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: MARION 2 N, OH **COOP ID: 334942**

Climate Division: OH 5 **NWS Call Sign:** **Elevation: 965 Feet** **Lat: 40˚37N** **Lon: 83˚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	33.0	16.0	24.5	67+	1999	23	34.7	1990	-23+	1994	20	9.8	1977	1256	0	.0	.0	2.7	14.9	28.7	4.1
Feb	36.9	18.0	27.5	73+	2000	27	37.3	1998	-23	1963	26	12.6	1978	1051	0	.0	.0	4.3	10.9	24.7	2.8
Mar	47.9	27.0	37.5	82	1938	22	44.8	1973	-11	1963	2	28.6	1984	853	0	.0	.0	12.7	3.6	21.6	.3
Apr	60.0	36.3	48.2	89	1960	24	54.4	1985	6	1964	1	40.8	1975	506	1	.0	.0	23.6	.1	9.9	.0
May	70.9	48.0	59.5	96	1962	18	68.0	1991	24	1966	10	53.7	1997	230	58	.0	.5	30.6	.0	.6	.0
Jun	79.9	57.7	68.8	103	1988	26	72.6	1991	36+	1990	5	63.6	1972	35	148	.1	3.2	30.0	.0	.0	.0
Jul	83.7	61.6	72.7	105	1936	14	77.1	1999	41	1963	10	69.2	1979	5	241	.1	5.5	31.0	.0	.0	.0
Aug	81.9	58.7	70.3	102	1936	19	76.2	1995	35	1986	29	66.2	1992	26	190	.0	3.4	31.0	.0	.0	.0
Sep	75.5	51.1	63.3	100	1939	14	67.7	1978	24+	1983	25	57.6	1974	108	58	.0	1.3	30.0	.0	.2	.0
Oct	63.6	40.1	51.9	91	1951	4	58.5	1971	16	1952	21	45.4	1988	415	7	.0	@	28.0	.0	5.7	.0
Nov	49.9	31.5	40.7	80	1950	1	46.1	1975	-5	1958	30	33.2	1976	729	0	.0	.0	14.6	1.4	17.1	.0
Dec	37.7	22.2	30.0	73	1982	4	38.4	1982	-21	1950	27	16.6	1989	1086	0	.0	.0	4.9	9.7	25.9	1.3
Ann	60.1	39.0	49.6	105	Jul 1936	14	77.1	Jul 1999	-23+	Jan 1994	20	9.8	Jan 1977	6300	703	.2	13.9	243.4	40.6	134.4	8.5

\+ 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: 1936-2001

(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	2.39	2.34	3.00	1940	17	4.51	1975	.55	1983
Feb	1.77	1.74	1.86	1948	13	3.90+	1990	.28+	1987
Mar	2.34	2.27	3.00	1939	12	4.63	1980	.73	1981
Apr	3.68	3.84	2.64	1972	20	7.13	1972	.68	1971
May	4.18	4.17	2.68	1987	31	8.75	1987	1.06	1975
Jun	4.25	4.11	5.40	1939	18	9.28	1998	1.08	1991
Jul	4.42	4.34	5.33	1987	2	13.13	1992	.51	1974
Aug	3.77	3.68	3.00	1995	5	9.54	1979	1.05	1993
Sep	2.98	2.93	3.00	1957	21	5.97	1986	.84	1978
Oct	2.70	2.40	2.76	1941	7	7.34	1983	.56	1994
Nov	3.00	2.40	2.36	1955	16	8.07	1985	.36	1976
Dec	2.87	2.61	1.85	1937	17	9.19	1990	.59	1976
Ann	38.35	37.88	5.40	Jun 1939	18	13.13	Jul 1992	.28+	Feb 1987

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	10.9	5.6	1.2	.4
Feb	9.5	4.6	.9	.3
Mar	11.2	6.0	1.5	.3
Apr	13.1	8.5	2.3	.7
May	12.5	8.2	2.8	1.0
Jun	10.5	7.2	2.8	1.1
Jul	10.1	7.2	3.2	1.3
Aug	9.9	6.5	2.5	1.0
Sep	9.6	6.0	1.9	.6
Oct	9.8	6.1	1.7	.5
Nov	11.5	7.1	1.8	.6
Dec	12.7	6.9	1.8	.4
Ann	131.3	79.9	24.4	8.2

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	.98	1.31	1.60	1.88	2.17	2.49	2.86	3.34	4.09	4.78
Feb	.42	.58	.84	1.07	1.30	1.55	1.82	2.15	2.58	3.26	3.90
Mar	1.00	1.21	1.51	1.75	1.98	2.21	2.45	2.74	3.09	3.64	4.13
Apr	1.42	1.76	2.25	2.65	3.04	3.43	3.85	4.34	4.97	5.92	6.80
May	1.37	1.77	2.35	2.85	3.33	3.82	4.36	4.99	5.80	7.06	8.22
Jun	1.41	1.82	2.41	2.91	3.39	3.89	4.43	5.07	5.88	7.15	8.31
Jul	1.15	1.56	2.21	2.77	3.33	3.91	4.56	5.34	6.34	7.93	9.42
Aug	1.33	1.69	2.20	2.64	3.05	3.47	3.93	4.47	5.16	6.22	7.20
Sep	.99	1.27	1.69	2.04	2.38	2.73	3.11	3.56	4.13	5.02	5.84
Oct	.77	1.02	1.41	1.75	2.08	2.42	2.80	3.25	3.83	4.74	5.59
Nov	.74	1.02	1.46	1.85	2.23	2.64	3.09	3.63	4.33	5.45	6.49
Dec	.92	1.20	1.60	1.94	2.27	2.62	2.99	3.43	4.00	4.88	5.70
Ann	28.37	30.33	32.83	34.71	36.38	37.98	39.63	41.45	43.65	46.82	49.56

