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: NEWBERRY 3 S, MI **COOP ID: 205816**

Climate Division: MI 2 **NWS Call Sign:** **Elevation: 850 Feet** **Lat: 46˚19N** **Lon: 85˚30W**

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	23.9	8.0	16.0	47	1939	5	25.6	1990	-30	1927	26	5.2	1994	1522	0	.0	.0	.0	26.1	30.9	9.2
Feb	27.8	9.8	18.8	52	2000	24	29.7	1998	-27+	1918	5	10.2	1994	1295	0	.0	.0	.2	20.1	27.9	7.6
Mar	36.5	17.6	27.1	74	1946	28	35.4	1973	-20	1923	26	20.7	1972	1177	0	.0	.0	2.5	11.5	28.7	3.2
Apr	50.6	29.2	39.9	82+	1915	25	46.7	1987	-2	1923	1	34.2	1996	753	0	.0	.0	14.2	2.0	20.6	@
May	66.0	40.3	53.2	93	1986	29	59.7	1977	16	1966	7	45.5	1997	387	20	.0	.1	28.2	.0	6.8	.0
Jun	73.6	48.2	60.9	99	1931	30	66.9	1995	24	1928	15	55.7	1982	161	38	.0	.2	29.9	.0	.7	.0
Jul	78.3	53.5	65.9	103	1936	13	71.4	1983	32	1992	21	59.0	1992	67	96	.0	.6	31.0	.0	@	.0
Aug	76.5	53.2	64.9	98+	1916	20	69.6	1983	30	1915	27	60.3	1982	84	81	.0	.3	31.0	.0	.0	.0
Sep	67.5	45.7	56.6	96	1931	11	61.3	1998	18	1936	25	51.4	1974	260	8	.0	.0	29.1	.0	2.0	.0
Oct	55.4	36.4	45.9	82+	1922	2	53.1	1971	4	1933	28	41.3	1980	591	0	.0	.0	20.9	.2	11.7	.0
Nov	40.9	26.3	33.6	71	1990	2	39.8	1999	-10	1976	29	26.6	1995	942	0	.0	.0	4.8	7.4	23.9	.1
Dec	28.8	14.6	21.7	60	1982	2	30.5	1994	-22	1919	17	10.6	1989	1343	0	.0	.0	.2	20.5	30.1	4.1
Ann	52.2	31.9	42.0	103	Jul 1936	13	71.4	Jul 1983	-30	Jan 1927	26	5.2	Jan 1994	8582	243	.0	1.2	192.0	87.8	183.3	24.2

\+ 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: 1910-2001

(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	2.25	2.14	3.00	1938	24	4.52	1997	.77	1991
Feb	1.17	.95	1.55	1938	13	3.74	1981	.00+	2000
Mar	1.93	1.53	2.00	1972	4	6.17	1977	.00+	1999
Apr	1.90	1.57	2.04	1954	26	4.58	1985	.22	2000
May	2.51	2.27	3.59	1970	31	5.12	1993	.01	1996
Jun	3.14	3.29	2.82	1961	22	5.58	1979	.79	1983
Jul	3.14	3.09	4.18	1994	22	7.44	1994	.70	1989
Aug	3.48	3.27	3.90	1941	29	8.23	1988	.15	2000
Sep	3.52	3.54	4.10	1937	1	7.59	1990	1.17	1989
Oct	3.18	2.87	2.40	1923	18	6.20	1995	1.38	1972
Nov	2.49	2.83	1.89	1966	27	5.01	1988	.30	1999
Dec	2.16	2.32	1.20	1975	14	4.35	1977	.00	1997
Ann	30.87	31.55	4.18	Jul 1994	22	8.23	Aug 1988	.00+	Feb 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	17.3	6.4	.6	.1
Feb	11.8	4.2	.3	@
Mar	10.3	5.1	1.0	.2
Apr	9.2	5.1	1.2	.2
May	9.4	5.7	1.7	.4
Jun	9.6	6.6	1.8	.7
Jul	9.7	6.2	1.7	.7
Aug	10.5	7.0	2.4	.9
Sep	12.3	7.6	2.4	.6
Oct	13.0	7.7	2.0	.4
Nov	13.4	7.0	1.3	.3
Dec	14.5	6.5	.8	.1
Ann	141.0	75.1	17.2	4.6

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	1.00	1.20	1.48	1.70	1.92	2.13	2.36	2.62	2.95	3.45	3.90
Feb	.00	.00	.28	.49	.69	.91	1.17	1.48	1.89	2.58	3.24
Mar	.00	.15	.46	.77	1.09	1.45	1.87	2.39	3.10	4.30	5.47
Apr	.44	.62	.89	1.14	1.39	1.66	1.95	2.30	2.77	3.50	4.20
May	.38	.59	.95	1.30	1.66	2.06	2.51	3.07	3.82	5.04	6.20
Jun	1.08	1.38	1.81	2.18	2.52	2.88	3.27	3.73	4.32	5.22	6.05
Jul	1.03	1.33	1.77	2.14	2.50	2.87	3.27	3.75	4.36	5.30	6.17
Aug	.85	1.17	1.68	2.13	2.58	3.05	3.58	4.21	5.04	6.34	7.57
Sep	1.47	1.79	2.24	2.61	2.96	3.31	3.69	4.12	4.68	5.52	6.28
Oct	1.43	1.71	2.10	2.42	2.71	3.01	3.33	3.70	4.16	4.85	5.48
Nov	.70	.94	1.29	1.61	1.91	2.23	2.58	3.00	3.54	4.39	5.18
Dec	.28	.55	.92	1.23	1.53	1.86	2.22	2.66	3.23	4.14	5.01
Ann	21.80	23.55	25.79	27.50	29.01	30.48	31.99	33.66	35.70	38.64	41.20

