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: HERMAN, MI **COOP ID: 203744**

Climate Division: MI 1 **NWS Call Sign:** **Elevation: 1,740 Feet** **Lat: 46˚40N** **Lon: 88˚21W**

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	20.1	3.5	11.8	54	1973	26	22.2	1990	-36	1977	9	1.0	1977	1649	0	.0	.0	.1	27.2	31.0	12.3
Feb	26.1	5.7	15.9	61	1976	24	29.6	1998	-40	1979	17	6.2	1979	1375	0	.0	.0	.7	20.7	27.9	10.3
Mar	36.2	14.2	25.2	71	2000	8	33.7	2000	-32	1984	7	17.3	1972	1233	0	.0	.0	3.8	11.7	28.6	5.8
Apr	50.3	26.2	38.3	91	1980	22	46.9	1987	-17	1982	7	30.7	1975	804	0	.0	@	14.9	2.2	22.5	.9
May	65.5	38.7	52.1	93	1969	28	60.7	1977	12	1974	7	42.8	1997	422	22	.0	@	28.3	.2	10.3	.0
Jun	72.9	47.4	60.2	96	1971	27	67.3	1995	22	1972	10	53.6	1982	183	37	.0	.2	29.8	.0	2.0	.0
Jul	76.6	52.4	64.5	96	1988	28	69.5	1983	26+	1968	10	58.5	1992	97	82	.0	.9	31.0	.0	.3	.0
Aug	74.1	51.2	62.7	95	1976	19	68.2	1995	27+	1968	27	56.4	1977	132	61	.0	.4	31.0	.0	.7	.0
Sep	65.2	43.5	54.4	95	1976	7	60.9	1998	11	2000	28	48.1	1974	325	5	.0	.1	28.6	.0	4.6	.0
Oct	53.1	34.0	43.6	86	1992	2	49.9	1971	1	1969	23	37.3	1976	666	0	.0	.0	19.4	.5	15.0	.0
Nov	36.2	22.0	29.1	73	1978	3	37.3	1999	-12+	1976	30	20.9	1995	1078	0	.0	.0	3.8	12.3	26.5	.8
Dec	24.3	9.8	17.1	58	1982	3	26.8	1994	-37	1983	19	6.9	1983	1487	0	.0	.0	.2	25.0	30.8	7.5
Ann	50.1	29.1	39.6	96+	Jul 1988	28	69.5	Jul 1983	-40	Feb 1979	17	1.0	Jan 1977	9451	207	.0	1.6	191.6	99.8	200.2	37.6

\+ 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: 1968-2001

(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	2.47	2.25	.99	1996	18	4.87	1997	1.23	1991
Feb	1.64	1.62	1.17	1971	5	3.68	1971	.35	1993
Mar	2.83	2.58	2.60	1996	25	6.18	1976	.76	1974
Apr	2.31	2.06	3.07	1985	19	5.64	1985	.44	1998
May	3.37	3.09	2.13	1975	20	9.83	1999	.55	1986
Jun	3.69	3.56	3.09	1972	20	7.19	1979	.82	1992
Jul	4.07	3.55	3.36	1982	11	9.64	1982	1.40	1989
Aug	4.10	3.76	3.20	1987	1	9.42	1987	.54	1976
Sep	4.07	3.82	3.12	1978	11	8.67	1980	.67	1989
Oct	3.58	3.34	2.97	1982	20	7.64	1979	1.06	1994
Nov	3.35	3.33	1.59	1982	12	6.77	1983	.37	1994
Dec	2.77	2.88	1.35	1975	14	6.77	2000	.56	1994
Ann	38.25	38.94	3.36	Jul 1982	11	9.83	May 1999	.35	Feb 1993

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	20.1	8.6	.8	.0
Feb	14.5	5.4	.4	.1
Mar	13.6	7.0	1.4	.6
Apr	10.2	6.0	1.1	.2
May	10.6	7.3	2.2	.8
Jun	12.6	8.2	2.4	.8
Jul	12.0	7.7	2.8	1.0
Aug	13.0	7.5	2.6	1.0
Sep	13.8	9.0	2.3	.8
Oct	14.0	8.9	1.6	.6
Nov	16.0	9.5	1.6	.4
Dec	19.1	8.5	1.2	.1
Ann	169.5	93.6	20.4	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	1.10	1.32	1.63	1.87	2.11	2.34	2.59	2.88	3.24	3.79	4.28
Feb	.54	.69	.92	1.11	1.30	1.50	1.71	1.95	2.27	2.77	3.22
Mar	.71	.98	1.39	1.75	2.11	2.49	2.92	3.42	4.07	5.11	6.08
Apr	.63	.85	1.18	1.47	1.76	2.06	2.39	2.79	3.30	4.11	4.86
May	.83	1.15	1.64	2.07	2.51	2.96	3.47	4.08	4.87	6.12	7.30
Jun	1.24	1.59	2.10	2.53	2.95	3.38	3.85	4.40	5.11	6.20	7.21
Jul	1.44	1.82	2.38	2.85	3.29	3.75	4.25	4.84	5.58	6.74	7.79
Aug	1.26	1.65	2.23	2.73	3.21	3.71	4.27	4.91	5.75	7.05	8.26
Sep	1.57	1.95	2.49	2.94	3.36	3.79	4.26	4.80	5.49	6.55	7.51
Oct	1.25	1.59	2.08	2.49	2.89	3.29	3.73	4.25	4.91	5.93	6.86
Nov	1.07	1.38	1.85	2.26	2.64	3.04	3.48	4.00	4.66	5.70	6.65
Dec	1.00	1.26	1.63	1.95	2.25	2.56	2.90	3.29	3.79	4.56	5.27
Ann	25.24	27.68	30.86	33.29	35.47	37.60	39.80	42.26	45.26	49.64	53.46