+ 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: 1936-2001
(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	8.3	6.3	3	1
Feb	6.4	5.3	2	1
Mar	3.4	2.5	#	#
Apr	.6	.0	#	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	#	.0	#	0
Nov	.8	.2	#	#
Dec	5.3	5.3	1	#
Ann	24.8	19.6	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	7.0	1978	9	22.2	1977	18+	1978	23	12	1977
Feb	5.8	1979	26	17.5	1993	18	1977	2	13	1978
Mar	9.0	1988	4	11.0	1988	14	1978	4	5	1978
Apr	4.0	1982	9	7.4	1982	2	1974	9	#+	1997
May	.0	0	0	.0	0	0	0	0	0	0
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	#	1980	26	#+	1980	#	1993	30	#	1993
Nov	3.2	1980	18	6.7	1980	3	1980	29	#+	2000
Dec	8.3	1995	20	13.1	2000	8+	1995	26	3	1995
Ann	9.0	Mar 1988	4	22.2	Jan 1977	18+	Jan 1978	23	13	Feb 1978

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	6.5	3.6	1.0	.3	.0
Feb	4.3	1.9	.5	.1	.0
Mar	2.2	.9	.3	.1	.0
Apr	.6	.3	.1	.0	.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	.0	.0	.0	.0	.0
Nov	1.0	.3	@	.0	.0
Dec	3.9	2.0	.5	.2	.0
Ann	18.5	9.0	2.4	.7	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	12.8	7.4	6.1	1.3
Feb	10.9	7.4	5.2	2.2
Mar	2.5	1.2	.8	.4
Apr	.1	.0	.0	.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	.0	.0	.0	.0
Nov	.4	.1	.0	.0
Dec	4.6	1.8	.9	.0
Ann	31.3	17.9	13.0	3.9

+ 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	5/24	5/19	5/15	5/12	5/09	5/06	5/03	4/29	4/24
32	5/11	5/07	5/04	5/01	4/29	4/26	4/23	4/20	4/16
28	4/27	4/23	4/20	4/18	4/16	4/13	4/11	4/08	4/05
24	4/19	4/15	4/11	4/08	4/05	4/03	3/31	3/27	3/23
20	4/08	4/04	3/31	3/28	3/26	3/23	3/20	3/17	3/12
16	4/02	3/27	3/22	3/19	3/15	3/12	3/08	3/03	2/25

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	9/16	9/21	9/24	9/27	9/30	10/03	10/06	10/10	10/15
32	9/29	10/04	10/07	10/09	10/12	10/14	10/17	10/20	10/24
28	10/07	10/13	10/17	10/21	10/24	10/27	10/31	11/04	11/10
24	10/16	10/23	10/28	11/01	11/05	11/08	11/13	11/17	11/24
20	11/02	11/08	11/13	11/17	11/20	11/24	11/28	12/03	12/09
16	11/16	11/22	11/26	11/30	12/03	12/06	12/10	12/15	12/21

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	163	156	151	147	143	140	135	131	124
32	185	178	173	169	166	162	158	153	146
28	214	206	200	195	191	186	181	176	168
24	239	230	223	218	212	207	201	195	186
20	261	254	248	243	239	235	230	224	217
16	285	277	272	267	262	258	253	247	239

***** 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	1256	1051	853	506	230	35	5	26	108	415	729	1086	6300
60	1101	911	698	362	137	9	0	5	41	279	579	931	5053
57	1008	827	608	282	93	4	0	1	19	209	490	838	4379
55	946	771	552	232	70	2	0	0	10	168	432	776	3959
50	791	637	410	128	29	0	0	0	2	87	298	633	3015
32	312	228	79	1	0	0	0	0	0	0	26	207	853

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	79	101	249	486	850	1103	1259	1187	939	616	287	144	7300
55	0	0	9	27	207	415	546	474	259	70	4	0	2011
57	0	0	4	16	169	357	484	412	209	49	1	0	1701
60	0	0	0	7	119	272	391	324	140	26	0	0	1279
65	0	0	0	1	58	148	241	190	58	7	0	0	703
70	0	0	0	0	22	59	112	92	15	0	0	0	300

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	14	27	114	296	617	880	1028	958	717	393	142	36	14	41	155	451	1068	1948	2976	3934	4651	5044	5186	5222
45	4	11	64	187	465	730	873	803	567	259	76	14	4	15	79	266	731	1461	2334	3137	3704	3963	4039	4053
50	0	1	31	109	326	580	718	648	420	156	38	5	0	1	32	141	467	1047	1765	2413	2833	2989	3027	3032
55	0	0	14	57	205	432	563	494	282	80	15	0	0	0	14	71	276	708	1271	1765	2047	2127	2142	2142
60	0	0	4	25	113	289	408	341	167	37	2	0	0	0	4	29	142	431	839	1180	1347	1384	1386	1386
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	2	15	76	185	375	574	691	638	454	238	80	16	2	17	93	278	653	1227	1918	2556	3010	3248	3328	3344

(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