

Climatology of the United States

No. 20

1971-2000

Station: BROCKTON, MA

COOP ID: 190860

Climate Division: MA 3

NWS Call Sign:

Elevation: 80 Feet

Lat: 42°03N

Lon: 71°00W

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	37.9	17.8	27.9	69	1950	26	35.0	1990	-18	1961	22	18.8	1981	1151	0	.0	.0	4.6	9.8	28.4	1.9
Feb	40.0	20.1	30.1	69+	1957	26	37.0	1984	-17	1967	13	21.5	1979	978	0	.0	.0	5.2	6.7	25.2	1.0
Mar	48.1	28.2	38.2	87	1998	31	43.1	2000	-5	1967	19	33.1	1984	832	0	.0	.0	12.8	1.3	22.0	@
Apr	58.0	36.5	47.3	93	1976	19	51.7	1976	13	1954	4	42.6	1972	533	0	.0	.1	24.4	@	10.0	.0
May	69.1	45.9	57.5	95+	1987	30	63.2	1991	25+	1956	9	53.9	1974	243	9	.0	.7	30.5	.0	1.0	.0
Jun	77.8	54.9	66.4	98+	1988	15	70.5	1999	35+	1957	9	62.0	1982	50	90	.0	2.4	30.0	.0	.0	.0
Jul	83.2	60.9	72.1	101	1949	4	76.7	1994	40+	1968	30	68.7	1992	4	223	.1	5.0	31.0	.0	.0	.0
Aug	81.3	59.6	70.5	104	1948	28	75.1	1988	37	1965	30	67.6	1982	8	176	@	3.3	31.0	.0	.0	.0
Sep	73.6	50.7	62.2	100	1953	2	66.5	1999	27	1957	29	57.9	1978	116	30	.0	.5	30.0	.0	.5	.0
Oct	63.4	39.8	51.6	88+	1949	10	56.8	1990	13	1966	31	47.5	1974	417	1	.0	.0	30.0	.0	7.1	.0
Nov	52.8	32.1	42.5	79	1982	2	46.9	1999	3	1989	24	37.5	1976	677	0	.0	.0	18.4	.2	17.2	.0
Dec	42.4	23.2	32.8	78	1998	7	38.2	1990	-13	1963	31	20.3	1989	999	0	.0	.0	7.2	4.5	25.8	.5
Ann	60.6	39.1	49.9	104	Aug 1948	28	76.7	Jul 1994	-18	Jan 1961	22	18.8	Jan 1981	6008	529	.1	12.0	255.1	22.5	137.2	3.4

+ 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

Issue Date: February 2004

(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

007-A

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No. 20 1971-2000

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

Station: BROCKTON, MA

COOP ID: 190860

Climate Division: MA 3

NWS Call Sign:

Elevation: 80 Feet

Lat: 42°03N

Lon: 71°00W

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	4.20	3.94	3.25	1998	24	14.20	1979	.86	1981	10.1	6.8	2.8	1.4	.77	1.14	1.76	2.33	2.91	3.54	4.25	5.11	6.26	8.11	9.87
Feb	3.60	3.44	3.05	1998	24	7.82	1998	.72	1987	9.2	5.7	2.4	1.0	1.27	1.61	2.10	2.51	2.91	3.32	3.76	4.28	4.94	5.96	6.90
Mar	4.33	3.84	3.94	1968	18	9.75	1983	.88	1981	11.3	7.2	3.1	1.1	1.58	1.98	2.57	3.06	3.53	4.01	4.53	5.13	5.91	7.10	8.19
Apr	4.18	3.93	2.93	1991	21	9.20	1987	1.13	1985	10.4	6.7	2.9	1.3	1.39	1.78	2.36	2.86	3.33	3.82	4.36	4.99	5.79	7.04	8.19
May	3.48	3.63	3.69	1967	25	6.41	1998	.88	1980	11.1	6.8	2.4	.7	1.08	1.41	1.90	2.32	2.73	3.15	3.62	4.16	4.86	5.96	6.97
Jun	3.52	2.90	5.16	1998	30	13.55	1998	.12	1999	9.9	5.6	2.3	.9	.28	.52	.98	1.47	2.00	2.62	3.35	4.28	5.56	7.70	9.82
Jul	3.65	2.88	4.38	1996	13	10.83	1988	1.30	1987	8.8	5.6	2.3	1.0	1.09	1.43	1.95	2.40	2.84	3.29	3.79	4.38	5.14	6.33	7.43
Aug	4.27	4.44	7.88	1955	19	10.65	1976	.34	1993	9.2	6.0	2.9	1.4	.81	1.19	1.82	2.39	2.98	3.61	4.33	5.20	6.35	8.20	9.96
Sep	3.98	3.00	4.70	1954	11	10.16	1999	.39	1980	8.6	6.1	2.7	1.2	.71	1.06	1.64	2.18	2.74	3.34	4.02	4.85	5.96	7.74	9.44
Oct	4.25	3.67	5.80	1996	20	10.33	1996	.96	1994	9.2	6.3	3.0	1.3	1.44	1.84	2.43	2.93	3.40	3.90	4.43	5.06	5.86	7.11	8.26
Nov	4.42	3.75	3.88	1955	5	10.50	1983	.87	1976	9.9	7.1	2.9	1.2	1.27	1.69	2.32	2.87	3.41	3.97	4.58	5.31	6.25	7.73	9.10
Dec	4.37	3.26	4.00	1992	12	10.67	1992	.79	1989	10.8	7.1	2.6	1.1	.81	1.20	1.84	2.43	3.04	3.69	4.43	5.32	6.51	8.43	10.25
Ann	48.25	45.43	7.88	Aug 1955	19	14.20	Jan 1979	.12	Jun 1999	118.5	77.0	32.3	13.6	34.37	37.05	40.49	43.10	45.42	47.66	49.98	52.53	55.64	60.13	64.02

+ 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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Station: BROCKTON, MA

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Climate Division: MA 3

NWS Call Sign:

Elevation: 80 Feet

Lat: 42°03N

Lon: 71°00W

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	3.2	-99.9	3	1	15.8	1996	8	15.8	1996	46	1996	11	13	1996	2.6	2.1	1.2	.7	.1	-9.9	-9.9	-9.9	-9.9
Feb	5.2	4.7	3	1	9.0	1994	9	17.0	1983	36	1978	12	24	1978	1.8	1.4	.8	.4	.0	7.3	4.2	2.5	.3
Mar	3.7	.4	1	#	14.0	1997	31	17.0+	1997	12	1978	6	5	1978	1.3	1.0	.5	.3	.1	1.8	.9	.6	.0
Apr	1.1	.0	#	0	10.0	1982	6	10.5	1996	18	1997	1	2	1997	.2	.2	.1	.1	.1	.4	.2	.2	.1
May	#	.0	0	0	#	1983	19	#	1983	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	#	1988	28	#	1988	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	.3	.0	#	0	2.0	1980	18	2.5	1987	12	1987	13	2	1987	.2	.2	.0	.0	.0	.2	.0	.0	.0
Dec	4.9	2.6	1	#	9.0	1993	30	16.0	1981	18	1975	25	6	1975	1.1	1.0	.6	.2	.0	3.1	1.9	1.1	.6
Ann	18.4	-9.9	N/A	N/A	15.8	Jan 1996	8	17.0+	Mar 1997	46	Jan 1996	11	24	Feb 1978	7.2	5.9	3.2	1.7	.3	-9.9	-9.9	-9.9	-9.9

+ 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	6/05	5/30	5/25	5/21	5/18	5/14	5/11	5/06	4/30
32	5/16	5/11	5/07	5/04	5/01	4/29	4/26	4/22	4/17
28	5/04	4/28	4/24	4/21	4/18	4/15	4/12	4/08	4/02
24	4/15	4/09	4/05	4/02	3/30	3/27	3/23	3/19	3/14
20	4/02	3/28	3/25	3/22	3/19	3/16	3/13	3/10	3/05
16	3/25	3/20	3/17	3/14	3/11	3/08	3/05	3/02	2/25
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	9/15	9/19	9/22	9/24	9/26	9/28	10/01	10/03	10/07
32	9/21	9/26	9/30	10/03	10/06	10/09	10/12	10/15	10/20
28	10/06	10/11	10/15	10/18	10/21	10/24	10/27	10/31	11/05
24	10/22	10/28	11/01	11/04	11/08	11/11	11/15	11/19	11/25
20	11/02	11/08	11/13	11/16	11/20	11/23	11/27	12/01	12/07
16	11/16	11/21	11/26	11/29	12/02	12/06	12/09	12/14	12/19
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	149	143	138	134	131	127	123	118	112
32	174	168	164	160	157	153	149	145	139
28	211	202	196	191	186	180	175	169	160
24	247	238	232	227	222	217	212	206	198
20	271	262	256	250	245	240	234	228	219
16	290	282	276	271	266	261	256	250	242

* 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	1151	978	832	533	243	50	4	8	116	417	677	999	6008
60	996	838	677	383	123	10	0	0	40	270	527	844	4708
57	903	754	584	296	70	3	0	0	17	193	437	751	4008
55	841	698	522	240	45	1	0	0	8	148	379	689	3571
50	686	558	371	121	10	0	0	0	1	64	243	538	2592
32	214	140	30	0	0	0	0	0	0	0	9	122	515

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	87	86	221	457	789	1031	1241	1192	904	607	322	145	7082
55	0	0	0	7	121	341	528	479	222	42	2	0	1742
57	0	0	0	3	84	283	466	417	171	25	1	0	1450
60	0	0	0	1	44	201	373	324	104	9	0	0	1056
65	0	0	0	0	9	90	223	176	30	1	0	0	529
70	0	0	0	0	1	26	96	65	4	0	0	0	192

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	17	22	77	231	547	796	1003	950	676	375	145	38	17	39	116	347	894	1690	2693	3643	4319	4694	4839	4877
45	5	3	35	119	392	646	848	795	526	234	70	13	5	8	43	162	554	1200	2048	2843	3369	3603	3673	3686
50	0	0	10	52	247	496	693	640	378	128	34	2	0	0	10	62	309	805	1498	2138	2516	2644	2678	2680
55	0	0	4	20	133	346	538	485	242	55	13	0	0	0	4	24	157	503	1041	1526	1768	1823	1836	1836
60	0	0	1	8	61	214	383	331	131	20	2	0	0	0	1	9	70	284	667	998	1129	1149	1151	1151
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	16	16	53	140	322	507	670	635	422	229	86	25	16	32	85	225	547	1054	1724	2359	2781	3010	3096	3121

(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.
Complete documentation for the 1971-2000 Normals is available on the internet from:
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">a. Temperature/ Precipitation Tables<ol style="list-style-type: none">1. 1971-2000 Monthly Normals2. Cooperative Summary of the Day3. National Weather Service station records4. 1971-2000 serially complete daily datab. Degree Day Table<ol style="list-style-type: none">1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data | <ol style="list-style-type: none">c. Snow Tables<ol style="list-style-type: none">1. Snow Climatology2. Cooperative Summary of the Dayd. Freeze Data Table
1971-2000 serially complete daily data |
|---|---|

References

U.S. Climate Normals 1971-2000, www.ncdc.noaa.gov/normal.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normal/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