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: NEWARK WATER WORKS, OH **COOP ID: 335747**

Climate Division: OH 5 **NWS Call Sign:** **Elevation: 835 Feet** **Lat: 40˚05N** **Lon: 82˚25W**

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	34.2	17.3	25.8	76	1950	25	35.0	1990	-24	1994	19	11.1	1977	1217	0	.0	.0	4.0	12.2	27.0	2.9
Feb	38.5	19.4	29.0	75	2000	27	37.8	1998	-26	1951	3	14.9	1978	1010	0	.0	.0	6.2	8.4	23.1	1.9
Mar	49.4	27.9	38.7	85	1945	25	46.5	1973	-7	1984	9	30.4	1984	818	0	.0	.0	16.2	2.0	19.3	.2
Apr	60.9	36.9	48.9	90	1948	26	54.5	1985	12	1953	21	44.6	1982	483	1	.0	.0	26.0	.1	8.9	.0
May	71.7	48.1	59.9	95	1962	18	67.7	1991	23	1947	10	53.7	1997	209	52	.0	.3	30.9	.0	.9	.0
Jun	80.2	57.3	68.8	101	1952	29	72.6	1971	32	1972	11	64.4	1972	29	141	@	3.1	30.0	.0	@	.0
Jul	83.8	61.5	72.7	106	1936	14	76.8	1999	41+	1979	6	68.8	2000	4	241	@	6.0	31.0	.0	.0	.0
Aug	81.6	59.3	70.5	101	1948	27	76.1	1995	38+	1986	29	66.3	1976	18	187	.1	3.6	31.0	.0	.0	.0
Sep	75.1	52.1	63.6	103	1953	3	67.5	1971	25	1942	29	57.7	1975	102	59	.0	1.0	30.0	.0	.2	.0
Oct	63.4	39.8	51.6	90+	1951	5	58.8	1971	14	1952	21	45.1	1988	422	6	.0	.0	29.1	.0	5.6	.0
Nov	50.7	31.2	41.0	81+	1961	3	46.3	1975	-4	1958	30	33.0	1976	722	0	.0	.0	16.7	.7	16.2	.0
Dec	39.3	23.0	31.2	76	1982	3	39.2	1982	-21+	1951	17	17.4	1989	1050	0	.0	.0	6.7	7.3	24.5	1.0
Ann	60.7	39.5	50.1	106	Jul 1936	14	76.8	Jul 1999	-26	Feb 1951	3	11.1	Jan 1977	6084	687	.1	14.0	257.8	30.7	125.7	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: 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	2.90	2.73	3.43	1952	27	6.04	1978	.77	1981
Feb	2.49	2.64	1.80	1988	2	4.69	1988	.26+	1987
Mar	3.16	3.16	3.13	1945	6	5.74	1980	.78	1979
Apr	3.74	3.89	2.90	1970	2	7.28	1981	.88	1971
May	4.19	4.39	2.23	1962	24	8.06	1990	.96	1991
Jun	4.27	4.18	3.44	1981	14	9.96	1998	.48	1999
Jul	4.54	4.49	3.30	1990	13	10.19	1992	1.21	1991
Aug	4.23	4.11	3.31	1943	4	10.50	1978	.78	1996
Sep	2.87	2.43	4.16	1979	14	6.74	1979	.74	1995
Oct	2.69	2.34	2.78	1986	4	6.31	1986	.94	1994
Nov	3.32	3.08	3.08	1985	11	12.16	1985	.90	1976
Dec	3.22	3.05	3.27	1998	22	8.21	1990	.89	1976
Ann	41.62	41.72	4.16	Sep 1979	14	12.16	Nov 1985	.26+	Feb 1987

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	12.5	7.3	1.6	.4
Feb	10.3	6.0	1.4	.3
Mar	11.8	7.8	2.1	.3
Apr	11.9	7.7	2.4	.7
May	11.3	8.0	3.2	1.0
Jun	10.0	7.4	3.1	1.2
Jul	10.4	7.8	3.1	1.2
Aug	9.6	6.8	2.8	1.2
Sep	8.4	5.7	1.9	.6
Oct	9.1	5.9	1.6	.4
Nov	11.2	7.5	2.4	.6
Dec	11.8	6.8	2.0	.5
Ann	128.3	84.7	27.6	8.4

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	1.08	1.35	1.74	2.07	2.38	2.69	3.04	3.44	3.94	4.73	5.44
Feb	.62	.85	1.22	1.54	1.86	2.19	2.57	3.02	3.60	4.52	5.39
Mar	1.19	1.48	1.90	2.26	2.59	2.93	3.30	3.73	4.28	5.12	5.89
Apr	1.30	1.66	2.17	2.60	3.02	3.44	3.90	4.44	5.14	6.21	7.19
May	1.31	1.71	2.30	2.81	3.30	3.80	4.36	5.01	5.86	7.17	8.38
Jun	1.26	1.67	2.27	2.80	3.31	3.84	4.43	5.12	6.01	7.41	8.71
Jul	1.34	1.77	2.42	2.98	3.52	4.09	4.71	5.45	6.40	7.89	9.28
Aug	1.05	1.44	2.06	2.61	3.15	3.72	4.35	5.11	6.10	7.67	9.14
Sep	.78	1.05	1.47	1.83	2.19	2.56	2.97	3.46	4.11	5.11	6.04
Oct	.77	1.03	1.41	1.75	2.07	2.41	2.79	3.23	3.81	4.71	5.54
Nov	.95	1.27	1.74	2.16	2.56	2.98	3.45	3.99	4.71	5.82	6.86
Dec	1.16	1.46	1.90	2.26	2.61	2.97	3.36	3.81	4.39	5.29	6.11
Ann	32.13	34.02	36.42	38.21	39.79	41.31	42.87	44.57	46.62	49.57	52.10

