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: ST JOHNS, MI **COOP ID: 207280**

Climate Division: MI 9 **NWS Call Sign:** **Elevation: 743 Feet** **Lat: 43˚01N** **Lon: 84˚33W**

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	28.7	13.9	21.3	63	1950	26	31.7	1990	-25	1984	21	11.1	1977	1355	0	.0	.0	.9	18.5	29.9	4.1
Feb	31.7	15.0	23.4	69	1999	12	33.4	1998	-17	1979	17	12.3	1979	1166	0	.0	.0	1.8	13.8	26.4	3.2
Mar	42.9	24.1	33.5	79+	1963	29	41.6	2000	-10+	1962	2	26.3	1984	976	0	.0	.0	9.2	4.8	24.9	.6
Apr	55.8	35.0	45.4	89	1990	25	51.5	1985	7+	1965	3	39.2	1975	588	1	.0	.0	21.7	.3	13.4	.0
May	68.9	46.7	57.8	92+	1987	28	64.4	1998	23	1949	11	49.7	1997	266	41	.0	.5	30.6	.0	1.9	.0
Jun	78.0	55.9	67.0	100	1953	20	71.6	1971	29	1949	8	62.0	1982	56	114	.0	2.3	30.0	.0	.0	.0
Jul	82.5	60.0	71.3	100	1988	6	77.1	1988	41+	1950	1	66.0	1992	11	204	@	5.2	31.0	.0	.0	.0
Aug	79.8	57.9	68.9	100+	1955	2	74.9	1995	38+	1964	15	63.7	1992	36	155	@	2.3	31.0	.0	.0	.0
Sep	72.4	50.4	61.4	99+	1953	1	66.8	1998	27+	1951	29	56.8	1975	143	35	.0	.8	30.0	.0	.5	.0
Oct	60.1	39.9	50.0	89	1953	3	58.7	1971	18+	1960	25	45.1	1972	468	4	.0	.0	27.2	.0	7.1	.0
Nov	45.9	30.1	38.0	79	1950	1	44.9	1975	-6	1949	26	31.2	1995	811	0	.0	.0	11.6	1.9	19.3	@
Dec	34.0	20.4	27.2	69	2001	6	35.8	1982	-10+	1951	19	17.0	2000	1172	0	.0	.0	2.4	11.8	28.5	1.5
Ann	56.7	37.4	47.1	100+	Jul 1988	6	77.1	Jul 1988	-25	Jan 1984	21	11.1	Jan 1977	7048	554	.0	11.1	227.4	51.1	151.9	9.4

\+ 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	1.67	1.33	1.50	1985	1	5.11	1998	.25	1981
Feb	1.40	.95	2.40	1997	22	4.55	1997	.38	1978
Mar	2.19	1.85	1.80	1982	31	5.21	1982	.00	1981
Apr	3.24	2.95	4.50	1994	26	7.13	1994	.56	1982
May	3.09	2.97	4.86	2001	16	8.39	2000	.42	1988
Jun	3.35	3.00	3.74	1976	30	8.57	1994	.50	1988
Jul	2.98	2.75	3.36	1997	26	5.35	1997	.59	1989
Aug	3.78	3.16	4.63	1975	21	11.36	1975	1.17	1973
Sep	3.82	3.02	3.82	1986	10	13.61	1986	.03	1979
Oct	2.89	2.70	6.50	1981	1	7.96	1981	.86	1975
Nov	2.61	2.27	2.18	1995	11	6.10	1990	.47	1986
Dec	1.96	1.82	1.67	1972	30	4.74	1972	.62	1989
Ann	32.98	31.90	6.50	Oct 1981	1	13.61	Sep 1986	.00	Mar 1981

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	10.0	4.8	1.0	.1
Feb	8.1	3.8	.6	.2
Mar	9.4	5.4	1.5	.3
Apr	11.6	7.7	1.9	.4
May	9.9	6.3	2.1	.6
Jun	9.4	6.4	2.2	.8
Jul	9.2	6.1	1.9	.8
Aug	9.7	6.8	2.7	.9
Sep	10.3	6.9	2.7	.9
Oct	10.6	6.1	1.9	.4
Nov	11.3	5.8	1.7	.4
Dec	10.0	5.3	1.1	.2
Ann	119.5	71.4	21.3	6.0

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	.34	.50	.74	.97	1.19	1.43	1.71	2.03	2.47	3.16	3.82
Feb	.30	.43	.64	.82	1.01	1.21	1.43	1.70	2.05	2.62	3.15
Mar	.59	.90	1.26	1.53	1.79	2.05	2.33	2.65	3.07	3.70	4.29
Apr	1.15	1.45	1.89	2.27	2.62	2.98	3.38	3.84	4.43	5.34	6.18
May	.76	1.05	1.50	1.90	2.30	2.72	3.19	3.74	4.47	5.63	6.72
Jun	1.02	1.34	1.81	2.22	2.62	3.03	3.48	4.02	4.70	5.78	6.77
Jul	.68	.96	1.40	1.79	2.18	2.59	3.06	3.61	4.34	5.50	6.59
Aug	1.27	1.63	2.15	2.60	3.02	3.46	3.95	4.51	5.23	6.35	7.39
Sep	.52	.84	1.38	1.91	2.47	3.08	3.80	4.67	5.85	7.77	9.63
Oct	1.13	1.40	1.78	2.10	2.39	2.70	3.02	3.40	3.88	4.62	5.30
Nov	.72	.97	1.34	1.67	2.00	2.33	2.71	3.15	3.72	4.63	5.47
Dec	.57	.75	1.03	1.28	1.51	1.76	2.03	2.35	2.77	3.42	4.03
Ann	25.55	27.04	28.92	30.33	31.57	32.75	33.97	35.31	36.92	39.22	41.20

\+ 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	11.8	10.7	5	4
Feb	8.8	7.4	4	3
Mar	6.3	6.4	1	1
Apr	2.3	1.0	#	#
May	#	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.3	.0	#	0
Nov	2.9	2.0	#	#
Dec	9.8	7.0	2	1
Ann	42.2	34.5	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	14.0	1978	26	27.7	1979	25+	1979	26	15	1979
Feb	11.0	1990	23	20.6	1986	30	1978	5	20	1978
Mar	9.0	1973	17	12.0+	1992	15	1978	7	9	1978
Apr	12.1	1975	3	13.5	1975	13	1975	3	1	1975
May	#	1996	1	#+	1996	#	1996	1	#	1996
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	3.0	1997	27	3.0	1997	3	1997	28	#+	1997
Nov	5.0	1974	14	8.8	1978	7	1978	28	1	1995
Dec	14.0	2000	12	23.1	1973	14+	2000	20	9	2000
Ann	14.0+	Dec 2000	12	27.7	Jan 1979	30	Feb 1978	5	20	Feb 1978

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	6.2	4.0	1.7	.5	@
Feb	4.9	3.4	1.1	.2	@
Mar	3.2	2.2	.7	.2	.0
Apr	.9	.7	.3	.1	@
May	.0	.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	.2	.1	@	.0	.0
Nov	1.8	1.3	.3	.1	.0
Dec	5.6	3.9	1.4	.3	.1
Ann	22.8	15.6	5.5	1.4	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	18.0	14.6	10.0	2.7
Feb	14.7	10.4	7.3	3.0
Mar	5.4	3.3	2.3	.4
Apr	.6	.3	.1	.1
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	.1	.0	.0
Nov	2.0	.6	.3	.0
Dec	11.1	6.1	2.7	.8
Ann	52.0	35.4	22.7	7.0

+ 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	6/03	5/29	5/25	5/21	5/18	5/14	5/11	5/07	5/01
32	5/20	5/15	5/12	5/09	5/06	5/03	5/01	4/27	4/23
28	5/05	5/01	4/28	4/26	4/24	4/22	4/19	4/17	4/13
24	4/20	4/16	4/14	4/11	4/09	4/07	4/04	4/02	3/29
20	4/14	4/09	4/06	4/04	4/01	3/30	3/27	3/24	3/20
16	4/03	3/30	3/27	3/24	3/22	3/19	3/17	3/14	3/10

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	9/15	9/19	9/22	9/25	9/27	9/29	10/02	10/05	10/09
32	9/25	9/29	10/02	10/05	10/08	10/10	10/13	10/16	10/21
28	10/05	10/10	10/14	10/18	10/21	10/24	10/27	10/31	11/06
24	10/17	10/24	10/28	11/01	11/05	11/09	11/13	11/18	11/24
20	10/31	11/06	11/11	11/15	11/19	11/23	11/27	12/01	12/08
16	11/13	11/19	11/23	11/27	11/30	12/04	12/08	12/12	12/18

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	140	136	131	127	123	117	110
32	173	166	162	158	154	150	146	142	135
28	200	193	188	183	179	175	171	165	158
24	234	226	220	214	209	205	199	193	185
20	259	250	243	237	231	225	219	212	203
16	276	268	262	258	253	248	243	238	230

***** 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.

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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	1355	1166	976	588	266	56	11	36	143	468	811	1172	7048
60	1200	1026	821	442	164	17	0	8	60	326	661	1017	5742
57	1107	942	728	358	115	7	0	2	30	251	571	924	5035
55	1045	886	666	306	88	4	0	0	18	205	512	862	4592
50	890	746	519	189	39	0	0	0	3	113	369	708	3576
32	372	293	120	6	0	0	0	0	0	2	42	243	1078

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	40	51	167	408	799	1048	1216	1142	883	560	221	93	6628
55	0	0	0	18	173	361	503	429	210	51	1	0	1746
57	0	0	0	10	138	304	441	369	163	34	0	0	1459
60	0	0	0	4	94	224	348	282	102	17	0	0	1071
65	0	0	0	1	41	114	204	155	35	4	0	0	554
70	0	0	0	0	14	41	93	68	7	0	0	0	223

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	8	71	236	580	831	992	919	664	343	94	16	1	9	80	316	896	1727	2719	3638	4302	4645	4739	4755
45	0	0	35	140	429	681	837	764	516	224	46	5	0	0	35	175	604	1285	2122	2886	3402	3626	3672	3677
50	0	0	18	78	291	532	682	609	371	123	19	1	0	0	18	96	387	919	1601	2210	2581	2704	2723	2724
55	0	0	5	40	175	384	527	455	241	58	6	0	0	0	5	45	220	604	1131	1586	1827	1885	1891	1891
60	0	0	0	17	94	249	374	304	134	24	0	0	0	0	0	17	111	360	734	1038	1172	1196	1196	1196
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	1	50	156	360	536	662	605	417	200	55	7	0	1	51	207	567	1103	1765	2370	2787	2987	3042	3049

(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