\+ 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: 1910-2001
(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	32.5	26.0	17	15	23.0	1982	4	65.5	1978	49	1994	27	32	1994	17.4	10.1	3.0	1.3	.2	29.3	28.6	26.7	22.1
Feb	20.2	19.1	19	18	10.0	1974	22	49.7	1972	43	1977	3	31	1977	10.7	5.9	2.0	.5	@	-9.9	-9.9	-9.9	-9.9
Mar	17.4	15.0	14	13	10.5	1983	19	34.0	1972	44	1972	8	36	1972	7.4	4.4	1.5	.5	.1	23.6	22.0	19.7	14.9
Apr	7.4	4.8	3	1	13.0	1985	6	28.0	1979	33	1972	13	22	1972	2.8	1.6	.6	.3	.1	5.5	3.5	2.5	1.9
May	.2	.0	#	0	2.5	1990	10	3.5	1990	2	1990	10	#	1990	.1	.1	.0	.0	.0	@	.0	.0	.0
Jun	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.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	#	1992	29	#+	1992	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	1.2	.0	#	0	3.8	1976	22	6.9	1981	3	1992	18	#+	1997	.6	.4	.1	.0	.0	.5	@	.0	.0
Nov	12.2	10.8	1	1	12.0	1982	14	32.4	1976	14	1989	30	5	1989	6.5	3.4	1.1	.5	.1	6.7	3.5	1.9	.3
Dec	32.8	30.3	7	6	14.0	1985	26	56.8	1985	30	1972	16	24	1989	13.5	8.3	2.7	1.0	.2	27.7	21.6	16.2	8.4
Ann	123.9	106.0	N/A	N/A	23.0	Jan 1982	4	65.5	Jan 1978	49	Jan 1994	27	36	Mar 1972	59.0	34.2	11.0	4.1	.7	-9.9	-9.9	-9.9	-9.9

+ 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	7/10	7/02	6/26	6/21	6/16	6/11	6/06	5/31	5/23
32	6/19	6/13	6/08	6/04	6/01	5/28	5/24	5/19	5/13
28	5/28	5/22	5/18	5/15	5/12	5/09	5/06	5/02	4/26
24	5/10	5/05	5/02	4/29	4/26	4/23	4/20	4/17	4/12
20	4/25	4/21	4/18	4/16	4/14	4/12	4/10	4/07	4/04
16	4/17	4/13	4/10	4/07	4/05	4/02	3/31	3/28	3/23

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	8/22	8/27	8/31	9/04	9/07	9/10	9/14	9/18	9/23
32	9/06	9/12	9/17	9/20	9/24	9/27	10/01	10/05	10/11
28	9/23	9/28	10/02	10/06	10/09	10/12	10/15	10/19	10/24
24	10/09	10/14	10/18	10/22	10/25	10/29	11/01	11/05	11/11
20	10/24	10/29	11/02	11/05	11/08	11/11	11/14	11/18	11/23
16	11/01	11/06	11/09	11/12	11/15	11/18	11/21	11/24	11/29

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	114	103	95	88	82	76	69	61	50
32	143	133	126	120	114	109	103	96	86
28	172	164	158	153	149	144	139	134	126
24	204	196	191	186	182	178	173	168	160
20	228	221	216	212	207	203	199	194	187
16	245	238	232	228	224	219	215	209	202

***** 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	1522	1295	1177	753	387	161	67	84	260	591	942	1343	8582
60	1367	1155	1022	604	263	77	17	25	141	440	792	1188	7091
57	1274	1071	929	517	202	42	6	10	87	354	702	1095	6289
55	1212	1015	867	459	165	27	2	4	60	299	642	1033	5785
50	1057	875	712	323	91	7	0	0	18	181	493	878	4635
32	510	392	218	30	1	0	0	0	0	5	83	367	1606

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	12	21	64	266	657	867	1052	1019	738	436	131	46	5309
55	0	0	0	6	108	203	341	311	108	18	0	0	1095
57	0	0	0	3	82	159	283	254	75	10	0	0	866
60	0	0	0	1	51	104	201	176	39	4	0	0	576
65	0	0	0	0	20	38	96	81	8	0	0	0	243
70	0	0	0	0	6	9	30	24	1	0	0	0	70

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	10	99	379	602	781	748	476	193	32	1	0	0	10	109	488	1090	1871	2619	3095	3288	3320	3321
45	0	0	0	42	247	452	626	593	330	102	9	0	0	0	0	42	289	741	1367	1960	2290	2392	2401	2401
50	0	0	0	17	143	310	472	438	202	43	1	0	0	0	0	17	160	470	942	1380	1582	1625	1626	1626
55	0	0	0	5	74	186	319	288	108	12	0	0	0	0	0	5	79	265	584	872	980	992	992	992
60	0	0	0	0	30	89	184	156	48	1	0	0	0	0	0	0	30	119	303	459	507	508	508	508
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	0	5	62	238	364	495	462	267	99	11	0	0	0	5	67	305	669	1164	1626	1893	1992	2003	2003

(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

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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