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: KENTON, OH **COOP ID: 334189**

Climate Division: OH 4 **NWS Call Sign:** **Elevation: 995 Feet** **Lat: 40˚39N** **Lon: 83˚36W**

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	32.2	15.6	23.9	71	1906	21	35.0	1990	-24	1912	13	7.5	1977	1273	0	.0	.0	2.4	15.0	28.9	4.3
Feb	36.6	19.0	27.8	74	2000	26	37.2	1998	-20	1912	13	11.6	1978	1042	0	.0	.0	4.4	10.5	24.8	3.0
Mar	47.4	27.9	37.7	83	1910	24	44.6	1973	-10	1948	12	28.8	1978	848	0	.0	.0	12.7	3.5	21.5	.2
Apr	59.8	37.8	48.8	89+	1990	26	55.8	1985	10+	1982	7	42.3	1975	488	1	.0	.0	24.3	.2	8.5	.0
May	71.7	48.9	60.3	96	1911	28	68.5	1991	23	1943	1	55.4	1997	212	66	.0	1.1	30.7	.0	.7	.0
Jun	80.7	58.3	69.5	104	1988	26	74.3	1991	31	1912	8	64.7	1972	33	168	.1	4.1	30.0	.0	.0	.0
Jul	84.9	62.2	73.6	106	1936	14	78.3	1999	41	1937	1	70.0	1971	5	269	.1	7.4	31.0	.0	.0	.0
Aug	82.6	59.9	71.3	103+	1988	18	77.5	1995	35	1915	31	65.9	1976	23	217	@	4.1	31.0	.0	.0	.0
Sep	76.0	52.5	64.3	101	1953	2	69.8	1998	27	1974	23	58.9	1975	99	75	.0	1.5	30.0	.0	.2	.0
Oct	63.8	41.1	52.5	90+	1951	4	59.1	1971	14	1925	29	45.3	1976	399	10	.0	.0	28.3	.0	5.5	.0
Nov	49.5	31.9	40.7	78+	1987	4	46.5	1999	-4	1958	30	32.7	1976	729	0	.0	.0	14.6	1.7	16.6	.0
Dec	37.2	21.5	29.4	71+	1982	4	38.6	1982	-20	1950	27	17.2	1989	1105	0	.0	.0	4.5	9.4	26.6	1.5
Ann	60.2	39.7	50.0	106	Jul 1936	14	78.3	Jul 1999	-24	Jan 1912	13	7.5	Jan 1977	6256	806	.2	18.2	243.9	40.3	133.3	9.0

\+ 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	2.41	1.98	3.08	1959	21	5.89	1999	.55	1981
Feb	2.04	1.91	1.90	1975	23	5.16	1990	.05	1987
Mar	2.70	2.46	3.60	1913	25	5.43	1980	1.08	1981
Apr	3.38	3.47	2.50	1964	20	8.08	1972	.90	1971
May	3.82	4.09	3.43	1969	18	7.01	1989	.48	1988
Jun	3.59	3.53	3.66	1937	21	7.03	1981	.79	1988
Jul	3.94	3.58	3.65	1915	16	9.64	1992	.42	1974
Aug	3.39	3.00	3.14	1906	26	6.83	1974	.34	1983
Sep	2.74	2.67	3.12	1905	10	7.08	1986	.46	1985
Oct	2.11	1.73	2.86	1910	6	6.74	1983	.49	1994
Nov	2.84	2.28	2.40	1921	1	7.19	1985	.25	1976
Dec	2.69	2.47	2.00	1990	30	7.72	1990	.71	1976
Ann	35.65	35.57	3.66	Jun 1937	21	9.64	Jul 1992	.05	Feb 1987

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	10.4	5.5	1.2	.4
Feb	9.4	5.4	1.0	.3
Mar	10.3	7.1	1.8	.2
Apr	11.5	8.2	1.9	.5
May	10.2	7.4	2.6	1.0
Jun	9.6	6.9	2.3	.9
Jul	9.0	6.6	2.9	1.0
Aug	8.9	6.4	2.5	.6
Sep	8.1	5.4	1.7	.7
Oct	8.4	5.6	1.3	.2
Nov	10.3	7.2	1.8	.4
Dec	11.2	6.6	1.4	.3
Ann	117.3	78.3	22.4	6.5

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	.70	.93	1.28	1.58	1.87	2.17	2.51	2.90	3.41	4.21	4.95
Feb	.36	.54	.84	1.11	1.40	1.71	2.06	2.49	3.06	3.98	4.86
Mar	1.19	1.43	1.77	2.04	2.30	2.56	2.84	3.15	3.55	4.16	4.72
Apr	1.25	1.57	2.02	2.40	2.76	3.13	3.54	4.00	4.60	5.52	6.36
May	1.25	1.61	2.14	2.60	3.03	3.49	3.98	4.56	5.30	6.46	7.53
Jun	1.18	1.52	2.02	2.44	2.86	3.28	3.74	4.29	4.98	6.07	7.07
Jul	1.31	1.68	2.23	2.70	3.14	3.61	4.11	4.70	5.46	6.64	7.72
Aug	.87	1.19	1.68	2.12	2.54	3.00	3.50	4.10	4.88	6.11	7.26
Sep	.50	.75	1.15	1.52	1.90	2.31	2.78	3.34	4.09	5.30	6.45
Oct	.62	.82	1.13	1.39	1.64	1.90	2.19	2.53	2.98	3.67	4.31
Nov	.66	.93	1.34	1.71	2.09	2.48	2.92	3.45	4.14	5.23	6.27
Dec	.97	1.22	1.59	1.90	2.19	2.49	2.81	3.19	3.68	4.43	5.11
Ann	26.79	28.55	30.78	32.46	33.94	35.36	36.83	38.44	40.38	43.19	45.59

