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ANNUAL REPORT OF HYDROLOGIC CONDITIONS - 1981 WATER YEAR

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INTRODUCTION

The Water Resources Department of the St. Johns River Water Management District has prepared an annual report for the water year 1981 (October 1980 through September 1981). This report is directed toward state, regional and local governmental units, planning agencies, agricultural and business concerns, and interested members of the public; and is intended to provide current information on hydrologic conditions in the District and on the activities of the Water Resources Department.

This report is divided into two parts. The first section deals with the status of the resource. 1. Precipitation, 2. ground water, and 3. surface water data for the 1981 water year are presented and compared with historical data. Rainfall statistics for the period 1941 to 1970 are presented in the appendices along with a list of current technical reports and information circulars available through the Department. Future annual reports will be expanded and modified, as data become available, to provide more detailed information on water quantity and quality, water use, and other water resources information of interest to the people of the District.

STATUS OF THE RESOURCE

RAINFALL

Precipitation in the St. Johns River Water Management District occurs primarily as rainfall. The isohyetal map of the normal rainfall which is the annual mean for the period 1941-1970 is shown in Figure 1.

The annual rainfall variation in the District for the water year 1981 is shown in Figure 2. Rainfall within the District during the 1981 water year ranged from a low of 30.04 inches at Jacksonville Beach in Duval County to a high of 49.18 inches at Isleworth in Orange County. Average rainfall for the 1981 water year calculated using the isohyetal map (Figure 2) was 38.2 inches as compared to a District mean of 54.90 inches (based on Figure 1) for the period of 1941-1970.

The departure from the normal rainfall for the 1981 water year is illustrated on Figure 3. Rainfall was below normal through the entire District. Jacksonville, Gainesville and Sanford areas experienced maximum deficiencies exceeding 20 inches.

In summary, rainfall throughout the District during the 1981 water year was much below the period of record normal rainfall.

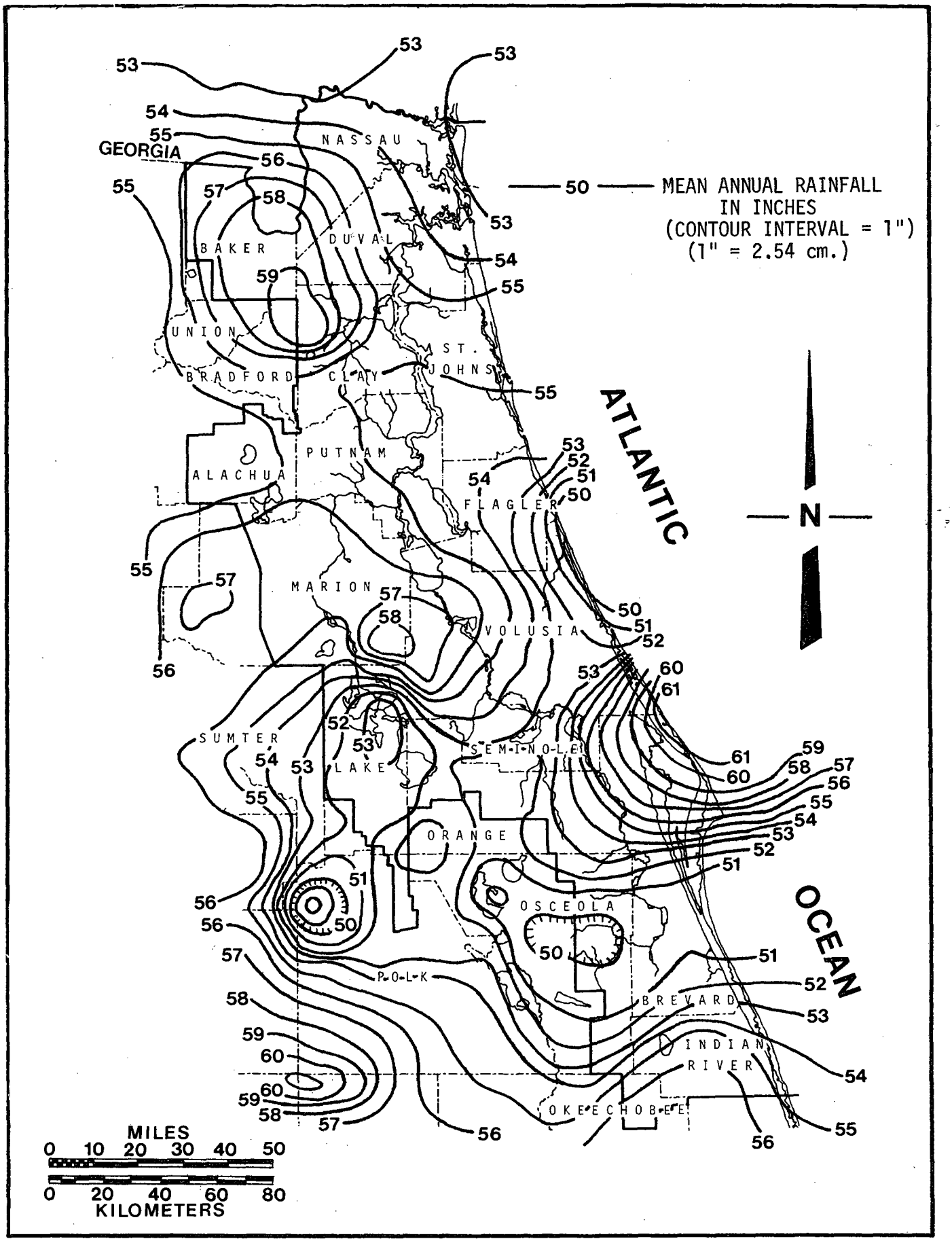

FIGURE 1. -- Mean Annual Rainfall in the SJRWMD, 1941-1970.

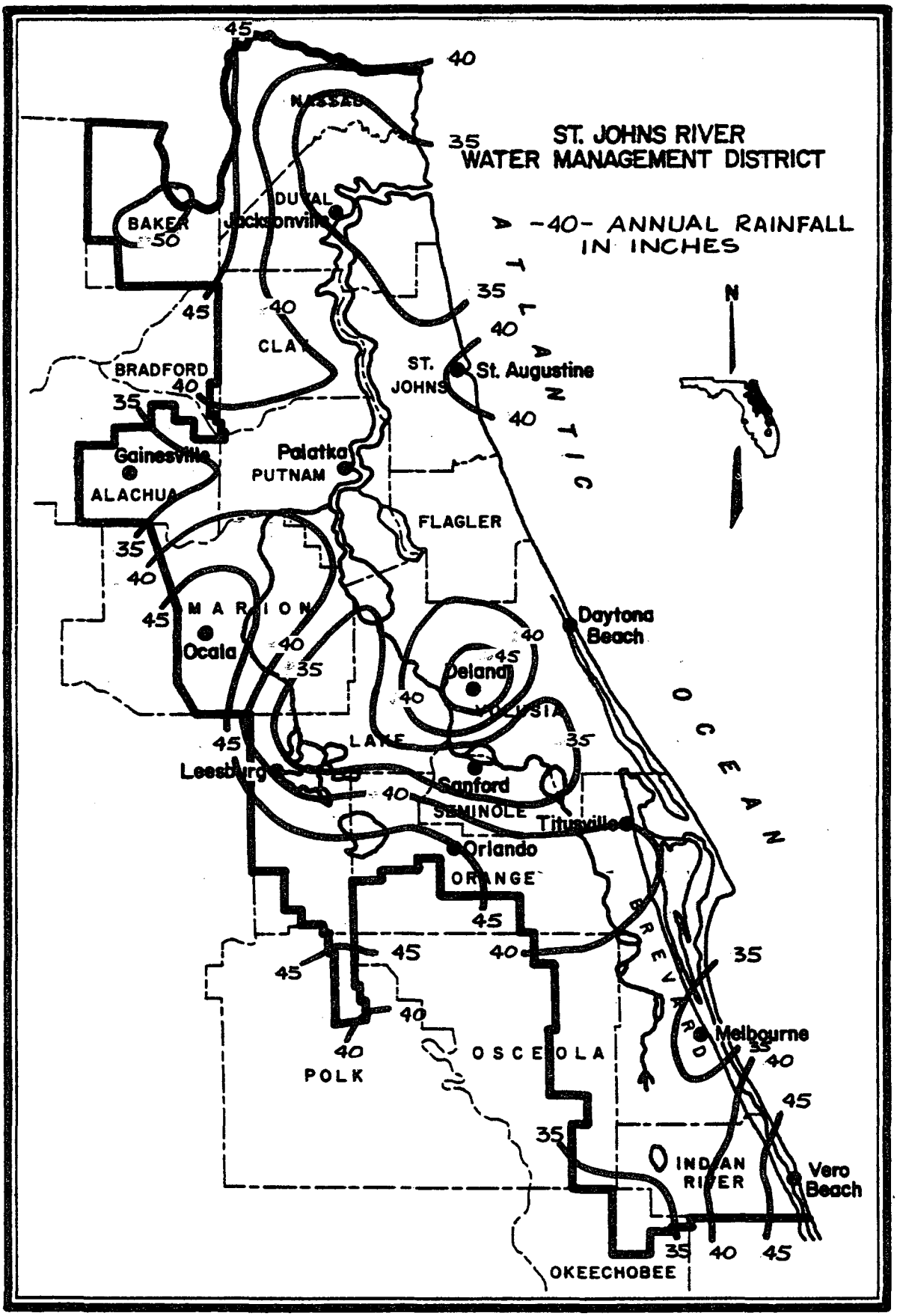

FIGURE 2 . -- 1981 Rainfall in Inches (October 1980 - September 1981)

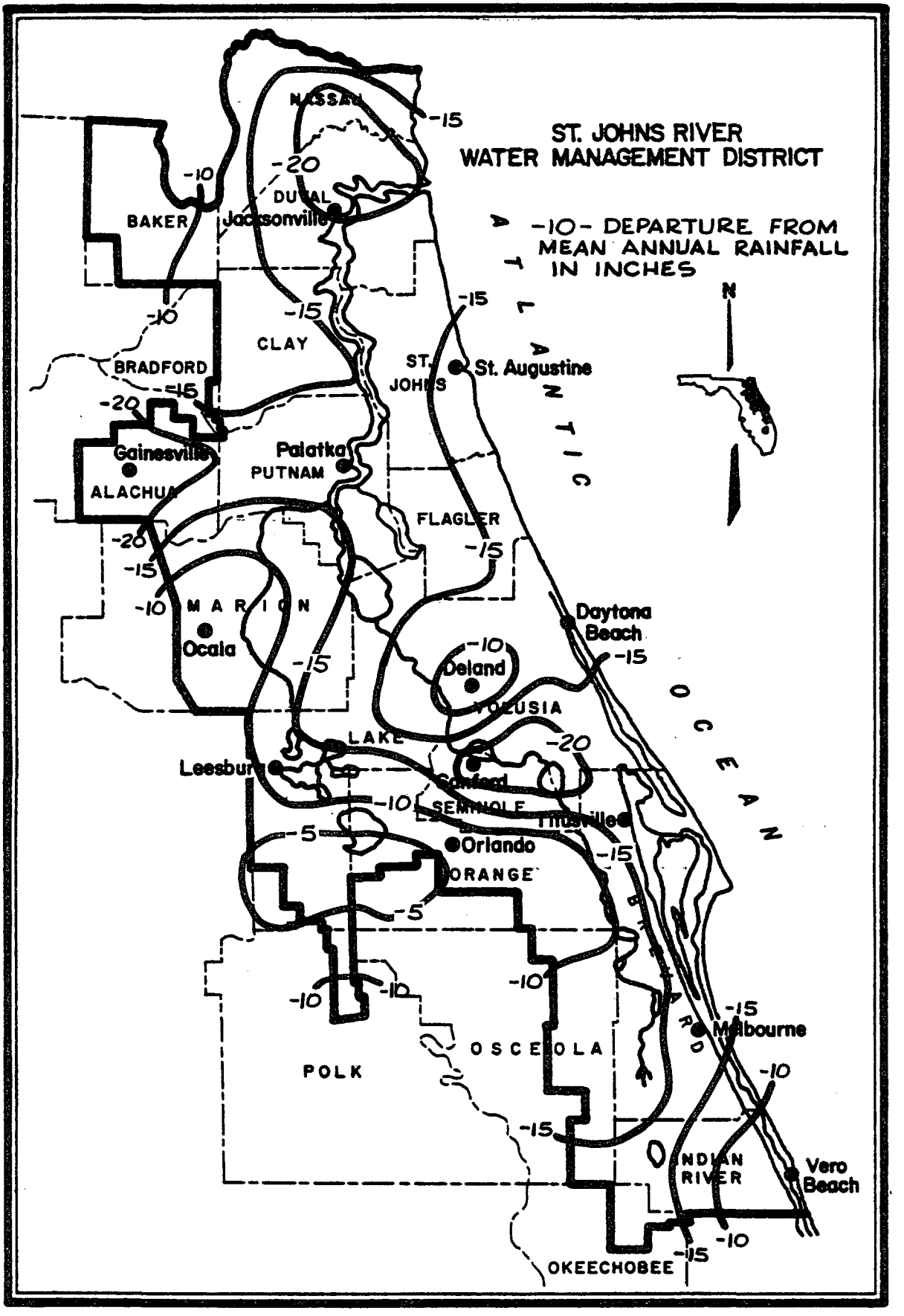

FIGURE 3. -- Departure from Mean Annual Rainfall for 1981 in Inches (Oct 80 - Sep 81)

FLORIDAN AQUIFER

Figures 4 and 5 display the potentiometric surface of the Floridan aquifer for May and September 1981 respectively. The potentiometric change of water level differences between the normal seasonal low in May, and the seasonal high in September are shown in Figure 6. During this period the potentiometric surface increases of up to 5 feet were recorded throughout the District. The Fernandina Beach area experienced a decline of greater than 1 foot resulting from industrial pumpage. The west-central portion of the District including parts of Alachua, Lake, Marion, and Putnam Counties recorded a decline of greater than 1/2 foot.

