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: BRADFORD RGNL AP, PA **COOP ID: 360865**

Climate Division: PA10 **NWS Call Sign: BFD** **Elevation: 2,117 Feet** **Lat: 41˚48N** **Lon: 78˚38W**

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	28.3	13.5	20.9	60	1967	25	30.7	1990	-27	1982	17	5.9	1977	1367	0	.0	.0	1.0	21.1	29.8	5.0
Feb	31.8	14.8	23.3	63	1976	29	31.0	1976	-30	1979	11	12.3	1979	1168	0	.0	.0	1.4	17.3	26.4	4.2
Mar	41.9	22.8	32.4	78	1986	30	39.3	1973	-21	1980	2	24.5	1984	1012	0	.0	.0	7.3	7.8	25.8	1.1
Apr	54.1	32.8	43.5	85+	1990	27	49.0	1985	6+	1964	1	38.9	1975	647	0	.0	.0	18.4	1.2	16.6	.0
May	65.8	41.7	53.8	86+	1959	20	60.5	1991	18	1974	5	47.4	1997	362	13	.0	.0	28.7	.0	6.1	.0
Jun	73.4	50.3	61.9	89+	1988	25	65.9	1976	25	1972	11	58.1	1985	125	32	.0	.0	29.8	.0	1.0	.0
Jul	77.4	54.7	66.1	97	1988	16	69.2	1977	33+	1963	9	60.6	1971	56	89	.0	.5	31.0	.0	.0	.0
Aug	76.0	53.2	64.6	93	1988	2	69.9	1980	25	1986	29	61.1	1982	88	77	.0	.2	31.0	.0	.2	.0
Sep	68.4	46.6	57.5	88	1959	9	61.7	1971	19	1957	27	54.4	1974	231	6	.0	.0	29.5	.0	2.4	.0
Oct	57.2	36.7	47.0	79+	1959	5	54.3	1971	10	1965	29	41.0	1988	559	0	.0	.0	22.6	.1	11.0	.0
Nov	44.3	29.1	36.7	73	1982	2	45.1	1975	-2	1976	30	28.4	1976	849	0	.0	.0	9.0	5.8	21.5	.1
Dec	33.3	19.2	26.3	69	1982	3	33.7	1982	-20+	1980	25	13.1	1989	1202	0	.0	.0	2.1	16.6	28.6	2.5
Ann	54.3	34.6	44.5	97	Jul 1988	16	69.9	Aug 1980	-30	Feb 1979	11	5.9	Jan 1977	7666	217	.0	.7	211.8	69.9	169.4	12.9

\+ 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: 1957-2001

(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	3.61	3.31	2.45	1959	21	8.13	1999	1.29+	1981
Feb	2.90	2.84	1.57	1961	25	5.29	1990	.75	1987
Mar	3.79	3.84	3.02	1992	11	6.72	1994	.50	1999
Apr	3.50	3.46	2.20	1981	28	6.23	1981	1.30	1985
May	3.94	3.50	2.31	1984	28	8.84	1989	.94	1977
Jun	5.53	5.50	3.55	1984	17	11.21	1972	1.55	1979
Jul	4.14	4.07	3.17	1980	29	10.09	1992	1.50	2000
Aug	3.98	3.38	2.49	1994	14	8.55	1994	1.75	1972
Sep	4.21	3.63	4.91	1967	28	7.57	1977	1.77	1995
Oct	3.22	3.07	2.38	1980	25	6.81	1981	.98	1999
Nov	3.79	3.53	1.65	1993	17	8.93	1985	.40	2000
Dec	3.94	3.75	1.85	1977	5	7.28	1992	1.21	1999
Ann	46.55	48.19	4.91	Sep 1967	28	11.21	Jun 1972	.40	Nov 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	20.8	9.6	1.4	.2
Feb	18.0	8.5	1.2	.2
Mar	15.4	8.7	2.0	.5
Apr	13.7	8.1	1.9	.4
May	12.5	8.4	2.3	.6
Jun	11.4	7.8	3.1	1.3
Jul	10.1	7.4	2.3	1.0
Aug	10.0	6.6	2.5	1.0
Sep	11.2	7.5	2.5	.8
Oct	11.6	6.6	1.7	.3
Nov	17.0	10.6	1.8	.4
Dec	21.4	13.4	1.8	.5
Ann	173.1	103.2	24.5	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	1.29	1.63	2.12	2.53	2.92	3.33	3.77	4.28	4.93	5.94	6.87
Feb	1.18	1.45	1.83	2.13	2.42	2.72	3.04	3.40	3.87	4.58	5.22
Mar	1.14	1.50	2.04	2.51	2.96	3.42	3.94	4.55	5.33	6.55	7.69
Apr	1.59	1.90	2.33	2.67	3.00	3.32	3.67	4.07	4.57	5.33	6.01
May	1.45	1.82	2.35	2.79	3.21	3.65	4.12	4.66	5.36	6.43	7.41
Jun	1.79	2.31	3.09	3.75	4.39	5.04	5.76	6.61	7.70	9.39	10.95
Jul	1.85	2.22	2.73	3.15	3.53	3.93	4.35	4.83	5.43	6.35	7.18
Aug	1.54	1.91	2.44	2.88	3.29	3.71	4.17	4.70	5.37	6.40	7.34
Sep	1.96	2.33	2.83	3.24	3.62	4.01	4.42	4.88	5.47	6.36	7.16
Oct	1.33	1.63	2.04	2.38	2.70	3.03	3.38	3.78	4.29	5.07	5.78
Nov	1.20	1.56	2.09	2.55	2.99	3.44	3.94	4.53	5.29	6.47	7.56
Dec	1.91	2.25	2.71	3.08	3.42	3.77	4.14	4.55	5.08	5.87	6.57
Ann	33.44	35.99	39.25	41.72	43.91	46.03	48.21	50.62	53.54	57.78	61.43

