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: GROTON, CT **COOP ID: 063207**

Climate Division: CT 3 **NWS Call Sign:** **Elevation: 40 Feet** **Lat: 41˚21N** **Lon: 72˚02W**

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	37.7	20.0	28.9	65	1967	24	36.5	1990	-14	1961	22	20.2	1981	1121	0	.0	.0	4.1	9.1	27.6	1.4
Feb	39.4	21.8	30.6	67	1976	25	36.4	1984	-12	1965	4	20.4	1979	964	0	.0	.0	3.9	6.2	24.2	.6
Mar	47.1	29.3	38.2	78	1998	29	42.5	2000	0	1967	19	34.2	1984	832	0	.0	.0	11.4	1.4	20.6	.0
Apr	56.3	38.1	47.2	84+	1976	17	50.8	1991	14	1982	7	42.5	1972	534	0	.0	.0	24.3	.1	6.4	.0
May	66.3	47.7	57.0	91+	1979	10	62.4	1991	30+	1966	3	53.8	1997	254	6	.0	.1	30.8	.0	@	.0
Jun	74.9	56.6	65.8	95+	1964	30	68.5	1984	38	1967	1	63.2	1972	42	64	.0	.6	30.0	.0	.0	.0
Jul	80.7	62.9	71.8	101	1991	21	75.2	1994	47	1988	1	68.4	1992	2	213	@	2.0	31.0	.0	.0	.0
Aug	79.6	62.2	70.9	99	1975	2	73.8	1984	41	1965	31	68.4	1992	4	186	.0	.8	31.0	.0	.0	.0
Sep	72.7	54.5	63.6	93	1983	11	67.8	1971	29	1957	28	60.5	1978	83	40	.0	.2	30.0	.0	@	.0
Oct	62.5	43.4	53.0	83	1959	6	58.7	1971	22	1966	31	48.8	1974	376	2	.0	.0	29.9	.0	3.0	.0
Nov	52.7	35.2	44.0	75	1982	1	48.6	1975	8	1989	21	39.2	1976	632	0	.0	.0	19.2	.2	13.0	.0
Dec	42.7	25.7	34.2	69+	1998	4	38.8	1984	-10+	1962	31	21.2	1989	955	0	.0	.0	7.5	4.1	24.4	.2
Ann	59.4	41.5	50.4	101	Jul 1991	21	75.2	Jul 1994	-14	Jan 1961	22	20.2	Jan 1981	5799	511	@	3.7	253.1	21.1	119.2	2.2

\+ 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

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	4.39	3.80	2.86	1962	6	12.20	1979	.88	1985
Feb	3.54	3.23	2.28	1966	13	6.38	1971	.53	1987
Mar	4.46	4.71	3.15	1988	26	8.17	1980	.72	1981
Apr	4.23	4.14	3.05	1983	10	10.38	1983	1.29	1985
May	3.79	3.31	3.51	1967	25	7.65	1978	.81	1993
Jun	3.67	2.73	6.30	1982	5	13.97	1982	.08	1999
Jul	3.31	2.98	3.10	1973	15	7.73	1984	.36	1979
Aug	4.46	3.82	5.14	1955	12	11.58	1991	.76	1984
Sep	4.06	4.09	7.43	1961	21	8.90	1999	.65	1971
Oct	3.98	3.57	4.82	1962	5	8.11	1989	.48	2000
Nov	4.51	3.81	3.39	1985	5	10.88	1983	.57	1976
Dec	4.32	3.87	3.68	1986	3	8.70	1986	1.17	1998
Ann	48.72	49.60	7.43	Sep 1961	21	13.97	Jun 1982	.08	Jun 1999

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	10.7	7.5	3.3	1.1
Feb	8.9	6.5	2.7	.9
Mar	10.8	7.6	3.0	.9
Apr	10.4	7.2	2.8	1.3
May	10.9	7.7	2.8	.8
Jun	9.0	5.8	2.0	1.1
Jul	8.1	5.4	2.3	.9
Aug	8.5	6.0	2.8	1.3
Sep	8.4	6.0	2.7	1.3
Oct	8.4	6.4	2.7	1.1
Nov	9.9	6.8	3.2	1.4
Dec	11.3	7.9	2.9	1.2
Ann	115.3	80.8	33.2	13.3

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	1.71	2.34	2.88	3.40	3.95	4.56	5.27	6.20	7.64	8.98
Feb	1.25	1.58	2.06	2.47	2.86	3.26	3.70	4.20	4.85	5.86	6.78
Mar	1.71	2.12	2.72	3.21	3.67	4.15	4.67	5.26	6.02	7.19	8.25
Apr	1.50	1.89	2.47	2.96	3.42	3.90	4.42	5.02	5.79	6.98	8.08
May	1.21	1.57	2.10	2.55	2.99	3.45	3.95	4.53	5.29	6.46	7.54
Jun	.40	.68	1.19	1.70	2.25	2.87	3.59	4.48	5.70	7.72	9.68
Jul	.78	1.09	1.58	2.01	2.44	2.90	3.41	4.01	4.81	6.08	7.26
Aug	1.10	1.52	2.17	2.75	3.32	3.92	4.60	5.40	6.44	8.10	9.66
Sep	1.01	1.39	1.98	2.51	3.03	3.58	4.19	4.92	5.87	7.38	8.79
Oct	1.21	1.59	2.15	2.64	3.11	3.60	4.14	4.77	5.59	6.86	8.05
Nov	1.15	1.57	2.23	2.81	3.38	3.98	4.65	5.45	6.49	8.13	9.67
Dec	1.30	1.71	2.33	2.86	3.37	3.91	4.49	5.19	6.08	7.48	8.78
Ann	36.88	39.23	42.21	44.45	46.42	48.32	50.27	52.42	55.00	58.72	61.92

\+ 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	6.7	4.5	1	#	9.5	1978	20	19.5	1996	14	1996	8	4	1996	3.3	2.4	.8	.3	.0	7.3	4.0	1.7	.1
Feb	6.8	4.5	1	#	11.2	1978	6	26.5	1994	15	1978	7	9	1978	2.7	1.8	.8	.4	.1	5.8	2.5	1.7	.5
Mar	2.7	1.5	#	#	7.0	1999	15	11.3	1978	9	1978	3	3	1978	1.5	.9	.3	.2	.0	2.0	1.2	.6	.0
Apr	.6	.0	#	0	6.0	1982	6	9.5	1996	6	1982	6	#+	2000	.2	.2	.1	.1	.0	.2	.1	@	.0
May	#	.0	0	0	#	1977	9	#	1977	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	#	2000	29	#+	2000	#+	2000	29	#+	2000	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	.7	.0	#	0	6.4	1989	23	6.4	1989	6	1989	23	#+	1996	.2	.2	.1	@	.0	.2	.1	@	.0
Dec	2.9	2.1	#	#	6.0	1976	29	13.9	1995	8	1995	20	2	1995	1.7	1.1	.4	.1	.0	2.8	1.0	.3	.0
Ann	20.4	12.6	N/A	N/A	11.2	Feb 1978	6	26.5	Feb 1994	15	Feb 1978	7	9	Feb 1978	9.6	6.6	2.5	1.1	.1	18.3	8.9	4.3	.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	5/18	5/13	5/10	5/07	5/04	5/01	4/28	4/25	4/20
32	4/28	4/25	4/22	4/20	4/18	4/16	4/14	4/11	4/08
28	4/20	4/15	4/12	4/09	4/07	4/04	4/01	3/29	3/25
24	4/08	4/04	3/31	3/29	3/26	3/24	3/21	3/18	3/13
20	4/02	3/28	3/25	3/22	3/19	3/16	3/14	3/10	3/05
16	3/27	3/21	3/17	3/13	3/10	3/07	3/03	2/27	2/21

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	9/24	9/29	10/03	10/05	10/08	10/11	10/14	10/17	10/22
32	10/04	10/09	10/13	10/16	10/19	10/22	10/25	10/29	11/03
28	10/19	10/25	10/28	11/01	11/04	11/07	11/10	11/14	11/20
24	11/01	11/07	11/12	11/15	11/19	11/22	11/26	11/30	12/06
20	11/17	11/22	11/26	11/29	12/02	12/05	12/08	12/11	12/16
16	11/26	12/02	12/06	12/10	12/13	12/16	12/20	12/24	12/30

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	173	167	163	160	156	153	149	145	139
32	204	197	192	187	183	179	175	170	163
28	231	224	219	214	210	206	202	197	190
24	261	253	247	242	237	232	227	221	213
20	278	271	265	261	257	253	248	243	236
16	301	293	287	282	277	273	268	262	254

***** 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)

Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1121	964	832	534	254	42	2	4	83	376	632	955	5799
60	966	824	677	385	129	6	0	0	23	236	482	800	4528
57	873	740	584	297	75	1	0	0	8	164	393	707	3842
55	811	684	522	240	48	0	0	0	4	124	335	645	3413
50	656	544	368	119	11	0	0	0	0	51	201	497	2447
32	198	133	21	0	0	0	0	0	0	0	4	100	456

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	100	93	212	456	774	1012	1234	1206	947	649	362	167	7212
55	0	0	0	6	110	323	521	493	261	60	3	0	1777
57	0	0	0	3	74	263	459	431	206	38	1	0	1475
60	0	0	0	0	36	178	366	338	130	17	0	0	1065
65	0	0	0	0	6	64	213	186	40	2	0	0	511
70	0	0	0	0	0	10	86	68	5	0	0	0	169

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	18	18	69	233	535	781	991	962	712	408	169	42	18	36	105	338	873	1654	2645	3607	4319	4727	4896	4938
45	2	0	26	115	380	631	836	807	562	263	83	16	2	2	28	143	523	1154	1990	2797	3359	3622	3705	3721
50	0	0	4	45	231	481	681	652	412	148	33	2	0	0	4	49	280	761	1442	2094	2506	2654	2687	2689
55	0	0	1	13	112	331	526	497	269	64	9	0	0	0	1	14	126	457	983	1480	1749	1813	1822	1822
60	0	0	0	0	45	192	371	343	148	19	0	0	0	0	0	0	45	237	608	951	1099	1118	1118	1118
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	3	7	38	112	285	482	673	651	433	218	84	18	3	10	48	160	445	927	1600	2251	2684	2902	2986	3004

(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