



JULY 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	85	73	79	2	73	74	0	14	RA BR				0.25	29.87	30.07	13.0	19	13.3	31	19	25	20	01	
02	87	71	79	2	71	74	0	14					0.00	29.92	30.12	12.0	21	12.2	25	21	21	20	02	
03	92	74	83	6	74	76	0	18					0.00	29.97	30.17	7.6	21	8.7	21	21	15	22	03	
04	93	73	83	6	75	77	0	18					0.00	29.93	30.13	6.1	21	6.9	18	19	13	20	04	
05	98	76	87	10	75	79	0	22	BR HZ				0.00	29.84	30.04	2.4	26	5.9	18	26	15	01	05	
06	96	77	87	10	75	79	0	22	BR HZ				0.00	29.75	29.95	2.3	19	6.7	17	22	16	22	06	
07	91	71	81	3	73	75	0	16	TS TSRA RA BR HZ				0.35	29.75	29.95	0.7	21	7.1	29	31	23	34	07	
08	89	71	80	2	64	70	0	15	BR				0.00	29.80	30.00	2.4	33	5.6	16	32	13	01	08	
09	95	70	83	5	69	74	0	18	BR HZ				0.00	29.77	29.96	7.6	22	8.0	22	23	18	23	09	
10	90	70	80	2	69	73	0	15	TSRA RA BR				0.55	29.72	29.91	5.8	25	9.3	31	30	28	29	10	
11	78	66	72	-6	51	60	0	7	RA				T	29.96	30.15	4.8	04	7.6	18	04	16	02	11	
12	72	59	66	-12	60	62	0	1	RA BR				0.36	30.00	30.20	7.0	04	7.8	20	02	16	06	12	
13	71	59*	65*	-13	63	64	0	0	RA BR				0.51	29.97	30.17	6.3	05	7.7	18	01	16	01	13	
14	73	62	68	-10	65	65	0	3	RA BR				0.61	30.00	30.20	4.7	03	5.2	14	02	11	01	14	
15	83	66	75	-3	67	69	0	10					0.00	30.00	30.20	1.3	19	4.1	11	17	10	17	15	
16	87	65	76	-2	68	71	0	11	BR				0.00	29.99	30.19	5.1	17	5.6	13	17	10	16	16	
17	88	66	77	-1	69	72	0	12	BR				0.00	29.98	30.18	5.0	19	5.6	17	18	14	18	17	
18	89	72	81	3	70	73	0	16	BR HZ				0.00	29.92	30.12	2.1	21	3.6	25	30	22	31	18	
19	92	69	81	3	69	73	0	16	BR HZ				0.00	29.83	30.03	7.7	24	8.2	20	23	16	24	19	
20	90	72	81	3	72	75	0	16	BR HZ				0.00	29.82	30.02	2.5	04	6.0	17	09	15	08	20	
21	85	73	79	1	73	74	0	14	RA BR HZ				0.01	29.90	30.10	5.3	10	6.2	15	11	14	12	21	
22	92	73	83	4	74	76	0	18	BR HZ				0.00	29.80	29.99	3.4	24	5.8	15	27	13	27	22	
23	94	73	84	5	72	76	0	19	BR HZ				0.00	29.74	29.94	2.9	04	6.4	16	02	14	01	23	
24	97	71	84	5	73	75	0	19	TSRA RA BR HZ				0.10	29.69	29.88	5.4	21	8.4	31	36	25	36	24	
25	94	71	83	4	70	74	0	18	BR				0.00	29.63	29.83	3.6	24	7.1	20	23	17	24	25	
26	94	70	82	3	66	71	0	17	RA BR				T	29.63	29.83	5.1	34	6.3	26	31	20	30	26	
27	94	69	82	3	66	71	0	17	HZ FU				0.00	29.70	29.90	3.1	24	4.9	16	22	13	23	27	
28	95	70	83	5	69	73	0	18	TSRA RA BR HZ				0.03	29.71	29.91	3.2	20	5.6	44*	29	33*	29	28	
29	91	67	79	1	69	72	0	14	BR				0.00	29.57	29.77	3.0	24	5.8	18	27	15	23	29	
30	97	70	84	6	70	75	0	19	HZ				0.00	29.53	29.73	1.9	23	4.7	17	23	14	23	30	
31	100*	76	88*	10	71	76	0	23	BR HZ				0.00	29.60	29.79	2.1	23	5.0	21	22	17	23	31	

89.4	69.8	79.6	■ ■	69.2	72.5	0.0	14.8	< MONTHLY AVERAGES	TOTALS-->				2.77	29.82	30.01	0.4	27	6.8	<- MONTHLY AVERAGES			
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1.0	2.3	1.6	■ ■	----- DEPARTURE FROM NORMAL ----->								-2.26	SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3											
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DEGREE DAYS								GREATEST 24-HR PRECIPITATION: 0.87 DATE: 12-13				SEA LEVEL PRESSURE DATE TIME							
MONTHLY TOTAL DEPARTURE				SEASON TO DATE TOTAL DEPARTURE				GREATEST 24-HR SNOWFALL: DATE: DATE:				MAXIMUM : 30.24 12 1054							
HEATING: 0 0 0 0				COOLING: 460 57 798 23				GREATEST SNOW DEPTH: DATE: DATE:				MINIMUM : 29.68 30 1554							
NUMBER OF DAYS WITH →								MAXIMUM TEMP ≥ 90: 19				MINIMUM TEMP ≤ 32: 0				PRECIPITATION ≥ 0.01 INCH : 9			
								MAXIMUM TEMP ≤ 32 : 0				MINIMUM TEMP ≤ 0 : 0				PRECIPITATION ≥ 0.10 INCH : 7			
								THUNDERSTORMS : 4				HEAVY FOG : 0				SNOWFALL ≥ 1.0 INCH :			

JULY 1999 RICHMOND, VA

HOURLY PRECIPITATION

(WATER EQUIVALENT IN INCHES)

RICHMOND, VA

JULY 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					T	T	0.14	0.09	0.01	0.01	T	T	01												01		0.25		
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				0.11	0.18	0.06						07		0.35		
08													08												08		0.00		
09													09												09		0.00		
10													10		0.04	0.02	T		T	0.01	T	0.23	0.25	T	10		0.55		
11					T								11												11		T		
12													12	T	T	T	0.02	0.03		0.04	0.01		0.07	0.04	0.07	12	0.28	0.36	
13	0.08	0.12	0.09	0.07	0.14	0.02	T						13		T										13	0.52	0.51		
14	0.07	0.02	0.04	0.08	0.13	0.01	0.08	0.09	0.02	0.01	0.03	0.01	14	0.01	0.01	T									14		0.61		
15													15												15		0.00		
16													16												16		0.00		
17													17												17		0.00		
18													18												18		0.00		
19													19												19		0.00		
20													20												20		0.00		
21			T	T	T	T							21	T	T					0.01	T				21		0.01		
22													22												22		0.00		
23													23												23		0.00		
24													24				0.06	T	0.04	T					24		0.10		
25													25												25		0.00		
26													26												26		T		
27													27												27		0.00		
28													28												28		0.03		
29													29						T	0.03	T				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	SQ Squalls
PR Partial	RA Rain	PY Spray	SS Sandstorm
SH Shower(s)	SG Snow Grains	SA Sand	GL Glaze
TS Thunderstorm	SN Snow	VA Volcanic Ash	
VC In the Vicinity	UP Unknown Precipitation		

Intensity (as indicated on pages 4 to 6):

'+' = Heavy '' = Moderate '-' = Light

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Ceilometer (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							1.50	10.00	
02							7.00	10.00	
03							9.00	10.00	
04							7.00	10.00	
05							4.00	10.00	
06							4.00	7.00	
07							1.50	10.00	
08							4.00	10.00	
09							4.00	10.00	
10							1.50	10.00	
11							7.00	10.00	
12							2.00	10.00	
13							2.50	10.00	
14							6.00	10.00	
15							9.00	10.00	
16							4.00	10.00	
17							6.00	10.00	
18							2.50	8.00	
19							4.00	9.00	
20							2.00	9.00	
21							2.00	9.00	
22							.75	10.00	
23							4.00	10.00	
24							1.00	10.00	
25							6.00	10.00	
26							6.00	10.00	
27							5.00	10.00	
28							4.00	10.00	
29							5.00	10.00	
30							6.00	10.00	
31							4.00	10.00	
MONTHLY AVGS							4.27	9.74	
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		10		5					

OBSERVATIONS AT 3-HOURLY INTERVALS

RICHMOND, VA

JULY 1999

RIC

WBAN # 13740

Table with columns for HOUR (LST), SKY COVER, CEILING, SATELLITE, WEATHER, TEMPERATURE (F), WIND, PRESSURE (INCHES, HG), and their respective sub-columns for each day from JUL 01 to JUL 12.

OBSERVATIONS AT 3-HOURLY INTERVALS

RICHMOND, VA

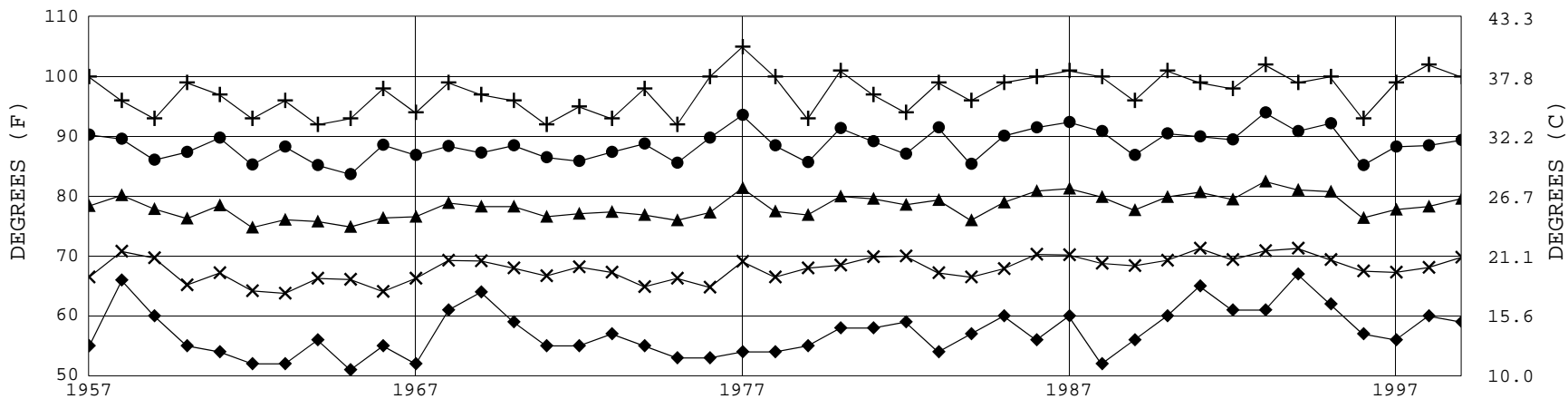
JULY 1999

RIC

WBAN # 13740

HOUR (LST)	SKY COVER		CEILING 100'S OF FT	SATELLITE		WEATHER	TEMPERATURE ° F			RELATIVE HUMIDITY (PCT)	WIND		PRESSURE (INCHES, HG)		HOUR (LST)	SKY COVER		CEILING 100'S OF FT	SATELLITE		WEATHER	TEMPERATURE ° F			RELATIVE HUMIDITY (PCT)	WIND		PRESSURE (INCHES, HG)		
	SKY COVER	CEILING		OBSERVATION TIME (LST)	EFF CLD AMT Ok/as		VISIBILITY (MILES)	DRY BULB	DEW POINT		WET BULB	SPEED (MPH)	DIRECTION TENS OF DEG	STATION		SEA LEVEL	SKY COVER		CEILING	OBSERVATION TIME (LST)		EFF CLD AMT Ok/as	VISIBILITY (MILES)	DRY BULB		DEW POINT	WET BULB	RELATIVE HUMIDITY (PCT)	SPEED (MPH)	DIRECTION TENS OF DEG
SUNRISE: 0507							JUL 25			SUNSET: 1924					SUNRISE: 0512							JUL 31			SUNSET: 1919					
01	CLR	NC			9.00		72	70	71	94	9	26	29.67	29.87	01	CLR	NC			6.00	HZ		79	72	74	79	0	00	29.56	29.75
04	BKN	250			9.00		72	69	70	91	6	24	29.63	29.83	04	CLR	NC			5.00	BR		77	73	74	88	3	27	29.57	29.77
07	SCT	NC			6.00	BR	75	71	72	88	5	29	29.66	29.86	07	CLR	NC			5.00	HZ		83	73	76	72	5	35	29.63	29.82
10	FEW	NC			10.00		87	71	76	59	9	01	29.69	29.88	10	FEW	NC			10.00			93	70	77	47	5	33	29.63	29.83
13	SCT	NC			10.00		92	63	73	38	9	30	29.65	29.85	13	SCT	NC			10.00			97	64	75	34	5	VR	29.62	29.81
16	BKN	090			9.00		88	72	77	59	9	15	29.60	29.79	16	SCT	NC			10.00			98	65	75	34	7	22	29.57	29.76
19	SCT	NC			10.00		85	69	74	59	6	22	29.59	29.78	19	BKN	250			8.00			88	74	78	63	7	20	29.58	29.78
22	CLR	NC			10.00		78	72	74	82	6	18	29.61	29.81	22	BKN	250			8.00			83	74	77	74	0	00	29.62	29.81
SUNRISE: 0508							JUL 26			SUNSET: 1924					3-HOURLY OBSERVATION NOTES															
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.																														
01	CLR	NC			9.00		75	70	72	84	5	32	29.62	29.81																
04	CLR	NC			8.00		72	68	69	87	5	32	29.61	29.80																
07	CLR	NC			7.00		76	68	71	77	7	32	29.64	29.83																
10	CLR	NC			10.00		87	63	71	45	8	29	29.64	29.83																
13	FEW	NC			10.00		92	62	72	37	12	32	29.62	29.82																
16	SCT	NC			10.00		92	62	72	37	14	33	29.60	29.80																
19	FEW	NC			10.00		83	66	72	57	6	07	29.62	29.82																
22	CLR	NC			10.00		77	67	70	71	0	00	29.67	29.87																
SUNRISE: 0509							JUL 27			SUNSET: 1923					SUMMARY BY HOUR															
AVERAGES														RESULTANT WIND (MPH)																
HOUR (LST)	CEILOMETER	EFF CLD AMT	DRY BULB	DEW POINT	WET BULB	RELATIVE HUMIDITY	PRESSURE (INCHES, HG)		VISIBILITY (MILES)	WIND SPEED (MPH)	SPEED	DIRECTION																		
							STATION	SEA LEVEL																						
01			74	69	71	85	29.82	30.01	7.42	5	3	22																		
02			73	69	70	87	29.81	30.01	7.48	4	2	21																		
03			72	69	70	88	29.81	30.00	7.11	5	2	21																		
04			72	69	70	90	29.81	30.00	6.66	5	2	21																		
05			72	68	70	91	29.82	30.02	6.27	4	1	24																		
06			72	69	70	90	29.83	30.02	5.59	5	0	0																		
07			75	69	71	84	29.84	30.04	6.15	6	2	26																		
08			78	69	72	76	29.85	30.05	7.58	8	2	30																		
09			81	69	73	70	29.85	30.04	8.29	8	1	29																		
10			83	69	74	64	29.85	30.04	8.81	8	2	29																		
11			85	69	74	61	29.85	30.04	8.77	7	2	24																		
12			86	68	74	57	29.84	30.03	8.90	7	2	24																		
13			87	68	74	54	29.82	30.02	8.97	8	2	24																		
14			87	68	75	56	29.81	30.01	8.90	8	3	20																		
15			87	68	74	54	29.79	29.99	9.03	9	3	21																		
16			87	68	74	56	29.79	29.98	8.61	9	3	21																		
17			86	68	74	59	29.78	29.98	8.35	9	3	19																		
18			84	69	74	64	29.79	29.97	8.15	8	4	19																		
19			81	70	74	71	29.79	29.99	8.03	8	4	18																		
20			79	71	73	77	29.80	30.00	8.45	6	3	18																		
21			77	71	73	81	29.81	30.01	8.32	6	4	18																		
22			76	69	72	80	29.82	30.01	8.05	6	3	19																		
23			76	69	71	82	29.82	30.01	8.06	6	3	21																		
24			75	69	71	83	29.82	30.01	7.84	5	2	22																		
SUNRISE: 0510							JUL 28			SUNSET: 1922																				
01	CLR	NC			7.00		76	69	71	79	0	00	29.72	29.92																
04	CLR	NC			6.00	BR	72	68	69	87	3	18	29.72	29.91																
07	OVC	250			6.00	HZ	79	68	72	69	6	32	29.75	29.95																
10	FEW	NC			10.00		90	67	74	47	6	03	29.77	29.96																
13	OVC	250			10.00		93	66	75	41	8	18	29.71	29.91																
16	OVC	250			8.00		91	70	76	50	8	19	29.66	29.86																
19	OVC	150			7.00	-TSRA	87	74	78	65	9	25	29.67	29.87																
22	BKN	095			9.00		72	69	70	91	6	24	29.69	29.88																
SUNRISE: 0511							JUL 29			SUNSET: 1921																				
01	FEW	NC			7.00		70	68	69	93	7	21	29.64	29.83																
04	SCT	NC			6.00	BR	69	68	68	96	5	24	29.60	29.80																
07	SCT	NC			5.00	BR	72	69	70	91	6	32	29.62	29.81																
10	OVC	250			10.00		82	68	73	63	5	19	29.59	29.79																
13	FEW	NC			10.00		86	70	75	59	12	19	29.57	29.77																
16	BKN	043			10.00		88	71	76	57	6	22	29.52	29.71																
19	SCT	NC			9.00		85	72	76	65	5	25	29.51	29.70																
22	FEW	NC			10.00		78	69	72	74	6	28	29.55	29.74																
SUNRISE: 0511							JUL 30			SUNSET: 1920																				
01	SCT	NC			10.00		75	69	71	82	3	31	29.56	29.75																
04	CLR	NC			9.00		72	69	70	91	0	00	29.52	29.72																
07	FEW	NC			7.00		76	69	71	79	6	19	29.54	29.73																
10	SCT	NC			10.00		90	68	75	49	10	21	29.54	29.73																
13	SCT	NC			9.00		95	70	77	44	7	24	29.51	29.70																
16	SCT	NC			9.00		96	67	76	39	8	35	29.48	29.68																
19	FEW	NC			8.00		90	72	77	56	3	10	29.51	29.70																
22	CLR	NC			7.00		81	73	75	77	0	00	29.56	29.75																

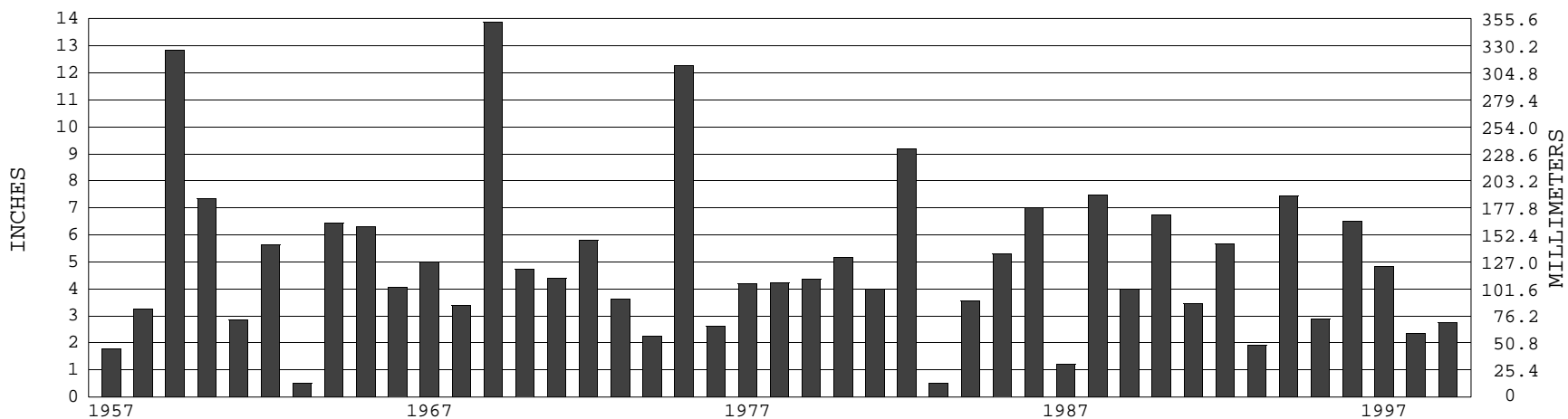
RICHMOND, VA JULY TEMPERATURES



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

Long-Term (1957-1999) Mean: 78.3 1961-1990 Normal: 78.0

RICHMOND, VA JULY PRECIPITATION



Long-Term (1957-1999) Mean Monthly Total: 4.98

1961-1990 Normal: 5.03



JULY 1999
RICHMOND, VA

LOCAL CLIMATOLOGICAL DATA

NOAA, National Climatic Data Center

I certify that this is an official publication of the National Oceanic and Atmospheric Administration (NOAA). It is compiled using information from weather observing sites operated by NOAA – National Weather Service / Department Of Transportation – Federal Aviation Administration and received at the National Climatic Data Center (NCDC), Asheville, North Carolina 28801.

DIRECTOR

NOTICE

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

We welcome your questions or comments, please contact us at
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