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: ALMA, MI **COOP ID: 200146**

Climate Division: MI 6 **NWS Call Sign:** **Elevation: 760 Feet** **Lat: 43˚23N** **Lon: 84˚40W**

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	28.5	12.9	20.7	62	1950	26	31.7	1990	-24	1959	26	10.8	1977	1373	0	.0	.0	.5	19.6	30.1	4.5
Feb	31.7	14.1	22.9	67	1999	12	31.7	1998	-25	1959	2	11.9	1979	1179	0	.0	.0	1.1	14.5	26.8	3.7
Mar	42.2	22.7	32.5	79	2000	9	42.3	2000	-13	1962	2	25.6	1978	1009	0	.0	.0	7.9	5.4	26.3	.6
Apr	55.7	33.8	44.8	88	1990	26	50.3	1977	5	1982	7	39.7	1975	609	1	.0	.0	20.5	.4	14.1	.0
May	69.2	44.9	57.1	93	1977	21	64.9	1977	23	1966	10	49.9	1997	287	41	.0	.7	30.2	.0	2.0	.0
Jun	78.3	54.2	66.3	100	1995	20	71.3	1971	34+	1958	6	60.3	1982	74	111	@	2.6	30.0	.0	.0	.0
Jul	82.8	58.6	70.7	103	1988	7	75.3	1987	41+	1952	31	65.6	1992	13	191	.1	5.5	31.0	.0	.0	.0
Aug	80.1	56.6	68.4	101	1988	2	72.7	1988	36	1982	29	63.4	1992	37	139	@	2.6	31.0	.0	.0	.0
Sep	72.0	48.6	60.3	97	1953	2	64.3	1971	27	1991	28	54.7	1993	168	26	.0	.6	29.9	.0	.8	.0
Oct	59.6	37.8	48.7	87+	1971	1	56.1	1971	20+	1960	25	43.6	1980	507	2	.0	.0	26.0	.0	8.6	.0
Nov	45.1	28.7	36.9	82	1950	1	43.8	1999	-1	1949	26	30.2	1995	845	0	.0	.0	10.3	3.0	21.4	.0
Dec	33.4	19.3	26.4	68	2001	6	33.7	1982	-10	1976	30	17.4	1989	1199	0	.0	.0	1.9	13.5	29.1	1.3
Ann	56.6	36.0	46.3	103	Jul 1988	7	75.3	Jul 1987	-25	Feb 1959	2	10.8	Jan 1977	7300	511	.1	12.0	220.3	56.4	159.2	10.1

\+ 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

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: ALMA, MI **COOP ID: 200146**

Climate Division: MI 6 **NWS Call Sign:** **Elevation: 760 Feet** **Lat: 43˚23N** **Lon: 84˚40W**

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	1.52	1.28	1985	1	3.90	1998	.51	1971
Feb	1.45	1.28	1.86	1997	22	4.37	1997	.05	1987
Mar	2.34	2.15	2.20	1976	2	6.31	1976	.40	1981
Apr	2.94	2.74	2.23	1994	26	5.33	1991	1.41	1997
May	2.95	2.70	3.22	2001	16	6.68	2000	.31	1977
Jun	3.18	3.19	3.22	2000	13	6.47	1996	.73	1988
Jul	2.70	2.71	2.50	1957	8	7.03	1994	.47	1998
Aug	3.75	3.32	3.74	1955	30	10.39	1975	1.40	1976
Sep	3.75	3.33	9.33	1986	11	16.31	1986	.03	1979
Oct	2.72	2.59	4.04	1981	1	5.99	1990	.78	1982
Nov	2.65	2.15	2.02	1990	28	5.47	1990	.51	1986
Dec	2.17	1.98	1.80	1982	3	5.09	1972	.52	1993
Ann	32.47	32.97	9.33	Sep 1986	11	16.31	Sep 1986	.03	Sep 1979

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	11.2	5.2	1.0	.2
Feb	8.9	4.1	.6	.1
Mar	10.4	5.4	1.4	.2
Apr	11.6	7.2	1.7	.4
May	10.0	5.8	1.9	.6
Jun	9.9	6.3	2.2	.7
Jul	9.5	5.1	1.6	.5
Aug	10.1	6.4	2.6	1.0
Sep	10.7	6.7	2.4	.9
Oct	10.5	5.6	1.7	.5
Nov	11.5	5.8	1.6	.5
Dec	11.2	5.1	1.4	.2
Ann	125.5	68.7	20.1	5.8

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	.53	.71	.97	1.21	1.43	1.67	1.94	2.25	2.65	3.28	3.87
Feb	.27	.40	.61	.81	1.01	1.22	1.47	1.76	2.15	2.78	3.38
Mar	.74	.96	1.29	1.57	1.84	2.12	2.43	2.79	3.26	3.99	4.66
Apr	1.42	1.67	2.02	2.30	2.55	2.81	3.09	3.40	3.79	4.38	4.91
May	.68	.95	1.38	1.77	2.15	2.56	3.02	3.57	4.30	5.44	6.52
Jun	1.13	1.43	1.86	2.23	2.58	2.93	3.32	3.78	4.36	5.25	6.08
Jul	.79	1.05	1.44	1.77	2.09	2.43	2.80	3.24	3.80	4.69	5.51
Aug	1.28	1.63	2.15	2.59	3.01	3.44	3.91	4.46	5.17	6.26	7.26
Sep	.55	.87	1.41	1.93	2.47	3.06	3.75	4.59	5.71	7.55	9.31
Oct	.86	1.11	1.50	1.83	2.14	2.47	2.83	3.26	3.80	4.65	5.44
Nov	.66	.91	1.30	1.64	1.98	2.33	2.73	3.20	3.82	4.80	5.71
Dec	.59	.80	1.11	1.38	1.65	1.93	2.24	2.61	3.09	3.84	4.54
Ann	24.73	26.27	28.21	29.67	30.96	32.20	33.47	34.87	36.55	38.97	41.05

