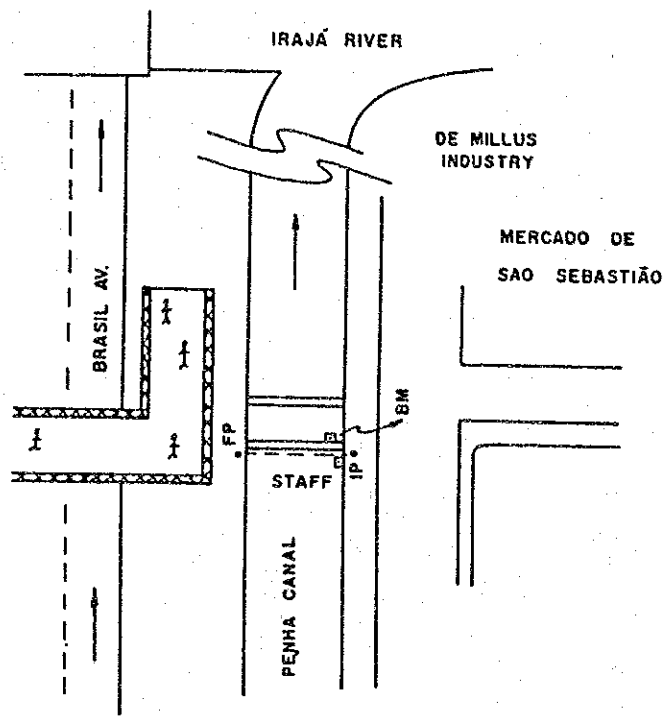
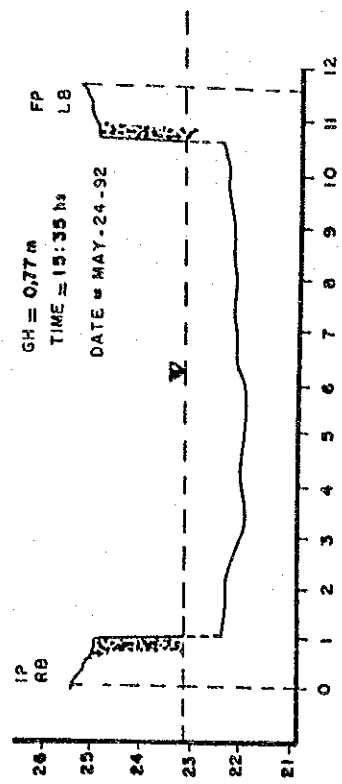
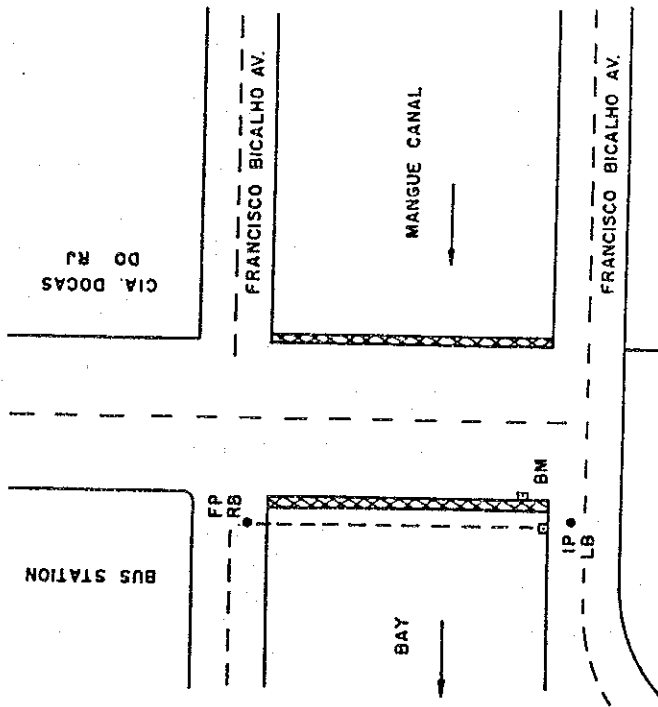
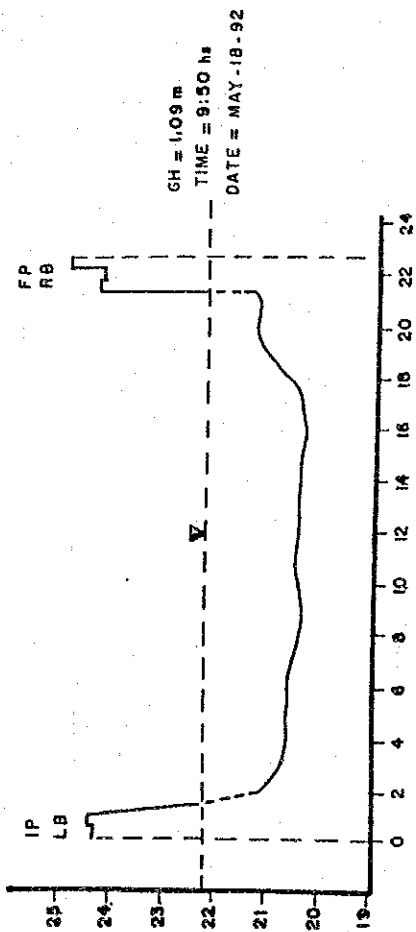


St-24 Cross Section of River and Description of Staff and BM (CN100 : Canal do Cunha)



St-23 Cross Section of River and Description of Staff and BM (PN180 : Canal do Penha)

Fig. 2-1 Cross Section of Rivers



CEG St-25 Cross Section of River and Description
 of Staff and BM (MN000 : Canal do Mangue)

FIG. 2-1 Cross Section of Rivers

CHAPTER 3

**ANNUAL PRECIPITATION DATA AT
OBSERVATION STATIONS**

Table 3-1 List of Precipitation Observation Stations

St. No	St. Name	PERIOD
53729320	SAMBAETIBA	1977-1988
53329560	SAO BENTO	1986-1988
53129910	SAO CRISTOVAO	
53189420	SAO JERONIMO	1970-1976
53769080	TANGUA	1977-1988
53329080	XEREM	1977-1988
53729520	FAZENDA COQUEIRO	1979-1988
53769620	FAZENDA MACACU	
53119089	PRAIA DE BOTAFOGO	
53729650	QUIZANGA	1977-1990
53189120	REALENGO	1977-1990
53129470	SABOIA LIMA	1977-1990
53129230	MORRO DO ENCONTRO	1970-1973
53329890	NILOPOLIS	1986-1988
53329780	NOVA IGUACU	1977-1988
53059550	PAQUETA	1977-1981
53189990	PARADA DE LUCAS-DTN	1977-1981
53729710	POSTO GARRAFAO	1977-1990
53129220	PRACA ROCCO	1977-1980
53039660	ILHA DO GOVERNADOR	1977-1981
53189940	IRAJA	1977-1990
53729195	JAPUIBA	1977-1990
53129080	LEOPOLDO	1977-1981
53159930	LOBO JUNIOR	1977-1981
53129440	COLEGIO REGINA COELI	
53189320	COPEBA	1977-1985
53119090	ELEV DE BOTAFOGO	
53729870	ESCOLA UNIAO	1977-1990
53189370	FUNABEN	1977-1981
53729420	FAZENDA SANTO AMARO	1977-1990
53969220	HORTO FLORESTAL-NIT	1977-1990
53539240	ANDORINHAS	1977-1990
53569240	APOLINARIO	1977-1988
53149910	BENFICA	1977-1990
53729120	CACHOEIRA DE NACACU	1977-1988
53139890	CAJU	1987-1990
53019550	CIDADE UNIVERSITARIA	
	DUQUE DE CAXIAS	1988-1993

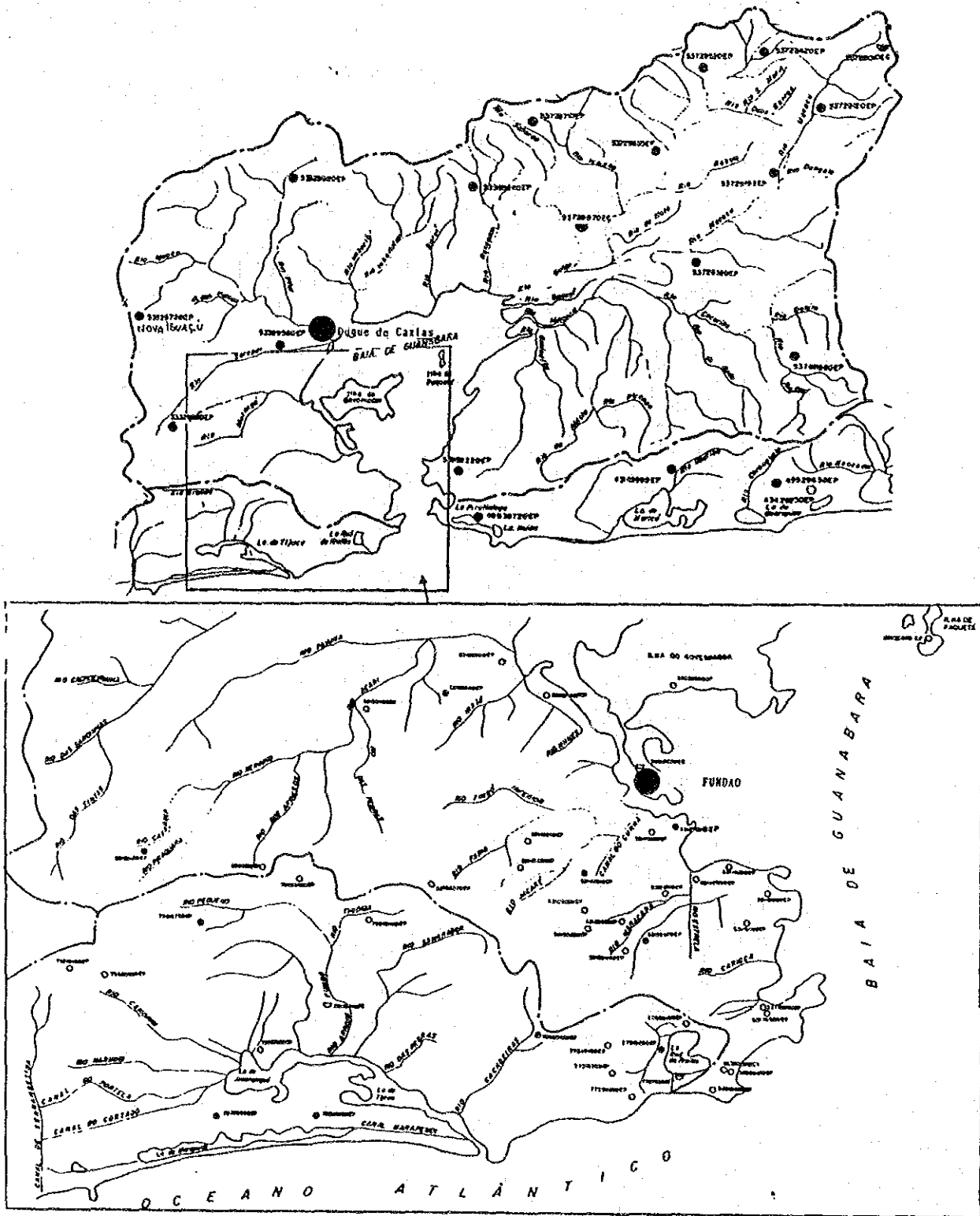


Fig. 3-1 Location of Precipitation Observation Stations

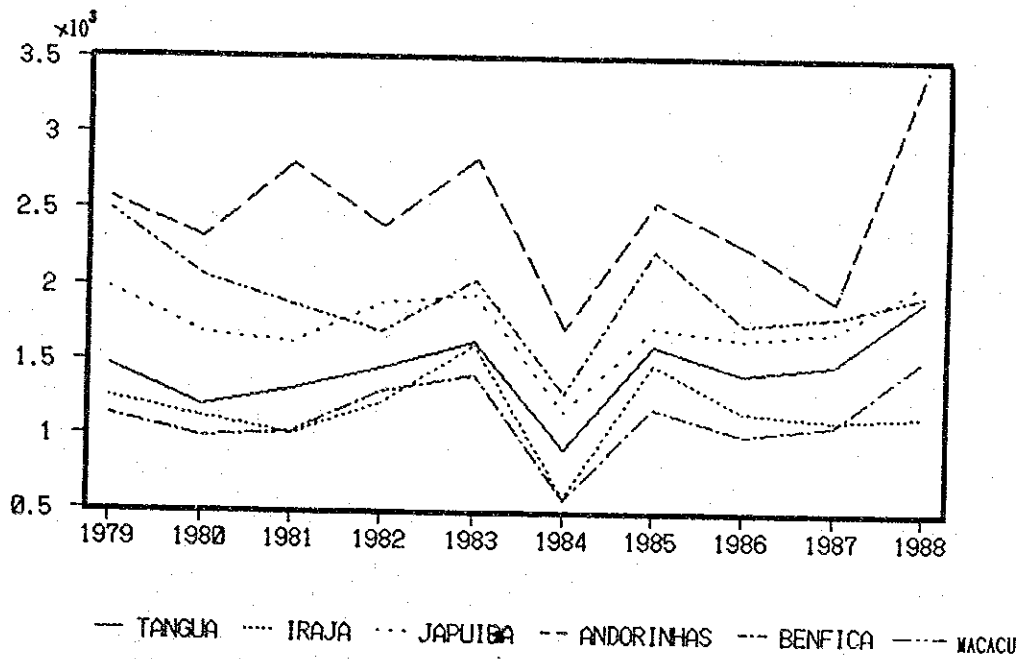


Fig. 3-4 Annual Change of Precipitation at Major Observation Stations (1979-1988)

Table 3-2 Annual Change of Precipitation (1979-1988)

St. No	St. Name	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	Average
53129320	SAMBAETIBA	1,556.6	-	-	-	-	-	1,679.5	-	-	-	-
53329560	SAO BENTO	-	-	-	-	-	-	-	-	1,548.3	1,785.2	-
53129910	SAO CRISTOVAO	-	-	-	-	-	-	-	-	-	-	-
53189420	SAO JERONIMO	585.1	1,194.4	705.0	1,068.7	-	-	-	-	-	-	-
53769080	TANGUA	1,457.9	1,197.5	1,305.4	1,457.3	1,629.9	910.3	1,612.0	1,423.1	1,482.0	1,912.3	1,438.8
53329080	XEREM	2,440.9	2,019.2	2,421.5	2,329.0	2,821.0	1,464.1	-	-	-	-	-
53729520	FAZENDA COQUEIRO	2,464.3	2,074.2	2,355.0	2,216.8	2,417.0	1,642.8	2,710.9	2,141.5	2,059.2	2,696.5	2,278.8
53769620	FAZENDA MACACU	-	-	-	-	-	-	-	-	-	-	-
53119089	PRAIA DE BOTAFOGO	-	-	-	-	-	-	-	-	-	-	-
53729650	QUIZANGA	1,837.0	1,517.1	1,786.7	1,981.8	2,432.4	1,269.3	2,339.1	1,560.0	1,661.4	2,490.5	1,887.5
53189120	REALENGO	1,070.9	1,023.2	1,015.1	1,204.5	1,522.2	643.1	1,301.8	1,203.8	1,239.7	1,611.6	1,183.6
53129470	SABOIA LIMA	1,743.2	1,487.9	1,403.1	1,672.0	1,696.2	895.7	1,831.9	1,719.7	1,540.7	2,463.9	1,645.4
53129230	MORRO DO ENCONTRO	1,273.1	1194.9	-	-	-	-	-	-	-	-	-
53329890	NILOPOLIS	-	-	-	-	-	-	-	-	1,152.9	-	-
53329780	NOVA IGUACU	1,092.8	1,263.5	1,151.0	1,204.2	1,643.9	-	-	1,252.6	1,546.2	-	-
53059550	PAQUETA	1,139.1	1,148.3	-	-	-	-	-	-	-	-	-
53189990	PARADA DE LUCAS-DTN	1,097.8	1,108.5	-	-	-	-	-	-	-	-	-
53729710	POSTO GARRAFAO	3,439.6	2,780.8	3,159.3	3,064.4	3,143.6	2,443.6	2,998.5	2,804.2	2,460.3	4,042.8	3,033.7
53129220	PRACA ROCCO	1,318.3	629.7	-	-	-	-	-	-	-	-	-
53039660	ILHA DO GOVERNADOR	1,061.2	972.7	-	-	-	-	-	-	-	-	-
53189940	IRAJA	1,253.6	1,121.4	1,007.2	1,218.3	1,607.8	590.4	1,487.9	1,162.6	1,107.0	1,147.0	1,170.3
53729195	JAPUIBA	1,967.5	1,661.1	1,615.5	1,886.2	1,940.9	1,159.5	1,726.8	1,649.9	1,702.7	2,038.5	1,736.9
53129080	LEOPOLDO	1,269.2	1,238.9	-	-	-	-	-	-	-	-	-
53159930	LOBO JUNIOR	1,189.9	1,009.3	-	-	-	-	-	-	-	-	-
53129440	COLEGIO REGINA COELI	-	-	-	-	-	-	-	-	-	-	-
53189320	COPEBA	1,160.1	1,109.6	1,059.2	1,152.3	1,444.4	520.7	-	-	-	-	-
53119090	ELEV DE BOTAFOGO	-	-	-	-	-	-	-	-	-	-	-
53729870	ESCOLA UNIAO	1,741.6	1,768.5	1,582.0	1,991.6	4,147.6	936.0	2,347.9	1,671.8	1,758.9	2,976.1	2,092.2
53189370	FUNABEN	1,285.4	1,078.2	-	-	-	-	-	-	-	-	-
53729420	FAZENDA SANTO AMARO	3,009.0	2,220.5	2,559.9	2,794.8	2,809.6	2,173.3	2,669.0	2,544.8	2,612.8	3,044.9	2,643.9
53969220	HORTO FLORESTAL-NIT	1,189.8	1,064.3	1,074.6	1,233.4	1,521.1	612.7	1,155.6	983.8	1,052.0	1,526.0	1,141.3
53569240	ANDORINHAS	2,566.2	2,311.0	2,807.4	2,394.6	2,831.4	1,717.7	2,554.8	2,276.0	1,909.9	3,439.3	2,480.8
53539240	APOLINARIO	3,603.0	3,116.4	2,903.4	2,933.2	3,150.2	2,594.3	3,283.8	2,674.6	-	3,398.5	3,073.0
53149910	BENFICA	1,128.3	991.9	1,024.0	1,301.0	1,405.4	577.8	1,189.9	1,009.2	1,074.7	1,525.8	1,122.8
53729120	CACHOEIRA DE NACACU	2,496.8	2,063.7	1,871.9	1,692.0	2,042.3	1,282.7	2,233.5	1,746.5	1,801.2	1,946.6	1,917.7
53139890	CAJU	-	-	-	-	-	-	-	-	-	-	-
53019550	CIDADE UNIVERSITARIA	-	-	-	-	-	-	-	-	-	1,290.3	-

Table 3-3 Monthly Normals of Precipitation (1977-1990)
(1983)

St. No	St. Name	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
53729320	SAMBAETIBA	-	-	224.1	126.2	89.6	146.8	62.7	29.8	219.7	146.9	151.0	263.8	-
53329560	SAO BENTO	-	-	-	-	-	-	-	-	-	-	-	-	-
53129910	SAO CRISTOVAO	-	-	-	-	-	-	-	-	-	-	-	-	-
53189420	SAO JERONIMO	51.1	114.0	125.7	37.5	187.7	-	-	-	-	-	-	-	-
53769080	TANGUA	177.8	43.3	284.2	127.1	94.0	127.5	56.2	22.3	224.4	107.1	163.9	202.1	1,629.9
53329080	XEREM	467.9	122.4	454.5	180.9	179.4	218.7	86.3	61.1	356.5	193.1	221.7	278.5	2,821.0
53729520	FAZENDA COQUEIRO	194.4	165.6	368.0	161.7	153.8	237.0	71.4	39.9	350.1	165.1	210.3	299.7	2,417.0
53769620	FAZENDA MACACU	-	-	-	-	-	-	-	-	-	-	-	-	-
53119089	PRAIA DE BOTAFOGO	-	-	-	-	-	-	-	-	-	-	-	-	-
53729650	QUIZANGA	340.2	192.9	362.8	163.1	87.7	199.7	68.1	37.5	235.0	154.5	201.3	389.6	2,432.4
53189120	REALENGO	188.8	78.0	301.8	86.8	67.8	136.6	52.7	28.9	206.4	74.5	123.8	176.1	1,522.2
53129470	SABOIA LIMA	110.1	69.1	344.3	115.1	111.9	180.4	52.2	56.7	225.2	124.7	119.3	187.2	1,696.2
53129230	MORRO DO ENCONTRO	-	-	-	-	-	-	-	-	-	-	-	-	-
53329890	NILOPOLIS	-	-	-	-	-	-	-	-	-	-	-	-	-
53329780	NOVA IGUAÇU	157.1	115.3	285.6	102.1	90.5	150.0	51.4	37.4	186.3	102.3	88.4	277.5	1,643.9
53059550	PAQUETA	-	-	-	-	-	-	-	-	-	-	-	-	-
53189990	PARADA DE LUCAS-DTN	-	-	-	-	-	-	-	-	-	-	-	-	-
53729710	POSTO GARRAFÃO	229.8	399.9	531.7	256.8	211.4	243.3	82.4	59.6	434.0	246.1	189.4	319.2	3,143.6
53129220	PRACA ROCCO	-	-	-	-	-	-	-	-	-	-	-	-	-
53039660	ILHA DO GOVERNADOR	-	-	-	-	-	-	-	-	-	-	-	-	-
53189940	IRAJA	166.4	21.7	287.2	82.2	78.7	136.0	99.4	49.5	231.9	66.5	197.1	191.2	1,607.8
53729195	JAPUIBA	164.6	144.9	246.0	128.2	111.9	167.0	54.3	26.7	249.1	159.5	149.1	339.6	1,940.9
53129080	LEOPOLDO	-	-	-	-	-	-	-	-	-	-	-	-	-
53159930	LOBO JUNIOR	-	-	-	-	-	-	-	-	-	-	-	-	-
53129440	COLEGIO REGINA COELI	-	-	-	-	-	-	-	-	-	-	-	-	-
53189320	COPEBA	133.4	100.0	286.3	88.7	65.6	130.4	52.3	33.4	188.0	80.6	114.1	171.3	1,444.4
53119090	ELEV DE BOTAFOGO	-	-	-	-	-	-	-	-	-	-	-	-	-
53729870	ESCOLA UNIAO	263.7	121.5	341.8	137.2	99.2	164.7	69.5	33.5	261.3	127.6	2,194.5	333.1	4,147.6
53189370	FUNABEN	-	-	-	-	-	-	-	-	-	-	-	-	-
53729420	FAZENDA SANTO AMARO	275.1	295.2	350.7	180.4	153.3	274.7	67.6	68.6	386.9	191.1	217.6	348.4	2,809.6
53969220	HORTO FLORESTAL-NIT	91.7	27.2	287.5	99.7	81.9	172.5	54.4	57.4	224.3	107.9	145.8	170.8	1,521.1
53569240	ANDORINHAS	332.8	354.4	507.3	178.7	159.7	191.7	70.3	37.0	330.2	156.2	160.7	352.4	2,831.4
53539240	APOLINARIO	329.9	186.0	408.9	233.7	203.9	251.7	75.0	80.2	476.0	247.3	205.0	452.6	3,150.2
53149910	BENFICA	117.7	14.9	328.9	89.4	77.7	166.5	46.1	40.5	171.5	67.1	133.4	151.7	1,405.4
53729120	CACHOEIRA DE NACACU	136.7	187.4	241.2	141.5	70.9	190.3	54.0	24.2	301.6	134.1	247.0	313.4	2,042.3
53139890	CAJU	-	-	-	-	-	-	-	-	-	-	-	-	-
53019550	CIDADE UNIVERSITARIA	-	-	-	-	-	-	-	-	-	-	-	-	-

(1984)

St. No	St. Name	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
53729320	SAMBAETIBA	68.0	49.8	140.3	112.2	-	14.9	19.6	67.7	32.7	55.0	113.3	134.3	-
53329560	SAO BENTO	-	-	-	-	-	-	-	-	-	-	-	-	-
53129910	SAO CRISTOVAO	-	-	-	-	-	-	-	-	-	-	-	-	-
53189420	SAO JERONIMO	-	-	-	-	-	-	-	-	-	-	-	-	-
53769080	TANGUA	102.0	5.2	144.5	115.6	133.5	21.6	23.8	23.2	39.8	61.9	136.8	102.4	910.3
53329080	XEREM	185.9	65.2	172.7	140.7	126.4	93.1	20.7	91.9	61.5	120.8	201.1	244.1	1,464.1
53729520	FAZENDA COQUEIRO	161.4	72.8	289.6	149.1	79.2	34.5	50.2	108.0	60.7	76.7	247.3	313.3	1,642.8
53769620	FAZENDA MACACU	-	-	-	-	-	-	-	-	-	-	-	-	-
53119089	PRAIA DE BOTAFOGO	-	-	-	-	-	-	-	-	-	-	-	-	-
53729650	QUIZANGA	217.0	18.4	172.2	83.9	125.9	21.0	16.8	78.8	19.4	95.6	197.9	222.4	1,269.3
53189120	REALENGO	109.6	0.0	125.7	62.7	104.2	1.5	14.7	29.8	29.3	52.5	45.9	67.2	643.1
53129470	SABOIA LIMA	78.3	1.0	185.5	122.1	67.3	7.6	75.7	85.4	46.7	67.0	84.2	74.9	895.7
53129230	MORRO DO ENCONTRO	-	-	-	-	-	-	-	-	-	-	-	-	-
53329890	NILOPOLIS	-	-	-	-	-	-	-	-	-	-	-	-	-
53329780	NOVA IGUAÇU	181.6	1.2	160.9	65.4	99.2	6.8	13.5	31.2	35.7	26.4	-	124.8	-
53059550	PAQUETA	-	-	-	-	-	-	-	-	-	-	-	-	-
53189990	PARADA DE LUCAS-DTN	-	-	-	-	-	-	-	-	-	-	-	-	-
53729710	POSTO GARRAFÃO	228.5	91.8	585.2	189.1	146.1	64.3	73.5	166.1	81.8	177.3	387.5	452.4	2,443.6
53129220	PRACA ROCCO	-	-	-	-	-	-	-	-	-	-	-	-	-
53039660	ILHA DO GOVERNADOR	-	-	-	-	-	-	-	-	-	-	-	-	-
53189940	IRAJA	125.6	1.7	113.2	71.8	87.8	4.2	8.4	38.8	41.6	41.1	0.0	56.2	590.4
53729195	JAPUIBA	158.2	55.6	173.9	161.3	94.5	19.7	43.3	82.8	19.7	65.8	132.9	151.8	1,159.5
53129080	LEOPOLDO	-	-	-	-	-	-	-	-	-	-	-	-	-
53159930	LOBO JUNIOR	-	-	-	-	-	-	-	-	-	-	-	-	-
53129440	COLEGIO REGINA COELI	-	-	-	-	-	-	-	-	-	-	-	-	-
53189320	COPEBA	87.8	0.2	104.5	78.7	101.8	1.9	7.4	29.6	31.0	22.1	0.0	55.7	520.7
53119090	ELEV DE BOTAFOGO	-	-	-	-	-	-	-	-	-	-	-	-	-
53729870	ESCOLA UNIAO	190.4	34.9	118.9	124.3	101.3	19.2	23.1	59.9	26.5	8.4	21.7	208.0	936.0
53189370	FUNABEN	-	-	-	-	-	-	-	-	-	-	-	-	-
53729420	FAZENDA SANTO AMARO	140.4	95.6	342.6	273.1	136.2	52.0	42.2	146.6	59.6	167.7	280.0	437.3	2,173.3
53969220	HORTO FLORESTAL-NIT	82.7	6.4	85.1	87.6	91.0	32.3	25.2	43.0	46.6	1.1	30.5	81.2	612.7
53569240	ANDORINHAS	255.1	60.6	266.7	149.2	121.5	32.0	93.4	97.9	33.1	143.1	213.6	311.5	1,717.7
53539240	APOLINARIO	292.7	115.4	337.5	246.3	106.5	65.0	64.6	205.9	90.6	272.5	332.0	445.3	2,594.3
53149910	BENFICA	115.5	0.0	95.9	75.1	80.2	2.2	28.7	32.5	37.2	48.7	0.0	60.8	577.8
53729120	CACHOEIRA DE NACACU	150.3	35.7	182.4	184.5	75.4	0.7	53.6	92.6	37.8	122.9	104.1	242.7	1,282.7
53139890	CAJU	-	-	-	-	-	-	-	-	-	-	-	-	-
53019550	CIDADE UNIVERSITARIA	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 3-3 Monthly Normals of Precipitation (1977-1990)

(1985)

St. No	St. Name	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
53729320	SAMBAETIBA	355.3	172.6	216.7	228.5	119.9	43.4	13.9	63.3	96.4	73.2	108.8	137.5	1,679.5
53329560	SAO BENTO	-	-	-	-	-	-	-	-	-	-	-	-	-
53129910	SAO CRISTOVAO	-	-	-	-	-	-	-	-	-	-	-	-	-
53189420	SAO JERONIMO	-	-	-	-	-	-	-	-	-	-	-	-	-
53769080	TANGUA	271.8	119.9	227.9	224.8	95.7	69.8	24.6	63.3	128.9	73.7	120.1	191.5	1,612.0
53329080	XEREM	546.4	423.7	328.7	224.6	138.0	33.0	11.9	75.8	197.5	260.1	262.9	-	-
53729520	FAZENDA COQUEIRO	682.5	307.6	273.2	263.3	132.6	30.5	16.2	89.0	247.6	91.0	320.7	256.7	2,710.9
53769620	FAZENDA MACACU	-	-	-	-	-	-	-	-	-	-	-	-	-
53119089	PRAIA DE BOTAFOGO	-	-	-	-	-	-	-	-	-	-	-	-	-
53729650	QUIZANGA	473.8	380.1	225.1	337.0	121.3	26.3	13.2	66.3	162.4	131.8	237.3	164.5	2,339.1
53189120	REALENGO	264.5	223.4	128.2	126.6	74.0	22.3	2.3	44.0	127.5	41.1	61.3	186.6	1,301.8
53129470	SABOIA LIMA	269.5	214.4	241.9	157.1	126.6	77.4	38.6	55.1	163.5	61.0	168.7	258.1	1,831.9
53129230	NORRO DO ENCONTRO	-	-	-	-	-	-	-	-	-	-	-	-	-
53329890	NILOPOLIS	-	-	-	-	-	-	-	-	-	-	-	-	-
53329780	NOVA IGUACU	375.1	235.0	203.1	79.7	101.2	7.1	0.0	50.2	-	-	-	-	-
53059550	PAQUETA	-	-	-	-	-	-	-	-	-	-	-	-	-
53189990	PARADA DE LUCAS-DTN	-	-	-	-	-	-	-	-	-	-	-	-	-
53729710	POSTO GARRAFAO	697.1	362.2	256.7	313.4	185.3	33.9	27.1	87.5	224.1	192.5	418.9	199.8	2,998.5
53129220	PRACA ROCCO	-	-	-	-	-	-	-	-	-	-	-	-	-
53039660	ILHA DO GOVERNADOR	-	-	-	-	-	-	-	-	-	-	-	-	-
53189940	IRAJA	229.5	358.8	178.2	71.9	59.9	31.0	12.8	47.6	248.5	10.8	54.4	184.5	1,487.9
53729195	JAPUIBA	374.2	203.9	199.4	180.7	153.4	38.0	21.7	54.7	115.9	109.2	172.8	102.9	1,726.8
53129080	LEOPOLDO	-	-	-	-	-	-	-	-	-	-	-	-	-
53159930	LOBO JUNIOR	-	-	-	-	-	-	-	-	-	-	-	-	-
53129440	COLEGIO REGINA COELI	-	-	-	-	-	-	-	-	-	-	-	-	-
53189320	COPEBA	305.7	215.4	72.5	-	-	-	-	-	-	-	-	-	-
53119090	ELEY DE BOTAFOGO	-	-	-	-	-	-	-	-	-	-	-	-	-
53729870	ESCOLA UNIAO	423.6	471.1	297.1	180.6	144.4	28.3	10.3	71.1	203.4	147.0	208.3	162.7	2,347.9
53189370	FUNABEN	-	-	-	-	-	-	-	-	-	-	-	-	-
53729420	FAZENDA SANTO AMARO	669.5	300.1	344.7	260.1	182.7	41.6	13.2	59.8	192.8	57.2	377.0	170.3	2,669.0
53969220	HORTO FLORESTAL-NIT	301.5	182.1	101.5	116.6	75.2	52.7	9.0	35.9	0.0	0.0	81.2	199.9	1,155.6
53569240	ANDORINHAS	524.2	390.5	274.3	275.9	43.5	24.2	16.1	85.5	113.3	215.6	312.1	279.6	2,554.8
53539240	APOLINARIO	746.8	389.3	296.2	235.5	194.0	95.5	60.9	133.6	261.8	233.5	427.6	209.1	3,283.8
53149910	BENFICA	211.9	224.3	140.7	78.9	57.2	53.5	12.5	45.2	91.8	30.4	59.1	184.4	1,189.9
53729120	CACHOEIRA DE NACACU	513.3	282.5	299.3	217.8	201.4	44.0	40.6	66.3	114.9	126.1	212.7	114.6	2,233.5
53139890	CAJU	-	-	-	-	-	-	-	-	-	-	-	-	-
53019550	CIDADE UNIVERSITARIA	-	-	-	-	-	-	-	-	-	-	-	-	-

(1986)

St. No	St. Name	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
53729320	SAMBAETIBA	302.3	208.6	199.6	131.3	57.8	41.8	-	40.7	63.7	56.7	121.7	197.7	-
53329560	SAO BENTO	-	-	-	-	-	-	-	50.4	-	26.8	50.7	-	-
53129910	SAO CRISTOVAO	-	-	-	-	-	-	-	-	-	-	-	-	-
53189420	SAO JERONIMO	-	-	-	-	-	-	-	-	-	-	-	-	-
53769080	TANGUA	145.1	300.3	188.4	129.9	5.8	42.3	84.4	37.1	54.6	55.0	101.3	278.9	1,423.1
53329080	XEREM	154.0	280.9	241.0	269.8	61.2	33.3	131.3	85.6	-	-	123.8	-	-
53729520	FAZENDA COQUEIRO	312.4	233.3	207.4	228.6	38.6	22.8	159.3	72.7	150.9	120.7	99.7	494.6	2,141.5
53769620	FAZENDA MACACU	-	-	-	-	-	-	-	-	-	-	-	-	-
53119089	PRAIA DE BOTAFOGO	-	-	-	-	-	-	-	-	-	-	-	-	-
53729650	QUIZANGA	266.4	228.7	152.2	165.7	44.2	22.5	91.5	49.2	96.1	103.0	117.5	229.0	1,560.0
53189120	REALENGO	50.5	299.4	187.7	96.8	22.4	28.8	78.1	46.3	60.0	33.7	50.2	249.9	1,203.8
53129470	SABOIA LIMA	42.1	221.6	203.3	266.7	41.8	30.6	223.1	57.8	176.8	67.2	72.3	316.6	1,719.7
53129230	NORRO DO ENCONTRO	-	-	-	-	-	-	-	-	-	-	-	-	-
53329890	NILOPOLIS	-	-	-	-	-	-	-	46.7	59.4	35.2	27.2	196.7	-
53329780	NOVA IGUACU	129.1	286.8	183.8	83.5	28.1	22.6	84.4	44.0	67.8	20.2	65.0	237.3	1,252.6
53059550	PAQUETA	-	-	-	-	-	-	-	-	-	-	-	-	-
53189990	PARADA DE LUCAS-DTN	-	-	-	-	-	-	-	-	-	-	-	-	-
53729710	POSTO GARRAFAO	308.4	333.3	257.2	256.3	70.2	48.8	241.6	107.7	262.6	136.1	177.3	604.7	2,804.2
53129220	PRACA ROCCO	-	-	-	-	-	-	-	-	-	-	-	-	-
53039660	ILHA DO GOVERNADOR	-	-	-	-	-	-	-	-	-	-	-	-	-
53189940	IRAJA	100.4	195.0	172.7	142.3	19.1	37.8	80.4	44.2	82.6	33.2	41.8	213.1	1,162.6
53729195	JAPUIBA	259.9	266.5	213.7	199.2	32.3	30.2	63.2	48.0	94.9	62.1	101.5	278.4	1,649.9
53129080	LEOPOLDO	-	-	-	-	-	-	-	-	-	-	-	-	-
53159930	LOBO JUNIOR	-	-	-	-	-	-	-	-	-	-	-	-	-
53129440	COLEGIO REGINA COELI	-	-	-	-	-	-	-	-	-	-	-	-	-
53189320	COPEBA	-	-	-	-	-	-	-	-	-	-	-	-	-
53119090	ELEY DE BOTAFOGO	-	-	-	-	-	-	-	-	-	-	-	-	-
53729870	ESCOLA UNIAO	238.6	194.2	266.1	133.5	37.2	34.7	80.3	55.1	108.7	75.4	83.0	365.0	1,671.8
53189370	FUNABEN	-	-	-	-	-	-	-	-	-	-	-	-	-
53729420	FAZENDA SANTO AMARO	428.2	289.5	240.8	211.1	36.5	45.5	152.9	73.5	208.2	136.3	231.3	491.0	2,544.8
53969220	HORTO FLORESTAL-NIT	46.8	92.0	116.1	137.1	28.0	39.6	134.9	42.3	41.6	64.4	55.5	185.5	983.8
53569240	ANDORINHAS	326.7	283.8	154.2	181.9	117.7	35.5	174.2	63.3	185.4	142.3	106.3	504.7	2,276.0
53539240	APOLINARIO	404.5	247.0	259.9	288.1	61.1	68.2	110.7	82.1	204.8	129.3	330.0	488.9	2,674.6
53149910	BENFICA	48.2	206.0	146.2	177.8	15.2	20.8	56.0	39.0	55.3	20.8	50.9	173.0	1,009.2
53729120	CACHOEIRA DE NACACU	263.1	164.9	249.1	101.0	21.4	43.7	66.8	49.5	116.3	105.5	159.3	403.9	1,746.5
53139890	CAJU	-	-	-	-	-	-	-	-	-	-	-	-	-
53019550	CIDADE UNIVERSITARIA	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 3-3 Monthly Normals of Precipitation (1977-1990)

(1989)

St. No	St. Name	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
53729320	SAMBAETIBA	-	-	-	-	-	-	-	-	-	-	-	-	-
53329560	SÃO BENTO	-	-	-	-	-	-	-	-	-	-	-	-	-
53129910	SÃO CRISTOVÃO	-	-	-	-	-	-	-	-	-	-	-	-	-
53189420	SÃO JERONIMO	-	-	-	-	-	-	-	-	-	-	-	-	-
53769080	TANGUA	-	-	-	-	-	-	-	-	-	-	-	-	-
53329080	XEREM	-	-	-	-	-	-	-	-	-	-	-	-	-
53729520	FAZENDA COQUEIRO	-	-	-	-	-	-	-	-	-	-	-	-	-
58769620	FAZENDA MACACU	-	-	-	-	-	31.4	90.5	54.4	78.8	46.1	14.1	0.0	-
53119089	PRAIA DE BOTAFOGO	-	-	-	-	-	-	-	-	-	-	-	-	-
53729650	QUIZANGA	336.4	257.0	187.7	117.0	71.2	109.5	99.7	50.6	119.6	83.2	55.4	175.0	1,662.3
53189120	REALENGO	145.2	135.4	95.6	134.0	44.5	174.7	70.8	41.7	77.9	40.4	94.0	120.0	1,174.2
53129470	SABOIA LIMA	158.8	154.6	39.1	106.6	127.0	17.1	176.4	53.5	116.4	90.6	131.6	79.1	1,250.8
53129230	MORRO DO ENCONTRO	-	-	-	-	-	-	-	-	-	-	-	-	-
53329890	NILOPOLIS	-	-	-	-	-	-	-	-	-	-	-	-	-
53329780	NOVA IGUAÇU	-	-	-	-	-	-	-	-	-	-	-	-	-
53059550	PAQUETA	-	-	-	-	-	-	-	-	-	-	-	-	-
53189990	PARADA DE LUCAS-DTN	-	-	-	-	-	-	-	-	-	-	-	-	-
53729710	POSTO GARRAFAO	234.4	342.4	625.7	205.4	177.7	229.6	122.9	92.2	164.9	184.8	26.6	283.3	2,689.9
53129220	PRACA ROCCO	-	-	-	-	-	-	-	-	-	-	-	-	-
53039660	ILHA DO GOVERNADOR	-	-	-	-	-	-	-	-	-	-	-	-	-
53189940	IRAJA	80.9	217.9	80.0	102.0	30.0	129.9	58.3	36.9	98.2	49.3	80.1	61.1	1,024.6
53729195	JAPUIBA	222.7	105.2	154.3	125.5	43.0	57.7	43.7	29.7	107.0	67.7	52.4	170.8	1,179.7
53129080	LEOPOLDO	-	-	-	-	-	-	-	-	-	-	-	-	-
53159930	LOBO JUNIOR	-	-	-	-	-	-	-	-	-	-	-	-	-
53129440	COLEGIO REGINA COELI	-	-	-	-	-	-	-	-	-	-	-	-	-
53189320	COPEBA	-	-	-	-	-	-	-	-	-	-	-	-	-
53119090	ELEV DE BOTAFOGO	-	-	-	-	-	-	-	-	-	-	-	-	-
53729870	ESCOLA UNIAO	261.0	298.4	246.2	117.3	117.7	151.2	117.9	65.7	10.9	86.6	94.6	117.0	1,684.5
53189370	FUNABEN	-	-	-	-	-	-	-	-	-	-	-	-	-
53729420	FAZENDA SANTO AMARO	242.8	360.7	302.4	236.5	120.1	0.0	114.1	85.0	201.1	158.8	134.0	305.1	2,260.6
53969220	HORTO FLORESTAL-NIT	67.0	183.7	56.7	77.0	65.4	141.4	106.1	56.1	103.8	93.3	80.5	148.2	1,179.2
53569240	ANDORINHAS	271.8	200.8	287.7	206.6	130.6	251.9	90.4	71.8	118.0	124.3	186.0	329.5	-
53539240	APOLINARIO	-	-	-	-	-	-	-	-	-	-	-	-	-
53149910	BENFICA	120.4	140.8	67.1	83.2	52.2	157.4	62.4	22.9	76.9	31.4	94.5	109.7	1,018.9
53729120	CACHOEIRA DE NACACU	-	-	-	-	-	-	-	-	-	-	-	-	0.0
53139890	CAJU	91.7	165.2	22.7	88.7	42.7	183.6	40.5	27.2	41.8	47.2	100.0	101.0	952.3
52019550	CIDADE UNIVERSITARIA DUQUE DE CAXIOS	-	0.0	0.0	0.0	46.0	54.0	164.9	26.0	0.0	0.0	0.0	0.0	290.9

(1990)

St. No	St. Name	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
53729320	SAMBAETIBA	-	-	-	-	-	-	-	-	-	-	-	-	-
53329560	SÃO BENTO	-	-	-	-	-	-	-	-	-	-	-	-	-
53129910	SÃO CRISTOVÃO	-	-	-	-	-	-	-	-	-	-	-	-	-
53189420	SÃO JERONIMO	-	-	-	-	-	-	-	-	-	-	-	-	-
53769080	TANGUA	-	-	-	-	-	-	-	-	-	-	-	-	-
53329080	XEREM	-	-	-	-	-	-	-	-	-	-	-	-	-
53729520	FAZENDA COQUEIRO	-	-	-	-	-	-	-	-	-	-	-	-	-
53769620	FAZENDA MACACU	-	-	-	-	-	-	-	-	-	-	-	-	-
53119069	PRAIA DE BOTAFOGO	-	-	-	-	-	-	-	-	-	-	-	-	-
53729550	QUIZANGA	158.7	143.9	277.3	0.0	197.5	51.6	64.3	38.4	156.3	0.0	0.0	0.0	1,088.0
53139120	REALENGO	80.1	0.0	0.0	157.7	94.6	12.0	41.9	41.6	105.8	-	-	-	-
53129470	SABOIA LIMA	101.5	30.9	120.4	464.6	150.5	53.5	108.8	98.2	166.8	-	-	-	-
53129230	MORRO DO ENCONTRO	-	-	-	-	-	-	-	-	-	-	-	-	-
53329890	NILOPOLIS	-	-	-	-	-	-	-	-	-	-	-	-	-
53329780	NOVA IGUAÇU	-	-	-	-	-	-	-	-	-	-	-	-	-
53059550	PAQUETA	-	-	-	-	-	-	-	-	-	-	-	-	-
53189990	PARADA DE LUCAS-DTN	-	-	-	-	-	-	-	-	-	-	-	-	-
53729710	POSTO GARRAFAO	182.7	250.0	65.5	196.4	193.2	90.2	67.4	174.3	207.4	-	-	-	-
53129220	PRACA ROCCO	-	-	-	-	-	-	-	-	-	-	-	-	-
53039660	ILHA DO GOVERNADOR	-	-	-	-	-	-	-	-	-	-	-	-	-
53189940	IRAJA	136.1	36.7	80.6	285.7	101.6	28.8	97.0	54.9	101.2	0.0	0.0	0.0	922.6
53729195	JAPUIBA	92.6	155.4	268.2	144.1	205.4	26.5	0.0	92.4	158.8	-	-	-	-
53129080	LEOPOLDO	-	-	-	-	-	-	-	-	-	-	-	-	-
53159930	LOBO JUNIOR	-	-	-	-	-	-	-	-	-	-	-	-	-
53129440	COLEGIO REGINA COELI	-	-	-	-	-	-	-	-	-	-	-	-	-
53189320	COPEBA	-	-	-	-	-	-	-	-	-	-	-	-	-
53119090	ELEV DE BOTAFOGO	-	-	-	-	-	-	-	-	-	-	-	-	-
53729870	ESCOLA UNIAO	90.3	172.5	212.4	218.6	182.4	573.6	53.8	88.8	164.5	-	-	-	-
53189370	FUNABEN	-	-	-	-	-	-	-	-	-	-	-	-	-
53729420	FAZENDA SANTO AMARO	74.0	212.8	272.3	301.0	112.4	112.4	146.6	132.5	222.9	-	-	-	-
53969220	HORTO FLORESTAL-NIT	79.3	19.9	12.2	254.4	100.3	37.6	139.2	76.4	148.0	-	-	-	-
53569240	ANDORINHAS	145.9	177.7	248.9	330.1	191.8	77.4	51.7	110.5	148.2	-	-	-	-
53539240	APOLINARIO	-	-	-	-	-	-	-	-	-	-	-	-	-
53149910	BENFICA	68.8	21.0	57.9	189.0	90.4	20.9	8.7	58.5	103.6	-	-	-	-
53729120	CACHOEIRA DE NACACU	-	-	-	-	-	-	-	-	-	-	-	-	-
53139890	CAJU	66.5	21.2	26.5	208.1	96.8	19.1	65.1	-	-	-	-	-	-
52019550	CIDADE UNIVERSITARIA DUQUE DE CAXIOS	-	0.0	0.0	147.5	6.3	20.6	0.0	92.1	79.1	169.6	123.3	125.4	763.9

Table 3-4 Monthly Precipitation at Observation Stations

1 Monthly Precipitation at St-(321218187), SAO CRISTIANO

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1977	109.7	177.8	124.7	118.7	15.3	49.8	21.0	45.1	72.8	127.2	181.2	281.3	1,211.4
1978	59.8	125.3	82.2	64.3	129.3	24.7	21.8	62.8	41.8	51.5	226.5	228.7	1,222.4
1979	100.1	204.2	102.3	45.3	82.3	52.8	41.1	67.8	80.2	42.3	146.1	114.3	1,218.4
1980	172.1	15.6	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	111.4
1981	245.4	32.3	102.3	32.3	35.8	4.2	84.2	31.2	29.9	34.4	22.2	231.4	1,014.4
1982	---	---	224.1	124.2	85.8	142.8	61.2	218.2	103.9	151.8	219.8	1,488.8	1,488.8
1983	58.6	67.8	148.2	212.2	---	16.3	175.6	97.1	22.7	53.9	112.3	151.3	881.4
1984	101.3	122.6	218.7	228.2	118.5	64.4	143.8	43.2	26.4	18.2	108.8	181.5	1,275.5
1985	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1986	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1987	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1988	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1989	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1990	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1991	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1992	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8

Note: The yearly mean (1979-1989)

Source: INSTITUTO PLURIQUIMICO S.A. - GOBIERNO DE ESTADO RIO DE JANEIRO, SEMAR, SEMTA, DIRETORIO DE ESTUDIOS E PROJETOS, DIVISAO DE BIOTECNOLOGIA 1989

2 Monthly Precipitation at St-(321218187), SAO CRISTIANO

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1977	109.7	177.8	124.7	118.7	15.3	49.8	21.0	45.1	72.8	127.2	181.2	281.3	1,211.4
1978	59.8	125.3	82.2	64.3	129.3	24.7	21.8	62.8	41.8	51.5	226.5	228.7	1,222.4
1979	100.1	204.2	102.3	45.3	82.3	52.8	41.1	67.8	80.2	42.3	146.1	114.3	1,218.4
1980	172.1	15.6	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	111.4
1981	245.4	32.3	102.3	32.3	35.8	4.2	84.2	31.2	29.9	34.4	22.2	231.4	1,014.4
1982	---	---	224.1	124.2	85.8	142.8	61.2	218.2	103.9	151.8	219.8	1,488.8	1,488.8
1983	58.6	67.8	148.2	212.2	---	16.3	175.6	97.1	22.7	53.9	112.3	151.3	881.4
1984	101.3	122.6	218.7	228.2	118.5	64.4	143.8	43.2	26.4	18.2	108.8	181.5	1,275.5
1985	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1986	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1987	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1988	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1989	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1990	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1991	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1992	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8

Note: The yearly mean (1979-1989)

Source: INSTITUTO PLURIQUIMICO S.A. - GOBIERNO DE ESTADO RIO DE JANEIRO, SEMAR, SEMTA, DIRETORIO DE ESTUDIOS E PROJETOS, DIVISAO DE BIOTECNOLOGIA 1989

3 Monthly Precipitation at St-(321218187), SAO CRISTIANO

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1977	109.7	177.8	124.7	118.7	15.3	49.8	21.0	45.1	72.8	127.2	181.2	281.3	1,211.4
1978	59.8	125.3	82.2	64.3	129.3	24.7	21.8	62.8	41.8	51.5	226.5	228.7	1,222.4
1979	100.1	204.2	102.3	45.3	82.3	52.8	41.1	67.8	80.2	42.3	146.1	114.3	1,218.4
1980	172.1	15.6	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	111.4
1981	245.4	32.3	102.3	32.3	35.8	4.2	84.2	31.2	29.9	34.4	22.2	231.4	1,014.4
1982	---	---	224.1	124.2	85.8	142.8	61.2	218.2	103.9	151.8	219.8	1,488.8	1,488.8
1983	58.6	67.8	148.2	212.2	---	16.3	175.6	97.1	22.7	53.9	112.3	151.3	881.4
1984	101.3	122.6	218.7	228.2	118.5	64.4	143.8	43.2	26.4	18.2	108.8	181.5	1,275.5
1985	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1986	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1987	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1988	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1989	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1990	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1991	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1992	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8

Note: The yearly mean (1979-1989)

Source: INSTITUTO PLURIQUIMICO S.A. - GOBIERNO DE ESTADO RIO DE JANEIRO, SEMAR, SEMTA, DIRETORIO DE ESTUDIOS E PROJETOS, DIVISAO DE BIOTECNOLOGIA 1989

4 Monthly Precipitation at St-(321218187), SAO JERONIMO

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1977	141.3	188.3	84.3	31.4	43.1	32.2	24.9	48.2	45.7	102.8	104.5	109.9	881.4
1978	118.4	201.6	102.3	45.3	82.3	52.8	41.1	67.8	80.2	42.3	146.1	114.3	1,218.4
1979	172.1	15.6	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	111.4
1980	245.4	32.3	102.3	32.3	35.8	4.2	84.2	31.2	29.9	34.4	22.2	231.4	1,014.4
1981	---	---	224.1	124.2	85.8	142.8	61.2	218.2	103.9	151.8	219.8	1,488.8	1,488.8
1982	58.6	67.8	148.2	212.2	---	16.3	175.6	97.1	22.7	53.9	112.3	151.3	881.4
1983	101.3	122.6	218.7	228.2	118.5	64.4	143.8	43.2	26.4	18.2	108.8	181.5	1,275.5
1984	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1985	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1986	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1987	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1988	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1989	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1990	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1991	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8
1992	202.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	201.6	1,412.8

Note: The yearly mean (1979-1989)

Source: INSTITUTO PLURIQUIMICO S.A. - GOBIERNO DE ESTADO RIO DE JANEIRO, SEMAR, SEMTA, DIRETORIO DE ESTUDIOS E PROJETOS, DIVISAO DE BIOTECNOLOGIA 1989

Table 3-4 Monthly Precipitation at Observation Stations

Table 3.3-II Monthly Precipitation at St-(531818002), IRUA

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1977	184.5	0.0	188.7	213.8	205.6	197.8	218.9	219.7	199.7	203.3	184.8	179.4	1,843.3
1978	29.0	14.2	156.3	156.3	144.5	144.5	144.5	144.5	144.5	144.5	144.5	144.5	1,444.5
1979	144.5	144.5	144.5	144.5	144.5	144.5	144.5	144.5	144.5	144.5	144.5	144.5	1,444.5
1980	248.9	131.2	237.6	237.6	237.6	237.6	237.6	237.6	237.6	237.6	237.6	237.6	2,376.0
1981	93.3	146.0	146.0	146.0	146.0	146.0	146.0	146.0	146.0	146.0	146.0	146.0	1,460.0
1982	232.0	84.3	232.0	232.0	232.0	232.0	232.0	232.0	232.0	232.0	232.0	232.0	2,320.0
1983	164.4	21.7	217.2	217.2	217.2	217.2	217.2	217.2	217.2	217.2	217.2	217.2	2,172.0
1984	225.4	338.8	338.8	338.8	338.8	338.8	338.8	338.8	338.8	338.8	338.8	338.8	3,388.0
1985	233.7	233.7	233.7	233.7	233.7	233.7	233.7	233.7	233.7	233.7	233.7	233.7	2,337.0
1986	213.3	417.9	417.9	417.9	417.9	417.9	417.9	417.9	417.9	417.9	417.9	417.9	4,179.0
1987	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	1,675.0
1988	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	1,675.0
1989	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	1,675.0
1990	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	1,675.0
1991	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	1,675.0
1992	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	1,675.0
Total	313.3	138.8	137.6	137.4	137.3	137.2	137.1	137.0	136.9	136.8	136.7	136.6	1,366.6

Note: The yearly mean(1979-1989)

Source: BOLETIM PLURIANTRICO MOI-2
GOVERNO DO ESTADO DO PARANÁ
STANISLAU
DIRETORIA DE ESTUDOS E PROJETOS, DIVISÃO DE HIDROLOGIA 1989

Table 3.3-III Monthly Precipitation at St-(531818002), JAPURA

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1977	241.7	1.0	204.4	110.5	81.0	101.1	101.1	101.1	101.1	101.1	101.1	101.1	1,011.1
1978	185.2	179.7	185.2	185.2	185.2	185.2	185.2	185.2	185.2	185.2	185.2	185.2	1,852.0
1979	218.8	218.8	218.8	218.8	218.8	218.8	218.8	218.8	218.8	218.8	218.8	218.8	2,188.0
1980	232.8	157.2	232.8	232.8	232.8	232.8	232.8	232.8	232.8	232.8	232.8	232.8	2,328.0
1981	151.2	151.2	151.2	151.2	151.2	151.2	151.2	151.2	151.2	151.2	151.2	151.2	1,512.0
1982	184.6	184.6	184.6	184.6	184.6	184.6	184.6	184.6	184.6	184.6	184.6	184.6	1,846.0
1983	218.8	218.8	218.8	218.8	218.8	218.8	218.8	218.8	218.8	218.8	218.8	218.8	2,188.0
1984	218.8	218.8	218.8	218.8	218.8	218.8	218.8	218.8	218.8	218.8	218.8	218.8	2,188.0
1985	233.9	233.9	233.9	233.9	233.9	233.9	233.9	233.9	233.9	233.9	233.9	233.9	2,339.0
1986	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	2,426.0
1987	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	2,426.0
1988	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	2,426.0
1989	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	2,426.0
1990	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	2,426.0
1991	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	2,426.0
1992	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	242.6	2,426.0
Total	323.4	221.0	171.7	137.6	103.7	81.7	61.7	41.7	21.7	11.7	11.7	11.7	1,117.0

Note: The yearly mean(1979-1989)

Source: BOLETIM PLURIANTRICO MOI-2
GOVERNO DO ESTADO DO PARANÁ
STANISLAU
DIRETORIA DE ESTUDOS E PROJETOS, DIVISÃO DE HIDROLOGIA 1989

Table 3.3-IV Monthly Precipitation at St-(531818007), LIDUQUELO

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1977	184.3	0.0	184.3	184.3	184.3	184.3	184.3	184.3	184.3	184.3	184.3	184.3	1,843.0
1978	217.9	117.9	217.9	217.9	217.9	217.9	217.9	217.9	217.9	217.9	217.9	217.9	2,179.0
1979	208.1	71.8	208.1	208.1	208.1	208.1	208.1	208.1	208.1	208.1	208.1	208.1	2,081.0
1980	144.5	144.5	144.5	144.5	144.5	144.5	144.5	144.5	144.5	144.5	144.5	144.5	1,445.0
1981	232.0	232.0	232.0	232.0	232.0	232.0	232.0	232.0	232.0	232.0	232.0	232.0	2,320.0
1982	164.4	21.7	217.2	217.2	217.2	217.2	217.2	217.2	217.2	217.2	217.2	217.2	2,172.0
1983	225.4	338.8	338.8	338.8	338.8	338.8	338.8	338.8	338.8	338.8	338.8	338.8	3,388.0
1984	233.7	233.7	233.7	233.7	233.7	233.7	233.7	233.7	233.7	233.7	233.7	233.7	2,337.0
1985	213.3	417.9	417.9	417.9	417.9	417.9	417.9	417.9	417.9	417.9	417.9	417.9	4,179.0
1986	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	1,675.0
1987	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	1,675.0
1988	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	1,675.0
1989	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	1,675.0
1990	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	1,675.0
1991	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	1,675.0
1992	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	167.5	1,675.0
Total	313.0	87.3	85.8	85.3	84.8	84.3	83.8	83.3	82.8	82.3	81.8	81.3	813.0

Note: The yearly mean(1979-1989)

Source: BOLETIM PLURIANTRICO MOI-7
GOVERNO DO ESTADO DO PARANÁ
STANISLAU
DIRETORIA DE ESTUDOS E PROJETOS, DIVISÃO DE HIDROLOGIA 1989

Table 3.3-V Monthly Precipitation at St-(531818007), LORO JABUON

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1977	210.0	0.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	2,100.0
1978	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	2,100.0
1979	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	2,100.0
1980	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	2,100.0
1981	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	2,100.0
1982	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	2,100.0
1983	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	2,100.0
1984	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	2,100.0
1985	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	2,100.0
1986	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	2,100.0
1987	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	2,100.0
1988	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	2,100.0
1989	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	2,100.0
1990	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	2,100.0
1991	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	2,100.0
1992	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	210.0	2,100.0
Total	310.0	0.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	310.0	3,100.0

Note: The yearly mean(1979-1989)

Source: BOLETIM PLURIANTRICO MOI-7
GOVERNO DO ESTADO DO PARANÁ
STANISLAU
DIRETORIA DE ESTUDOS E PROJETOS, DIVISÃO DE HIDROLOGIA 1989

Table 3-4 Monthly Precipitation at Observation Stations

Table 3-13 Monthly Precipitation at 31-(5112161007), COLÉGIO RECINHA COELI

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1971													0.0
1972													0.0
1973													0.0
1974													0.0
1975													0.0
1976													0.0
1977													0.0
1978													0.0
1979													0.0
1980													0.0
1981													0.0
1982													0.0
1983													0.0
1984													0.0
1985													0.0
1986													0.0
1987													0.0
1988													0.0
1989													0.0
1990													0.0
1991													0.0
1992													0.0
1993													0.0

Note: The year 1971-1983

Source: BOLETIM MENSUAL DO IZM-2
GOVERNO DO ESTADO DO RIO DE JANEIRO,
SERVA SIELA
DIRETOR DE ESTUDOS E PROJETOS, DIVISÃO DE HIDROLOGIA 1983

Table 3-19 Monthly Precipitation at 31-(511191007), SLEF DE SANTIAGO

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1971													0.0
1972													0.0
1973													0.0
1974													0.0
1975													0.0
1976													0.0
1977													0.0
1978													0.0
1979													0.0
1980													0.0
1981													0.0
1982													0.0
1983													0.0
1984													0.0
1985													0.0
1986													0.0
1987													0.0
1988													0.0
1989													0.0
1990													0.0
1991													0.0
1992													0.0
1993													0.0

Note: The year 1971-1983

Source: BOLETIM MENSUAL DO IZM-2
GOVERNO DO ESTADO DO RIO DE JANEIRO,
SERVA SIELA
DIRETOR DE ESTUDOS E PROJETOS, DIVISÃO DE HIDROLOGIA 1983

Table 3-16 Monthly Precipitation at 31-(511031007), COPENA

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1971	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1972	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1973	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1974	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1975	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1976	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1977	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1978	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1979	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1980	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1981	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1982	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1983	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1984	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1985	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1986	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1987	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1988	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1989	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1990	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1991	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1992	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9
1993	164.0	11.0	137.0	177.7	64.7	19.7	91.5	45.9	115.1	53.3	122.7	11.5	1,100.9

Note: The year 1971-1983

Source: BOLETIM MENSUAL DO IZM-2
GOVERNO DO ESTADO DO RIO DE JANEIRO,
SERVA SIELA
DIRETOR DE ESTUDOS E PROJETOS, DIVISÃO DE HIDROLOGIA 1983

Table 3-20 Monthly Precipitation at 31-(511031007), ESCOLA UNIAO

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1971	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1972	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1973	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1974	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1975	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1976	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1977	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1978	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1979	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1980	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1981	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1982	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1983	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1984	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1985	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1986	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1987	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1988	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1989	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1990	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1991	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1992	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5
1993	164.7	22.4	116.7	217.0	50.5	61.2	55.0	51.0	110.0	50.3	184.7	211.4	1,594.5

Note: The year 1971-1983

Source: BOLETIM MENSUAL DO IZM-2
GOVERNO DO ESTADO DO RIO DE JANEIRO,
SERVA SIELA
DIRETOR DE ESTUDOS E PROJETOS, DIVISÃO DE HIDROLOGIA 1983

Table 3-4 Monthly Precipitation at Observation Stations

Table 2.2-10 Monthly Precipitation at Sta-(151311102P), FAIENZA

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1974	35.0	28.0	44.0	23.0	36.0	13.0	47.0	36.0	36.0	28.0	23.0	33.0	429.0
1975	32.0	25.0	35.0	23.0	38.0	33.0	30.0	27.0	22.0	22.0	20.0	26.0	309.0
1976	42.0	38.0	38.0	30.0	32.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	403.0
1977	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1978	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1979	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1980	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1981	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1982	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1983	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1984	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1985	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1986	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1987	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1988	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1989	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1990	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1991	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1992	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1993	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1994	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1995	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1996	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1997	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1998	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1999	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
2000	42.0	40.0	38.0	28.0	25.0	31.0	25.0	25.0	25.0	25.0	25.0	25.0	390.0
1974-2000	372.0	345.0	343.0	273.0	252.0	312.0	252.0	252.0	252.0	252.0	252.0	252.0	3111.0

Note: The yearly mean (1974-2000)

Source: BOLETIN MATEMÁTICO NO. 2 GOBIERNO DE ESTADO RÍO DE JANEIRO, SEMANAL, SERIA. DIRETORIO DE ESTUDIOS E PROJETOS, DIVISAO DE HIDROLOGIA 1989

Table 2.2-11 Monthly Precipitation at Sta-(151411102P), MONTE SUDESTAL-RT

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1974	53.0	44.0	57.0	44.0	53.0	33.0	62.0	44.0	44.0	44.0	44.0	44.0	552.0
1975	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1976	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1977	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1978	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1979	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1980	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1981	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1982	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1983	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1984	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1985	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1986	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1987	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1988	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1989	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1990	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1991	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1992	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1993	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1994	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1995	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1996	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1997	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1998	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1999	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
2000	47.0	44.0	47.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	478.0
1974-2000	470.0	440.0	470.0	440.0	440.0	440.0	440.0	440.0	440.0	440.0	440.0	440.0	5328.0

Note: The yearly mean (1974-2000)

Source: BOLETIN MATEMÁTICO NO. 2 GOBIERNO DE ESTADO RÍO DE JANEIRO, SEMANAL, SERIA. DIRETORIO DE ESTUDIOS E PROJETOS, DIVISAO DE HIDROLOGIA 1989

Table 3-4 Monthly Precipitation at Observation Stations

Table 2.1-37 Monthly Precipitation at 51-52301510072, CIDADE UNIVERSTARIA

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1977	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1978	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1979	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1981	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1982	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1983	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1984	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1985	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1986	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1987	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1988	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1989	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1994	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1995	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1996	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1997	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Date: The forty-ninth (1995-1999)

Source: MONITOR PLUVIOMETRICO NO. 1
 CENTRO DE ESTUDOS E PROJETOS DE HIDROLOGIA
 UNIVERSIDADE FEDERAL DO RIO DE JANEIRO
 INSTITUTO DE ESTUDOS E PROJETOS, DIVISAO DE HIDROLOGIA 1995

CHAPTER 4

METEOROLOGICAL DATA

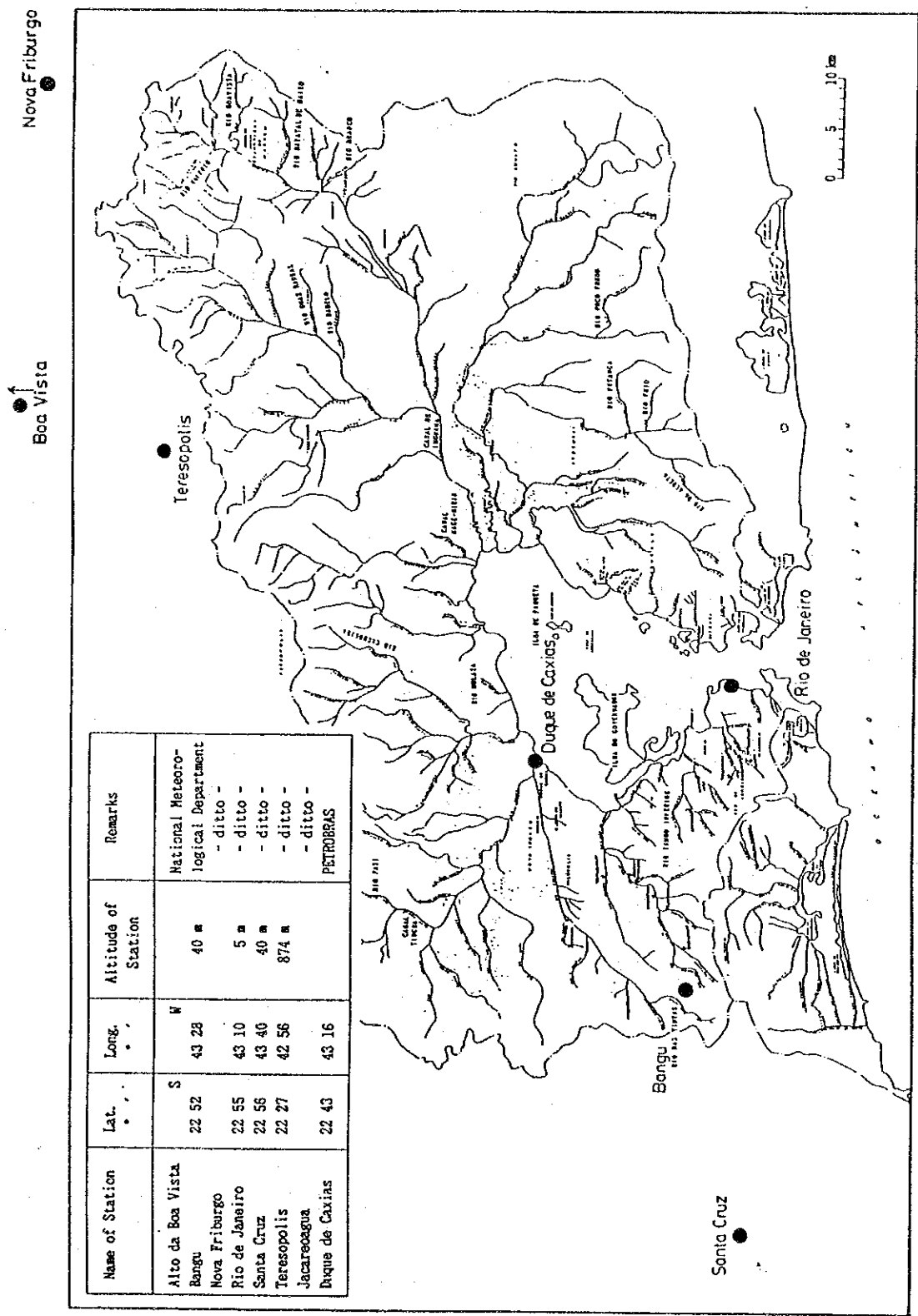


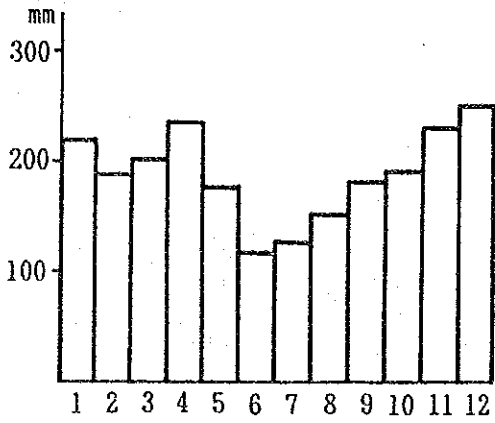
Fig. 4-1 Location of Meteorological Stations

Table 4-1 Monthly Normals of Precipitation at Meteorological Stations

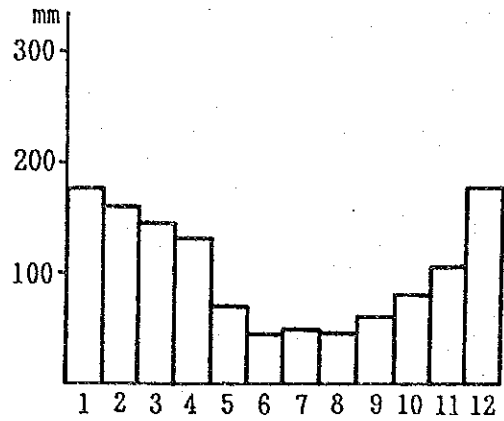
(unit:0.1mm)

STATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	PERIOD
Alto da Boa Vista	2181	1879	2014	2364	1770	1167	1271	1528	1832	1920	2321	2524	22770	1966-1990
Bangu	1766	1609	1450	1306	691	437	474	450	597	803	1055	1772	12410	1961-1990
Nova Friburgo	2086	1672	1510	723	456	266	197	229	413	834	1692	2387	12463	1961-1990
Rio de Janeiro	1141	1053	1033	1374	856	804	564	505	871	882	956	1690	11729	1973-1990
Santa Cruz	1405	1221	1199	1103	714	376	394	480	655	807	891	1587	10833	1964-1990
Teresopolis	2865	2001	1839	1155	552	430	472	518	811	1489	2194	2966	17294	1961-1990
Duque de Caxias	—	3713	811	1380	554	973	355	249	444	646	2395	—	—	1988-1990

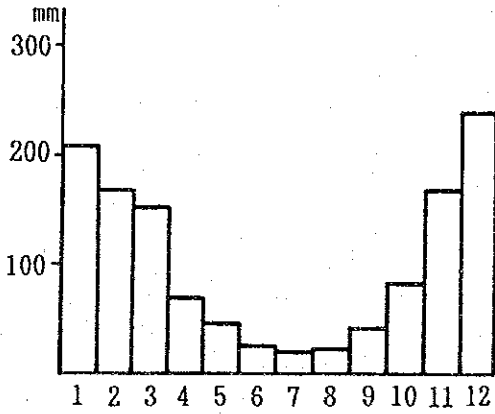
Alto da Boa Vista



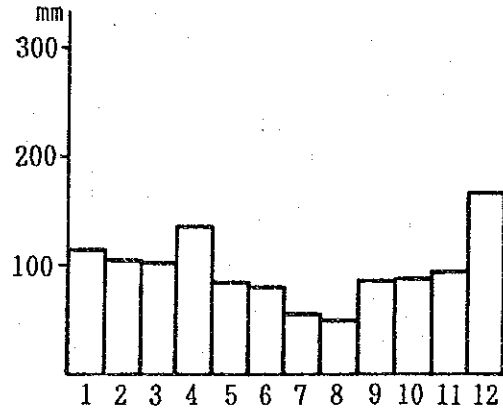
Bangu



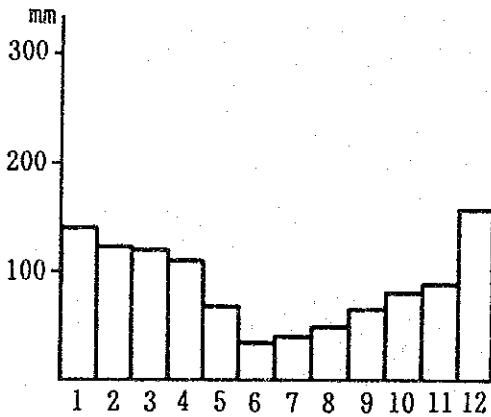
Nova Friburgo



Rio de Janeiro



Santa Cruz



Teresopolis

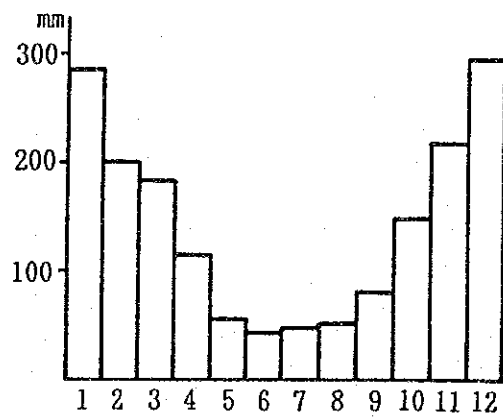


Fig. 4-2 Monthly Normals of Precipitation at Meteorological Stations

—●— : Maximum
 - - - ● - - - : Mean
 —○— : Minimum

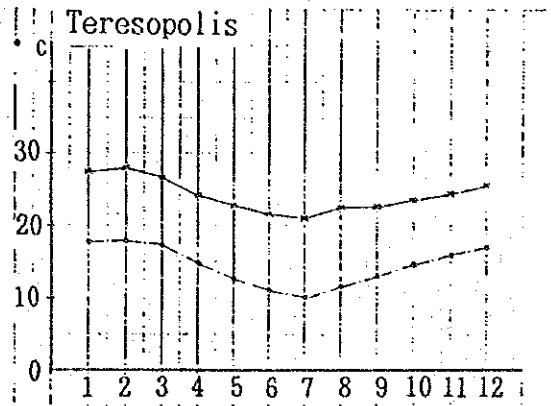
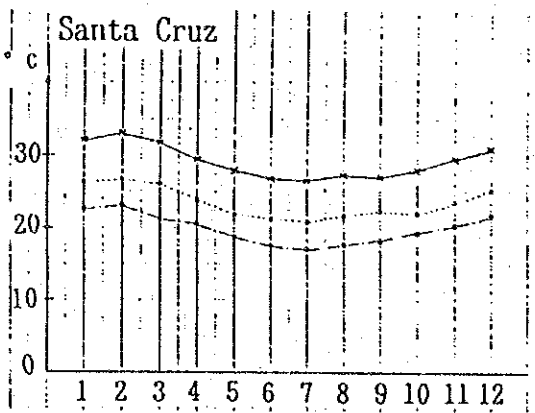
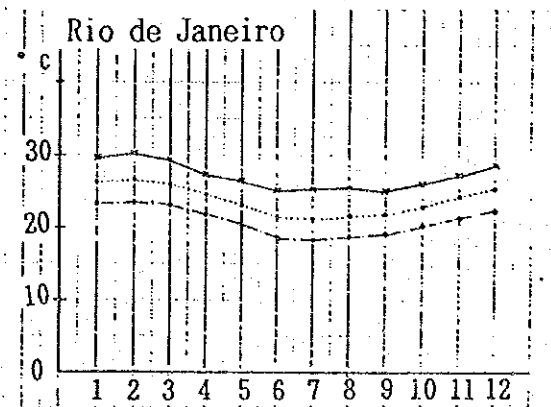
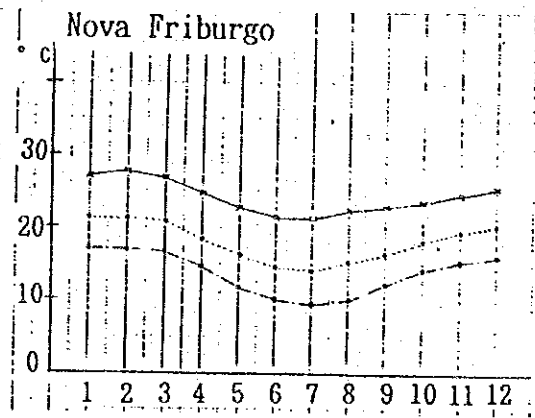
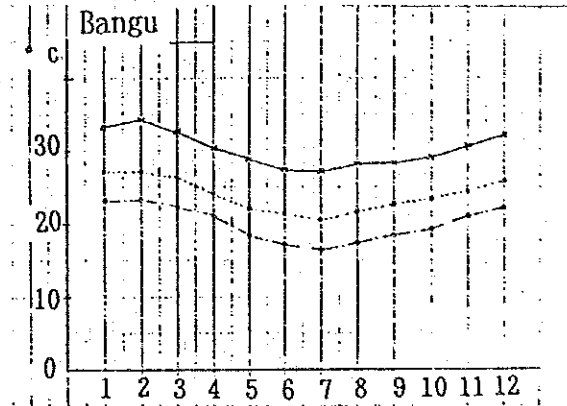
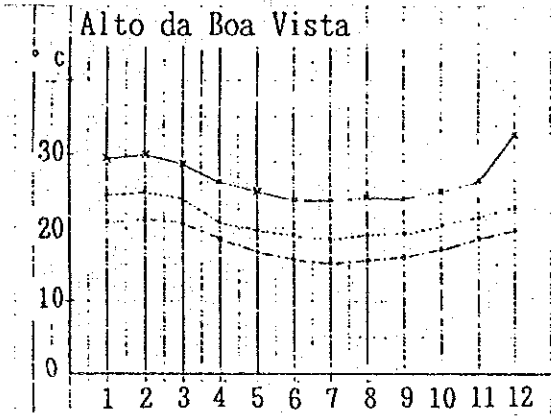


Fig. 4-3 Monthly Normals of Temperature at Meteorological Stations

Table 4-2 Meteorological (Temperature etc.) Data at Meteorological Stations

1. Monthly Normals

1) Temperature

(1) Monthly Normals of Temperature (Mean)

(unit : °C)

STATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	PERIOD
Alto da Boa Vista	24.4	24.6	23.7	20.8	19.6	19.0	18.5	19.0	19.4	20.2	21.3	22.8	21.1	1966-1978
Bangu	27.0	27.1	26.4	24.2	22.0	21.1	20.5	21.8	22.5	23.3	24.4	25.8	23.9	1961-1978
Nova Friburgo	21.2	21.4	20.9	18.7	16.2	14.7	14.0	15.2	16.6	18.3	19.5	20.3	18.1	1961-1990
Rio de Janeiro	26.2	26.5	26.0	24.5	23.0	21.5	21.3	21.8	21.8	22.8	24.2	25.2	23.7	1973-1990
Santa Cruz	26.2	26.6	25.8	23.8	21.9	21.1	20.7	21.7	22.3	22.5	23.5	25.2	23.5	1964-1976
Teresopolis	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Duque de Caxias	—	30.4	26.6	25.0	21.7	20.0	19.5	19.6	21.8	22.2	24.7	—	22.1	1988-1990

(2) Monthly Normals of Daily Maximum Temperature (Mean)

(unit : °C)

STATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	PERIOD
Alto da Boa Vista	29.5	30.0	28.6	26.4	24.9	23.7	23.7	24.2	24.0	25.0	26.3	27.9	26.2	1966-1990
Bangu	33.2	33.8	32.6	30.2	28.8	27.4	27.1	28.2	28.3	29.1	30.7	32.0	30.1	1961-1990
Nova Friburgo	27.0	27.6	26.9	24.8	22.9	21.6	21.1	22.5	22.9	23.9	24.8	25.5	24.3	1961-1990
Rio de Janeiro	29.7	30.2	29.4	27.8	26.4	25.2	25.3	25.6	25.0	26.0	27.4	28.6	27.2	1973-1990
Santa Cruz	32.5	33.1	31.8	29.5	27.8	26.9	26.6	27.4	27.2	28.0	29.6	31.0	29.3	1964-1990
Teresopolis	27.5	28.0	26.7	24.2	22.9	21.9	21.0	22.7	22.8	23.7	24.7	25.9	24.3	1964-1987
Duque de Caxias*	—	38.5	35.0	33.9	33.0	30.0	32.0	34.9	37.1	36.5	37.5	—	40.5	1988-1990

[NOTE] Duque de Caxias* : Daily Maximum Temperature (Maximum)

(3) Monthly Normals of Daily Minimum Temperature (Mean)

(unit : °C)

STATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	PERIOD
Alto da Boa Vista	20.7	21.0	20.3	18.4	16.9	15.6	15.1	15.5	16.0	17.2	18.4	19.7	17.9	1966-1990
Bangu	23.1	23.4	22.7	20.9	18.6	17.2	16.4	17.4	18.4	19.8	21.1	22.2	20.1	1961-1990
Nova Friburgo	17.1	17.1	16.8	14.8	11.9	10.1	9.5	10.3	12.3	14.3	15.5	16.3	13.8	1961-1990
Rio de Janeiro	23.3	23.5	23.3	21.9	20.4	18.7	18.4	18.9	19.2	20.2	21.4	22.4	21.0	1973-1990
Santa Cruz	22.6	23.0	22.3	20.7	18.8	17.7	17.1	17.8	18.3	19.4	20.4	21.8	20.0	1964-1990
Teresopolis	17.7	17.9	17.1	14.9	12.8	11.2	10.2	11.7	13.1	14.8	16.0	17.2	14.6	1964-1987
Duque de Caxias*	—	23.0	15.7	18.0	14.0	10.5	11.0	11.0	14.5	16.0	15.0	—	9.8	1988-1990

[NOTE] Duque de Caxias* : Daily Minimum Temperature (Minimum)

Table 4-2 Meteorological (Temperature etc.) Data at Meteorological Stations
2) Atmospheric Pressure

Monthly Normals of Atmospheric Pressure

(unit : hPa)

STATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	PERIOD
Alto da Boa Vista	--	--	--	--	--	--	--	--	--	--	--	--	--	
Bangu	--	--	--	--	--	--	--	--	--	--	--	--	--	
Nova Friburgo	917.1	917.7	918.8	920.3	921.2	921.9	922.5	921.7	920.1	918.9	916.8	916.5	919.5	1961-72
Rio de Janeiro	1011.3	1012.1	1012.5	1014.8	1016.3	1018.7	1019.6	1018.3	1017.5	1014.7	1012.8	1011.3	1015.0	1973-90
Santa Cruz	--	--	--	--	--	--	--	--	--	--	--	--	--	
Terresopolis	915.2	915.7	917.1	918.1	919.7	920.8	922.0	920.7	919.3	917.4	915.6	915.2	918.1	1961-72
Duque de Caxias	--	1013.0	1016.0	1015.8	1015.4	1016.9	1018.2	1022.6	1017.6	1017.2	1014.2	--	1016.7	1988-90

3) Sunshine Duration

Monthly Normals of Sunshine Duration

(unit : 0.1 h)

STATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	PERIOD
Alto da Boa Vista	--	--	--	--	--	--	--	--	--	--	--	--	--	
Bangu	1870	1822	2070	1783	1958	1763	1839	1987	1705	1478	1732	1733	21745	1961-1969
Nova Friburgo	1482	1366	1573	1332	1587	1320	1459	1624	1384	985	1082	1510	16719	1961-1974
Rio de Janeiro	1962	2070	1956	1660	1714	1656	1825	1784	1369	1585	1687	1601	20869	1973-1989
Santa Cruz	--	--	--	--	--	--	--	--	--	--	--	--	--	
Terresopolis	--	--	--	--	--	--	--	--	--	--	--	--	--	
Duque de Caxias	--	--	--	--	--	--	--	--	--	--	--	--	--	

4) Wind Speed

Monthly Normals of Wind Speed

(unit : m/sec)

STATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	PERIOD
Alto da Boa Vista														
Bangu	1.0	1.1	1.0	1.0	1.0	1.0	0.9	1.0	1.3	1.1	1.1	1.1	1.0	1931-1960
Nova Friburgo														
Rio de Janeiro	3.5	3.5	3.2	3.1	2.7	2.7	2.8	2.9	3.3	3.4	3.7	3.4	3.2	1974-1985
Santa Cruz	3.7	3.7	3.5	3.7	3.7	3.6	3.9	3.9	3.9	3.6	3.6	3.6	3.7	1943-1960
Terresopolis	1.8	1.6	1.4	1.6	1.4	1.5	1.5	1.7	1.8	1.8	1.8	1.7	1.6	1931-1970
Duque de Caxias	2.0	2.2	2.2	2.4	2.1	1.9	2.2	2.1	2.3	2.3	2.3	2.4	2.1	1988-1990

Table 4-2 Meteorological (Temperature etc.) Data at Meteorological Stations

5) Wind Direction

Monthly Normals of Prevailing Wind Direction

STATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	PERIOD
Alto da Boa Vista														
1st Frequency (0.1 %)														
2nd Frequency (0.1 %)														
3rd Frequency (0.1 %)														
Bangu														1931-1960
1st Frequency (0.1 %)	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	
	495	464	505	522	527	533	548	516	489	462	489	473	502	
2nd Frequency (0.1 %)	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	
	161	167	140	156	172	167	140	172	178	194	167	172	165	
3rd Frequency (0.1 %)	SE	SE	SE	SE	E	SE	SE	SE	SE	SE	SE	SE	SE	
	108	119	118	100	86	89	108	108	111	108	100	118	105	
Nova Friburgo														
1st Frequency (0.1 %)														
2nd Frequency (0.1 %)														
3rd Frequency (0.1 %)														
Rio de Janeiro														1974-1985
1st Frequency (0.1 %)	S	S	S	S	S	S	N	S	S	S	S	S	S	
	258	262	247	222	194	200	204	204	222	280	311	258	235	
2nd Frequency (0.1 %)	SE	SE	SE	SE	N	N	S	SE	SE	SE	SE	SE	SE	
	215	202	194	189	172	189	172	161	189	247	233	194	185	
3rd Frequency (0.1 %)	N	N	N	N	SE&C	Calm	SE	N	Calm	N&C	N&E	N	N	
	129	155	161	178	151	156	151	161	122	97	111	140	150	
Santa Cruz														1943-1960
1st Frequency (0.1 %)	SW	SW	SE	SE	NE	SE	SE	SE	SW	SW	SW	SW	SW	
	161	155	172	189	172	167	172	161	200	183	189	183	166	
2nd Frequency (0.1 %)	SE	SE	SW	SW	SE	SW	S	SW	SE	SE	SE	SE	SE	
	161	155	151	156	161	151	161	161	144	151	167	161	164	
3rd Frequency (0.1 %)	S&NE	S	S	NE	SW	S	SW	S	W	W	W	W&NE	S	
	129	155	140	144	151	140	151	151	144	151	133	129	133	
Terresopolis														1931-1970
1st Frequency (0.1 %)	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	Calm	SW	SW	Calm	Calm	
	290	310	322	311	355	367	355	312	267	239	267	247	300	
2nd Frequency (0.1 %)	N	N	SW	SW	SW	SW	SW	SW	SW	Calm	Calm	SW	SW	
	183	179	204	256	215	167	194	194	200	239	233	237	207	
3rd Frequency (0.1 %)	NE	SW	N	N	N	N	N	N	N	N	N&S	N	N	
	151	167	129	156	140	167	151	151	156	151	122	161	154	
Duquo do Caxias														1988-1989
1st Frequency (0.1 %)	NW	-	SW	W	W	NW	NW	SE	SE	SE	NW	S	NW	
	246		329	186	320	214	283	212	252	269	212	233	421	
2nd Frequency (0.1 %)													SE	
													263	
3rd Frequency (0.1 %)													N & W	
													105	

[NOTE] Observation time : 3 times per day (9,15 & 21 h)

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