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: FREDERICKTOWN 4 S, OH **COOP ID: 332956**

Climate Division: OH 6 **NWS Call Sign:** **Elevation: 1,050 Feet** **Lat: 40˚25N** **Lon: 82˚32W**

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	14.0	23.4	72	1950	25	33.7	1998	-30	1994	19	7.4	1977	1290	0	.0	.0	2.6	14.8	28.9	6.2
Feb	36.7	17.1	26.9	72+	2000	27	36.7	1998	-26	1985	3	12.6	1978	1066	0	.0	.0	4.5	11.1	25.6	3.9
Mar	47.7	26.3	37.0	82	1986	31	45.7	1973	-21	1984	9	26.2	1984	869	0	.0	.0	12.9	3.5	23.5	.7
Apr	59.6	35.3	47.5	88+	1986	28	52.5	1985	11	1964	1	41.3	1975	528	0	.0	.0	23.5	.2	12.9	.0
May	70.4	45.5	58.0	93	1962	19	67.0	1991	21	1978	1	51.9	1997	258	39	.0	.1	30.5	.0	2.1	.0
Jun	79.3	55.0	67.2	100	1988	26	71.5	1971	34	1972	11	63.3	1972	50	113	@	1.9	30.0	.0	.0	.0
Jul	83.0	58.3	70.7	99	1965	25	73.9	1999	38	1988	1	67.5	2000	6	179	.0	3.7	31.0	.0	.0	.0
Aug	81.4	55.8	68.6	99+	1948	28	74.4	1995	32	1986	29	64.4	1976	35	146	.0	2.0	31.0	.0	@	.0
Sep	74.9	48.4	61.7	99+	1953	3	67.4	1971	26+	1978	30	57.0	1975	141	39	.0	.7	30.0	.0	1.4	.0
Oct	63.1	37.2	50.2	89	1951	5	59.4	1971	12	1952	21	44.3	1988	465	5	.0	.0	27.9	.0	11.3	.0
Nov	49.5	29.7	39.6	80	1950	1	44.8	1985	-7	1958	30	31.1	1976	761	0	.0	.0	14.5	1.6	19.1	@
Dec	38.0	20.8	29.4	75	1982	4	37.0	1971	-23	1950	27	15.8	1989	1105	0	.0	.0	5.0	9.5	26.9	2.1
Ann	59.7	37.0	48.4	100	Jun 1988	26	74.4	Aug 1995	-30	Jan 1994	19	7.4	Jan 1977	6574	521	@	8.4	243.4	40.7	151.7	12.9

+ 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

(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	2.68	2.26	2.97	1959	21	5.67	1975	.54	1981
Feb	2.12	1.97	2.00	1961	26	5.76	1988	.17	1987
Mar	3.04	2.97	3.48	1993	31	4.95	1992	.87	1990
Apr	3.58	3.52	1.98	1972	20	6.70	1996	.98	1985
May	4.32	4.22	2.70	1985	2	9.55	1990	1.17	1991
Jun	4.28	4.30	4.00	1951	9	9.14	1998	.68	1988
Jul	4.12	3.49	2.48	1987	2	9.59	1992	1.48	1982
Aug	3.82	3.62	2.50	1992	28	9.24	1979	.83	1993
Sep	3.31	3.18	4.82	1979	14	6.64	1979	1.21	1985
Oct	2.57	2.15	2.65	1973	2	5.95	1973	.79	1996
Nov	3.26	3.00	1.90	1951	7	9.93	1985	.89	1976
Dec	2.84	2.74	1.67	1990	14	7.45	1990	.58	1976
Ann	39.94	39.68	4.82	Sep 1979	14	9.93	Nov 1985	.17	Feb 1987

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	12.3	7.1	2.0	.6
Feb	9.1	5.3	1.4	.3
Mar	11.6	7.3	2.2	.5
Apr	12.0	7.7	2.4	.8
May	11.6	8.1	3.0	1.2
Jun	9.8	7.7	3.0	1.2
Jul	9.4	7.1	2.9	1.2
Aug	9.1	6.5	2.8	1.0
Sep	8.2	5.8	2.0	.8
Oct	8.8	5.9	1.5	.5
Nov	11.1	6.9	2.4	.6
Dec	11.7	7.0	1.7	.5
Ann	124.7	82.4	27.3	9.2

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	.80	1.05	1.44	1.76	2.08	2.42	2.78	3.21	3.77	4.64	5.45
Feb	.30	.47	.77	1.07	1.37	1.71	2.10	2.58	3.23	4.29	5.31
Mar	1.20	1.48	1.88	2.21	2.53	2.84	3.19	3.58	4.09	4.86	5.56
Apr	1.39	1.72	2.20	2.59	2.96	3.34	3.75	4.22	4.82	5.75	6.59
May	1.50	1.91	2.50	3.00	3.48	3.97	4.51	5.14	5.94	7.18	8.31
Jun	1.27	1.68	2.29	2.81	3.33	3.86	4.45	5.14	6.03	7.44	8.74
Jul	1.41	1.80	2.37	2.85	3.31	3.78	4.30	4.90	5.67	6.86	7.96
Aug	1.05	1.41	1.96	2.44	2.91	3.41	3.95	4.60	5.43	6.75	7.98
Sep	1.18	1.50	1.95	2.32	2.69	3.06	3.46	3.93	4.53	5.45	6.30
Oct	.80	1.05	1.41	1.72	2.02	2.33	2.67	3.07	3.59	4.40	5.14
Nov	1.01	1.32	1.78	2.17	2.56	2.95	3.39	3.90	4.56	5.59	6.54
Dec	.80	1.07	1.48	1.83	2.18	2.54	2.94	3.41	4.02	4.98	5.87
Ann	30.14	32.08	34.53	36.38	38.02	39.58	41.20	42.97	45.10	48.18	50.83

