.3	.5	@
Ann	131.0	70.3	18.2	4.8

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	.27	.37	.53	.67	.82	.97	1.14	1.34	1.60	2.02	2.41
Feb	.05	.13	.26	.39	.52	.66	.83	1.04	1.33	1.79	2.24
Mar	.28	.42	.67	.90	1.14	1.40	1.70	2.06	2.55	3.34	4.09
Apr	.61	.82	1.13	1.40	1.67	1.95	2.25	2.62	3.09	3.83	4.52
May	.86	1.16	1.61	2.01	2.40	2.80	3.25	3.79	4.48	5.57	6.58
Jun	1.66	1.99	2.45	2.83	3.18	3.54	3.92	4.35	4.90	5.74	6.49
Jul	1.37	1.74	2.29	2.75	3.20	3.65	4.15	4.73	5.48	6.63	7.69
Aug	1.52	1.87	2.36	2.77	3.15	3.54	3.97	4.45	5.07	6.01	6.87
Sep	1.06	1.42	1.96	2.44	2.90	3.38	3.92	4.55	5.38	6.67	7.87
Oct	1.13	1.39	1.75	2.04	2.32	2.60	2.90	3.25	3.70	4.37	4.99
Nov	.54	.74	1.04	1.30	1.56	1.83	2.13	2.48	2.95	3.68	4.36
Dec	.39	.51	.70	.86	1.01	1.17	1.34	1.55	1.82	2.23	2.62
Ann	21.73	23.41	25.55	27.18	28.62	30.01	31.45	33.04	34.97	37.76	40.17

\+ 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	17.8	15.5	13	13	11.0	1971	4	36.0	1976	39	1997	2	26	1997	10.7	7.3	1.9	.4	@	30.9	30.9	30.8	24.4
Feb	9.2	8.6	14	14	11.0	1971	5	17.5	1981	32	1996	20	29	1996	6.6	4.6	1.0	.3	@	28.0	28.0	26.8	21.6
Mar	13.0	11.1	10	9	10.0	1972	4	29.0	1972	34	1996	28	27	1996	6.4	4.3	1.7	.7	.1	25.3	22.3	18.0	12.2
Apr	6.0	4.0	2	#	9.0	1985	1	19.0+	1996	34	1996	4	19	1996	3.0	2.2	.7	.2	.0	5.8	3.8	2.6	1.4
May	.8	.0	#	0	4.5	1979	5	5.0	1979	7	1996	1	#+	1997	.4	.3	.1	.0	.0	.3	.1	.1	.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	#	1995	23	#+	1995	#	1989	23	#	1989	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	1.7	.5	#	#	5.0	1995	21	7.8	1992	5	1995	21	1	1988	1.1	.7	.2	@	.0	1.0	.2	@	.0
Nov	10.6	9.9	2	1	10.0	1992	13	23.0	1991	15	1991	29	5	1992	6.1	4.4	1.3	.2	@	11.8	6.2	2.8	.4
Dec	17.1	17.0	6	5	11.0	1996	31	44.6	1996	39	1996	31	17	1995	9.5	6.6	2.0	.6	@	28.9	24.7	18.0	6.5
Ann	76.2	66.6	N/A	N/A	11.0+	Dec 1996	31	44.6	Dec 1996	39+	Jan 1997	2	29	Feb 1996	43.8	30.4	8.9	2.4	.1	132.0	116.2	99.1	66.5

+ 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	7/25	7/16	7/11	7/06	7/01	6/26	6/21	6/15	6/07
32	7/04	6/27	6/22	6/18	6/14	6/10	6/05	5/31	5/24
28	6/10	6/05	6/02	5/30	5/28	5/25	5/22	5/19	5/15
24	5/21	5/16	5/13	5/11	5/08	5/06	5/03	4/30	4/25
20	5/10	5/06	5/02	4/30	4/27	4/25	4/22	4/19	4/14
16	4/26	4/22	4/19	4/16	4/14	4/12	4/09	4/07	4/03

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	8/03	8/09	8/13	8/17	8/21	8/24	8/28	9/01	9/07
32	8/18	8/24	8/28	8/31	9/03	9/06	9/10	9/14	9/19
28	9/07	9/11	9/14	9/16	9/19	9/21	9/24	9/26	9/30
24	9/21	9/26	9/30	10/03	10/05	10/08	10/11	10/15	10/20
20	9/26	10/02	10/07	10/10	10/14	10/18	10/22	10/26	11/02
16	10/14	10/19	10/24	10/27	10/30	11/03	11/06	11/10	11/16

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	79	69	62	56	50	44	38	31	20
32	108	99	92	86	81	75	70	63	54
28	131	125	121	117	113	110	106	102	96
24	166	161	156	153	150	146	143	139	133
20	191	183	178	173	169	165	160	155	147
16	219	212	207	202	198	194	190	185	178

***** 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	1767	1481	1294	819	451	189	102	150	378	718	1113	1566	10028
60	1612	1341	1139	670	319	95	33	64	237	563	963	1411	8447
57	1519	1257	1046	582	250	55	14	32	164	473	873	1318	7583
55	1457	1201	984	524	210	35	7	18	123	415	813	1256	7043
50	1302	1061	829	385	125	9	0	2	49	280	663	1101	5806
32	747	570	316	56	5	0	0	0	0	21	196	568	2479

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	3	14	46	227	591	825	988	916	613	326	73	25	4647
55	0	0	0	5	82	170	282	220	46	7	0	0	812
57	0	0	0	3	61	130	227	172	28	4	0	0	625
60	0	0	0	1	36	80	153	112	11	0	0	0	393
65	0	0	0	0	13	24	67	43	1	0	0	0	148
70	0	0	0	0	4	5	17	10	0	0	0	0	36

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	12	109	384	614	762	700	420	164	23	0	0	0	12	121	505	1119	1881	2581	3001	3165	3188	3188
45	0	0	1	58	255	464	607	545	281	83	8	0	0	0	1	59	314	778	1385	1930	2211	2294	2302	2302
50	0	0	0	28	154	322	452	392	170	38	0	0	0	0	0	28	182	504	956	1348	1518	1556	1556	1556
55	0	0	0	15	81	198	302	248	90	10	0	0	0	0	0	15	96	294	596	844	934	944	944	944
60	0	0	0	3	34	99	172	129	36	2	0	0	0	0	0	3	37	136	308	437	473	475	475	475
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	15	96	274	396	487	449	271	118	15	0	0	0	15	111	385	781	1268	1717	1988	2106	2121	2121

(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