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: TIONESTA 2 SE LAKE, PA **COOP ID: 368873**

Climate Division: PA10 **NWS Call Sign:** **Elevation: 1,200 Feet** **Lat: 41˚29N** **Lon: 79˚26W**

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	32.5	13.4	23.0	72	1950	26	33.3	1998	-24	1963	29	9.8	1977	1303	0	.0	.0	2.2	15.1	29.2	4.8
Feb	35.7	14.5	25.1	70+	1997	22	35.8	1998	-27	1963	27	13.7	1979	1118	0	.0	.0	3.6	11.7	26.3	4.4
Mar	45.7	22.5	34.1	82	1998	31	41.7	1973	-14	1960	9	26.2	1984	957	0	.0	.0	11.5	4.6	26.0	1.1
Apr	57.8	32.3	45.1	89	1990	29	49.3	1985	7	1982	8	39.2	1975	599	0	.0	.0	21.5	.4	16.8	.0
May	69.6	42.7	56.2	91+	1996	20	64.1	1991	21	1970	7	49.8	1997	301	27	.0	.2	30.2	.0	4.1	.0
Jun	77.7	52.1	64.9	97+	1952	17	69.4	1995	29	1990	5	60.7	1972	85	82	.0	1.1	30.0	.0	.1	.0
Jul	81.2	57.0	69.1	99	1995	16	73.0	1999	39+	2001	2	66.1	1971	16	143	.0	2.6	31.0	.0	.0	.0
Aug	79.7	56.0	67.9	99	1993	28	73.2	1995	34	1982	29	64.0+	1990	35	124	.0	1.5	31.0	.0	.0	.0
Sep	72.5	48.9	60.7	97	1953	3	65.3	1971	27	1957	28	57.0+	1990	152	24	.0	.3	29.9	.0	.4	.0
Oct	61.3	37.2	49.3	86+	1951	6	55.8	1971	13	1988	31	43.6	1988	490	2	.0	.0	26.8	.0	9.5	.0
Nov	48.3	29.4	38.9	80	1950	2	44.1	1975	0	1950	28	31.8	1976	785	0	.0	.0	13.1	1.7	20.7	.0
Dec	37.1	20.0	28.6	72	1982	4	35.6	1982	-20	1950	28	13.3	1989	1131	0	.0	.0	3.9	9.8	27.4	2.3
Ann	58.3	35.5	46.9	99+	Jul 1995	16	73.2	Aug 1995	-27	Feb 1963	27	9.8	Jan 1977	6972	402	.0	5.7	234.7	43.3	160.5	12.6

\+ 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

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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	2.70	2.80	1.91	1998	8	6.23	1999	.69	1983
Feb	2.29	1.99	1.76	1959	10	4.35	1976	.48	1987
Mar	3.16	2.86	2.26	1953	24	6.32	1974	1.12	1988
Apr	3.59	3.68	2.13	1961	25	6.03	1998	1.39	1985
May	3.79	3.76	2.69	1953	31	7.49	1984	1.09	1993
Jun	5.01	4.92	2.92	1981	9	10.90	1972	.88	1992
Jul	4.76	4.62	3.03	1956	2	11.31	1992	.92	1997
Aug	4.21	3.74	4.72	1994	14	9.02	1994	1.09	1972
Sep	4.23	3.81	2.96	1992	22	8.67	1987	1.62	1995
Oct	3.12	3.04	4.72	1954	16	5.81	1981	1.30	1982
Nov	3.44	3.07	2.42	1999	3	10.14	1985	1.20	1976
Dec	3.19	2.93	2.00	1991	3	6.80	1990	1.36	1989
Ann	43.49+	41.84+	4.72+	Aug 1994	14	11.31	Jul 1992	.48	Feb 1987

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	16.9	7.4	1.4	.2
Feb	13.4	6.2	1.0	.1
Mar	14.2	8.2	1.7	.5
Apr	15.1	8.9	2.1	.5
May	13.8	8.9	2.6	.4
Jun	13.6	8.9	3.4	1.3
Jul	12.1	8.4	3.3	1.2
Aug	11.3	7.5	2.7	1.0
Sep	12.2	8.1	2.9	1.0
Oct	13.4	7.6	1.9	.5
Nov	15.2	8.3	2.2	.4
Dec	17.4	8.4	1.6	.4
Ann	168.6	96.8	26.8	7.5

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	.89	1.14	1.52	1.84	2.15	2.47	2.82	3.23	3.75	4.56	5.32
Feb	.81	1.03	1.34	1.61	1.86	2.12	2.40	2.72	3.14	3.79	4.38
Mar	1.20	1.50	1.92	2.27	2.60	2.94	3.31	3.74	4.28	5.12	5.88
Apr	1.55	1.88	2.33	2.70	3.04	3.39	3.77	4.20	4.74	5.57	6.32
May	1.57	1.92	2.41	2.81	3.18	3.56	3.97	4.44	5.04	5.95	6.78
Jun	1.76	2.23	2.92	3.50	4.05	4.61	5.23	5.95	6.87	8.29	9.59
Jul	1.71	2.16	2.80	3.35	3.86	4.39	4.97	5.64	6.50	7.83	9.04
Aug	1.68	2.07	2.62	3.08	3.51	3.94	4.41	4.96	5.65	6.70	7.66
Sep	1.90	2.27	2.79	3.22	3.61	4.01	4.43	4.92	5.53	6.46	7.30
Oct	1.43	1.71	2.09	2.39	2.68	2.97	3.28	3.63	4.07	4.74	5.34
Nov	1.28	1.60	2.06	2.45	2.82	3.19	3.60	4.07	4.67	5.60	6.45
Dec	1.41	1.70	2.09	2.41	2.72	3.02	3.34	3.72	4.19	4.90	5.55
Ann	35.29	36.96	39.06	40.62	41.98	43.29	44.62	46.07	47.81	50.29	52.41

