

# Climatography of the United States No. 20

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801  
www.ncdc.noaa.gov

Station: ROCHESTER, MA

1971-2000

COOP ID: 196938

Climate Division: MA 3

NWS Call Sign:

Elevation: 60 Feet

Lat: 41°47N

Lon: 70°55W

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	18.5	28.1	67	1995	15	36.3	1995	-18	1961	22	17.4	1981	1144	0	.0	.0	4.3	9.6	27.9	2.0
Feb	39.5	20.3	29.9	68+	1976	26	36.9	1998	-15	1961	2	20.0	1979	982	0	.0	.0	4.9	7.5	24.6	1.2
Mar	47.4	28.6	38.0	82	1990	16	42.1+	2000	-9	1967	19	32.8	1978	838	0	.0	.0	12.0	1.4	21.3	.0
Apr	56.9	37.3	47.1	92+	1976	19	51.3	1991	9	1954	5	41.5	1972	537	0	.0	.1	23.8	.1	7.7	.0
May	68.0	46.9	57.5	97	1996	22	63.2	1991	24	1956	9	53.4	1974	244	10	.0	.5	30.2	.0	.3	.0
Jun	77.2	55.9	66.6	99+	1952	27	69.6	1999	35+	1964	6	62.0	1982	47	94	.0	1.9	30.0	.0	.0	.0
Jul	82.8	61.7	72.3	102	1991	22	76.4	1994	42	1965	7	68.8	1992	2	226	.1	4.0	31.0	.0	.0	.0
Aug	81.1	60.6	70.9	100+	1975	3	74.6	1988	34	1965	31	67.1	1982	7	188	@	2.3	31.0	.0	.0	.0
Sep	73.5	52.6	63.1	97+	1953	3	67.0	1983	28	1957	29	58.8	1978	98	40	.0	.5	30.0	.0	.1	.0
Oct	62.7	41.7	52.2	86	1979	23	58.9	1990	18	1966	31	46.6	1972	400	3	.0	.0	29.8	.0	4.6	.0
Nov	52.5	34.4	43.5	77+	1982	2	48.7	1994	8+	1989	24	37.8	1976	648	0	.0	.0	18.1	.4	14.5	.0
Dec	42.4	24.7	33.6	75	1998	8	39.9	1998	-12	1963	31	19.3	1989	975	0	.0	.0	7.7	4.5	25.2	.5
Ann	60.1	40.3	50.2	102	Jul 1991	22	76.4	Jul 1994	-18	Jan 1961	22	17.4	Jan 1981	5922	561	.1	9.3	252.8	23.5	126.2	3.7

+ 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/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1951-2001

