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: BOWLING GREEN WWTP, OH **COOP ID: 330862**

Climate Division: OH 1 **NWS Call Sign:** **Elevation: 675 Feet** **Lat: 41˚23N** **Lon: 83˚37W**

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	31.0	15.2	23.1	72	1950	25	34.0	1990	-20+	1994	20	9.1	1977	1299	0	.0	.0	2.1	15.9	28.9	4.0
Feb	34.8	17.6	26.2	72	2000	27	36.2	1998	-13	1982	10	12.3	1978	1087	0	.0	.0	3.4	11.9	25.4	2.1
Mar	46.2	26.2	36.2	81+	1945	25	43.5	1973	-7+	1978	5	27.0	1984	893	0	.0	.0	11.8	3.6	22.2	.1
Apr	58.8	35.8	47.3	88+	1985	22	54.9	1985	8	1982	7	41.7	1975	532	1	.0	.0	23.7	.1	9.7	.0
May	71.0	47.9	59.5	96+	1964	23	66.0	1991	25	1978	1	52.7	1997	227	54	.0	.8	30.6	.0	.6	.0
Jun	80.3	57.7	69.0	104	1988	26	73.0	1984	36	1972	10	64.6	1992	33	152	.1	3.7	30.0	.0	.0	.0
Jul	84.2	61.6	72.9	110+	1936	14	77.2	1999	41	1974	21	69.9	1992	1	245	.1	6.2	31.0	.0	.0	.0
Aug	81.6	58.7	70.2	105+	1951	31	75.6	1995	38	1982	29	65.8	1992	20	179	.0	2.9	31.0	.0	.0	.0
Sep	75.4	51.1	63.3	101	1939	15	67.7	1971	29	1942	29	59.1	1975	104	51	.0	1.2	30.0	.0	.1	.0
Oct	63.1	40.0	51.6	91+	1953	3	60.4	1971	21+	1988	31	44.8	1987	425	8	.0	.0	28.2	.0	4.9	.0
Nov	48.9	30.9	39.9	80	1950	1	46.4	1975	2	1950	24	32.3	1976	753	0	.0	.0	14.1	1.5	17.0	.0
Dec	36.5	21.4	29.0	70	1982	2	38.1	1982	-19	1989	23	15.5	1989	1118	0	.0	.0	4.1	9.8	26.5	1.4
Ann	59.3	38.7	49.0	110+	Jul 1936	14	77.2	Jul 1999	-20+	Jan 1994	20	9.1	Jan 1977	6492	690	.2	14.8	240.0	42.8	135.3	7.6

\+ 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: 1936-2001

(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	1.74	1.62	1.85	1948	1	3.42	1999	.55	1983
Feb	1.63	1.60	2.00	1997	27	5.42	1990	.12	1987
Mar	2.37	2.27	2.08	1938	23	4.67	1973	.67	1981
Apr	3.20	3.32	3.07	1977	23	5.64	1977	.87	1971
May	3.58	3.52	2.66	1991	26	6.38	1997	.44	1988
Jun	3.56	3.42	3.30	1979	30	8.52	1981	.44	1988
Jul	3.57	2.92	4.49	1979	10	8.62	1989	.21	1974
Aug	3.36	3.32	3.85	1949	28	10.87	1998	.29	1996
Sep	2.67	2.42	3.01	1959	2	5.50	1977	.54	1994
Oct	2.50	1.83	3.37	1991	26	6.54	1991	.74	1974
Nov	2.64	2.30	2.17	1966	9	7.18	1982	.29	1976
Dec	2.36	2.42	2.06	1992	31	6.17	1990	.61	1998
Ann	33.18	33.29	4.49	Jul 1979	10	10.87	Aug 1998	.12	Feb 1987

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.9	4.8	1.0	.1
Feb	6.8	4.1	.9	.2
Mar	8.8	5.9	1.5	.3
Apr	10.3	7.3	1.9	.4
May	9.6	7.3	2.3	.7
Jun	9.4	6.8	2.4	.7
Jul	8.0	6.5	2.4	.8
Aug	8.1	6.4	2.2	.8
Sep	7.7	5.6	1.8	.7
Oct	8.1	5.6	1.4	.4
Nov	9.0	6.4	1.6	.4
Dec	9.1	6.2	1.3	.3
Ann	102.8	72.9	20.7	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	.56	.73	.97	1.18	1.38	1.59	1.82	2.08	2.43	2.97	3.46
Feb	.26	.40	.63	.86	1.09	1.34	1.63	1.99	2.46	3.24	3.98
Mar	.84	1.06	1.39	1.66	1.92	2.18	2.47	2.81	3.24	3.91	4.52
Apr	1.09	1.40	1.84	2.21	2.57	2.94	3.34	3.81	4.42	5.35	6.21
May	1.42	1.75	2.22	2.61	2.98	3.35	3.75	4.22	4.81	5.72	6.54
Jun	1.10	1.44	1.95	2.38	2.79	3.23	3.70	4.26	4.98	6.11	7.15
Jul	.96	1.30	1.81	2.26	2.71	3.17	3.69	4.30	5.10	6.35	7.52
Aug	.70	1.01	1.51	1.95	2.41	2.89	3.43	4.08	4.95	6.32	7.63
Sep	.69	.94	1.33	1.67	2.01	2.36	2.76	3.22	3.83	4.79	5.69
Oct	.61	.85	1.21	1.53	1.85	2.19	2.57	3.02	3.61	4.54	5.42
Nov	.64	.88	1.27	1.61	1.95	2.31	2.72	3.20	3.83	4.83	5.76
Dec	.80	1.03	1.35	1.63	1.89	2.17	2.46	2.81	3.25	3.94	4.58
Ann	25.46	27.00	28.95	30.41	31.69	32.93	34.20	35.59	37.26	39.67	41.73

