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: WANAQUE RAYMOND DAM, NJ **COOP ID: 289187**

Climate Division: NJ 1 **NWS Call Sign:** **Elevation: 245 Feet** **Lat: 41˚03N** **Lon: 74˚18W**

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	35.6	18.4	27.0	65+	1998	10	35.7	1998	-11+	1994	27	17.2	1977	1179	0	.0	.0	2.9	10.6	28.5	1.6
Feb	38.6	19.5	29.1	72	1997	28	36.8	1998	-5	1996	6	18.1	1979	1007	0	.0	.0	4.3	7.8	24.7	.9
Mar	47.5	28.7	38.1	82+	1998	28	43.1	2000	8	1996	9	31.8	1984	834	0	.0	.0	12.9	1.8	23.1	.0
Apr	59.1	38.5	48.8	95	1976	19	52.5	1976	21+	1950	1	44.0	1975	486	0	.0	.2	25.2	@	6.2	.0
May	70.1	48.5	59.3	96	1996	21	65.4	1991	29+	1974	5	55.8	1971	195	20	.0	.6	30.8	.0	.2	.0
Jun	78.7	57.8	68.3	95	1988	23	71.0	1973	41+	1993	2	64.8	1972	27	123	.0	1.9	30.0	.0	.0	.0
Jul	84.1	63.1	73.6	100	1999	7	77.8	1999	49	2001	3	70.0	2000	1	268	@	4.0	31.0	.0	.0	.0
Aug	81.6	61.4	71.5	101	2001	10	74.5	1988	42	1986	29	68.1	1982	6	209	.0	2.5	31.0	.0	.0	.0
Sep	73.7	53.7	63.7	94	1991	17	66.8	1998	35+	1991	30	59.9	1975	82	44	.0	.7	30.0	.0	.0	.0
Oct	62.6	41.1	51.9	86	1986	1	57.6	1990	21	1974	22	47.1	1976	411	4	.0	.0	30.0	.0	4.5	.0
Nov	51.6	33.4	42.5	79+	1974	2	47.6	1994	12	1989	24	36.0	1976	675	0	.0	.0	17.4	.2	14.5	.0
Dec	40.8	24.8	32.8	74	1998	8	40.5	1998	1	1989	24	20.8	1989	998	0	.0	.0	5.1	5.6	25.5	.2
Ann	60.3	40.7	50.6	101	Aug 2001	10	77.8	Jul 1999	-11+	Jan 1994	27	17.2	Jan 1977	5901	668	@	9.9	250.6	26.0	127.2	2.7

\+ 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: 1948-2001

(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	3.95	3.54	2.52	1979	21	11.06	1979	.50	1981
Feb	2.98	2.92	2.80	1958	28	7.41	1981	.37	1987
Mar	4.04	3.81	2.91	1980	22	9.06	1983	.92	1981
Apr	4.23	3.78	2.90+	1980	10	10.61	1983	.71	1985
May	4.54	3.96	3.45+	1984	30	11.05	1989	.79	1993
Jun	4.34	3.66	5.15	1973	30	11.50	1972	.39	1988
Jul	4.31	3.83	3.92	1951	28	10.12	1975	.90	1999
Aug	4.25	4.21	7.05	1971	28	9.70	1990	.93	1984
Sep	4.58	3.76	7.67	1999	17	13.00	1999	.46	1980
Oct	3.67	3.84	3.53	1995	6	8.84	1995	1.00	2000
Nov	4.10	3.64	3.20	1977	8	8.78	1977	.63	1976
Dec	3.79	3.28	3.49	1990	4	10.10	1973	.57	1989
Ann	48.78	47.59	7.67	Sep 1999	17	13.00	Sep 1999	.37	Feb 1987

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	9.7	6.8	2.8	1.1
Feb	8.1	5.7	2.0	.7
Mar	9.0	6.5	2.9	1.1
Apr	10.1	7.2	2.9	1.1
May	10.8	7.7	2.7	1.2
Jun	10.8	7.1	2.8	1.2
Jul	10.2	6.9	2.8	1.4
Aug	8.5	6.6	2.7	1.3
Sep	8.4	6.3	2.7	1.3
Oct	7.8	5.8	2.4	.9
Nov	8.4	5.8	3.0	1.4
Dec	9.4	6.3	2.6	1.1
Ann	111.2	78.7	32.3	13.8

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	.94	1.31	1.89	2.40	2.91	3.45	4.06	4.78	5.72	7.22	8.63
Feb	.91	1.20	1.62	1.98	2.33	2.70	3.10	3.57	4.18	5.12	6.00
Mar	1.41	1.79	2.34	2.81	3.26	3.71	4.21	4.80	5.54	6.70	7.76
Apr	1.33	1.73	2.33	2.84	3.33	3.84	4.41	5.06	5.91	7.24	8.46
May	1.24	1.66	2.32	2.89	3.45	4.04	4.69	5.47	6.47	8.05	9.52
Jun	.99	1.39	2.03	2.60	3.17	3.77	4.45	5.26	6.33	8.03	9.62
Jul	1.16	1.57	2.19	2.74	3.27	3.84	4.46	5.20	6.17	7.68	9.09
Aug	1.29	1.69	2.30	2.82	3.32	3.84	4.42	5.10	5.97	7.34	8.61
Sep	1.07	1.50	2.17	2.77	3.36	4.00	4.71	5.55	6.66	8.43	10.08
Oct	1.14	1.49	2.01	2.45	2.88	3.33	3.82	4.39	5.13	6.29	7.36
Nov	1.18	1.57	2.16	2.67	3.16	3.68	4.25	4.93	5.80	7.17	8.44
Dec	.72	1.06	1.62	2.13	2.65	3.21	3.85	4.61	5.63	7.26	8.82
Ann	36.12	38.61	41.77	44.16	46.27	48.31	50.40	52.70	55.49	59.51	62.97

\+ 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: 1948-2001
(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	6.9	6.7	2	#	17.0	1996	9	17.7	1978	24	1996	10	10	1996	2.4	1.7	.8	.4	@	6.4	4.1	1.6	.1
Feb	6.3	2.7	2	1	18.5	1983	12	23.3	1983	26	1994	12	14	1978	2.4	1.6	.9	.5	.1	7.1	5.0	3.2	1.1
Mar	3.7	3.8	1	#	21.0	1993	14	21.0	1993	21	1993	14	9	1978	1.1	.8	.6	.3	@	3.0	1.9	1.2	.3
Apr	.6	.0	#	0	8.0	1982	7	12.0	1982	8	1982	8	1	1982	.2	.1	.1	@	.0	.2	.2	.1	.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	.0	0	0	.0	0	#	1979	10	#	1979	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	.2	.0	#	0	3.0	1989	23	3.0	1989	2	1978	29	#+	1997	.1	.1	@	.0	.0	.1	.0	.0	.0
Dec	2.8	2.0	#	#	9.0	1995	20	17.5	1995	14	1995	22	6	1995	1.4	1.0	.2	@	.0	2.6	1.0	.6	.3
Ann	20.5	15.2	N/A	N/A	21.0	Mar 1993	14	23.3	Feb 1983	26	Feb 1994	12	14	Feb 1978	7.6	5.3	2.6	1.2	.1	19.4	12.2	6.7	1.8

+ 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	5/16	5/12	5/09	5/07	5/05	5/03	4/30	4/27	4/23
32	5/07	5/02	4/28	4/24	4/21	4/18	4/15	4/11	4/06
28	4/20	4/16	4/13	4/11	4/09	4/07	4/04	4/02	3/29
24	4/06	4/01	3/29	3/26	3/23	3/21	3/18	3/14	3/10
20	3/28	3/22	3/17	3/13	3/09	3/05	3/01	2/25	2/18
16	3/21	3/14	3/10	3/06	3/02	2/27	2/23	2/18	2/12

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	9/23	9/28	10/01	10/04	10/07	10/10	10/13	10/17	10/22
32	10/05	10/10	10/13	10/16	10/19	10/21	10/24	10/28	11/02
28	10/16	10/21	10/25	10/28	10/30	11/02	11/05	11/09	11/13
24	10/26	11/01	11/06	11/10	11/13	11/17	11/20	11/25	12/01
20	11/13	11/18	11/22	11/25	11/27	11/30	12/03	12/07	12/12
16	11/26	12/02	12/06	12/09	12/12	12/15	12/19	12/23	12/28

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	174	167	163	159	155	151	147	142	135
32	199	192	188	183	180	176	172	167	160
28	223	216	212	208	204	200	196	191	185
24	258	250	244	239	234	229	224	218	210
20	284	277	272	267	263	258	254	248	241
16	308	300	294	289	284	279	274	268	260

***** 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	1179	1007	834	486	195	27	1	6	82	411	675	998	5901
60	1024	867	679	338	91	4	0	0	24	272	525	843	4667
57	931	783	586	253	49	1	0	0	10	200	436	750	3999
55	869	727	524	201	30	0	0	0	5	158	377	688	3579
50	714	587	377	95	6	0	0	0	1	78	241	541	2640
32	244	176	42	0	0	0	0	0	0	0	7	132	601

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	88	93	231	504	848	1086	1290	1226	952	616	322	157	7413
55	0	0	0	15	165	396	577	513	266	61	2	0	1995
57	0	0	0	7	122	337	515	451	211	41	1	0	1685
60	0	0	0	2	71	250	422	358	136	20	0	0	1259
65	0	0	0	0	20	123	268	209	44	4	0	0	668
70	0	0	0	0	3	40	129	89	6	0	0	0	267

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	13	18	77	286	607	837	1016	982	722	377	153	33	13	31	108	394	1001	1838	2854	3836	4558	4935	5088	5121
45	2	4	29	164	452	687	861	827	572	231	76	7	2	6	35	199	651	1338	2199	3026	3598	3829	3905	3912
50	0	0	12	85	304	537	706	672	423	116	30	3	0	0	12	97	401	938	1644	2316	2739	2855	2885	2888
55	0	0	4	35	174	388	551	517	283	46	9	0	0	0	4	39	213	601	1152	1669	1952	1998	2007	2007
60	0	0	0	11	84	248	396	363	159	13	0	0	0	0	0	11	95	343	739	1102	1261	1274	1274	1274
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	5	13	55	163	356	540	688	666	449	216	84	15	5	18	73	236	592	1132	1820	2486	2935	3151	3235	3250

(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