

# Climatology of the United States

No. 20

1971-2000

Station: BEDFORD, MA

COOP ID: 190535

Climate Division: MA 2

NWS Call Sign:

Elevation: 160 Feet

Lat: 42°29N

Lon: 71°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	35.0	15.7	25.4	65	1995	15	32.9	1990	-19+	1961	22	17.1	1981	1229	0	.0	.0	2.7	13.0	29.0	3.4
Feb	38.0	18.2	28.1	72	1997	22	34.5	1981	-15+	1967	8	19.7	1979	1033	0	.0	.0	3.5	8.7	25.8	1.7
Mar	46.8	26.6	36.7	90	1998	31	41.8	2000	-7	1967	19	30.7	1984	878	0	.0	@	11.0	2.2	23.3	.1
Apr	58.0	35.8	46.9	94+	1976	19	51.1	1976	6	1964	1	42.6	1972	544	0	.0	.2	23.7	.1	10.5	.0
May	69.4	45.8	57.6	95	1962	19	62.3	1991	26	1964	3	53.9	1974	239	9	.0	.7	30.4	.0	.9	.0
Jun	77.5	54.7	66.1	97	1999	7	70.5	1999	35	1964	6	62.1	1982	55	88	.0	2.0	30.0	.0	.0	.0
Jul	82.7	60.3	71.5	99+	1964	1	75.6	1994	42+	1965	7	67.6	1992	5	206	.0	4.2	31.0	.0	.0	.0
Aug	80.7	58.9	69.8	101	1975	2	73.1	1973	32	1965	31	66.8	1986	10	159	@	2.4	31.0	.0	.0	.0
Sep	72.4	50.2	61.3	95	1969	1	66.1	1999	28+	1962	22	58.1	1978	133	23	.0	.4	30.0	.0	.3	.0
Oct	61.7	39.0	50.4	89	1963	7	56.0	1971	17	1966	31	46.8+	1988	455	0	.0	.0	29.1	.0	8.0	.0
Nov	50.7	31.2	41.0	79	1994	5	46.4	1975	-1	1989	24	36.6	1996	721	0	.0	.0	15.2	.7	18.2	@
Dec	39.6	21.5	30.6	77	1998	7	36.1+	1996	-17	1963	31	17.4	1989	1068	0	.0	.0	4.8	7.1	27.4	.7
Ann	59.4	38.2	48.8	101	Aug 1975	2	75.6	Jul 1994	-19+	Jan 1961	22	17.1	Jan 1981	6370	485	@	9.9	242.4	31.8	143.4	5.9

+ 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/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: 1957-2001

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

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**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: BEDFORD, MA**

**COOP ID: 190535**

**Climate Division: MA 2**

**NWS Call Sign:**

**Elevation: 160 Feet**

**Lat: 42°29N**

**Lon: 71°17W**

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	4.24	3.97	3.82	1979	25	13.24	1979	.70	1980	11.6	7.4	2.9	1.0	.92	1.31	1.93	2.49	3.06	3.66	4.33	5.15	6.21	7.92	9.53
Feb	3.33	3.05	2.40	1969	9	7.50	1984	.20	1987	10.1	5.9	2.4	.8	.98	1.29	1.77	2.18	2.58	3.00	3.46	4.00	4.70	5.79	6.81
Mar	4.21	3.83	4.72	2001	22	9.16	1983	.84	1981	12.3	7.9	2.9	.9	1.54	1.93	2.50	2.98	3.43	3.90	4.40	4.99	5.73	6.89	7.94
Apr	3.99	3.78	2.67	1991	21	9.32	1987	.81	1999	12.2	7.4	2.7	.9	1.43	1.80	2.34	2.80	3.23	3.68	4.17	4.73	5.45	6.57	7.59
May	3.76	3.38	3.96	1984	31	9.92	1984	1.15	1987	13.1	7.7	2.6	.7	1.28	1.63	2.15	2.59	3.02	3.45	3.93	4.48	5.19	6.29	7.31
Jun	3.61	2.93	5.84	1998	13	12.69	1998	.19	1999	11.5	6.7	2.0	.7	.45	.74	1.25	1.75	2.28	2.87	3.56	4.41	5.56	7.44	9.27
Jul	3.83	3.78	4.01	1996	13	8.84	1988	.95	1987	10.0	5.8	2.7	.9	1.51	1.86	2.36	2.78	3.17	3.57	4.01	4.51	5.14	6.12	7.01
Aug	3.54	3.34	5.47	1991	19	8.41	1991	.84	1996	10.6	6.1	2.3	.8	.89	1.23	1.74	2.20	2.65	3.12	3.65	4.28	5.10	6.39	7.60
Sep	3.84	3.12	5.41	1999	10	10.16	1999	.88	1978	9.9	6.4	2.3	1.0	.88	1.23	1.80	2.30	2.81	3.34	3.94	4.66	5.61	7.11	8.52
Oct	4.14	3.45	7.83	1996	20	12.41	1996	.58	1994	9.9	6.4	2.8	1.1	1.27	1.67	2.25	2.75	3.24	3.75	4.30	4.95	5.80	7.11	8.33
Nov	4.39	4.26	3.07	1985	5	9.36	1983	.68	1976	11.8	7.0	2.9	1.3	1.52	1.94	2.54	3.05	3.54	4.04	4.58	5.22	6.04	7.30	8.46
Dec	4.07	3.81	2.44	1992	12	8.01	1986	.97	1980	12.3	7.3	2.7	1.1	1.02	1.40	2.00	2.52	3.04	3.59	4.20	4.92	5.87	7.37	8.78
Ann	46.95	46.41	7.83	Oct 1996	20	13.24	Jan 1979	.19	Jun 1999	135.3	82.0	31.2	11.2	35.76	37.98	40.80	42.91	44.77	46.56	48.40	50.42	52.85	56.35	59.35

+ 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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Climate Division: MA 2

NWS Call Sign:

Elevation: 160 Feet

Lat: 42°29N

Lon: 71°17W

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	14.7	13.7	5	4	20.0	1977	7	45.2	1987	32	1996	12	20	1977	7.1	4.0	1.7	.9	.2	18.5	14.6	11.4	4.8
Feb	11.2	9.5	5	3	20.0	1978	7	29.5	1983	31	1978	7	16	1978	6.0	2.7	1.2	.7	.2	17.2	12.0	8.6	4.9
Mar	9.4	5.3	2	#	12.8	1984	29	38.0	1993	22	1993	24	11	1994	4.7	2.5	1.0	.5	.1	9.8	5.8	4.0	2.0
Apr	2.8	.6	#	#	17.0	1982	6	17.4	1982	21	1997	1	2	1997	1.3	.6	.3	.1	.1	1.2	.6	.3	.1
May	.3	.0	#	0	5.0	1977	10	9.5	1977	5	1977	10	#	1977	.1	.1	.1	@	.0	.1	.1	@	.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	.1	.0	#	0	3.2	1979	10	3.2	1979	2	1979	10	#+	2000	.1	@	@	.0	.0	@	.0	.0	.0
Nov	3.2	1.6	#	#	9.2	1971	25	17.0	1971	10	1971	25	1+	1997	1.7	.9	.4	.1	.0	2.6	1.0	.3	@
Dec	10.2	9.2	2	1	16.5	1992	12	31.8	1981	16	1992	12	7	1995	5.6	2.5	1.2	.6	.2	11.1	6.6	4.2	1.4
Ann	51.9	39.9	N/A	N/A	20.0+	Feb 1978	7	45.2	Jan 1987	32	Jan 1996	12	20	Jan 1977	26.6	13.3	5.9	2.9	.8	60.5	40.7	28.8	13.2

+ 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	5/26	5/22	5/19	5/16	5/14	5/12	5/09	5/06	5/02
32	5/12	5/08	5/06	5/03	5/01	4/29	4/27	4/24	4/21
28	4/26	4/22	4/20	4/17	4/15	4/13	4/10	4/08	4/04
24	4/15	4/11	4/08	4/05	4/02	3/31	3/28	3/25	3/20
20	4/04	3/30	3/28	3/25	3/23	3/20	3/18	3/15	3/11
16	3/28	3/24	3/20	3/18	3/15	3/13	3/10	3/07	3/03
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	9/14	9/18	9/20	9/22	9/24	9/26	9/28	10/01	10/04
32	9/25	9/29	10/02	10/05	10/07	10/10	10/12	10/15	10/19
28	10/06	10/10	10/14	10/16	10/19	10/22	10/24	10/28	11/01
24	10/16	10/22	10/26	10/30	11/02	11/06	11/09	11/13	11/19
20	10/29	11/04	11/09	11/13	11/16	11/20	11/24	11/28	12/04
16	11/15	11/20	11/23	11/26	11/29	12/02	12/05	12/09	12/14
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	147	142	138	135	133	130	127	123	119
32	174	169	165	161	158	155	151	147	142
28	203	197	193	190	186	183	180	175	170
24	234	227	222	217	213	209	205	199	192
20	262	254	248	243	238	233	228	222	214
16	279	272	267	262	258	254	250	245	237

\* 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)													
Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1229	1033	878	544	239	55	5	10	133	455	721	1068	6370
60	1074	893	723	395	118	12	0	0	48	306	571	913	5053
57	981	809	630	307	65	4	0	0	21	225	481	820	4343
55	919	753	568	251	40	1	0	0	11	176	422	758	3899
50	764	613	415	130	8	0	0	0	1	82	282	607	2902
32	266	174	45	0	0	0	0	0	0	0	15	169	669

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	60	65	190	446	793	1023	1224	1171	880	568	284	123	6827
55	0	0	0	6	120	334	511	458	201	31	1	0	1662
57	0	0	0	3	83	276	449	396	151	18	0	0	1376
60	0	0	0	0	43	195	356	304	88	6	0	0	992
65	0	0	0	0	9	88	206	159	23	0	0	0	485
70	0	0	0	0	1	25	83	54	2	0	0	0	165

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	11	12	68	228	555	795	983	935	647	333	122	32	11	23	91	319	874	1669	2652	3587	4234	4567	4689	4721
45	1	1	30	124	401	645	828	780	497	205	60	7	1	2	32	156	557	1202	2030	2810	3307	3512	3572	3579
50	0	0	11	61	257	495	673	625	350	106	26	2	0	0	11	72	329	824	1497	2122	2472	2578	2604	2606
55	0	0	4	25	143	345	518	470	218	47	10	0	0	0	4	29	172	517	1035	1505	1723	1770	1780	1780
60	0	0	3	12	65	213	365	317	113	15	2	0	0	0	3	15	80	293	658	975	1088	1103	1105	1105
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	7	12	51	146	328	500	657	617	397	203	72	19	7	19	70	216	544	1044	1701	2318	2715	2918	2990	3009

(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> |
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## 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)