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: TITUSVILLE WATER WORKS, PA **COOP ID: 368888**

Climate Division: PA10 **NWS Call Sign:** **Elevation: 1,220 Feet** **Lat: 41˚38N** **Lon: 79˚42W**

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	31.6	13.5	22.6	66	1972	14	32.2	1990	-31	1994	19	9.6	1977	1317	0	.0	.0	2.2	16.4	29.5	5.5
Feb	34.4	13.5	24.0	69+	1997	22	34.9	1998	-37	1963	26	11.8	1979	1149	0	.0	.0	3.3	13.0	26.2	5.2
Mar	44.4	22.3	33.4	81	1986	31	41.7	1973	-18	1980	2	25.0	1984	982	0	.0	.0	10.8	5.7	25.9	1.3
Apr	56.2	31.5	43.9	88	1986	29	48.9	1985	4	1982	8	37.1	1975	635	0	.0	.0	20.6	.6	17.3	.0
May	68.3	42.1	55.2	91+	1991	24	65.0	1991	18	1963	24	49.3	1997	321	19	.0	.2	29.7	.0	5.1	.0
Jun	76.5	51.5	64.0	94	1988	26	68.9	1991	27	1966	1	60.1	1992	92	62	.0	.4	29.9	.0	.2	.0
Jul	80.5	55.8	68.2	100	1988	17	71.5	1991	34	1963	9	64.2	1976	26	123	@	1.9	31.0	.0	.0	.0
Aug	78.9	54.2	66.6	96+	1955	3	71.6	1995	32+	1976	30	62.5	1982	57	106	.0	1.3	31.0	.0	.1	.0
Sep	71.7	47.2	59.5	97	1954	5	64.5	1971	21+	1957	27	54.1	1974	187	20	.0	.2	29.9	.0	1.2	.0
Oct	60.7	36.4	48.6	87	1995	13	55.7	1971	11	1965	29	42.9	1976	513	2	.0	.0	26.3	.0	11.2	.0
Nov	47.5	29.1	38.3	78	1971	1	43.7	1985	-1	2000	23	29.3	1976	801	0	.0	.0	12.1	2.0	21.0	.1
Dec	36.2	20.0	28.1	72	1982	4	35.4	1982	-22	1960	24	14.2	1989	1143	0	.0	.0	3.7	10.8	27.5	2.0
Ann	57.2	34.8	46.0	100	Jul 1988	17	71.6	Aug 1995	-37	Feb 1963	26	9.6	Jan 1977	7223	332	@	4.0	230.5	48.5	165.2	14.1

\+ 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: 1954-2001

(3) Derived from 1971-2000 serially complete daily data

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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	2.55	2.45	2.40	1959	21	5.29	1999	.79	1980
Feb	2.38	2.35	1.85	1959	10	5.99	1990	.27	1987
Mar	3.16	2.67	2.15	1974	9	6.40	1985	1.40	1986
Apr	3.78	3.58	2.90	1981	29	7.03	1981	1.71	1985
May	4.01	3.82	1.87	1956	13	8.34	1989	1.26	1991
Jun	4.84	4.60	2.85	1995	26	10.16	1972	.97	1991
Jul	4.38	3.93	3.70	1990	15	10.40	1990	1.88	1971
Aug	4.26	4.04	3.09	1994	14	7.73	1975	1.64	1972
Sep	4.53	4.02	2.90	1993	3	9.92	1996	1.16	1995
Oct	3.54	3.38	3.79	1954	15	6.23	1990	1.47	1994
Nov	3.83	3.32	2.72	1999	3	10.01	1985	1.52	1978
Dec	3.26	3.15	1.98	1968	28	7.45	1990	1.10	1980
Ann	44.52	43.71	3.79	Oct 1954	15	10.40	Jul 1990	.27	Feb 1987

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	17.9	7.5	1.1	.2
Feb	14.2	6.6	1.1	.2
Mar	14.9	8.0	1.8	.4
Apr	14.8	9.4	1.9	.5
May	13.2	8.5	2.7	.8
Jun	13.1	9.0	3.7	.9
Jul	11.8	8.0	2.8	1.0
Aug	11.1	7.8	3.0	1.0
Sep	12.4	8.4	3.1	1.1
Oct	13.6	8.1	2.2	.5
Nov	16.1	9.0	2.4	.5
Dec	17.9	9.0	1.8	.3
Ann	171.0	99.3	27.6	7.4

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	.91	1.15	1.50	1.79	2.07	2.36	2.67	3.03	3.50	4.22	4.88
Feb	.73	.96	1.29	1.58	1.86	2.15	2.47	2.85	3.33	4.09	4.79
Mar	1.26	1.55	1.96	2.30	2.63	2.95	3.31	3.72	4.23	5.03	5.75
Apr	1.89	2.21	2.64	2.98	3.30	3.62	3.96	4.34	4.82	5.54	6.19
May	1.75	2.11	2.61	3.02	3.40	3.79	4.21	4.68	5.28	6.20	7.03
Jun	1.51	1.97	2.65	3.24	3.80	4.39	5.04	5.79	6.77	8.29	9.70
Jul	1.71	2.11	2.69	3.17	3.62	4.08	4.58	5.16	5.89	7.02	8.04
Aug	1.90	2.28	2.80	3.23	3.63	4.04	4.47	4.96	5.59	6.53	7.39
Sep	1.44	1.87	2.50	3.05	3.58	4.12	4.72	5.42	6.32	7.73	9.03
Oct	1.77	2.07	2.48	2.80	3.10	3.39	3.71	4.07	4.51	5.19	5.79
Nov	1.47	1.83	2.34	2.76	3.16	3.57	4.01	4.52	5.17	6.16	7.07
Dec	1.61	1.89	2.26	2.56	2.84	3.12	3.42	3.75	4.17	4.80	5.37
Ann	34.71	36.68	39.16	41.01	42.64	44.21	45.81	47.57	49.68	52.71	55.30

\+ 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: 1954-2001
(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	17.9	15.1	5	3	9.3	1996	3	51.0	1978	21	1996	11	16	1994	11.8	7.0	1.8	.3	.0	23.6	16.4	11.4	5.1
Feb	13.9	13.9	5	4	7.0	1980	16	25.0	1972	20	1985	16	16	1985	8.6	5.2	1.5	.5	.0	19.9	15.8	12.4	4.2
Mar	12.0	12.0	2	1	14.0	1973	18	22.6	1971	19	1993	16	10	1994	6.2	3.9	1.2	.4	@	10.6	6.6	4.5	1.9
Apr	3.3	2.3	#	#	10.0	1975	4	14.0	1975	8	1975	6	1	1989	1.9	1.2	.2	.1	@	1.6	.4	.2	.0
May	#	.0	#	0	#	1996	14	#+	1996	#+	1996	14	#+	1996	.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	.5	.0	#	0	4.0	1976	22	4.1	1988	3	1992	20	#+	1997	.2	.1	.1	.0	.0	.2	.1	.0	.0
Nov	6.9	5.1	1	#	14.0	1976	8	20.6	1995	12	1976	8	2	1997	4.1	2.5	.8	.2	@	5.2	2.4	.6	@
Dec	18.2	15.2	3	3	12.0	1989	16	40.2	1989	18	1989	16	9	1989	10.0	7.1	1.8	.6	.1	17.1	10.7	6.1	1.9
Ann	72.7	63.6	N/A	N/A	14.0+	Nov 1976	8	51.0	Jan 1978	21	Jan 1996	11	16+	Jan 1994	42.8	27.0	7.4	2.1	.1	78.2	52.4	35.2	13.1

+ 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	6/19	6/13	6/09	6/05	6/02	5/29	5/26	5/22	5/16
32	6/07	6/02	5/29	5/26	5/22	5/19	5/16	5/12	5/07
28	5/18	5/14	5/11	5/09	5/06	5/04	5/01	4/29	4/25
24	5/06	5/02	4/29	4/26	4/23	4/21	4/18	4/15	4/11
20	4/24	4/20	4/16	4/13	4/11	4/08	4/05	4/02	3/28
16	4/14	4/10	4/06	4/03	4/01	3/29	3/26	3/23	3/18

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	9/02	9/07	9/11	9/14	9/17	9/19	9/22	9/26	10/01
32	9/12	9/17	9/21	9/25	9/28	10/01	10/05	10/09	10/14
28	9/30	10/04	10/08	10/11	10/13	10/16	10/19	10/22	10/27
24	10/13	10/18	10/22	10/25	10/28	10/31	11/03	11/07	11/12
20	10/26	10/31	11/04	11/07	11/10	11/13	11/16	11/19	11/25
16	11/03	11/10	11/14	11/18	11/22	11/26	11/30	12/04	12/11

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	128	120	115	110	106	102	97	92	85
32	147	140	136	132	128	124	120	116	109
28	178	172	167	163	159	156	152	147	141
24	209	202	196	191	187	182	178	172	164
20	231	225	220	216	212	209	205	200	194
16	256	249	243	239	234	230	225	220	212

***** 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	1317	1149	982	635	321	92	26	57	187	513	801	1143	7223
60	1162	1009	827	485	202	32	4	14	88	367	651	988	5829
57	1069	925	734	397	144	14	0	4	49	287	561	895	5079
55	1007	869	672	340	111	7	0	1	31	238	502	833	4611
50	852	729	524	210	50	1	0	0	7	138	360	684	3555
32	346	277	121	5	0	0	0	0	0	3	38	231	1021

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	52	52	162	360	721	960	1121	1072	823	515	227	111	6176
55	0	0	0	5	118	277	408	360	164	38	1	0	1371
57	0	0	0	3	89	223	346	301	122	24	0	0	1108
60	0	0	0	1	55	151	256	218	71	11	0	0	763
65	0	0	0	0	19	62	123	106	20	2	0	0	332
70	0	0	0	0	5	14	40	36	3	0	0	0	98

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	4	10	68	194	487	731	878	827	593	288	92	21	4	14	82	276	763	1494	2372	3199	3792	4080	4172	4193
45	0	0	34	114	343	581	723	672	444	168	46	5	0	0	34	148	491	1072	1795	2467	2911	3079	3125	3130
50	0	0	11	58	218	433	568	517	304	90	18	1	0	0	11	69	287	720	1288	1805	2109	2199	2217	2218
55	0	0	3	22	121	294	413	365	184	38	4	0	0	0	3	25	146	440	853	1218	1402	1440	1444	1444
60	0	0	0	9	56	169	269	220	94	6	0	0	0	0	0	9	65	234	503	723	817	823	823	823
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	3	8	54	141	313	466	577	534	375	191	60	9	3	11	65	206	519	985	1562	2096	2471	2662	2722	2731

(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