(3) Derived from 1971-2000 serially complete daily data

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Precipitation (inches)																								
	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution										
Month	Mean	Med-ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	4.50	4.07	3.92	1962	7	11.94	1979	1.24	1981	11.3	7.3	3.2	1.3	1.14	1.57	2.22	2.80	3.37	3.97	4.64	5.44	6.47	8.12	9.65
Feb	3.51	3.19	3.05	1970	4	8.10	1998	.73	1980	9.5	6.2	2.4	.7	1.17	1.50	1.99	2.40	2.80	3.21	3.66	4.18	4.85	5.89	6.85
Mar	4.46	3.93	4.20	1968	18	8.49	1994	.73	1981	10.7	7.1	3.6	1.2	1.43	1.86	2.48	3.01	3.53	4.06	4.64	5.33	6.21	7.58	8.84
Apr	4.53	4.25	3.96	1997	1	10.09	1983	1.61	1999	11.3	6.6	2.9	1.3	1.58	2.01	2.63	3.16	3.66	4.17	4.73	5.39	6.22	7.52	8.70
May	3.66	3.46	3.93	1967	26	7.26	1979	1.09	1993	11.5	7.5	2.5	.7	1.45	1.79	2.27	2.66	3.04	3.42	3.83	4.31	4.91	5.84	6.68
Jun	3.79	3.08	3.64	1998	14	10.17	1984	.35	1999	10.4	6.4	2.4	1.1	.46	.75	1.29	1.82	2.38	3.00	3.73	4.63	5.86	7.87	9.82
Jul	3.71	3.16	6.75	1990	25	10.26	1990	1.30	1999	9.6	6.0	2.4	1.0	1.27	1.62	2.13	2.56	2.98	3.40	3.87	4.41	5.11	6.19	7.19
Aug	4.23	4.19	5.86	1976	9	10.62	1985	.61	1993	9.6	6.3	2.8	1.2	1.04	1.44	2.05	2.60	3.15	3.72	4.36	5.12	6.12	7.70	9.18
Sep	4.18	3.79	4.29	1960	20	9.71	1972	.79	1997	9.6	5.8	2.8	1.6	.95	1.34	1.95	2.50	3.05	3.64	4.29	5.08	6.11	7.74	9.29
Oct	4.00	3.88	3.74	1962	6	9.16	1996	.52	1994	9.1	6.7	2.9	1.1	1.30	1.68	2.24	2.71	3.17	3.65	4.17	4.77	5.56	6.77	7.89
Nov	4.64	3.95	3.86	1997	2	8.91	1983	1.23	1976	11.0	7.3	3.2	1.2	1.46	1.90	2.55	3.11	3.65	4.21	4.83	5.55	6.48	7.93	9.27
Dec	4.68	3.90	4.55	1969	27	11.21	1973	.90	1988	11.5	7.8	3.3	1.1	1.23	1.67	2.35	2.94	3.53	4.15	4.83	5.65	6.70	8.37	9.93
Ann	49.89	48.87	6.75	Jul 1990	25	11.94	Jan 1979	.35	Jun 1999	125.1	81.0	34.4	13.5	35.81	38.54	42.04	44.69	47.04	49.32	51.66	54.25	57.39	61.93	65.86

+ 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

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**Lon: 70°55W**

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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	9.5	5.9	2	1	14.0	1996	8	22.7	1976	25	1996	11	8	1996	4.1	2.4	.9	.5	.1	9.3	5.2	2.3	.5
Feb	7.8	6.9	2	1	17.0	1978	7	22.0	1978	22+	1983	13	10	1978	2.5	1.8	.7	.4	.1	8.9	5.4	3.5	1.1
Mar	3.4	2.5	1	#	8.0	1976	10	11.5	1978	12	1978	8	6	1978	1.1	.9	.4	.1	.0	2.6	1.4	1.0	.3
Apr	.4	.0	#	0	10.0	1997	1	10.0	1997	10+	1997	2	1+	1997	.3	.2	.1	@	@	.1	.0	.0	.0
May	.0	.0	0	0	.7	1977	10	.7	1977	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	#	1988	29	#+	1988	#	1972	19	#	1972	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	.6	.0	#	0	8.0	1987	12	8.0	1987	10	1989	24	1	1989	.3	.2	.1	.1	.0	.2	.1	@	.0
Dec	4.1	3.3	1	#	8.0	1976	30	14.0	1976	11	1976	30	2	1995	1.6	1.1	.6	.2	.0	3.3	2.1	.9	.1
Ann	25.8	18.6	N/A	N/A	17.0	Feb 1978	7	22.7	Jan 1976	25	Jan 1996	11	10	Feb 1978	9.9	6.6	2.8	1.3	.2	24.4	14.2	7.7	2.0

+ 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

Complete documentation available from:

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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	5/24	5/19	5/15	5/12	5/09	5/06	5/03	4/29	4/24
32	5/07	5/02	4/29	4/26	4/23	4/20	4/17	4/14	4/09
28	4/24	4/19	4/15	4/12	4/09	4/06	4/02	3/29	3/24
24	4/08	4/04	4/01	3/29	3/27	3/24	3/22	3/19	3/15
20	4/02	3/28	3/25	3/22	3/19	3/16	3/13	3/10	3/05
16	3/26	3/20	3/16	3/12	3/09	3/05	3/02	2/25	2/20
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	9/22	9/26	9/29	10/02	10/04	10/07	10/09	10/12	10/17
32	10/01	10/06	10/09	10/12	10/15	10/18	10/21	10/25	10/30
28	10/15	10/21	10/25	10/28	11/01	11/04	11/07	11/12	11/17
24	10/31	11/06	11/10	11/14	11/18	11/21	11/25	11/29	12/05
20	11/14	11/20	11/24	11/28	12/01	12/04	12/08	12/12	12/18
16	11/25	12/01	12/05	12/08	12/11	12/15	12/18	12/22	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	165	159	155	151	148	144	140	136	130
32	196	189	183	179	175	170	166	160	153
28	232	223	216	210	205	200	194	188	179
24	261	252	245	240	235	230	225	218	209
20	282	273	267	261	256	251	246	240	231
16	302	294	287	282	277	272	267	260	252

