

# Climatography of the United States

## No. 20

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801  
www.ncdc.noaa.gov

Station: GRATERFORD 1 E, PA

1971-2000

COOP ID: 363437

Climate Division: PA 3

NWS Call Sign:

Elevation: 240 Feet

Lat: 40°14N

Lon: 75°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	37.6	18.6	28.1	69+	1967	25	37.1	1998	-17	1994	20	18.7	1977	1146	0	.0	.0	4.0	9.9	28.8	1.3
Feb	40.5	20.4	30.5	71+	1976	26	38.5	1998	-10	1979	18	20.7	1979	968	0	.0	.0	6.0	6.7	24.3	.7
Mar	49.5	28.6	39.1	87	1998	31	46.4	1973	-2	1967	19	30.0	1984	804	0	.0	.0	14.8	1.5	20.8	.0
Apr	61.0	38.1	49.6	93	1976	19	53.9	1976	13+	1995	3	45.3	1984	464	0	.0	.2	25.9	@	8.2	.0
May	71.3	48.0	59.7	95	1962	20	64.8	1998	21	2000	1	54.8	1994	198	32	.0	.5	30.7	.0	1.3	.0
Jun	79.7	56.7	68.2	99	1983	15	73.0	1973	28	1987	11	64.0	1992	38	133	.0	2.5	30.0	.0	@	.0
Jul	84.8	61.8	73.3	103+	1966	4	76.0	1980	41	1987	30	69.7	1992	0	258	.3	7.3	31.0	.0	.0	.0
Aug	83.0	59.2	71.1	99+	1983	21	75.5	1988	28	1987	25	67.0	1992	13	202	.0	4.3	31.0	.0	.1	.0
Sep	76.1	51.3	63.7	99	1983	11	69.0	1980	22	1987	26	57.4	1984	97	57	.0	1.3	30.0	.0	.8	.0
Oct	65.1	40.1	52.6	89	1990	7	59.2	1971	10	1987	30	46.8	1992	393	8	.0	.0	30.0	.0	7.6	.0
Nov	53.9	32.6	43.3	82	1982	3	49.0	1977	8	1993	26	38.6	1976	652	0	.0	.0	19.4	.1	16.7	.0
Dec	42.7	23.7	33.2	75	1998	8	40.6	1982	-4	1963	31	21.2	1989	986	0	.0	.0	7.1	4.8	26.1	.2
Ann	62.1	39.9	51.0	103+	Jul 1966	4	76.0	Jul 1980	-17	Jan 1994	20	18.7	Jan 1977	5759	690	.3	16.1	259.9	23.0	134.7	2.2

+ 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](http://www.ncdc.noaa.gov/oa/climate/normals/usnormals.html)

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1960-2001

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

021-A

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**COOP ID: 363437**

**Climate Division: PA 3**

**NWS Call Sign:**

**Elevation: 240 Feet Lat: 40°14N**

**Lon: 75°26W**

Precipitation (inches)																								
	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution										
Month	Mean	Med-ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	3.62	3.43	2.64	1979	25	9.75	1979	.44	1981	8.1	6.3	2.5	1.1	.77	1.10	1.63	2.11	2.60	3.11	3.70	4.40	5.32	6.79	8.18
Feb	2.64	2.52	2.18	1965	8	5.84	1971	.91	1980	7.0	5.4	2.0	.6	.96	1.21	1.57	1.87	2.15	2.44	2.76	3.13	3.60	4.32	4.99
Mar	3.49	3.22	3.23	2000	22	6.75	1984	1.23	1985	8.0	6.1	2.4	.9	1.16	1.49	1.98	2.39	2.79	3.19	3.64	4.16	4.83	5.87	6.83
Apr	3.69	3.31	2.35	1984	5	7.80	1983	.93	1985	9.0	6.6	2.7	1.0	1.25	1.60	2.11	2.54	2.95	3.38	3.85	4.39	5.09	6.17	7.17
May	4.27	4.25	3.64	1990	30	8.56	1990	.81	1993	9.8	7.4	2.9	1.1	1.62	2.01	2.58	3.06	3.51	3.97	4.47	5.05	5.78	6.91	7.95
Jun	3.60	3.13	2.84	2001	17	8.80	1982	.72	1995	9.6	6.8	2.3	.9	.90	1.24	1.76	2.23	2.69	3.17	3.71	4.35	5.19	6.51	7.75
Jul	4.13	3.86	2.91	1991	13	10.93	1984	.32	1999	8.7	6.6	2.7	1.2	.80	1.17	1.78	2.34	2.90	3.51	4.20	5.03	6.13	7.90	9.58
Aug	4.22	3.99	5.25	1971	27	11.10	1971	.97	1972	8.6	6.3	2.6	1.2	1.37	1.77	2.36	2.86	3.35	3.85	4.40	5.04	5.87	7.16	8.34
Sep	4.20	3.63	5.90	1999	17	10.78	1999	1.13	1972	7.4	5.4	2.6	1.3	1.00	1.39	2.01	2.55	3.10	3.67	4.32	5.08	6.09	7.69	9.19
Oct	3.34	3.31	3.00	1995	6	7.80	1995	.25	1982	7.1	5.3	2.5	1.0	1.08	1.40	1.87	2.27	2.65	3.05	3.48	3.99	4.65	5.67	6.61
Nov	3.71	3.38	2.73	1963	7	8.94	1972	.53	1976	7.8	5.5	2.6	1.3	.94	1.29	1.83	2.31	2.78	3.28	3.83	4.48	5.34	6.69	7.96
Dec	3.44	2.82	2.76	1993	5	8.51	1996	.27	1989	8.3	6.0	2.4	.8	.60	.91	1.41	1.88	2.36	2.88	3.47	4.19	5.15	6.70	8.18
Ann	44.35	46.18	5.90	Sep 1999	17	11.10	Aug 1971	.25	Oct 1982	99.4	73.7	30.2	12.4	33.67	35.79	38.48	40.50	42.27	43.98	45.74	47.67	49.99	53.34	56.21

+ 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: 1960-2001

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

Complete documentation available from:  
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**Climate Division: PA 3**

**NWS Call Sign:**

**Elevation: 240 Feet**

**Lat: 40°14N**

**Lon: 75°26W**

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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	2.5	1.0	1	#	8.0	1982	14	8.0	1982	9	1982	15	9	1982	1.0	.8	.3	.1	.0	.8	.6	.1	.0
Feb	2.7	.0	#	#	6.0	1975	13	11.6	1974	25	1983	12	4	1983	1.0	.6	.3	.2	.0	.4	.2	.2	.0
Mar	2.5	.0	#	0	6.5	1978	4	10.9	1978	8	1993	14	1	1994	.5	.5	.3	.1	.0	.4	.3	.1	.0
Apr	.4	.0	#	0	4.5	1982	6	4.5	1982	3	1980	1	#+	1992	.1	.1	.1	.0	.0	.1	.1	.0	.0
May	.0	.0	0	0	.0	0	0	.0	0	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	1.1	1972	19	1.1	1972	1	1972	19	#	1972	.1	.1	.0	.0	.0	.1	.0	.0	.0
Nov	.3	.0	#	0	4.5	1989	23	4.5	1989	5	1989	23	#+	1995	.1	.1	.1	.0	.0	.1	.1	.1	.0
Dec	3.1	.0	#	0	7.5	1990	28	17.0	1995	8	1990	28	1	1990	.8	.8	.4	.2	.0	.4	.2	.2	.0
Ann	11.6	1.0	N/A	N/A	8.0	Jan 1982	14	17.0	Dec 1995	25	Feb 1983	12	9	Jan 1982	3.6	3.0	1.5	.6	.0	2.3	1.5	.7	.0

+ 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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**NWS Call Sign:**