\+ 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)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	10.3	8.8	3	2
Feb	6.1	5.8	2	2
Mar	4.4	3.8	1	#
Apr	.6	.0	#	0
May	.0	.0	0	0
Jun	.0	.0	#	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.0	.0	#	0
Nov	1.1	.0	#	#
Dec	5.1	3.5	1	#
Ann	27.6	21.9	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	9.0	1996	3	33.5	1978	17	1978	29	8	1978
Feb	7.0	1984	28	13.5	1993	15	1985	16	9	1978
Mar	9.5	1988	4	13.8	1984	12	1984	13	6	1984
Apr	4.0	1982	6	4.0+	1982	4	1994	6	#+	1997
May	.0	0	0	.0	0	0	0	0	0	0
Jun	.0	0	0	.0	0	#	1994	17	#	1994
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	1.0	1992	20	1.0	1992	1	1992	20	#+	1993
Nov	3.0	1980	18	4.4	1977	3	1986	19	#+	1997
Dec	12.0	1995	20	16.3	1977	12	1977	12	3	1989
Ann	12.0	Dec 1995	20	33.5	Jan 1978	17	Jan 1978	29	9	Feb 1978

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	5.7	3.2	1.2	.3	.0
Feb	3.7	2.1	.8	.2	.0
Mar	2.4	1.6	.5	.2	.0
Apr	.3	.2	.1	.0	.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
Nov	1.0	.5	.1	.0	.0
Dec	3.9	1.8	.4	.2	@
Ann	17.0	9.4	3.1	.9	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	16.3	12.2	7.0	2.4
Feb	12.2	9.4	5.9	1.7
Mar	5.7	3.1	1.7	.8
Apr	.3	.1	.0	.0
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
Nov	1.0	.1	.0	.0
Dec	6.6	2.5	1.7	.2
Ann	42.1	27.4	16.3	5.1

+ 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	5/24	5/18	5/14	5/11	5/08	5/04	5/01	4/27	4/21
32	5/12	5/06	5/02	4/29	4/26	4/23	4/19	4/16	4/10
28	4/29	4/25	4/21	4/18	4/15	4/12	4/10	4/06	4/01
24	4/19	4/14	4/11	4/08	4/05	4/02	3/30	3/27	3/22
20	4/08	4/04	3/31	3/28	3/26	3/23	3/20	3/16	3/12
16	4/01	3/26	3/22	3/18	3/15	3/11	3/07	3/03	2/25

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	9/21	9/25	9/29	10/01	10/04	10/07	10/10	10/13	10/17
32	9/26	10/02	10/06	10/10	10/13	10/16	10/20	10/24	10/30
28	10/07	10/13	10/18	10/22	10/26	10/30	11/03	11/08	11/15
24	10/21	10/27	10/31	11/04	11/07	11/11	11/14	11/18	11/24
20	10/29	11/06	11/12	11/16	11/21	11/25	11/30	12/05	12/13
16	11/12	11/20	11/25	11/30	12/05	12/09	12/14	12/20	12/28

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	170	163	158	153	149	144	140	134	127
32	194	186	179	174	169	164	159	153	144
28	222	212	205	199	193	187	181	174	164
24	242	233	227	221	216	210	205	198	189
20	270	259	252	245	239	233	227	219	209
16	291	282	275	270	264	259	253	247	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)

Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1273	1042	848	488	212	33	5	23	99	399	729	1105	6256
60	1118	902	693	344	122	9	0	5	38	267	579	950	5027
57	1025	818	603	265	81	3	0	1	18	200	492	857	4363
55	963	762	546	216	59	2	0	0	10	161	435	795	3949
50	810	629	404	115	23	0	0	0	2	84	303	653	3023
32	333	223	76	1	0	0	0	0	0	1	32	225	891

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	83	105	251	505	877	1125	1288	1217	967	634	294	143	7489
55	0	0	8	30	224	436	575	504	286	82	7	0	2152
57	0	0	3	18	184	378	513	443	235	59	3	0	1836
60	0	0	0	7	132	293	420	354	164	33	1	0	1404
65	0	0	0	1	66	168	269	217	75	10	0	0	806
70	0	0	0	0	26	75	137	114	24	1	0	0	377

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	11	29	116	307	642	891	1050	981	739	401	139	34	11	40	156	463	1105	1996	3046	4027	4766	5167	5306	5340
45	2	7	66	194	490	741	895	826	589	266	75	12	2	9	75	269	759	1500	2395	3221	3810	4076	4151	4163
50	0	2	34	110	343	591	740	671	442	160	36	2	0	2	36	146	489	1080	1820	2491	2933	3093	3129	3131
55	0	0	10	57	216	443	585	516	301	82	11	0	0	0	10	67	283	726	1311	1827	2128	2210	2221	2221
60	0	0	2	23	120	302	430	362	180	37	2	0	0	0	2	25	145	447	877	1239	1419	1456	1458	1458
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	2	17	73	187	388	582	709	657	466	244	77	15	2	19	92	279	667	1249	1958	2615	3081	3325	3402	3417

(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