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: YOUNGSTOWN MUNICIPAL AP, OH **COOP ID: 339406**

Climate Division: OH 3 **NWS Call Sign: YNG** **Elevation: 1,180 Feet** **Lat: 41˚15N** **Lon: 80˚40W**

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	32.4	17.4	24.9	71	1950	25	34.9	1990	-22	1994	19	9.9	1977	1243	0	.0	.0	2.7	15.8	27.8	2.7
Feb	36.0	19.3	27.7	73	2000	26	37.0	1998	-14	1979	17	15.2	1978	1057	0	.0	.0	3.9	11.8	23.7	2.1
Mar	46.3	27.1	36.7	82	1986	30	44.8	1973	-10	1980	2	28.5	1984	879	1	.0	.0	12.1	5.0	21.7	.3
Apr	58.2	36.5	47.4	88	1990	27	53.0	1985	11	1950	14	40.4	1975	530	8	.0	.0	22.1	.3	11.1	.0
May	69.0	46.2	57.6	92	1962	18	65.7	1991	24+	1970	7	51.4	1997	252	33	.0	@	30.3	.0	1.3	.0
Jun	77.1	54.6	65.9	99+	1988	25	69.9	1971	30	1972	11	60.6	1980	71	112	.0	1.1	30.0	.0	@	.0
Jul	81.0	58.7	69.9	100+	1988	16	74.1	1999	40	2001	2	67.0	2000	18	186	.1	3.2	31.0	.0	.0	.0
Aug	79.3	57.5	68.4	97+	1988	17	74.9	1995	32	1982	29	64.5	1982	28	149	.0	1.7	31.0	.0	@	.0
Sep	72.1	50.9	61.5	99	1954	5	66.3	1971	29+	1991	28	57.9	1975	148	57	.0	.3	30.0	.0	.2	.0
Oct	60.7	40.9	50.8	87+	1951	5	58.5	1971	20+	1988	31	44.9	1988	439	5	.0	.0	26.7	.0	4.8	.0
Nov	48.4	33.0	40.7	80	1961	3	45.8	1975	1+	1976	30	32.0	1976	723	1	.0	.0	13.7	1.9	15.7	.0
Dec	37.3	23.4	30.4	76	1982	3	39.8	1982	-12+	1989	22	18.0	1989	1063	0	.0	.0	4.7	10.7	25.5	.9
Ann	58.2	38.8	48.5	100+	Jul 1988	16	74.9	Aug 1995	-22	Jan 1994	19	9.9	Jan 1977	6451	552	.1	6.3	238.2	45.5	131.8	6.0

\+ 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: 1948-2001

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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	2.34	2.11	2.65	1959	21	4.88	1998	.73	1985
Feb	2.03	1.84	1.88	1950	13	4.56	1990	.55	1987
Mar	3.05	3.12	1.96	1964	9	5.77	1985	1.07	1990
Apr	3.33	3.02	1.56	1972	15	7.29	1998	1.01	1982
May	3.45	3.51	1.93	1975	31	6.24	1989	.78	1977
Jun	3.91	3.62	3.57	1986	11	10.66	1986	.71	1988
Jul	4.10	3.43	3.82	1967	2	9.68	1992	.66	1997
Aug	3.43	3.06	3.47	1994	13	7.74	1980	.86	1991
Sep	3.89	3.81	2.97	1979	14	6.35	1996	1.06	1995
Oct	2.46	2.46	4.31	1954	15	4.95	1995	.59	1982
Nov	3.07	2.71	2.73	1985	4	9.11	1985	.94	1976
Dec	2.96	2.91	1.86	1979	25	6.53	1990	1.45	1989
Ann	38.02	37.86	4.31	Oct 1954	15	10.66	Jun 1986	.55	Feb 1987

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	16.1	6.2	1.1	.2
Feb	13.5	5.8	.8	.1
Mar	14.4	7.8	1.7	.3
Apr	14.3	7.8	1.9	.7
May	12.9	8.4	2.1	.5
Jun	12.0	7.7	2.8	.7
Jul	10.4	6.8	2.6	1.1
Aug	10.2	6.5	2.2	.8
Sep	11.4	7.3	3.0	1.0
Oct	11.1	6.0	1.5	.3
Nov	14.6	7.2	1.7	.2
Dec	16.5	7.4	1.4	.5
Ann	157.4	84.9	22.8	6.4

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	.74	.96	1.29	1.57	1.84	2.12	2.43	2.79	3.26	3.99	4.66
Feb	.76	.95	1.22	1.45	1.66	1.88	2.12	2.40	2.75	3.29	3.79
Mar	1.32	1.60	1.98	2.29	2.59	2.88	3.20	3.56	4.02	4.72	5.35
Apr	1.26	1.57	2.01	2.39	2.74	3.10	3.49	3.94	4.52	5.40	6.21
May	1.21	1.54	2.01	2.41	2.79	3.18	3.60	4.09	4.73	5.70	6.60
Jun	1.18	1.55	2.11	2.59	3.05	3.53	4.06	4.69	5.49	6.75	7.92
Jul	1.33	1.72	2.29	2.78	3.25	3.74	4.27	4.89	5.70	6.95	8.10
Aug	1.03	1.35	1.84	2.26	2.67	3.10	3.57	4.12	4.83	5.94	6.98
Sep	1.89	2.22	2.67	3.04	3.38	3.72	4.08	4.49	5.00	5.77	6.47
Oct	.93	1.16	1.49	1.76	2.02	2.28	2.57	2.90	3.33	3.98	4.57
Nov	1.07	1.36	1.78	2.14	2.48	2.82	3.20	3.64	4.21	5.08	5.88
Dec	1.51	1.76	2.09	2.36	2.60	2.85	3.11	3.40	3.77	4.32	4.81
Ann	30.07	31.67	33.69	35.19	36.51	37.77	39.07	40.48	42.18	44.61	46.69

\+ 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)

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	13.1	11.7	3	1	7.6	1999	13	36.4	1999	18	1999	15	10	1977	12.5	4.6	1.0	.3	.0	17.6	9.6	6.4	2.1
Feb	9.6	9.2	2	1	9.0	1971	8	19.0	1972	18	1977	5	7	1977	9.2	3.2	.7	.2	.0	13.9	8.1	4.0	.6
Mar	10.4	9.2	1	1	14.7	1993	13	30.9	1993	11+	1984	3	3	1984	7.0	2.6	1.0	.5	.1	6.9	3.2	1.7	.2
Apr	2.2	1.6	#	0	11.8	1987	4	12.4	1987	10	1987	1	1	1987	2.6	.4	.1	@	@	1.0	.2	.2	@
May	.0	.0	#	0	.3	1989	7	.3	1989	0	0	0	#	2000	.0	.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	#	1983	23	#	1983	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.6	.0	#	0	5.1	1993	31	7.7	1993	1+	1993	31	#	1993	.6	.2	.1	@	.0	.1	.0	.0	.0
Nov	4.5	3.7	#	0	7.6	1971	21	20.1	1971	13	1971	23	2	1971	5.0	1.3	.3	.1	.0	2.6	.7	.4	@
Dec	12.3	11.0	1	1	11.6	1995	19	29.5	1987	13+	1995	27	5	1995	10.7	3.8	.9	.3	@	11.5	5.3	2.5	.5
Ann	52.7	46.4	N/A	N/A	14.7	Mar 1993	13	36.4	Jan 1999	18+	Jan 1999	15	10	Jan 1977	47.6	16.1	4.1	1.4	.1	53.6	27.1	15.2	3.4

+ 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	6/09	6/03	5/29	5/25	5/21	5/18	5/14	5/09	5/03
32	5/22	5/17	5/14	5/11	5/08	5/05	5/02	4/29	4/24
28	5/02	4/28	4/26	4/23	4/21	4/19	4/17	4/14	4/10
24	4/21	4/17	4/14	4/11	4/09	4/06	4/04	3/31	3/27
20	4/15	4/10	4/07	4/04	4/01	3/29	3/26	3/23	3/18
16	4/04	3/30	3/27	3/24	3/21	3/18	3/15	3/11	3/06

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	9/23	9/26	9/28	10/01	10/04	10/08
32	9/21	9/28	10/03	10/07	10/11	10/15	10/19	10/24	10/31
28	10/13	10/17	10/20	10/23	10/25	10/28	10/31	11/03	11/07
24	10/26	10/31	11/04	11/08	11/11	11/14	11/17	11/21	11/26
20	11/06	11/12	11/16	11/20	11/24	11/27	12/01	12/05	12/11
16	11/18	11/24	11/28	12/02	12/05	12/09	12/12	12/17	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	145	139	134	130	127	123	119	114	108
32	176	169	164	159	155	151	147	142	135
28	203	197	193	190	186	183	180	176	170
24	236	229	224	219	215	211	207	202	195
20	261	252	246	241	236	231	226	219	211
16	278	271	267	262	259	255	251	246	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	1243	1057	879	530	252	71	18	28	148	439	723	1063	6451
60	1089	906	722	384	158	25	1	6	53	304	578	919	5145
57	996	822	629	301	108	11	0	1	26	231	490	826	4441
55	934	766	571	249	81	6	0	0	14	188	432	764	4005
50	783	627	428	140	32	1	0	0	2	102	298	620	3033
32	311	212	78	2	0	0	0	0	0	1	25	195	824

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	59	83	228	473	806	1032	1195	1149	899	592	288	104	6908
55	0	1	13	48	160	350	482	437	233	59	13	2	1798
57	0	0	9	35	125	295	420	376	187	40	8	1	1496
60	0	0	5	21	82	218	328	286	129	21	4	1	1095
65	0	0	1	8	33	112	186	149	57	5	1	0	552
70	0	0	0	1	8	41	81	57	19	0	0	0	207

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	31	109	271	567	801	955	908	669	362	136	37	14	45	154	425	992	1793	2748	3656	4325	4687	4823	4860
45	5	11	59	170	415	651	800	753	519	228	73	14	5	16	75	245	660	1311	2111	2864	3383	3611	3684	3698
50	0	3	32	96	278	502	645	598	374	129	33	4	0	3	35	131	409	911	1556	2154	2528	2657	2690	2694
55	0	0	12	47	164	361	491	444	241	63	14	1	0	0	12	59	223	584	1075	1519	1760	1823	1837	1838
60	0	0	4	24	85	227	338	296	135	26	3	0	0	0	4	28	113	340	678	974	1109	1135	1138	1138
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	5	15	69	169	344	520	636	599	412	200	71	18	5	20	89	258	602	1122	1758	2357	2769	2969	3040	3058

(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