\+ 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

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data,
and Information Services

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: ALMA, MI **COOP ID: 200146**

Climate Division: MI 6 **NWS Call Sign:** **Elevation: 760 Feet** **Lat: 43°23N** **Lon: 84°40W**

Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	10.8	9.6	6	5
Feb	7.7	6.8	6	4
Mar	7.0	6.9	2	2
Apr	2.1	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	3.5	2.5	#	#
Dec	9.5	9.8	2	2
Ann	40.8	36.6	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	10.5	1978	26	28.3	1979	24	1979	16	18	1979
Feb	9.3	1985	12	17.7	1985	22	1985	14	18	1978
Mar	9.0	1971	7	21.3	1971	18	1978	9	13	1978
Apr	11.0	1975	3	13.0	1975	13	1975	3	2	1975
May	.5	1994	1	.5	1994	#+	1996	12	#+	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	2.7	1992	21	3.2	1992	2	1997	27	#+	1997
Nov	7.8	1995	28	12.6	1995	8	1995	28	2	1995
Dec	7.0	1994	7	28.3	2000	12	2000	22	7	2000
Ann	11.0	Apr 1975	3	28.3+	Dec 2000	24	Jan 1979	16	18+	Jan 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	6.4	4.1	.9	.3	@
Feb	4.9	2.8	.8	.2	.0
Mar	3.5	2.1	.9	.3	.0
Apr	1.0	.6	.2	.1	@
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	.1	.1	.0	.0	.0
Nov	2.3	1.2	.3	.1	.0
Dec	5.7	3.5	.9	.5	.0
Ann	23.9	14.4	4.0	1.5	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	23.3	20.1	15.7	4.3
Feb	22.2	18.0	12.3	4.9
Mar	11.2	7.7	5.2	1.3
Apr	1.1	.6	.3	.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	.1	.0	.0	.0
Nov	2.9	1.2	.5	.0
Dec	15.5	9.9	4.3	.6
Ann	76.3	57.5	38.3	11.2

+ 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

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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: ALMA, MI **COOP ID: 200146**

Climate Division: MI 6 **NWS Call Sign:** **Elevation: 760 Feet** **Lat: 43˚23N** **Lon: 84˚40W**

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	6/04	5/29	5/25	5/22	5/19	5/15	5/12	5/08	5/02
32	5/18	5/13	5/10	5/08	5/05	5/03	4/30	4/27	4/23
28	5/08	5/03	4/30	4/27	4/24	4/21	4/18	4/15	4/10
24	4/24	4/19	4/16	4/13	4/10	4/07	4/04	4/01	3/27
20	4/14	4/10	4/07	4/04	4/02	3/30	3/28	3/25	3/20
16	4/06	4/01	3/29	3/26	3/24	3/21	3/18	3/15	3/11

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	9/22	9/24	9/26	9/29	10/02	10/06
32	9/23	9/28	10/01	10/04	10/06	10/09	10/12	10/15	10/19
28	10/05	10/10	10/14	10/18	10/21	10/24	10/28	11/01	11/06
24	10/17	10/23	10/26	10/30	11/02	11/05	11/08	11/12	11/18
20	10/30	11/04	11/08	11/11	11/15	11/18	11/21	11/25	11/30
16	11/13	11/18	11/22	11/25	11/28	12/01	12/05	12/08	12/13

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	146	140	135	131	128	124	120	116	109
32	172	166	161	157	153	150	146	141	135
28	204	195	189	184	179	174	169	163	154
24	228	220	214	210	205	201	196	190	183
20	246	239	234	230	226	222	218	213	206
16	271	264	258	253	249	244	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

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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: ALMA, MI **COOP ID: 200146**

Climate Division: MI 6 **NWS Call Sign:** **Elevation: 760 Feet** **Lat: 43˚23N** **Lon: 84˚40W**

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	1373	1179	1009	609	287	74	13	37	168	507	845	1199	7300
60	1218	1039	854	462	182	26	1	7	75	362	695	1044	5965
57	1125	955	761	378	131	12	0	2	40	282	605	951	5242
55	1063	899	699	324	102	7	0	0	25	234	545	889	4787
50	908	759	549	205	48	1	0	0	5	133	399	734	3741
32	384	298	134	8	0	0	0	0	0	2	48	251	1125

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	34	43	149	390	777	1028	1201	1125	848	520	193	74	6382
55	0	0	0	16	167	344	488	412	183	38	0	0	1648
57	0	0	0	10	133	289	426	352	139	25	0	0	1374
60	0	0	0	4	91	214	333	265	83	11	0	0	1001
65	0	0	0	1	41	111	191	139	26	2	0	0	511
70	0	0	0	0	15	42	85	55	4	0	0	0	201

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	3	54	215	548	803	966	897	624	300	74	8	0	3	57	272	820	1623	2589	3486	4110	4410	4484	4492
45	0	0	26	124	402	653	811	742	475	185	31	2	0	0	26	150	552	1205	2016	2758	3233	3418	3449	3451
50	0	0	13	67	268	503	656	587	334	100	12	0	0	0	13	80	348	851	1507	2094	2428	2528	2540	2540
55	0	0	3	33	156	359	501	433	210	45	3	0	0	0	3	36	192	551	1052	1485	1695	1740	1743	1743
60	0	0	0	14	82	223	346	282	113	14	0	0	0	0	0	14	96	319	665	947	1060	1074	1074	1074
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	38	138	341	511	635	581	387	180	45	3	0	0	38	176	517	1028	1663	2244	2631	2811	2856	2859

(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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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