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: CADILLAC, MI **COOP ID: 201176**

Climate Division: MI 3 **NWS Call Sign:** **Elevation: 1,295 Feet** **Lat: 44˚16N** **Lon: 85˚24W**

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	25.9	9.1	17.5	55	1973	27	25.6	1990	-43	1951	30	9.1	1994	1473	0	.0	.0	.1	23.4	30.5	7.5
Feb	28.9	8.7	18.8	61	2000	27	30.7	1998	-34	1979	17	9.3	1978	1293	0	.0	.0	.6	18.4	27.7	7.5
Mar	38.7	17.2	28.0	75+	1990	16	38.3	2000	-22	1962	1	21.1	1971	1148	0	.0	.0	5.1	9.6	27.9	4.0
Apr	52.0	29.8	40.9	86+	1980	23	46.0	1986	-12	1954	4	35.2	1972	723	0	.0	.0	16.9	1.5	19.4	.1
May	66.3	40.4	53.4	91	1978	28	60.4	1977	15	1955	9	46.0	1997	383	21	.0	.1	28.7	.0	7.6	.0
Jun	74.8	49.9	62.4	96+	1952	16	67.2	1995	18	1949	8	56.1	1982	140	59	.0	.7	29.9	.0	.8	.0
Jul	79.2	54.5	66.9	99	1995	15	71.3	1999	32+	1950	1	61.3	1992	46	103	.0	1.5	31.0	.0	@	.0
Aug	76.7	52.6	64.7	99	1955	21	71.2	1995	26	1982	29	60.5	1992	94	82	.0	.6	31.0	.0	.3	.0
Sep	68.3	44.7	56.5	96	1953	1	60.7	1998	19+	1989	27	52.5	1993	261	6	.0	.0	29.6	.0	3.6	.0
Oct	55.9	35.2	45.6	84+	1963	6	54.1	1971	10+	1952	6	40.3	1988	603	0	.0	.0	22.1	.1	12.9	.0
Nov	42.0	26.3	34.2	74	1950	1	39.7	1999	-16	1950	25	27.2	1995	925	0	.0	.0	7.2	5.9	22.8	.2
Dec	30.6	16.0	23.3	64	2001	6	31.6	1982	-25	1976	30	11.8	1989	1294	0	.0	.0	1.0	18.2	29.7	3.6
Ann	53.3	32.0	42.7	99+	Jul 1995	15	71.3	Jul 1999	-43	Jan 1951	30	9.1	Jan 1994	8383	271	.0	2.9	203.2	77.1	183.2	22.9

\+ 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	1.87	1.79	1.35	1950	25	3.37	1997	.62	1981
Feb	1.37	1.32	1.28	1953	20	3.39	1997	.40	1982
Mar	2.05	1.82	1.78	1998	31	5.35	1976	.56	1978
Apr	2.67	2.46	2.60	1979	26	5.13	1981	.82	1986
May	2.85	2.54	2.15+	1989	31	5.76	2000	.68	1992
Jun	2.99	2.63	3.42	1965	23	6.31	1990	.65	1977
Jul	3.12	2.75	4.36	1994	5	10.14	1994	1.01	1989
Aug	3.81	3.17	3.72	1996	20	9.33	1987	.89	1973
Sep	3.99	3.46	2.70	1986	11	12.25	1986	.06	1979
Oct	3.16	2.96	4.60	1991	25	10.39	1991	.67	1971
Nov	2.70	2.58	1.69	1988	6	7.61	1988	.71	1986
Dec	1.98	1.92	2.01	1982	3	4.67	1982	.42	1994
Ann	32.56	32.16	4.60	Oct 1991	25	12.25	Sep 1986	.06	Sep 1979

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	16.6	5.8	.6	@
Feb	12.4	4.1	.4	.1
Mar	11.4	5.7	.9	.2
Apr	11.8	6.8	1.2	.4
May	10.7	6.7	1.8	.5
Jun	10.8	6.1	2.0	.6
Jul	10.1	6.2	1.9	.6
Aug	11.4	6.8	2.3	.9
Sep	12.6	7.7	2.4	.9
Oct	13.4	7.2	1.6	.4
Nov	14.4	6.9	1.5	.5
Dec	15.8	5.7	.7	.2
Ann	151.4	75.7	17.3	5.3

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	.75	.92	1.16	1.37	1.56	1.75	1.96	2.20	2.51	2.97	3.40
Feb	.43	.56	.75	.92	1.08	1.24	1.42	1.64	1.91	2.34	2.73
Mar	.66	.85	1.14	1.38	1.62	1.87	2.14	2.45	2.86	3.49	4.07
Apr	.94	1.20	1.56	1.87	2.16	2.46	2.79	3.17	3.65	4.41	5.10
May	.98	1.25	1.64	1.97	2.29	2.62	2.97	3.39	3.92	4.74	5.50
Jun	.95	1.23	1.65	2.01	2.36	2.72	3.11	3.58	4.17	5.10	5.97
Jul	.98	1.28	1.72	2.09	2.46	2.84	3.25	3.74	4.37	5.34	6.25
Aug	.97	1.33	1.89	2.38	2.86	3.36	3.93	4.60	5.47	6.85	8.15
Sep	.75	1.11	1.69	2.23	2.78	3.37	4.05	4.86	5.94	7.67	9.32
Oct	1.04	1.34	1.78	2.15	2.51	2.89	3.29	3.77	4.39	5.34	6.22
Nov	.81	1.07	1.45	1.79	2.11	2.44	2.81	3.24	3.80	4.67	5.48
Dec	.70	.89	1.16	1.39	1.61	1.83	2.07	2.36	2.72	3.28	3.79
Ann	23.93	25.62	27.77	29.40	30.84	32.23	33.66	35.24	37.14	39.90	42.27

\+ 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	16.6	12.4	11	9
Feb	12.7	13.3	11	9
Mar	10.5	9.7	4	2
Apr	2.8	2.8	#	#
May	#	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	#	.0	0	0
Oct	.6	.0	#	0
Nov	7.3	6.8	1	#
Dec	18.4	19.7	4	3
Ann	68.9	64.7	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	14.0	1985	1	32.8	1976	67	1991	31	49	1991
Feb	7.9	1993	22	19.4	1972	33	1985	19	26	1985
Mar	10.8	1989	18	25.0	1975	30	1985	5	22	1986
Apr	5.3	1982	3	6.5	1983	6+	1985	7	2	1975
May	#	1976	3	#+	1976	#	1976	3	#	1976
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	#	1974	21	#	1974	0	0	0	0	0
Oct	3.0	1988	11	3.0+	1989	3+	1989	19	#+	1989
Nov	13.1	1990	6	15.4	1976	13	1990	6	3	1977
Dec	12.0	1987	16	30.1	1976	20	1989	31	14	1985
Ann	14.0	Jan 1985	1	32.8	Jan 1976	67	Jan 1991	31	49	Jan 1991

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	12.6	6.6	1.8	.8	.1
Feb	10.4	5.5	1.6	.4	.0
Mar	6.1	4.1	1.3	.5	.1
Apr	1.8	1.3	.4	.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	.4	.2	.1	.0	.0
Nov	4.6	2.3	1.0	.4	@
Dec	11.1	6.6	1.7	.3	.1
Ann	47.0	26.6	7.9	2.5	.3

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	-9.9	-9.9	-9.9	-9.9
Mar	-9.9	-9.9	-9.9	-9.9
Apr	3.1	1.1	.6	.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	.3	.1	.0	.0
Nov	4.6	2.1	1.2	.2
Dec	19.1	14.4	11.6	3.7
Ann	-9.9	-9.9	-9.9	-9.9

+ Also occurred on an earlier date(s) #Denotes trace amounts

(1) Derived from Snow Climatology and 1971-2000 daily data

@ Denotes mean number of days greater than 0 but less than .05

(2) Derived from 1971-2000 daily data

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

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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	7/18	7/09	7/02	6/26	6/21	6/15	6/09	6/02	5/24
32	6/19	6/13	6/09	6/05	6/02	5/30	5/26	5/22	5/17
28	6/02	5/27	5/23	5/19	5/15	5/12	5/08	5/03	4/27
24	5/16	5/11	5/07	5/04	5/01	4/29	4/26	4/22	4/17
20	5/03	4/28	4/24	4/21	4/18	4/16	4/13	4/09	4/04
16	4/20	4/16	4/12	4/09	4/07	4/04	4/01	3/29	3/24

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	8/11	8/18	8/24	8/29	9/02	9/07	9/11	9/17	9/25
32	8/26	9/01	9/05	9/09	9/12	9/16	9/19	9/24	9/30
28	9/14	9/20	9/24	9/27	9/30	10/03	10/07	10/11	10/16
24	9/26	10/03	10/08	10/13	10/17	10/21	10/25	10/30	11/06
20	10/17	10/23	10/27	10/30	11/03	11/06	11/10	11/14	11/19
16	10/31	11/05	11/09	11/12	11/15	11/18	11/21	11/25	11/30

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	112	99	89	81	73	65	57	47	34
32	129	119	113	107	101	96	90	83	74
28	160	152	147	142	137	133	128	122	114
24	194	185	178	173	168	162	157	150	141
20	222	213	207	202	198	193	188	182	174
16	243	236	230	226	221	217	213	207	200

***** 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	1473	1293	1148	723	383	140	46	94	261	603	925	1294	8383
60	1318	1153	993	574	260	65	9	31	139	452	775	1139	6908
57	1225	1069	900	486	198	36	2	13	83	364	685	1046	6107
55	1163	1013	838	429	162	23	0	7	55	309	625	984	5608
50	1008	873	685	296	88	6	0	0	15	190	476	829	4466
32	464	395	224	24	1	0	0	0	0	6	76	327	1517

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	15	26	99	291	662	910	1080	1012	734	426	141	56	5452
55	0	0	0	6	110	243	367	306	100	16	0	0	1148
57	0	0	0	3	85	196	307	250	67	9	0	0	917
60	0	0	0	1	53	135	221	175	33	3	0	0	621
65	0	0	0	0	21	59	103	82	6	0	0	0	271
70	0	0	0	0	7	17	31	26	0	0	0	0	81

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	27	141	432	677	838	773	500	217	52	3	0	0	27	168	600	1277	2115	2888	3388	3605	3657	3660
45	0	0	11	77	293	527	683	618	359	120	20	1	0	0	11	88	381	908	1591	2209	2568	2688	2708	2709
50	0	0	2	42	180	386	528	465	233	57	5	0	0	0	2	44	224	610	1138	1603	1836	1893	1898	1898
55	0	0	0	19	103	251	374	312	132	22	0	0	0	0	0	19	122	373	747	1059	1191	1213	1213	1213
60	0	0	0	5	50	139	235	184	65	4	0	0	0	0	0	5	55	194	429	613	678	682	682	682
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	0	19	101	280	431	544	496	310	130	25	0	0	0	19	120	400	831	1375	1871	2181	2311	2336	2336

(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