\+ 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: 1957-2001
(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	20.1	20.1	8	6	10.9	1978	17	40.0	1994	42+	1994	20	31	1994	17.0	6.0	1.7	.7	.1	25.4	21.0	16.5	10.7
Feb	18.3	15.6	10	8	11.6	1971	13	41.9	1972	44+	1977	7	25	1978	13.5	5.7	1.6	.6	@	23.2	20.5	17.6	12.2
Mar	16.4	11.4	5	2	30.2	1992	11	52.2	1994	45+	1993	16	23	1993	9.9	4.1	1.6	.8	.2	16.2	11.6	8.6	4.8
Apr	4.2	3.9	#	1	6.3	1982	6	10.5	1982	11	1984	1	1+	1987	4.7	1.6	.2	@	.0	3.2	1.5	.4	@
May	.5	.0	#	0	6.5	1989	7	8.5	1989	3	1989	7	#	1994	.4	.1	@	@	.0	.1	@	.0	.0
Jun	.0	.0	#	0	.0	0	0	.0	0	0	0	0	#	1989	.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	#	1989	23	#+	1989	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	1.7	.9	#	0	5.9	1993	31	8.1	1993	2+	1993	31	#	1993	1.7	.6	.1	@	.0	.4	.0	.0	.0
Nov	7.7	6.2	1	0	9.1	1986	18	17.3	1980	10	1971	7	2+	1976	8.3	2.9	.4	.1	.0	7.9	3.1	1.2	@
Dec	21.5	18.9	5	4	17.9	1977	5	44.9	1992	39+	1992	13	13	1989	15.3	6.2	1.7	.7	.2	21.0	16.0	11.3	4.7
Ann	90.4	77.0	N/A	N/A	30.2	Mar 1992	11	52.2	Mar 1994	45+	Mar 1993	16	31	Jan 1994	70.8	27.2	7.3	2.9	.5	97.4	73.7	55.6	32.4

+ 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	7/07	6/28	6/22	6/16	6/11	6/06	5/31	5/25	5/16
32	6/19	6/12	6/07	6/03	5/30	5/26	5/22	5/17	5/10
28	6/03	5/27	5/22	5/18	5/14	5/11	5/06	5/02	4/25
24	5/17	5/10	5/05	5/01	4/27	4/23	4/19	4/14	4/07
20	4/27	4/22	4/18	4/15	4/12	4/09	4/06	4/02	3/28
16	4/18	4/13	4/09	4/05	4/02	3/30	3/27	3/23	3/18

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	8/11	8/19	8/24	8/29	9/02	9/07	9/11	9/17	9/24
32	8/30	9/05	9/10	9/14	9/18	9/22	9/26	10/01	10/07
28	9/12	9/19	9/24	9/29	10/03	10/07	10/12	10/17	10/24
24	10/06	10/11	10/15	10/19	10/22	10/25	10/29	11/02	11/07
20	10/17	10/23	10/27	10/30	11/02	11/06	11/09	11/13	11/19
16	10/26	11/02	11/07	11/11	11/14	11/18	11/22	11/27	12/04

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	121	108	98	90	83	75	67	58	45
32	139	129	122	116	110	105	98	91	81
28	169	159	152	146	141	135	129	122	113
24	202	193	187	182	177	172	167	161	153
20	226	218	213	208	204	199	195	189	182
16	253	244	237	231	225	220	214	207	197

***** 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	1367	1168	1012	647	362	125	56	88	231	559	849	1202	7666
60	1212	1028	857	497	234	47	11	26	112	409	699	1047	6179
57	1119	944	764	409	172	22	4	10	62	325	609	954	5394
55	1057	888	702	351	135	12	0	5	39	272	550	892	4903
50	902	748	550	216	65	2	0	0	8	162	409	738	3800
32	385	286	131	4	0	0	0	0	0	5	61	266	1138

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	41	42	142	347	675	896	1056	1012	764	469	202	87	5733
55	0	0	0	3	97	218	343	304	113	23	1	0	1102
57	0	0	0	2	71	168	284	247	76	14	0	0	862
60	0	0	0	0	41	103	198	170	37	6	0	0	555
65	0	0	0	0	13	32	89	77	6	0	0	0	217
70	0	0	0	0	3	5	24	22	0	0	0	0	54

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	5	9	50	166	427	646	798	752	516	239	74	10	5	14	64	230	657	1303	2101	2853	3369	3608	3682	3692
45	0	0	27	97	285	497	643	597	371	140	33	5	0	0	27	124	409	906	1549	2146	2517	2657	2690	2695
50	0	0	11	49	173	352	488	443	239	69	15	1	0	0	11	60	233	585	1073	1516	1755	1824	1839	1840
55	0	0	4	22	88	217	334	293	133	27	4	0	0	0	4	26	114	331	665	958	1091	1118	1122	1122
60	0	0	0	7	40	109	191	159	62	2	0	0	0	0	0	7	47	156	347	506	568	570	570	570
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	2	37	112	264	398	509	466	308	139	39	3	0	2	39	151	415	813	1322	1788	2096	2235	2274	2277

(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