



DECEMBER 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): 165 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	38	25	32	-13	12	25	33	0					0.00	30.24	30.44	11.5	34	11.8	30	01	23	36	01										
02	53	24	39	-5	14	30	26	0					0.00	30.16	30.35	1.7	28	2.7	11	26	9	26	02										
03	63	29	46	2	26	38	19	0					0.00	30.07	30.26	4.2	19	5.0	11	22	9	21	03										
04	72*	44	58	15	38	48	7	0					0.00	30.05	30.24	6.9	23	7.4	21	22	16	22	04										
05	70	45	58*	15	46	52	7	0					0.00	29.95	30.14	11.0	20	11.5	37*	22	24	23	05										
06	62	45	54	11	54	56	11	0	RA BR				0.15	29.71	29.90	2.2	20	11.8	33	01	26*	36	06										
07	52	32	42	0	30	37	23	0					0.00	30.03	30.23	8.5	33	8.8	28	32	21	33	07										
08	56	28	42	0	32	37	23	0	BR				0.00	30.21	30.40	2.1	17	2.7	10	23	9	24	08										
09	60	30	45	3	35	41	20	0					0.00	30.14	30.34	4.6	18	4.8	13	18	11	18	09										
10	61	46	54	13	49	52	11	0	RA BR HZ				0.16	29.80	29.99	6.0	21	10.5	32	01	25	02	10										
11	53	29	41	0	23	35	24	0					0.00	30.01	30.21	4.7	31	7.3	31	01	25	01	11										
12	52	26	39	-2	28	35	26	0					0.00	29.98	30.17	1.5	17	2.0	9	20	7	18	12										
13	59	45	52	11	47	49	13	0	RA BR				0.07	29.84	30.03	1.3	10	3.8	11	02	9	02	13										
14	54	46	50	10	49	50	15	0	RA FG BR				1.02	29.69	29.88	5.0	35	7.7	17	30	15	29	14										
15	53	40	47	7	43	44	18	0	FG BCFG BR				0.00	29.85	30.04	4.4	15	5.2	17	20	15	20	15										
16	51	33	42	2	26	38	23	0					0.00	29.86	30.05	8.1	26	9.2	26	27	22	25	16										
17	55	28	42	2	23	35	23	0					0.00	30.04	30.24	8.1	22	8.9	18	23	16	23	17										
18	60	30	45	6	28	38	20	0					0.00	30.04	30.24	2.0	14	4.6	13	15	9	15	18										
19	49	40	45	6	41	43	20	0	BR				0.00	30.07	30.27	10.1	03	10.2	18	04	15	03	19										
20	49	44	47	8	45	46	18	0	RA DZ BR				0.09	29.90	30.10	3.9	35	7.6	16	04	13	02	20										
21	51	36	44	5	43	44	21	0	RA DZ BR				0.20	29.97	30.16	3.6	03	5.9	18	03	15	04	21										
22	42	27	35	-3	30	33	30	0	RA DZ BR				0.03	30.09	30.29	6.1	01	7.1	22	01	18	02	22										
23	44	23	34	-4	28	31	31	0	FG+ FZFG BR				0.00	30.07	30.27	4.2	23	5.1	15	23	11	26	23										
24	34	23	29	-9	18	25	36	0	SN				T	30.04	30.24	6.2	02	7.8	20	01	16	36	24										
25	33	18*	26*	-12	11	20	39	0					0.00	30.19	30.39	5.0	33	7.7	20	01	17	01	25										
26	51	20	36	-2	17	29	29	0					0.00	29.70	29.90	10.1	23	12.5	30	24	24	23	26										
27	45	24	35	-2	21	30	30	0	SN				T	29.68	29.88	2.8	32	5.0	17	26	14	02	27										
28	36	27	32	-5	22	29	33	0	SN				T	29.59	29.78	1.5	17	5.3	15	16	11	28	28										
29	45	22	34	-3	21	30	31	0					0.00	29.72	29.92	5.6	24	7.0	21	27	16	24	29										
30	62	34	48	11	28	39	17	0					0.00	29.74	29.93	10.9	21	11.1	22	23	21	22	30										
31	62	36	49	12	34	41	16	0					0.00	29.87	30.06	1.4	29	4.1	13	34	11	29	31										
										52.5		32.2	42.4	■ ■	31.0	38.1	22.4	0.0	< MONTHLY AVERAGES		TOTALS-->		1.72	29.95	30.14	1.7	26	7.2	<- MONTHLY AVERAGES				
										2.3	2.3	2.3	■ ■	<----- DEPARTURE FROM NORMAL ----->										-1.54	SUNSHINE, CLOUD, & VISIBILITY TABLES ON PAGE 3								
DEGREE DAYS										GREATEST 24-HR PRECIPITATION: 1.05 DATE: 13-14				SEA LEVEL PRESSURE DATE TIME																			
MONTHLY TOTAL DEPARTURE										SEASON TO DATE TOTAL DEPARTURE				GREATEST 24-HR SNOWFALL: DATE: DATE:				MAXIMUM : 30.51 01 0154															
HEATING: 693 -79										1333 -157				GREATEST SNOW DEPTH: DATE: DATE:				MINIMUM : 29.65 28 1854															
COOLING: 0 0										1362 14				NUMBER OF DAYS WITH →				MAXIMUM TEMP ≥ 90: 0				MINIMUM TEMP ≤ 32: 18				PRECIPITATION ≥ 0.01 INCH : 7							
																		MAXIMUM TEMP ≤ 32 : 0				MINIMUM TEMP ≤ 0 : 0				PRECIPITATION ≥ 0.10 INCH : 4							
																						THUNDERSTORMS : 0				HEAVY FOG : 1				SNOWFALL ≥ 1.0 INCH :			