**Elevation: 240 Feet**

**Lat: 40° 14N**

**Lon: 75° 26W**

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	5/26	5/21	5/17	5/14	5/10	5/06	5/01	4/25
32	5/24	5/17	5/11	5/07	5/02	4/28	4/23	4/18	4/10
28	5/10	5/02	4/27	4/22	4/18	4/13	4/09	4/03	3/26
24	4/22	4/15	4/11	4/07	4/03	3/31	3/27	3/22	3/16
20	4/11	4/03	3/28	3/24	3/19	3/15	3/10	3/05	2/25
16	3/29	3/22	3/17	3/13	3/09	3/04	2/28	2/23	2/16
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	9/08	9/15	9/20	9/24	9/28	10/02	10/06	10/11	10/18
32	9/16	9/24	9/29	10/04	10/09	10/13	10/18	10/24	10/31
28	9/24	10/03	10/10	10/16	10/22	10/27	11/02	11/09	11/18
24	10/07	10/17	10/24	10/30	11/05	11/11	11/17	11/24	12/04
20	10/30	11/07	11/13	11/18	11/23	11/28	12/03	12/09	12/17
16	11/07	11/17	11/24	11/30	12/05	12/10	12/16	12/23	1/02
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	171	159	151	143	137	130	123	115	103
32	198	185	175	166	159	151	142	133	119
28	227	213	203	194	186	178	169	159	145
24	253	240	230	222	215	207	199	190	177
20	285	272	263	255	248	241	233	224	211
16	304	293	284	277	271	264	257	249	237

\* 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

Complete documentation available from:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)

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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	1146	968	804	464	198	38	0	13	97	393	652	986	5759
60	991	828	649	317	99	9	0	1	35	260	502	831	4522
57	898	744	561	237	57	3	0	0	15	192	414	738	3859
55	836	688	503	188	37	1	0	0	8	153	357	676	3447
50	687	550	364	92	9	0	0	0	1	77	225	527	2532
32	232	153	56	1	0	0	0	0	0	0	6	116	564

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	109	109	274	527	856	1085	1281	1212	950	638	345	154	7540
55	0	0	9	25	180	396	568	499	268	78	5	0	2028
57	0	0	5	14	139	338	506	437	216	55	2	0	1712
60	0	0	0	4	87	254	413	346	145	30	1	0	1280
65	0	0	0	0	32	133	258	202	57	8	0	0	690
70	0	0	0	0	8	50	115	91	14	1	0	0	279

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	19	29	109	294	603	860	1033	962	709	384	157	38	19	48	157	451	1054	1914	2947	3909	4618	5002	5159	5197
45	2	10	56	179	449	710	878	807	559	242	79	12	2	12	68	247	696	1406	2284	3091	3650	3892	3971	3983
50	0	0	26	92	301	560	723	652	411	134	35	3	0	0	26	118	419	979	1702	2354	2765	2899	2934	2937
55	0	0	8	38	181	412	568	497	274	61	13	1	0	0	8	46	227	639	1207	1704	1978	2039	2052	2053
60	0	0	3	16	92	272	414	347	157	20	5	0	0	0	3	19	111	383	797	1144	1301	1321	1326	1326
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	13	24	76	185	365	568	699	646	462	254	100	26	13	37	113	298	663	1231	1930	2576	3038	3292	3392	3418

(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:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)

## 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.  
Complete documentation for the 1971-2000 Normals is available on the internet from:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/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 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.

- |   |   |
|---|---|
| <ol style="list-style-type: none"><li>a. Temperature/ Precipitation Tables<ol style="list-style-type: none"><li>1. 1971-2000 Monthly Normals</li><li>2. Cooperative Summary of the Day</li><li>3. National Weather Service station records</li><li>4. 1971-2000 serially complete daily data</li></ol></li><li>b. Degree Day Table<ol style="list-style-type: none"><li>1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals</li><li>2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data</li></ol></li></ol> | <ol style="list-style-type: none"><li>c. Snow Tables<ol style="list-style-type: none"><li>1. Snow Climatology</li><li>2. Cooperative Summary of the Day</li></ol></li><li>d. Freeze Data Table<br/>1971-2000 serially complete daily data</li></ol> |
|---|---|

## References

U.S. Climate Normals 1971-2000, [www.ncdc.noaa.gov/normal.html](http://www.ncdc.noaa.gov/normal.html)  
U.S. Climate Normals 1971-2000-Products Clim20, [www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html)  
Snow Climatology Project Description, [www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html](http://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](http://www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf)