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: ALLEGAN 5 NE, MI **COOP ID: 200128**

Climate Division: MI 8 **NWS Call Sign:** **Elevation: 750 Feet** **Lat: 42˚35N** **Lon: 85˚47W**

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	28.8	14.4	21.6	67	1950	25	30.5	1990	-21	1981	4	10.8	1977	1345	0	.0	.0	1.1	18.2	29.8	3.8
Feb	32.6	15.6	24.1	70	1999	12	34.9	1998	-25	1996	4	11.9	1978	1145	0	.0	.0	1.8	13.2	26.1	3.6
Mar	43.1	23.8	33.5	80	1963	29	43.0	1973	-10	1980	2	25.6	1978	978	0	.0	.0	9.5	4.6	24.8	.7
Apr	56.2	33.0	44.6	88+	1977	19	49.9	1985	0	1982	7	39.1	1982	612	0	.0	.0	22.3	.2	13.2	@
May	68.3	43.4	55.9	94	1970	22	62.6	1977	23	1989	7	48.6	1997	316	32	.0	.5	30.2	.0	2.8	.0
Jun	77.5	52.8	65.2	101	1953	20	70.2	1971	32+	1972	11	60.3	1982	86	90	.0	2.2	30.0	.0	.1	.0
Jul	81.8	57.5	69.7	104	1953	1	73.3	1988	39+	1979	19	66.7	1992	14	157	@	4.3	31.0	.0	.0	.0
Aug	79.5	56.1	67.8	98	1964	2	74.1	1995	36	1986	29	62.7	1992	50	138	.0	2.4	31.0	.0	.0	.0
Sep	71.9	48.3	60.1	96+	1953	1	64.9	1998	26	1984	30	55.0	1975	174	25	.0	.6	29.9	.0	.7	.0
Oct	59.3	38.0	48.7	89+	1971	2	56.1	1971	18+	1976	28	42.9	1987	510	2	.0	.0	27.0	.0	8.6	.0
Nov	45.2	30.1	37.7	81	1950	1	43.9	1999	-8	1950	25	31.5	1995	821	0	.0	.0	11.6	2.4	19.4	.0
Dec	33.3	20.7	27.0	70	2001	6	35.3	1982	-18	1989	22	16.9	1989	1179	0	.0	.0	2.3	11.5	27.9	1.3
Ann	56.5	36.1	46.3	104	Jul 1953	1	74.1	Aug 1995	-25	Feb 1996	4	10.8	Jan 1977	7230	444	@	10.0	227.7	50.1	153.4	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

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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	2.94	2.39	1.90+	1960	13	6.59	1999	.99	1986
Feb	1.87	1.56	1.36	2001	25	4.08	1985	.00	1987
Mar	2.63	2.32	2.10	1954	25	6.39	1974	.54	1997
Apr	3.57	3.50	2.78	1975	19	5.96	1981	.65	1997
May	3.64	3.51	3.73	1989	31	10.95	2000	.83	1988
Jun	4.01	3.77	6.23	1978	26	9.33	1978	.51	1984
Jul	3.59	2.84	4.79	1982	17	9.69	1986	1.19	1996
Aug	4.06	3.78	3.52	1981	27	10.98	1987	.67	1996
Sep	4.17	4.50	3.40	2000	23	8.79	1986	.02	1979
Oct	3.02	2.77	2.52	1993	17	6.17	1991	.99	1989
Nov	3.64	2.94	3.28	1990	5	6.80	1990	.63	1999
Dec	3.28	3.00	2.23	1982	3	7.47	2000	.95	1998
Ann	40.42	40.43	6.23	Jun 1978	26	10.98	Aug 1987	.00	Feb 1987

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	16.3	8.4	1.6	.2
Feb	11.5	6.0	1.0	.0
Mar	11.7	6.2	1.7	.3
Apr	12.3	7.9	2.3	.7
May	11.1	7.1	2.1	.8
Jun	9.6	6.3	2.6	.9
Jul	9.2	6.0	2.6	.9
Aug	10.2	7.1	2.6	1.1
Sep	10.5	7.2	3.1	1.1
Oct	11.3	7.1	2.1	.4
Nov	13.0	8.5	2.1	.7
Dec	15.5	9.0	1.5	.4
Ann	142.2	86.8	25.3	7.5

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	.80	1.08	1.50	1.87	2.24	2.62	3.04	3.55	4.20	5.22	6.18
Feb	.36	.62	.94	1.19	1.44	1.69	1.97	2.29	2.72	3.38	3.99
Mar	.91	1.16	1.52	1.83	2.12	2.42	2.75	3.13	3.62	4.37	5.07
Apr	1.44	1.77	2.24	2.62	2.98	3.35	3.74	4.20	4.78	5.66	6.46
May	.92	1.27	1.80	2.26	2.73	3.21	3.76	4.40	5.24	6.58	7.82
Jun	.93	1.30	1.89	2.41	2.94	3.49	4.12	4.86	5.84	7.39	8.84
Jul	1.09	1.43	1.94	2.38	2.80	3.24	3.73	4.30	5.04	6.19	7.25
Aug	1.18	1.56	2.14	2.65	3.14	3.65	4.21	4.88	5.74	7.09	8.34
Sep	.56	.90	1.49	2.07	2.68	3.35	4.13	5.09	6.39	8.51	10.56
Oct	1.17	1.45	1.85	2.18	2.50	2.82	3.17	3.57	4.08	4.86	5.58
Nov	1.21	1.55	2.06	2.49	2.90	3.33	3.79	4.34	5.04	6.12	7.12
Dec	1.11	1.42	1.87	2.26	2.63	3.01	3.42	3.90	4.52	5.49	6.37
Ann	31.60	33.37	35.60	37.27	38.74	40.15	41.59	43.17	45.07	47.79	50.12

\+ 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	27.9	23.2	7	5
Feb	16.3	13.4	6	5
Mar	7.7	7.8	2	1
Apr	2.1	.0	#	#
May	#	.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	6.6	5.4	1	#
Dec	20.9	19.4	3	2
Ann	81.7	69.2	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	12.5	1997	11	76.9	1997	33	1978	31	21	1979
Feb	7.7	1994	26	35.9	1993	33	1978	1	23	1978
Mar	9.2	1992	22	19.5	1996	23	1982	9	12	1978
Apr	7.8	1975	3	15.6	1982	10	1982	6	1	1982
May	#	1989	6	#	1989	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	5.9	1997	27	5.9	1997	5	1997	27	#+	1997
Nov	17.0	2000	21	22.6	1991	20	2000	21	4	2000
Dec	13.5	2000	12	56.9	1983	21	2000	30	13	2000
Ann	17.0	Nov 2000	21	76.9	Jan 1997	33+	Feb 1978	1	23	Feb 1978

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	12.5	8.2	2.9	1.0	.1
Feb	8.4	5.2	1.7	.7	.0
Mar	4.6	2.6	.7	.2	.0
Apr	1.0	.6	.2	.1	.0
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	.1	@	.0
Nov	3.4	2.2	1.1	.4	@
Dec	10.6	7.6	2.8	1.0	@
Ann	40.7	26.5	9.5	3.4	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	23.5	18.0	13.9	6.9
Feb	20.1	15.6	10.6	4.9
Mar	9.0	4.5	1.9	.5
Apr	1.3	.4	.2	@
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	.1	.1	@	.0
Nov	3.6	1.5	.8	.1
Dec	17.2	11.5	7.2	2.4
Ann	74.8	51.6	34.6	14.8

+ 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	6/07	6/02	5/29	5/26	5/22	5/18	5/14	5/08
32	5/27	5/21	5/17	5/13	5/10	5/06	5/02	4/28	4/22
28	5/14	5/08	5/04	5/01	4/28	4/25	4/22	4/18	4/13
24	4/24	4/20	4/17	4/15	4/12	4/10	4/07	4/05	3/31
20	4/15	4/11	4/08	4/05	4/02	3/31	3/28	3/25	3/20
16	4/10	4/05	4/01	3/29	3/26	3/23	3/20	3/17	3/12

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	9/12	9/16	9/19	9/21	9/23	9/26	9/28	10/01	10/05
32	9/20	9/24	9/28	9/30	10/03	10/06	10/09	10/12	10/17
28	9/30	10/06	10/10	10/14	10/17	10/21	10/24	10/28	11/03
24	10/14	10/19	10/24	10/27	10/31	11/03	11/07	11/11	11/17
20	10/31	11/07	11/12	11/16	11/20	11/24	11/29	12/04	12/11
16	11/16	11/21	11/25	11/29	12/02	12/05	12/09	12/13	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	139	133	128	124	120	116	112	107	100
32	169	161	155	150	146	141	136	130	122
28	197	188	182	176	171	166	161	154	146
24	224	216	210	205	201	196	191	185	177
20	257	248	242	236	231	226	221	214	206
16	271	264	259	254	250	246	241	236	229

***** 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	1345	1145	978	612	316	86	14	50	174	510	821	1179	7230
60	1190	1005	823	464	205	32	0	13	79	364	671	1024	5870
57	1097	921	730	378	151	16	0	5	43	285	581	931	5138
55	1035	865	668	323	119	9	0	2	27	236	521	869	4674
50	880	725	522	201	58	2	0	0	6	136	376	714	3620
32	364	281	122	6	0	0	0	0	0	3	39	244	1059

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	41	60	167	384	739	995	1167	1110	842	518	208	88	6319
55	0	0	0	12	145	314	454	399	178	39	1	0	1542
57	0	0	0	7	115	260	392	340	134	25	0	0	1273
60	0	0	0	3	76	187	299	256	80	12	0	0	913
65	0	0	0	0	32	90	157	138	25	2	0	0	444
70	0	0	0	0	11	29	59	58	4	0	0	0	161

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	2	9	72	238	551	802	958	906	651	322	96	18	2	11	83	321	872	1674	2632	3538	4189	4511	4607	4625
45	0	2	35	137	406	652	803	751	501	199	48	6	0	2	37	174	580	1232	2035	2786	3287	3486	3534	3540
50	0	0	18	76	269	502	648	596	357	113	17	1	0	0	18	94	363	865	1513	2109	2466	2579	2596	2597
55	0	0	6	40	161	360	493	442	227	55	4	0	0	0	6	46	207	567	1060	1502	1729	1784	1788	1788
60	0	0	0	15	82	228	342	292	131	16	0	0	0	0	0	15	97	325	667	959	1090	1106	1106	1106
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	5	50	154	343	520	636	599	405	196	54	5	0	5	55	209	552	1072	1708	2307	2712	2908	2962	2967

(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