

1998

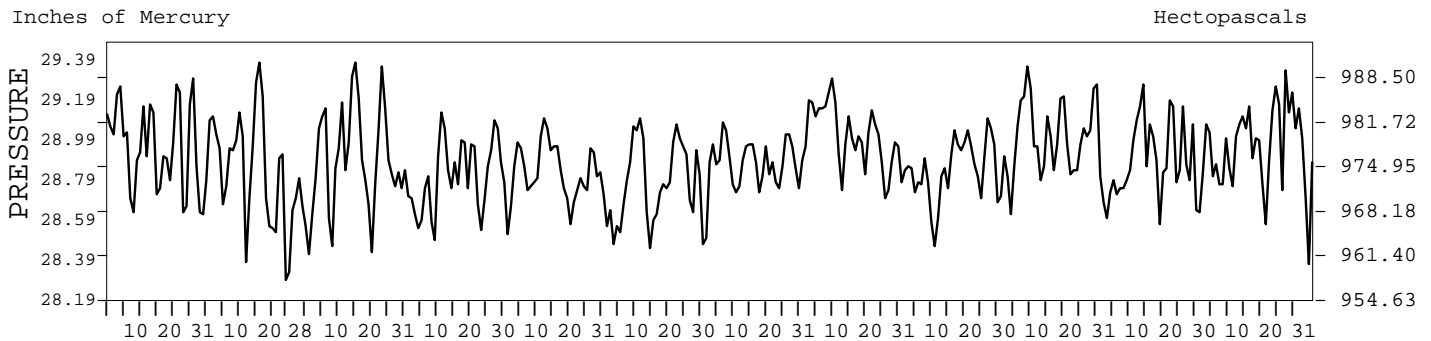
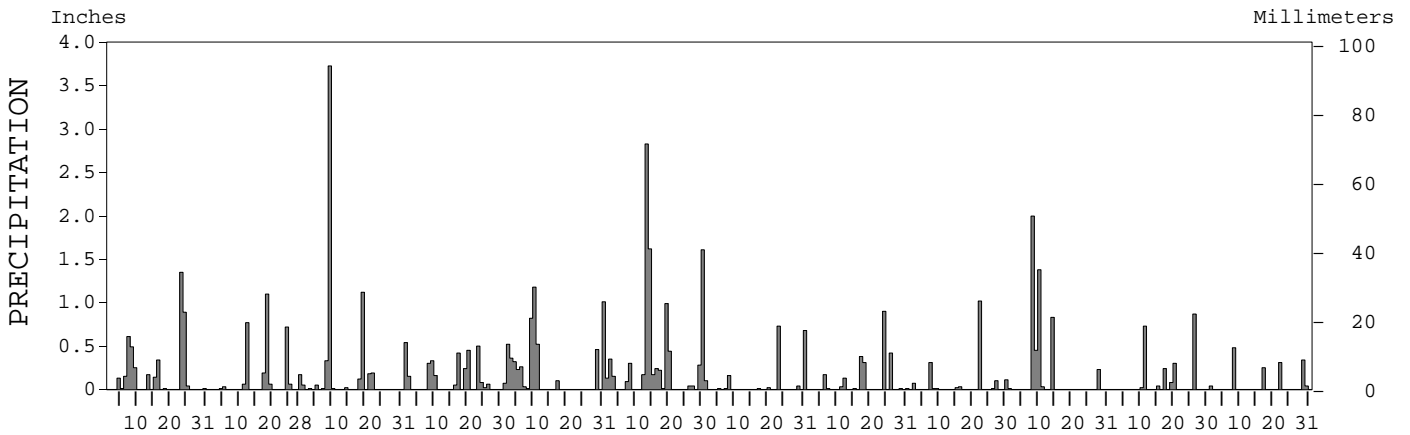
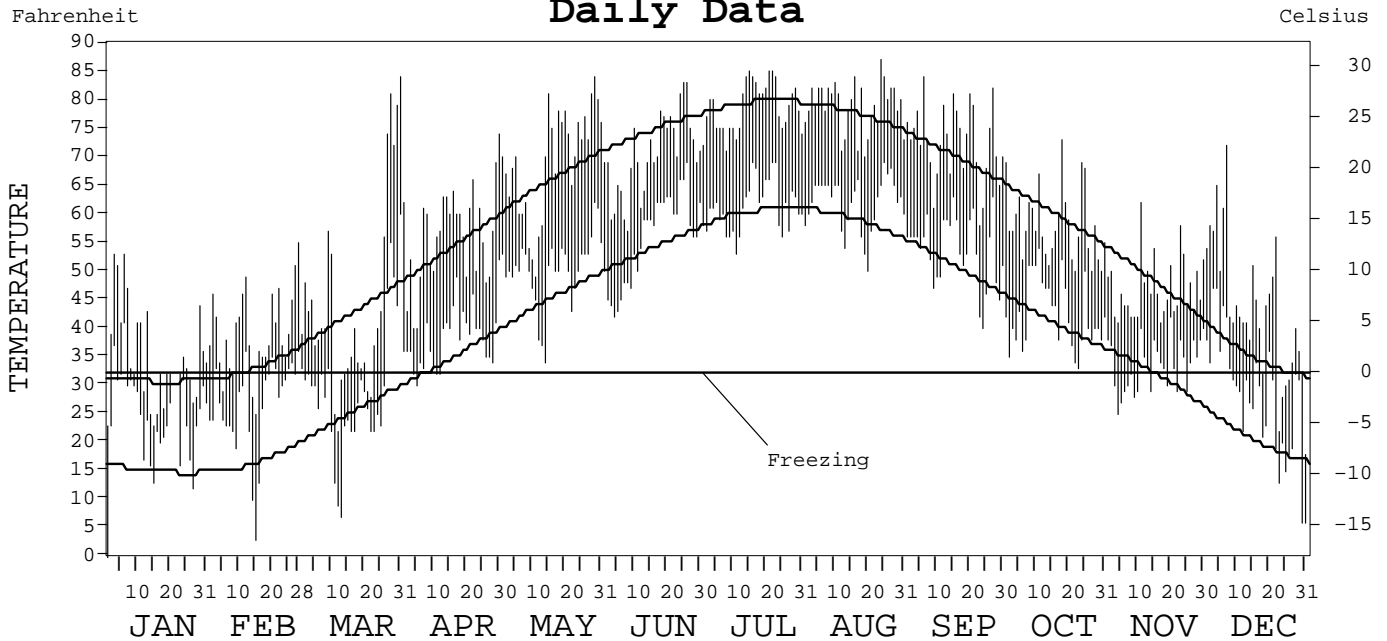
LOCAL CLIMATOLOGICAL DATA  
ANNUAL SUMMARY WITH COMPARATIVE DATA



ISSN 0198-246X

WORCESTER,  
MASSACHUSETTS (ORH)

Daily Data



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*Thomas R. Karl*

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	NATIONAL ENVIRONMENTAL AND INFORMATION SERVICE	NATIONAL SATELLITE, DATA, AND INFORMATION SERVICE	NATIONAL CLIMATIC DATA CENTER ASHEVILLE, NORTH CAROLINA	DIRECTOR NATIONAL CLIMATIC DATA CENTER
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NORMALS, MEANS, AND EXTREMES

WORCESTER, MA (ORH)

LATITUDE: 42° 16' 02" N

LONGITUDE: 71° 52' 34" W

ELEVATION (FT): GRND: 986 BARO: 1001

TIME ZONE: EASTERN (UTC+ 5)

WBAN: 94746

Table with 15 columns: ELEMENT, POR, JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC, YEAR. Rows include Temperature (°F), H/C, RH, S, W/O, Cloudiness, PR, Winds, Precipitation, and Snowfall.



HEATING DEGREE DAYS (base 65°F) 1998 WORCESTER, MA (ORH)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1969-70	19	15	163	468	773	1224	1547	1137	1068	604	261	99	7378
1970-71	2	12	174	410	738	1319	1461	1087	1083	667	327	61	7341
1971-72	3	35	98	258	844	1061	1189	1203	1065	733	290	116	6895
1972-73	16	41	171	622	897	1152	1200	1120	738	555	338	37	6887
1973-74	6	8	202	420	750	1017	1191	1145	969	520	391	82	6701
1974-75	6	9	190	592	760	1063	1158	1110	1037	721	180	104	6930
1975-76	2	47	223	413	586	1161	1412	972	920	511	310	60	6617
1976-77	17	46	192	571	905	1331	1508	1115	798	571	244	115	7413
1977-78	16	32	189	481	711	1202	1359	1255	1054	674	288	69	7330
1978-79	33	38	229	511	767	1116	1225	1354	824	601	243	80	7021
1979-80	25	53	180	500	614	1019	1235	1233	983	562	246	148	6798
1980-81	2	19	165	540	853	1259	1516	894	934	521	241	42	6986
1981-82	1	29	204	562	772	1145	1478	1094	961	639	212	127	7224
1982-83	7	55	140	436	632	929	1199	996	871	548	318	44	6175
1983-84	5	20	115	459	682	1163	1303	892	1099	577	300	54	6669
1984-85	9	1	184	338	713	928	1382	1011	855	518	230	121	6290
1985-86	2	25	128	406	713	1223	1206	1166	879	501	262	119	6630
1986-87	48	49	182	471	830	1069	1266	1130	867	571	273	58	6814
1987-88	9	56	152	495	761	1052	1298	1107	922	629	253	115	6849
1988-89	19	32	155	597	693	1166	1123	1129	984	674	257	90	6919
1989-90	7	38	172	436	846	1540	1035	1006	884	632	413	58	7067
1990-91	22	30	192	379	683	957	1270	965	877	501	167	80	6123
1991-92	13	16	222	402	739	1090	1222	1092	1056	676	321	82	6931
1992-93	40	55	203	558	810	1117	1204	1259	1039	574	229	74	7162
1993-94	10	5	201	545	754	1115	1515	1226	968	515	337	49	7240
1994-95	5	48	182	431	636	975	1086	1170	887	667	329	58	6474
1995-96			191	352	877	1260	1279	1158	1031	587	331	36	
1996-97		14	159	467	863	980	1277		1020	638	394	93	
1997-98	15	18	158	498	858	1079		891	872	527	180	111	
1998-	3	8	98	450	736	902							

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COOLING DEGREE DAYS (base 65°F) 1998 WORCESTER, MA (ORH)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1969	0	0	0	5	17	98	131	192	44	1	0	0	488
1970	0	0	0	0	16	70	197	177	50	6	0	0	516
1971	0	0	0	0	0	87	184	141	57	2	0	0	471
1972	0	0	0	0	9	41	215	109	20	0	0	0	394
1973	0	0	0	1	11	118	201	224	62	0	0	0	617
1974	0	0	0	4	8	59	159	164	36	0	0	0	430
1975	0	0	0	0	33	69	218	132	0	1	0	0	453
1976	0	0	0	37	7	154	110	119	16	0	0	0	443
1977	0	0	2	4	37	44	156	150	32	0	0	0	425
1978	0	0	0	0	32	57	138	137	14	0	0	0	378
1979	0	0	0	0	24	44	225	142	38	10	0	0	483
1980	0	0	0	0	8	48	206	178	57	0	0	0	497
1981	0	0	0	0	29	78	184	110	10	0	0	0	411
1982	0	0	0	0	8	29	216	92	34	0	0	0	379
1983	0	0	0	4	4	138	238	188	118	11	0	0	701
1984	0	0	0	2	10	156	171	209	30	0	0	0	578
1985	0	0	0	0	15	22	177	120	47	0	0	0	381
1986	0	0	0	0	50	54	151	111	21	2	0	0	389
1987	0	0	0	0	49	90	193	110	25	0	0	0	467
1988	0	0	0	0	24	112	260	266	17	1	0	0	680
1989	0	0	0	0	16	70	131	116	47	0	0	0	380
1990	0	0	0	6	0	52	159	153	25	10	0	0	405
1991	0	0	0	4	57	79	173	149	40	2	0	0	504
1992	0	0	0	0	30	44	75	78	37	0	0	0	264
1993	0	0	0	0	12	67	181	163	44	0	0	0	467
1994	0	0	0	0	12	122	260	97	9	0	0	0	500
1995	0	0	0	0	6	77			29	3	0	0	
1996	0	0	0	2	23	70		143	47	0	0	0	
1997	0		0	0	0	123	148	106	25	2	0	0	
1998		0	10	0	21	58	165	181	47	0	0	0	

SNOWFALL (inches) 1998 WORCESTER, MA (ORH)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1969-70	0.0	0.0	0.0	T	0.3	29.5	7.7	11.4	19.9	3.3	T	0.0	72.1
1970-71	0.0	0.0	0.0	T	T	32.1	16.6	11.4	12.1	7.8	0.0	0.0	80.0
1971-72	0.0	0.0	0.0	0.0	0.0	20.7	9.6	6.7	35.0	20.1	7.2	0.0	99.3
1972-73	0.0	0.0	0.0	T	6.1	13.8	17.9	5.8	0.4	0.4	0.0	0.0	44.4
1973-74	0.0	0.0	0.0	0.0	T	0.9	12.5	15.0	1.7	3.7	0.0	0.0	33.8
1974-75	0.0	0.0	0.0	T	1.2	13.1	22.6	21.9	4.9	1.4	0.0	0.0	65.1
1975-76	0.0	0.0	0.0	T	1.5	18.1	21.6	4.7	16.4	T	T	0.0	62.3
1976-77	0.0	0.0	0.0	T	3.0	13.5	21.7	13.8	21.5	1.0	12.7	0.0	87.2
1977-78	0.0	0.0	0.0	0.0	2.2	13.7	34.2	20.8	15.0	T	T	0.0	85.9
1978-79	0.0	0.0	0.0	0.0	5.4	13.1	16.0	6.5	1.3	5.4	0.0	0.0	47.7
1979-80	0.0	0.0	0.0	7.5	0.0	2.1	0.8	6.5	9.7	T	0.0	0.0	26.6
1980-81	0.0	0.0	0.0	0.0	9.0	6.8	12.5	11.4	3.3	T	T	0.0	43.0
1981-82	0.0	0.0	0.0	T	T	24.6	16.7	6.5	11.0	15.1	0.0	0.0	73.9
1982-83	0.0	0.0	0.0	0.0	0.5	6.4	18.6	32.1	3.5	2.3	T	0.0	63.4
1983-84	0.0	0.0	0.0	T	1.1	17.2	24.1	3.3	30.9	T	T	0.0	76.6
1984-85	0.0	0.0	0.0	0.0	T	7.0	9.7	11.0	7.2	4.9	0.0	0.0	39.8
1985-86	0.0	0.0	0.0	0.0	6.9	9.1	5.8	14.5	2.3	0.1	0.3	0.0	39.0
1986-87	0.0	0.0	0.0	0.0	11.5	4.9	46.8	3.0	6.4	21.0	0.0	0.0	93.6
1987-88	0.0	0.0	0.0	0.0	10.2	12.9	25.2	15.8	6.4	0.6	0.0	0.0	71.1
1988-89	0.0	0.0	0.0	0.4	T	5.0	2.8	7.7	8.5	3.7	0.0	0.0	28.1
1989-90	0.0	0.0	0.0	0.0	7.9	10.2	11.3	15.2	6.4	2.1	0.0	T	53.1
1990-91	0.0	0.0	0.0	0.0	0.7	5.0	11.3	9.1	9.3	0.2	0.0	0.0	35.6
1991-92	0.0	0.0	0.0	0.0	5.8	14.5	2.7	8.4	11.8	2.7	0.0	0.1	46.0
1992-93	0.0	0.0	T	0.0	1.9	37.0	14.6	19.7	44.1	2.8	0.0	T	120.1
1993-94	0.0	0.0	0.0	T	0.2	12.9	34.1	25.9	27.1	0.0	T	0.0	100.2
1994-95	0.0	T	T	0.0	2.9	3.2	4.5	14.3	T	T	0.0	0.0	24.9
1995-96	0.0	0.0	0.0	0.0									
1996-97													
1997-98													
1998-													
POR= 40 YRS	0.0	T	T	0.5	3.6	13.2	15.9	15.7	13.7	3.5	0.3	0.0	66.4

WBAN : 94746

REFERENCE NOTES:

<p>PAGE 1: THE TEMPERATURE GRAPH SHOWS NORMAL MAXIMUM AND NORMAL MINIMUM DAILY TEMPERATURES (SOLID CURVES) AND THE ACTUAL DAILY HIGH AND LOW TEMPERATURES (VERTICAL BARS).</p> <p>PAGE 2 AND 3: H/C INDICATES HEATING AND COOLING DEGREE DAYS. RH INDICATES RELATIVE HUMIDITY W/O INDICATES WEATHER AND OBSTRUCTIONS S INDICATES SUNSHINE. PR INDICATES PRESSURE. CLOUDINESS ON PAGE 3 IS THE SUM OF THE CEILOMETER AND SATELLITE DATA NOT TO EXCEED EIGHT EIGHTHS(OKTAS).</p> <p>GENERAL: T INDICATES TRACE PRECIPITATION, AN AMOUNT GREATER THAN ZERO BUT LESS THAN THE LOWEST REPORTABLE VALUE. + INDICATES THE VALUE ALSO OCCURS ON EARLIER DATES. BLANK ENTRIES DENOTE MISSING OR UNREPORTED DATA. NORMALS ARE 30-YEAR AVERAGES (1961 - 1990). ASOS INDICATES AUTOMATED SURFACE OBSERVING SYSTEM. PM INDICATES THE LAST DAY OF THE PREVIOUS MONTH. POR (PERIOD OF RECORD) BEGINS WITH THE JANUARY DATA MONTH AND IS THE NUMBER OF YEARS USED TO COMPUTE THE MEAN. INDIVIDUAL MONTHS WITHIN THE POR MAY BE MISSING. WHEN THE POR FOR A NORMAL IS LESS THAN 30 YEARS, THE NORMAL IS PROVISIONAL AND IS BASED ON THE NUMBER OF YEARS INDICATED. 0.* OR * INDICATES THE VALUE OR MEAN-DAYS-WITH IS BETWEEN 0.00 AND 0.05. CLOUDINESS FOR ASOS STATIONS DIFFERS FROM THE NON-ASOS OBSERVATION TAKEN BY A HUMAN OBSERVER. ASOS STATION CLOUDINESS IS BASED ON TIME-AVERAGED CEILOMETER DATA FOR CLOUDS AT OR BELOW 12,000 FEET AND ON SATELLITE DATA FOR CLOUDS ABOVE 12,000 FEET. THE NUMBER OF DAYS WITH CLEAR, PARTLY CLOUDY, AND CLOUDY CONDITIONS FOR ASOS STATIONS IS THE SUM OF THE CEILOMETER AND SATELLITE DATA FOR THE SUNRISE TO SUNSET PERIOD.</p>	<p>GENERAL CONTINUED: CLEAR INDICATES 0 - 2 OKTAS, PARTLY CLOUDY INDICATES 3 - 6 OKTAS, AND CLOUDY INDICATES 7 OR 8 OKTAS. WHEN AT LEAST ONE OF THE ELEMENTS (CEILOMETER OR SATELLITE) IS MISSING, THE DAILY CLOUDINESS IS NOT COMPUTED. WIND DIRECTION IS RECORDED IN TENS OF DEGREES (2 DIGITS) CLOCKWISE FROM TRUE NORTH. "00" INDICATES CALM. "36" INDICATES TRUE NORTH. RESULTANT WIND IS THE VECTOR AVERAGE OF THE SPEED AND DIRECTION. AVERAGE TEMPERATURE IS THE SUM OF THE MEAN DAILY MAXIMUM AND MINIMUM TEMPERATURE DIVIDED BY 2. SNOWFALL DATA COMPRISE ALL FORMS OF FROZEN PRECIPITATION, INCLUDING HAIL. A HEATING (COOLING) DEGREE DAY IS THE DIFFERENCE BETWEEN THE AVERAGE DAILY TEMPERATURE AND 65° F. DRY BULB IS THE TEMPERATURE OF THE AMBIENT AIR. DEW POINT IS THE TEMPERATURE TO WHICH THE AIR MUST BE COOLED TO ACHIEVE 100 PERCENT RELATIVE HUMIDITY. WET BULB IS THE TEMPERATURE THE AIR WOULD HAVE IF THE MOISTURE CONTENT WAS INCREASED TO 100 PERCENT RELATIVE HUMIDITY.</p> <p>ON JULY 1, 1996, THE NATIONAL WEATHER SERVICE BEGAN USING THE "METAR" OBSERVATION CODE THAT WAS ALREADY EMPLOYED BY MOST OTHER NATIONS OF THE WORLD. THE MOST NOTICEABLE DIFFERENCE IN THIS ANNUAL PUBLICATION WILL BE THE CHANGE IN UNITS FROM TENTHS TO EIGHTHS(OKTAS) FOR REPORTING THE AMOUNT OF SKY COVER.</p>
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1998  
WORCESTER,  
MASSACHUSETTS (ORH)

Worcester Municipal Airport is located on the crest of a hill, 1,000 feet above sea level. It is about 500 feet above and 3 1/2 miles northwest of the city proper. The airport is surrounded by ridges and valleys with many of the valleys containing reservoirs. Only two of the ridges extend above the airport elevation. One is 400 feet higher and 2 1/2 miles to the northwest, and the other is 1,000 feet higher and 15 miles to the north.

The proximity to the Atlantic Ocean, Long Island Sound, and the Berkshire Hills plays an important part in determining the weather and, hence, the climate of Worcester. Rapid weather changes occur when storms move up the east coast after developing off the Carolina Coast. In the majority of these cases, they pass to the south and east, resulting in northeast and easterly winds with rain or snow and fog. Storms developing in the Texas-Oklahoma area normally travel up the St. Lawrence River Valley and, depending on the movement and intensity, usually deposit little precipitation over the area. However, they do bring an influx of warm air into the region. Wintertime cold snaps are quite frequent, but temperatures are usually modified by the passage of the air over land and mountains before reaching the county. Summertime thunderstorms develop over the hills to the west, with a majority moving toward the northeast. From the use of radar, we find many break up just before reaching Worcester, or pass either north or south of the city proper.

Airport site temperatures are moderate. The normal mean for the warmest month, July, is around 70 degrees. Though winters are reasonably cold, prolonged periods of severe cold weather are extremely rare. The three coldest months, December through February, have an average temperature of over 25 degrees. A review of Worcester Cooperative records since 1901 shows maximum temperatures above 100 degrees and minimum temperatures below -24 degrees.

Precipitation is usually plentiful and well distributed throughout the year. The annual snowfall for all Worcester sites since 1901, averages slightly less than 60 inches. The airport location averages slightly higher.

Based on the 1951-1980 period, the average first occurrence of 32 degrees Fahrenheit in the fall is October 17 and the average last occurrence in the spring is April 27.

# STATION LOCATION

WORCESTER, MASSACHUSETTS

LOCATION	OCCUPIED FROM	OCCUPIED TO	AIRLINE DISTANCES AND DIRECTIONS FROM PREVIOUS LOCATION	LATITUDE NORTH	LONGITUDE WEST	ELEVATION ABOVE											* Type	REMARKS	
						SEA LEVEL	GROUND												AUTOMATED
							WIND	WIND	WIND	WIND	WIND	WIND	WIND	WIND	WIND	WIND			
<u>COOPERATIVE</u> On building on top of knoll	5/01/92	12/31/23		42°16'	71°48'													Residence of G.W. Swan.	
On ground on top of knoll	1/01/24	5/31/48	3.5 mi. NNW	41°18'	71°49'	628												Residence of Clifford L. Davis.	
<u>AIRPORT</u> Building on SE corner of airport	11/29/47	4/27/54		42°16'	71°52'	986	69	5	4						3			CAA taking observations.	
Control Tower Building East side of runways Municipal Airport	4/27/54	Present	3/4 mi. NW	42°16'	71°52'	986	a22 h33 k33	f5	d6	NA	b5 j4	NA	g5 m4	e4 i5	M			Weather Bureau opened office 11/1/55 and assumed observation program 5/21/56. a - 69 feet prior to relocation to field site 8/25/59. b - Installed 11/1/55. 3 feet to 10/18/67. M - Commissioned 11/29/56. 20' to 5/10/66 & 6' thereafter. d - 4 feet to 5/10/66. Removed before 12/73. re - Commissioned 2/28/75. r - Moved 265' SSW 11/18/81. g - Moved 285' SSW 11/18/81. g - Raised 8/1/84. i - Minor move 6/1/85. j - Moved about 500' NW 6/1/85. k - Moved 2370' SE 6/1/85. m - Minor move 11/18/85. S ASOS Commissioned 07/01/95	

SUBSCRIPTION: Price and ordering information available through: National Climatic Data Center, Federal Building, Asheville, North Carolina 28801.  
INQUIRIES/COMMENTS CALL: (828) 271-4800

National Climatic Data Center  
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Asheville NC 28801-5001

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