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: FRANCIS E WALTER DAM, PA **COOP ID: 363018**

Climate Division: PA 1 **NWS Call Sign:** **Elevation: 1,509 Feet** **Lat: 41˚07N** **Lon: 75˚44W**

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	31.0	10.3	20.7	66	1967	26	30.0	1998	-26+	1981	13	9.6	1977	1375	0	.0	.0	1.8	16.5	29.8	5.7
Feb	34.2	11.6	22.9	69	1985	25	30.3	1998	-28	1979	18	13.3	1979	1179	0	.0	.0	2.7	13.0	26.9	4.5
Mar	43.7	20.6	32.2	84	1998	31	39.8	2000	-13+	1967	19	24.8	1984	1018	0	.0	.0	8.9	5.0	26.8	.5
Apr	55.5	30.3	42.9	90	1976	19	46.7	1994	4	1975	5	36.7	1975	664	0	.0	@	20.6	.3	16.9	.0
May	67.2	40.6	53.9	91	1998	17	59.7	1998	21	1974	8	49.6	1990	348	5	.0	.1	29.8	.0	4.4	.0
Jun	74.6	49.0	61.8	95	1999	19	65.6	1995	27	1972	11	58.5	1972	125	29	.0	.4	30.0	.0	.5	.0
Jul	79.1	53.7	66.4	96	1966	4	71.3	1999	35	1982	3	63.2	1976	41	85	.0	1.2	31.0	.0	.0	.0
Aug	77.5	52.1	64.8	96	1988	14	69.2	1980	31	1965	30	61.5	1982	77	71	.0	.4	31.0	.0	@	.0
Sep	69.8	44.1	57.0	91	1980	3	60.8	1999	23+	1974	24	51.3	1991	248	6	.0	@	29.7	.0	2.5	.0
Oct	59.0	33.1	46.1	83	1986	1	51.7	1995	11	1969	24	40.8	1972	588	0	.0	.0	26.0	.0	13.8	.0
Nov	47.0	25.9	36.5	77	1982	3	41.4	1994	2	1976	30	30.3	1976	857	0	.0	.0	11.8	2.2	22.1	.0
Dec	35.8	16.4	26.1	66+	1998	7	34.7	1998	-22	1989	24	10.2	1989	1205	0	.0	.0	2.6	11.2	29.1	2.3
Ann	56.2	32.3	44.3	96+	Aug 1988	14	71.3	Jul 1999	-28	Feb 1979	18	9.6	Jan 1977	7725	196	.0	2.1	225.9	48.2	172.8	13.0

\+ 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: 1963-2001

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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	3.22	2.72	2.63	1978	9	9.63	1979	.57	1985
Feb	2.55	2.32	2.16	1981	2	7.47	1981	.57	1987
Mar	3.28	3.40	2.32	1986	15	6.26	1994	.72	1981
Apr	3.77	3.46	3.97	1983	16	10.38	1983	1.30	1978
May	4.53	4.27	3.16	1984	29	9.65	1990	1.19	1993
Jun	4.71	4.23	6.67	1969	15	10.64	1973	1.20	1988
Jul	4.51	4.04	2.89	1988	21	10.15	1988	1.52	1999
Aug	4.25	3.77	3.95	1973	2	7.80	1994	1.62	1972
Sep	4.77	4.32	5.44	1999	17	12.25	1999	.55	1984
Oct	3.72	3.49	2.87	1977	17	8.11	1995	.50	1994
Nov	3.79	3.58	4.31	1996	9	8.23	1985	.81	1973
Dec	3.19	2.69	2.98	1990	4	7.51	1996	.56	1989
Ann	46.29	45.26	6.67	Jun 1969	15	12.25	Sep 1999	.50	Oct 1994

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	11.6	6.3	2.1	.7
Feb	9.3	5.4	1.5	.5
Mar	10.5	6.7	2.2	.7
Apr	12.0	7.4	2.5	1.0
May	14.0	8.3	3.2	.9
Jun	12.6	8.3	3.2	1.0
Jul	12.1	7.8	3.3	1.2
Aug	12.0	7.1	2.9	1.0
Sep	12.1	7.1	2.9	1.4
Oct	10.8	6.4	2.5	1.0
Nov	10.2	6.2	2.4	1.0
Dec	11.2	6.3	2.4	.6
Ann	138.4	83.3	31.1	11.0

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	.60	.88	1.35	1.79	2.24	2.71	3.26	3.92	4.79	6.20	7.54
Feb	.84	1.09	1.44	1.74	2.03	2.33	2.66	3.04	3.54	4.30	5.00
Mar	1.29	1.59	2.02	2.38	2.72	3.06	3.43	3.86	4.40	5.24	6.00
Apr	1.23	1.59	2.12	2.56	2.99	3.44	3.92	4.49	5.23	6.37	7.42
May	1.55	1.98	2.60	3.13	3.64	4.16	4.73	5.39	6.24	7.56	8.77
Jun	1.39	1.84	2.51	3.09	3.66	4.24	4.89	5.66	6.65	8.19	9.63
Jul	1.59	2.02	2.63	3.15	3.64	4.15	4.71	5.35	6.18	7.45	8.62
Aug	1.78	2.17	2.71	3.16	3.58	4.00	4.46	4.98	5.64	6.65	7.57
Sep	1.21	1.66	2.36	2.97	3.57	4.21	4.92	5.76	6.86	8.60	10.23
Oct	1.04	1.39	1.93	2.39	2.85	3.33	3.86	4.48	5.30	6.57	7.76
Nov	1.33	1.69	2.20	2.64	3.06	3.49	3.95	4.50	5.20	6.27	7.26
Dec	.75	1.05	1.52	1.93	2.35	2.78	3.28	3.86	4.63	5.85	6.99
Ann	35.46	37.61	40.34	42.38	44.19	45.92	47.70	49.65	52.00	55.37	58.27