DECEMBER 1999
RICHMOND, VA

HOURLY PRECIPITATION

(WATER EQUIVALENT IN INCHES)

RICHMOND, VA

DECEMBER 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												01		0.00		
02													02												02		0.00		
03													03												03		0.00		
04													04												04		0.00		
05													05												05		0.00		
06				T	0.03	0.02	T	0.04		T	0.01	0.02	06	0.01	T				0.01		T	0.01	T	T	06	1.01	0.15		
07													07												07		0.00		
08													08												08		0.00		
09													09												09		0.00		
10												T	10	0.13	0.03										10		0.16		
11													11												11		0.00		
12													12												12		0.00		
13													13	T								T	0.02	0.01	13		0.07		
14		T	T	0.02	0.10	0.17	0.04	0.29	0.28	0.14	0.01		14												14	1.01	1.02		
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	T	0.01	T	T	T	0.01	T	0.01	0.01	T	T	0.01	20	T	0.02	0.01	0.01	T	T	T	T	T	T	20		0.09			
21													21		T	0.02	0.12	0.05	0.01	T				21		0.20			
22	0.01	T	T	T	0.01	T	T	0.01					22											T	22		0.03		
23													23												23		0.00		
24									T	T	T	T	24	T	T	T								24		T			
25													25												25		0.00		
26													26												26		0.00		
27													27								T	T			27		T		
28													28												28		T		
29													29									T	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

RICHMOND, VA DECEMBER 1999

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 to saturation at constant pressure by evaporation of water into it.

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							10.00	10.00	
02							10.00	10.00	
03							10.00	10.00	
04							10.00	10.00	
05							10.00	10.00	
06							2.00	10.00	
07							10.00	10.00	
08							6.00	10.00	
09							7.00	10.00	
10							2.00	10.00	
11							10.00	10.00	
12							10.00	10.00	
13							4.00	10.00	
14							.00	10.00	
15							.50	10.00	
16							8.00	10.00	
17							10.00	10.00	
18							10.00	10.00	
19							1.50	10.00	
20							1.25	10.00	
21							.50	10.00	
22							1.00	10.00	
23							<.25	10.00	
24							2.00	10.00	
25							10.00	10.00	
26							10.00	10.00	
27							8.00	10.00	
28							6.00	10.00	
29							10.00	10.00	
30							10.00	10.00	
31							10.00	10.00	
MONTHLY AVGS							6.47	9.94	
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 1 10 18									

OBSERVATIONS AT 3-HOURLY INTERVALS

RICHMOND, VA

DECEMBER 1999

RIC

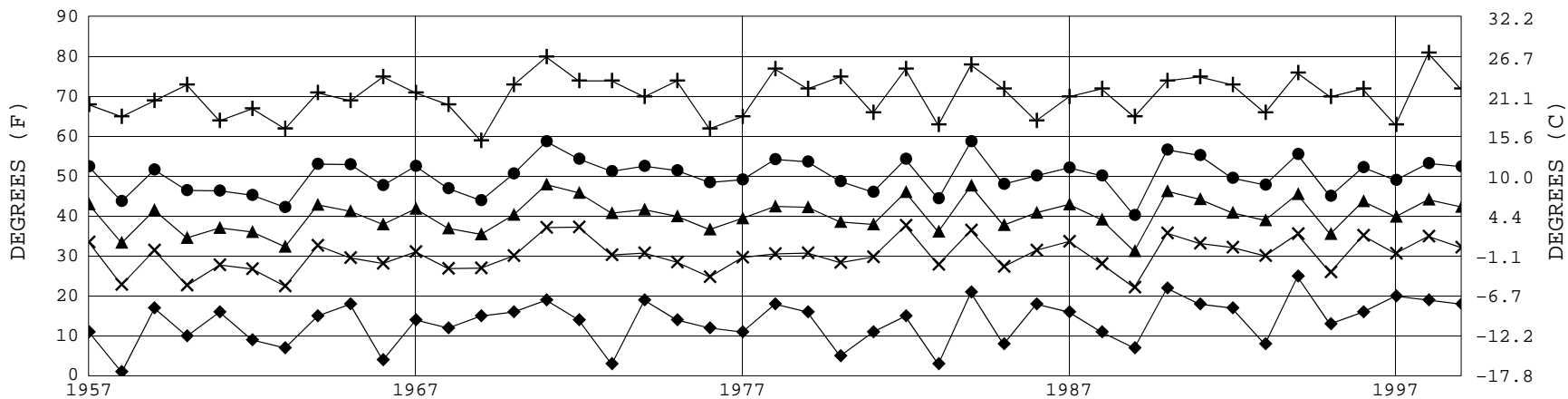
WBAN # 13740

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)
SUNRISE: 0722							DEC 25	SUNSET: 1657							SUNRISE: 0724							DEC 31	SUNSET: 1701						
01	CLR	NC			10.00		22	9	18	57	10	35	30.18	30.38	01	OVC	150			10.00		50	32	42	50	7	22	29.73	29.92
04	CLR	NC			10.00		21	10	18	62	9	35	30.20	30.40	04	BKN	150			10.00		44	32	39	63	3	24	29.75	29.94
07	CLR	NC			10.00		18	10	16	71	3	34	30.25	30.45	07	BKN	150			10.00		41	32	37	70	3	29	29.79	29.98
10	CLR	NC			10.00		26	10	22	51	13	01	30.28	30.48	10	BKN	140			10.00		48	33	42	56	3	32	29.86	30.05
13	FEW	NC			10.00		30	10	24	43	9	02	30.23	30.43	13	FEW	NC			10.00		59	35	48	41	7	31	29.84	30.04
16	CLR	NC			10.00		32	9	25	38	9	30	30.18	30.38	16	FEW	NC			10.00		60	35	48	39	7	36	29.88	30.07
19	CLR	NC			10.00		27	12	23	53	6	27	30.17	30.37	19	CLR	NC			10.00		46	35	41	66	0	00	29.96	30.16
22	CLR	NC			10.00		20	11	18	68	7	21	30.10	30.31	22	CLR	NC			10.00		38	33	36	83	5	18	30.01	30.20
SUNRISE: 0722							DEC 26	SUNSET: 1657							3-HOURLY OBSERVATION NOTES														
01	FEW	NC			10.00		22	12	19	66	10	20	30.02	30.22	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.														
04	CLR	NC			10.00		23	13	20	65	9	20	29.90	30.10	Ceiling is reported in hundreds of feet above ground level for clouds at or below 12,000 feet.														
07	CLR	NC			10.00		25	14	22	63	15	21	29.80	30.00	NC= No ceiling detected.														
10	FEW	NC			10.00		35	15	28	44	18	22	29.68	29.88	& = Original observation contained additional weather elements.														
13	FEW	NC			10.00		48	21	38	34	23	22	29.53	29.73	See page 3 for additional notes.														
16	SCT	NC			10.00		50	22	39	33	15	26	29.51	29.70															
19	CLR	NC			10.00		40	21	33	47	8	32	29.61	29.81															
22	FEW	NC			10.00		37	18	30	46	10	30	29.65	29.85															
SUNRISE: 0723							DEC 27	SUNSET: 1658																					
01	CLR	NC			10.00		34	18	29	52	8	26	29.66	29.85															
04	CLR	NC			10.00		27	19	24	72	0	00	29.65	29.84															
07	BKN	250			10.00		26	20	24	78	0	00	29.73	29.93															
10	OVC	200			10.00		37	22	32	54	0	00	29.73	29.93															
13	BKN	250			10.00		42	19	34	40	5	VR	29.66	29.85															
16	BKN	110			10.00		43	18	34	37	10	28	29.63	29.83															
19	OVC	090			10.00		39	18	32	43	7	35	29.68	29.88															
22	OVC	110			10.00		35	27	32	72	3	01	29.69	29.89															
SUNRISE: 0723							DEC 28	SUNSET: 1659																					
01	OVC	060			10.00		33	23	29	67	9	03	29.71	29.90															
04	OVC	075			10.00		31	22	28	69	0	00	29.71	29.90															
07	OVC	090			10.00		28	20	25	72	0	00	29.69	29.88															
10	OVC	045			10.00		32	18	27	56	7	07	29.69	29.89															
13	OVC	075			10.00		35	19	30	52	8	14	29.55	29.75															
16	OVC	120			10.00		35	21	30	57	5	19	29.47	29.67															
19	BKN	100			10.00		34	22	30	61	6	16	29.46	29.66															
22	OVC	039			6.00	-SN	34	27	31	76	8	26	29.48	29.67															
SUNRISE: 0723							DEC 29	SUNSET: 1659																					
01	FEW	NC			10.00		31	25	29	79	6	28	29.49	29.69															
04	OVC	060			10.00		30	23	28	75	7	28	29.57	29.77															
07	CLR	NC			10.00		27	21	25	78	0	00	29.66	29.86															
10	CLR	NC			10.00		36	21	31	55	6	27	29.79	29.99															
13	CLR	NC			10.00		41	17	33	38	12	27	29.77	29.97															
16	FEW	NC			10.00		44	18	35	35	12	25	29.77	29.97															
19	CLR	NC			10.00		33	20	29	59	6	18	29.81	30.01															
22	CLR	NC			10.00		33	24	30	70	13	20	29.79	29.99															
SUNRISE: 0723							DEC 30	SUNSET: 1700																					
01	CLR	NC			10.00		35	24	31	64	12	20	29.77	29.96															
04	CLR	NC			10.00		37	25	33	62	12	20	29.74	29.93															
07	CLR	NC			10.00		36	26	32	67	10	21	29.75	29.94															
10	CLR	NC			10.00		46	28	39	50	13	22	29.78	29.97															
13	OVC	250			10.00		60	27	46	28	16	22	29.70	29.89															
16	BKN	250			10.00		62	30	47	30	13	22	29.69	29.88															
19	BKN	200			10.00		51	31	42	46	8	21	29.73	29.93															
22	OVC	150			10.00		50	32	42	50	10	21	29.75	29.95															

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)	SPEED	DIRECTION
							STATION	SEA LEVEL				
01			39	29	35	70	29.95	30.15	8.85	7	2	30
02			38	29	35	73	29.95	30.15	8.69	7	1	27
03			38	30	35	75	29.95	30.15	8.45	6	1	28
04			37	30	34	76	29.95	30.14	8.48	6	1	27
05			37	30	34	77	29.95	30.14	8.15	6	1	27
06			36	30	34	78	29.95	30.15	8.23	6	1	28
07			36	30	34	79	29.97	30.16	8.06	5	1	27
08			36	30	34	79	29.97	30.17	7.88	6	0	0
09			40	32	37	74	29.98	30.17	7.95	6	1	30
10			43	32	39	66	29.98	30.17	8.64	9	2	26
11			46	31	40	60	29.97	30.17	9.09	8	2	28
12			48	31	41	56	29.95	30.14	8.97	9	3	26
13			50	31	42	54	29.92	30.12	8.82	9	4	26
14			51	31	43	52	29.90	30.10	9.40	9	5	24
15			51	32	43	52	29.90	30.09	9.55	9	4	25
16			51	32	43	53	29.90	30.10	9.32	9	4	26
17			48	32	41	59	29.91	30.10	9.42	8	3	24
18			45	31	40	62	29.92	30.11	9.58	7	0	0
19			44	32	39	66	29.93	30.13	9.65	6	1	26
20			43	32	38	69	29.94	30.14	9.68	6	2	24
21			42	32	38	71	29.95	30.14	9.58	7	1	26
22			41	32	38	71	29.95	30.14	9.29	7	2	24
23			40	31	37	72	29.95	30.15	9.26	7	1	26
24			40	31	36	72	29.95	30.14	9.10	7	1	29

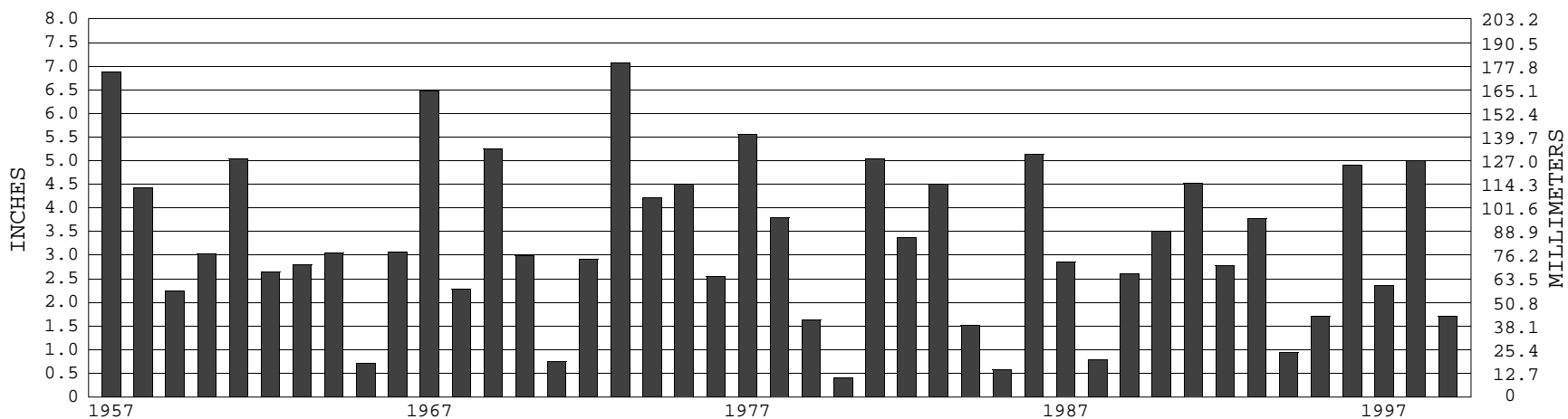
RICHMOND, VA DECEMBER TEMPERATURES



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

Long-Term (1957-1999) Mean: 40.3 1961-1990 Normal: 40.1

RICHMOND, VA DECEMBER PRECIPITATION



Long-Term (1957-1999) Mean Monthly Total: 3.30

1961-1990 Normal: 3.26



**DECEMBER 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
828–271–4800 (voice), 828–271–4876 (fax),
828–271–4010(TDD)
or orders@ncdc.noaa.gov
Local Climatological Data is available at www.ncdc.noaa.gov

For address correction, please return a photocopy of this page to Subscription Services indicating changes

NATIONAL CLIMATIC DATA CENTER
151 PATTON AVE RM 120
ASHEVILLE, NC 28801 –5001

OFFICIAL BUSINESS. PENALTY FOR PRIVATE USE \$300

FIRST CLASS
POSTAGE AND FEES PAID
NOAA
PERMIT G–19