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: ALPENA COLLINS AP, MI **COOP ID: 200164**

Climate Division: MI 4 **NWS Call Sign: APN** **Elevation: 689 Feet** **Lat: 45˚04N** **Lon: 83˚35W**

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	26.1	9.5	17.8	52+	1950	10	26.1	1990	-28+	1963	15	7.6	1994	1448	0	.0	.0	.3	21.9	30.2	7.2
Feb	28.2	9.7	19.0	65	1984	23	29.7	1998	-37	1979	17	8.0	1979	1285	0	.0	.0	.7	18.0	27.1	7.1
Mar	37.3	18.7	28.0	80	2000	8	36.8	2000	-27+	1962	2	20.5	1972	1133	0	.0	.0	4.5	8.6	27.8	2.6
Apr	50.3	30.2	40.3	90	1990	25	44.6	1991	0	1965	2	34.1	1972	729	3	.0	@	16.1	1.0	18.3	.0
May	64.3	40.0	52.2	94	1962	16	58.1	1998	20+	1950	3	46.0	1997	394	13	.0	.2	29.0	.0	5.7	.0
Jun	73.8	48.8	61.3	103	1995	19	65.1	1976	28+	1964	3	55.9	1982	150	54	@	1.7	30.0	.0	.3	.0
Jul	79.0	54.5	66.7	102	1983	14	71.8	1983	34	1965	20	60.6	1992	46	115	.1	2.8	31.0	.0	.0	.0
Aug	76.1	52.9	64.5	102	1988	2	68.0	1980	30	1982	29	60.7	1977	82	82	@	1.2	31.0	.0	@	.0
Sep	67.4	45.2	56.3	99	1953	1	59.9	1998	23	1957	28	51.1	1993	267	22	.0	.2	29.7	.0	2.0	.0
Oct	55.6	35.6	45.6	88	1971	1	52.9	1971	16+	1965	28	40.7	1981	587	1	.0	.0	23.0	.1	10.6	.0
Nov	42.2	27.0	34.6	77	1950	1	40.5	1999	-6	1995	29	28.8	1995	897	0	.0	.0	7.3	4.3	21.6	.1
Dec	31.2	16.9	24.0	65+	1982	25	31.6	1994	-18+	1977	11	11.6	1989	1256	0	.0	.0	1.2	15.6	28.7	2.6
Ann	52.6	32.4	42.5	103	Jun 1995	19	71.8	Jul 1983	-37	Feb 1979	17	7.6	Jan 1994	8274	290	.1	6.1	203.8	69.5	172.3	19.6

\+ 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: 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	1.76	1.71	1.83	1978	26	4.12	1997	.46	1981
Feb	1.35	1.07	1.51	1997	21	3.88	1997	.12	1982
Mar	2.13	2.24	1.85	1998	31	7.37	1998	.34	1993
Apr	2.31	2.32	1.64	1955	19	4.15	1980	1.18	1978
May	2.61	2.39	2.21	1965	6	8.29	1983	.99	1988
Jun	2.53	2.76	2.52	1969	12	5.88	1971	.20	1991
Jul	3.17	3.01	2.80	1974	3	7.17	1975	.22	1989
Aug	3.50	2.86	2.61	1973	1	6.26	1994	1.32	1999
Sep	2.80	2.52	3.02	1968	10	7.12	1986	.28	1979
Oct	2.33	2.09	3.44	1998	6	6.53	1991	.61	1971
Nov	2.08	2.11	1.82	1966	29	4.17	1995	.61	1986
Dec	1.83	1.66	1.63	1971	10	5.07	1996	.39	1994
Ann	28.40	27.66	3.44	Oct 1998	6	8.29	May 1983	.12	Feb 1982

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	15.3	5.4	.5	.1
Feb	11.6	3.7	.5	.1
Mar	12.7	5.3	1.2	.1
Apr	11.5	6.1	1.3	@
May	11.1	6.2	1.6	.3
Jun	10.3	5.7	1.8	.4
Jul	10.6	6.1	2.0	.8
Aug	10.6	6.5	2.6	.7
Sep	12.2	6.3	1.8	.5
Oct	12.5	6.1	1.2	.3
Nov	13.5	6.0	.8	.2
Dec	14.8	5.1	.8	.2
Ann	146.7	68.5	16.1	3.7

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	.56	.72	.97	1.18	1.39	1.60	1.83	2.11	2.46	3.01	3.52
Feb	.31	.43	.63	.81	.98	1.17	1.38	1.64	1.97	2.50	2.99
Mar	.46	.66	.97	1.26	1.54	1.84	2.18	2.59	3.13	3.99	4.80
Apr	1.16	1.36	1.62	1.83	2.02	2.22	2.42	2.65	2.94	3.38	3.77
May	.82	1.07	1.44	1.75	2.05	2.37	2.71	3.12	3.64	4.46	5.21
Jun	.65	.88	1.25	1.58	1.90	2.23	2.61	3.05	3.64	4.55	5.41
Jul	.82	1.12	1.58	1.99	2.39	2.81	3.27	3.83	4.55	5.69	6.76
Aug	1.33	1.65	2.12	2.51	2.88	3.26	3.67	4.14	4.74	5.67	6.52
Sep	.79	1.06	1.46	1.81	2.15	2.51	2.91	3.37	3.98	4.93	5.81
Oct	.72	.95	1.27	1.56	1.83	2.11	2.42	2.79	3.26	3.99	4.67
Nov	.71	.90	1.19	1.44	1.67	1.91	2.17	2.48	2.88	3.49	4.05
Dec	.45	.62	.89	1.13	1.36	1.61	1.89	2.22	2.65	3.33	3.97
Ann	21.50	22.87	24.61	25.91	27.07	28.17	29.31	30.56	32.07	34.24	36.10

