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: NEW CASTLE 1 N, PA **COOP ID: 366233**

Climate Division: PA 9 **NWS Call Sign:** **Elevation: 825 Feet** **Lat: 41˚01N** **Lon: 80˚22W**

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	35.4	16.4	25.9	75	1950	25	35.9	1990	-29	1930	28	11.1	1977	1213	0	.0	.0	3.7	12.8	27.8	3.3
Feb	39.3	17.4	28.4	75	2000	27	37.6	1998	-23	1934	28	16.2	1978	1026	0	.0	.0	5.3	8.2	24.7	2.1
Mar	49.6	24.6	37.1	84	1938	24	45.0	1973	-19	1934	1	26.9	1984	866	0	.0	.0	14.6	2.6	22.8	.4
Apr	61.1	33.5	47.3	90	1942	26	51.3	1991	10	1950	14	41.4	1975	532	0	.0	.0	24.4	.1	13.5	.0
May	72.1	44.7	58.4	93	1939	27	66.3	1991	22+	1966	10	52.0	1997	245	39	.0	.2	30.7	.0	2.5	.0
Jun	80.2	53.9	67.1	99+	1933	10	70.6	1973	30+	1966	1	61.7	1985	51	113	.0	1.7	30.0	.0	.1	.0
Jul	84.5	58.6	71.6	101	1936	16	75.0	1999	38	1963	9	67.5	1984	8	211	@	4.9	31.0	.0	.0	.0
Aug	82.9	57.0	70.0	100	1930	6	75.0	1995	32	1982	29	65.9	1986	22	175	.0	2.5	31.0	.0	@	.0
Sep	76.4	50.3	63.4	100	1953	2	67.5	1971	26	1957	27	59.6	1975	96	46	.0	1.0	30.0	.0	.2	.0
Oct	64.9	38.4	51.7	91	1927	2	58.1	1971	17+	1965	29	46.7	1976	416	3	.0	.0	28.7	.0	6.9	.0
Nov	51.7	30.8	41.3	83	1961	3	46.5	1994	-1+	1950	28	32.7	1976	713	0	.0	.0	16.0	.6	17.2	.0
Dec	40.4	22.7	31.6	76+	1982	3	38.9	1982	-17	1951	17	17.9	1989	1036	0	.0	.0	5.7	7.0	24.9	.8
Ann	61.5	37.4	49.5	101	Jul 1936	16	75.0+	Jul 1999	-29	Jan 1930	28	11.1	Jan 1977	6224	587	@	10.3	251.1	31.3	140.6	6.6

\+ 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: 1926-2001

(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	2.29	1.94	1.70	1996	19	7.01	1999	.65	1983
Feb	2.08	1.92	1.44	1959	10	4.18	1981	.21	1987
Mar	2.94	2.70	2.55	1985	29	5.51	1985	1.35	1978
Apr	3.28	3.08	2.82	1929	5	6.21	1998	.78	1971
May	3.48	3.35	3.35	1946	27	6.34	1983	1.21	1976
Jun	4.30	4.35	2.61	1938	26	9.03	1972	.68	1988
Jul	4.19	3.82	2.91	1937	14	10.12	1992	1.23	1997
Aug	3.56	3.19	2.83	1974	28	7.00	1994	1.27	1989
Sep	3.74	3.93	3.10	1965	1	6.11	1990	.93	1985
Oct	2.60	2.40	3.84	1998	8	5.73	1986	.54	1997
Nov	3.16	3.07	2.30	1999	3	10.20	1985	.71	1976
Dec	2.81	2.65	1.97	1991	3	5.72	1990	1.47+	1995
Ann	38.43	37.84	3.84	Oct 1998	8	10.20	Nov 1985	.21	Feb 1987

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	14.1	6.1	1.0	.3
Feb	11.3	5.7	1.2	.2
Mar	12.8	7.0	1.6	.5
Apr	14.0	8.0	1.7	.5
May	13.4	8.2	2.1	.4
Jun	12.3	7.8	3.3	1.0
Jul	11.2	7.5	2.9	1.0
Aug	10.8	6.8	2.4	.8
Sep	11.4	6.7	2.3	.9
Oct	11.9	6.0	1.6	.2
Nov	13.4	7.3	1.9	.4
Dec	14.0	6.6	1.7	.4
Ann	150.6	83.7	23.7	6.6

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	.72	.94	1.26	1.54	1.81	2.08	2.39	2.74	3.21	3.92	4.58
Feb	.65	.85	1.15	1.40	1.64	1.89	2.17	2.49	2.91	3.56	4.17
Mar	1.21	1.48	1.85	2.17	2.46	2.76	3.08	3.45	3.92	4.64	5.29
Apr	1.26	1.57	2.00	2.36	2.71	3.06	3.43	3.87	4.43	5.28	6.06
May	1.33	1.65	2.12	2.50	2.87	3.24	3.64	4.11	4.70	5.62	6.45
Jun	1.25	1.65	2.27	2.80	3.32	3.86	4.46	5.16	6.08	7.50	8.83
Jul	1.57	1.96	2.52	2.99	3.43	3.89	4.38	4.95	5.68	6.80	7.83
Aug	1.28	1.62	2.10	2.51	2.89	3.29	3.72	4.22	4.87	5.86	6.76
Sep	1.39	1.74	2.24	2.66	3.06	3.47	3.92	4.43	5.09	6.10	7.02
Oct	.74	.98	1.36	1.68	2.00	2.33	2.70	3.13	3.69	4.58	5.40
Nov	1.03	1.33	1.77	2.14	2.50	2.88	3.29	3.77	4.38	5.34	6.23
Dec	1.37	1.61	1.94	2.20	2.44	2.69	2.95	3.24	3.61	4.17	4.66
Ann	29.67	31.42	33.64	35.29	36.76	38.16	39.59	41.17	43.07	45.79	48.13

\+ 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: 1926-2001
(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	9.4	5.6	2	1	6.0	1978	18	29.7	1978	19	1977	15	10	1977	5.9	3.1	.8	.3	.0	13.2	6.9	4.1	.6
Feb	7.5	8.4	2	1	7.5	1971	9	15.5	1985	15	1977	5	8	1985	4.0	2.6	.6	.2	.0	10.2	5.8	3.3	.0
Mar	4.1	3.1	#	#	12.0	1993	14	12.0	1993	12	1993	14	2	1993	2.4	1.4	.5	.2	@	2.7	1.1	.6	@
Apr	.8	.0	#	0	6.0	1987	4	9.0	1987	3	1987	4	#+	1994	.5	.4	.1	@	.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	.0	.0	#	0	.4	1974	20	.4	1974	#	1974	20	#	1974	@	.0	.0	.0	.0	.0	.0	.0	.0
Nov	2.5	1.2	#	#	10.0	1971	22	15.5	1971	10	1971	22	1	1971	1.3	.7	.1	.1	@	.8	.2	.1	@
Dec	5.1	3.5	1	#	9.0	1995	20	12.9	1974	16	1995	26	4	1995	3.6	1.9	.4	.2	.0	4.9	1.4	.6	.0
Ann	29.4	21.8	N/A	N/A	12.0	Mar 1993	14	29.7	Jan 1978	19	Jan 1977	15	10	Jan 1977	17.7	10.1	2.5	1.0	@	31.9	15.5	8.7	.6

+ 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	6/12	6/06	6/01	5/28	5/25	5/21	5/17	5/13	5/06
32	5/29	5/23	5/19	5/15	5/12	5/08	5/05	4/30	4/25
28	5/10	5/06	5/04	5/01	4/29	4/27	4/24	4/22	4/18
24	4/30	4/25	4/21	4/17	4/14	4/11	4/08	4/04	3/30
20	4/16	4/11	4/08	4/05	4/03	3/31	3/28	3/25	3/21
16	4/12	4/06	4/02	3/30	3/27	3/24	3/20	3/17	3/11

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	9/13	9/18	9/22	9/25	9/28	10/01	10/04	10/08	10/13
32	9/22	9/28	10/02	10/06	10/09	10/13	10/16	10/21	10/27
28	10/11	10/16	10/19	10/22	10/24	10/27	10/29	11/01	11/06
24	10/23	10/28	11/01	11/04	11/07	11/10	11/13	11/16	11/21
20	11/03	11/10	11/14	11/18	11/22	11/25	11/29	12/04	12/10
16	11/16	11/22	11/26	11/30	12/04	12/07	12/11	12/16	12/22

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	148	140	135	130	126	121	117	111	103
32	176	167	161	155	150	145	139	132	123
28	194	189	184	181	177	174	170	166	160
24	227	220	215	210	206	201	197	191	184
20	257	248	242	237	232	228	222	216	208
16	275	267	261	256	251	247	241	235	227

***** 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	1213	1026	866	532	245	51	8	22	96	416	713	1036	6224
60	1058	886	711	384	143	14	0	4	30	275	563	881	4949
57	965	802	618	299	95	5	0	0	12	202	475	788	4261
55	903	746	560	246	70	3	0	0	5	159	418	726	3836
50	754	609	417	133	26	0	0	0	1	78	284	583	2885
32	288	198	74	1	0	0	0	0	0	0	23	172	756

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	99	96	231	460	817	1053	1226	1176	940	610	300	159	7167
55	0	0	4	15	174	365	513	463	256	56	5	0	1851
57	0	0	0	7	137	308	451	401	202	36	2	0	1544
60	0	0	0	3	92	226	358	311	131	17	0	0	1138
65	0	0	0	0	39	113	211	175	46	3	0	0	587
70	0	0	0	0	12	39	95	79	9	0	0	0	234

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	22	28	111	280	583	825	979	937	712	384	144	41	22	50	161	441	1024	1849	2828	3765	4477	4861	5005	5046
45	3	10	60	176	429	675	824	782	562	250	75	18	3	13	73	249	678	1353	2177	2959	3521	3771	3846	3864
50	0	1	32	96	290	525	669	627	413	140	34	4	0	1	33	129	419	944	1613	2240	2653	2793	2827	2831
55	0	0	9	50	174	380	514	472	276	67	10	0	0	0	9	59	233	613	1127	1599	1875	1942	1952	1952
60	0	0	2	18	90	244	360	320	158	24	1	0	0	0	2	20	110	354	714	1034	1192	1216	1217	1217
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	7	24	87	199	371	541	656	625	454	245	89	24	7	31	118	317	688	1229	1885	2510	2964	3209	3298	3322

(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