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: TOLEDO EXPRESS AP, OH **COOP ID: 338357**

Climate Division: OH 1 **NWS Call Sign: TOL** **Elevation: 669 Feet** **Lat: 41˚35N** **Lon: 83˚48W**

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	31.4	16.4	23.9	65	1995	13	34.2	1990	-20	1984	21	10.0	1977	1281	0	.0	.0	2.1	16.7	28.5	4.3
Feb	35.1	18.9	27.0	71+	2000	26	36.3	1998	-14+	1982	11	12.2	1978	1079	0	.0	.0	3.1	12.6	24.6	3.0
Mar	46.5	27.9	37.2	81	1998	30	44.5	1973	-6	1984	9	28.4	1984	878	1	.0	.0	11.3	4.0	21.5	.2
Apr	58.9	37.7	48.3	88+	1990	27	54.3	1985	8	1982	7	43.2	1975	517	7	.0	.0	23.2	.2	9.6	.0
May	70.7	48.6	59.6	95+	1962	18	66.6	1991	25	1974	7	52.5	1997	224	42	.0	.9	30.5	.0	1.0	.0
Jun	79.5	58.2	68.8	104	1988	25	72.2	1984	32	1972	11	64.5	1972	45	148	.1	3.4	30.0	.0	@	.0
Jul	83.4	62.6	73.0	104	1995	14	77.3	1999	40	1988	1	69.5	1971	6	248	.2	5.9	31.0	.0	.0	.0
Aug	81.0	60.7	70.8	99	1993	27	77.9	1995	34	1982	29	66.5	1994	18	190	.0	3.2	31.0	.0	.0	.0
Sep	74.0	52.9	63.5	98	1978	8	68.5	1978	26	1974	23	57.9	1975	129	73	.0	1.2	30.0	.0	.4	.0
Oct	62.1	41.6	51.8	91	1963	7	59.5	1971	15	1976	28	45.6	1988	431	6	.0	.0	28.0	.0	6.1	.0
Nov	48.3	32.6	40.5	78+	1987	2	45.8	1975	2	1958	30	32.8	1976	745	0	.0	.0	13.3	1.7	16.8	.0
Dec	36.0	22.3	29.2	70	2001	5	37.4	1982	-19	1989	22	16.7	1989	1107	0	.0	.0	3.7	10.6	26.0	1.4
Ann	58.9	40.0	49.5	104+	Jul 1995	14	77.9	Aug 1995	-20	Jan 1984	21	10.0	Jan 1977	6460	715	.3	14.6	237.2	45.8	134.5	8.9

\+ 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: 1955-2001

(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	1.93	1.84	1.53	1959	21	3.61	1982	.48	1981
Feb	1.88	1.55	2.59	1990	22	5.39	1990	.53	1987
Mar	2.62	2.44	2.60	1985	28	5.70	1985	.63	1981
Apr	3.24	3.46	2.89	1977	22	6.10	1977	1.08	1971
May	3.14	2.79	1.85	2000	18	6.80	2000	1.11	1994
Jun	3.80	3.70	3.12	1989	19	8.48	1981	.27	1988
Jul	2.80	2.67	4.34	1969	4	6.51	1992	.34	1995
Aug	3.19	3.19	2.42	1972	14	5.93	1986	.40	1976
Sep	2.84	2.42	3.33	1972	17	8.10	1972	.73	1991
Oct	2.35	1.97	2.88	1988	17	5.53	1991	.70	1974
Nov	2.78	2.64	2.71	1982	1	6.86	1982	.55	1976
Dec	2.64	2.93	3.53	1967	21	5.69	1990	.61	1998
Ann	33.21	31.89	4.34	Jul 1969	4	8.48	Jun 1981	.27	Jun 1988

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	13.6	5.3	1.0	.1
Feb	10.6	4.7	.9	.2
Mar	12.5	6.9	1.5	.2
Apr	12.7	7.6	2.0	.3
May	11.9	6.8	2.0	.6
Jun	10.6	6.6	2.5	.7
Jul	9.4	5.4	2.0	.6
Aug	9.6	6.1	2.1	.6
Sep	9.9	5.5	1.8	.6
Oct	9.9	5.4	1.3	.3
Nov	12.0	6.1	1.8	.4
Dec	13.6	6.7	1.5	.3
Ann	136.3	73.1	20.4	4.9

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	.85	1.11	1.34	1.55	1.78	2.02	2.30	2.66	3.22	3.74
Feb	.38	.55	.83	1.08	1.33	1.61	1.92	2.29	2.78	3.57	4.32
Mar	1.06	1.30	1.64	1.92	2.19	2.46	2.74	3.08	3.50	4.15	4.74
Apr	1.30	1.60	2.02	2.37	2.70	3.03	3.40	3.82	4.35	5.16	5.90
May	1.17	1.46	1.88	2.24	2.57	2.91	3.29	3.72	4.27	5.11	5.89
Jun	1.05	1.41	1.95	2.43	2.90	3.39	3.94	4.58	5.41	6.72	7.95
Jul	.73	1.00	1.40	1.76	2.11	2.48	2.90	3.38	4.02	5.03	5.97
Aug	.74	1.03	1.50	1.92	2.34	2.78	3.28	3.87	4.65	5.89	7.06
Sep	.73	.99	1.41	1.77	2.13	2.51	2.93	3.43	4.09	5.12	6.08
Oct	.84	1.06	1.38	1.65	1.91	2.17	2.46	2.79	3.22	3.87	4.47
Nov	.80	1.07	1.46	1.81	2.15	2.50	2.89	3.34	3.93	4.86	5.72
Dec	.94	1.18	1.55	1.85	2.14	2.44	2.76	3.14	3.62	4.37	5.05
Ann	25.89	27.36	29.22	30.61	31.83	33.01	34.21	35.53	37.11	39.39	41.33

