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: THREE RIVERS, MI **COOP ID: 208184**

Climate Division: MI 9 **NWS Call Sign:** **Elevation: 810 Feet** **Lat: 41˚56N** **Lon: 85˚38W**

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	30.1	13.4	21.8	67	1950	25	32.4	1990	-23	1994	20	8.9	1977	1341	0	.0	.0	1.5	16.8	29.2	4.0
Feb	34.1	15.2	24.7	72	1999	12	34.7	1998	-18	1979	9	11.3	1978	1131	0	.0	.0	2.8	11.6	25.5	3.1
Mar	45.5	24.1	34.8	80+	1981	31	42.6	2000	-7	1967	1	26.0	1984	936	0	.0	.0	11.5	3.6	22.9	.2
Apr	57.9	33.9	45.9	87+	1980	22	51.5	1985	7	1982	7	40.0	1975	575	1	.0	.0	23.6	.2	11.3	.0
May	70.2	45.2	57.7	92+	1953	30	65.2	1991	25+	1968	6	51.1	1997	270	44	.0	.7	30.4	.0	1.4	.0
Jun	79.6	54.7	67.2	103	1988	26	71.9	1971	34	1972	11	62.7	1992	54	118	.1	3.3	30.0	.0	.0	.0
Jul	83.4	59.0	71.2	102	1999	31	75.9	1999	41+	1984	8	67.7	1992	7	200	@	5.8	31.0	.0	.0	.0
Aug	80.9	56.7	68.8	100+	1948	26	75.0	1995	35	1976	30	64.5	1992	34	151	@	2.9	31.0	.0	.0	.0
Sep	73.9	48.9	61.4	100+	1953	1	65.5	1978	27	1976	24	56.5	1975	142	34	.0	.9	30.0	.0	.6	.0
Oct	61.8	37.5	49.7	89+	1951	4	57.6	1971	13	1962	26	44.0	1976	479	3	.0	.0	27.7	.0	7.4	.0
Nov	47.1	28.9	38.0	81	1950	1	44.1	1999	-6	1950	25	30.3	1976	810	0	.0	.0	13.2	1.8	18.6	.0
Dec	35.3	19.5	27.4	72	2001	6	36.2	1982	-15+	1976	31	16.8	1983	1167	0	.0	.0	3.1	10.7	27.6	1.4
Ann	58.3	36.4	47.4	103	Jun 1988	26	75.9	Jul 1999	-23	Jan 1994	20	8.9	Jan 1977	6946	551	.1	13.6	235.8	44.7	144.5	8.7

\+ 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	1.97	1.88	2.69	1960	12	4.30	1998	.50	1981
Feb	1.63	1.45	3.09	1954	16	4.23	1997	.04	1987
Mar	2.61	2.64	2.12	1949	31	5.38	1976	.60	1981
Apr	3.32	3.37	3.22	1950	24	6.19	1981	.30	1971
May	3.67	3.83	3.06	1952	24	6.93	2000	.62	1977
Jun	3.75	3.87	4.35	1989	1	6.83	1989	.49	1988
Jul	3.99	3.81	4.08	1992	23	9.40	1992	.84	1977
Aug	3.83	3.65	3.22	1997	17	7.76	1975	.84	1976
Sep	3.66	3.46	2.44	1993	3	7.15	1993	.01	1979
Oct	3.00	2.50	3.19	1986	4	7.88	1991	.98	1982
Nov	2.96	2.75	3.17	1990	28	6.21	1985	1.06	1999
Dec	2.61	2.60	1.87	1965	24	4.87	1990	.82	1976
Ann	37.00	36.54	4.35	Jun 1989	1	9.40	Jul 1992	.01	Sep 1979

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	13.1	5.3	1.0	.2
Feb	10.7	4.6	.7	.3
Mar	11.6	5.9	1.6	.4
Apr	12.6	7.5	2.0	.6
May	12.2	7.2	2.5	.7
Jun	10.1	6.3	2.5	.8
Jul	10.1	6.4	2.1	1.1
Aug	9.9	6.4	2.5	1.1
Sep	10.4	6.4	2.5	1.1
Oct	11.3	6.3	1.9	.7
Nov	12.7	6.7	1.5	.4
Dec	14.7	6.6	1.4	.4
Ann	139.4	75.6	22.2	7.8

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	.55	.74	1.03	1.27	1.51	1.76	2.04	2.37	2.80	3.47	4.09
Feb	.29	.44	.68	.90	1.13	1.37	1.65	1.99	2.44	3.17	3.86
Mar	.94	1.19	1.54	1.84	2.12	2.41	2.73	3.09	3.56	4.28	4.94
Apr	1.14	1.46	1.91	2.30	2.67	3.05	3.47	3.95	4.57	5.53	6.42
May	1.27	1.62	2.12	2.55	2.95	3.37	3.83	4.36	5.04	6.10	7.07
Jun	1.03	1.38	1.92	2.40	2.86	3.35	3.88	4.52	5.34	6.64	7.86
Jul	1.12	1.50	2.07	2.57	3.06	3.57	4.13	4.80	5.66	7.02	8.28
Aug	1.19	1.55	2.09	2.56	3.01	3.47	3.99	4.59	5.37	6.58	7.70
Sep	.61	.93	1.46	1.96	2.48	3.04	3.68	4.46	5.50	7.19	8.81
Oct	.98	1.26	1.68	2.04	2.38	2.73	3.12	3.58	4.16	5.07	5.91
Nov	.95	1.24	1.65	2.00	2.35	2.70	3.08	3.54	4.12	5.03	5.86
Dec	.95	1.19	1.55	1.84	2.13	2.42	2.73	3.10	3.56	4.29	4.95
Ann	29.47	30.99	32.90	34.33	35.58	36.78	38.00	39.34	40.95	43.25	45.21

