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: MINERAL RIDGE WTR WKS, OH **COOP ID: 335356**

Climate Division: OH 3 **NWS Call Sign:** **Elevation: 890 Feet** **Lat: 41˚09N** **Lon: 80˚47W**

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	35.6	18.0	26.8	72	1950	25	35.4	1990	-24	1994	19	11.8	1977	1185	0	.0	.0	3.8	12.0	27.9	2.4
Feb	39.8	20.2	30.0	75	2000	25	39.2	1998	-20+	1963	26	15.3	1978	981	0	.0	.0	6.2	8.4	23.7	2.1
Mar	50.7	28.3	39.5	82	1998	31	46.5	2000	-7	1960	11	30.8	1984	791	0	.0	.0	15.8	2.2	21.1	.2
Apr	62.4	37.5	50.0	90	1990	27	54.8	1985	10	1964	1	43.1	1975	452	1	.0	@	25.6	.1	10.3	.0
May	73.5	47.4	60.5	93	1962	18	68.9	1991	24+	1970	7	55.2	1997	196	55	.0	.2	30.8	.0	1.7	.0
Jun	81.5	56.3	68.9	99+	1952	26	72.4	1987	29	1972	11	64.5	1992	36	153	.0	3.4	30.0	.0	.1	.0
Jul	85.5	60.7	73.1	102+	1988	16	77.5	1999	39	1963	9	70.1	2000	2	252	.2	7.3	31.0	.0	.0	.0
Aug	83.5	59.2	71.4	100	1988	2	76.6	1995	34	1982	29	67.8	1992	12	208	@	4.4	31.0	.0	.0	.0
Sep	76.8	52.4	64.6	99	1953	2	67.9	1998	26+	1989	27	60.4+	1975	79	68	.0	.9	30.0	.0	.2	.0
Oct	65.2	41.3	53.3	91	1989	14	59.6	1971	14	1988	31	47.1	1988	373	9	.0	.1	29.1	.0	5.1	.0
Nov	51.8	33.1	42.5	81	1961	3	47.4	1975	1	1959	18	33.9	1976	677	0	.0	.0	16.6	.7	15.4	.0
Dec	40.3	24.0	32.2	74	1982	3	40.0	1982	-17	1950	28	19.8	1989	1019	0	.0	.0	6.0	7.6	25.0	.6
Ann	62.2	39.9	51.1	102+	Jul 1988	16	77.5	Jul 1999	-24	Jan 1994	19	11.8	Jan 1977	5803	746	.2	16.3	255.9	31.0	130.5	5.3

\+ 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: 1940-2000

(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	2.18	1.86	1.68	1952	17	4.57	1999	.90	1988
Feb	1.82	1.70	2.95	1959	10	4.14	1981	.14	1978
Mar	2.66	2.65	2.21	1985	29	5.28	1985	.77	1990
Apr	3.18	3.15	2.31	1972	15	6.73	1998	.64	1982
May	3.39	3.60	2.28	1974	12	6.14	1984	.62	1977
Jun	4.33	4.31	3.17	1977	18	8.73	1989	.93	1999
Jul	4.13	3.81	3.02	1970	31	10.14	1992	.92	1997
Aug	3.42	3.20	3.93	1987	3	7.17	1974	1.01	1991
Sep	4.00	3.80	3.62	1979	14	6.87	1977	1.77	1998
Oct	2.54	2.33	3.01	1954	15	6.19	1995	.52	1982
Nov	2.90	2.65	3.04	1985	4	11.09	1985	.34	1976
Dec	2.74	2.59	1.63	1979	25	5.79	1990	1.01	1988
Ann	37.29	37.23	3.93	Aug 1987	3	11.09	Nov 1985	.14	Feb 1978

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	12.4	5.8	1.1	.3
Feb	10.6	5.5	.6	.1
Mar	12.4	6.9	1.6	.2
Apr	11.8	7.6	1.8	.5
May	12.2	8.0	2.1	.4
Jun	11.6	8.3	2.7	.8
Jul	10.1	7.2	2.7	1.1
Aug	10.1	6.3	2.4	.7
Sep	9.9	7.0	2.8	1.0
Oct	11.3	5.8	1.6	.3
Nov	12.4	7.0	1.6	.3
Dec	13.7	6.8	1.6	.4
Ann	138.5	82.2	22.6	6.1

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	.76	.96	1.26	1.52	1.76	2.00	2.28	2.59	3.00	3.62	4.19
Feb	.51	.69	.95	1.18	1.40	1.63	1.89	2.20	2.59	3.21	3.79
Mar	.99	1.24	1.60	1.90	2.18	2.47	2.78	3.15	3.61	4.33	4.98
Apr	.95	1.25	1.70	2.09	2.47	2.87	3.30	3.81	4.47	5.50	6.46
May	1.14	1.46	1.93	2.32	2.71	3.10	3.53	4.04	4.68	5.68	6.61
Jun	1.40	1.81	2.42	2.93	3.43	3.94	4.51	5.17	6.01	7.33	8.55
Jul	1.44	1.83	2.40	2.88	3.33	3.80	4.32	4.91	5.68	6.86	7.95
Aug	1.07	1.39	1.88	2.29	2.69	3.11	3.56	4.10	4.79	5.87	6.86
Sep	1.88	2.23	2.71	3.09	3.45	3.81	4.20	4.63	5.19	6.02	6.77
Oct	.82	1.07	1.42	1.72	2.01	2.31	2.64	3.03	3.53	4.30	5.01
Nov	.74	1.01	1.43	1.81	2.17	2.56	2.99	3.50	4.17	5.23	6.22
Dec	1.15	1.40	1.75	2.04	2.31	2.58	2.87	3.21	3.64	4.29	4.88
Ann	29.14	30.78	32.84	34.38	35.74	37.04	38.37	39.83	41.58	44.10	46.25

