



AUGUST 1999

LOCAL CLIMATOLOGICAL DATA

NOAA, National Climatic Data Center

RICHMOND, VA

R.E.BYRD INTERNATIONAL AP. (RIC)
 Lat: 37°30' N Long: 77°19' W Elev (Ground): 164 Feet
 Time Zone: EASTERN WBAN: 13740 ISSN #:0198-537X

DATE	TEMPERATURE °F							DEG DAYS BASE 65°		WEATHER	SNOW/ICE ON GND(IN)		PRECIPITATION (INCHES)		PRESSURE (INCHES OF HG)		WIND SPEED = MPH DIR = TENS OF DEGREES								DATE
	MAXIMUM	MINIMUM	AVERAGE	DEP FROM NORMAL	AVERAGE DEW PT	AVERAGE WET BULB	HEATING	COOLING	0700 LST		1300 LST	2400 LST	2400 LST	AVERAGE STATION	AVERAGE SEA LEVEL	RESULTANT SPEED	RES DIR	AVERAGE SPEED	MAXIMUM						
																			5-SEC		2-MIN				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
01	99*	75	87	9	73	76	0	22	TS TSRA RA BR HZ				0.12	29.63	29.82	1.5	35	5.8	23	06	18	04	01		
02	89	70	80	2	60	67	0	15					0.00	29.77	29.97	10.1	36	10.4	22	36	17	01	02		
03	89	66	78	0	61	67	0	13					0.00	29.85	30.05	6.5	04	8.6	20	36	16	01	03		
04	88	65	77	-1	63	68	0	12					0.00	29.76	29.96	3.0	06	5.6	15	01	11	12	04		
05	94	67	81	3	64	70	0	16					0.00	29.65	29.85	3.1	23	6.8	22	23	18	23	05		
06	91	68	80	2	60	67	0	15	BR HZ				0.00	29.74	29.94	2.0	33	6.2	18	26	15	26	06		
07	94	64	79	1	65	70	0	14	BR HZ				0.00	29.79	29.99	3.5	16	6.5	18	22	15	21	07		
08	98	76	87*	9	70	74	0	22	RA BR HZ				0.01	29.64	29.83	10.2	24	11.8	28	23	21	26	08		
09	85	66	76	-2	59	65	0	11					0.00	29.66	29.85	6.7	02	8.1	24	36	20	02	09		
10	86	59*	73	-5	62	67	0	8					0.00	29.68	29.88	6.3	18	6.9	24	18	20	18	10		
11	97	70	84	6	66	71	0	19					0.00	29.64	29.84	5.5	21	9.4	22	11	17	10	11		
12	90	69	80	2	72	74	0	15	BR HZ				0.00	29.74	29.94	4.0	13	5.8	18	14	15	16	12		
13	94	74	84	7	75	78	0	19	BR HZ				0.00	29.70	29.90	10.1	18	10.5	23	18	20	17	13		
14	94	71	83	6	75	76	0	18	TS TSRA RA BR HZ				0.32	29.64	29.84	7.0	19	9.4	31	01	24	01	14		
15	86	70	78	1	70	72	0	13	BR				0.00	29.83	30.03	4.7	02	5.8	18	01	13	35	15		
16	89	66	78	1	67	71	0	13	BR				0.00	29.99	30.19	2.3	06	5.7	14	36	11	02	16		
17	97	70	84	7	71	74	0	19	BR HZ				0.00	29.81	30.01	7.1	21	8.2	25	21	17	21	17		
18	95	71	83	6	69	73	0	18	RA BR HZ				T	29.66	29.86	2.0	07	5.5	15	01	11	01	18		
19	90	67	79	2	65	70	0	14	TS TSRA FG BR				0.91	29.76	29.96	5.3	06	7.9	31	30	28	30	19		
20	85	66	76	0	68	70	0	11	TS TSRA RA BR				0.13	29.76	29.96	3.9	23	7.9	25	31	20	30	20		
21	80	66	73	-3	67	69	0	8	BR				0.00	29.78	29.98	5.0	02	5.6	20	36	16	01	21		
22	83	65	74	-2	64	67	0	9	BR				0.00	29.85	30.05	2.3	03	4.6	14	33	10	32	22		
23	82	65	74	-2	67	69	0	9	TS RA BR HZ				T	29.88	30.08	4.9	15	5.3	16	17	14	18	23		
24	85	67	76	0	64	68	0	11	BR HZ				0.00	29.87	30.07	7.4	14	7.7	22	13	16	12	24		
25	80	68	74	-2	71	72	0	9	TS RA BR				0.37	29.77	29.97	4.3	14	6.8	21	16	20	15	25		
26	83	69	76	1	71	72	0	11	TS TSRA RA BR HZ				0.13	29.69	29.89	3.9	19	6.1	26	19	23	18	26		
27	86	69	78	3	69	71	0	13	RA BR				0.01	29.72	29.92	2.1	21	4.4	14	21	11	20	27		
28	88	69	79	4	68	71	0	14	BR HZ				0.00	29.76	29.96	2.6	01	4.0	14	13	9	36	28		
29	89	68	79	4	68	72	0	14	BR HZ				0.00	29.73	29.93	1.8	07	3.9	28	03	23	04	29		
30	73	63	68	-7	51	58	0	3					0.00	29.84	30.04	17.0	02	17.5	38*	02	29*	02	30		
31	70	62	66*	-9	54	59	0	1					0.00	29.93	30.14	14.0	36	14.1	25	01	21	01	31		

88.0	67.8	77.9	■ ■	66.1	69.9	0.0	13.2	< MONTHLY AVERAGES		TOTALS-->			2.00	29.76	29.96	0.7	07	7.5	<- MONTHLY AVERAGES			
------	------	------	-----	------	------	-----	------	--------------------	--	-----------	--	--	------	-------	-------	-----	----	-----	---------------------	--	--	--

0.9	1.4	1.1	■ ■	----- DEPARTURE FROM NORMAL ----->								-2.40	SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3										
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DEGREE DAYS				GREATEST 24-HR PRECIPITATION: 1.04 DATE: 19-20				SEA LEVEL PRESSURE DATE TIME			
MONTHLY		SEASON TO DATE		GREATEST 24-HR SNOWFALL:		DATE:		MAXIMUM		: 30.26 16 0954	
TOTAL DEPARTURE		TOTAL DEPARTURE		GREATEST SNOW DEPTH:		DATE:		MINIMUM		: 29.75 14 1554	
HEATING:	0	0	0	0	0	NUMBER OF DAYS WITH	→	MAXIMUM TEMP ≥ 90: 12	MINIMUM TEMP ≤ 32: 0	PRECIPITATION ≥ 0.01 INCH: 8	
COOLING:	409	43	1207	66	66			MAXIMUM TEMP ≤ 32: 0	MINIMUM TEMP ≤ 0: 0	PRECIPITATION ≥ 0.10 INCH: 6	
								THUNDERSTORMS: 7	HEAVY FOG: 0	SNOWFALL ≥ 1.0 INCH: :	

AUGUST 1999
RICHMOND, VA

HOURLY PRECIPITATION

(WATER EQUIVALENT IN INCHES)

RICHMOND, VA

AUGUST 1999

RIC

WBAN # 13740

DATE	FOR HOUR (LST) ENDING AT												DATE	FOR HOUR (LST) ENDING AT												DATE	Sum if Different (See Note)	2400 LST	
	1	2	3	4	5	6	7	8	9	10	11	12		13	14	15	16	17	18	19	20	21	22	23	24			Water	Equiv.
01													01							0.12	T	T			01		0.12		
02													02												02		0.00		
03													03												03		0.00		
04													04												04		0.00		
05													05												05		0.00		
06													06												06		0.00		
07													07												07		0.00		
08													08			T									08		0.01		
09													09						T	0.01	T				09		0.00		
10													10												10		0.00		
11													11												11		0.00		
12													12												12		0.00		
13													13												13		0.00		
14													14				T	0.05	0.01	T	0.14	0.09	0.01	0.02	14		0.32		
15													15												15		0.00		
16													16												16		0.00		
17													17				T								17		0.00		
18													18												18		T		
19													19												19		0.91		
20	T		0.08	0.03		T	0.02	T	T	T			20											T	0.91	20	0.13		
21													21												21		0.00		
22													22												22		0.00		
23													23	T									T	T	23		T		
24													24										T	T	24		0.00		
25					T	0.07	0.05	T			0.01	0.06	0.05	25	0.10		T					0.01	T	0.02	25		0.37		
26	T												26			T	0.12	T					T	T	26	0.12	0.13		
27	0.02	T											27												27	0.02	0.01		
28													28												28		0.00		
29													29												29		0.00		
30													30												30		0.00		
31													31												31		0.00		

MAXIMUM SHORT DURATION PRECIPITATION (See Note)

Time Period (Minutes)	5	10	15	20	30	45	60	80	100	120	150	180
Precipitation (Inches)												
Ending Date												
Ending Time (Hour/Min)												

Date and time are not entered for TRACE amounts.

Note : The sum of the hourly totals is given when it differs from the daily total. NWS does not edit ASOS hourly values but may edit daily and monthly totals. Hourly, daily, and monthly totals are printed as reported by the ASOS site.

REFERENCE NOTES & SUPPLEMENTAL SUMMARIES

* = Extreme for the month (last occurrence if more than one)

T = Trace precipitation amount

+ = also occurs on earlier date

FG+ = Heavy fog, visibility .25 miles or less
BLANK entries denote missing or unreported data

Resultant wind is the vector sum of the wind speeds and directions divided by the number of observations.

Wind direction is recorded in tens of degrees (2 digits) clockwise from true north. '00' = calm, 'VR' = variable.

Precipitation is for the 24-hour period ending at the time indicated in the column heading.

Water Equivalent of snow on the ground is reported only when the depth is 2 or more inches.

NORMALS ARE FOR THE YEARS 1961 – 1990

WEATHER NOTATIONS

QUALIFIER	WEATHER PHENOMENA		
	PRECIPITATION	OBSCURATION	OTHER
BC Patches	DZ Drizzle	BR Mist	DS Duststorm
BL Blowing	GR Hail	DU Widespread Dust	FC Funnel Cloud
DR Low Drifting	GS Small Hail and/or Snow Pellets	FG Fog	+FC Tornado Waterspout
FZ Freezing	IC Ice Crystals	FU Smoke	PO Well-Developed Dust/Sand Whirls
MI Shallow	PL Ice Pellets	HZ Haze	
PR Partial	RA Rain	PY Spray	SQ Squalls
SH Shower(s)	SG Snow Grains	SA Sand	SS Sandstorm
TS Thunderstorm	SN Snow	VA Volcanic Ash	GL Glaze
VC In the Vicinity	UP Unknown Precipitation		

Intensity (as indicated on pages 4 to 6):
'+' = Heavy '' = Moderate '-' = Light

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Ceilorometer (30-second) data are used to derive cloudiness at or below 12,000 feet. This cloudiness is the mean cloud cover detected during sunrise to sunset (SR-SS), or midnight to midnight (MN-MN).

Satellite data are used to derive cloudiness above 12,000 feet. Effective Cloud Amount is based on the cloud cover and the transparency of the clouds within the satellite field of view (approx. 31x31 miles).

Sky Condition is based on the sum (not to exceed 8) of the sunrise to sunset cloud cover below and above 12,000 feet. Both ceilometer and satellite data must be present to compute Sky Condition. Clear = 0-2 oktas, Partly Cloudy = 3-6 oktas, Cloudy = 7-8 oktas.

A Heating (Cooling) Degree Day is the difference between the average daily temperature and 65 degrees F. The HDD season begins July 1, the CDD season begins January 1.

Dew Point is the temperature to which the air must be cooled to achieve 100% relative humidity. Wet Bulb is the temperature the air would have if cooled at constant pressure by evaporation of moisture into it, to 100% relative humidity.

Snow Depth, Snowfall, and Sunshine data may come from nearby sites that the National Weather Service deems Climatologically representative of this site.

ADDITIONAL NOTES:

DATE	SUNSHINE		CLOUDINESS (OKTAS)				VISIBILITY (MILES)		RESERVED
	TOTAL MINUTES	PERCENT POSSIBLE	SR-SS		MN-MN		MINIMUM	MAXIMUM	
			CEILOMETER	SATELLITE	CEILOMETER	SATELLITE			
01							5.00	10.00	
02							8.00	10.00	
03							10.00	10.00	
04							9.00	10.00	
05							7.00	10.00	
06							5.00	10.00	
07							4.00	10.00	
08							4.00	10.00	
09							8.00	10.00	
10							8.00	10.00	
11							7.00	10.00	
12							3.00	8.00	
13							2.00	7.00	
14							3.00	10.00	
15							6.00	10.00	
16							6.00	10.00	
17							2.00	10.00	
18							3.00	10.00	
19							7.00	10.00	
20							6.00	10.00	
21							1.75	10.00	
22							3.00	10.00	
23							3.00	9.00	
24							4.00	10.00	
25							2.00	10.00	
26							6.00	10.00	
27							2.00	10.00	
28							2.50	7.00	
29							1.50	10.00	
30							10.00	10.00	
31							10.00	10.00	
MONTHLY AVGS							5.12	9.71	
SUNSHINE (MINUTES)									
Total: Possible:									
Percent Possible:									
NUMBER OF DAYS WITH:									
SKY CONDITION									
CLR PTLY CLDY CLOUDY MISSING									
31									
MINIMUM VISIBILITY (MILES)									
<=0.25 <=3.0 >=7.0									
0 12 10									

OBSERVATIONS AT 3-HOURLY INTERVALS

RICHMOND, VA

AUGUST 1999

RIC

WBAN # 13740

Table with columns for Hour (LST), Sky Cover, Ceiling, Observation Time, Satellites, Visibility, Weather, Temperature (Dry Bulb, Dew Point, Wet Bulb), Relative Humidity, Wind (Speed, Direction), Pressure (Station, Sea Level), and their counterparts for the second half of the day (Aug 07-12).

OBSERVATIONS AT 3-HOURLY INTERVALS

RICHMOND, VA

AUGUST 1999

RIC

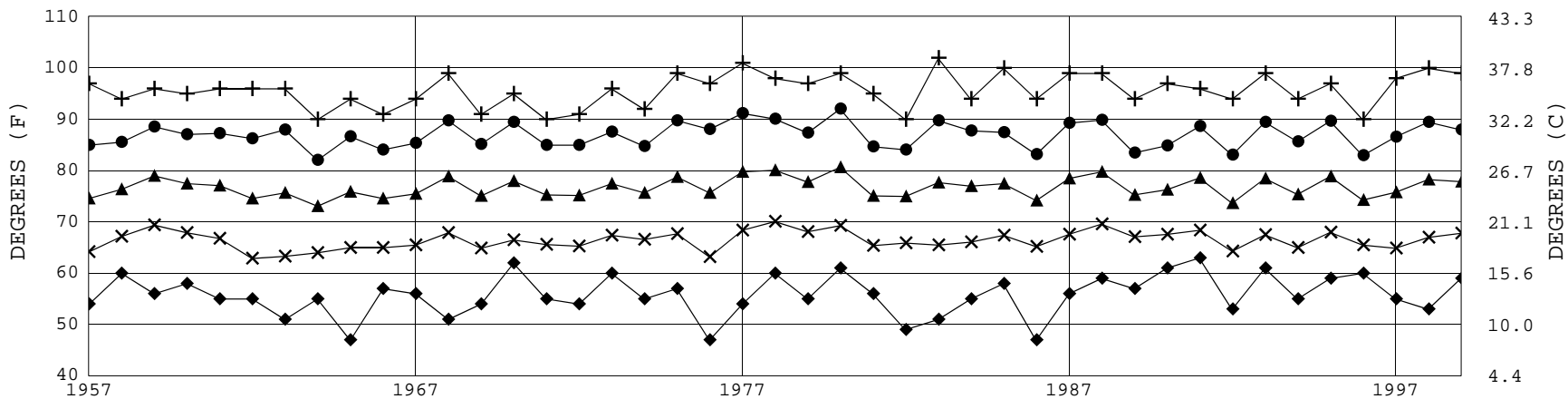
WBAN # 13740

HOUR (LST)	SATELLITE		WEATHER	TEMPERATURE °F			RELATIVE HUMIDITY (PCT)	WIND		PRESSURE (INCHES, HG)		HOUR (LST)	SATELLITE		WEATHER	TEMPERATURE °F			RELATIVE HUMIDITY (PCT)	WIND		PRESSURE (INCHES, HG)				
	SKY COVER	CEILING 100'S OF FT		OBSERVATION TIME (LST)	EFF CLD AMT Oktas	VISIBILITY (MILES)		DRY BULB	DEW POINT	WET BULB	SPEED (MPH)		DIRECTION TENS OF DEG	STATION		SEA LEVEL	SKY COVER	CEILING 100'S OF FT		OBSERVATION TIME (LST)	EFF CLD AMT Oktas	VISIBILITY (MILES)	DRY BULB	DEW POINT	WET BULB	SPEED (MPH)
				SUNRISE: 0533		AUG 25		SUNSET: 1849								SUNRISE: 0538		AUG 31		SUNSET: 1840						
01	OVC	150		10.00								01	BKN	150		10.00										
04	OVC	065		10.00								04	OVC	150		10.00										
07	OVC	045		9.00	-RA							07	OVC	150		10.00										
10	OVC	025		10.00								10	OVC	150		10.00										
13	OVC	008		9.00								13	OVC	150		10.00										
16	BKN	060		10.00								16	OVC	150		10.00										
19	SCT	NC		10.00								19	OVC	150		10.00										
22	OVC	150		10.00								22	OVC	150		10.00										
				SUNRISE: 0534		AUG 26		SUNSET: 1847				3-HOURLY OBSERVATION NOTES														
01	OVC	016		10.00								Sky Cover is the amount of the sky obscured. CLR or SKC = 0, FEW = 1/8-2/8, SCT = 3/8-4/8, BKN = 5/8-7/8, OVC = 8/8, VV = Vertical Visibility = 8/8. Ceiling is reported in hundreds of feet above ground level for clouds at or below 12,000 feet. NC= No ceiling detected. & = Original observation contained additional weather elements. See page 3 for additional notes.														
04	BKN	003		6.00	BR																					
07	BKN	250		7.00																						
10	OVC	007		7.00																						
13	BKN	023		6.00	HZ																					
16	OVC	031		10.00	-TSRA																					
19	BKN	046		9.00	TS																					
22	OVC	150		8.00																						
				SUNRISE: 0535		AUG 27		SUNSET: 1846																		
01	OVC	031		5.00	-RA BR																					
04	OVC	150		4.00	BR																					
07	OVC	004		2.50	BR																					
10	OVC	022		8.00																						
13	SCT	NC		8.00																						
16	SCT	NC		10.00																						
19	SCT	NC		9.00																						
22	SCT	NC		7.00																						
				SUNRISE: 0536		AUG 28		SUNSET: 1845																		
01	SCT	NC		4.00	BR																					
04	FEW	NC		4.00	BR																					
07	CLR	NC		4.00	BR																					
10	CLR	NC		7.00																						
13	FEW	NC		7.00																						
16	SCT	NC		7.00																						
19	SCT	NC		5.00	HZ																					
22	SCT	NC		4.00	BR																					
				SUNRISE: 0537		AUG 29		SUNSET: 1843																		
01	SCT	NC		3.00	BR																					
04	BKN	250		3.00	BR																					
07	OVC	250		2.00	BR																					
10	OVC	250		6.00	HZ																					
13	OVC	250		7.00																						
16	OVC	055		5.00	HZ																					
19	OVC	200		4.00	HZ																					
22	OVC	200		5.00	HZ																					
				SUNRISE: 0538		AUG 30		SUNSET: 1842																		
01	OVC	060		10.00																						
04	OVC	200		10.00																						
07	OVC	160		10.00																						
10	OVC	200		10.00																						
13	OVC	200		10.00																						
16	OVC	050		10.00																						
19	BKN	170		10.00																						
22	BKN	150		10.00																						

SUMMARY BY HOUR

HOUR (LST)	AVERAGES											RESULTANT WIND (MPH)	
	CEILOMETER	EFF CLD AMT	DRY BULB	DEW POINT	WET BULB	RELATIVE HUMIDITY	PRESSURE (INCHES, HG)		VISIBILITY (MILES)	WIND SPEED (MPH)	DIRECTION	SPEED	DIRECTION
							STATION	SEA LEVEL					
01			72	67	68	85	29.76	29.95	7.48	5	0	0	0
02			71	67	68	87	29.75	29.95	7.48	5	0	0	0
03			70	66	68	89	29.75	29.95	7.06	5	1	2	2
04			69	66	67	89	29.75	29.94	7.19	6	0	0	0
05			69	66	67	88	29.76	29.95	7.05	6	2	35	
06			69	66	67	89	29.77	29.97	6.35	6	2	1	1
07			71	66	68	85	29.78	29.98	6.73	7	2	1	1
08			74	67	69	77	29.79	29.98	7.60	9	2	36	
09			78	67	71	71	29.79	29.99	8.37	9	3	36	
10			80	67	71	65	29.79	29.99	8.56	8	2	36	
11			83	66	72	59	29.79	29.99	8.58	8	1	35	
12			84	66	72	55	29.77	29.97	8.55	7	0	0	0
13			86	65	72	52	29.76	29.96	8.68	7	1	8	
14			86	65	72	51	29.75	29.94	8.74	9	2	16	
15			86	65	72	52	29.73	29.93	8.68	10	2	14	
16			85	65	72	53	29.73	29.92	8.90	10	2	15	
17			83	65	71	56	29.73	29.92	8.77	10	1	14	
18			82	66	71	61	29.73	29.93	8.65	8	2	13	
19			79	67	71	68	29.74	29.94	8.26	8	3	10	
20			76	67	70	76	29.75	29.95	8.39	7	2	11	
21			75	67	70	78	29.77	29.96	7.97	7	2	14	
22			73	67	69	82	29.77	29.97	7.55	6	1	11	
23			73	67	69	82	29.78	29.97	7.52	6	1	8	
24			72	66	68	84	29.77	29.97	7.68	6	1	9	

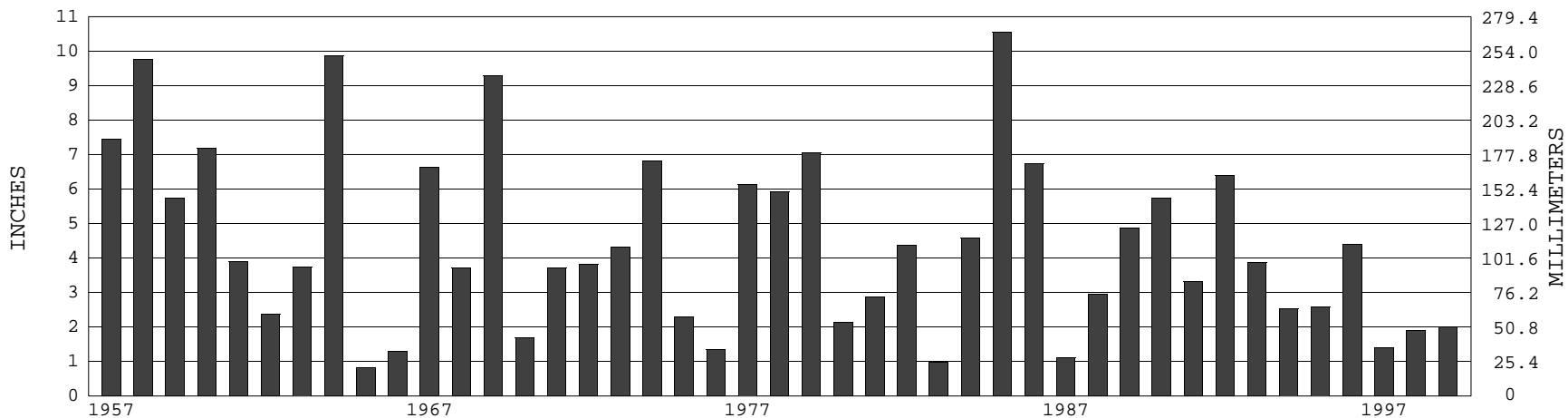
RICHMOND, VA AUGUST TEMPERATURES



+ Extreme Max. ● Mean Max. ▲ Mean × Mean Min. ◆ Extreme Min.

Long-Term (1957-1999) Mean: 76.8 1961-1990 Normal: 76.8

RICHMOND, VA AUGUST PRECIPITATION



Long-Term (1957-1999) Mean Monthly Total: 4.43

1961-1990 Normal: 4.40



**AUGUST 1999
RICHMOND, VA**

LOCAL CLIMATOLOGICAL DATA

NOAA, National Climatic Data Center

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DIRECTOR

NOTICE

Effective July 1, 1996, the National Weather Service & Federal Aviation Administration began using the METAR format for Hourly Observations.

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