The overall increase in the potentiometric surface of the Floridan aquifer is deceiving, in light of the fact, that in May 1981, the Governing Board of the St. Johns River Water Management District implemented mandatory 15% water use cutbacks east of the St. Johns River, Indian River County and parts of Osceola and Okeechobee counties within the District. Voluntary 15% curtailments were in effect in the remainder of the District. The May to September increase reflects potentiometric surface at or near record low levels in May increasing slightly to higher September levels. September levels were still comparatively low due to the continued deficiency of accumulated rainfall during the summer months.

Figure 7 shows the location of four long-term monitor wells. May, June and July water levels reached all time lows at many places throughout the District. This is exemplified in Figure 8. Two wells V-1, Alamana in Volusia County and B-1, Cocoa in Brevard County, showed record low levels. At V-1 a record low water level of 25.11 feet was set on July 19, 1981, 1.44 feet below the previous recorded low. A new record low potentiometric level at B-1 of 22.57 feet was established on May 23, 1981 surpassing the previous low of 23.15 feet. Two other monitor wells, 122-A in Jacksonville and C-5 Keystone Heights, showed sub-

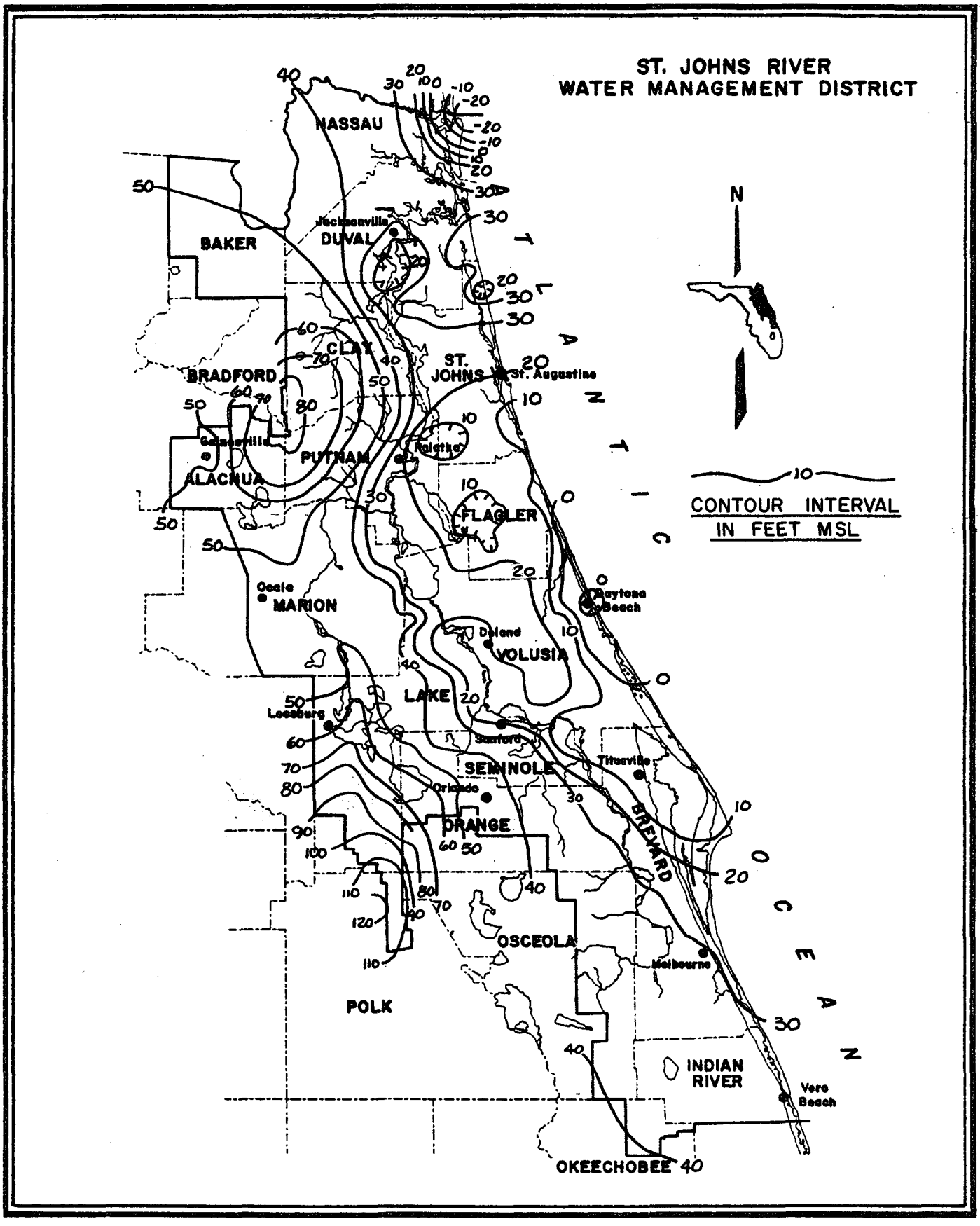

FIGURE 4.-- Potentiometric Level of the Floridan Aquifer, May 1981

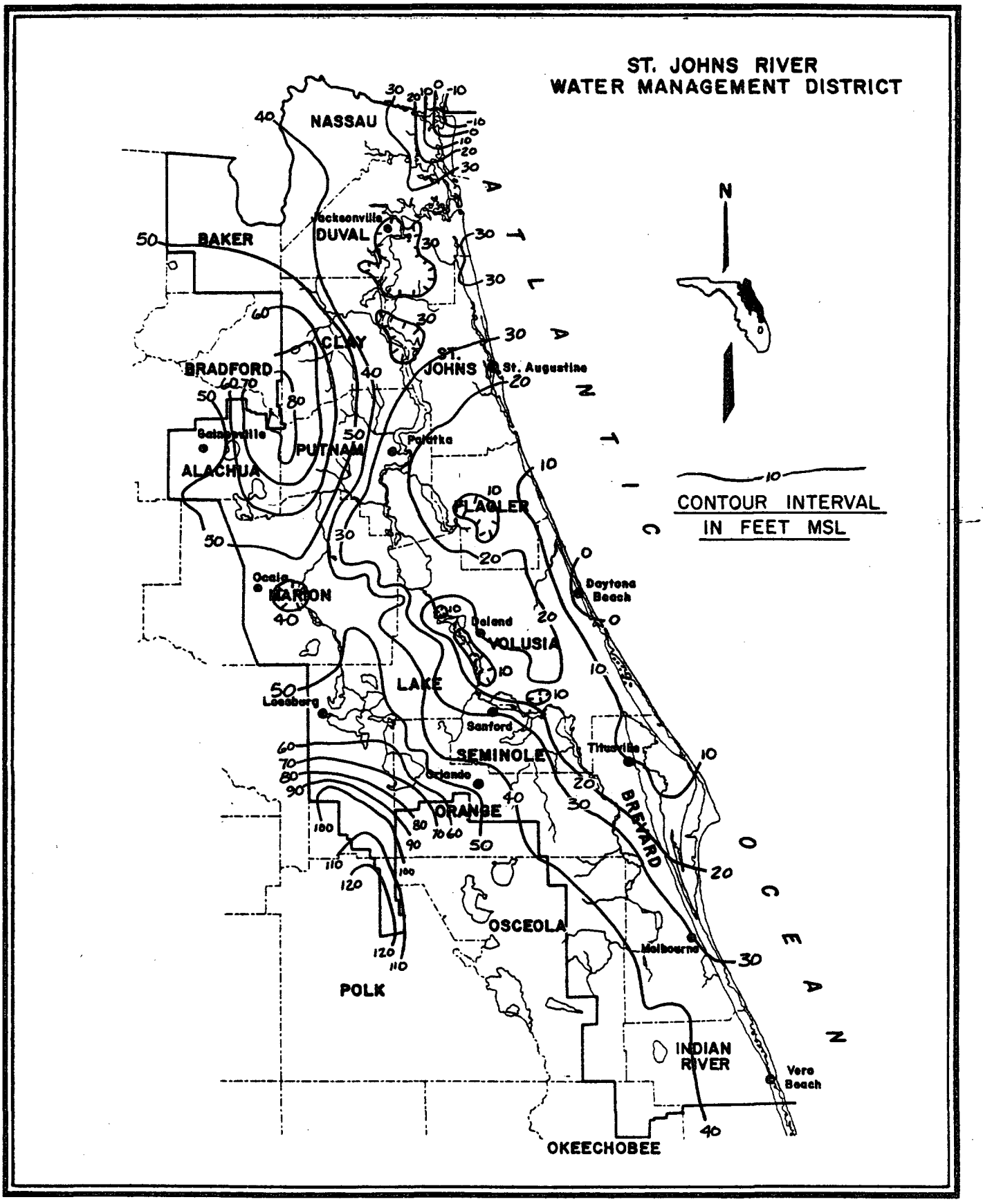

FIGURE 5.-- Potentiometric Level of the Floridan Aquifer, September 1981

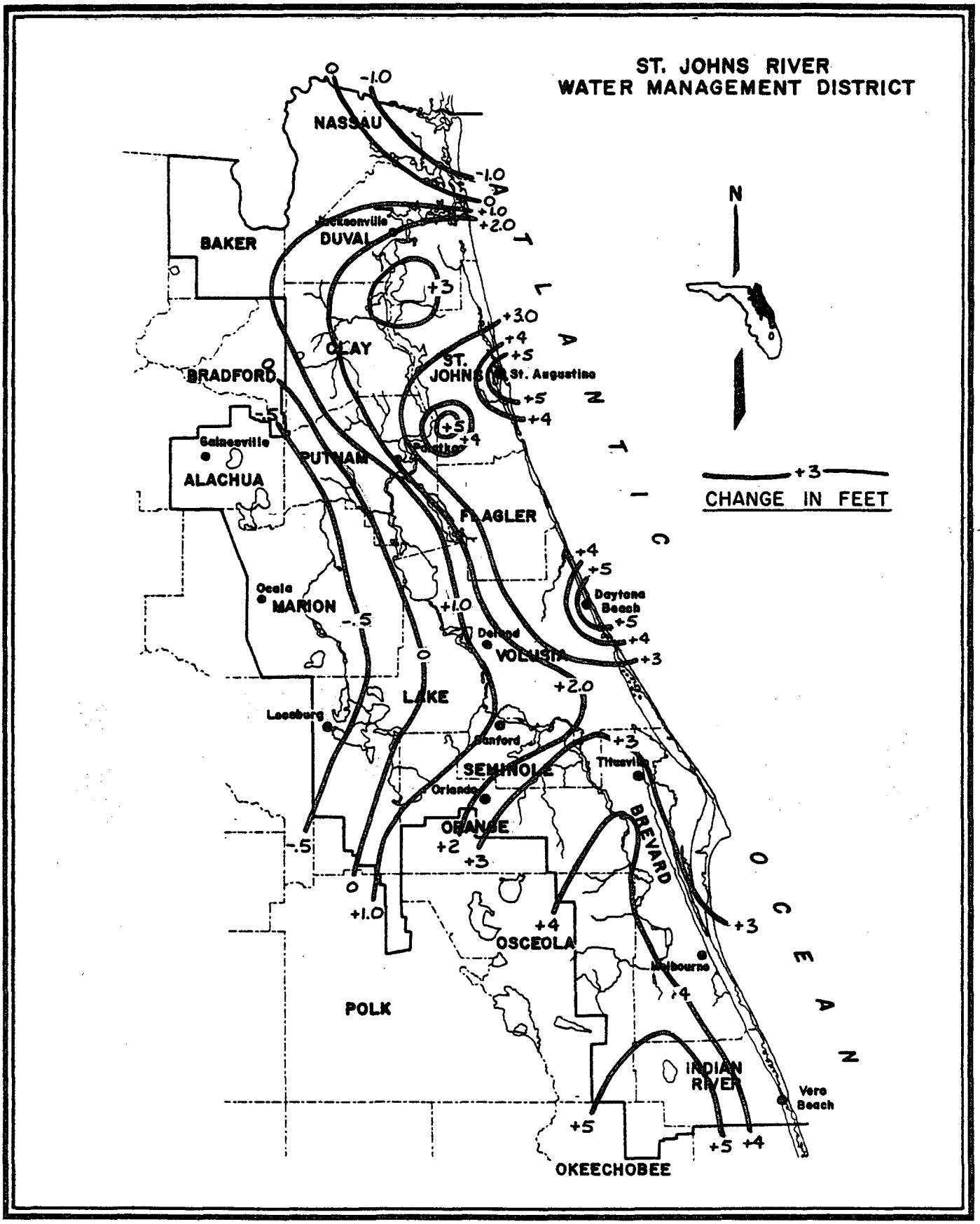

FIGURE 6.-- Change in the Potentiometric Surface of the Floridan Aquifer

May 1981 - September 1981

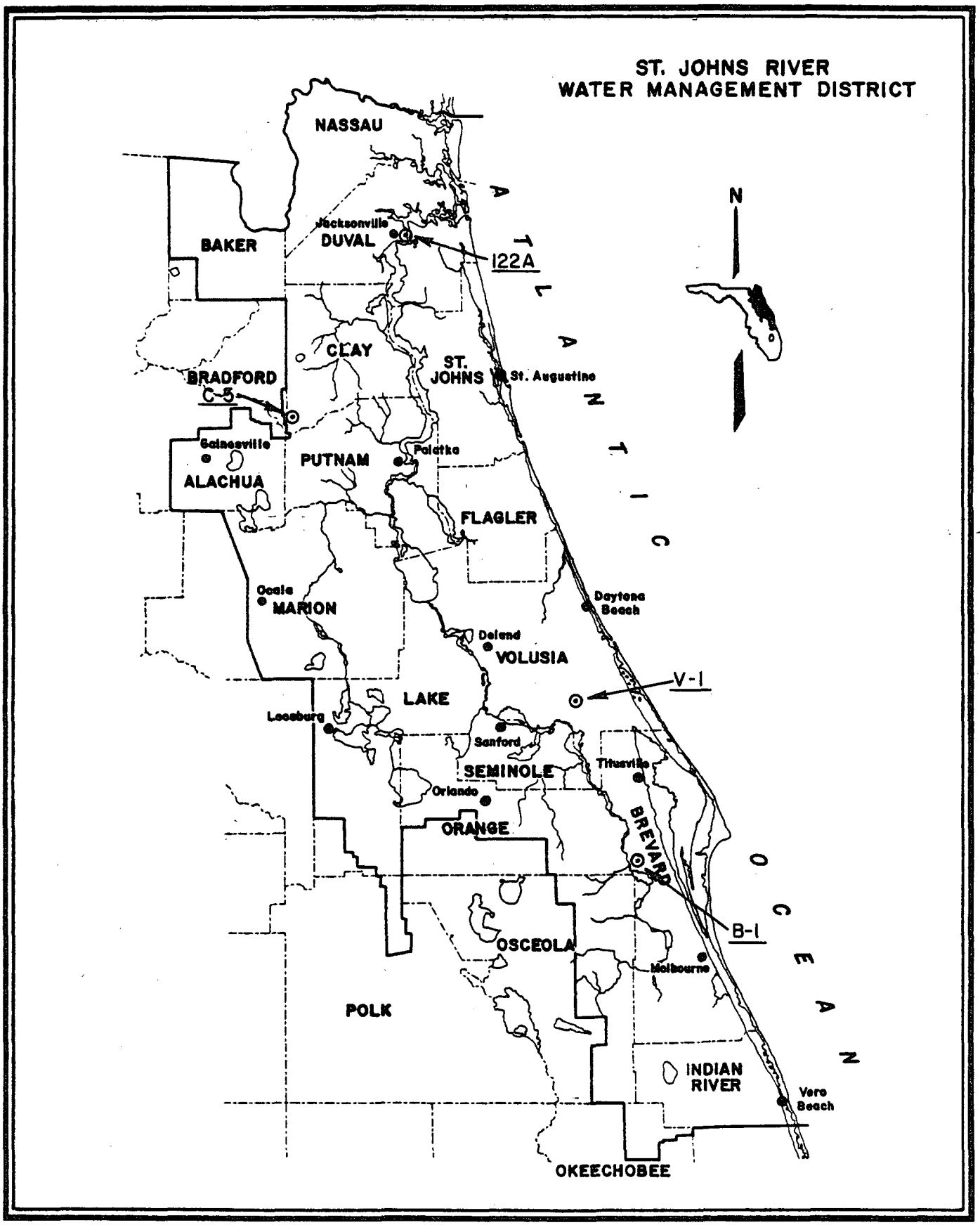

FIGURE 7.-- LONG-TERM MONITOR WELL LOCATION

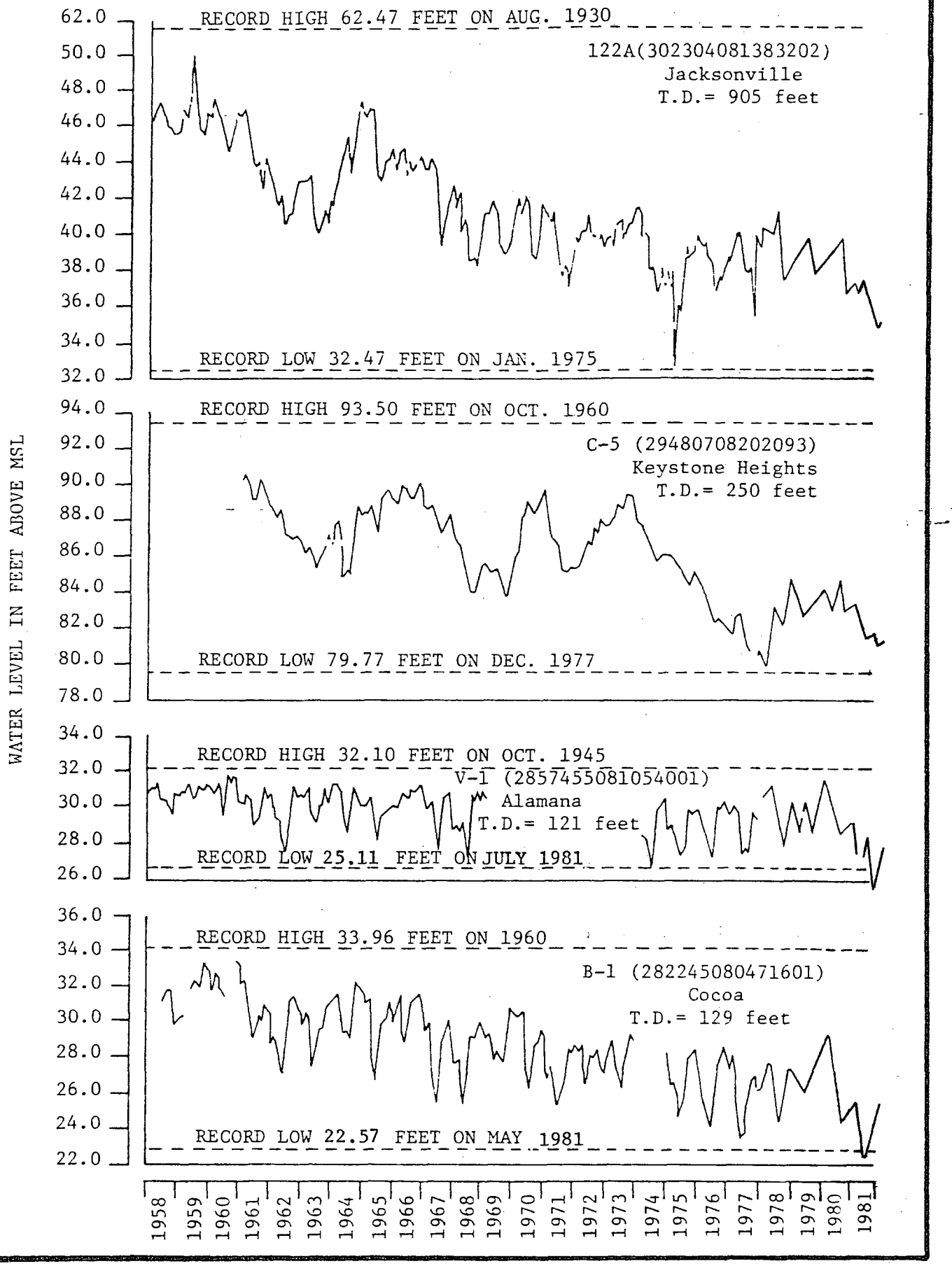

FIGURE 8. -- Hydrographs of Selected Wells in the SJRWMD.

stantial declines in water levels during this period.

Wells C-5 and B-1 are located in recharge areas which are not densely populated. These two wells show the relationship between natural recharge and discharge. At C-5, situated in an area of high recharge, the change in the water level of the Floridan aquifer between May and September is zero or slightly less. This indicates that any recharge occurring at this site was balanced by withdrawals and discharge in hydraulically connected areas down gradient in the system. The potentometric surface of V-1 increased between 1 and 2 feet. V-1 is also in an area of high recharge. The increase in water level indicates that recharge replenished slightly more water than was discharged or withdrawn. Typically Floridan aquifer water levels showed substantial increase during the summer months at these two sites.