\+ 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	6.1	4.0	2	1	6.0	1978	18	19.4	1979	19	1978	21	11	1985	4.2	2.5	1.0	.3	.0	-9.9	-9.9	-9.9	-9.9
Feb	5.4	5.0	2	#	7.0	1971	9	14.3	1979	18	1978	22	17	1978	2.5	1.6	.4	.2	.0	7.0	3.7	2.6	2.3
Mar	3.5	3.7	#	#	4.0	1982	3	10.0	1971	16	1978	5	6	1978	1.8	.9	.1	.0	.0	2.1	1.0	.7	.7
Apr	.4	.0	#	0	12.0	1987	5	12.0	1987	3	1974	9	#+	1989	.2	.2	.1	@	@	.1	.0	.0	.0
May	.0	.0	0	0	1.0	1989	7	1.0	1989	0	0	0	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	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	1.0	.0	#	0	5.0	1980	18	9.0	1980	5	1980	18	#+	1995	.4	.3	@	@	.0	.4	.1	.1	.0
Dec	3.7	3.5	#	#	7.0	1984	6	8.0	1984	12	1974	3	3	1974	1.8	1.2	.2	.1	.0	1.3	.2	.2	.0
Ann	20.1	16.2	N/A	N/A	12.0	Apr 1987	5	19.4	Jan 1979	19	Jan 1978	21	17	Feb 1978	10.9	6.7	1.8	.6	@	-9.9	-9.9	-9.9	-9.9

+ Also occurred on an earlier date(s) #Denotes trace amounts

(1) Derived from Snow Climatology and 1971-2000 daily data

@ Denotes mean number of days greater than 0 but less than .05

(2) Derived from 1971-2000 daily data

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

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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	6/01	5/27	5/23	5/20	5/17	5/15	5/12	5/08	5/03
32	5/17	5/13	5/10	5/08	5/06	5/03	5/01	4/28	4/24
28	5/05	4/30	4/27	4/24	4/22	4/19	4/17	4/13	4/09
24	4/26	4/21	4/18	4/15	4/12	4/09	4/07	4/03	3/29
20	4/12	4/08	4/05	4/02	3/31	3/28	3/26	3/22	3/18
16	4/04	3/29	3/25	3/22	3/19	3/15	3/12	3/08	3/03

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	9/06	9/11	9/14	9/16	9/19	9/22	9/24	9/27	10/02
32	9/15	9/20	9/23	9/26	9/29	10/02	10/05	10/08	10/13
28	10/01	10/06	10/09	10/12	10/15	10/17	10/20	10/24	10/29
24	10/11	10/17	10/21	10/25	10/28	10/31	11/04	11/08	11/14
20	10/21	10/27	10/31	11/04	11/08	11/11	11/15	11/19	11/25
16	11/01	11/08	11/13	11/18	11/22	11/26	11/30	12/05	12/12

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	141	135	131	127	124	120	117	113	107
32	163	157	153	149	146	142	138	134	128
28	196	189	184	179	175	171	167	161	154
24	223	215	208	203	198	193	188	181	173
20	244	236	230	226	221	217	212	206	198
16	272	264	258	252	247	243	237	231	223

***** 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	1290	1066	869	528	258	50	6	35	141	465	761	1105	6574
60	1135	926	714	380	155	14	0	7	60	325	611	950	5277
57	1042	842	621	295	106	6	0	2	31	251	522	857	4575
55	980	786	565	243	80	3	0	0	18	207	464	795	4141
50	835	651	422	130	32	0	0	0	4	116	327	654	3171
32	358	238	82	1	0	0	0	0	0	2	33	228	942

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	90	96	236	464	804	1054	1197	1134	889	565	262	146	6937
55	0	0	6	15	171	367	484	421	217	56	3	0	1740
57	0	0	0	8	135	309	422	361	170	38	1	0	1444
60	0	0	0	3	91	228	329	273	108	20	0	0	1052
65	0	0	0	0	39	113	179	146	39	5	0	0	521
70	0	0	0	0	13	38	65	60	8	0	0	0	184

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	12	22	101	261	565	823	958	895	654	332	121	33	12	34	135	396	961	1784	2742	3637	4291	4623	4744	4777
45	4	6	54	159	414	673	803	740	505	208	64	12	4	10	64	223	637	1310	2113	2853	3358	3566	3630	3642
50	0	1	31	90	279	524	648	585	362	113	28	4	0	1	32	122	401	925	1573	2158	2520	2633	2661	2665
55	0	0	10	43	165	378	493	431	232	53	9	0	0	0	10	53	218	596	1089	1520	1752	1805	1814	1814
60	0	0	2	14	86	242	340	282	128	18	0	0	0	0	2	16	102	344	684	966	1094	1112	1112	1112
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	4	16	75	178	355	534	639	589	426	222	79	17	4	20	95	273	628	1162	1801	2390	2816	3038	3117	3134

(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