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: NORWALK WWTP, OH **COOP ID: 336118**

Climate Division: OH 2 **NWS Call Sign:** **Elevation: 670 Feet** **Lat: 41˚16N** **Lon: 82˚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	32.5	16.7	24.6	72	1906	21	35.0	1990	-23	1912	13	11.0	1977	1253	0	.0	.0	2.5	15.4	28.6	4.0
Feb	35.6	18.9	27.3	73	2000	27	36.1	1998	-25	1929	20	13.0	1978	1058	0	.0	.0	3.7	12.1	24.8	2.6
Mar	45.7	27.5	36.6	85	1910	24	44.0	1973	-15	1948	12	27.2	1984	881	0	.0	.0	10.5	4.3	22.1	.2
Apr	57.7	36.9	47.3	91	1915	25	54.2	1985	7	1982	7	40.4	1975	531	1	.0	.0	21.8	.1	10.0	.0
May	69.3	47.9	58.6	98	1911	28	66.6	1991	22	1966	10	52.9	1997	243	44	.0	.4	30.4	.0	.6	.0
Jun	78.5	57.4	68.0	103+	1988	26	71.3	1984	33	1972	11	61.8	1972	46	133	@	2.8	30.0	.0	.0	.0
Jul	82.4	61.5	72.0	108	1934	24	76.6	1999	39	1930	15	69.0	2000	4	218	.0	4.7	31.0	.0	.0	.0
Aug	80.5	59.6	70.1	104+	1930	4	75.2	1995	29	1931	27	66.4	1992	18	174	.0	2.3	31.0	.0	.0	.0
Sep	74.1	52.3	63.2	102	1939	14	66.8	1998	28	1942	29	57.9	1975	100	45	.0	.8	30.0	.0	.1	.0
Oct	62.4	41.4	51.9	92	1928	11	58.6	1971	17	1988	31	44.7	1988	416	9	.0	.0	27.5	.0	4.8	.0
Nov	49.3	33.0	41.2	82	1933	1	45.9	1985	-2	1958	30	34.4	1976	716	0	.0	.0	13.8	1.3	16.0	.0
Dec	37.4	22.9	30.2	73	1982	4	39.2	1982	-17+	1989	23	17.0	1989	1081	0	.0	.0	4.4	9.3	26.0	1.2
Ann	58.8	39.7	49.3	108	Jul 1934	24	76.6	Jul 1999	-25	Feb 1929	20	11.0	Jan 1977	6347	624	@	11.0	236.6	42.5	133.0	8.0

\+ 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	2.20	2.10	2.81	1959	21	4.79	1978	.69	1981
Feb	1.83	1.72	2.42	1959	10	3.47	1976	.09	1987
Mar	2.72	2.63	2.93	1913	25	5.30	1973	.48	1981
Apr	3.29	3.45	2.48	1934	4	6.05	1996	.87	1971
May	3.57	4.00	2.86	1956	12	6.64	1997	.57	1988
Jun	4.25	4.03	3.74	1929	20	7.57	1977	.22	1988
Jul	3.89	3.38	9.02	1969	5	12.71	1977	1.82	1974
Aug	3.92	3.72	4.38	1948	12	7.89	1994	.55	1996
Sep	3.24	3.10	3.60	1990	9	8.95	1996	.77	1998
Oct	2.34	2.21	2.50	1929	22	4.64	1986	.23	1982
Nov	2.93	2.60	2.80	1958	17	7.26	1983	.34	1976
Dec	2.77	2.71	2.00+	1992	31	6.76	1990	.70	1976
Ann	36.95	37.04	9.02	Jul 1969	5	12.71	Jul 1977	.09	Feb 1987

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	11.6	6.0	1.2	.2
Feb	9.7	4.9	.9	.2
Mar	11.5	6.8	1.6	.3
Apr	12.7	7.7	2.3	.4
May	12.0	7.5	2.4	.8
Jun	10.9	7.4	3.0	1.2
Jul	9.3	6.9	2.9	.9
Aug	9.9	6.6	3.0	1.0
Sep	9.5	6.4	2.1	.8
Oct	9.9	5.7	1.5	.3
Nov	11.3	7.1	1.8	.4
Dec	12.2	6.8	1.5	.3
Ann	130.5	79.8	24.2	6.8

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	.66	.87	1.18	1.45	1.71	1.98	2.28	2.64	3.09	3.81	4.47
Feb	.51	.68	.95	1.18	1.40	1.64	1.90	2.21	2.61	3.24	3.82
Mar	1.02	1.28	1.64	1.94	2.23	2.52	2.84	3.21	3.68	4.40	5.06
Apr	1.17	1.48	1.93	2.31	2.67	3.04	3.44	3.91	4.51	5.43	6.28
May	1.05	1.39	1.90	2.34	2.77	3.21	3.70	4.28	5.03	6.20	7.28
Jun	1.16	1.56	2.17	2.71	3.24	3.79	4.40	5.12	6.06	7.54	8.92
Jul	1.31	1.68	2.22	2.67	3.11	3.56	4.06	4.63	5.37	6.52	7.58
Aug	1.16	1.53	2.09	2.57	3.04	3.53	4.07	4.70	5.52	6.81	8.00
Sep	.85	1.16	1.62	2.04	2.45	2.87	3.35	3.91	4.65	5.80	6.89
Oct	.64	.87	1.20	1.50	1.79	2.09	2.42	2.82	3.33	4.14	4.89
Nov	.69	.96	1.39	1.77	2.16	2.56	3.01	3.56	4.27	5.39	6.46
Dec	1.14	1.39	1.75	2.04	2.32	2.60	2.90	3.25	3.69	4.37	4.98
Ann	28.08	29.84	32.07	33.75	35.23	36.65	38.11	39.71	41.64	44.42	46.81