\+ 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)

Extremes (2)

Mean Number of Days (1)

Snow Fall >= Thresholds

Snow Depth >= Thresholds

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year	0.1	1.0	3.0	5.0	10.0	1	3	5	10
Jan	18.2	17.1	9	7	16.3	1978	26	42.0	1978	29	1978	29	20	1979	15.7	6.1	1.9	.5	.1	29.5	26.4	21.1	12.6
Feb	15.1	15.9	10	9	11.4	1994	23	22.7	1988	37+	1985	20	23	1985	13.1	4.6	1.5	.6	.1	27.1	24.9	21.1	13.4
Mar	13.1	9.4	6	4	17.3	1985	4	35.8	1971	28+	1985	6	16	1978	9.5	3.6	1.1	.4	.2	20.8	17.7	15.3	7.9
Apr	5.7	4.8	1	2	10.8	1992	10	12.7	1992	11	1992	11	2+	1978	4.0	1.9	.5	.2	@	4.6	2.4	1.4	@
May	.3	.0	#	0	3.7	1974	6	3.7	1974	3	1994	1	#	1996	.3	.1	@	.0	.0	.2	@	.0	.0
Jun	.0	.0	#	0	.0	0	0	.0	0	0	0	0	#	1996	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jul	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Aug	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	#	.0	0	0	#	1995	22	#+	1995	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.4	.2	#	0	1.7	1992	20	2.8	1992	1+	1992	18	#	1992	1.0	.1	.0	.0	.0	.1	.0	.0	.0
Nov	8.8	6.6	1	0	9.9	1989	16	34.8	1995	14	1977	28	4	1995	7.0	2.5	1.0	.3	.0	6.6	3.4	1.5	.3
Dec	19.0	18.0	4	4	16.4	1989	14	43.1	1989	26	1989	16	15	1989	15.0	5.8	1.8	.8	.1	21.4	15.5	10.5	3.8
Ann	80.6	72.0	N/A	N/A	17.3	Mar 1985	4	43.1	Dec 1989	37+	Feb 1985	20	23	Feb 1985	65.6	24.7	7.8	2.8	.5	110.3	90.3	70.9	38.0

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

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	9/01	9/06	9/09	9/12	9/15	9/17	9/20	9/23	9/28
32	9/12	9/17	9/20	9/22	9/25	9/27	9/30	10/03	10/07
28	9/25	9/29	10/03	10/06	10/09	10/12	10/15	10/18	10/23
24	10/12	10/17	10/21	10/24	10/27	10/29	11/01	11/05	11/10
20	10/27	11/01	11/05	11/08	11/11	11/13	11/17	11/20	11/25
16	11/05	11/10	11/14	11/17	11/20	11/23	11/26	11/30	12/05

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	120	113	108	104	100	96	92	87	80
32	142	135	131	126	123	119	115	110	104
28	170	164	160	156	152	149	145	141	135
24	208	200	195	191	187	183	178	173	166
20	236	228	223	218	214	210	205	200	192
16	252	245	241	236	233	229	225	220	213

***** 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	1448	1285	1133	729	394	150	46	82	267	587	897	1256	8274
60	1309	1149	992	592	272	72	11	27	147	449	762	1115	6897
57	1216	1065	899	504	204	39	3	10	92	361	672	1022	6087
55	1154	1009	837	446	164	24	0	4	63	306	612	960	5579
50	999	869	682	308	85	6	0	0	19	184	462	805	4419
32	460	389	202	23	0	0	0	0	0	3	60	310	1447

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	10	19	84	289	644	893	1092	1028	752	446	156	33	5446
55	0	0	1	14	81	223	380	318	129	22	1	0	1169
57	0	0	0	10	61	177	319	260	97	14	0	0	938
60	0	0	0	6	38	119	233	182	59	6	0	0	643
65	0	0	0	3	13	54	115	82	22	1	0	0	290
70	0	0	0	1	3	17	43	27	6	0	0	0	97

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	24	125	407	664	852	788	524	229	51	2	0	0	24	149	556	1220	2072	2860	3384	3613	3664	3666
45	0	0	9	66	270	515	697	633	376	128	20	1	0	0	9	75	345	860	1557	2190	2566	2694	2714	2715
50	0	0	3	29	156	370	542	478	241	57	3	0	0	0	3	32	188	558	1100	1578	1819	1876	1879	1879
55	0	0	0	13	82	230	388	326	136	24	0	0	0	0	0	13	95	325	713	1039	1175	1199	1199	1199
60	0	0	0	8	41	125	244	188	64	4	0	0	0	0	0	8	49	174	418	606	670	674	674	674
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	21	87	259	412	547	499	309	130	27	1	0	0	21	108	367	779	1326	1825	2134	2264	2291	2292

(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