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: WARREN, PA **COOP ID: 369298**

Climate Division: PA10 **NWS Call Sign:** **Elevation: 1,210 Feet** **Lat: 41˚51N** **Lon: 79˚09W**

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	31.3	16.6	24.0	74	1950	25	33.4	1990	-23	1948	31	11.9	1977	1272	0	.0	.0	1.9	15.5	28.7	3.6
Feb	34.8	17.5	26.2	73	1997	22	35.7	1998	-34	1979	11	13.2	1979	1089	0	.0	.0	3.6	11.7	25.6	3.1
Mar	44.6	24.9	34.8	83	1946	28	43.0	1973	-18	1980	2	27.2	1984	937	0	.0	.0	11.2	5.1	24.9	.9
Apr	57.0	34.7	45.9	92	1976	18	50.5	1985	10+	1958	9	40.5	1975	575	0	.0	.1	21.8	.4	15.4	.0
May	69.0	44.4	56.7	92+	1949	4	63.8	1991	21	1947	10	49.6	1997	284	27	.0	.4	30.2	.0	3.4	.0
Jun	77.3	53.8	65.6	97	1952	26	68.7	1973	29+	1977	8	62.0	1992	67	83	.0	1.6	30.0	.0	.1	.0
Jul	81.3	58.5	69.9	99+	1988	8	73.3	1999	37	1963	9	66.4	2000	11	162	.0	4.1	31.0	.0	.0	.0
Aug	79.6	57.7	68.7	100	1988	3	73.2	1995	36+	1930	12	64.6	1982	27	141	@	1.9	31.0	.0	.0	.0
Sep	72.1	51.2	61.7	100	1953	2	66.5	1971	26	1957	27	59.0	1981	126	25	.0	.3	29.9	.0	.4	.0
Oct	60.3	40.8	50.6	90	1949	10	57.8	1971	14	1965	29	45.9	1988	450	2	.0	.0	26.3	.0	6.8	.0
Nov	46.9	32.5	39.7	84	1950	1	46.6	1975	2	1929	30	32.5	1976	759	0	.0	.0	12.5	2.0	17.3	.0
Dec	35.8	22.9	29.4	74	1982	4	36.5	1982	-12+	1942	21	17.0	1989	1106	0	.0	.0	3.5	9.8	26.6	.9
Ann	57.5	38.0	47.8	100+	Aug 1988	3	73.3	Jul 1999	-34	Feb 1979	11	11.9	Jan 1977	6703	440	@	8.4	232.9	44.5	149.2	8.5

\+ 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

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	3.01	2.89	2.27	1998	8	5.70	1999	1.20	1983
Feb	2.40	2.27	3.20	1926	1	4.83	1981	.35	1987
Mar	3.39	3.29	1.96	1945	22	5.49	1985	1.51	1990
Apr	3.71	3.45	2.40	1937	26	5.79	1981	1.68	1985
May	3.93	3.58	2.37	1953	23	7.35	1984	1.41	1993
Jun	5.14	4.88	4.29	1982	29	9.24	1972	1.14	1991
Jul	4.04	3.80	3.67	1964	13	10.82	1992	1.78	1997
Aug	4.35	3.88	3.70	1994	14	9.80	1977	1.87	1995
Sep	4.23	3.80	2.81	1975	12	8.30	1977	1.94	1995
Oct	3.41	3.13	4.66	1954	16	5.82	1990	1.44	1982
Nov	3.87	3.81	2.94	1950	25	8.48	1985	1.28	1998
Dec	3.62	3.31	1.97	1930	1	7.43	1990	1.24	1978
Ann	45.10	44.57	4.66	Oct 1954	16	10.82	Jul 1992	.35	Feb 1987

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	18.2	8.3	1.2	.2
Feb	13.8	6.7	1.0	.2
Mar	14.9	8.7	1.8	.4
Apr	15.5	9.0	2.2	.6
May	13.3	9.0	2.8	.6
Jun	13.3	9.1	3.5	1.1
Jul	11.8	7.7	2.8	.9
Aug	11.2	7.4	3.3	1.0
Sep	12.6	8.3	3.1	.8
Oct	14.0	8.5	1.9	.5
Nov	15.9	10.0	2.4	.4
Dec	17.5	10.2	2.0	.5
Ann	172.0	102.9	28.0	7.2

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	1.31	1.58	1.95	2.26	2.55	2.84	3.15	3.51	3.97	4.65	5.28
Feb	.84	1.07	1.40	1.68	1.94	2.21	2.51	2.86	3.30	3.98	4.61
Mar	1.63	1.93	2.33	2.65	2.94	3.24	3.56	3.92	4.37	5.05	5.66
Apr	1.87	2.18	2.60	2.94	3.25	3.56	3.89	4.27	4.73	5.44	6.07
May	1.76	2.11	2.59	2.99	3.35	3.73	4.12	4.58	5.15	6.02	6.81
Jun	1.87	2.36	3.05	3.63	4.19	4.76	5.37	6.09	7.01	8.42	9.72
Jul	1.79	2.15	2.65	3.06	3.44	3.83	4.24	4.71	5.31	6.21	7.03
Aug	1.83	2.23	2.78	3.24	3.66	4.10	4.56	5.09	5.77	6.80	7.74
Sep	2.02	2.38	2.88	3.29	3.66	4.04	4.44	4.89	5.46	6.33	7.10
Oct	1.56	1.86	2.27	2.61	2.93	3.24	3.58	3.96	4.45	5.19	5.85
Nov	1.68	2.02	2.51	2.91	3.28	3.66	4.06	4.53	5.11	6.00	6.81
Dec	1.73	2.04	2.47	2.82	3.13	3.45	3.79	4.18	4.67	5.40	6.06
Ann	35.56	37.48	39.91	41.72	43.31	44.83	46.39	48.10	50.15	53.08	55.59

\+ 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)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	19.5	16.1	4	3
Feb	12.7	12.9	4	3
Mar	9.5	9.2	1	1
Apr	1.9	.5	#	#
May	.0	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.2	.0	#	0
Nov	5.6	3.5	1	#
Dec	14.6	14.5	3	2
Ann	64.0	56.7	N/A	N/A

Extremes (2)

Month	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year
Jan	9.0	1996	3	46.6	1978	22	1996	10	11	1996
Feb	8.8	1971	14	33.0	1972	20	1977	5	12	1978
Mar	14.0	1993	14	24.5	1993	16	1993	14	8	1978
Apr	5.0	1977	7	7.6	1987	6	1987	1	1	1975
May	.1	1974	7	.1	1974	#+	1996	12	#+	1996
Jun	.0	0	0	.0	0	0	0	0	0	0
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	.0	0	0	.0	0	0	0	0	0	0
Oct	4.4	1974	20	4.4	1974	4	1974	20	#+	2000
Nov	11.0	1995	9	21.2	1976	11	1995	9	2	1996
Dec	10.7	1977	6	25.6	1975	19	1977	9	7	1989
Ann	14.0	Mar 1993	14	46.6	Jan 1978	22	Jan 1996	10	12	Feb 1978

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	12.1	6.7	1.5	.4	.0
Feb	8.0	4.7	1.1	.3	.0
Mar	5.2	3.3	.9	.4	@
Apr	1.1	.7	.2	@	.0
May	@	.0	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.0	.0	.0	.0	.0
Oct	.1	.1	@	.0	.0
Nov	3.5	2.2	.6	.3	@
Dec	8.8	5.6	1.5	.6	.1
Ann	38.8	23.3	5.8	2.0	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	19.6	12.6	8.1	4.2
Feb	18.0	13.2	9.5	4.1
Mar	7.8	4.0	2.5	.6
Apr	.9	.2	@	.0
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.1	@	.0	.0
Nov	3.7	1.5	.8	@
Dec	13.6	7.2	3.6	1.2
Ann	63.7	38.7	24.5	10.1

+ 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	6/13	6/07	6/02	5/29	5/25	5/21	5/17	5/12	5/06
32	5/27	5/23	5/19	5/16	5/13	5/10	5/07	5/04	4/29
28	5/10	5/05	5/02	4/29	4/27	4/24	4/22	4/18	4/14
24	4/28	4/23	4/19	4/16	4/13	4/10	4/07	4/03	3/29
20	4/15	4/10	4/07	4/04	4/01	3/29	3/27	3/23	3/19
16	4/05	4/01	3/29	3/27	3/25	3/23	3/21	3/18	3/14

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	9/12	9/17	9/20	9/23	9/25	9/28	10/01	10/04	10/09
32	9/26	10/01	10/05	10/08	10/12	10/15	10/18	10/22	10/27
28	10/09	10/14	10/19	10/22	10/25	10/29	11/01	11/05	11/11
24	10/22	10/28	11/02	11/05	11/09	11/12	11/16	11/20	11/26
20	11/01	11/08	11/12	11/16	11/20	11/23	11/27	12/02	12/08
16	11/14	11/20	11/24	11/28	12/01	12/05	12/08	12/13	12/18

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	144	137	131	127	123	118	114	108	101
32	171	164	159	155	151	147	142	137	130
28	206	198	191	186	181	176	170	164	155
24	238	228	221	215	209	204	198	191	181
20	259	250	243	237	232	227	221	214	205
16	269	263	258	254	251	247	243	238	232

***** 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	1272	1089	937	575	284	67	11	27	126	450	759	1106	6703
60	1117	949	782	427	173	20	0	4	43	307	609	951	5382
57	1024	865	689	341	120	8	0	0	19	231	520	858	4675
55	962	809	627	287	91	4	0	0	9	186	461	796	4232
50	807	669	481	168	38	0	0	0	1	97	322	646	3229
32	310	236	97	3	0	0	0	0	0	0	28	202	876

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	62	72	183	417	766	1005	1174	1136	889	576	259	119	6658
55	0	0	0	12	144	320	461	423	209	48	2	0	1619
57	0	0	0	6	111	263	399	361	158	31	1	0	1330
60	0	0	0	2	71	186	306	272	93	14	0	0	944
65	0	0	0	0	27	83	162	141	25	2	0	0	440
70	0	0	0	0	8	22	61	54	3	0	0	0	148

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	20	75	228	535	781	935	893	649	334	115	24	9	29	104	332	867	1648	2583	3476	4125	4459	4574	4598
45	1	4	40	136	386	631	780	738	500	206	58	8	1	5	45	181	567	1198	1978	2716	3216	3422	3480	3488
50	0	0	15	74	254	481	625	583	355	110	22	3	0	0	15	89	343	824	1449	2032	2387	2497	2519	2522
55	0	0	5	35	151	336	470	429	222	50	4	0	0	0	5	40	191	527	997	1426	1648	1698	1702	1702
60	0	0	0	13	72	205	316	275	118	14	0	0	0	0	0	13	85	290	606	881	999	1013	1013	1013
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	1	12	58	157	341	499	614	584	397	196	63	10	1	13	71	228	569	1068	1682	2266	2663	2859	2922	2932

(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/normals/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.
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