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: STANDISH 5 SW, MI **COOP ID: 207820**

Climate Division: MI 7 **NWS Call Sign:** **Elevation: 645 Feet** **Lat: 43˚57N** **Lon: 84˚02W**

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	28.0	9.6	18.8	58	1950	26	29.5	1990	-27	1994	31	9.2	1994	1432	0	.0	.0	.3	20.2	30.3	7.9
Feb	30.7	10.9	20.8	63	1999	12	30.3	1998	-28	1994	1	8.7	1979	1238	0	.0	.0	.6	15.8	27.7	6.8
Mar	40.5	20.4	30.5	79	2000	9	39.8	2000	-18	1962	2	23.5	1978	1072	0	.0	.0	5.8	6.5	27.4	1.9
Apr	54.0	31.0	42.5	89	1990	26	46.7	1986	5	1965	3	37.3	1975	675	0	.0	.0	18.2	.4	17.8	.0
May	67.4	41.3	54.4	96	1988	31	60.4	1991	20	1969	23	47.2	1997	347	16	.0	.3	29.9	.0	4.4	.0
Jun	76.7	50.9	63.8	100	1995	20	68.1	1971	29	1949	8	59.1	1982	104	68	@	1.6	30.0	.0	.1	.0
Jul	81.4	55.2	68.3	100+	1977	7	72.1	1988	36+	1965	6	62.9	1992	27	128	.1	3.2	31.0	.0	.0	.0
Aug	78.7	52.9	65.8	100	2001	9	70.0	1995	31+	1982	29	61.6	1992	65	89	.0	1.4	31.0	.0	.1	.0
Sep	70.8	45.4	58.1	99	1953	2	63.3	1971	23+	1991	28	52.6	1975	222	15	.0	.3	29.9	.0	2.0	.0
Oct	58.6	35.4	47.0	89	1963	6	53.3	1971	15	1966	30	41.7	1987	559	0	.0	.0	25.6	.0	11.5	.0
Nov	44.6	27.8	36.2	78	1950	1	42.1	1999	-11	1995	29	29.7	1995	865	0	.0	.0	8.9	2.4	22.0	@
Dec	33.1	17.9	25.5	67	2001	6	33.9	1982	-22	1951	19	15.0	1989	1224	0	.0	.0	1.6	13.8	29.1	2.5
Ann	55.4	33.2	44.3	100+	Aug 2001	9	72.1	Jul 1988	-28	Feb 1994	1	8.7	Feb 1979	7830	316	.1	6.8	212.8	59.1	172.4	19.1

\+ 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	1.75	1.62	1.50	1985	1	3.04	1998	.39	1977
Feb	1.24	1.09	1.44	1950	14	3.06	1997	.14	1995
Mar	2.00	1.80	1.60	1985	6	5.16	1985	.39	1999
Apr	2.65	2.40	2.80	1991	9	7.04	1991	.92	1997
May	2.86	2.70	2.66	1968	27	7.58	1983	.38	1988
Jun	3.33	3.17	2.60	1994	25	6.38	1974	1.13	1977
Jul	2.69	2.77	3.79	1952	21	4.91	1999	.53	1989
Aug	3.89	3.84	3.15	1955	30	9.00	1977	.60	1976
Sep	3.37	2.93	3.75	1986	11	13.11	1986	.00	1979
Oct	2.53	2.38	2.66	1991	5	5.42	1990	.56	1975
Nov	2.35	2.22	1.73	1990	6	5.05+	1994	.18	1976
Dec	1.79	1.64	2.33	1982	3	5.12	1971	.33+	1997
Ann	30.45	29.68	3.79	Jul 1952	21	13.11	Sep 1986	.00	Sep 1979

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	10.4	4.8	.9	.2
Feb	7.7	3.9	.5	.2
Mar	8.9	5.3	1.2	.2
Apr	10.9	6.4	1.6	.4
May	9.9	6.3	1.9	.5
Jun	9.8	6.2	2.4	.6
Jul	8.7	5.5	1.7	.5
Aug	10.2	6.8	2.6	1.0
Sep	11.1	6.6	2.3	.7
Oct	10.2	5.4	1.6	.4
Nov	10.4	5.6	1.3	.3
Dec	9.7	4.9	1.0	.2
Ann	117.9	67.7	19.0	5.2

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	.61	.77	1.01	1.22	1.41	1.61	1.82	2.08	2.40	2.90	3.36
Feb	.25	.36	.55	.71	.88	1.06	1.27	1.51	1.84	2.36	2.85
Mar	.53	.72	1.01	1.26	1.51	1.77	2.06	2.41	2.86	3.56	4.22
Apr	.98	1.23	1.58	1.88	2.16	2.45	2.77	3.13	3.60	4.31	4.97
May	.87	1.14	1.55	1.90	2.23	2.58	2.97	3.42	4.01	4.92	5.77
Jun	1.26	1.57	2.02	2.39	2.74	3.09	3.48	3.93	4.50	5.38	6.18
Jul	.79	1.04	1.43	1.76	2.08	2.42	2.79	3.23	3.80	4.68	5.51
Aug	.99	1.35	1.92	2.42	2.91	3.43	4.01	4.70	5.60	7.02	8.34
Sep	.64	1.11	1.68	2.14	2.58	3.04	3.54	4.13	4.89	6.09	7.20
Oct	.79	1.03	1.39	1.69	1.99	2.30	2.64	3.03	3.54	4.34	5.08
Nov	.51	.73	1.07	1.39	1.70	2.03	2.41	2.85	3.45	4.39	5.28
Dec	.38	.54	.80	1.04	1.28	1.54	1.83	2.17	2.63	3.36	4.06
Ann	22.98	24.45	26.33	27.74	28.98	30.18	31.40	32.75	34.38	36.73	38.74

\+ 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	14.0	11.0	7	6	13.0	1979	14	31.0	1978	37	1979	18	25	1979	6.5	4.2	1.5	.7	.1	23.2	19.8	15.2	5.4
Feb	8.7	8.6	6	3	10.0	1981	11	20.0	1985	34	1985	17	22	1985	4.2	2.9	.9	.2	.1	-9.9	-9.9	-9.9	-9.9
Mar	6.8	8.0	2	#	8.0	1985	5	15.0	1983	16+	1986	9	8	1978	3.0	2.3	.7	.3	.0	9.2	6.4	4.2	1.5
Apr	1.4	.0	#	0	7.0	1975	3	7.5	1975	5	1973	10	#+	1987	.7	.6	.1	.1	.0	.5	.1	@	.0
May	#	.0	0	0	#	1976	4	#	1976	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	#	.0	0	0	#	1979	28	#+	1979	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	3.4	2.1	#	#	4.5	1977	26	9.7	1977	10	1977	28	2	1977	1.6	1.3	.3	.0	.0	1.9	.9	.3	@
Dec	9.2	9.2	2	1	8.0	1983	22	22.8	1972	17	2000	31	9	2000	5.2	3.7	1.0	.3	.0	13.5	7.4	5.2	1.1
Ann	43.5	38.9	N/A	N/A	13.0	Jan 1979	14	31.0	Jan 1978	37	Jan 1979	18	25	Jan 1979	21.2	15.0	4.5	1.6	.2	-9.9	-9.9	-9.9	-9.9

+ 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	6/13	6/09	6/06	6/03	6/01	5/29	5/27	5/24	5/20
32	5/31	5/25	5/22	5/19	5/16	5/13	5/10	5/06	5/01
28	5/11	5/07	5/04	5/02	4/30	4/27	4/25	4/22	4/18
24	4/28	4/24	4/22	4/20	4/18	4/15	4/13	4/11	4/07
20	4/18	4/13	4/10	4/07	4/05	4/03	3/31	3/28	3/23
16	4/09	4/05	4/02	3/30	3/27	3/25	3/22	3/19	3/15

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	123	117	113	109	106	103	99	95	89
32	153	146	141	136	132	128	124	119	111
28	181	175	171	167	164	160	157	152	146
24	215	206	200	195	190	185	180	174	165
20	236	229	224	220	216	212	207	202	195
16	264	256	250	246	241	237	232	227	219

***** 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	1432	1238	1072	675	347	104	27	65	222	559	865	1224	7830
60	1277	1098	917	526	224	40	4	16	113	409	715	1069	6408
57	1184	1014	824	437	163	19	0	5	67	323	625	976	5637
55	1122	958	762	380	127	11	0	2	44	269	565	914	5154
50	967	818	609	247	60	2	0	0	11	155	416	759	4044
32	440	350	169	10	0	0	0	0	0	2	49	278	1298

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	31	36	120	325	692	955	1125	1048	783	466	175	76	5832
55	0	0	0	5	106	275	412	337	137	20	0	0	1292
57	0	0	0	2	80	224	350	278	100	12	0	0	1046
60	0	0	0	1	48	155	261	196	56	5	0	0	722
65	0	0	0	0	16	68	128	89	15	0	0	0	316
70	0	0	0	0	4	19	44	26	2	0	0	0	95

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	33	153	454	724	887	815	558	253	58	7	0	0	33	186	640	1364	2251	3066	3624	3877	3935	3942
45	0	0	14	83	308	574	732	660	409	141	25	2	0	0	14	97	405	979	1711	2371	2780	2921	2946	2948
50	0	0	6	42	191	425	577	506	275	69	7	0	0	0	6	48	239	664	1241	1747	2022	2091	2098	2098
55	0	0	1	17	106	282	422	351	158	27	0	0	0	0	1	18	124	406	828	1179	1337	1364	1364	1364
60	0	0	0	7	53	158	270	208	78	5	0	0	0	0	0	7	60	218	488	696	774	779	779	779
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	25	109	292	454	576	522	350	162	34	2	0	0	25	134	426	880	1456	1978	2328	2490	2524	2526

(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