\+ 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: 1963-2001
(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	14.1	14.4	5	3	15.3	1996	9	33.0	1978	33	1994	23	20	1994	5.0	4.5	1.4	.7	.2	19.5	13.9	9.7	3.5
Feb	11.0	11.0	6	4	17.0	1978	7	25.0	1978	34	1978	8	21+	1994	4.0	3.6	1.2	.3	.1	17.2	13.2	9.5	4.8
Mar	7.8	8.0	3	1	17.0	1993	14	28.0	1984	50	1986	4	16	1994	3.3	2.8	.9	.5	.1	9.4	6.0	4.3	2.0
Apr	3.7	1.0	#	#	14.7	1997	1	27.0	1983	15	1997	1	2	1983	1.2	1.1	.4	.2	.1	1.6	.8	.4	.1
May	.3	.0	#	0	4.0	1977	10	7.0	1977	6	1977	10	#+	1977	.1	.1	.1	.0	.0	.1	.1	@	.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	3.0	1977	17	3.0	1977	3	1977	18	#+	2000	@	@	@	.0	.0	.1	.1	.0	.0
Nov	2.0	1.8	#	#	7.0	1980	18	7.0	1980	20	1971	26	2	1995	1.4	1.3	.2	.1	.0	1.9	.4	.2	.0
Dec	7.6	6.0	2	1	9.0	1973	17	17.7	1973	12	1973	19	5	1995	3.6	3.0	1.0	.4	.0	10.4	6.1	3.1	.4
Ann	46.6	42.2	N/A	N/A	17.0+	Mar 1993	14	33.0	Jan 1978	50	Mar 1986	4	21+	Feb 1994	18.6	16.4	5.2	2.2	.5	60.2	40.6	27.2	10.8

+ 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	6/24	6/18	6/14	6/10	6/06	6/03	5/30	5/26	5/19
32	6/11	6/04	5/31	5/27	5/23	5/19	5/15	5/10	5/04
28	5/22	5/17	5/14	5/10	5/07	5/04	5/01	4/28	4/22
24	5/02	4/28	4/25	4/22	4/20	4/18	4/15	4/12	4/08
20	4/24	4/19	4/15	4/12	4/09	4/06	4/02	3/30	3/24
16	4/12	4/07	4/04	4/01	3/30	3/27	3/24	3/21	3/17

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	8/22	8/28	8/31	9/04	9/07	9/10	9/13	9/16	9/22
32	9/11	9/15	9/18	9/21	9/23	9/26	9/28	10/01	10/05
28	9/21	9/26	9/30	10/03	10/06	10/08	10/12	10/15	10/20
24	9/28	10/05	10/10	10/14	10/18	10/22	10/27	10/31	11/07
20	10/14	10/21	10/26	10/30	11/03	11/06	11/10	11/15	11/22
16	10/28	11/04	11/09	11/13	11/17	11/21	11/25	11/29	12/06

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	117	108	102	97	92	86	81	75	66
32	148	139	133	128	123	118	112	106	98
28	170	163	158	154	150	147	143	138	131
24	204	196	190	185	181	176	171	166	158
20	234	224	218	212	207	202	196	190	181
16	257	248	242	236	231	226	221	214	205

***** 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	1375	1179	1018	664	348	125	41	77	248	588	857	1205	7725
60	1220	1039	863	514	213	45	6	20	128	437	707	1050	6242
57	1127	955	770	425	146	19	0	7	76	350	617	957	5449
55	1065	899	708	366	109	9	0	3	50	295	557	895	4956
50	910	759	553	229	42	1	0	0	13	177	409	740	3833
32	391	287	111	4	0	0	0	0	0	4	46	269	1112

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	38	32	116	330	680	894	1067	1017	749	439	179	87	5628
55	0	0	0	2	75	213	354	306	108	17	0	0	1075
57	0	0	0	1	51	163	292	249	74	10	0	0	840
60	0	0	0	0	24	99	204	169	37	3	0	0	536
65	0	0	0	0	5	29	85	71	6	0	0	0	196
70	0	0	0	0	0	4	18	17	0	0	0	0	39

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	3	8	51	176	467	692	847	803	541	250	81	11	3	11	62	238	705	1397	2244	3047	3588	3838	3919	3930
45	0	0	22	95	324	542	692	648	395	140	34	3	0	0	22	117	441	983	1675	2323	2718	2858	2892	2895
50	0	0	7	44	196	394	537	495	259	63	14	0	0	0	7	51	247	641	1178	1673	1932	1995	2009	2009
55	0	0	3	18	106	255	384	343	149	23	4	0	0	0	3	21	127	382	766	1109	1258	1281	1285	1285
60	0	0	0	6	44	142	241	200	70	3	0	0	0	0	0	6	50	192	433	633	703	706	706	706
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	6	42	126	292	439	551	516	339	162	53	6	0	6	48	174	466	905	1456	1972	2311	2473	2526	2532

(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