\+ 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)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	8.3	7.1	4	3
Feb	5.8	5.7	4	2
Mar	4.7	3.5	1	1
Apr	1.4	.6	#	#
May	.0	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.5	.0	#	0
Nov	3.4	2.8	#	#
Dec	9.8	7.9	2	1
Ann	33.9	27.6	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	10.3	1979	14	23.2	1979	27	1978	31	14	1979
Feb	8.0	1985	12	14.4	1985	27	1978	5	21	1978
Mar	8.4	1973	17	12.5	1982	16	1982	5	10	1978
Apr	4.5	1975	3	6.8	1982	4	1982	7	1	1982
May	.4	1974	6	.4	1974	0	0	0	0	0
Jun	.0	0	0	.0	0	0	0	0	0	0
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	.0	0	0	.0	0	0	0	0	0	0
Oct	6.4	1989	20	7.1	1989	3	1989	20	#+	1997
Nov	8.2	1972	14	13.4	1972	6	1977	28	1+	2000
Dec	12.9	2000	12	35.0	2000	19	2000	31	14	2000
Ann	12.9	Dec 2000	12	35.0	Dec 2000	27+	Feb 1978	5	21	Feb 1978

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	8.9	3.2	.5	.2	@
Feb	6.8	2.3	.4	.1	.0
Mar	3.8	1.4	.6	.1	.0
Apr	1.2	.6	.1	.0	.0
May	@	.0	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.0	.0	.0	.0	.0
Oct	.3	.1	@	@	.0
Nov	3.2	1.4	.3	.1	.0
Dec	8.4	3.0	.5	.2	@
Ann	32.6	12.0	2.4	.7	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	14.9	7.7	3.5	1.5
Feb	13.7	8.0	3.3	.4
Mar	4.6	1.5	.4	.0
Apr	.7	.2	.0	.0
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.2	@	.0	.0
Nov	3.2	1.0	.2	.0
Dec	11.6	5.2	2.4	.2
Ann	48.9	23.6	9.8	2.1

+ 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	6/05	5/29	5/25	5/21	5/17	5/14	5/10	5/05	4/29
32	5/17	5/13	5/09	5/07	5/04	5/02	4/29	4/26	4/21
28	5/08	5/02	4/28	4/25	4/22	4/19	4/15	4/11	4/06
24	4/19	4/16	4/13	4/11	4/09	4/07	4/05	4/03	3/30
20	4/10	4/07	4/04	4/01	3/30	3/28	3/26	3/23	3/19
16	4/06	4/01	3/28	3/25	3/22	3/19	3/16	3/12	3/07

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	9/16	9/20	9/23	9/25	9/27	9/30	10/02	10/05	10/08
32	9/21	9/26	9/30	10/02	10/05	10/08	10/11	10/14	10/19
28	10/02	10/08	10/12	10/16	10/19	10/22	10/26	10/30	11/05
24	10/15	10/21	10/25	10/29	11/01	11/04	11/08	11/12	11/18
20	10/28	11/04	11/09	11/13	11/17	11/21	11/25	11/30	12/07
16	11/10	11/16	11/21	11/24	11/28	12/01	12/04	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	153	146	141	136	132	128	124	119	112
32	169	164	160	156	153	150	147	143	137
28	205	196	190	185	180	175	169	163	155
24	225	218	214	209	205	201	197	192	185
20	255	247	241	236	231	226	221	215	207
16	273	265	260	255	250	245	240	234	226

***** 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	1341	1131	936	575	270	54	7	34	142	479	810	1167	6946
60	1186	991	781	429	168	16	0	7	59	336	660	1012	5645
57	1093	907	688	344	119	7	0	2	30	259	570	919	4938
55	1031	851	626	292	91	4	0	0	17	213	510	857	4492
50	876	712	482	176	41	0	0	0	3	118	367	708	3483
32	373	277	102	4	0	0	0	0	0	2	39	251	1048

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	55	70	189	420	797	1054	1215	1141	882	549	220	107	6699
55	0	0	0	18	175	368	502	428	209	47	1	0	1748
57	0	0	0	10	141	311	440	367	162	31	0	0	1462
60	0	0	0	4	97	230	347	279	101	15	0	0	1073
65	0	0	0	1	44	118	200	151	34	3	0	0	551
70	0	0	0	0	16	43	84	64	6	0	0	0	213

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	5	16	94	273	605	862	1006	937	687	365	114	21	5	21	115	388	993	1855	2861	3798	4485	4850	4964	4985
45	0	3	55	169	451	712	851	782	537	233	60	8	0	3	58	227	678	1390	2241	3023	3560	3793	3853	3861
50	0	0	30	93	311	562	696	627	392	137	26	3	0	0	30	123	434	996	1692	2319	2711	2848	2874	2877
55	0	0	7	48	191	412	541	473	259	70	9	0	0	0	7	55	246	658	1199	1672	1931	2001	2010	2010
60	0	0	0	17	103	276	387	322	148	28	1	0	0	0	0	17	120	396	783	1105	1253	1281	1282	1282
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	10	67	178	377	562	672	622	435	227	64	11	0	10	77	255	632	1194	1866	2488	2923	3150	3214	3225

(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