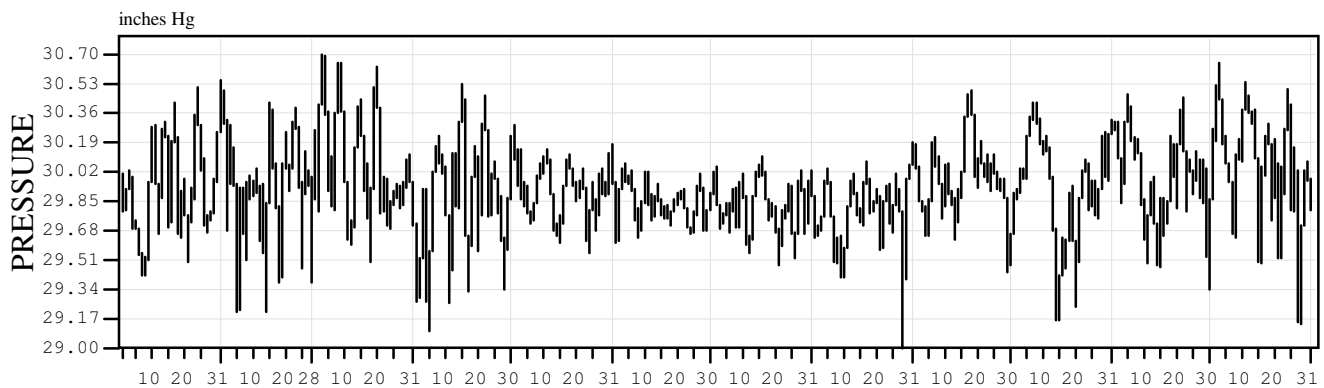
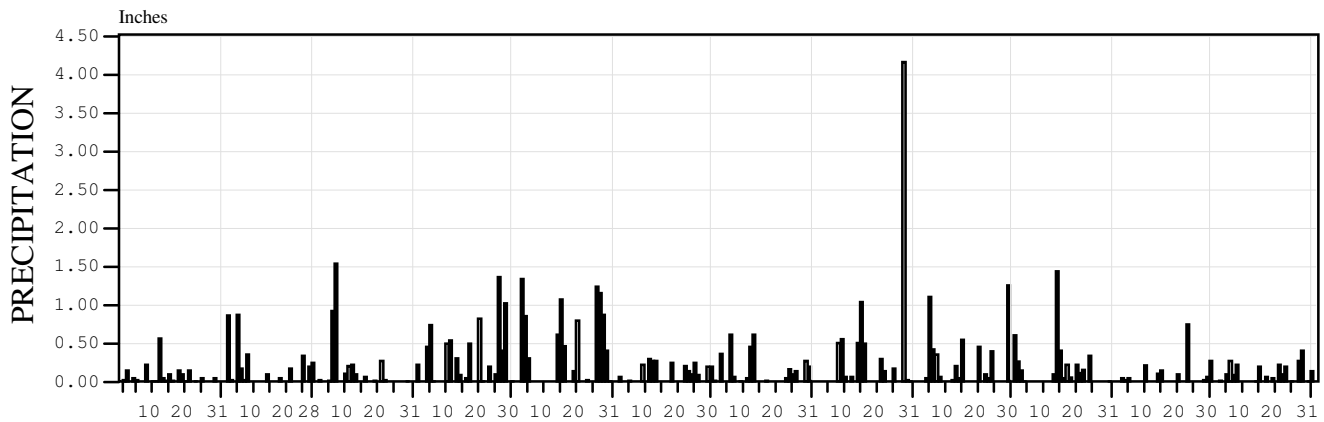
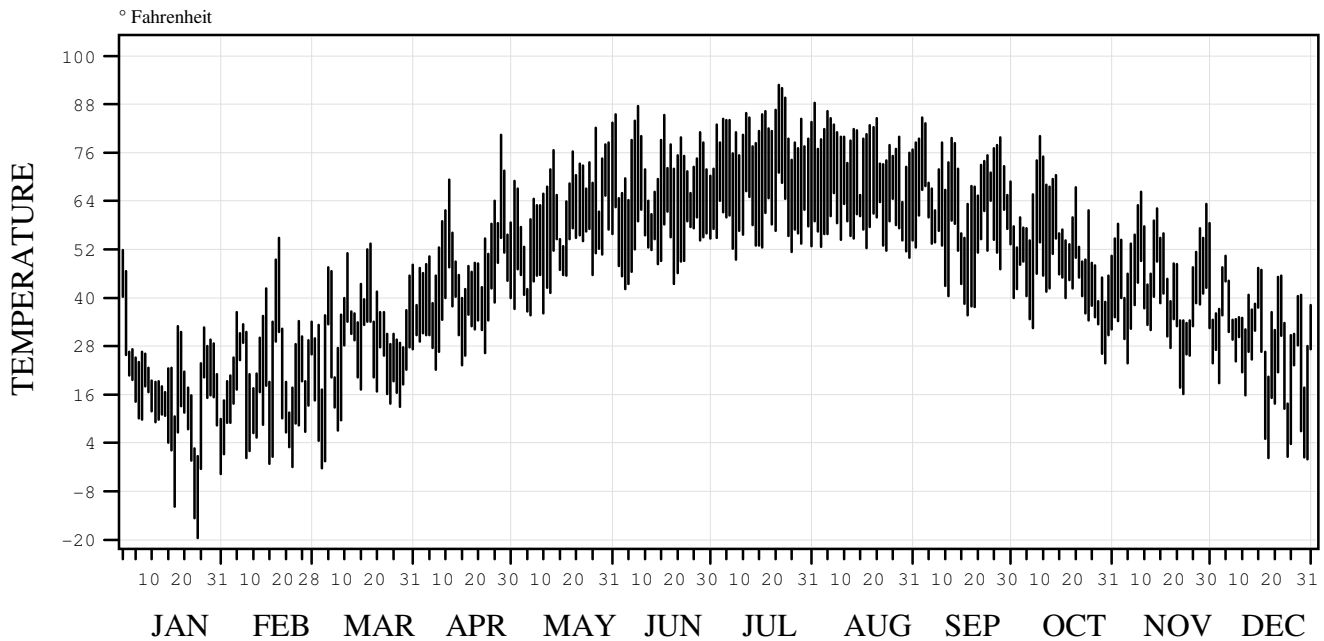


2011

LOCAL CLIMATOLOGICAL DATA

Annual Summary with Comparative Data
Westford
Daily Data



METEOROLOGICAL DATA FOR 2011

Westford

Latitude: 44° 37' 39" N Longitude: 73° 02' 29" W Elevation (Ground): 850 feet Time Zone: Eastern

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
TEMPERATURE													
Average													
-Daily Maximum	23.3	28.4	36.7	52.6	67.3	73.9	81.9	78.5	71.8	57.6	50.8	35.9	54.9
-Daily Minimum	9.5	11.5	20.2	35.3	48.7	53.0	58.4	57.3	52.6	40.8	34.6	20.6	36.9
-Monthly	16.4	20.0	28.5	44.0	58.0	63.5	70.1	67.9	62.2	49.2	42.7	28.3	45.9
-Monthly Dew Point	11.2	11.2	19.2	32.6	49.9	54.9	61.3	59.9	56.0	41.2	33.2	22.1	37.7
Extremes													
-Highest	51.9	54.9	53.6	80.6	83.6	87.7	92.9	88.3	84.8	80.2	66.3	50.6	92.9
-Date	1	18	18	27	31	8	21	1	3	9	9	5	JUL 21
-Lowest	-19.6	-2.1	-2.2	22.2	35.7	42.2	49.4	49.9	35.7	23.8	16.3	-0.1	-19.6
-Date	24	22	3	7	6	4	8	30	17	29	22	30	JAN 24
DEGREE DAYS													
Heating Base 65°F	1498	1256	1123	625	223	85	3	16	120	484	666	1126	7225
Cooling Base 65°F	0	0	0	3	20	47	171	115	47	2	0	0	405
SOLAR RADIATION (W/m2)													
	38.9	77.3	126.3	156.3	169.2	206.0	230.7	189.0	139.3	79.7	53.4	34.1	125.0
NUMBER OF DAYS													
Sunrise to Sunset													
-Clear	5	3	7	4	3	3	5	2	6	4	3	5	50
-Partly Cloudy	4	8	6	12	11	12	21	21	11	10	9	7	132
-Cloudy	21	17	17	13	17	15	5	8	13	17	18	18	179
Precipitation													
.01 inches or more	20	13	14	19	17	14	19	14	15	17	11	19	192
Snow, Ice pellets													
1.0 inches or more	12	10	3	0	0	0	0	0	0	0	1	6	32
Thunderstorms													
	0	1	0	5	6	9	7	6	3	2	0	0	39
Heavy Fog, visibility													
¼ mile or less	0	0	0	0	5	0	0	0	2	3	0	3	13
TEMPERATURE:													
-Maximum													
90°F and above	0	0	0	0	0	0	3	0	0	0	0	0	3
32°F and below	27	19	10	0	0	0	0	0	0	0	0	9	65
-Minimum													
32°F and below	30	28	26	14	0	0	0	0	0	4	10	28	140
0°F and below	6	3	2	0	0	0	0	0	0	0	0	2	13
PRESSURE													
Average													
-Monthly	29.936	29.936	30.075	29.863	29.926	29.844	29.835	29.803	29.981	29.938	29.995	30.074	29.934
Extremes													
-Highest	30.56	30.50	30.70	30.53	30.29	30.07	30.11	30.19	30.50	30.43	30.48	30.65	30.70
-Date	31	1	3	15	1	4	16	31	18	8	5	3	MAR 3
-Lowest	29.43	29.21	29.51	29.10	29.55	29.62	29.48	29.00	29.44	29.17	29.34	29.14	29.00
-Date	7	5	18	5	24	1	21	28	29	14	30	28	AUG 28
RELATIVE HUMIDITY (%)													
Average													
-Monthly	77.6	68.3	68.8	67.1	78.0	76.7	76.9	80.2	84.1	77.5	70.3	76.9	75.2
-Local Time													
Hour 01	80	72	73	70	85	85	87	90	91	83	74	79	81
Hour 07	82	71	76	75	84	86	89	90	93	87	75	80	82
Hour 13	71	62	62	60	69	67	63	66	71	65	61	71	66
Hour 19	78	70	67	64	75	71	72	78	85	78	72	78	74
PRECIPITATION													
Water Equivalent													
-Total	1.94	3.54	3.68	7.50	9.44	2.65	3.27	8.18	5.20	4.30	1.92	2.54	54.16
-Greatest (24 hrs)	0.14	0.12	0.00	1.66	1.98	0.53	0.70	4.22	1.43	1.75	0.35	0.38	4.22
-Date	9	1	1	26-27	26-27	12-13	6- 7	28-29	5- 6	14-15	29-30	5- 6	AUG 28-29
Snow, Ice pellets													
-Total	34.7	50.4	29.0	1.3	0.0	0.0	0.0	0.0	0.0	0.2	5.6	19.6	140.8
-Greatest (day)	8.2	10.7	20.9	0.9	0.0	0.0	0.0	0.0	0.0	0.2	5.6	7.5	20.9
-Date	12	2	7	1	1	1	1	1	1	30	23	28	MAR 7
WIND													
Resultant													
-Direction	264	243	249	243	238	251	247	255	226	238	218	224	237
-Speed	1.0	2.1	1.9	2.2	1.0	1.0	0.8	0.8	0.9	1.1	3.2	2.5	1.5
Average Speed	1.9	3.7	3.7	4.0	2.3	1.6	1.2	1.3	1.2	1.7	3.9	3.5	2.5
Maximum One-minute													
Average													
-Direction	WNW	WNW	SSW	W	SSW	W	WNW	NW	SSW	SSW	SSW	WSW	WSW
-Speed	15	22	20	22	18	18	15	18	13	16	18	23	23
-Date	2	18	5	11	23	1	26	28	4	15	30	16	DEC 16
Peak Gust													
-Direction	WNW	WNW	S	S	SSW	WNW	NW	WNW	S	SSE	SW	SW	SW
-Speed	25	41	34	40	34	30	27	34	25	29	35	46	46
-Date	2	18	4	27	23	1	26	28	13	15	10	16	DEC 16

MEANS AND EXTREMES*

Westford

Latitude: 44° 37' 39" N Longitude: 73° 02' 29" W Elevation (Ground): 850 feet Time Zone: Eastern

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Year
TEMPERATURE													
Average													
-Daily Maximum	26.5	30.7	39.5	54.0	66.3	75.7	79.4	77.7	69.8	55.7	44.4	32.2	54.3
-Daily Minimum	9.1	12.2	20.8	33.8	44.1	53.4	57.8	56.1	49.0	38.0	29.7	17.4	35.1
-Monthly	17.8	21.5	30.2	43.9	55.2	64.6	68.6	66.9	59.4	46.8	37.1	24.8	44.7
-Monthly Dew Point	5.3	5.8	10.8	17.3	24.6	29.6	32.3	31.5	28.1	21.2	16.1	9.6	19.4
Extremes													
-Record Highest	59.6	59.0	76.0	87.1	88.8	100.0	103.0	98.0	91.0	80.3	72.0	63.0	103.0
-Year	2008	1999	1998	2009	2010	1995	1995	1995	2002	2007	1996	1998	JUL 1995
-Record Lowest	-29.0	-18.1	-15.3	11.7	26.4	35.0	43.0	38.0	25.0	19.0	0.0	-18.4	-29.0
-Year	1997	2003	2003	2003	2005	2001	2000	1995	2000	2002	2000	2004	JAN 1997
MEAN DEGREE DAYS													
Heating Base 65°F	1454	1206	1079	615	314	84	22	46	191	557	827	1229	7625
Cooling Base 65°F	0	0	0	2	12	71	122	101	26	1	0	0	335
MEAN SOLAR RADIATION													
	2.4	4.8	7.9	9.8	10.6	12.1	13.6	11.1	11.4	9.6	6.3	3.6	8.6
MEAN NUMBER OF DAYS													
Sunrise to Sunset													
-Clear	17.2	15.3	17.7	16.6	16.3	15.8	16.1	17.0	17.5	16.5	15.9	16.0	197.8
-Partly Cloudy	4.6	5.2	5.3	5.6	7.1	7.9	8.9	9.1	6.7	5.1	4.4	3.5	73.2
-Cloudy	8.9	7.2	7.9	6.8	6.9	4.9	4.2	4.1	5.0	8.7	9.2	10.9	84.6
Precipitation ≥ .01"													
	17.0	12.7	13.9	13.7	15.9	14.6	15.2	13.1	12.7	15.8	16.4	17.6	178.6
Snow, Ice plts. ≥ 1.0"	9.4	6.4	5.2	2.1	0.3	0.0	0.0	0.0	0.0	0.4	3.5	9.4	36.7
Thunderstorms	0.0	0.1	0.3	1.3	2.8	5.2	5.9	4.8	1.5	0.6	0.3	0.1	22.7
Heavy Fog, vis. ≤ ¼ mi	0.1	0.0	0.6	0.0	0.8	0.2	0.1	0.5	0.4	0.7	0.5	0.4	4.3
TEMPERATURE:													
-Maximum													
90°F and above	0.0	0.0	0.0	0.0	0.0	1.4	1.4	1.2	0.1	0.0	0.0	0.0	4.1
32°F and below	20.0	14.5	7.5	0.6	0.0	0.0	0.0	0.0	0.0	0.1	3.0	14.9	60.6
-Minimum													
32°F and below	29.2	26.1	25.9	13.3	2.0	0.0	0.0	0.0	0.5	9.2	17.8	27.8	151.7
0°F and below	9.3	5.2	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.9	19.3
PRESSURE													
Average													
-Monthly	16.862	16.844	16.869	16.824	16.828	15.805	15.812	15.834	15.888	15.856	15.887	15.876	16.265
Extremes													
-Record Highest	30.85	30.89	30.77	30.69	30.52	30.29	30.34	30.34	30.54	30.72	30.67	30.76	30.89
-Year	2005	2003	2007	2003	2005	2008	2004	2003	2008	2008	2003	2006	FEB 2003
-Record Lowest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-Year	1996	1996	1996	1996	1996	1995	1995	1995	1995	1995	1995	1995	JUN 1995
RELATIVE HUMIDITY (%)													
Average													
-Monthly	40.9	38.2	37.2	35.8	39.3	41.5	42.3	43.0	43.0	42.2	40.1	41.4	40.4
-Local Time													
Hour 01	43	41	40	39	44	46	47	48	47	45	42	42	44
Hour 07	44	41	41	41	44	46	47	48	48	46	43	43	45
Hour 13	37	33	33	31	34	35	36	36	36	36	35	38	35
Hour 19	42	39	37	33	36	39	40	42	44	43	41	42	40
PRECIPITATION													
Water Equivalent													
-Mean	3.01	2.41	3.00	3.32	4.30	4.58	5.14	5.40	4.16	4.65	3.55	3.74	47.26
-Maximum Monthly	6.88	3.88	4.84	7.50	9.44	12.15	7.65	11.43	8.87	8.38	5.35	7.77	12.15
-Year	1998	2008	2001	2011	2011	1998	1996	2004	2002	2006	2007	2003	JUN 1998
-Minimum Monthly	1.28	0.83	1.05	0.00	0.00	0.00	3.10	1.54	1.65	1.45	1.92	1.32	0.00
-Year	2004	2004	1996	1996	1996	1998	2006	2002	2001	2004	1998	1998	
-Greatest (24 hrs)	2.85	0.95	1.50	1.66	2.58	3.08	2.58	6.05	2.65	1.92	1.87	2.24	6.05
-Year	1998	2000	2010	2011	2009	1998	1996	1995	1999	2007	2009	1996	AUG 1995
Snow, Ice pellets													
-Mean	27.0	22.1	18.9	6.7	0.3	0.0	0.0	0.0	0.0	1.4	8.1	29.1	113.6
-Maximum Monthly	41.8	50.4	41.6	21.7	2.2	0.0	0.0	0.0	0.0	6.5	20.5	69.8	69.8
-Year	2010	2011	2001	1996	1996	1995	1995	1995	1995	2005	2002	2003	DEC 2003
-Minimum Monthly	15.5	9.8	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.5	0.0
-Year	1996	1999	2010	1999	1997	1995	1995	1995	1995	1996	2006	1999	JUN 1995
-Greatest (day)	14.2	23.6	20.9	13.4	2.0	0.0	0.0	0.0	0.0	4.5	9.8	15.0	23.6
-Year	2010	2007	2011	2000	1996	1995	1995	1995	1995	2005	2002	1997	FEB 2007
WIND													
Resultant													
-Direction	243	253	254	247	247	247	240	244	229	245	225	232	241
-Speed	1.4	1.7	1.5	1.9	1.2	1.0	1.0	0.9	1.1	1.1	2.4	2.1	1.4
Average Speed	1.8	1.9	2.1	2.1	1.4	1.0	0.9	0.8	1.0	1.3	2.0	2.0	1.5
Maximum One-minute													
Average													
-Direction	WSW	S	S	WSW	SSW	W	WNW	W	W	S	S	SSW	WSW
-Speed	26	27	24	28	22	19	22	20	23	23	24	25	28
-Year	2008	2008	2003	2008	2009	2008	2010	2007	2008	2009	2007	2008	APR 2008
Peak Gust													
-Direction	WSW	W	WNW	W	SSW	W	W	W	W	SW	W	SW	W
-Speed	45	47	44	40	39	44	35	34	40	40	39	46	47
-Year	2008	2006	2009	2008	2004	2004	2010	2007	2008	2003	2003	2011	FEB 2006

* Length of record: June 1995 to December 2011

Westford

PRECIPITATION (inches)

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Annual
1995						1.36	3.92	10.18	3.15	6.48	4.24	3.39	32.72
1996	3.86	2.22	1.05	6.03	5.01	3.88	7.65	2.63	3.64	3.88	4.15	5.13	49.13
1997	2.05	1.82	3.34	0.00	0.00	0.00	6.06	5.47	4.28	2.04	4.41	3.78	33.25
1998	6.88	2.22	3.78	2.24	3.22	12.15	7.25	6.20	5.64	3.03	2.11	1.32	56.04
1999	4.61	0.96	2.79	0.76	3.83	2.95	5.07	2.80	8.33	3.82	3.35	1.73	41.00
2000	2.92	3.16	3.01	6.05	7.29	2.94	3.24	3.48	3.04	2.48	3.16	4.43	45.20
2001	1.98	2.27	4.84	0.65	2.63	2.20	4.04	6.07	1.65	2.39	2.72	2.35	33.79
2002	2.80	2.35	2.46	3.79	4.49	9.09	4.92	1.54	8.87	3.97	4.21	2.69	51.18
2003	1.52	1.56	3.72	2.82	4.75	2.76	3.67	6.26	2.81	6.46	4.52	7.77	48.62
2004	1.28	0.83	2.94	2.10	3.59	3.86	6.66	11.43	2.58	1.45	3.09	4.94	44.75
2005	3.25	2.99	2.41	3.68	1.40	4.38	5.22	5.35	4.09	8.00	4.80	3.54	49.11
2006	4.44	2.48	2.02	3.82	7.92	9.50	3.10	4.24	4.15	8.38	3.06	4.67	57.78
2007	3.93	3.13	3.11	4.42	2.72	2.64	4.81	3.50	2.96	7.33	5.35	3.62	47.52
2008	1.91	3.88	3.85	2.88	2.75	5.82	7.58	3.14	2.01	5.40	1.92	3.66	44.80
2009	2.18	2.39	2.07	2.79	7.36	4.58	6.01	3.97	3.38	3.86	4.21	3.25	46.05
2010	2.69	2.71	2.86	3.58	2.46	7.10	4.92	7.31	4.91	5.78	3.13	4.81	52.26
2011	1.94	3.54	3.68	7.50	9.44	2.65	3.27	8.18	5.20	4.30	1.92	2.54	54.16

SNOWFALL (inches)

Year	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	Total
1994-95												0.0	0.0
1995-96	0.0	0.0	0.0	0.1	13.9	46.0	15.5	15.3	13.0	21.7	2.2	0.0	127.7
1996-97	0.0	0.0	0.0	0.0	19.8	15.0	31.9	11.2	24.2	9.8	0.0	0.0	111.9
1997-98	0.0	0.0	0.0	4.7	17.3	40.9	21.9	9.9	24.6	0.2	0.0	0.0	119.5
1998-99	0.0	0.0	0.0	0.0	2.0	7.6	34.3	9.8	25.2	0.0	0.0	0.0	78.9
1999-00	0.0	0.0	0.0	0.0	10.3	2.5	27.8	23.5	9.3	18.9	0.0	0.0	92.3
2000-01	0.0	0.0	0.0	4.3	13.4	40.8	30.9	18.4	41.6	0.0	0.0	0.0	149.4
2001-02	0.0	0.0	0.0	0.9	3.3	17.8	30.0	17.1	20.0	5.0	0.0	0.0	94.1
2002-03	0.0	0.0	0.0	0.0	20.5	15.4	26.3	12.8	13.4	8.4	0.0	0.0	96.8
2003-04	0.0	0.0	0.0	T	4.3	69.8	22.5	12.0	10.5	3.9	1.5	0.0	124.5
2004-05	0.0	0.0	0.0	0.0	2.5	28.4	27.5	28.4	24.0	T	0.0	0.0	110.8
2005-06	0.0	0.0	0.0	6.5	5.2	30.1	23.9	15.5	21.5	3.2	0.0	0.0	105.9
2006-07	0.0	0.0	0.0	3.0	0.1	14.1	18.2	32.7	24.3	16.1	0.0	0.0	108.5
2007-08	0.0	0.0	0.0	0.0	9.5	41.2	19.3	40.1	10.5	1.0	T	0.0	121.6
2008-09	0.0	0.0	0.0	3.0	9.2	29.5	24.8	20.2	9.5	2.0	T	0.0	98.2
2009-10	0.0	0.0	0.0	T	T	22.9	41.8	36.7	1.9	15.2	1.0	0.0	119.5
2010-11	0.0	0.0	0.0	0.6	1.2	53.3	34.7	50.4	29.0	1.3	0.0	0.0	170.5
2011-12	0.0	0.0	0.0	0.2	5.6	19.6							

Westford

TEMPERATURE °F

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Annual
1995						69.5	74.0	70.9	56.3	51.1	33.4	19.6	53.5
1996	15.9	19.8	27.3	41.4	53.0	65.3	67.2	66.8	59.9	45.2	32.0	32.2	43.8
1997	18.0	25.6	27.1	41.1	50.4	65.0	66.8	64.1	56.7	44.6	33.4	23.0	43.0
1998	21.5	27.4	33.4	45.0	60.7	66.1	68.3	66.1	59.0	47.6	38.2	30.9	47.0
1999	18.6	24.0	30.4	44.3	57.9	68.2	71.5	65.3	61.5	44.1	40.4	27.3	46.1
2000	16.4	22.9	35.5	41.8	55.8	62.9	65.6	65.5	55.2	47.4	36.0	18.8	43.6
2001	20.0	22.6	28.4	43.1	58.2	65.4	66.3	70.1	59.6	49.6	40.5	32.6	46.4
2002	26.4	25.2	31.6	46.5	52.5	61.7	68.5	68.6	61.9	44.0	34.9	22.9	45.4
2003	10.1	15.0	28.4	39.9	53.8	62.8	68.1	68.3	60.4	45.3	37.2	23.5	42.7
2004	5.8	19.4	32.4	42.2	55.9	60.6	67.3	65.0	59.3	46.5	35.1	21.0	42.5
2005	13.2	21.9	26.8	45.4	50.5	68.3	69.6	67.9	61.6	48.4	37.8	21.6	44.4
2006	27.0	20.5	30.1	44.2	56.2	63.4	70.7	64.4	57.7	44.8	41.0	29.8	45.8
2007	19.0	12.7	27.4	41.0	54.6	64.7	66.4	66.2	61.4	52.2	33.7	22.3	43.5
2008	23.2	21.2	26.8	48.8	52.7	65.5	68.5	65.3	59.6	45.5	36.5	22.7	44.7
2009	12.8	21.5	31.5	45.3	54.6	61.9	65.5	67.8	57.6	44.5	41.3	23.3	44.0
2010	20.6	23.9	37.2	49.1	58.1	62.8	71.1	67.7	60.2	46.1	36.0	21.6	46.2
2011	16.4	20.0	28.5	44.0	58.0	63.5	70.1	67.9	62.2	49.2	42.7	28.3	45.9

HEATING DEGREE DAYS: Base 65°F

Year	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	Total
1994-95												33	33
1995-96	0	13	262	424	954	1416	1528	1320	1177	665	391	47	8197
1996-97	18	31	180	542	998	1027	1463	1112	1181	652	445	59	7708
1997-98	44	67	265	639	893	1227	1224	1060	954	588	158	69	7188
1998-99	13	53	196	528	784	1032	1444	1154	1049	588	212	46	7099
1999-00	12	50	169	657	696	1139	1466	1147	923	634	299	99	7291
2000-01	45	58	260	537	877	1395	1403	852	1143	643	190	62	7465
2001-02	27	19	189	422	743	917	1206	1122	1044	504	388	123	6704
2002-03	30	38	148	662	790	1270	1710	1408	1148	767	363	135	8469
2003-04	19	59	170	629	848	1303	1841	1337	1024	678	312	147	8367
2004-05	26	75	191	589	910	1377	1614	1220	1198	604	466	59	8329
2005-06	21	36	153	534	833	1351	1184	1250	1092	632	296	105	7487
2006-07	5	93	217	634	724	1086	1419	1457	1159	711	342	75	7922
2007-08	34	58	140	395	929	1316	1287	1258	1173	482	369	68	7509
2008-09	10	37	190	596	851	1301	1610	1206	1027	585	324	120	7857
2009-10	43	47	219	626	701	1283	1369	1143	850	474	245	101	7101
2010-11	19	32	183	575	860	1332	1498	1256	1123	625	223	85	7811
2011-12	3	16	120	484	666	1126							

Westford

COOLING DEGREE DAYS: Base 65°F

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1995						160	248	182	9	0	0	0	599
1996	0	0	0	0	10	52	74	78	23	0	0	0	237
1997	0	0	0	0	0	53	90	36	7	0	0	0	186
1998	0	0	0	0	16	93	92	78	14	0	0	0	293
1999	0	0	0	0	15	132	164	52	56	0	0	0	419
2000	0	0	0	0	7	40	54	64	8	0	0	0	173
2001	0	0	0	0	6	67	52	164	27	1	0	0	317
2002	0	0	0	16	7	30	125	128	55	4	0	0	365
2003	0	0	0	0	1	56	99	144	16	0	0	0	316
2004	0	0	0	5	15	28	82	59	2	0	0	0	191
2005	0	0	0	0	0	143	150	110	37	5	0	0	445
2006	0	0	0	0	19	52	176	65	4	0	0	0	316
2007	0	0	0	2	30	74	88	104	45	3	0	0	346
2008	0	0	0	3	0	92	127	57	36	0	0	0	315
2009	0	0	0	3	8	36	67	147	10	0	0	0	271
2010	0	0	0	5	40	46	218	126	47	0	0	0	482
2011	0	0	0	3	20	47	171	115	47	2	0	0	405

STATION LOCATION AND INSTRUMENTATION
Westford

Location	Occupied from	Occupied to	Latitude North	Longitude West	Elevation Above (ft)						
					Sea Level	Ground					
						Wind	Sun	Temp	Humidity	Rain	Barometer
			44° 37' 39"	73° 02' 29"	850	0	0	0	0	0	0

INSTRUMENTATION DETAIL

Units are: Temperature=°F, Wind=mph, Pressure=Inches Hg, Precipitation=inches.

The following equipment is used for measuring meteorological data at this station:

Davis Vantage Pro/Vue

OBSERVER NOTES

None.