\+ 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	9.2	8.7	2	1
Feb	5.4	4.5	2	1
Mar	2.7	1.9	#	#
Apr	.9	.0	#	0
May	#	.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	.5	#	#	#
Dec	2.8	2.0	1	#
Ann	21.5	17.1	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	6.5	1994	17	35.5	1978	15	1978	22	7	1978
Feb	9.0	1971	9	16.2	1985	14	1985	16	11	1978
Mar	6.0	1993	14	8.0	1999	13	1978	4	4	1978
Apr	8.0	1987	4	15.0	1987	15	1987	5	1	1987
May	#	1989	8	#	1989	#	1989	7	#	1989
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	#	1993	31	#+	1993	#	1989	19	#	1989
Nov	4.8	1980	18	4.8	1980	5	1980	18	#+	2000
Dec	5.5	1984	6	9.1	1974	7	1981	22	3	1989
Ann	9.0	Feb 1971	9	35.5	Jan 1978	15+	Apr 1987	5	11	Feb 1978

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	4.6	3.7	1.0	.4	.0
Feb	3.1	2.2	.5	.2	.0
Mar	1.6	1.1	.3	.1	.0
Apr	.3	.2	.1	.1	.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	.4	.2	@	.0	.0
Dec	2.1	1.3	.3	@	.0
Ann	12.1	8.7	2.2	.8	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	10.6	6.2	3.3	.7
Feb	7.4	3.7	2.4	.9
Mar	2.6	1.1	.7	.3
Apr	.2	.1	.1	@
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
Dec	4.0	1.4	.4	.0
Ann	25.2	12.6	6.9	1.9

+ 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	5/26	5/21	5/17	5/14	5/10	5/07	5/04	4/30	4/24
32	5/18	5/12	5/08	5/05	5/02	4/29	4/25	4/21	4/16
28	4/26	4/22	4/19	4/17	4/15	4/13	4/11	4/08	4/04
24	4/16	4/12	4/09	4/07	4/04	4/02	3/30	3/27	3/23
20	4/06	4/01	3/29	3/27	3/24	3/22	3/19	3/16	3/12
16	3/26	3/20	3/15	3/12	3/08	3/05	3/01	2/25	2/19

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	9/19	9/22	9/25	9/27	9/29	10/02	10/04	10/07	10/10
32	9/27	10/02	10/06	10/09	10/11	10/14	10/17	10/21	10/26
28	10/10	10/15	10/19	10/22	10/26	10/29	11/01	11/05	11/10
24	10/20	10/26	10/30	11/02	11/05	11/09	11/12	11/16	11/22
20	11/01	11/07	11/11	11/15	11/18	11/22	11/25	11/30	12/06
16	11/13	11/20	11/24	11/28	12/02	12/06	12/10	12/14	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	161	154	149	145	141	137	133	128	122
32	181	174	170	166	162	158	154	149	143
28	214	207	201	197	193	189	184	179	172
24	236	228	223	218	214	210	205	200	193
20	261	253	247	243	238	234	229	223	215
16	290	283	277	272	268	263	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.

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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	1217	1010	818	483	209	29	4	18	102	422	722	1050	6084
60	1062	870	663	337	117	6	0	2	38	286	572	895	4848
57	969	786	572	257	75	2	0	0	17	214	483	802	4177
55	907	730	515	207	54	1	0	0	9	173	425	740	3761
50	760	597	373	105	19	0	0	0	2	90	289	598	2833
32	292	197	58	0	0	0	0	0	0	0	22	187	756

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	98	111	263	508	866	1101	1259	1192	947	607	290	161	7403
55	0	0	7	25	206	412	546	479	266	67	3	0	2011
57	0	0	2	14	166	353	484	417	214	46	1	0	1697
60	0	0	0	5	114	268	391	326	145	24	0	0	1273
65	0	0	0	1	52	141	241	187	59	6	0	0	687
70	0	0	0	0	18	52	111	84	15	0	0	0	280

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	28	38	146	347	655	893	1040	983	746	413	158	49	28	66	212	559	1214	2107	3147	4130	4876	5289	5447	5496
45	5	16	86	225	502	743	885	828	596	275	87	21	5	21	107	332	834	1577	2462	3290	3886	4161	4248	4269
50	1	1	41	131	354	593	730	673	449	160	43	5	1	2	43	174	528	1121	1851	2524	2973	3133	3176	3181
55	0	0	18	68	223	444	575	518	309	82	15	0	0	0	18	86	309	753	1328	1846	2155	2237	2252	2252
60	0	0	4	30	124	306	420	363	185	32	1	0	0	0	4	34	158	464	884	1247	1432	1464	1465	1465
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	7	29	102	224	410	590	705	669	478	254	93	27	7	36	138	362	772	1362	2067	2736	3214	3468	3561	3588

(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