\+ 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: 1940-2000
(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	11.8	12.9	2	1	8.0	1978	9	31.7	1978	15	1996	11	9	1977	6.5	3.6	.9	.4	.0	13.2	5.5	3.0	.3
Feb	7.6	5.9	2	1	11.0	1984	28	18.1	1985	18	1977	7	9	1977	4.9	2.5	.8	.1	@	10.7	5.0	2.4	.2
Mar	6.1	5.0	1	#	16.0	1973	18	16.0	1973	16	1973	18	5	1984	3.1	2.0	.9	.3	.1	3.6	1.7	.8	.3
Apr	1.1	.0	#	0	12.0	1987	4	12.0	1987	10	1987	4	1	1987	.6	.2	.1	.1	@	.4	.1	@	@
May	#	.0	0	0	#	1989	8	#	1989	0	0	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	.1	.0	#	0	1.9	1989	19	1.9	1989	1	1989	19	#	1989	.1	@	.0	.0	.0	@	.0	.0	.0
Nov	2.0	.9	#	#	6.0	1986	13	9.8	1986	6	1986	13	#+	1999	1.7	.6	.2	.1	.0	.6	.1	@	.0
Dec	7.6	6.7	1	1	11.0	1974	2	20.7	1974	17	1995	28	5	1995	5.0	2.8	.7	.3	@	6.1	2.0	.7	.3
Ann	36.3	31.4	N/A	N/A	16.0	Mar 1973	18	31.7	Jan 1978	18	Feb 1977	7	9+	Feb 1977	21.9	11.7	3.6	1.3	.1	34.6	14.4	6.9	1.1

+ 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	6/11	6/05	5/31	5/27	5/24	5/20	5/16	5/12	5/06
32	5/27	5/21	5/17	5/13	5/09	5/05	5/02	4/27	4/21
28	5/08	5/03	4/30	4/27	4/24	4/22	4/19	4/16	4/11
24	4/21	4/16	4/13	4/10	4/08	4/05	4/02	3/30	3/26
20	4/13	4/08	4/05	4/03	3/31	3/28	3/26	3/23	3/18
16	4/01	3/28	3/24	3/21	3/18	3/16	3/13	3/09	3/04

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	9/19	9/23	9/26	9/29	10/02	10/05	10/09	10/14
32	9/27	10/03	10/06	10/10	10/13	10/16	10/19	10/23	10/28
28	10/09	10/14	10/18	10/22	10/25	10/28	10/31	11/04	11/09
24	10/20	10/25	10/29	11/02	11/05	11/08	11/11	11/15	11/21
20	11/06	11/13	11/17	11/21	11/25	11/28	12/02	12/07	12/13
16	11/14	11/21	11/25	11/30	12/04	12/07	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	150	142	137	132	128	123	119	113	106
32	178	170	165	160	156	152	147	141	134
28	205	197	192	187	183	178	173	168	160
24	231	224	219	215	211	207	202	197	190
20	262	254	248	243	238	233	228	222	214
16	283	275	269	264	260	255	250	244	236

***** 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	1185	981	791	452	196	36	2	12	79	373	677	1019	5803
60	1030	841	636	309	106	9	0	1	25	241	527	864	4589
57	937	757	548	232	67	3	0	0	10	176	440	771	3941
55	875	701	491	186	46	1	0	0	5	138	385	711	3539
50	729	570	353	94	15	0	0	0	1	67	254	568	2651
32	268	181	53	0	0	0	0	0	0	0	17	165	684

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	106	124	286	540	882	1107	1273	1219	979	659	330	169	7674
55	0	0	10	36	215	418	560	506	294	84	8	2	2133
57	0	0	5	22	174	360	498	444	239	59	3	0	1804
60	0	0	0	9	120	276	405	352	164	32	1	0	1359
65	0	0	0	1	55	153	252	208	68	9	0	0	746
70	0	0	0	0	19	65	118	97	17	1	0	0	317

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	23	34	130	323	631	869	1029	978	747	423	158	42	23	57	187	510	1141	2010	3039	4017	4764	5187	5345	5387
45	2	10	72	206	481	719	874	823	597	282	87	19	2	12	84	290	771	1490	2364	3187	3784	4066	4153	4172
50	0	1	40	118	335	569	719	668	448	165	38	6	0	1	41	159	494	1063	1782	2450	2898	3063	3101	3107
55	0	0	13	62	211	420	564	513	308	84	15	0	0	0	13	75	286	706	1270	1783	2091	2175	2190	2190
60	0	0	2	24	113	283	409	361	181	32	2	0	0	0	2	26	139	422	831	1192	1373	1405	1407	1407
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	10	21	95	215	406	576	696	653	477	258	93	25	10	31	126	341	747	1323	2019	2672	3149	3407	3500	3525

(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