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: WOOSTER EXP STN, OH **COOP ID: 339312**

Climate Division: OH 6 **NWS Call Sign:** **Elevation: 1,020 Feet** **Lat: 40˚47N** **Lon: 81˚55W**

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	32.8	16.9	24.9	73	1950	25	35.8	1990	-24+	1994	19	9.7	1977	1244	0	.0	.0	2.6	15.2	28.1	3.4
Feb	36.5	19.5	28.0	72	1932	11	37.0	1998	-20	1963	27	15.0	1978	1036	0	.0	.0	4.2	11.4	23.7	2.3
Mar	47.5	27.8	37.7	84	1910	24	46.1	1973	-9	1948	12	28.1	1984	848	0	.0	.0	12.6	4.1	21.1	.3
Apr	59.1	37.6	48.4	90	1925	24	52.8	1991	7	1923	1	43.0	1975	500	0	.0	.0	23.2	.3	10.0	.0
May	69.8	48.4	59.1	97	1902	4	67.4	1991	24	1966	10	53.0	1997	228	44	.0	@	30.5	.0	.9	.0
Jun	78.3	57.1	67.7	100	1988	25	71.5	1991	31+	1972	11	62.6	1972	43	124	@	1.0	30.0	.0	@	.0
Jul	82.0	60.9	71.5	104	1930	20	75.1	1988	37	1930	15	66.3	2000	8	209	.1	2.4	31.0	.0	.0	.0
Aug	80.1	59.1	69.6	105	1918	6	74.7	1995	36+	1982	29	65.5	1976	27	169	.0	1.2	31.0	.0	.0	.0
Sep	73.0	52.1	62.6	99+	1954	5	67.0	1971	27+	1942	29	58.0	1975	120	45	.0	.2	30.0	.0	.2	.0
Oct	61.2	40.6	50.9	91	1922	5	58.0	1971	16	1930	22	44.9	1988	441	4	.0	.0	27.5	.0	5.8	.0
Nov	48.6	32.5	40.6	80	1950	1	45.6	1987	-2+	1958	30	32.3	1976	733	0	.0	.0	14.1	1.7	16.4	.0
Dec	37.5	23.0	30.3	74	1982	3	38.3	1982	-19	1917	30	17.4	1989	1078	0	.0	.0	4.9	10.4	25.7	1.0
Ann	58.9	39.6	49.3	105	Aug 1918	6	75.1	Jul 1988	-24+	Jan 1994	19	9.7	Jan 1977	6306	595	.1	4.8	241.6	43.1	131.9	7.0

\+ 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: 1900-2001

(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	2.26	1.80	2.59	1995	16	5.89	1995	.54	1981
Feb	1.97	1.89	1.96	1956	25	4.66	1990	.41	1987
Mar	2.78	2.71	4.84	1913	25	4.67	1974	.84	1981
Apr	3.43	3.55	1.96	2000	8	6.29	1996	.80	1971
May	3.92	3.65	2.48	1923	12	6.31	1996	1.05	1977
Jun	4.02	3.75	2.75	1946	16	8.69	1989	.68	1988
Jul	3.96	3.19	9.37	1969	5	10.17	1992	.71	1974
Aug	4.03	4.05	4.44	1935	7	9.46	1980	.48	1971
Sep	3.42	2.99	6.18	1979	14	8.56	1979	.95	1998
Oct	2.58	2.34	2.35	1910	6	5.86	1990	.60	1982
Nov	3.00	2.87	2.30	1927	30	9.42	1985	.50	1976
Dec	2.67	2.51	2.08	2000	17	6.93	1990	.91	1976
Ann	38.04	37.28	9.37	Jul 1969	5	10.17	Jul 1992	.41	Feb 1987

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	12.3	5.7	1.0	.3
Feb	10.0	5.3	1.1	.1
Mar	11.8	7.0	1.8	.4
Apr	13.3	7.8	2.5	.6
May	12.9	8.3	2.6	.7
Jun	11.3	7.8	2.8	1.0
Jul	10.1	7.0	2.5	.9
Aug	9.5	6.6	2.8	1.1
Sep	9.8	5.8	1.9	.8
Oct	9.7	5.9	1.6	.4
Nov	11.7	6.7	2.1	.4
Dec	12.1	6.3	1.5	.3
Ann	134.5	80.2	24.2	7.0

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	.72	.94	1.26	1.53	1.79	2.06	2.36	2.71	3.16	3.85	4.50
Feb	.63	.82	1.10	1.33	1.56	1.80	2.05	2.36	2.75	3.35	3.91
Mar	1.29	1.54	1.87	2.14	2.39	2.64	2.91	3.22	3.60	4.19	4.71
Apr	1.26	1.58	2.04	2.43	2.80	3.18	3.59	4.07	4.68	5.62	6.48
May	1.47	1.84	2.36	2.80	3.22	3.64	4.10	4.64	5.32	6.37	7.33
Jun	1.30	1.68	2.24	2.72	3.18	3.66	4.18	4.80	5.59	6.82	7.95
Jul	1.03	1.41	1.98	2.49	2.98	3.51	4.09	4.78	5.67	7.09	8.42
Aug	1.13	1.51	2.09	2.59	3.09	3.60	4.17	4.85	5.73	7.10	8.39
Sep	.93	1.26	1.75	2.18	2.60	3.05	3.54	4.12	4.87	6.05	7.16
Oct	.80	1.05	1.41	1.73	2.03	2.34	2.69	3.09	3.62	4.43	5.19
Nov	.83	1.12	1.55	1.93	2.30	2.68	3.11	3.61	4.27	5.30	6.26
Dec	1.05	1.29	1.65	1.94	2.21	2.49	2.80	3.15	3.60	4.28	4.91
Ann	28.95	30.76	33.05	34.77	36.28	37.74	39.24	40.88	42.86	45.71	48.16

\+ 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: 1900-2001
(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	8.7	7.6	3	1	6.0	1974	10	28.0	1977	18	1978	22	10	1977	7.4	3.5	.9	.2	.0	13.9	7.1	4.1	1.1
Feb	7.3	7.0	2	1	11.1	1984	29	22.3	1984	20	1977	9	10	1985	5.3	2.7	.7	.1	@	12.1	5.6	3.5	.8
Mar	4.9	3.8	1	#	7.6	1982	3	14.7	1988	13	1984	1	5	1984	3.6	1.6	.5	.2	.0	5.3	2.3	1.5	.3
Apr	1.2	.1	#	#	8.0	1987	4	14.0	1987	8	1987	4	1	1987	.8	.4	.1	.1	.0	.6	.1	.1	.0
May	.0	.0	#	0	.3	1989	6	.3	1989	#	1989	6	#	1989	@	.0	.0	.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	.3	1974	19	.3	1974	2	1989	18	#+	2000	.1	.0	.0	.0	.0	.0	.0	.0	.0
Nov	1.9	1.0	#	#	3.7	1980	18	6.2	1980	4	1996	10	#+	2000	1.9	.8	.1	.0	.0	1.5	.2	.0	.0
Dec	6.5	6.6	1	1	19.0	1974	2	25.8	1974	20	1974	2	5	1974	5.0	2.2	.5	.2	@	8.4	3.5	1.4	.3
Ann	30.5	26.1	N/A	N/A	19.0	Dec 1974	2	28.0	Jan 1977	20+	Feb 1977	9	10+	Feb 1985	24.1	11.2	2.8	.8	@	41.8	18.8	10.6	2.5

+ 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	5/30	5/25	5/21	5/18	5/15	5/12	5/09	5/05	4/29
32	5/19	5/14	5/10	5/06	5/03	4/30	4/27	4/23	4/17
28	4/30	4/27	4/24	4/21	4/19	4/17	4/14	4/11	4/08
24	4/21	4/17	4/14	4/11	4/09	4/06	4/03	3/31	3/27
20	4/10	4/05	4/01	3/28	3/25	3/22	3/19	3/15	3/09
16	4/04	3/29	3/25	3/21	3/18	3/15	3/11	3/06	2/28

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	9/14	9/18	9/21	9/24	9/26	9/28	10/01	10/04	10/08
32	9/26	9/30	10/03	10/05	10/08	10/10	10/12	10/15	10/19
28	10/06	10/12	10/16	10/19	10/22	10/25	10/28	11/01	11/06
24	10/23	10/28	11/01	11/04	11/07	11/10	11/13	11/17	11/22
20	11/05	11/12	11/16	11/20	11/23	11/27	12/01	12/05	12/11
16	11/18	11/23	11/27	12/01	12/04	12/08	12/11	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	151	145	141	137	133	130	126	122	116
32	174	168	164	160	157	153	150	146	140
28	205	198	193	189	185	181	177	172	165
24	234	226	221	216	212	207	203	197	189
20	267	258	252	247	242	237	232	226	218
16	284	276	270	265	261	256	251	245	237

***** 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	1244	1036	848	500	228	43	8	27	120	441	733	1078	6306
60	1089	896	693	353	130	11	0	5	46	301	583	923	5030
57	996	812	603	270	85	4	0	0	22	226	494	830	4342
55	934	756	545	219	61	2	0	0	12	183	436	768	3916
50	784	618	403	113	22	0	0	0	2	96	301	624	2963
32	312	206	72	1	0	0	0	0	0	0	26	198	815

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	91	94	247	491	839	1071	1224	1166	916	586	283	143	7151
55	0	0	7	20	187	383	511	453	238	55	3	0	1857
57	0	0	3	10	149	325	449	391	188	37	1	0	1553
60	0	0	0	3	101	242	356	302	122	18	0	0	1144
65	0	0	0	0	44	124	209	169	45	4	0	0	595
70	0	0	0	0	14	45	92	76	10	0	0	0	237

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	13	28	115	278	584	827	972	918	676	360	132	34	13	41	156	434	1018	1845	2817	3735	4411	4771	4903	4937
45	2	11	65	168	434	677	817	763	527	225	73	15	2	13	78	246	680	1357	2174	2937	3464	3689	3762	3777
50	0	0	31	93	292	527	662	608	380	124	30	4	0	0	31	124	416	943	1605	2213	2593	2717	2747	2751
55	0	0	11	46	172	381	507	453	246	58	13	0	0	0	11	57	229	610	1117	1570	1816	1874	1887	1887
60	0	0	3	16	88	248	353	301	141	20	1	0	0	0	3	19	107	355	708	1009	1150	1170	1171	1171
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	3	16	72	167	349	536	653	609	418	205	70	14	3	19	91	258	607	1143	1796	2405	2823	3028	3098	3112

(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