+ 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	13.8	13.0	5	3	8.0	1978	18	36.0	1978	22+	1978	22	15	1977	7.9	6.0	1.5	.5	.0	17.6	10.8	8.1	3.3
Feb	11.4	11.0	5	4	7.0	1971	9	32.5	1972	29	1977	7	17	1977	5.6	4.6	1.2	.4	.0	18.5	13.1	8.9	3.7
Mar	9.9	8.5	2	1	12.0	1973	18	38.0	1971	18	1993	14	8	1994	4.4	3.4	1.3	.4	.1	9.2	6.0	3.8	1.0
Apr	1.8	.3	#	#	9.0	1975	4	10.0	1975	9	1975	4	1	1982	1.0	.8	.1	.1	.0	1.0	.3	.2	.0
May	#	.0	#	0	#	1978	2	#+	1978	#	1976	4	#	1976	.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	1.0	1974	20	1.0+	1976	1	1980	26	#+	1993	.1	.1	.0	.0	.0	.1	.0	.0	.0
Nov	3.5	3.0	#	#	5.0	1980	18	10.5	1980	7	1987	21	2	1995	2.4	1.9	.3	@	.0	3.0	.6	.3	.0
Dec	12.9	11.1	2	1	14.5	1992	11	28.0	1992	21	1977	10	6	1995	6.5	5.0	1.3	.4	@	12.5	6.3	3.5	1.4
Ann	53.4	46.9	N/A	N/A	14.5	Dec 1992	11	38.0	Mar 1971	29	Feb 1977	7	17	Feb 1977	27.9	21.8	5.7	1.8	.1	61.9	37.1	24.8	9.4

+ 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	6/14	6/08	6/04	5/31	5/28	5/24	5/21	5/16	5/10
32	6/03	5/28	5/24	5/20	5/17	5/14	5/10	5/06	4/30
28	5/15	5/11	5/08	5/06	5/03	5/01	4/28	4/25	4/21
24	4/28	4/25	4/22	4/20	4/18	4/15	4/13	4/10	4/07
20	4/21	4/16	4/13	4/10	4/07	4/04	4/01	3/29	3/24
16	4/12	4/08	4/04	4/01	3/29	3/26	3/23	3/20	3/15

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	9/10	9/15	9/19	9/22	9/25	9/28	10/01	10/04	10/09
32	9/24	9/30	10/03	10/07	10/10	10/13	10/16	10/20	10/26
28	10/06	10/12	10/16	10/19	10/22	10/25	10/29	11/02	11/07
24	10/19	10/24	10/28	10/31	11/03	11/06	11/09	11/12	11/17
20	10/31	11/06	11/09	11/13	11/16	11/19	11/22	11/26	12/01
16	11/09	11/15	11/20	11/24	11/27	12/01	12/05	12/09	12/16

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	133	128	124	120	116	111	106	99
32	171	162	156	150	145	140	135	128	119
28	188	182	178	175	171	168	164	160	155
24	219	212	207	203	198	194	190	185	178
20	244	236	231	226	222	217	213	207	200
16	268	259	253	248	243	238	232	226	217

***** 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	1303	1118	957	599	301	85	16	35	152	490	785	1131	6972
60	1148	978	802	451	188	30	1	6	62	345	635	976	5622
57	1055	894	709	364	133	14	0	1	32	266	545	883	4896
55	993	838	647	308	103	8	0	0	18	219	485	821	4440
50	838	698	499	185	45	1	0	0	3	121	344	677	3411
32	338	252	103	3	0	0	0	0	0	1	33	239	969

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	58	58	168	394	749	987	1150	1112	862	537	238	131	6444
55	0	0	0	9	138	304	437	399	190	41	1	0	1519
57	0	0	0	5	107	250	375	338	144	26	0	0	1245
60	0	0	0	2	69	177	283	250	85	12	0	0	878
65	0	0	0	0	27	82	143	124	24	2	0	0	402
70	0	0	0	0	8	24	49	43	3	0	0	0	127

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	7	9	67	210	502	754	916	862	628	305	100	21	7	16	83	293	795	1549	2465	3327	3955	4260	4360	4381
45	2	0	35	122	358	604	761	707	478	182	44	6	2	2	37	159	517	1121	1882	2589	3067	3249	3293	3299
50	0	0	9	60	231	455	606	552	337	95	17	1	0	0	9	69	300	755	1361	1913	2250	2345	2362	2363
55	0	0	2	26	130	314	451	398	208	42	4	0	0	0	2	28	158	472	923	1321	1529	1571	1575	1575
60	0	0	0	7	58	186	297	249	110	10	0	0	0	0	0	7	65	251	548	797	907	917	917	917
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	2	11	56	158	326	484	596	558	387	197	66	12	2	13	69	227	553	1037	1633	2191	2578	2775	2841	2853

(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