+ 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: 1955-2001
(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	10.5	8.4	2	2	10.2	1978	26	30.8	1978	17+	1978	31	7	1981	10.2	3.3	.9	.3	@	16.6	9.4	5.3	.6
Feb	8.8	8.9	2	2	9.4	1971	4	17.4	1971	19	1978	6	13	1978	7.4	2.8	.8	.2	.0	13.8	7.1	4.2	1.6
Mar	5.6	3.8	#	1	9.4	1993	4	17.7	1993	8+	1993	6	2+	1993	5.1	1.7	.5	.1	.0	5.4	2.6	1.0	.0
Apr	1.3	.6	#	0	5.6	1982	5	9.1	1982	7	1982	6	1	1982	1.7	.4	.1	.1	.0	.7	.3	.1	.0
May	.1	.0	#	0	.8	1989	7	1.3	1989	1	1989	7	#	1995	.1	.0	.0	.0	.0	@	.0	.0	.0
Jun	.0	.0	#	0	.0	0	0	.0	0	0	0	0	#	1989	.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	.2	.0	#	0	1.8	1989	19	2.0	1989	1	1989	19	#	1989	.3	.1	.0	.0	.0	@	.0	.0	.0
Nov	2.6	2.3	#	0	4.9	1995	17	6.8	1995	3+	1995	18	#	1995	3.4	1.0	.1	.0	.0	1.4	.2	.0	.0
Dec	8.3	7.4	1	1	13.9	1974	1	24.2	1977	16	1977	9	4+	1977	8.6	2.5	.5	.2	@	9.8	3.8	1.1	.3
Ann	37.4	31.4	N/A	N/A	13.9	Dec 1974	1	30.8	Jan 1978	19	Feb 1978	6	13	Feb 1978	36.8	11.8	2.9	.9	@	47.7	23.4	11.7	2.5

+ 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	5/29	5/23	5/19	5/16	5/13	5/10	5/06	5/02	4/27
32	5/18	5/12	5/08	5/04	5/01	4/28	4/24	4/20	4/14
28	5/03	4/28	4/24	4/21	4/18	4/15	4/12	4/08	4/03
24	4/19	4/15	4/12	4/09	4/07	4/04	4/01	3/29	3/25
20	4/13	4/09	4/05	4/02	3/31	3/28	3/25	3/21	3/17
16	4/03	3/29	3/25	3/22	3/19	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	9/15	9/19	9/22	9/25	9/27	9/29	10/02	10/05	10/09
32	9/23	9/28	10/02	10/05	10/08	10/11	10/14	10/17	10/22
28	10/05	10/10	10/15	10/18	10/22	10/25	10/28	11/02	11/08
24	10/15	10/22	10/27	10/31	11/04	11/08	11/12	11/17	11/23
20	10/25	11/01	11/06	11/10	11/14	11/17	11/22	11/26	12/03
16	11/05	11/12	11/18	11/22	11/26	11/30	12/05	12/10	12/17

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	155	148	144	140	137	133	129	125	119
32	183	175	169	164	159	155	150	144	136
28	212	203	196	191	186	181	175	169	160
24	237	228	222	216	211	205	200	193	184
20	251	243	237	232	227	223	218	212	204
16	278	269	262	257	252	246	241	234	226

***** 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	1281	1079	878	517	224	45	6	18	129	431	745	1107	6460
60	1119	924	706	356	126	7	0	3	37	281	586	956	5101
57	1026	840	613	274	84	3	0	0	17	212	497	863	4429
55	964	784	554	224	61	1	0	0	9	171	439	801	4008
50	810	648	411	119	23	0	0	0	1	91	302	656	3061
32	331	233	72	1	0	0	0	0	0	0	26	220	883

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	47	66	220	484	845	1094	1262	1195	934	603	271	84	7105
55	0	0	11	43	184	406	549	483	263	64	10	1	2014
57	0	0	7	31	145	349	487	421	215	46	6	1	1708
60	0	0	4	19	98	267	394	330	151	25	2	0	1290
65	0	0	1	7	42	148	248	190	73	6	0	0	715
70	0	0	0	1	14	66	121	81	27	1	0	0	311

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	9	16	97	278	608	860	1023	957	702	372	121	29	9	25	122	400	1008	1868	2891	3848	4550	4922	5043	5072
45	2	4	50	171	454	710	868	802	552	242	64	7	2	6	56	227	681	1391	2259	3061	3613	3855	3919	3926
50	0	1	26	92	311	560	713	647	408	141	30	3	0	1	27	119	430	990	1703	2350	2758	2899	2929	2932
55	0	0	10	45	192	411	558	492	272	69	10	0	0	0	10	55	247	658	1216	1708	1980	2049	2059	2059
60	0	0	2	23	104	272	403	341	157	28	1	0	0	0	2	25	129	401	804	1145	1302	1330	1331	1331
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	2	11	63	169	366	565	689	637	440	218	69	10	2	13	76	245	611	1176	1865	2502	2942	3160	3229	3239

(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