Wells 122A and B-1 are located near areas of high density population. The wells are also in discharge areas. The water level fluctuations reflect the effect of heavy withdrawals of ground water associated with increasing water use of urban areas. 122-A in Jacksonville shows steady decline throughout most of the year. Due to the thickness of the potable water zone and the cutbacks implemented, the area was not as affected by the water shortage as in the remainder of the District.

Since the water quality of the Floridan aquifer in Brevard County is poor and the Cocoa area receives its drinking water supply from a well field in Orange County, B-1 reflects more agricultural pumpage and industrial withdrawals than public supply demand.

Generally throughout the District water levels approached or exceeded all-time record low levels by the early summer of 1981. Towards the end of the water year most areas seem to be heading toward recovery. The degree of recovery will be mainly dependent on rainfall in water year 1982.

SURFACE WATER

The streams and rivers of the St. Johns River Water Management District derive their flows from runoff of precipitation and from ground water discharge. Overall rainfall was about 30% below normal for the District during the 1981 water year. Rainfall deficiency began in the later months of water year 1980, and finally developed into a severe drought. Streamflows and water elevations were well below normal throughout the District during the water year 1981. Locations of stream or lake gaging stations used in the preparation of this report are shown in Figure 9.

Figures 10 through 16 present monthly streamflow data for water years 1978-1981 for selected gaging stations in the District. On some of the figures, the monthly median flows for the period of record are also shown. The median flow indicates the flow value equaled or exceeded for 50 percent of time during the period of record.

Table 1 presents the annual mean flow data for different tributaries in the lower St. Johns River Basin.

TABLE 1 -- Annual Mean Flows for Selected Gaging Stations in the Lower St. Johns River Basin

Gaging Station	Mean Flow in cfs Water Year 1979	1980	1981
Etonia Creek at Bardin	107	105	72.0
Rice Creek near Springdale	61.8	36.8	17.3
Simms Creek near Bardin	72.8	47.0	24.4
South Fork Black Creek near Penney Farms	143	169	68.8
North Fork Black Creek near Middleburg	259	274	79.4
Ortega River at Jacksonville	46.6	28.2	9.85
Pablo Creek at Jacksonville	49.3	33.4	8.73

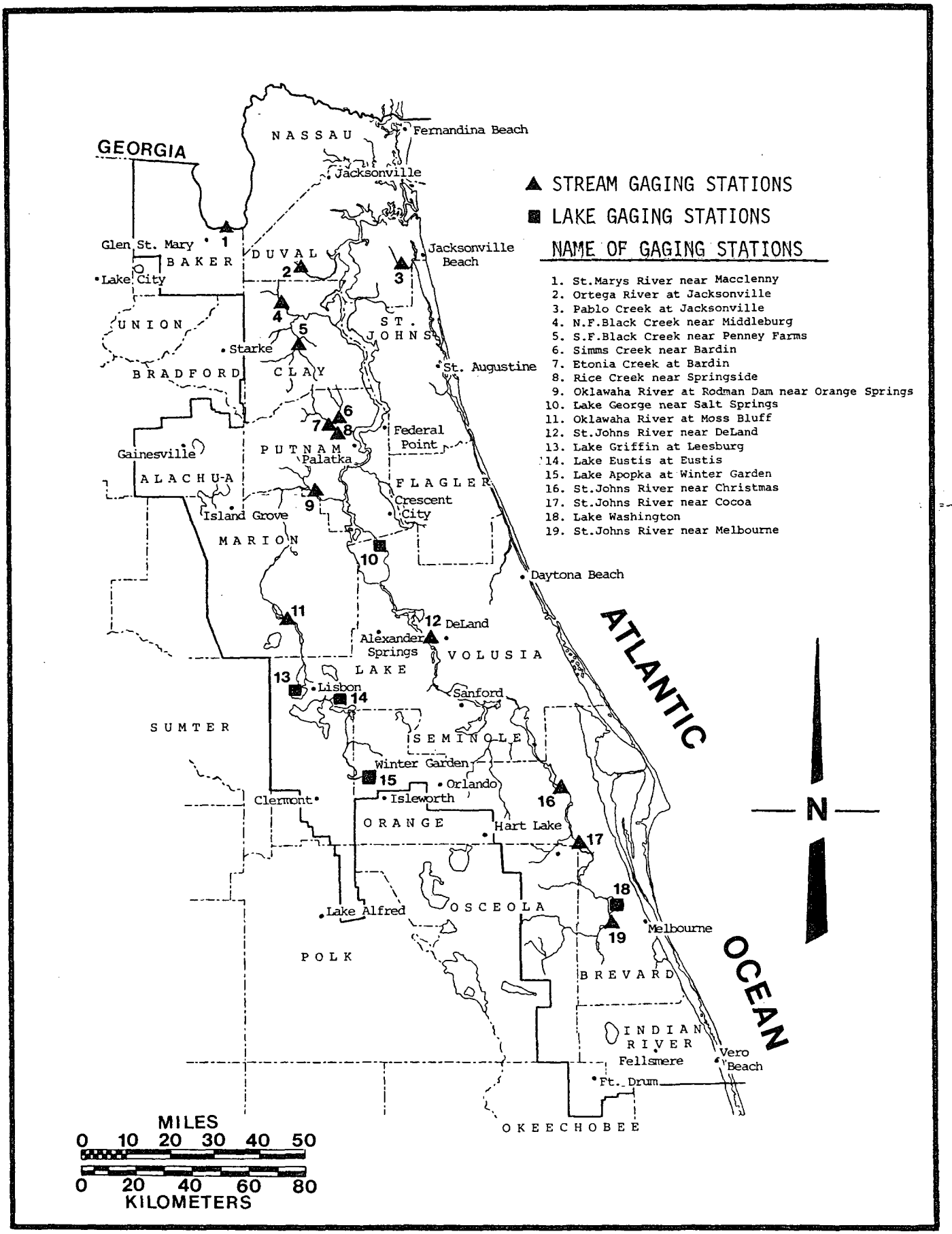

FIGURE 9. -- Location of Stream and Lake Gaging Stations Used in this Report.

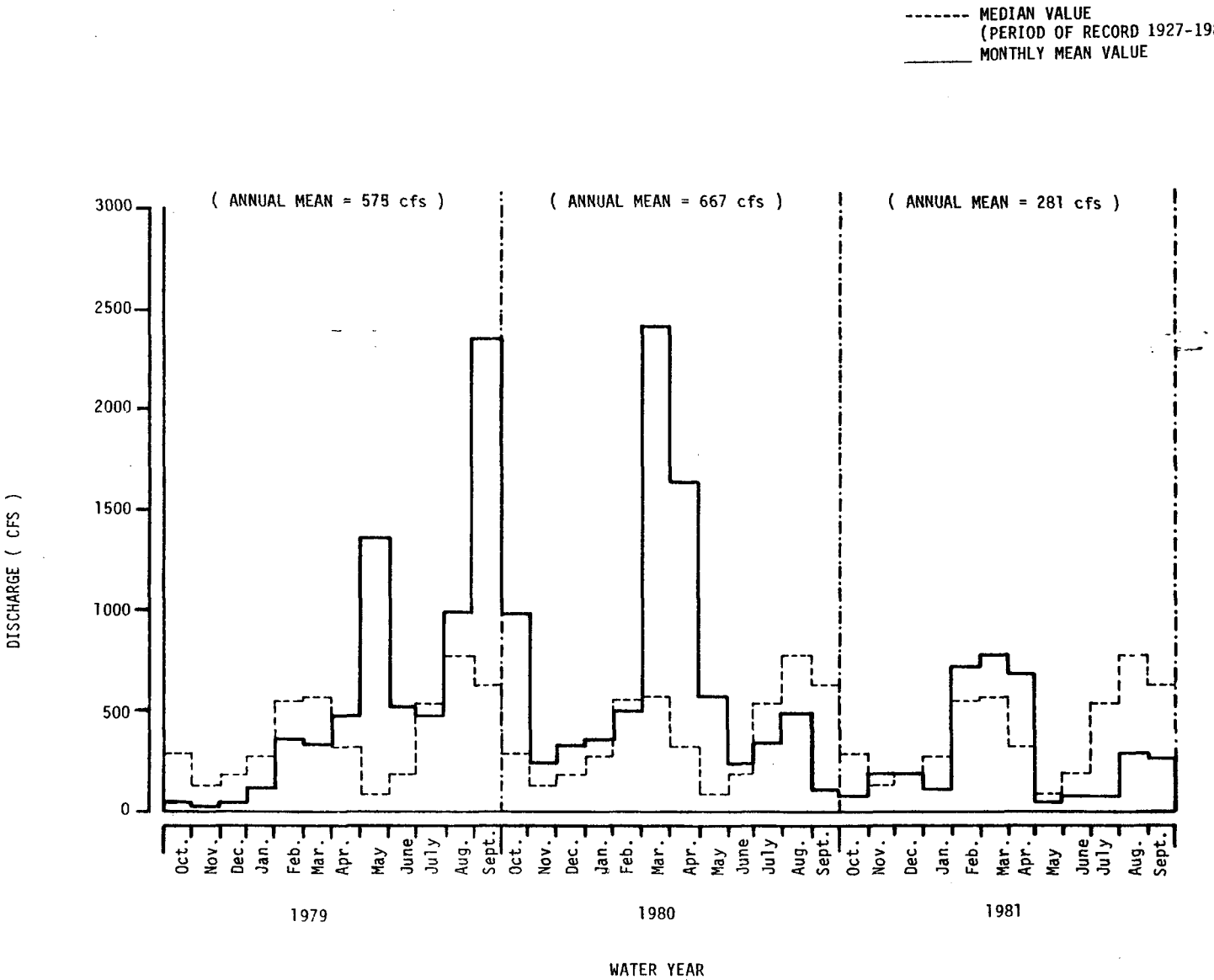

FIGURE 10. -- Streamflows, St. Marys River Near Macclenny

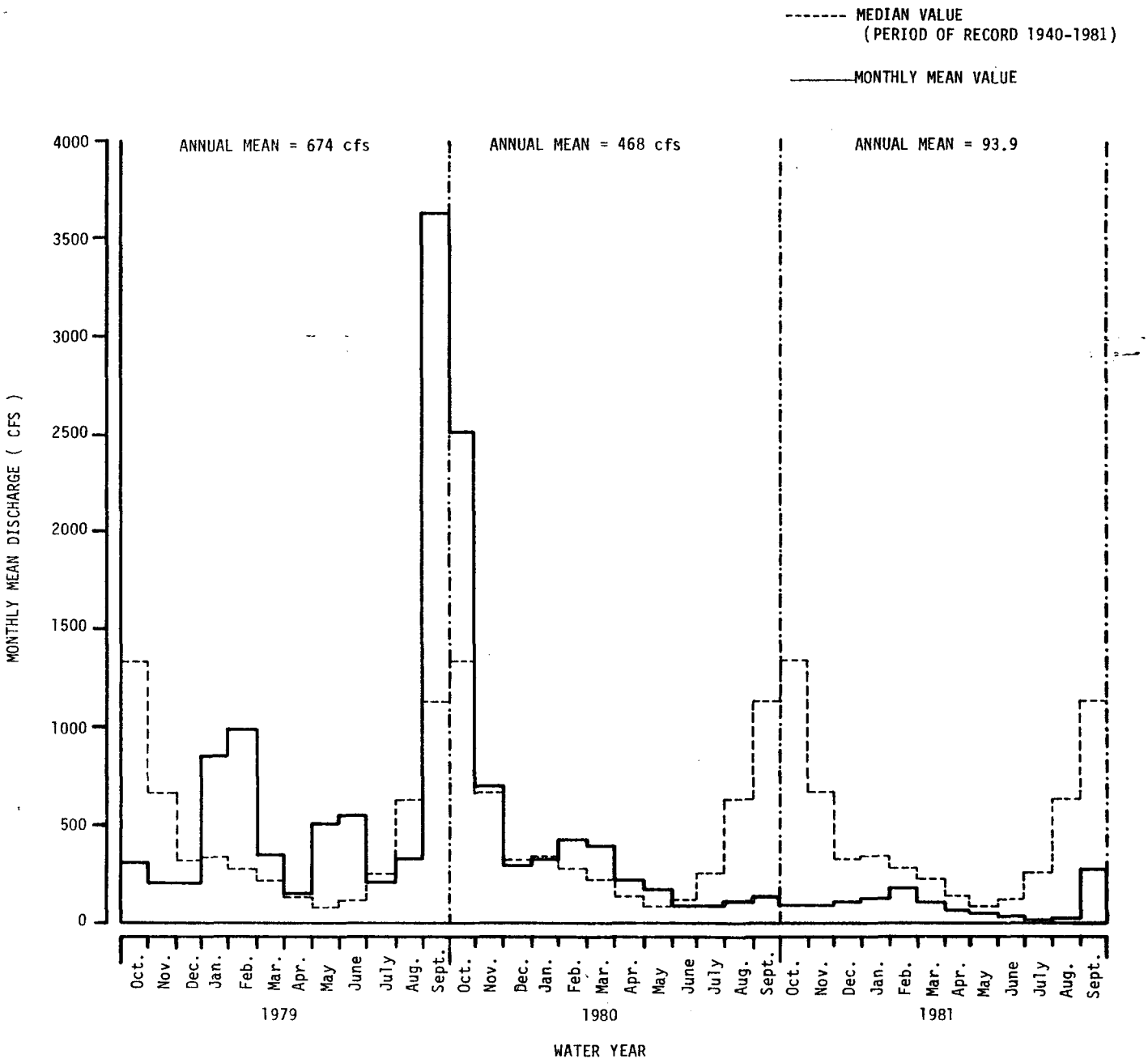

FIGURE 11. -- Streamflows, St. Johns River at Melbourne

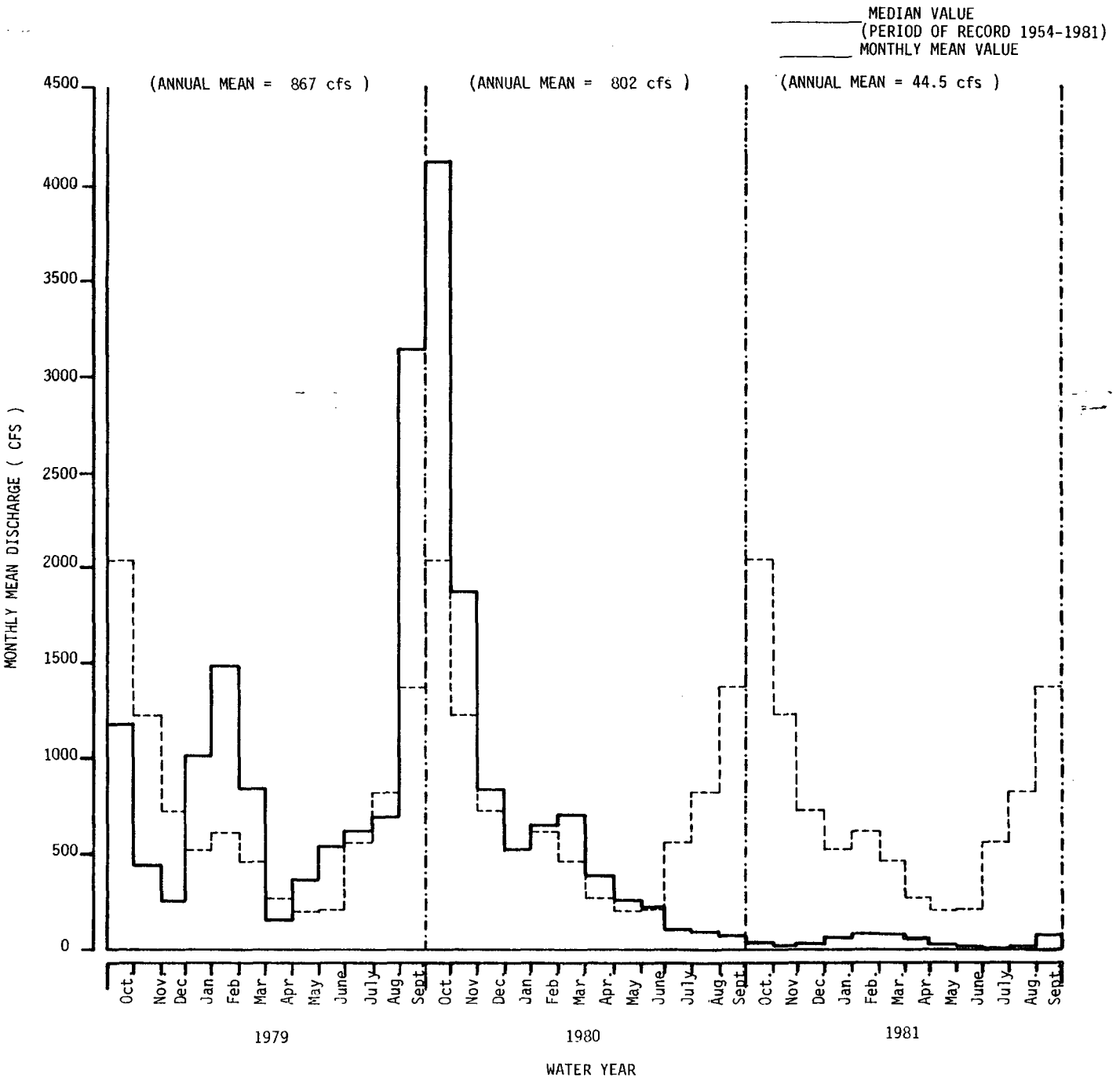

FIGURE 12. -- Streamflows, St. Johns River Near Cocoa

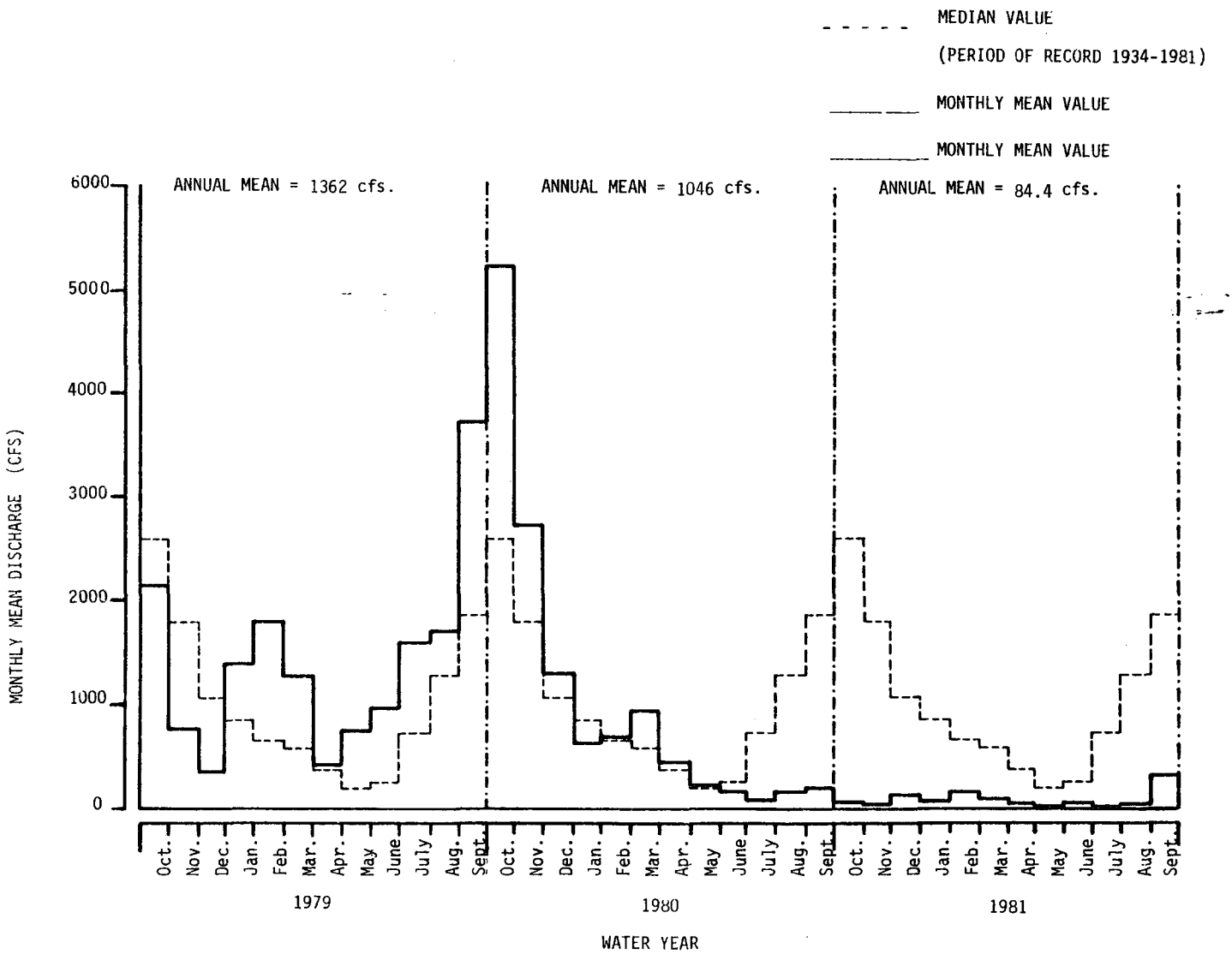

FIGURE 13. -- Streamflows, St. Johns River Near Christmas

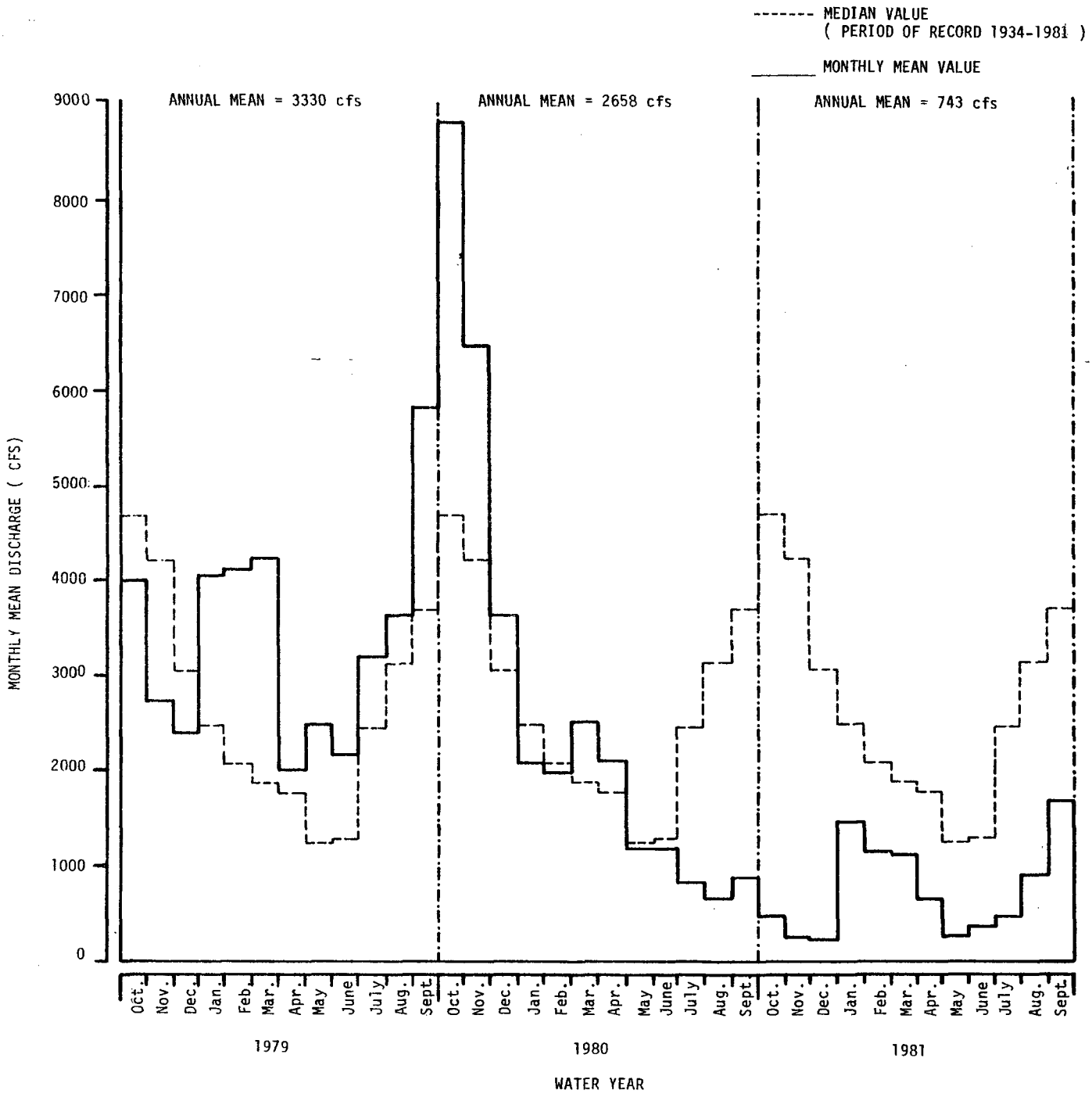

FIGURE 14. -- Streamflows, St. Johns River Near Deland

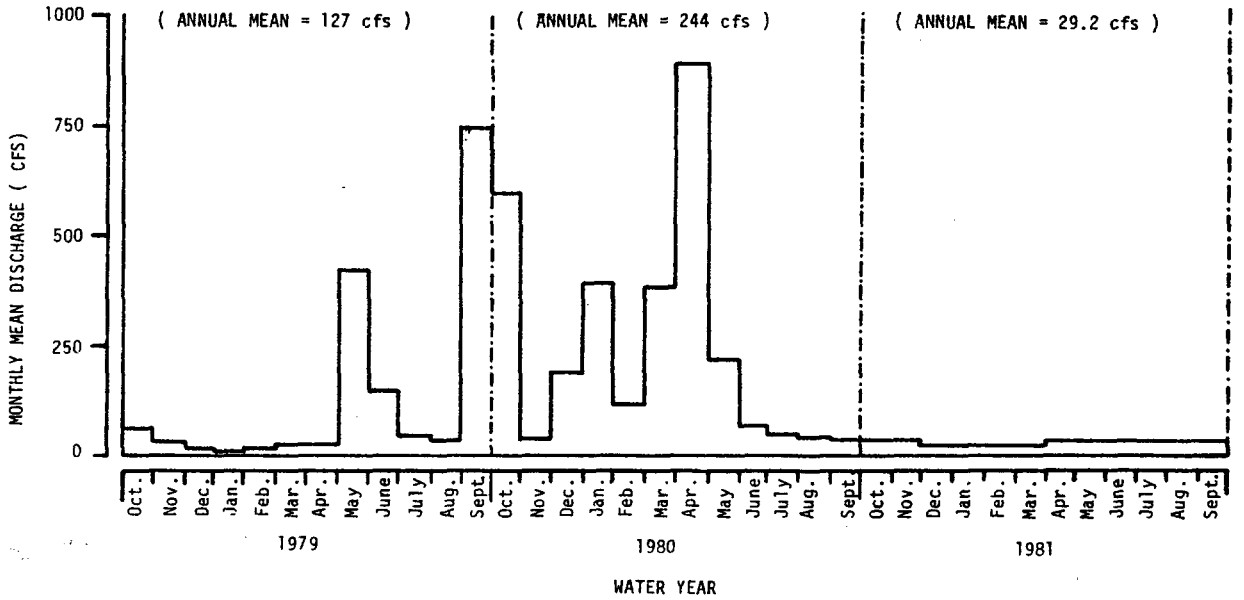

FIGURE 15. -- Streamflows, Oklawaha River at Moss Bluff

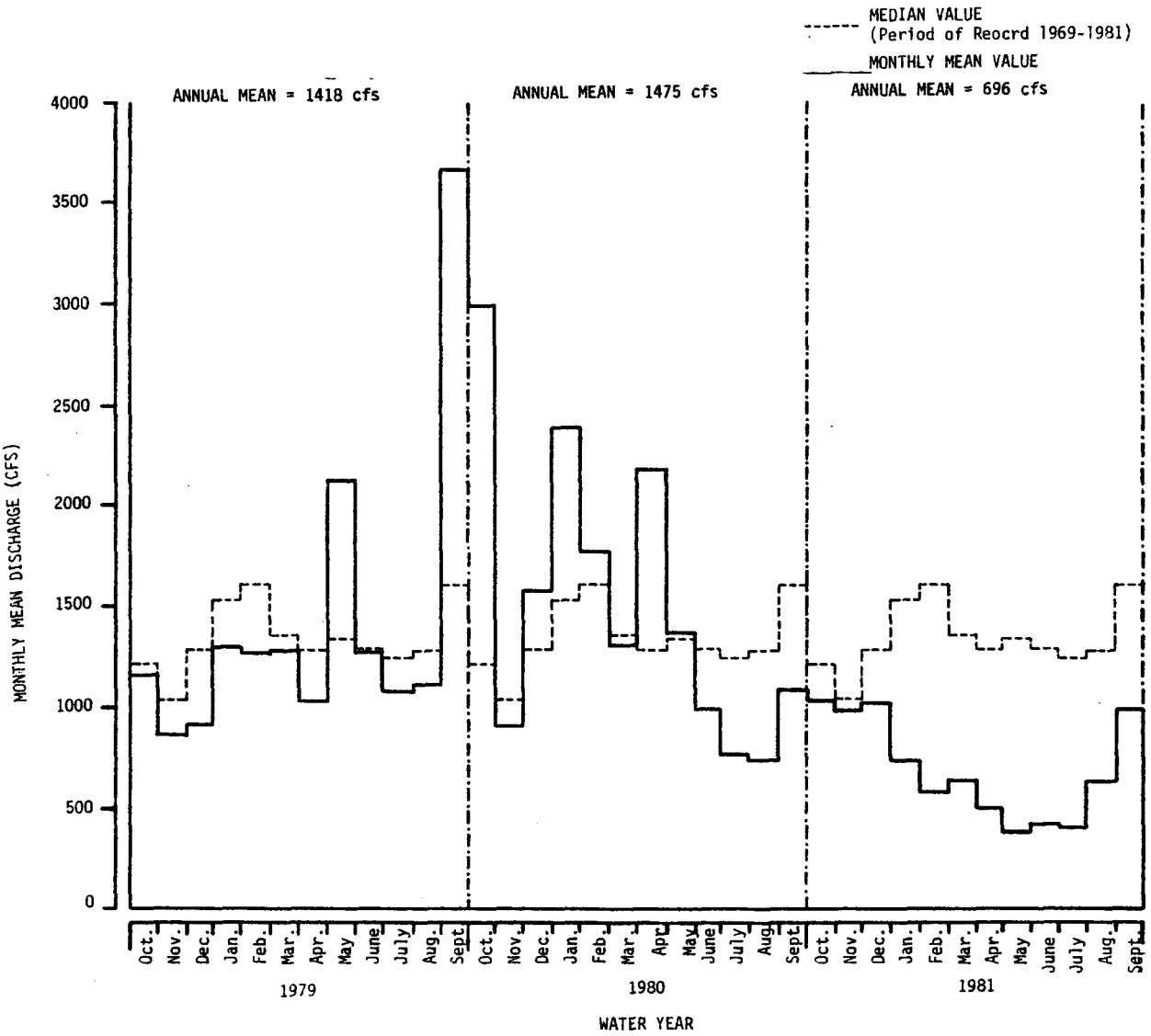

FIGURE 16. -- Streamflows, Oklawaha River at Rodman Dam, Near Orange Springs

Even though the rainfall deficiency for water year 1981 was only of the order of 30%, mean streamflows decreased to 5% to 28% of the 1979-1980 surface runoff in the upper and middle St. Johns River Basins (see Figures 11 through 14). In the St. Marys and Oklawaha Rivers, the decrease was 42% to 49% (see Figures 10 and 16). Likewise, the 1981 lake elevations were the lowest in recent years (Figures 17 through 21). This severe decline in streamflows/lake elevations was the result of persistent dry conditions throughout the river basins since the middle of 1980 calendar year. When a basin is dry more losses occur and the runoff potential is reduced for a given rainfall event.

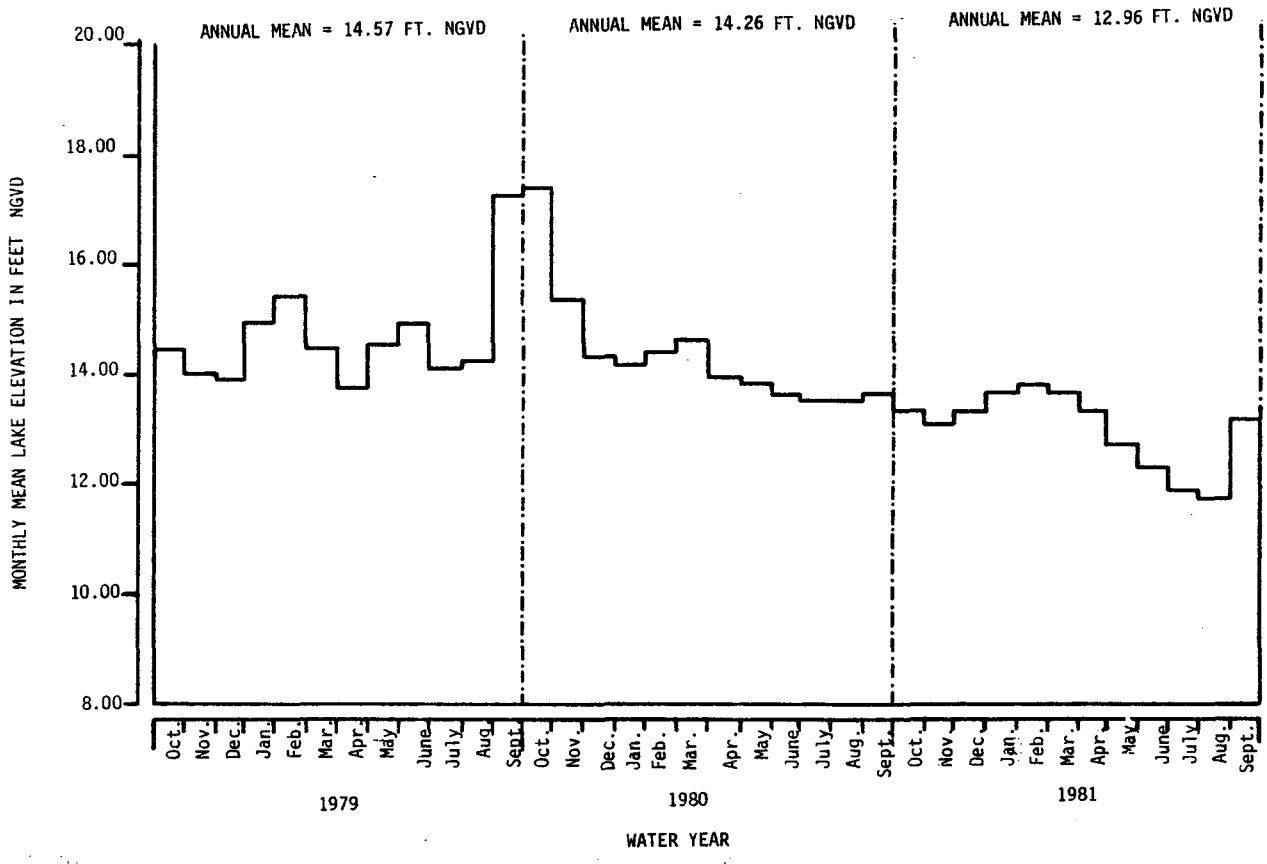

FIGURE 17. -- Elevation, Lake Wahsington Near Eau Gallie

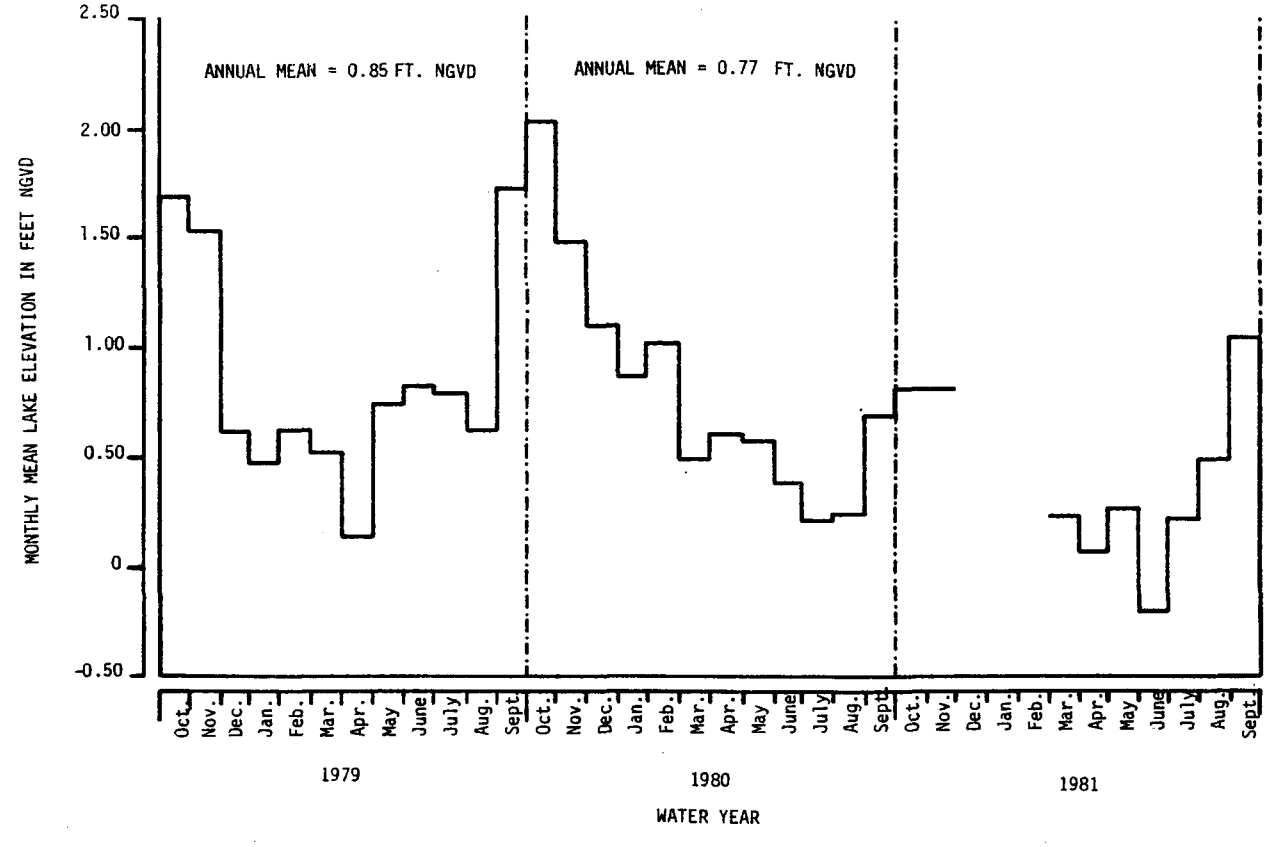

FIGURE 18. -- Elevation, Lake George Near Salt Springs

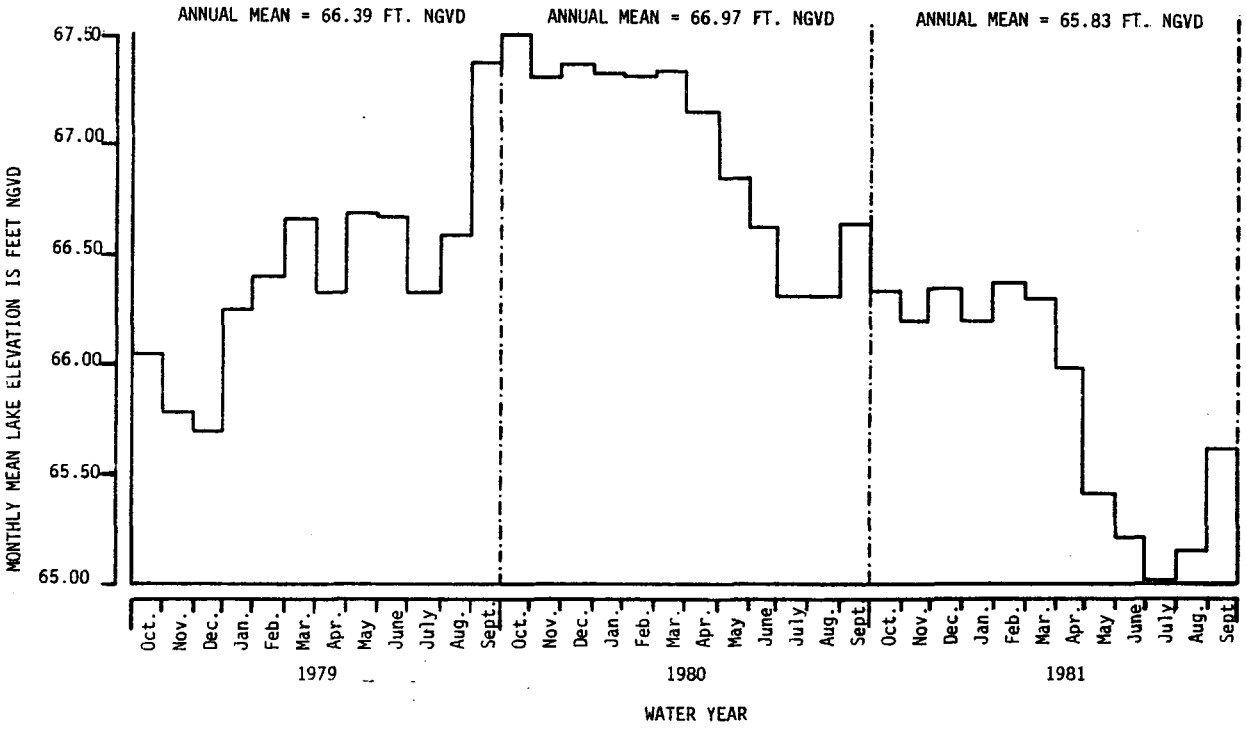

FIGURE 19. -- Elevation, Lake Apopka at Winter Garden

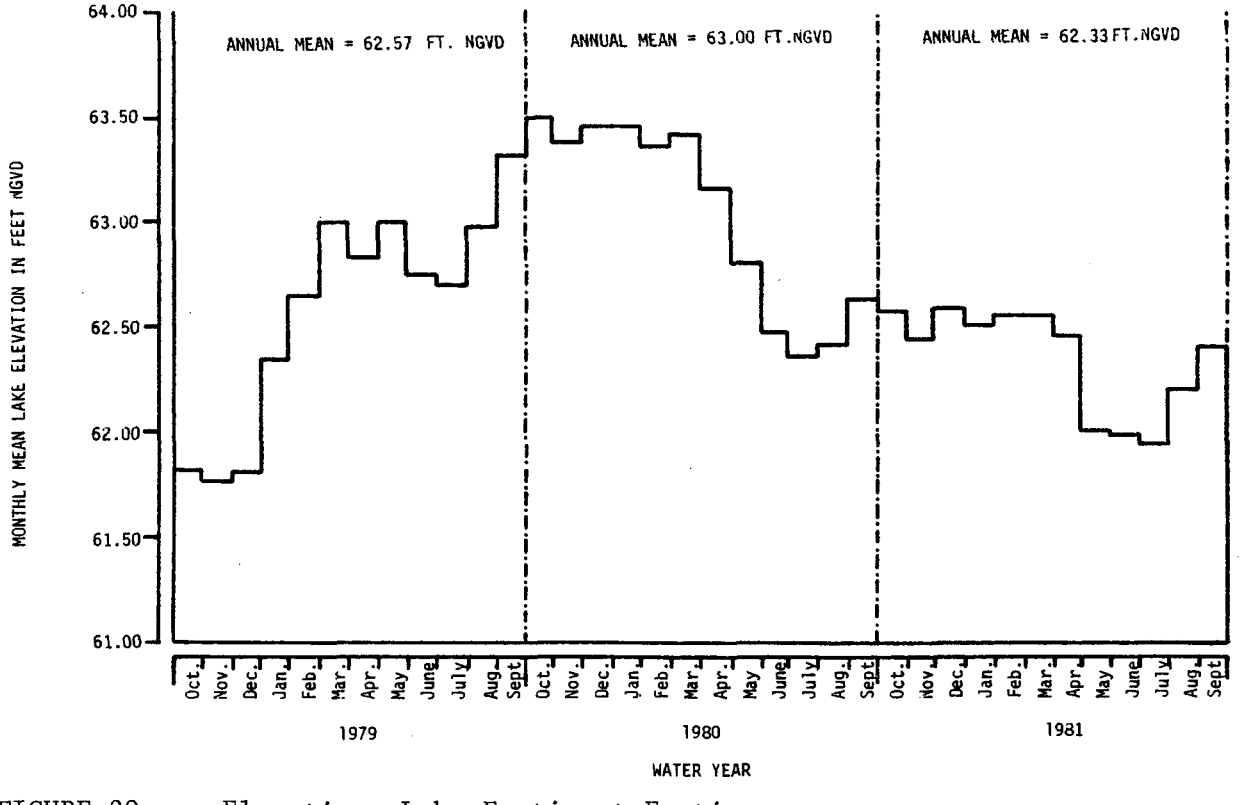

FIGURE 20. -- Elevation, Lake Eustis at Eustis

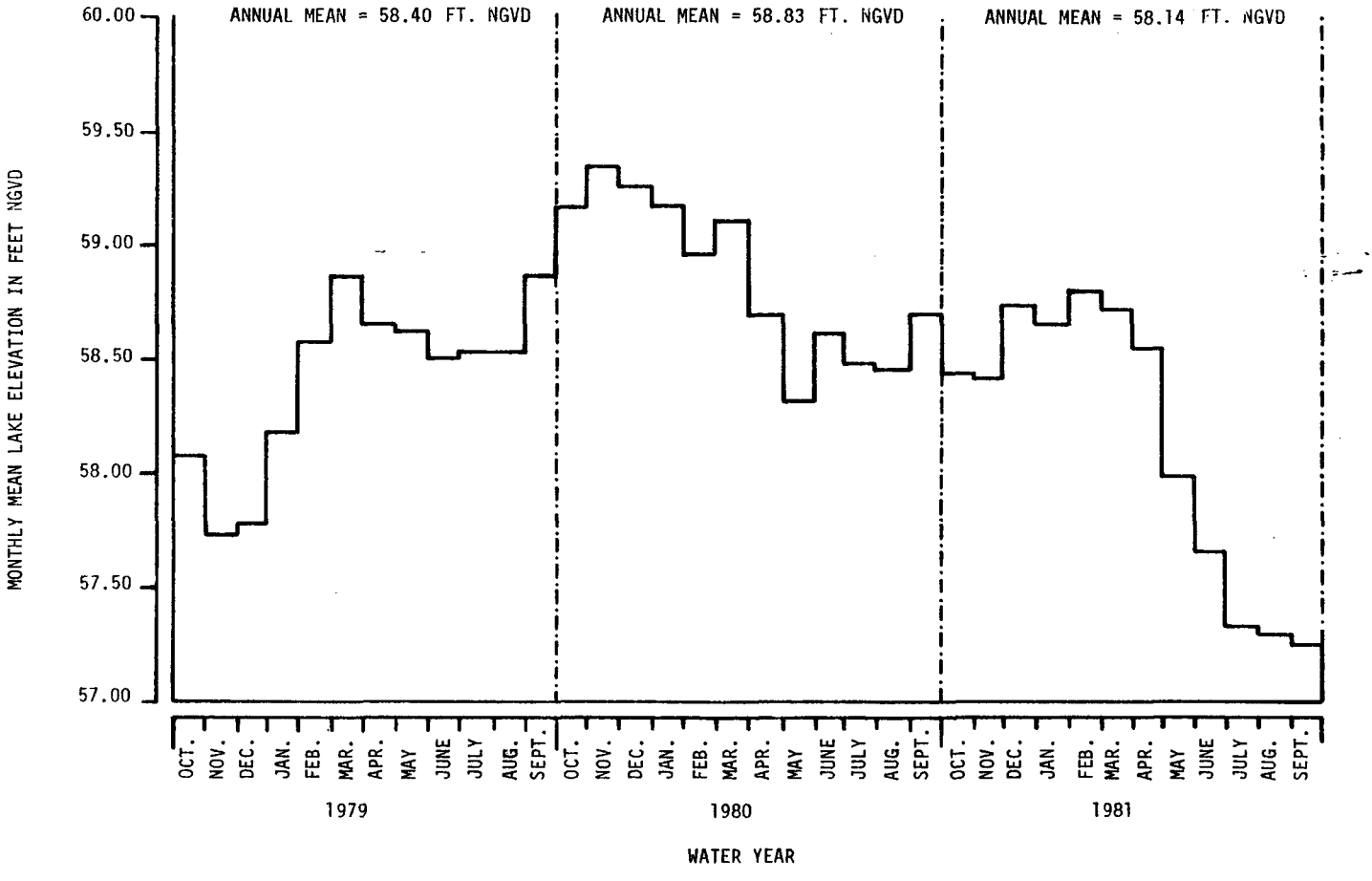

FIGURE 21. -- Elevation, Lake Griffin at Leesburg

WATER USE

Total water use by categories for 1980 is shown in Table 2. Agricultural Irrigation is the largest water use category for 1980 using 55% of the ground water and 58% of the total fresh water (Figure 22). The second largest category is public supply using 19% of the ground water and 15% of the total fresh water. Other categories using substantial amounts of ground water are Heat Pump/Air Conditioning with 10%, Industrial 8.5% and domestic self-supplied 4.5%. The remaining three categories, Institutional, Livestock, and Thermo-electric Power Generation, accounted for less than 2% of the total ground water used for 1980.

The two major fresh-water surface using categories are Agricultural irrigation and Thermo-electric Power Generation accounting for 89% of the total used in 1980. Industrial, Public Supply and Livestock accounted for the remaining 11% of total fresh surface water.

The 1980 per capita use, which is calculated by dividing the total water used in both public and domestic categories by the population, equals 175.74 GPCD District-wide.

TABLE 2.-- TOTAL WATER USE

ST.JOHNS RIVER WATER MANAGEMENT DISTRICT

1980

	WATER WITHDRAWN (MGD)						
	FRESH			SALINE			
WATER USE CATEGORY	GROUND	SURFACE	TOTAL	GROUND	SURFACE	TOTAL	TOTAL
PUBLIC	281.71	12.97	294.68	0.19	0.0	0.19	294.87
DOMESTIC (1)	87.4	0.0	87.4	0.0	0.0	0.0	87.4
INSTITUTIONAL (1)	13.82	0.03	13.85	0.0	0.0	0.0	13.85
INDUSTRIAL (1)	128.1	25.55	153.65	0.0	54.28	54.28	207.93
IRRIGATION	828.8	290.58	1,119.38	0.0	0.0	0.0	1,119.38
LIVESTOCK	6.87	7.27	14.14	0.0	0.0	0.0	14.14
THERMOELECTRIC POWER GENERATION	4.94	87.75	92.69	0.0	1,876.35	1,876.35	1,969.04
HEAT PUMP-A/C (2) LAWN IRRIGATION	147.67	0.0	147.67	0.0	0.0	0.0	147.67
TOTAL	1,499.31	424.15	1,923.46	0.19	1,930.63	1,930.82	3,854.28

TOTAL POPULATION (2,278,372) PER CAPITA USE (GPCD) 175.74 (3)

1. SELF-SUPPLIED ONLY.

2. DATA FOR THIS CATEGORY WAS ONLY COLLECTED IN TWO COUNTIES, BREVARD AND VOLUSIA. THE TOTAL IS THAT OF THOSE TWO COUNTIES.

3. GPCD IS BASED ON DISTRICT PUBLIC AND DOMESTIC WATER USE.

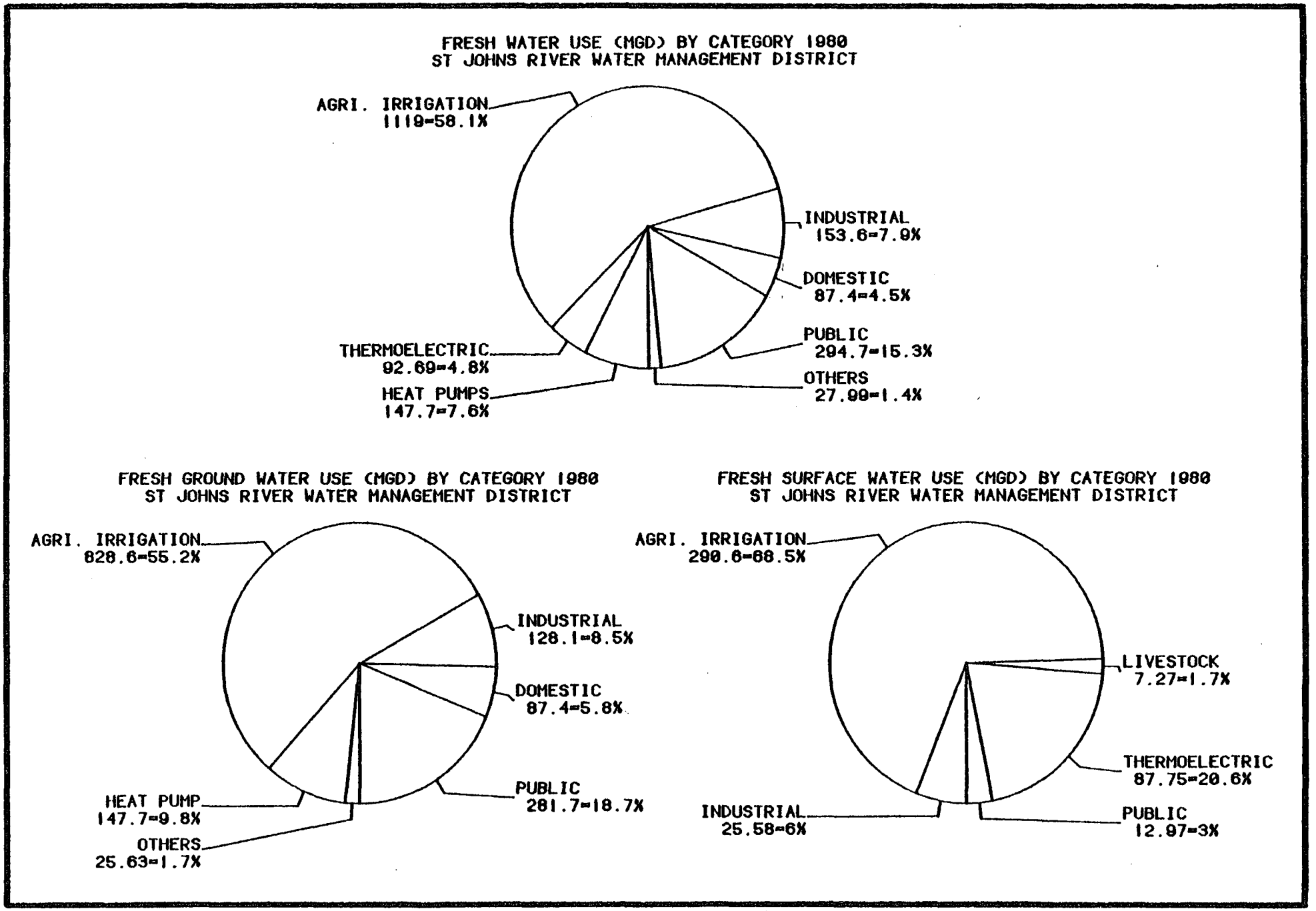

FIGURE 22.-TOTAL FRESH WATER USE BY CATEGORY

APPENDIX A

RAINFALL STATISTICS FOR 1941-1970

The mean rainfall for 1941-1970 is considered as normal for a given gaging station. However, other rainfall statistics, such as the median, normal range, and the lowest mean annual rainfall for a specified period will be of interest for comparison with 1981 water year rainfall data.

For 19 long term NOAA stations located within and close to the District, the rainfall statistics mean, median, normal range, maximum, minimum, and the lowest mean annual rainfall for 3, 5, and 10 years were evaluated for the period 1941-1970. These results are presented in Tables A-1 to A-3. Definitions for the above statistics are presented in the tables.

TABLE A-1. -- RAINFALL STATISTICS INCLUDING THE LOWEST MEAN ANNUAL RAINFALL FOR 3 YEARS FOR 1941-70(THE PERIOD USED FOR CALCULATING NORMAL RAINFALL)

(ALL RAINFALL VALUES ARE IN INCHES/YEAR)

STATION	MEAN	MEDIAN	NORMAL RANGE	MAX	MIN	LOWEST MEAN	PERIOD
FELLSMERE	55.86	55.52	50.22-62.49	78.83	27.94	41.77	1965-67
LAKE ALFRED	52.87	53.95	47.96-58.71	76.57	35.62	39.44	1954-56
MELBOURNE	50.79	50.56	44.50-57.76	73.28	32.52	41.61	1954-56
GAINESVILLE	54.60	55.33	47.75-61.14	76.95	35.24	41.98	1954-56
TITUSVILLE	59.20	61.21	49.22-66.03	81.74	41.88	48.95	1954-56
SANFORD	53.32	53.09	47.62-57.89	74.06	35.04	41.39	1961-63
ST.AUGUSTINE	55.22	55.27	46.94-62.64	79.91	32.68	38.12	1954-56
PALATKA	54.84	55.76	48.47-60.75	74.61	29.22	38.99	1954-56
ORLANDO	51.21	50.64	43.96-55.95	68.74	39.61	43.25	1942-44
GLEN ST. MARY	58.74	60.63	47.48-65.66	84.95	34.35	41.61	1954-56
JACKSONVILLE	54.47	54.00	49.00-62.53	77.37	36.83	43.75	1954-56
FERNANDINA BEACH	52.89	50.59	44.81-55.04	82.45	39.83	42.58	1954-56
DELAND	54.87	54.98	47.67-63.99	74.79	41.54	44.88	1954-56
DAYTONA BEACH	50.20	49.84	42.40-58.17	79.29	31.36	34.71	1954-56
CRESCENT CITY	54.67	53.37	46.75-62.43	75.03	37.97	42.80	1954-56
CLERMONT	51.41	51.67	47.11-55.15	68.09	32.28	40.88	1961-63
FEDERAL POINT	54.50	54.97	49.03-60.48	73.75	34.89	40.01	1954-56
HART LAKE	52.27	52.66	43.92-58.68	76.66	32.61	41.20	1961-63
ISLEWORTH	53.14	50.68	45.14-60.82	78.78	35.33	42.08	1954-56

NOTES:-
MEAN - ARITHMETIC AVERAGE OF ANNUAL RAINFALL VALUES FOR THE PERIOD OF RECORD
MEDIAN - RAINFALL WHICH WAS EQUALED OR EXCEEDED FOR 50% OF YEARS DURING THE PERIOD OF RECORD
NORMAL RANGE - RAINFALL WAS GREATER THAN THIS RANGE FOR 25% OF YEARS AND LESS THAN THIS RANGE FOR 25% OF YEARS DURING THE PERIOD OF RECORD
MAX - THE HIGHEST RECORDED ANNUAL RAINFALL FOR THE PERIOD OF RECORD
MIN - THE LOWEST RECORDED ANNUAL RAINFALL FOR THE PERIOD OF RECORD
LOWEST MEAN - MEAN ANNUAL RAINFALL FOR ANY 3-YEAR CONTINUOUS PERIOD HAVING THE LOWEST RAINFALL
PERIOD - CALENDAR YEARS FOR WHICH THE LOWEST MEAN RAINFALL OCCURRED

TABLE A-2. -- RAINFALL STATISTICS INCLUDING THE LOWEST MEAN ANNUAL RAINFALL FOR 5 YEARS FOR 1941-70(THE PERIOD USED FOR CALCULATING NORMAL RAINFALL)

(ALL RAINFALL VALUES ARE IN INCHES/YEAR)

STATION	MEAN	MEDIAN	NORMAL RANGE	MAX	MIN	LOWEST MEAN	PERIOD
FELLSMERE	55.86	55.52	50.22-62.49	78.83	27.94	43.47	1963-67
LAKE ALFRED	52.87	53.95	47.96-58.71	76.57	35.62	44.64	1961-65
MELBOURNE	50.79	50.56	44.50-57.76	73.28	32.52	45.59	1961-65
GAINESVILLE	54.60	55.33	47.75-61.14	76.95	35.24	47.95	1952-56
TITUSVILLE	59.20	61.21	49.22-66.03	81.74	41.88	53.18	1954-58
SANFORD	53.32	53.09	47.62-57.89	74.06	35.04	46.17	1961-65
ST.AUGUSTINE	55.22	55.27	46.94-62.64	79.91	32.68	46.51	1954-58
PALATKA	54.84	55.76	48.47-60.75	74.61	29.22	44.26	1952-56
ORLANDO	51.21	50.64	43.96-55.95	68.74	39.61	47.17	1942-46
GLEN ST. MARY	58.74	60.63	47.48-65.66	84.95	34.35	45.90	1951-55
JACKSONVILLE	54.47	54.00	49.00-62.53	77.37	36.83	47.35	1954-58
FERNANDINA BEACH	52.89	50.59	44.81-55.04	82.45	39.83	43.54	1954-58
DELAND	54.87	54.98	47.67-63.99	74.79	41.54	49.35	1961-65
DAYTONA BEACH	50.20	49.84	42.40-58.17	79.29	31.36	39.15	1954-58
CRESCENT CITY	54.67	53.37	46.75-62.43	75.03	37.97	48.08	1954-58
CLERMONT	51.41	51.67	47.11-55.15	68.09	32.28	45.12	1961-65
FEDERAL POINT	54.50	54.97	49.03-60.48	73.75	34.89	46.03	1952-56
HART LAKE	52.27	52.66	43.92-58.68	76.66	32.61	43.26	1961-65
ISLEWORTH	53.14	50.68	45.14-60.82	78.78	35.33	46.85	1948-52

NOTES:-
MEAN - ARITHMETIC AVERAGE OF ANNUAL RAINFALL VALUES FOR THE PERIOD OF RECORD
MEDIAN - RAINFALL WHICH WAS EQUALED OR EXCEEDED FOR 50% OF YEARS DURING THE PERIOD OF RECORD
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MIN - THE LOWEST RECORDED ANNUAL RAINFALL FOR THE PERIOD OF RECORD
LOWEST MEAN - MEAN ANNUAL RAINFALL FOR ANY 5-YEAR CONTINUOUS PERIOD HAVING THE LOWEST RAINFALL
PERIOD - CALENDAR YEARS FOR WHICH THE LOWEST MEAN RAINFALL OCCURRED

TABLE A-3. -- RAINFALL STATISTICS INCLUDING THE LOWEST MEAN ANNUAL RAINFALL FOR 10 YEARS FOR 1941-70(THE PERIOD USED FOR CALCULATING NORMAL RAINFALL)

(ALL RAINFALL VALUES ARE IN INCHES/YEAR)

STATION	MEAN	MEDIAN	NORMAL RANGE	MAX	MIN	LOWEST MEAN	PERIOD
FELLSMERE	55.86	55.52	50.22-62.49	78.83	27.94	46.53	1961-70
LAKE ALFRED	52.87	53.95	47.96-58.71	76.57	35.62	48.86	1961-70
MELBOURNE	50.79	50.56	44.50-57.76	73.28	32.52	48.09	1949-58
GAINESVILLE	54.60	55.33	47.75-61.14	76.95	35.24	50.01	1954-63
TITUSVILLE	59.20	61.21	49.22-66.03	81.74	41.88	57.12	1942-51
SANFORD	53.32	53.09	47.62-57.89	74.06	35.04	47.36	1961-70
ST.AUGUSTINE	55.22	55.27	46.94-62.64	79.91	32.68	51.30	1950-59
PALATKA	54.84	55.76	48.47-60.75	74.61	29.22	49.48	1952-61
ORLANDO	51.21	50.64	43.96-55.95	68.74	39.61	48.67	1961-70
GLEN ST. MARY	58.74	60.63	47.48-65.66	84.95	34.35	52.31	1949-58
JACKSONVILLE	54.47	54.00	49.00-62.53	77.37	36.83	48.62	1954-63
FERNANDINA BEACH	52.89	50.59	44.81-55.04	82.45	39.83	47.43	1954-63
DELAND	54.87	54.98	47.67-63.99	74.79	41.54	52.03	1948-57
DAYTONA BEACH	50.20	49.84	42.40-58.17	79.29	31.36	45.08	1954-63
CRESCENT CITY	54.67	53.37	46.75-62.43	75.03	37.97	48.90	1948-57
CLERMONT	51.41	51.67	47.11-55.15	68.09	32.28	48.42	1948-57
FEDERAL POINT	54.50	54.97	49.03-60.48	73.75	34.89	50.13	1950-59
HART LAKE	52.27	52.66	43.92-58.68	76.66	32.61	47.24	1961-70
ISLEWORTH	53.14	50.68	45.14-60.82	78.78	35.33	49.78	1949-58

NOTES:-
MEAN - ARITHMETIC AVERAGE OF ANNUAL RAINFALL VALUES FOR THE PERIOD OF RECORD
MEDIAN - RAINFALL WHICH WAS EQUALED OR EXCEEDED FOR 50% OF YEARS DURING THE PERIOD OF RECORD
NORMAL RANGE - RAINFALL WAS GREATER THAN THIS RANGE FOR 25% OF YEARS AND LESS THAN THIS RANGE FOR 25% OF YEARS DURING THE PERIOD OF RECORD
MAX - THE HIGHEST RECORDED ANNUAL RAINFALL FOR THE PERIOD OF RECORD
MIN - THE LOWEST RECORDED ANNUAL RAINFALL FOR THE PERIOD OF RECORD
LOWEST MEAN - MEAN ANNUAL RAINFALL FOR ANY 10-YEAR CONTINUOUS PERIOD HAVING THE LOWEST RAINFALL
PERIOD - CALENDAR YEARS FOR WHICH THE LOWEST MEAN RAINFALL OCCURRED

APPENDIX B

WATER RESOURCES DEPARTMENT TECHNICAL PUBLICATIONS

(TECHNICAL REPORTS)

Governing Board Approval			
March 1979	Technical Report No. 1	-	Geology of the Oklawaha Basin
July 1979	Technical Report No. 2	-	Saline Contamination of A Limestone Aquifer by Connate Intrusion in Agricultural Areas of St. Johns, Putnam, and Flagler Counties, Northeast Florida
April 1980	Technical Report No. 3	-	Investigation of Ground Water Resources and Salt Water Intrusion in the Coastal Areas of Northeast Florida
November 1979	Technical Report No. 4	-	Summary of the Hydrology of the Upper Etonia Creek Basin
March 1980	Technical Report No. 5	-	Hydrologic Investigation of the Potentiometric High Centered About the Crescent City Ridge, Putnam County, Florida
November 1979	Technical Report No. 6	-	Upper Oklawaha River Basin Water Management Study, Part I: Lake Griffin Region Study
June 1980	Technical Report No. 6A	-	Annual Water Use Survey - 1978
July 1980	Technical Report No. 7	-	Development of Environmental Constraints for the Proposed Jane Green Detention Area
November 1980	Technical Report No. 8	-	Effects on the Floridan Aquifer of Ground Water Withdrawals for Fernery Freeze Protection, Southeast Putnam County, Florida
July 1981	Technical Report No. 9	-	Structural Geologic Features and Their Relationship to Salt Water Intrusion in West Volusia, North Seminole and Northeast Lake Counties

TECHNICAL REPORTS

Governing Board Approval			
November 1981	Technical Report No. 10	-	Annual Water Use Survey - 1979
December 1981	Technical Report No. 11	-	Analysis of Residential Demand for Water in the St. Johns River Water Management District
December 1981	Technical Report No. 12	-	Frequencies of HIgh and Low Stages for Principal Lakes in the St. Johns River Water Management District
March 1982	Technical Report No. 13	-	Vegetation Community cructure of the Proposed Jane Green Detention Area
July 1982	Technical Report No. 14	-	Annual Water Use Survey - 1980
April 1982	Technical Report No. 15	-	Upper St. Johns River Hydrologic Model (USJM) Users Manual

WATER RESOURCES DEPARTMENT TECHNICAL PUBLICATIONS

(TECHNICAL MEMORANDUMS)

Governing Board Approval			
May 1979	Technical Memorandum No. 1	-	Test Drilling Report of Northeast Volusia County
July 1979	Technical Memorandum No. 2	-	Supplemental Data for Report of Saline Contamination of A Limestone Aquifer By Connate Intrusion in Agricultural Areas of St. Johns, Putnam, and Flagler Counties, Northeast Florida
August 1980	Technical Memorandum No. 3	-	Log Pearson Type 3 Distribution: Tables of Quantiles
July 1980	Technical Memorandum No. 4	-	Results of Test Drilling and Materials Investigation of Borrow Areas
Transmitted-	Technical Memorandum No. 5	-	Results of Fern Water Use Study

WATER RESOURCES DEPARTMENT TECHNICAL PUBLICATIONS

(INFORMATION CIRCULARS)

Governing Board Approval			
March 1978	Information Circular No. 1	-	Annual Report of Hydrologic Conditions and Water Resource Activities--1977 Water Year
August 1978	Information Circular No. 2	-	Improvement of Water Quality Through A Cooperative Well Plugging Program
March 1979	Information Circular No. 3	-	Annual Report of Hydrologic Conditions and Water Resource Activities--1978 Water Year
January 1980	Information Circular No. 4	-	Salt Water Intrusion in Coastal Aquifers: A Bibliography
February 1980	Information Circular No. 5	-	Annual Report of Hydrologic Conditions and Water Reosurce Activities--1979 Water Year
November 1981	Information Circular No. 6	-	Annual Report of Hydrologic Conditions 1980 Water Year