\* 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

Complete documentation available from:  
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**Degree Days to Selected Base Temperatures (°F)**

<b>Base</b>	<b>Heating Degree Days (1)</b>												
<b>Below</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>Ann</b>
<b>65</b>	1144	982	838	537	244	47	2	7	98	400	648	975	5922
<b>60</b>	989	842	683	388	125	10	0	0	32	259	498	820	4646
<b>57</b>	896	758	590	301	73	3	0	0	13	186	409	727	3956
<b>55</b>	834	702	528	246	47	1	0	0	6	144	351	665	3524
<b>50</b>	681	562	374	128	11	0	0	0	1	65	219	522	2563
<b>32</b>	222	150	26	0	0	0	0	0	0	0	7	129	534

<b>Base</b>	<b>Cooling Degree Days (1)</b>												
<b>Above</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>Ann</b>
<b>32</b>	101	92	211	453	789	1037	1247	1205	932	626	350	177	7220
<b>55</b>	0	0	0	9	123	347	534	492	248	57	4	0	1814
<b>57</b>	0	0	0	4	86	289	472	430	195	37	1	0	1514
<b>60</b>	0	0	0	1	45	206	379	337	123	17	0	0	1108
<b>65</b>	0	0	0	0	10	94	226	188	40	3	0	0	561
<b>70</b>	0	0	0	0	1	27	95	73	6	0	0	0	202

**Growing Degree Units (2)**

<b>Base</b>	<b>Growing Degree Units (Monthly)</b>												<b>Growing Degree Units (Accumulated Monthly)</b>											
	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
<b>40</b>	19	24	75	231	548	798	1002	961	695	388	165	41	19	43	118	349	897	1695	2697	3658	4353	4741	4906	4947
<b>45</b>	5	3	31	123	393	648	847	806	545	248	86	14	5	8	39	162	555	1203	2050	2856	3401	3649	3735	3749
<b>50</b>	0	0	9	56	249	498	692	651	396	139	38	2	0	0	9	65	314	812	1504	2155	2551	2690	2728	2730
<b>55</b>	0	0	2	17	132	351	537	496	257	62	11	0	0	0	2	19	151	502	1039	1535	1792	1854	1865	1865
<b>60</b>	0	0	0	4	58	215	383	342	142	20	1	0	0	0	0	4	62	277	660	1002	1144	1164	1165	1165
<b>Base</b>	<b>Growing Degree Units for Corn (Monthly)</b>												<b>Growing Degree Units for Corn (Accumulated Monthly)</b>											
<b>50/86</b>	11	10	47	124	306	499	675	641	427	219	86	27	11	21	68	192	498	997	1672	2313	2740	2959	3045	3072

(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](http://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.  
Complete documentation for the 1971-2000 Normals is available on the internet from:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/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 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.

- |   |   |
|---|---|
| <ol style="list-style-type: none"><li>a. Temperature/ Precipitation Tables<ol style="list-style-type: none"><li>1. 1971-2000 Monthly Normals</li><li>2. Cooperative Summary of the Day</li><li>3. National Weather Service station records</li><li>4. 1971-2000 serially complete daily data</li></ol></li><li>b. Degree Day Table<ol style="list-style-type: none"><li>1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals</li><li>2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data</li></ol></li></ol> | <ol style="list-style-type: none"><li>c. Snow Tables<ol style="list-style-type: none"><li>1. Snow Climatology</li><li>2. Cooperative Summary of the Day</li></ol></li><li>d. Freeze Data Table<br/>1971-2000 serially complete daily data</li></ol> |
|---|---|

## References

U.S. Climate Normals 1971-2000, [www.ncdc.noaa.gov/normal.html](http://www.ncdc.noaa.gov/normal.html)  
U.S. Climate Normals 1971-2000-Products Clim20, [www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html)  
Snow Climatology Project Description, [www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html](http://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](http://www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf)