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: EAST JORDAN, MI **COOP ID: 202381**

Climate Division: MI 3 **NWS Call Sign:** **Elevation: 590 Feet** **Lat: 45˚09N** **Lon: 85˚08W**

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	12.3	20.6	55	1996	18	29.5	1990	-36	1981	4	11.6	1994	1378	0	.0	.0	.2	20.1	30.1	5.2
Feb	32.0	11.5	21.8	62+	2000	26	33.3	1998	-41	1979	17	10.8	1979	1212	0	.0	.0	1.2	15.6	26.9	6.5
Mar	41.6	19.6	30.6	80	2000	8	40.4	2000	-29	1962	2	23.6	1972	1067	0	.0	.0	6.7	6.3	27.0	2.5
Apr	55.0	30.4	42.7	88+	1970	29	49.0	1977	0	1972	5	35.8	1975	671	0	.0	.0	19.5	.6	17.3	@
May	69.3	40.1	54.7	93	1998	16	62.9	1998	18	1968	6	47.9	1983	350	30	.0	.2	29.9	.0	6.3	.0
Jun	77.4	48.8	63.1	97	1954	15	67.8	1995	26	1966	1	57.0	1982	120	64	.0	1.8	30.0	.0	.7	.0
Jul	81.6	54.2	67.9	99+	1955	26	71.9	1983	33	1965	6	62.1	1992	30	120	.0	2.7	31.0	.0	.0	.0
Aug	79.2	52.9	66.1	99	1955	21	71.6	1995	30+	1967	24	61.6	1982	69	101	.0	1.4	31.0	.0	.1	.0
Sep	71.5	45.9	58.7	97	1953	2	63.1	1998	21	2000	28	55.1	1993	197	9	.0	.2	29.9	.0	1.4	.0
Oct	60.1	37.1	48.6	86+	1971	1	56.6	1971	15	1992	31	43.3	1981	511	1	.0	.0	25.9	.0	8.6	.0
Nov	45.1	28.5	36.8	75+	1990	1	41.6	1999	-8	1950	25	31.1	1976	846	0	.0	.0	9.4	2.9	19.9	.0
Dec	33.5	19.3	26.4	64+	1970	1	32.8	1994	-31	1976	28	15.4	1989	1195	0	.0	.0	1.4	13.5	29.2	1.3
Ann	56.3	33.4	44.8	99+	Aug 1955	21	71.9	Jul 1983	-41	Feb 1979	17	10.8	Feb 1979	7646	325	.0	6.3	216.1	59.0	167.5	15.5

\+ 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	2.09	2.04	1.41	1990	17	3.92	1997	.59	1987
Feb	1.22	1.17	.90	1977	24	2.91	1985	.23	1987
Mar	1.63	1.41	1.59	1998	31	3.92	1977	.20	1993
Apr	2.36	2.15	1.71	1981	4	4.63	1981	.67	1997
May	2.63	2.49	3.44	1963	8	5.24	1983	.74	1977
Jun	2.80	2.64	2.73	1960	24	6.33	1990	.28	1991
Jul	3.04	2.55	3.13	1995	23	6.57	1972	.45	1989
Aug	3.59	3.31	5.62	1995	17	8.40	1995	.28	1980
Sep	3.98	3.99	2.88	1961	13	7.42	1986	.56	1979
Oct	3.56	3.02	2.04	1991	25	7.64	1988	1.38	1975
Nov	2.88	2.95	1.95	1982	12	4.55	1988	.99	1999
Dec	2.36	2.11	1.22	1971	15	4.74	1982	.35	1994
Ann	32.14	31.34	5.62	Aug 1995	17	8.40	Aug 1995	.20	Mar 1993

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	17.1	7.4	.5	@
Feb	10.5	4.3	.3	.0
Mar	10.1	5.0	.6	.1
Apr	10.4	6.4	1.2	.3
May	9.5	6.4	1.5	.4
Jun	10.2	6.0	1.8	.5
Jul	9.0	5.7	2.1	.7
Aug	10.5	6.9	2.6	.7
Sep	12.9	8.4	2.6	.9
Oct	12.2	7.9	2.5	.7
Nov	14.4	8.6	1.3	.3
Dec	16.0	8.0	.7	.2
Ann	142.8	81.0	17.7	4.8

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	.92	1.10	1.37	1.58	1.78	1.98	2.19	2.44	2.75	3.22	3.65
Feb	.30	.42	.60	.75	.91	1.08	1.26	1.48	1.76	2.22	2.64
Mar	.28	.42	.66	.89	1.12	1.37	1.65	1.99	2.45	3.20	3.91
Apr	.91	1.13	1.44	1.70	1.95	2.20	2.47	2.78	3.18	3.80	4.35
May	.91	1.16	1.52	1.83	2.12	2.42	2.75	3.13	3.62	4.38	5.08
Jun	.82	1.08	1.48	1.83	2.17	2.52	2.91	3.36	3.96	4.88	5.74
Jul	.89	1.18	1.61	1.99	2.35	2.73	3.15	3.65	4.29	5.29	6.22
Aug	.87	1.21	1.73	2.20	2.66	3.15	3.69	4.34	5.19	6.54	7.80
Sep	1.43	1.81	2.35	2.80	3.23	3.68	4.16	4.72	5.43	6.54	7.55
Oct	1.27	1.61	2.09	2.50	2.89	3.29	3.72	4.22	4.87	5.86	6.78
Nov	1.31	1.56	1.92	2.20	2.47	2.74	3.02	3.35	3.76	4.39	4.95
Dec	.83	1.05	1.38	1.65	1.91	2.17	2.46	2.80	3.23	3.90	4.52
Ann	24.70	26.18	28.06	29.47	30.71	31.90	33.13	34.47	36.08	38.40	40.39

\+ 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	28.9	30.0	14	14
Feb	16.5	18.0	14	13
Mar	7.7	5.9	7	7
Apr	2.4	2.0	#	#
May	.2	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.4	.0	#	0
Nov	10.1	9.6	1	1
Dec	29.9	29.1	7	5
Ann	96.1	94.6	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	12.5	1990	25	48.3	1982	46	1985	31	35	1994
Feb	13.0	1985	14	44.8	1985	60	1985	15	38	1985
Mar	10.9	1989	4	22.0	1976	29	1989	5	19	1989
Apr	6.2	1980	15	8.5	1985	10	1975	1	3	1975
May	3.0	1990	11	3.0	1990	2	1979	5	#+	1990
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	3.5	1992	19	7.4	1992	2	1992	20	#+	1997
Nov	10.0	1976	29	27.3	1989	16	1976	30	5	1995
Dec	18.0	1995	9	59.9	1985	36	1993	30	19	1985
Ann	18.0	Dec 1995	9	59.9	Dec 1985	60	Feb 1985	15	38	Feb 1985

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	13.2	10.4	3.6	1.5	.2
Feb	8.3	5.7	2.3	.6	@
Mar	4.9	3.8	1.1	.3	@
Apr	1.3	.9	.3	.2	.0
May	.1	.1	@	.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	.2	@	.0	.0
Nov	5.1	4.2	1.3	.5	@
Dec	12.0	9.6	3.9	1.4	.1
Ann	45.1	34.9	12.5	4.5	.3

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	25.9	24.6	22.1	14.4
Feb	24.8	22.5	18.6	12.8
Mar	16.4	14.7	13.3	8.6
Apr	2.5	1.3	.5	@
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	.0
Nov	7.0	3.9	2.0	.2
Dec	21.9	16.2	11.4	4.9
Ann	98.7	83.2	67.9	40.9

+ 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	6/29	6/22	6/18	6/14	6/10	6/06	6/02	5/29	5/22
32	6/13	6/08	6/04	5/31	5/28	5/25	5/22	5/18	5/13
28	5/22	5/18	5/15	5/13	5/10	5/08	5/05	5/02	4/28
24	5/09	5/05	5/02	4/30	4/28	4/25	4/23	4/20	4/16
20	4/27	4/23	4/20	4/18	4/16	4/13	4/11	4/08	4/04
16	4/17	4/13	4/09	4/07	4/04	4/01	3/30	3/26	3/22

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	8/20	8/26	8/31	9/04	9/08	9/11	9/15	9/20	9/27
32	9/10	9/15	9/19	9/22	9/24	9/27	9/30	10/04	10/09
28	9/23	9/28	10/02	10/06	10/09	10/12	10/16	10/20	10/26
24	10/10	10/16	10/20	10/23	10/26	10/29	11/02	11/06	11/12
20	10/30	11/04	11/07	11/11	11/14	11/16	11/20	11/23	11/28
16	11/05	11/11	11/16	11/20	11/23	11/27	12/01	12/05	12/12

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	118	108	101	95	89	83	77	70	59
32	138	131	126	122	118	114	110	106	99
28	169	163	159	155	151	147	144	139	133
24	201	194	189	185	181	177	172	167	160
20	231	224	219	215	211	207	203	198	192
16	255	247	242	237	233	228	223	218	210

***** 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	1378	1212	1067	671	350	120	30	69	197	511	846	1195	7646
60	1223	1072	912	523	235	51	5	19	86	364	696	1040	6226
57	1130	988	819	437	178	27	0	7	44	283	606	947	5466
55	1068	932	757	381	145	16	0	3	26	235	546	885	4994
50	913	792	603	255	77	4	0	0	4	133	399	730	3910
32	381	333	163	16	0	0	0	0	0	2	40	244	1179

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	27	45	120	335	704	934	1113	1055	802	516	184	72	5907
55	0	0	0	11	135	260	400	345	138	35	0	0	1324
57	0	0	0	7	107	211	338	287	96	22	0	0	1068
60	0	0	0	3	71	145	250	205	48	10	0	0	732
65	0	0	0	0	30	64	120	101	9	1	0	0	325
70	0	0	0	0	11	18	39	35	1	0	0	0	104

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	36	166	463	707	871	821	572	290	68	3	0	3	39	205	668	1375	2246	3067	3639	3929	3997	4000
45	0	0	18	93	319	557	716	666	424	171	27	1	0	0	18	111	430	987	1703	2369	2793	2964	2991	2992
50	0	0	5	48	202	411	561	513	285	88	8	0	0	0	5	53	255	666	1227	1740	2025	2113	2121	2121
55	0	0	1	20	114	273	406	359	168	37	2	0	0	0	1	21	135	408	814	1173	1341	1378	1380	1380
60	0	0	0	10	54	153	260	216	84	11	0	0	0	0	0	10	64	217	477	693	777	788	788	788
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	27	122	314	457	568	533	355	179	36	1	0	1	28	150	464	921	1489	2022	2377	2556	2592	2593

(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