\+ 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: 1968-2001
(3) Derived from 1971-2000 serially complete daily data

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Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	46.7	42.6	23	22
Feb	30.6	27.8	27	28
Mar	33.6	31.2	24	24
Apr	12.9	9.5	9	8
May	3.5	.3	#	#
Jun	#	.0	#	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.2	.0	#	0
Oct	8.9	5.9	1	#
Nov	35.9	36.7	5	5
Dec	44.5	45.7	14	14
Ann	216.8	199.7	N/A	N/A

Extremes (2)

Month	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year
Jan	27.5	1975	26	80.1	1975	50	1997	25	38	1997
Feb	25.0	1983	3	58.2	1971	48	1985	14	38+	1996
Mar	26.0	1996	25	78.1	1976	58	1988	14	38+	1988
Apr	27.5	1977	5	41.0	1982	43+	1996	2	31	1972
May	17.0	1990	10	26.0	1997	24	1996	1	3	1996
Jun	#	1998	2	#+	1998	#	1998	2	#	1998
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	3.0	1995	22	3.0	1995	#+	1984	26	#+	1984
Oct	14.4	1982	20	30.5	1979	14	1982	20	3	1988
Nov	13.0	1988	6	57.1	1975	21+	1989	18	10+	1995
Dec	30.0	1996	19	75.3	2000	42	2000	26	25	2000
Ann	30.0	Dec 1996	19	80.1	Jan 1975	58	Mar 1988	14	38+	Jan 1997

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	19.8	13.7	6.1	2.5	.8
Feb	13.8	9.3	3.7	1.5	.3
Mar	11.6	8.9	4.0	2.3	.8
Apr	5.4	4.3	1.7	.7	.1
May	1.2	.9	.4	.2	.1
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.2	.1	@	.0	.0
Oct	3.9	2.7	1.0	.4	.1
Nov	12.9	9.3	4.9	2.0	.2
Dec	18.7	13.3	5.9	2.7	.6
Ann	87.5	62.5	27.7	12.3	3.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	28.9	28.9	28.9	28.1
Feb	26.9	26.9	26.9	26.3
Mar	29.7	29.1	28.3	25.7
Apr	17.8	15.2	13.1	9.1
May	1.0	.7	.4	.1
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	3.9	2.3	1.4	.4
Nov	19.5	16.4	12.4	4.4
Dec	29.0	28.9	28.7	23.0
Ann	156.7	148.4	140.1	117.1

+ 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	7/28	7/18	7/11	7/05	6/30	6/24	6/18	6/11	6/02
32	7/11	7/01	6/24	6/18	6/13	6/08	6/02	5/26	5/16
28	6/19	6/12	6/07	6/02	5/29	5/25	5/21	5/15	5/08
24	6/01	5/25	5/20	5/16	5/12	5/07	5/03	4/28	4/21
20	5/15	5/09	5/05	5/01	4/28	4/24	4/20	4/16	4/10
16	5/04	4/28	4/24	4/21	4/18	4/15	4/11	4/07	4/02

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	8/04	8/12	8/17	8/22	8/26	8/30	9/04	9/09	9/16
32	8/11	8/20	8/27	9/01	9/06	9/12	9/17	9/24	10/03
28	9/01	9/07	9/12	9/16	9/20	9/24	9/28	10/03	10/10
24	9/18	9/25	9/30	10/05	10/09	10/13	10/18	10/23	10/31
20	10/05	10/11	10/16	10/19	10/23	10/26	10/30	11/03	11/09
16	10/15	10/23	10/28	11/01	11/06	11/10	11/14	11/19	11/27

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	99	84	74	65	56	48	39	29	14
32	131	115	104	94	85	76	66	54	39
28	145	134	126	120	113	107	100	92	81
24	180	170	162	156	150	144	137	130	119
20	206	196	189	183	178	172	166	159	150
16	231	221	213	207	201	195	189	181	171

***** 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	1649	1375	1233	804	422	183	97	132	325	666	1078	1487	9451
60	1494	1235	1078	656	297	96	33	55	195	513	928	1332	7912
57	1401	1151	985	569	234	57	14	27	132	425	838	1239	7072
55	1339	1095	923	512	196	38	8	16	97	368	778	1177	6547
50	1184	955	768	379	117	11	0	2	37	241	628	1022	5344
32	637	475	280	62	5	0	0	0	0	14	170	491	2134

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	11	24	70	249	628	844	1008	952	670	372	82	27	4937
55	0	0	0	9	106	192	303	254	77	12	0	0	953
57	0	0	0	6	81	151	247	203	51	7	0	0	746
60	0	0	0	2	52	100	173	139	25	2	0	0	493
65	0	0	0	0	22	37	82	61	5	0	0	0	207
70	0	0	0	0	7	10	25	18	0	0	0	0	60

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	1	18	106	397	612	766	709	429	181	22	1	0	1	19	125	522	1134	1900	2609	3038	3219	3241	3242
45	0	0	5	59	271	462	611	554	291	97	8	0	0	0	5	64	335	797	1408	1962	2253	2350	2358	2358
50	0	0	0	28	167	322	458	400	177	45	2	0	0	0	0	28	195	517	975	1375	1552	1597	1599	1599
55	0	0	0	13	90	200	311	256	92	17	0	0	0	0	0	13	103	303	614	870	962	979	979	979
60	0	0	0	6	47	103	175	137	40	3	0	0	0	0	0	6	53	156	331	468	508	511	511	511
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	16	86	269	392	493	438	254	108	11	0	0	0	16	102	371	763	1256	1694	1948	2056	2067	2067

(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