\+ 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	8.9	7.5	3	2	8.5	1978	27	34.0	1978	19	1978	31	11	1977	5.4	3.5	.9	.1	.0	13.0	7.9	4.9	1.8
Feb	7.2	7.8	3	2	8.0	1971	9	13.0	1974	22	1978	5	16	1978	4.0	2.3	.7	.2	.0	11.8	5.9	3.9	1.9
Mar	4.1	3.8	1	#	7.0	1973	18	12.5	1975	30	1984	8	6	1984	2.8	1.7	.6	.2	.0	4.6	2.1	1.1	.3
Apr	.7	.0	#	#	5.8	1994	7	7.7	1994	7	1987	1	#+	1997	.4	.2	.1	@	.0	.4	.2	@	.0
May	#	.0	#	0	#	1974	7	#	1974	1	1989	7	#+	1989	.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	#	1997	5	#	1997	.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	#	1992	21	#+	1992	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	.8	.5	#	#	4.0	1997	14	4.0	1997	4	1997	14	#+	2000	1.1	.4	@	.0	.0	1.3	.1	.0	.0
Dec	7.3	5.8	1	1	10.0	1974	2	16.3	2000	12	1977	10	4	1995	4.0	2.3	.5	.3	@	6.6	2.8	1.4	.2
Ann	29.0	25.4	N/A	N/A	10.0	Dec 1974	2	34.0	Jan 1978	30	Mar 1984	8	16	Feb 1978	17.7	10.4	2.8	.8	@	37.7	19.0	11.3	4.2

+ 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	5/26	5/21	5/17	5/14	5/11	5/08	5/05	5/01	4/26
32	5/10	5/06	5/03	5/01	4/28	4/26	4/23	4/20	4/16
28	5/01	4/27	4/24	4/22	4/19	4/17	4/15	4/12	4/08
24	4/22	4/17	4/13	4/10	4/07	4/04	4/01	3/28	3/23
20	4/07	4/02	3/29	3/26	3/23	3/20	3/17	3/13	3/08
16	4/03	3/27	3/22	3/19	3/15	3/11	3/07	3/03	2/24

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	9/22	9/27	9/29	10/02	10/04	10/07	10/09	10/12	10/16
32	10/02	10/08	10/12	10/16	10/19	10/22	10/26	10/30	11/04
28	10/14	10/20	10/24	10/27	10/31	11/03	11/06	11/10	11/16
24	10/26	10/31	11/04	11/08	11/11	11/14	11/18	11/22	11/28
20	11/01	11/09	11/14	11/19	11/24	11/28	12/03	12/08	12/16
16	11/22	11/28	12/02	12/06	12/09	12/12	12/16	12/20	12/26

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	166	159	154	150	146	142	137	132	125
32	195	187	182	177	173	169	164	159	151
28	216	209	203	198	193	189	184	178	170
24	243	234	228	222	217	212	207	201	192
20	275	264	257	251	245	239	232	225	215
16	291	283	278	273	268	264	259	253	246

***** 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	1253	1058	881	531	243	46	4	18	100	416	716	1081	6347
60	1098	918	726	386	143	13	0	2	35	282	566	926	5095
57	1005	834	635	304	97	5	0	0	15	214	478	833	4420
55	943	778	578	252	72	3	0	0	8	173	420	771	3998
50	789	641	435	144	28	0	0	0	1	94	285	628	3045
32	307	226	89	2	0	0	0	0	0	1	21	202	848

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	77	92	231	462	825	1078	1238	1180	935	617	295	144	7174
55	0	0	7	21	183	390	525	467	253	77	4	0	1927
57	0	0	2	13	147	333	463	405	200	55	2	0	1620
60	0	0	0	5	100	251	370	313	129	31	0	0	1199
65	0	0	0	1	44	133	218	174	45	9	0	0	624
70	0	0	0	0	15	52	92	74	8	1	0	0	242

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	25	98	267	586	846	1001	940	704	384	142	32	14	39	137	404	990	1836	2837	3777	4481	4865	5007	5039
45	2	8	52	161	436	696	846	785	554	253	76	16	2	10	62	223	659	1355	2201	2986	3540	3793	3869	3885
50	0	2	26	92	296	547	691	630	408	148	37	4	0	2	28	120	416	963	1654	2284	2692	2840	2877	2881
55	0	0	11	47	184	403	536	475	271	74	15	0	0	0	11	58	242	645	1181	1656	1927	2001	2016	2016
60	0	0	2	22	99	265	381	322	161	31	3	0	0	0	2	24	123	388	769	1091	1252	1283	1286	1286
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	4	11	65	159	351	546	674	625	440	222	73	16	4	15	80	239	590	1136	1810	2435	2875	3097	3170	3186

(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