+ 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)

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	6.1	4.8	2	1	8.0	1996	3	18.4	1978	17	1978	31	10	1981	4.6	2.9	.5	.2	.0	12.2	6.5	3.7	.8
Feb	5.4	4.9	2	1	7.0	1982	4	19.5	1982	20	1978	10	16	1978	3.6	2.3	.5	.1	.0	9.2	4.1	2.0	.7
Mar	2.8	1.0	1	#	10.0	1993	5	14.5+	1993	10	1993	5	4	1978	1.9	1.2	.2	.1	@	2.9	1.3	.7	@
Apr	.7	.0	#	0	7.5	1982	6	7.7	1982	7	1982	6	1	1982	.5	.3	@	@	.0	.4	.2	.1	.0
May	.0	.0	#	0	1.0	1989	7	1.0	1989	1	1989	7	#	1989	@	@	.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	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	#	.0	0	0	#	1976	22	#+	1976	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	.6	.0	#	#	4.5	1977	28	4.5	1977	5	1977	28	#+	2000	.6	.4	@	.0	.0	.6	.1	@	.0
Dec	5.0	4.4	1	#	6.0	1977	9	12.0	1974	16	1977	11	4	1989	3.3	2.2	.4	.1	.0	4.6	2.1	.5	.0
Ann	20.6	15.1	N/A	N/A	10.0	Mar 1993	5	19.5	Feb 1982	20	Feb 1978	10	16	Feb 1978	14.5	9.3	1.6	.5	@	29.9	14.3	7.0	1.5

+ 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	5/23	5/18	5/14	5/11	5/08	5/06	5/03	4/29	4/24
32	5/10	5/06	5/03	5/01	4/28	4/26	4/23	4/20	4/16
28	4/27	4/23	4/20	4/17	4/15	4/13	4/10	4/07	4/03
24	4/16	4/12	4/09	4/06	4/03	4/01	3/29	3/26	3/21
20	4/09	4/04	3/31	3/28	3/26	3/23	3/20	3/16	3/11
16	3/31	3/26	3/22	3/18	3/15	3/11	3/08	3/04	2/26

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	9/20	9/24	9/27	9/30	10/03	10/05	10/08	10/11	10/15
32	9/30	10/05	10/09	10/12	10/14	10/17	10/20	10/24	10/28
28	10/08	10/14	10/18	10/22	10/25	10/28	11/01	11/05	11/11
24	10/22	10/28	11/02	11/05	11/09	11/13	11/17	11/21	11/28
20	11/07	11/13	11/17	11/20	11/23	11/27	11/30	12/04	12/09
16	11/15	11/21	11/26	11/30	12/04	12/07	12/11	12/16	12/23

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	165	158	154	150	146	143	139	134	128
32	189	182	177	172	168	164	160	155	148
28	217	208	202	197	192	188	182	176	168
24	243	235	229	224	219	214	209	203	195
20	266	258	252	247	242	237	232	226	218
16	287	279	273	268	263	258	254	248	240

***** 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	1299	1087	893	532	227	33	1	20	104	425	753	1118	6492
60	1144	947	738	386	132	8	0	3	38	290	603	963	5252
57	1051	863	645	303	89	3	0	0	17	220	514	870	4575
55	989	807	585	253	66	2	0	0	9	179	456	808	4154
50	835	671	442	143	26	0	0	0	2	97	318	664	3198
32	348	250	86	2	0	0	0	0	0	1	30	231	948

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	71	87	216	461	850	1110	1267	1182	937	607	266	136	7190
55	0	0	2	21	202	421	554	469	257	72	2	0	2000
57	0	0	0	12	164	363	492	407	204	51	1	0	1694
60	0	0	0	5	114	278	399	317	135	28	0	0	1276
65	0	0	0	1	54	152	245	179	51	8	0	0	690
70	0	0	0	0	20	61	108	80	11	1	0	0	281

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	8	20	101	283	626	891	1036	961	726	399	128	30	8	28	129	412	1038	1929	2965	3926	4652	5051	5179	5209
45	0	4	55	175	472	741	881	806	576	263	69	11	0	4	59	234	706	1447	2328	3134	3710	3973	4042	4053
50	0	1	25	98	329	591	726	651	427	155	29	3	0	1	26	124	453	1044	1770	2421	2848	3003	3032	3035
55	0	0	7	48	205	444	571	496	289	79	10	0	0	0	7	55	260	704	1275	1771	2060	2139	2149	2149
60	0	0	2	21	115	301	416	342	171	35	0	0	0	0	2	23	138	439	855	1197	1368	1403	1403	1403
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	1	13	68	177	383	584	700	643	458	238	69	13	1	14	82	259	642	1226	1926	2569	3027	3265	3334	3347

(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