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: HANOVER, NH **COOP ID: 273850**

Climate Division: NH 2 **NWS Call Sign:** **Elevation: 603 Feet** **Lat: 43˚42N** **Lon: 72˚17W**

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	29.3	8.7	19.0	63	1988	31	29.3	1990	-28+	1957	14	9.8	1994	1426	0	.0	.0	.8	18.8	30.2	8.7
Feb	34.0	11.6	22.8	63	1930	20	36.5	1981	-40	1943	16	13.3	1979	1182	0	.0	.0	1.6	13.0	26.9	6.8
Mar	43.5	22.1	32.8	86	1998	31	38.5	1977	-22+	1950	4	26.3	1984	1000	0	.0	.0	7.7	4.4	26.5	1.6
Apr	56.6	32.8	44.7	93	1990	28	50.6	1986	7	1964	1	38.5	1975	608	0	.0	.1	21.0	.1	15.9	.0
May	70.4	44.1	57.3	96	1989	20	61.9	1998	22+	1968	7	50.4	1997	260	20	.0	.7	30.4	.0	2.8	.0
Jun	78.5	53.5	66.0	98+	1988	15	70.4	1976	30	1987	7	62.8	1980	49	78	.0	1.9	30.0	.0	.1	.0
Jul	82.9	58.8	70.9	101+	1988	10	74.7	1988	39+	1946	16	65.7	1992	11	192	.1	4.4	31.0	.0	.0	.0
Aug	80.8	57.3	69.1	103	1975	2	73.1	1988	33	1965	31	66.4	1994	14	140	.1	2.2	31.0	.0	.0	.0
Sep	71.3	49.4	60.4	95	1953	2	63.9	1998	22	1947	27	57.4+	1978	160	19	.0	.3	30.0	.0	.7	.0
Oct	58.5	37.3	47.9	87	1963	7	53.7	1971	13	1936	28	41.8	1974	530	0	.0	.0	25.5	@	9.8	.0
Nov	45.6	28.4	37.0	79	1950	2	42.8	1999	-12	1938	26	32.0	1971	839	0	.0	.0	9.6	2.3	20.2	.0
Dec	33.6	15.6	24.6	70	1998	4	31.7	1998	-34	1933	30	8.1	1989	1252	0	.0	.0	1.8	13.8	29.0	4.0
Ann	57.1	35.0	46.0	103	Aug 1975	2	74.7	Jul 1988	-40	Feb 1943	16	8.1	Dec 1989	7331	449	.2	9.6	220.4	52.4	162.1	21.1

\+ 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	2.97	3.02	1.90	1998	8	5.88	1978	.40	1981
Feb	2.34	2.20	3.45	1996	21	7.56	1981	.09	1987
Mar	2.87	2.67	3.20	1984	14	5.19	1984	.70	1981
Apr	3.02	3.01	1.93	1945	25	5.31	1983	.65	1999
May	3.45	3.31	2.96	1984	31	10.37	1984	.88	1975
Jun	3.36	3.07	2.90	1952	1	7.00	1973	1.00	1979
Jul	3.69	3.54	3.58	1969	29	7.48	1986	.98	1977
Aug	3.70	3.42	3.99	1983	1	10.19	1983	1.12	1996
Sep	3.54	3.32	3.22	1999	17	8.23	1999	1.75	1983
Oct	3.47	2.99	3.04	1987	4	6.71	1995	.89	1994
Nov	3.38	3.25	3.81	1927	3	7.66	1983	1.42	1976
Dec	2.90	2.63	2.41	2000	17	7.69	1973	1.10	1980
Ann	38.69	38.77	3.99	Aug 1983	1	10.37	May 1984	.09	Feb 1987

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	11.0	6.5	2.2	.4
Feb	8.7	4.9	1.5	.4
Mar	10.5	6.4	2.1	.4
Apr	11.7	6.8	2.0	.4
May	12.7	7.4	2.0	.4
Jun	12.6	7.5	2.3	.4
Jul	12.2	6.6	2.5	.9
Aug	11.9	6.6	2.6	1.0
Sep	12.1	6.9	2.2	.8
Oct	11.6	6.2	2.3	.8
Nov	11.9	7.3	2.4	.6
Dec	11.4	6.4	1.8	.4
Ann	138.3	79.5	25.9	6.9

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	.84	1.12	1.54	1.91	2.28	2.66	3.08	3.57	4.21	5.22	6.16
Feb	.50	.71	1.06	1.37	1.68	2.02	2.40	2.85	3.44	4.40	5.30
Mar	1.26	1.52	1.88	2.17	2.44	2.72	3.01	3.35	3.78	4.42	5.01
Apr	1.18	1.46	1.86	2.19	2.50	2.82	3.16	3.56	4.06	4.83	5.54
May	1.01	1.34	1.83	2.26	2.67	3.11	3.58	4.14	4.87	6.01	7.06
Jun	.94	1.26	1.74	2.16	2.57	3.00	3.48	4.04	4.77	5.91	6.97
Jul	1.19	1.54	2.06	2.50	2.93	3.37	3.85	4.41	5.14	6.27	7.31
Aug	1.48	1.82	2.31	2.70	3.08	3.46	3.88	4.35	4.96	5.88	6.73
Sep	1.45	1.77	2.23	2.61	2.96	3.32	3.71	4.16	4.73	5.59	6.38
Oct	1.17	1.50	1.98	2.39	2.78	3.18	3.62	4.13	4.79	5.81	6.74
Nov	1.55	1.85	2.26	2.59	2.90	3.22	3.55	3.93	4.41	5.13	5.79
Dec	.86	1.13	1.55	1.90	2.25	2.61	3.01	3.48	4.09	5.04	5.93
Ann	28.61	30.59	33.11	35.02	36.70	38.32	39.99	41.83	44.05	47.26	50.03

\+ 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	17.6	17.5	9	9
Feb	12.7	10.5	12	12
Mar	10.8	9.2	7	6
Apr	2.0	.6	#	#
May	.0	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	#	.0	#	0
Oct	#	.0	#	0
Nov	4.0	1.6	1	#
Dec	15.3	12.8	4	3
Ann	62.4	52.2	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	13.5	1994	17	39.7	1987	32	1994	18	20	1971
Feb	19.6	1978	7	25.6	1993	39	1978	7	26	1978
Mar	16.0	1984	14	29.8	1971	34	1971	8	23	1971
Apr	10.0	1974	9	10.0	1974	11	1971	1	2	1971
May	.0	0	0	.0	0	0	0	0	0	0
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	#	1992	30	#	1992	#	1992	30	#	1992
Oct	#	1993	31	#+	1993	#+	1993	31	#+	1993
Nov	16.0	1971	25	24.9	1971	17	1971	25	5	1997
Dec	10.0	1996	8	44.8	1972	24	1972	22	17	1972
Ann	19.6	Feb 1978	7	44.8	Dec 1972	39	Feb 1978	7	26	Feb 1978

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	8.7	5.0	2.4	1.4	.1
Feb	6.0	3.4	1.5	.7	.1
Mar	3.8	2.5	1.4	.7	.1
Apr	1.2	.7	.2	.1	@
May	.0	.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	.0	.0	.0	.0	.0
Nov	2.8	1.4	.3	.1	@
Dec	7.3	4.3	1.9	.9	@
Ann	29.8	17.3	7.7	3.9	.3

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	23.8	21.3	19.0	13.1
Feb	25.8	23.5	20.9	16.5
Mar	15.5	12.9	11.2	6.8
Apr	1.7	.7	.3	@
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	.0	.0	.0	.0
Nov	4.0	1.7	1.2	.5
Dec	18.8	13.1	10.0	5.2
Ann	89.6	73.2	62.6	42.1

+ 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	6/10	6/05	6/01	5/28	5/25	5/22	5/19	5/15	5/10
32	5/25	5/20	5/17	5/14	5/11	5/09	5/06	5/03	4/28
28	5/12	5/08	5/05	5/02	4/30	4/28	4/25	4/22	4/18
24	4/30	4/25	4/22	4/19	4/16	4/14	4/11	4/07	4/02
20	4/16	4/12	4/09	4/06	4/04	4/01	3/30	3/27	3/22
16	4/11	4/05	4/01	3/29	3/26	3/23	3/20	3/16	3/11

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	9/08	9/13	9/16	9/19	9/21	9/24	9/26	9/30	10/04
32	9/21	9/25	9/28	10/01	10/04	10/06	10/09	10/12	10/17
28	9/23	9/30	10/05	10/09	10/12	10/16	10/20	10/25	10/31
24	10/08	10/14	10/19	10/23	10/27	10/31	11/04	11/09	11/15
20	10/22	10/28	11/01	11/04	11/08	11/11	11/14	11/18	11/24
16	11/10	11/14	11/17	11/19	11/21	11/24	11/26	11/29	12/03

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	138	131	126	122	118	114	110	105	98
32	164	157	152	148	145	141	137	132	125
28	188	180	174	169	165	160	155	149	141
24	220	211	204	198	193	188	182	175	166
20	237	231	225	221	217	213	209	204	197
16	261	254	248	244	240	235	231	226	218

***** 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	1426	1182	1000	608	260	49	11	14	160	530	839	1252	7331
60	1271	1042	845	461	149	9	0	1	67	380	689	1097	6011
57	1178	958	752	376	98	3	0	0	34	295	599	1004	5297
55	1116	902	690	322	72	1	0	0	20	243	539	942	4847
50	961	762	536	201	27	0	0	0	4	133	392	787	3803
32	425	301	111	6	0	0	0	0	0	1	45	301	1190

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	22	43	134	388	783	1019	1204	1149	849	494	196	72	6353
55	0	0	0	13	142	330	491	436	180	23	0	0	1615
57	0	0	0	7	106	272	429	374	134	13	0	0	1335
60	0	0	0	3	64	189	336	281	76	5	0	0	954
65	0	0	0	0	20	78	192	140	19	0	0	0	449
70	0	0	0	0	4	18	83	45	2	0	0	0	152

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	1	3	37	184	528	770	951	889	605	268	72	8	1	4	41	225	753	1523	2474	3363	3968	4236	4308	4316
45	0	0	14	99	377	620	796	734	455	153	33	2	0	0	14	113	490	1110	1906	2640	3095	3248	3281	3283
50	0	0	4	45	244	470	641	579	312	72	11	0	0	0	4	49	293	763	1404	1983	2295	2367	2378	2378
55	0	0	1	19	130	324	487	424	183	25	1	0	0	0	1	20	150	474	961	1385	1568	1593	1594	1594
60	0	0	0	7	57	195	333	279	95	7	0	0	0	0	0	7	64	259	592	871	966	973	973	973
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	1	36	132	332	492	627	581	365	151	35	4	0	1	37	169	501	993	1620	2201	2566	2717	2752	2756

(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