SOUTH CAROLINA
WATER RESOURCES COMMISSION

Report No. 6

A Reconnaissance of the Hydrology of the Edisto and Ashepoo Estuaries South Carolina

By

F. A. Johnson

Prepared by
U. S. Geological Survey, Water Resources Division
in cooperation with
South Carolina Water Resources Commission
Columbia, South Carolina
1977

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ABSTRACT

A reconnaissance study has been made to provide background information on some of the physical and chemical characteristics of the Edisto and Ashepoo estuaries in South Carolina. Data were collected from the estuaries on the physical dimensions, tidal stages, saltwater intrusion at high and low tides, and water-quality above the saltwater intrusion. Observation of flow in Fenwick Cut, a short segment of the intercoastal waterway which connects the Ashepoo and Edisto estuaries, shows that during ebb tide flow is from the Edisto to the Ashepoo. Flow is from the Ashepoo to the Edisto during flood tide.

As would be expected, the times of the high and low tides at the upper ends of the estuaries (as recorded near U.S. Highway 17) lag those at the lower end (as recorded at Fenwick Cut) by several hours. Tidal range is reduced at the upper ends by about 70 percent.

During average freshwater inflow conditions, the interface between freshwater and saltwater penetrates the Edisto estuary to mile 19.5 and the Ashepoo estuary to mile 24 at high tide. During periods of very low freshwater inflow, such as the 7-day 10-year low flow, the interface at high tide might penetrate to mile 32 (near Jacksonboro) on the Edisto River. During a similar low-flow period, the Ashepoo River would be brackish or salty to about mile 38.

Above the saltwater interface, the water of both estuaries is of good quality and suitable for most uses if treated for iron and color. The bed sediments throughout the study area, with the exception of iron, have little or no indications of heavy metals, herbicides or pesticides and, as such, probably are an indication of good water quality.

INTRODUCTION

Estuarine waters in many locations are being examined to anticipate the preservation of their health in meeting the needs of the 1970's. All too often, stresses have been applied to an estuary or an estuarine ecosystem with only the vaguest notion of existing conditions within the system. With inadequate knowledge of conditions prior to the introduction of stresses, there can be no clear idea of how they will affect the system immediately after application. Certainly, a definition of long-range effects would be unknown. When a given stress is foreseen a concentrated study of prevailing conditions pertinent to the case should be made. Such a concentrated study of an estuarine system may be subject to needless waste without prior basic data of a reconnaissance nature as a background from which to proceed.

Other publicly supported agencies with specialized skills are studying primarily the flora and fauna of South Carolina estuarine systems; the U. S. Geological Survey (Water Resources Division) has for the past several years been making a hydrologic reconnaissance of the estuarine waters of the State at the rate of one major estuary or estuarine system per year.

Conversion Table

For those readers interested in metric units, a conversion table is given here for those English units which are used in this report.

Multiply English unit	By	To obtain metric unit
feet (ft)	0.3048	meters (m)
miles (mi)	1.609	kilometers (km)
square miles (mi^2)	2.590	square kilometers (km^2)
cubic feet per second (ft^3/s)	2.832×10^{-2}	cubic meters per second (m^3/s)

Purpose and Scope of the Investigation

This report summarizes the results of a limited reconnaissance of the hydrology of the Edisto and Ashepoo estuaries which was made from July 1974 to June 1975. The purpose was to describe some of the major physical and chemical characteristics of each estuary, with primary emphasis on saltwater intrusion, and to relate them to tidal conditions and freshwater inflow.

Acknowledgments

The South Carolina Water Resources Commission aided significantly in the study by providing personnel, technical aid, and other supporting services. Especially helpful were: Frank Nelson, Assistant Executive Director: Jeffrey Havel and Ed Duncan, Environmental Biologists; Joe Dennis, Graphic Supervisor; Ed Richardson, Planner/Biologist; and Marilyn C. Moore, Public Information Specialist.

Appreciation is extended to the U.S. Coast Guard for permission to attach a tidal gage to one of their structures at Fenwick Cut; to Colleton County for permission to attach a tidal gage to their pier at West Bank Landing; and to Mr. Joe Smith for permission to attach a tidal gage to Smith's Fish Camp pier at Ashepoo.

Cooperation

This study was part of a cooperative program between the U.S. Geological Survey and the South Carolina Water Resources Commission, Mr. Clair P. Guess, Executive Director.

DESCRIPTION OF THE STUDY AREA

Location

The Edisto River drains an area of about 3,000 square miles including parts of a dozen counties in south-central South Carolina. Drainage is generally in a southeasterly direction until the river reaches Givhans, in Dorchester County. Near Givhans the river turns south and flows about 60 miles to the Atlantic Ocean. The river is considered to be tidal below river mile 38 (that is, 38 miles above the mouth).

The lower 21-mile section is named South Edisto River (see fig 1). North Edisto River, a short tidal stream which is not a part of the Edisto River basin proper, connects with the South Edisto River at the head of this reach through Dawho River. For ease of association in this report, the entire main channel will be called the Edisto River. The lower 32 miles examined in this investigation will be considered as the Edisto estuary. A large section of the estuary from below Watts Cut at mile 13.4 to Fenwick Cut at mile 6.4 is included in the Intracoastal Waterway.

The Ashepoo River drains a coastal area of about 375 square miles adjacent to and on the southern side of the Edisto Basin. The Ashepoo River is tidal as far upstream as the railroad trestle at mile 38. The tidal nature continues onward through several miles of swamps nearly to the headwaters of the river. The Ashepoo River and the Edisto River are connected by Fenwick Cut, a section of the Intracoastal Waterway, at mile 3.2 of the Ashepoo River and mile 6.4 of the Edisto River. The Intracoastal Waterway also includes the stretch of the Ashepoo River from mile 3 to mile 5.

The upper limit of this study was U.S. Highway 17, although, during periods of low freshwater inflow, the Ashepoo estuary was sampled for several miles further upstream. The lower limit was at the mouth of each estuary. St. Helena Sound, a part of the Atlantic Ocean, was not sampled, nor were any conclusions made regarding that body of water.

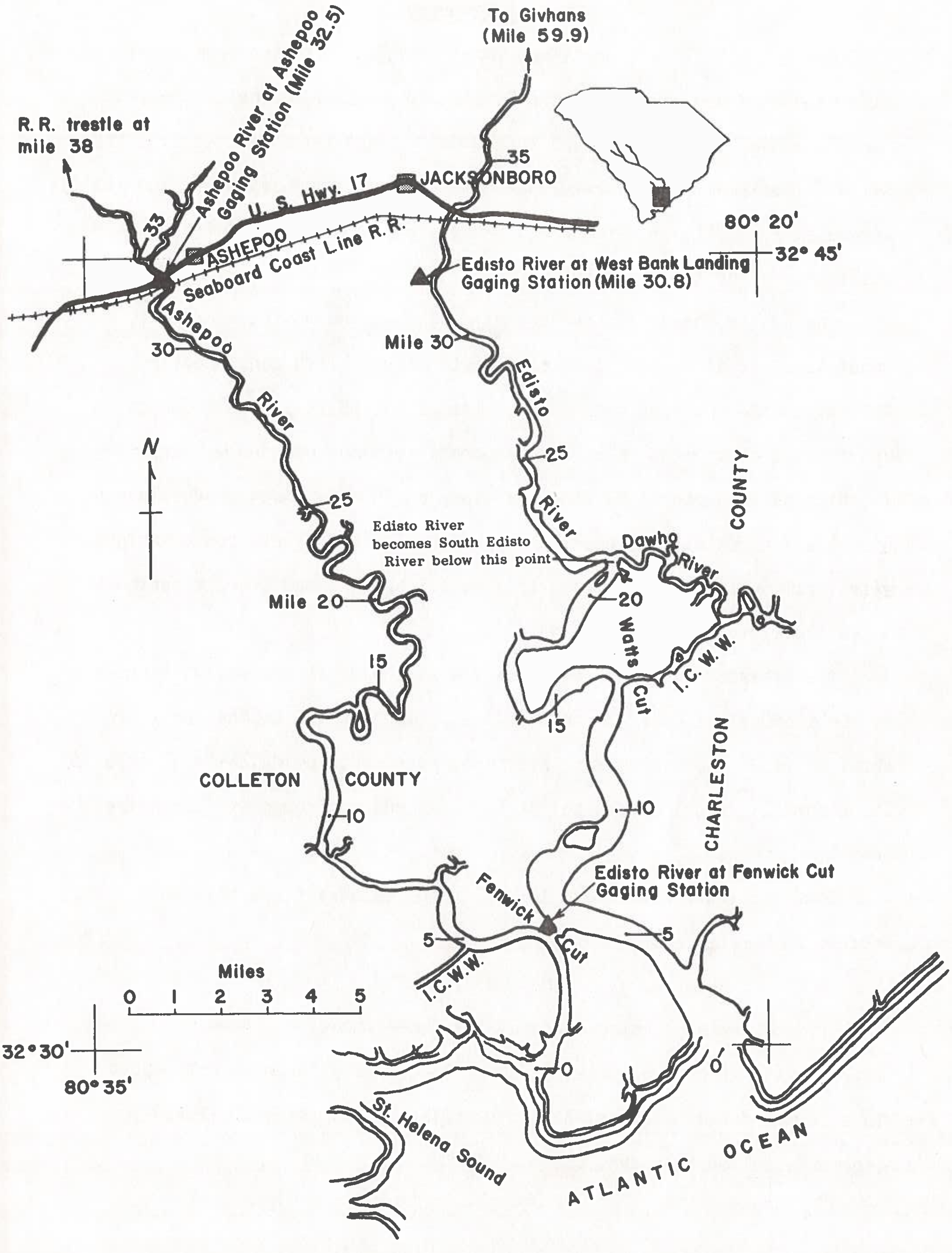


Figure I. Map of the Edisto and Ashepoo Estuaries.

Channel Geometry

Figures 2 and 3 are cross-sectional profiles selected from profiles made at each river mile along the Edisto and Ashepoo channels. These were developed from strip-chart recordings of soundings made at high-tide. Two NOS (National Ocean Survey) navigation charts (numbers 11517 and 11518) were used as additonal references, primarily, as indicators of streambed stability in the lower reaches.

The Edisto channel is about a mile wide at the mouth, narrows to about 4,600 ft at mile 2, then constricts more or less consistently to 400 ft at mile 30. The depths range from about 35 ft at the mouth to about 12 ft at mile 30. The deepest cross-section recorded was at mile 16 which had a depth of 43 ft and a width of 700 ft. Much of the length of the Edisto estuary meanders through marshland; however, conversations with local inhabitants indicate the channel has not had a great tendency historically to change direction.

The Ashepoo channel is about half a mile wide at the mouth, narrows to about 600 ft at mile 12 and 200 ft at mile 32. The depths range from about 15 to 30 ft, with the greatest recorded depth being 36 ft at mile 16. The channel, typical of coastal streams, meanders throughout its entire length.

Both the lower Edisto and lower Ashepoo estuaries are navigable and are so marked on NOS charts.

TIDAL CONDITIONS

Tide gages were established at the three locations shown in figure 1 and which are listed in table 1. These gages were referenced to a common datum, National Geodetic Vertical Datum of 1929 (NGVD) (formerly called Sea Level Datum of 1929).

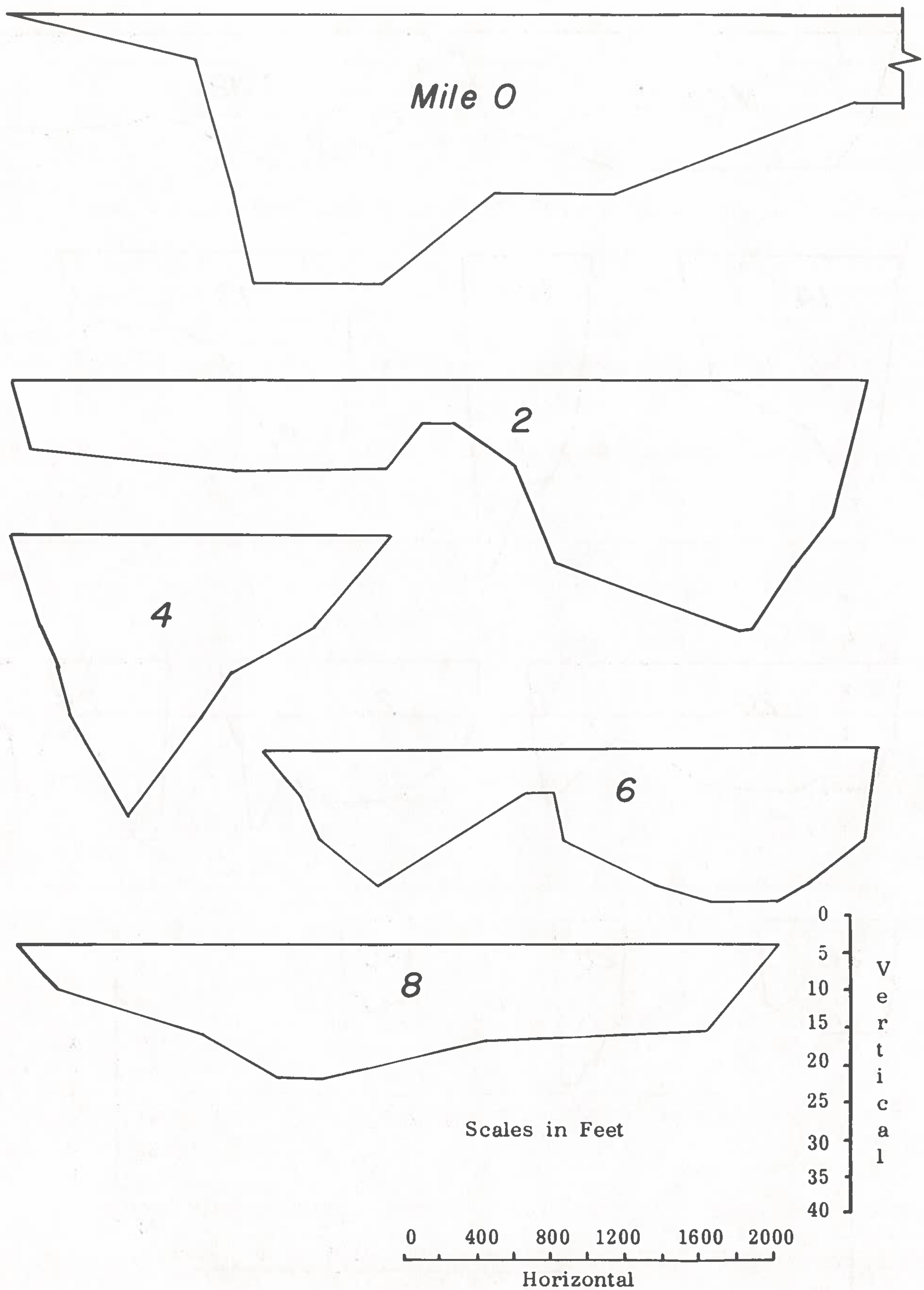


Figure 2A. Cross-sectional profiles at indicated mile points of the Edisto River at high tide, facing downstream.

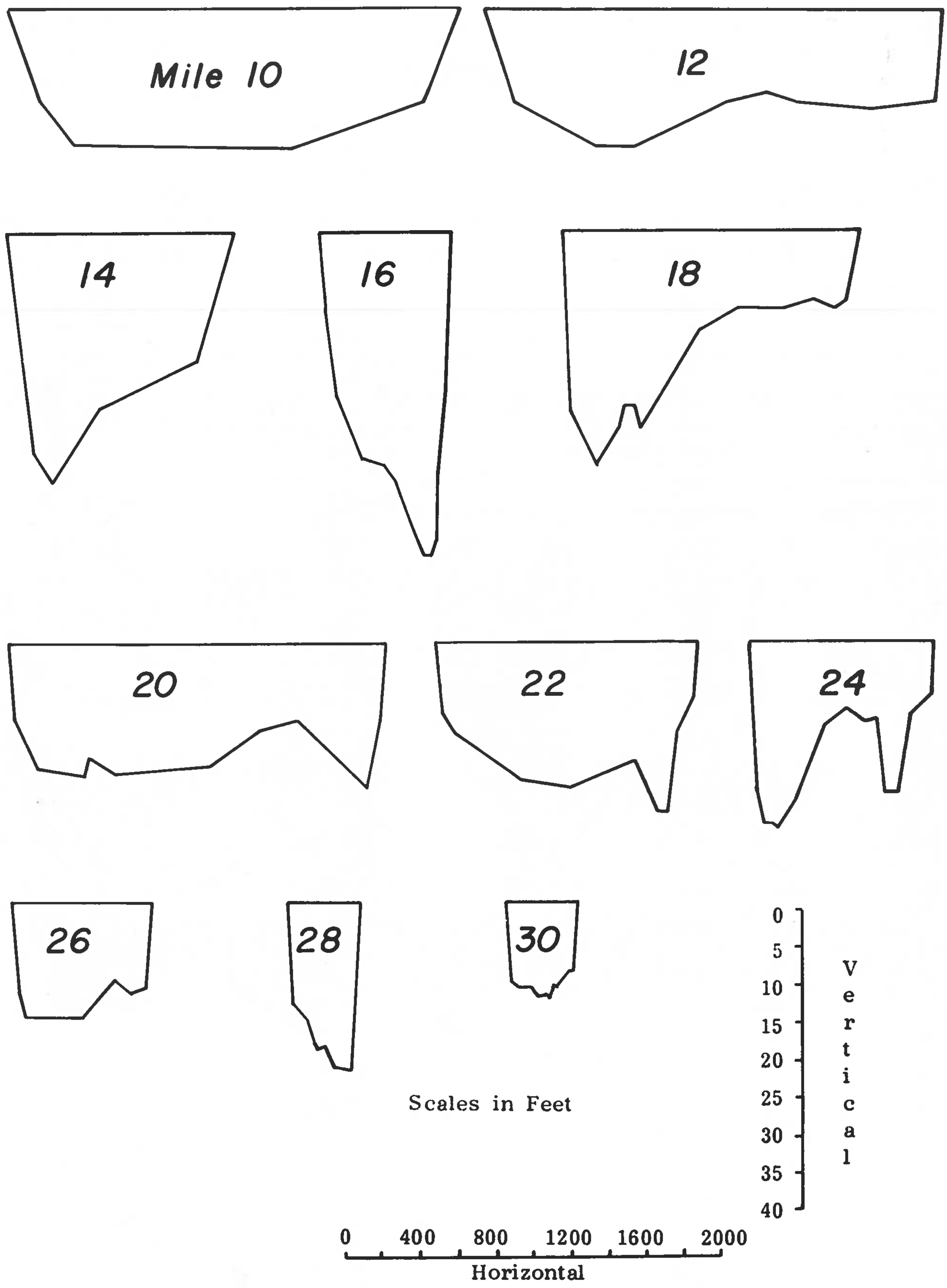


Figure 2B. Cross-sectional profiles at indicated mile points of the Edisto River at high tide, facing downstream.

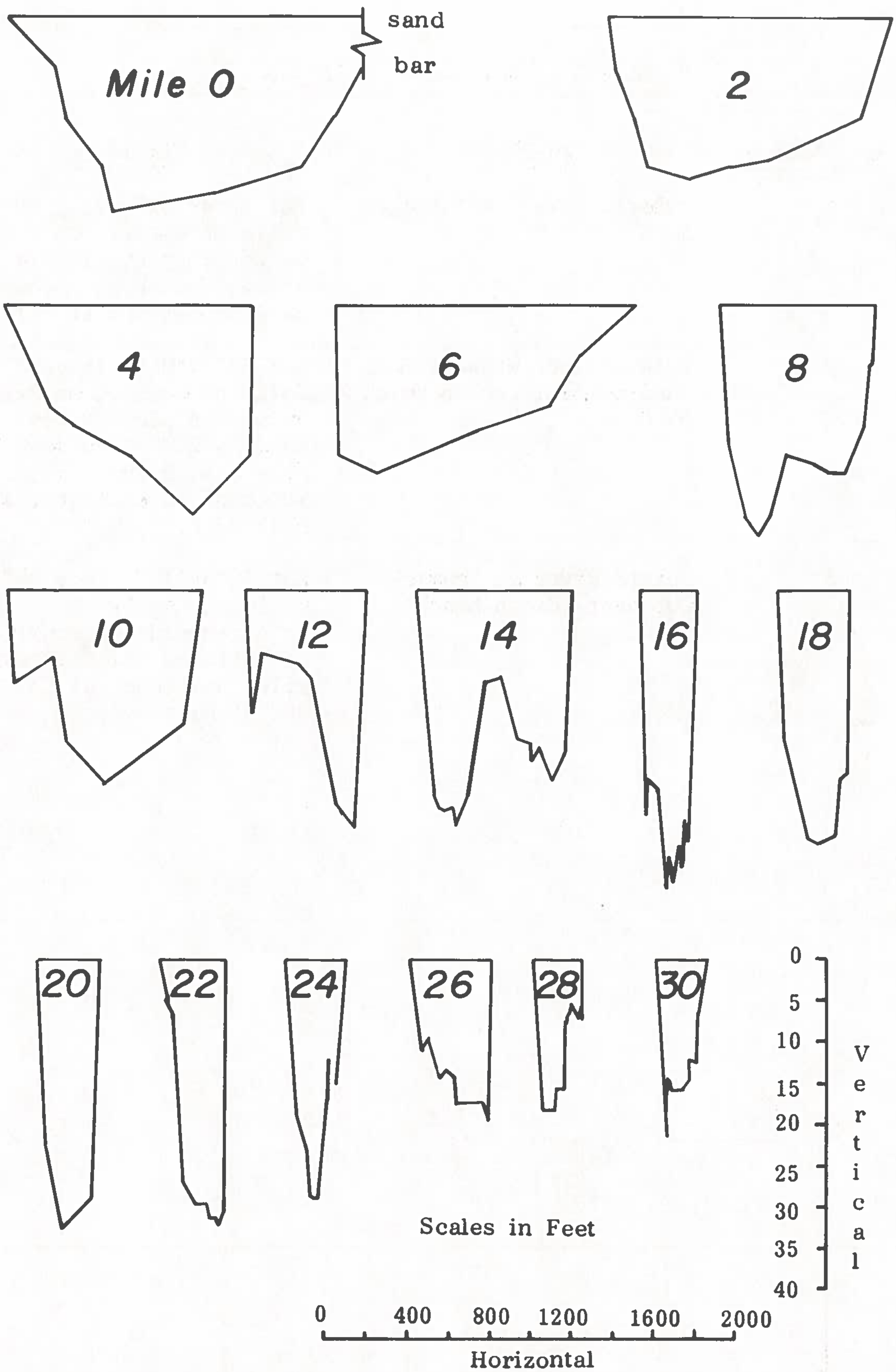


Figure 3. Cross-sectional profiles at indicated mile points of the Ashepoo River at high tide, facing downstream.

Table 1. Location of tide gages

Site Number	Place	Location
1	Ashepoo River at Ashepoo, S. C.	Lat 32°44'30", long 80°33'20" Colleton County, on right bank on wooden pier, 100 ft downstream from U.S. Highway 17 at Ashepoo, and at mile 32.5.
2	Edisto River at West Bank Landing near Jacksonboro, S. C.	Lat 32°44'05", long 80°27'06" Colleton County, on right bank on wooden pier at West Bank Landing 2.2 miles downstream from U.S. Highway 17, 2 miles south of Jacksonboro, and at mile 30.8.
3	Edisto River at Fenwick Cut near Edisto Beach, S. C.	Lat 32°32'15", long 80°24'40" Colleton County, on right bank on north side of Fenwick Cut of Intracoastal Waterway, 4 1/2 miles northeast of Edisto Beach and at mile 6.4.

The form of the data obtained from these gages consisted of the tidal stages punched on digital tape every quarter-hour on the quarter-hour. The data was computer processed to give print-outs which listed the stage every 15 minutes, the times of high and low tides, the maximum and minimum stages obtained, and the average stages of high and low tides. The tidal times and nodes (that is, high and low tides) at the 3 tide gages were compared with each other, with those predicted in NOS tide tables for Savannah River Entrance, and with freshwater inflow to the estuary as gaged upstream at Givhans.

Times of Tides

Since the NOS tide tables and predictions are readily available, the predicted tides for Savannah River Entrance were used as a base for purposes of comparison. The average differences in time-of-tides between those tides occurring at each gage and those tides predicted for Savannah River Entrance were computed and have been listed in table 2. The time differences are shown as corrections to be applied to the predicted times of tides at Savannah River Entrance in order to obtain the probable times of tidal occurrences at the gaging stations. It must be noted, however, that the inconsistencies of tidal prediction for points as far upstream as sites 1 and 2 are such that extreme error in actual time difference from the predicted difference may be as much as plus or minus one hour.

The reasons for such an error are veiled behind the large number of factors affecting tides. However, it was found that the amount of freshwater inflow had little or no effect on the time differences. The major factor is probably wind direction, velocity, and duration.

Table 2. Time corrections to be applied to daily predictions for Savannah River Entrance (found in NOS tide tables) to obtain probable time-of-tide at tide gages.

Site No.	River mile	Place	Time difference	
			High tide	Low tide
1	32.5	Ashepoo River at Ashepoo	+4h 15m	+3h 55m
2	30.8	Edisto River at West Bank Landing	+2h 10m	+2h 55m
3	6.4	Edisto River at Fenwick Cut	+0h 00m	+0h 05m

Heights of Tides

The heights of tides at the gages were compared with those heights predicted for Savannah River entrance and with freshwater inflow. The variations in the heights of the tides at the upstream gages were not of sufficient consistency to relate directly to either the freshwater inflow or the tidal heights predicted for Savannah River Entrance. However, the tidal ranges, the maximum stages, and the minimum stages have been listed in table 3 which compares those salient features of tidal behaviour for the several locations under discussion.

Figure 4 is a graphical representation of the simultaneous rise and fall of the tide as related to NGVD at the several locations. Because an isolated tidal event can be misleading, neither the date shown nor any of the particular tide curves are intended to be of significance in themselves. The intent of the figure is only to give the reader a better "feel" for the general tidal relationships between the locations.

The Effect of Fenwick Cut on Tidal Flows

An indication of the effect of Fenwick Cut on tidal flow in the Edisto and Ashepoo estuaries was obtained by the use of dye as a tracer. The dye was dissipated beyond normal traceability within 24 hours after its introduction into the system. Dye was dumped into the Edisto estuary near the right (west) bank upstream from Fenwick Cut during a falling tide; on a rising tide one month later, dye was dumped into the Edisto estuary also near the right bank downstream from Fenwick Cut.

The results showed that on outgoing tides, Edisto water flows southwestward through Fenwick Cut and, therefore, out of the mouth of both the Edisto and the Ashepoo Rivers (fig. 5). On the incoming tide, water

Table 3. Comparison of tide heights

Site Number	River mile		Range-in-tide during period of study (feet)	Minimum Tide		Maximum Tide		Average tidal range (feet)	Comparison of average range with that for Savannah River Entrance
				Date	Stage (feet)	Date	Stage (feet)		
-	-	Savannah River Entrance (predictions)	11.0	11-15-74	-5.4	2-26-75	5.6	6.9	- -
1	32.5	Ashepoo River at Ashepoo	5.55	3-28-75	-2.62	4-03-75	2.93	1.9	30 percent
2	30.8	Edisto River at West Bank Landing	6.87	3-27-75	-1.46	11-21-74	5.41	3.4	50 percent
3	6.4	Edisto River at Fenwick Cut	10.37	6-11-75	-5.15	2-26-75	5.22	6.3	90 percent

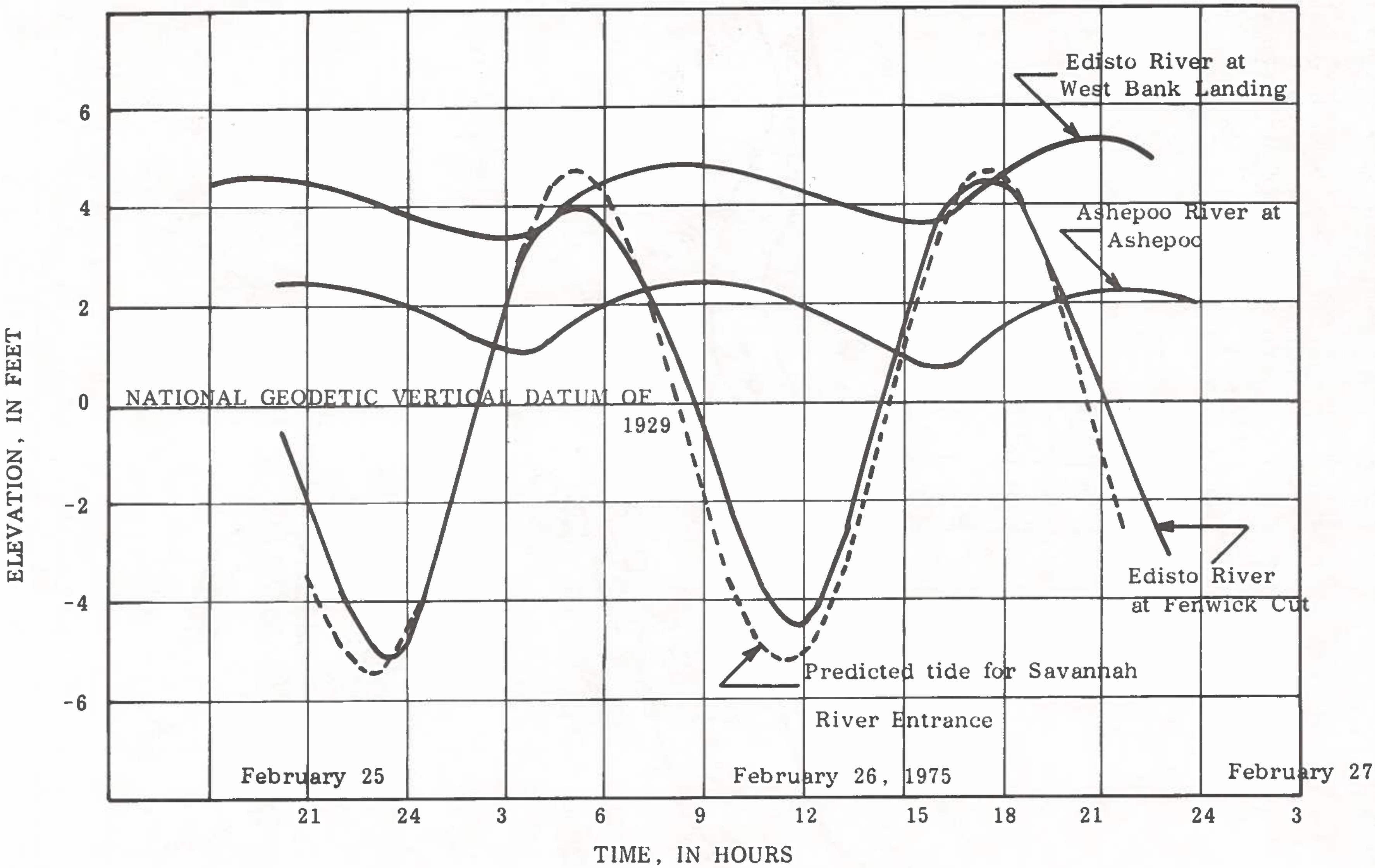
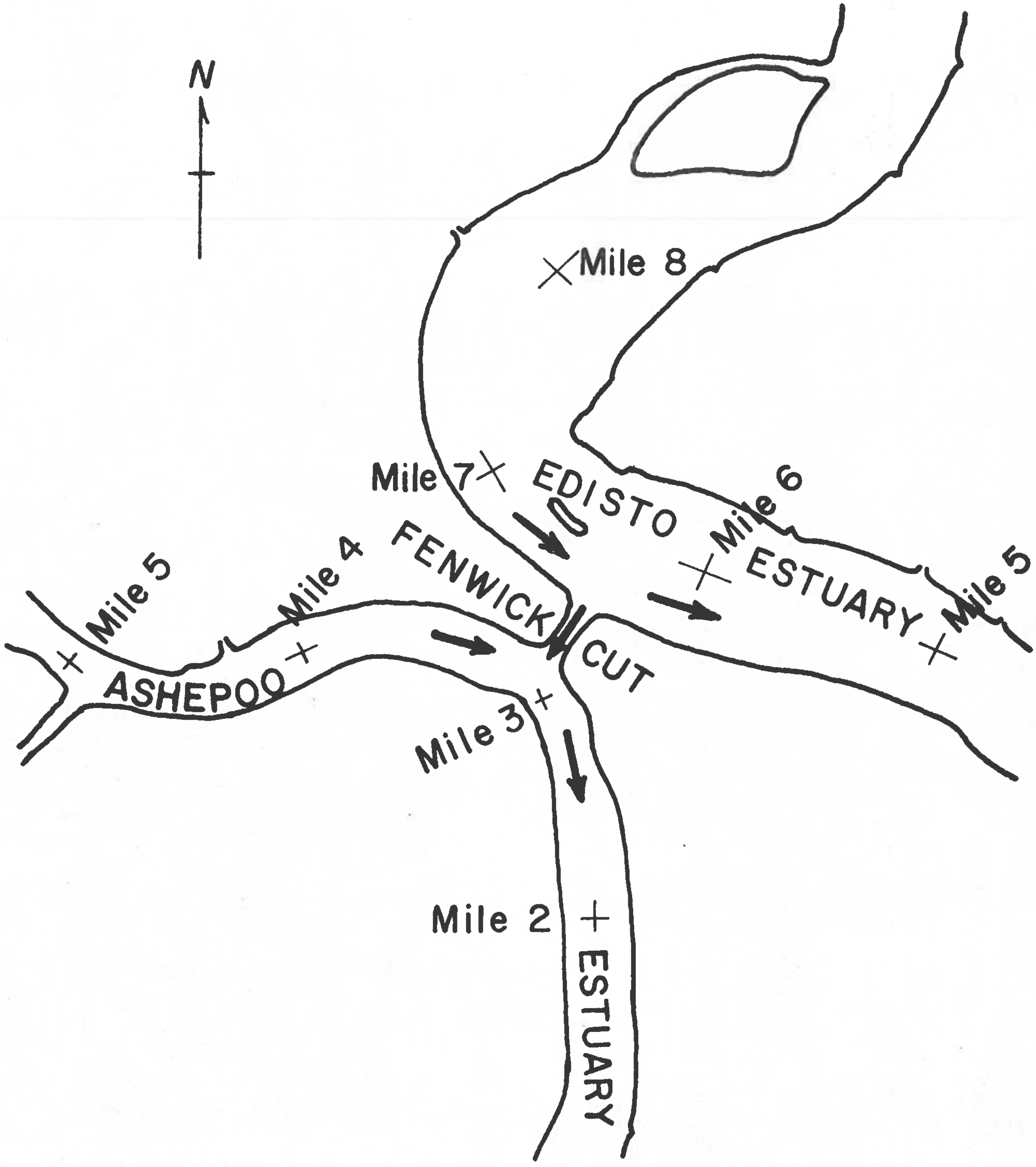


Figure 4. Graphical representation of tides at gage sites February 26, 1975.



Arrows indicate direction of flow.

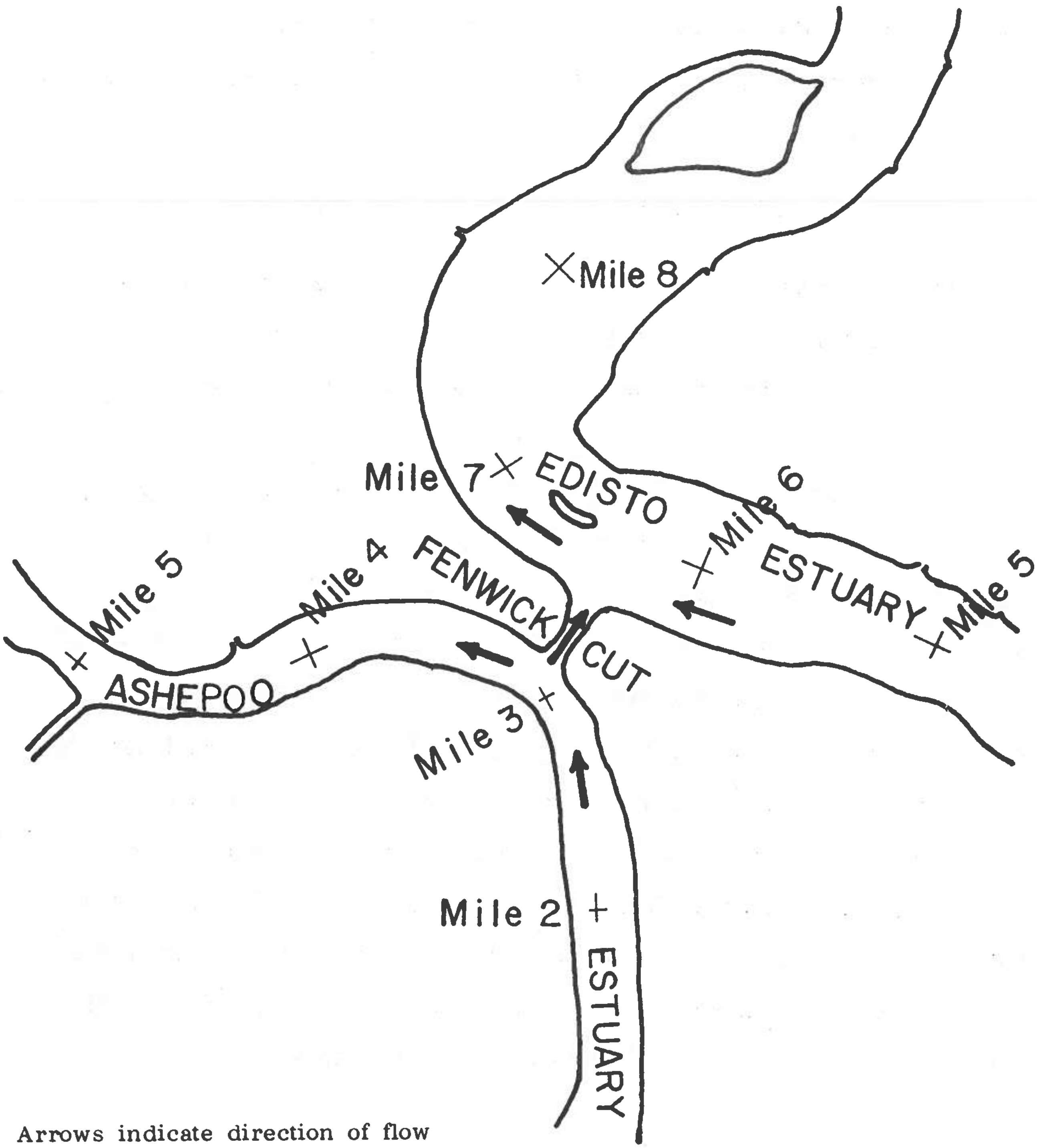
Figure 5. Direction of flow in Fenwick Cut on outgoing tides.

in Fenwick Cut flows northeastward, carrying water from the mouth of the Ashepoo River upstream to the Edisto River in addition to that which continues flowing upstream in the Ashepoo channel (fig. 6). The implication here is that solute introduced into the system in the proximity of Fenwick Cut may migrate to the downstream areas of both estuaries or migrate upstream within the limits of the tidal excursion.

THE MIXING OF SEAWATER AND RIVER WATER

Seawater compared to the water of most rivers is a highly mineralized solution normally containing about 35,000 mg/l (milligrams per liter) of dissolved solids, the most abundant of these being sodium and chloride. When seawater and river water mix in an estuary, the body of saltwater that results has a composition that reflects the quantity and the quality of the waters that mix and the manner in which they mix. Because the saltwater has a greater density than freshwater, it is often found to be moving inland as a more dense current along the bottom of a channel, while the less dense freshwater moves seaward at the surface. This temporary condition usually occurs just before or directly after slack-tidal periods.

The manner in which seawater and river water mix and the extent of saltwater encroachment or salinity is dependent on many factors. Among these are tides, currents, freshwater discharge, sea level, winds, depth and configuration of an estuary, the rotation of the earth, temperature of both seawater and freshwater, evaporation, and rainfall. Because of the large numbers of factors, conditions are highly variable throughout an estuary.



Arrows indicate direction of flow

Figure 6. Direction of flow in Fenwick Cut on incoming tides.

SALINITY CONDITIONS

The U.S. Naval Oceanographic Office defines salinity as "a measure of the quantity of dissolved salts in sea water. It is formally defined as the total amount of dissolved solids in sea water in parts per thousand by weight when all the carbonate has been converted to oxide, the bromide and iodide to chloride, and all organic matter is completely oxidized. These qualifications result from the chemical difficulty in drying the salts in sea water. In practice, salinity is not determined directly but is computed from chlorinity, electrical conductivity (specific conductance), refractive index, or some other property whose relationship to salinity is well established." In this reconnaissance investigation conductivity was measured and converted to its equivalent in dissolved chloride in mg/l instead of salinity for use in defining saltwater intrusion. Figure 7 shows the relation between dissolved chloride and dissolved solids, to specific conductance @ 25°C for the study area.

During this reconnaissance, periodic measurements of specific conductance were made in the estuarine zone usually at mile points. Water in the reach in which most of the measurements were made ranged from water having a specific conductance of several thousand micromhos to water having a specific conductance of less than 100 micromhos. Most measurements were made at either high or low tide near the time of slack water. At each mile point where a measurement was made, specific conductance was determined from surface to bottom. Data obtained are given in tables 4-7.

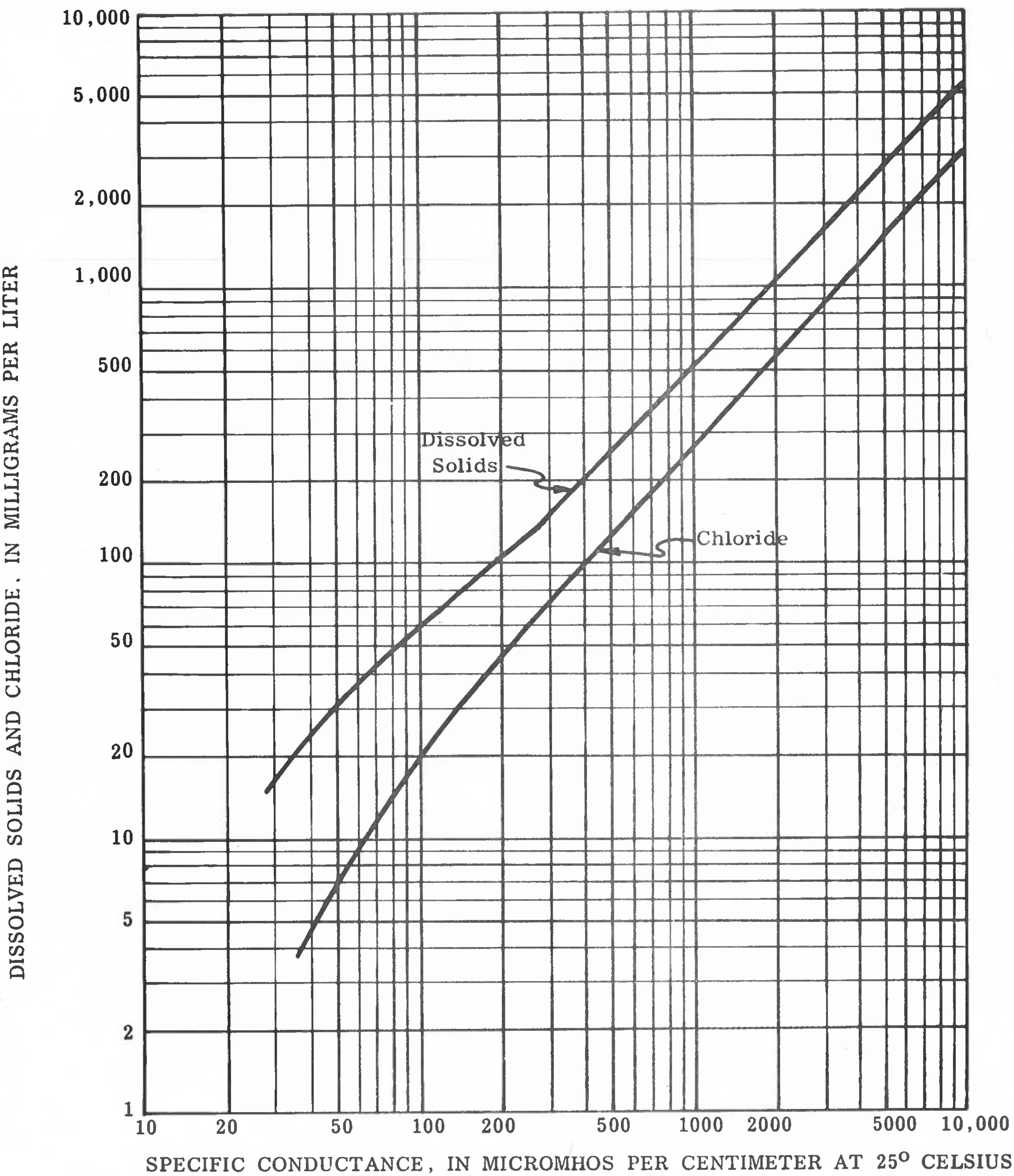


Figure 7. Relation of dissolved-solids and chloride concentration to specific conductance in the Edisto and Ashepoo River Estuaries.

Table 4 . Field measurements of specific conductance (in micromhos per centimeter at 25°C) of the Edisto River at high tide.
(Depths in feet)

Date	Mile	Depth	Cond.
Oct. 8, 1974	13	1	26,000
		5	26,000
		10	26,000
		15	26,000
		20	26,000
		25	26,000
		29	26,000
Oct. 8, 1974	15	1	19,500
		5	20,800
		10	21,000
		15	21,000
		19	21,000
Oct. 8, 1974	17	1	15,500
		5	16,000
		10	16,000
		15	16,000
Oct. 8, 1974	19	1	11,800
		5	12,000
		10	12,500
Oct. 8, 1974	21	1	4,000
		5	4,000
		10	4,000
		15	4,100
		20	4,500
		25	4,500
Oct. 8, 1974	22	1	2,800
		5	2,850
		10	3,100
		15	3,100
		16	3,100
Oct. 8, 1974	23	1	1,350
		5	1,350
		10	1,350
		11	1,350
Oct. 8, 1974	24	1	700
		5	750
		10	840
		14	840
Oct. 8, 1974	25	1	360
		5	370
		10	340
		15	340
		19	340
Oct. 8, 1974	26	1	160
		5	160
		9	160
Oct. 8, 1974	27	1	115
		5	115
		9	115
Oct. 8, 1974	28	1	72
		5	72
		10	72
		15	72
		17	72
Nov. 14, 1974	19	1	16,000
		5	17,500
		10	19,000
		15	19,000
		18	19,000
Nov. 14, 1974	21	1	11,700
		5	12,000
		10	12,300
		15	12,500
		20	12,800
		26	12,800
Nov. 14, 1974	23	1	4,000
		5	4,600
		10	4,700
		16	4,700
Nov. 14, 1974	24	1	2,580
		5	2,600
		11	2,600
Nov. 14, 1974	25	1	1,680
		5	1,680
		10	1,680
		15	1,680
Nov. 14, 1974	26	1	1,000
		5	1,000
		10	1,100
		13	1,100
Nov. 14, 1974	27	1	400
		5	480
		10	480
		15	450
		20	520
Nov. 14, 1974	28	1	280
		5	290
		10	310
		14	310
Nov. 14, 1974	29	1	170
		5	110
		10	110
		15	200
Nov. 14, 1974	30	1	65
		5	65
		12	65
Nov. 14, 1974	32	1	50
		5	50
		10	50
		12	52
Jan. 22, 1975	14	1	1,800
		5	1,800
		10	2,000
		15	2,500
		20	3,000
		25	3,000
		30	3,000
		35	3,000
Jan. 22, 1975	17	1	110
		5	110
		10	110
		15	115
		20	120
		25	120
Jan. 22, 1975	19	1	70
		5	70
		10	70
		15	70
Feb. 27, 1975	6	1	6,000
		5	6,000
		10	6,000
		15	6,500
		20	6,500
		25	6,500
		27	6,500
Feb. 27, 1975	8	1	6,000
		5	6,100
		10	6,100
		15	6,100
		20	6,100

Table 4. Field measurements of specific conductance (in micromhos per centimeter at 25°C) of the Edisto River at high tide--continued.
(Depths in feet)

Date	Mile	Depth	Cond.
Feb. 27, 1975	10	1	5,900
		5	6,000
		10	6,110
		15	6,200
		18	6,200
Feb. 27, 1975	12	1	2,600
		5	4,000
		10	4,500
		15	5,000
Feb. 27, 1975	14	1	1,500
		5	1,500
		10	1,600
		15	1,600
		20	1,600
		25	1,600
		28	1,600
Feb. 27, 1975	16	1	500
		5	500
		10	500
		15	500
		20	500
		25	500
		30	500
		35	500
Feb. 27, 1975	18	1	175
		5	200
		10	195
		15	190
		20	190
Feb. 27, 1975	20	1	130
		5	130
		10	130
		15	130
		17	130
Feb. 27, 1975	22	1	73
		5	73
		10	73
		15	73
Feb. 27, 1975	24	1	64
		5	64
		10	64
		15	64
		20	64
Mar. 26, 1975	6	1	25,000
		5	26,000
		10	27,000
		15	34,000
		20	37,000
Mar. 26, 1975	8	1	12,000
		5	18,000
		10	23,000
		20	28,000
Mar. 26, 1975	10	1	6,500
		5	10,000
		10	12,000
		15	12,000
		20	12,000
Mar. 26, 1975	12	1	1,600
		5	1,600
		10	1,800
		15	2,200
		20	2,200
Mar. 26, 1975	13	1	700
		5	700
		10	750
		15	780
		20	850
		22	850
Mar. 26, 1975	14	1	410
		5	410
		10	410
		15	410
		20	420
Mar. 26, 1975	15	1	190
		5	190
		10	190
		15	200
Mar. 26, 1975	16	1	150
		5	150
		10	150
		20	150
		30	155
		40	155
Mar. 26, 1975	17	1	110
		5	110
		10	110
		15	110
		20	110
		25	110
Mar. 26, 1975	18	1	90
		5	90
		10	90
		20	95
Mar. 26, 1975	19	1	75
		5	77
		10	80
		20	85
Mar. 26, 1975	20	1	60
		5	60
		10	60
		20	63
Apr. 11, 1975	1	1	45,000
		15	45,000
Apr. 11, 1975	11	1	6,500
		5	7,500
		10	11,000
		20	16,000
		25	16,000
		33	16,500
Apr. 11, 1975	12	1	6,250
		10	9,100
Apr. 11, 1975	13	1	2,200
		10	3,400
		20	3,800
Apr. 11, 1975	14	1	2,600
		5	2,600
		10	2,650
		15	2,800
		20	2,850
Apr. 11, 1975	17	1	300
		10	340
		20	395
		23	400
Apr. 11, 1975	18	1	170
		10	160
		15	180
Apr. 11, 1975	19	1	67
		15	67
		25	75

Table 4. Field measurements of specific conductance (in micromhos per centimeter at 25°C) of the Edisto River at high tide--continued.
(Depths in feet)

Apr. 11, 1975			May 19, 1975			May 19, 1975			May 19, 1975			May 19, 1975			May 19, 1975			May 19, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
21	1	58	7	1	30,000	10	1	14,500	11	1	12,500	12	1	6,750	13	1	5,700	13.5	1	3,000
	10	58		5	30,000		5	17,000		5	13,000		5	9,500		5	6,200		10	3,200
	14	58		10	31,000		10	20,000		10	14,000		10	9,500		10	6,600		20	3,200
				15	31,000		15	20,000		15	14,500		15	9,500		15	6,700		30	3,200
				20	32,000					20	16,000		20	9,500		20	6,700			
				23	32,000					25	17,000		22	9,500		25	6,700			
										30	17,000					30	6,700			
										33	17,000					37	6,700			

May 19, 1975			May 19, 1975			May 19, 1975			May 19, 1975			May 19, 1975			May 19, 1975			Jun. 3, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
14	1	2,000	15	1	1,500	16	1	1,200	18	1	450	19	1	96	20	1	85	6	1	29,000
	5	2,400		5	1,600		5	1,250		5	550		5	100		5	85		5	34,000
	10	2,600		10	1,600		10	1,250		10	550		10	105		10	85		10	38,000
	15	2,600		15	1,600		15	1,300		15	600		15	110		15	93		15	39,000
	20	2,600		18	1,600		20	1,300		20	600		20	120		18	95		20	40,000
	25	2,600					25	1,300					25	127					25	40,000
							27	1,300												

Jun. 3, 1975			Jun. 3, 1975			Jun. 2, 1975			Jun. 2, 1975			Jun. 3, 1975			Jun. 3, 1975			Jun. 3, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
8	1	26,000	10	1	12,500	12	1	5,000	13	1	4,800	14	1	2,200	16	1	1,700	18	1	170
	5	26,000		5	15,000		5	7,500		5	5,000		5	2,200		5	1,700		5	250
	10	28,000		10	19,000		10	11,000		10	5,500		10	2,400		10	1,800		10	360
	15	32,000		15	22,000		15	11,000		15	5,800		15	2,400		15	1,850		15	450
	20	32,000		20	22,000					20	6,000		20	2,400		20	1,900		20	500
				23	22,000					25	6,000					25	2,100		23	525
										30	6,000					30	2,100			

Jun. 3, 1975			Jun. 3, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.
20	1	85	22	1	60
	5	88		5	56
	10	90		10	56
	15	91		13	56

Table 5. Field measurements of specific conductance (in micromhos per centimeter at 25°C) of Ashepoo River at high tide. (Depths in feet)

Feb. 26, 1975			Feb. 26, 1975			Feb. 26, 1975			Feb. 26, 1975			Feb 26, 1975			Feb. 26, 1975			Feb. 26, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
10	1	2,100	12	1	1,500	14	1	1,000	16	1	750	18	1	390	20	1	290	22	1	200
	5	2,100		5	1,600		5	1,100		5	680		5	395		5	290		5	200
	10	2,100		10	1,600		10	900		10	680		10	395		10	290		10	200
	15	2,400		15	1,600		15	1,050		15	750		15	395		15	290		15	202
	20	2,400		20	1,700		20	900		20	750		20	395		20	290		20	205
				25	1,700					25	750		25	385		25	290		25	205
										30	750		30	385		27			30	205
										34	700									

Feb 26, 1975			Feb. 26, 1975			Feb. 26, 1975			Feb. 26, 1975			Feb. 26, 1975			Mar. 27, 1975			March. 27, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
24	1	148	26	1	115	28	1	115	30	1	85	32.5	1	70	6	1	22,500	8	1	9,000
	5	148		5	115		5	115		5	85		5	75		5	23,500		5	9,000
	10	148		10	115		10	115		10	85		10	75		10	25,500		10	9,400
	15	148		15	115		15	115					15	75		15	26,000		20	10,300
	20	148		20	115		20	115					17	75		20	26,000			
	25	148																		
	26	148																		

Mar. 27, 1975			Mar. 27, 1975			Mar. 27, 1975			Mar. 27, 1975			Mar. 27, 1975			Mar. 27, 1975			Mar. 27, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
10	1	3,090	11	1	2,250	12	1	1,100	13	1	650	14	1	310	15	1	370	16	1	310
	5	3,190		5	2,400		10	1,150		5	650		5	310		5	375		5	310
	10	3,400		10	2,400		20	1,100		10	650		10	310		10	375		10	310
	15	3,400		15	2,400					15	650		15	310		15	375		15	310
	20	3,400		20	2,400					20	650		20	315		20	380		20	310

Mar. 27, 1975			Mar. 27, 1975			Mar. 27, 1975			Mar. 27, 1975			Mar. 27, 1975			Mar. 27, 1975			Mar. 27, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
17	1	275	18	1	220	19	1	190	20	1	175	21	1	145	22	1	130	23	1	110
	5	275		5	220		5	190		5	175		5	145		10	130		10	110
	10	275		10	220		10	190		10	175		10	145		20	130		20	110
	15	275		15	220		15	200		15	175		15	148		30	130		30	11
				20	225					20	175		20	150						

Table 5 . Field measurements of specific conductance (in micromhos per centimeter at 25°C) of Ashepoo River at high tide--continued.
(Depths in feet)

Oct. 7, 1974			Oct. 7, 1974			Oct. 7, 1974			Oct. 7, 1974			Oct. 7,1974			Oct. 7, 974			Oct. 7, 1974		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
20	1	12,600	21	1	11,900	23	1	6,000	26	1	5,100	29	1	2,190	32.5	1	625	33	1	625
	5	12,800		5	11,900		5	6,000		5	5,000		5	2,200		5	625		5	600
	10	12,800		10	11,900		10	6,000		10	5,000		10	2,200		10	625		10	600
	15	12,800		15	12,100		15	6,000		15	5,100		15	2,200		15	610		15	600
	20	12,800		20	12,000		20	6,000		18	5,000								17	600
	25	12,800		25	12,300		21	6,000												
	30	13,000		30	12,300															
	35	13,000																		

Oct. 7, 1974			Nov. 13, 1974			Nov. 13, 1974			Nov. 13, 1974			Nov. 13 1974			Nov. 13, 1974			Nov. 13, 1974		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
34	1	370	25	1	18,000	27	1	14,500	29	1	10,400	31	1	7,200	32.5	1	5,500	34	1	3,800
	5	365		5	18,000		5	14,500		5	10,500		5	7,200		5	5,500		5	3,800
	10	380		10	19,500		10	14,500		10	10,500		10	7,200		10	5,800		10	3,800
				15	19,500		15	14,500		16	10,500		16	7,450		16	5,800		14	3,800
				20	20,000		20	14,500												
				25	20,000															
				30	20,000															

Nov. 13, 1974			Nov. 13, 1974			Nov. 13, 1974			Nov. 13, 1974			Jan. 21 1975			Jan. 21, 1975			Jan. 21, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
35	1	2,850	36	1	1,730	37	1	540	38	1	163	14.5	1	1,100	16	1	900	18	1	500
	5	2,850		5	1,740		6	550		2	163		5	1,100		5	900		5	500
	8	2,900		10	1,750								10	1,100		10	900		10	500
													15	1,200		15	900		15	500
													20	1,600		20	900		20	500
													22	1,500		30	900		25	500
																35	900		29	500

Jan. 21, 1975			Jan 21, 1975			Jan. 21, 1975			Jan. 21, 1975			Jan. 21, 1975			Jan. 21, 1975			Feb. 26, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
20	1	310	22	1	250	24	1	210	26	1	200	29	1	120	32.5	1	105	8	1	3,000
	5	310		5	250		5	210		5	200		5	120		5	105		5	3,000
	10	310		10	250		10	210		10	200		10	120		10	105		10	3,000
	15	310		15	250		15	210		15	200		15	115		15	105		15	3,000
	20	310		20	250		20	210					16	115					20	3,300
	25	310		25	250		25	210											23	3,300
	30	310		27	250															

Table 5. Field measurements of specific conductance (in micromhos per centimeter at 25°C) of Ashepoo River at high tide--continued.
(Depths in feet)

Mar. 27, 1975			Apr. 10, 1975			Apr. 10, 1975			Apr. 10, 1975			Apr. 10, 1975			Apr. 10, 1975			Apr. 10, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
24	1	105	14	1	3,000	16	1	2,750	18	1	1,600	20	1	650	22	1	330	24	1	210
	10	105		5	3,400		5	2,800		5	1,700		5	675		5	335		5	215
	20	108		10	3,500		10	3,000		10	1,800		10	700		10	335		10	215
				15	3,600		15	3,000		15	1,800		15	700		15	335		15	215
				18			20	3,000		20	1,900		20	750		20	335		21	215
							23	3,000		25	1,900		25	750		27	340			
										27	1,950									

Apr. 10, 1975			Apr. 10, 1975			Apr. 10, 1975			Apr. 10, 1975			Apr. 10, 1975			Apr. 10, 1975			Apr. 10, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
26	1	170	28	1	130	29	1	113	30	1	96	31	1	85	32.5	1	80	34	1	70
	5	170		5	130		5	113		5	96		5	85		5	80		5	70
	10	170		10	130		10	113		10	96		11	85		10	80		9	70
	15	170		15	130		15	113		14	96					15	80			
	19	170		20	130		18	113												

May 19, 1975			May 19, 1975			May 19, 1975			May 19, 1975			May 19, 1975			May 19, 1975			May 19, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
7	1	16,500	8	1	13,000	12	1	6,000	14	1	3,200	16	1	3,000	18	1	2,200	20	1	1,200
	5	18,500		5	14,500		5	6,000		10	3,700		5	3,000		5	2,200		5	1,200
	10	19,000		10	14,500		10	6,000		19	4,000		10	3,000		10	2,200		10	1,200
	15	19,000		15	14,500		15	6,500					15	3,000		15	2,200		15	1,200
	20	19,000		20	14,500		20	6,500					20	2,800		20	2,200		20	1,200
				25	14,500		25	7,000					30	2,800		25	2,200		25	1,200
				28	14,500		30	7,000					35	2,800		29	2,200		30	1,200
																			34	1,200

May 19, 1975			May 19, 1975			May 19, 1975			May 19, 1975			May 19, 1975			May 19, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
22	1	620	24	1	280	26	1	170	28	1	100	30	1	70	32.5	1	60
	5	620		5	280		5	170		10	100		5	70		5	60
	10	620		10	280		10	170		20	100		10	70		10	60
	15	620		15	280		15	170					15	70		17	60
	20	620		20	280		21	170					18	70			
	27	620		26	280												

Table 6. Field measurements of specific conductance (in micromhos per centimeter at 25°C) of the Edisto River at low tide.
(Depths in feet)

Date	Mile	Depth	Cond.
Oct. 8, 1974	5	1	27,000
		5	28,000
		10	20,000
		15	34,000
		20	36,000
		22	36,000
Oct. 8, 1974	7	1	22,500
		5	22,500
		10	22,500
		15	25,500
		20	25,500
		25	26,000
		30	27,000
		33	27,000
Oct. 8, 1974	9	1	17,000
		5	17,000
		10	17,000
		15	17,500
		20	18,500
		25	19,500
		30	20,000
Oct. 8, 1974	11	1	13,000
		5	13,000
		10	13,000
		15	13,000
		20	13,000
		25	13,000
Oct. 8, 1974	13	1	6,500
		5	7,500
		10	9,500
		15	10,000
		20	11,000
		25	13,000
Oct. 8, 1974	15	1	3,000
		5	3,000
		10	3,100
		15	3,200
		20	3,300
		22	3,300
Oct. 8, 1974	16	1	2,200
		5	2,200
		10	2,400
		15	2,700
		20	3,400
Oct. 8, 1974	17	1	1,500
		5	1,500
		10	1,500
		15	1,500
		20	1,500
Oct. 8, 1974	18	1	770
		5	770
		10	800
		15	800
		17	860
Oct. 8, 1974	19	1	400
		5	400
		10	400
		15	660
		16	660
Oct. 8, 1974	20	1	149
		5	149
		10	150
Oct. 8, 1974	21	1	71
		5	72
		10	72
		15	75
		20	86
		22	86
Jan. 22, 1975	6	1	13,000
		5	17,000
		10	24,000
		15	30,000
		17	30,000
Jan. 22, 1975	9	1	5,500
		10	6,500
		15	10,000
		20	12,000
		25	13,500
		30	15,000
Jan. 22, 1975	12	1	1,100
		5	1,700
		10	3,500
		15	3,500
Jan. 22, 1975	13	1	240
		5	550
		10	700
		15	700
		17	700
Jan. 22, 1975	14*	1	150
		5	400
		7	500
		9	850
		10	1,000
		12	3,000
		14	3,000
		16	3,000
Jan. 22, 1975	15	1	100
		5	100
		10	100
		15	100
		16	100
Jan. 22, 1975	17	1	70
		5	70
		10	70
		15	70
Feb. 26, 1975	4	1	2,500
		5	2,700
		10	3,000
		15	3,200
		20	3,400
		25	3,400
Feb. 26, 1975	6	1	630
		5	650
		10	650
Feb. 26, 1975	8	1	410
		5	410
		10	410
		14	410
Feb. 26, 1975	10	1	198
		5	198
		10	198
Feb. 26, 1975	12	1	130
		5	130
		10	130
Feb. 26, 1975	14	1	95
		5	110
		10	110
		15	110
Feb. 26, 1975	16	1	92
		5	92
		10	92
		15	92
		20	92
Feb. 26, 1975	18	1	68
		5	68
		10	68
Mar. 26, 1975	6	1	800
		5	850
		10	900
		15	950

*Influenced by Watts Cut

Table 6 . Field measurements of specific conductance (in micromhos per centimeter at 25°C) of the Edisto River at low tide--continued.
(Depths in feet)

Mar. 26, 1975			Mar. 26, 1975			Mar. 26, 1975			Mar. 26, 1975			Mar. 26, 1975			Mar. 26, 1975			Mar. 26, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
7	1	480	8	1	470	9	1	210	10	1	135	11	1	96	12	1	87	13	1	85
	5	480		5	470		5	210		5	135		5	98		5	87		5	85
	10	500		10	470		10	225		10	135		10	100		10	90		10	85
	15	520					15	300		15	140		15	100					15	85
	20	540					20	310					20	102					20	86

Apr. 8, 1975			Apr. 8, 1975			Apr. 8, 1975			Apr. 8, 1975			Apr. 8, 1975			Apr. 8, 1975			Apr. 8, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
4	1	17,000	6	1	12,000	8	16	16,000	9	1	3,500	10	1	2,550	11	1	1,500	12	1	375
	5	18,000		5	12,500					5	3,600		5	2,750		5	1,700		5	380
	10	24,000		10	15,000					10	3,600		10	3,000		10	2,300		10	380
	15	26,000		15	20,000					15	3,800		13	3,000		15	2,600		15	390
	20	28,000		17	20,000					20	4,250					22	3,000			
	25	30,000								25	4,500									

Apr. 8, 1975			Apr. 8, 1975			Apr. 8, 1975			May 20, 1975			May 20, 1975			May 20, 1975			May 20, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
13	1	140	14	1	90	15	1	83	6	1	5,200	7	1	1,800	8	1	1,500	9	1	1,300
	5	150		5	90		5	83		5	7,600		5	2,000		5	1,800		5	1,300
	10	180		10	95		10	83		10	8,000		10	2,300		10	1,800		10	1,400
	15	300		15	95		16	85		15	9,300		15	2,500		11	1,800		15	1,400
	20	475		20	97								20	2,600					20	1,400
	25	775		25									25	3,000					25	1,400

May 20, 1975			May 20, 1975			May 20, 1975			May 20, 1975			May 20, 1975			Jun. 4, 1975			Jun. 4, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
10	1	750	11	1	500	12	1	125	13	1	100	14	1	95	4	1	17,500	6	1	21,000
	5	775		5	500		5	140		5	105		5	95		5	25,000		5	22,000
	10	800		10	650		10	140		10	110		10	90		10	29,000		10	22,000
				15	650		13	140		15	110		15	90		15	30,000		15	22,000
				20	850					20	110		20	90		20	37,000		17	22,000
				23	850					25	110		22	90		25	37,000			
										27	110					30	37,000			
																35	37,000			

Table 6. Field measurements of specific conductance (in micromhos per centimeter at 25°C) of the Edisto River at low tide--continued
(Depths in feet)

Jun. 4, 1975		
Mile	Depth	Cond.
8	1	7,500
	5	11,500
	10	13,000
	12	14,500

Jun. 4, 1975		
Mile	Depth	Cond.
10	1	3,000
	5	3,000
	10	3,200
	15	5,000
	16	5,500

Jun. 4, 1975		
Mile	Depth	Cond.
12	1	850
	5	1,400
	10	2,300
	13	2,300

Jun. 4, 1975		
Mile	Depth	Cond.
13	1	475
	5	850
	10	1,200
	15	1,400
	20	1,800
	25	2,300
	28	2,300

Jun. 4, 1975		
Mile	Depth	Cond.
14	1	150
	5	135
	10	320
	15	1,300
	20	3,700
	25	4,400
	27	4,400

Jun. 4, 1975		
Mile	Depth	Cond.
15	1	90
	5	90
	10	90
	15	90
	19	90

Jun. 4, 1975		
Mile	Depth	Cond.
16	1	75
	5	73
	10	70
	15	77
	20	80
	25	80

Jun. 4, 1975		
Mile	Depth	Cond.
18	1	55
	5	55
	10	55
	15	55
	18	56

Table 7 . Field measurements of specific conductance (in micromhos per centimeter at 25°C) of the Ashepoo River at low tide. (Depths in feet)

Oct. 9, 1974			Oct. 9, 1974			Oct. 9, 1974			Oct. 9, 1974			Oct. 9, 1974			Oct. 9, 1974			Oct. 9, 1974		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
11	1	18,000	13	1	16,300	15	1	13,000	17	1	11,500	19	1	9,100	20	1	7,800	21	1	6,600
	5	18,000		5	16,300		5	13,000		5	11,500		5	9,100		5	7,900		5	6,600
	10	18,000		10	16,300		10	13.000		10	11,500		10	9,100		10	7,900		10	6,600
	11	18,000		15	16,500		15	13,000		15	11,500		15	9,100		15	7,900		15	6,700
				20	16,500		20	13,000		20	11,600		20	9,200		20	7,900		20	6,700
				21	16,500		25	13,000					25	9,200		25	8,000		23	6,700
							29	13,000					30	9,200		28	8,000			

Oct. 9, 1974			Oct. 9, 1974			Oct. 9, 1974			Oct. 9, 1974			Oct. 9, 1974			Oct. 9, 1974			Oct. 9, 1974		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
22	1	5,900	23	1	4,500	24	1	4,500	26	1	2,450	28.6	1	1,320	30.8	1	625	32.5	1	435
	5	6,000		5	4,500		5	4,500		5	2,500		5	1,350		5	640		5	440
	10	6,000		10	4,500		10	4,500		10	2,500		10	1,450		10	640		10	450
	15	6,000		15	4,500		15	4,500		15	2,600		15	1,450		13	650		15	450
	20	6,000		20	4,500		20	4,600		17	2,600									
	25	6,000		24	4,500															

Oct. 9, 1974			Oct. 9, 1974			Oct. 9, 1974			Oct. 9, 1974			Jan. 23, 1975			Jan. 23, 1975			Jan. 23, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
34	1	240	35	1	160	36	1	90	37	1	70	6	1	18,000	9	1	6,500	11	1	1,900
	5	240		5	165		5	90		5	72		5	20,000		5	6,800		5	2,000
	10	240		8	165		10	95		10	73		10	21,000		10	7,500		10	2,200
										12	73		15	22,000		15	8,500		13	2,500
													16	22,000		20	10,000			
																21	10,000			

Jan. 23, 1975			Jan. 23, 1975			Jan. 23, 1975			Jan. 23, 1975			Jan. 23, 1975			Jan. 23, 1975			Jan. 23, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
13	1	1,200	15	1	650	17	1	425	19	1	310	21	1	250	23	1	200	25	1	160
	5	1,300		5	650		5	425		5	310		5	240		5	200		5	160
	10	1,300		10	650		10	425		10	310		10	240		10	200		10	160
	15	1,300		15	650		15	425		15	300		15	240		15	200		15	160
	20	1,300		20	650		20	450		20	320		20	240		20	200		20	160
	25	1,300		25	650		23	450		25	320		25	240					25	160
										30	320									

Table 7 . Field measurements of specific conductance (in micromhos per centimeter at 25°C) of the Ashepoo River at low tide--continued.
(Depths in feet)

Feb 25, 1975			Feb. 25, 1975			Feb. 25, 1975			Feb. 25, 1975			Feb. 25, 1975			Feb. 25, 1975			Feb. 25, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
4	1	2,000	6	1	1,700	8	1	1,000	10	1	700	12	1	380	14	1	260	16	1	203
	5	2,500		5	1,700		5	1,000		5	700		5	380		5	260		5	200
	10	2,500		10	1,700		10	1,000		20	700		10	380		10	260		10	200
	15	3,000		15	1,700		15	1,000					20	380		15	260		15	200
							20	1,000												

Feb. 25, 1975			Feb. 25, 1975			Feb. 25, 1975			Mar. 27, 1975			Mar. 27, 1975			Mar. 27, 1975			Mar. 27, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
18	1	160	20	1	130	22	1	112	3	1	3,200	4	1	1,700	5	1	2,600	6	1	1,600
	5	158		5	130		5	110		5	3,400		5	3,200		5	2,800		5	1,700
	10	160		10	130		10	110		10	3,700		10	3,500		10	2,800		10	1,700
	20	160		15	130					15	4,100		15	4,000		15	2,800		15	1,700
				20	130					20	4,000					18	2,800			
				25	130					22	4,000									
				30	130															

Mar. 27, 1975			Mar. 27, 1975			Mar. 27, 1975			Mar. 27, 1975			Mar. 27, 1975			Mar. 27, 1975			Mar. 27, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
8	1	460	10	1	370	12	1	275	14	1	210	16	1	170	18	1	140	20	1	110
	5	460		5	370		5	270		10	210		10	170		10	140		10	110
	10	460		10	370		10	280		18	210		20	170		20	140		20	110
				15	370		15	280								25	140			
				20	370															

Mar. 27, 1975			May 20, 1975			May 20, 1975			May 20, 1975			May 20, 1975			May 20, 1975			May 20, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
22	1	104	4	1	11,750	6	1	10,500	8	1	4,000	10	1	3,200	12	1	2,200	14	1	1,450
	10	106		5	11,750		5	10,500		5	4,100		5	3,200		5	2,200		5	1,450
	20	109		10	11,750		10	10,500		10	4,200		8	3,300		10	2,200		10	1,450
				15	11,750		11	10,500		15	4,400					15	2,300		14	1,475
																20	2,300			
																24	2,400			

Table 7. Field measurements of specific conductance (in micromhos per centimeter at 25°C) of the Ashepoo River at low tide--continued.
(Depths in feet)

May 20, 1975			May 20, 1975			May 20, 1975			May 20, 1975			Jun. 3, 1975			Jun. 3, 1975			Jun. 3, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
16	1	950	18	1	505	20	1	230	21	1	180	2	1	14,500	4	1	13,700	7	1	7,000
	5	950		15	505		15	230		10	180		5	18,000		5	14,000		5	7,000
	10	950		31	530		33	230		22	180		10	23,000		10	15,000		10	7,500
	15	950											15	29,500		15	17,500		14	8,000
	20	950											20	30,500		16	17,500			
	25	950											23	30,500						

Jun. 3, 1975			Jun. 3, 1975			Jun. 3, 1975			Jun. 3, 1975			Jun. 3, 1975			Jun. 3, 1975			Jun. 3, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.	Mile	Depth	Cond.
9	1	4,500	11	1	4,300	13	1	3,500	15	1	2,200	17	1	1,900	19	1	950	23	1	320
	5	4,500		5	4,300		5	3,500		5	2,500		5	1,900		5	950		5	320
	10	4,500		10	4,300		10	3,500		10	2,500		10	1,900		10	950		10	320
	15	4,500		12	4,300		15	3,500		15	2,500		15	1,900		15	950		15	320
	20	4,500					20	3,500		20	2,500		20	1,900		20	950			
	25	4,500								26	2,500		25	1,900		25	950			
	27	4,500														28	950			

Jun. 3, 1975			Jun. 3, 1975		
Mile	Depth	Cond.	Mile	Depth	Cond.
25	1	220	32.5	1	220
	5	220		5	220
	10	220		10	220
	15	230		14	220
	18	230			

Effect of the Tide on the Saltwater Interface

The location of the saltwater interface in an estuary is controlled principally by tides and freshwater inflow. On a semidiurnal basis in the study area, the interface moves up the estuaries during flood (incoming) tide, and recedes during ebb (outgoing) tide. The distance traveled between high and low tides depends primarily on the height of the tide, the freshwater inflow, and the estuary depth. Because of inertia, the mass of water will continue its upstream or downstream movement until slack water occurs a short time after high or low tides. In the Ashepoo and Edisto estuaries the maximum intrusion of the saltwater interface occurs at high-slack tide, and the minimum intrusion occurs at low-slack tide. The higher the tide, the farther upstream the interface will move if the fresh-water inflow remains fairly constant. Also, any given rate of freshwater inflow which remained fairly constant in this study did not appear to have much effect on the distance of the interface movement or excursion between high and low tides. The tidal excursion during this reconnaissance was generally 4 to 6 miles.

Effect of Freshwater Inflow on the Saltwater Interface

While any constant rate of freshwater inflow has minor effect on tidal excursion, a change in that rate has major effect on the average location and shape of the interface. The amount of freshwater inflow to an estuary has a limiting effect on the saltwater intrusion: for any given tidal stage, the greater the freshwater inflow, the farther downstream the saltwater interface will be found. If there is appreciable freshwater inflow to an estuary, the saltwater interface becomes in effect, a saltwater wedge caused by the less-dense freshwater overriding the saltwater. The wedge is positioned so that its greatest upstream advance is along the bottom of the channel. In this stratified condition, the water in a vertical section has the least salt content at the surface and becomes progressively more salty with depth. When freshwater inflow is high the trailing edge of the wedge may be a mile or more seaward from the leading edge. During periods of low freshwater inflow the wedge is almost nonexistant, and the saltwater interface may be replaced by a gradual transition from fresh to saltwater, exhibiting little or no stratification.

Freshwater inflow to the Edisto and Ashepoo estuaries

The freshwater inflow to the Ashepoo estuary has not been gaged sufficiently to be well defined. It is known, however, that the flow is quite low when compared to the freshwater inflow to the adjoining Edisto estuary. Because of the proximity of the two estuaries to each other and the fact that they are connected by Fenwick Cut, some of the flow characteristics of the one may be reasonably correlated with the known amount of freshwater inflow to the other.

Freshwater inflow to the Edisto estuary is measured at a stream-gaging station located 2.8 miles west of Givhans and about 18 miles north-east of Jacksonboro at river mile 59.9. Average discharge for the past 36 years (1939-75) is 2,690 cfs. Discharge is generally higher in winter and spring, and lower in summer and fall. Figure 8 illustrates normal monthly mean discharges as percentages of annual flow. A statistical analysis of low flows and the duration of daily flows at the Givhans gaging station from 1940 to 1965 was published in 1967 in Stallings' report on streamflow characteristics. It is reproduced here as table 8. Daily flows at the Givhans station may be found in annual Survey publications of

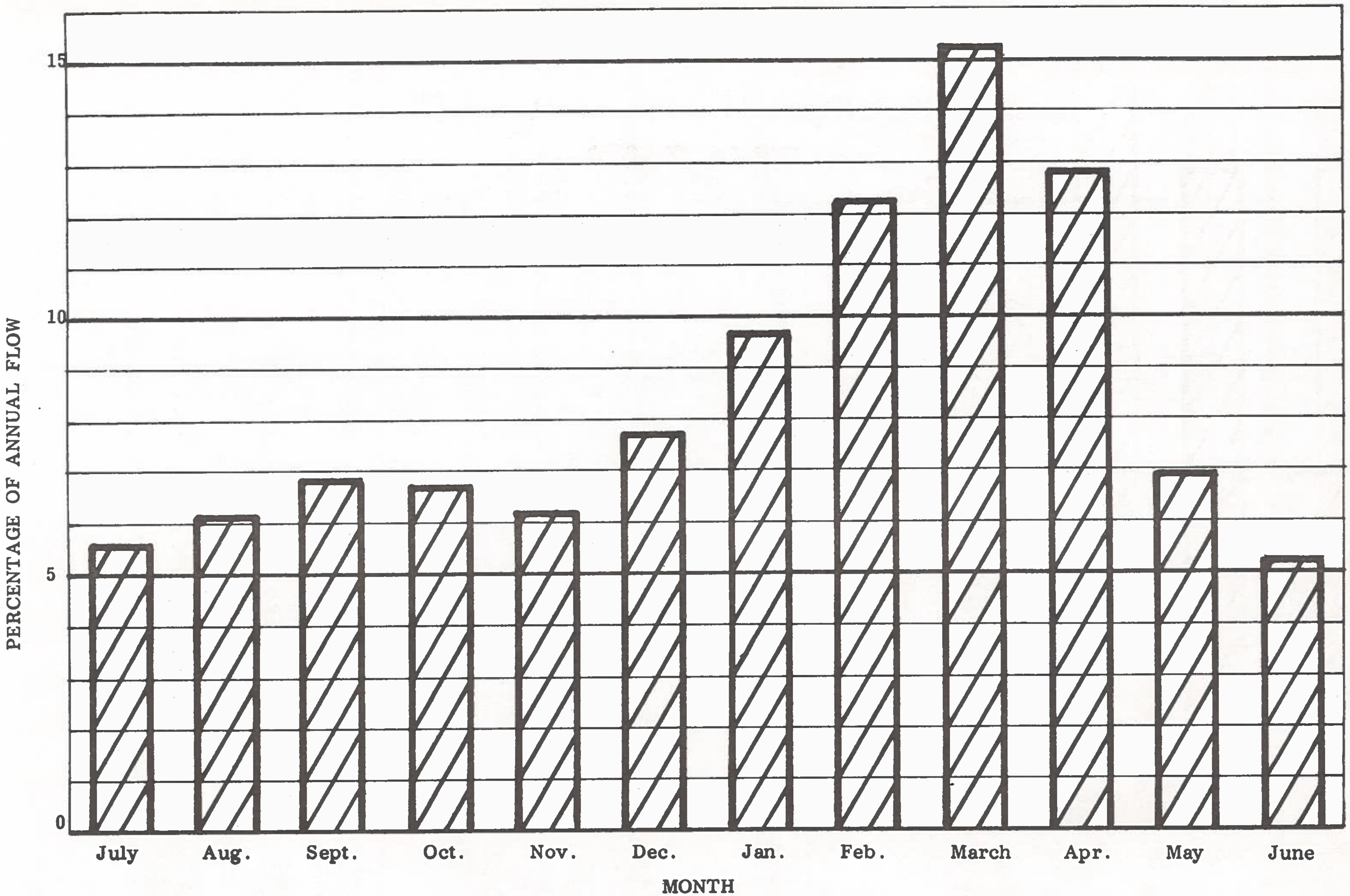


Figure 8. Normal monthly mean discharges as percentages of annual flow at Edisto River near Givhans.

Table 8. Streamflow statistics for Edisto River near Givhans, 1939 to 1965
(from South Carolina streamflow characteristics, low-flow frequency and flow duration, 1967)

MAGNITUDE AND FREQUENCY OF ANNUAL LOW FLOWS

Period (Consecutive days)	Lowest average flow, in cubic feet per second, for indicated recurrence interval, in years				
	2	5	10	20	40
7	680	457	373	314	270
30	760	510	414	349	300
50	920	620	505	430	374
120	1,110	720	560	455	370
274	1,590	1,070	890	765	680

DURATION OF DAILY FLOW

Period	Flow, in cubic feet per second, which was equaled or exceeded for indicated percent of time											
	2	10	30	50	70	80	90	95	98	99	99.5	99.9
1940-65	11,700	5,800	2,700	1,750	1,180	940	720	598	450	402	373	340

LOWEST MEAN DISCHARGE, IN CUBIC FEET PER SECOND, FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS IN YEAR BEGINNING APRIL 1

Year	1	3	7	14	30	60	90	120	150	183	274
1939	653.0	658.0	664.0	691.0	717.0	792.0	839.0	901.0	1030.0	1020.0	1200.0
1940	593.0	593.0	604.0	619.0	634.0	684.0	854.0	977.0	1110.0	1180.0	1490.0
1941	455.0	455.0	459.0	479.0	536.0	934.0	1090.0	1750.0	2200.0	2950.0	2790.0
1942	701.0	712.0	729.0	760.0	825.0	859.0	901.0	975.0	1110.0	1240.0	1530.0
1943	593.0	593.0	593.0	601.0	619.0	705.0	739.0	797.0	894.0	991.0	1390.0
1944	681.0	686.0	697.0	709.0	750.0	784.0	847.0	868.0	932.0	980.0	1140.0
1945	569.0	583.0	619.0	701.0	729.0	937.0	986.0	1060.0	1120.0	2470.0	2490.0
1946	660.0	670.0	694.0	736.0	790.0	957.0	1140.0	1060.0	1190.0	1280.0	1500.0
1947	864.0	867.0	883.0	913.0	1050.0	1150.0	1390.0	1620.0	1660.0	1730.0	3320.0
1948	1020.0	1050.0	1070.0	1110.0	1130.0	1360.0	1380.0	1680.0	1870.0	2350.0	3670.0
1949	1020.0	1080.0	1120.0	1250.0	1420.0	1630.0	1700.0	1700.0	1720.0	1820.0	2500.0
1950	615.0	625.0	649.0	685.0	851.0	962.0	1070.0	1110.0	1170.0	1320.0	1420.0
1951	625.0	625.0	631.0	652.0	750.0	833.0	942.0	1020.0	1010.0	989.0	1170.0
1952	565.0	570.0	574.0	585.0	672.0	848.0	1130.0	1290.0	1280.0	1310.0	1540.0
1953	574.0	579.0	617.0	657.0	701.0	741.0	769.0	762.0	899.0	883.0	1300.0
1954	310.0	312.0	321.0	336.0	378.0	396.0	406.0	415.0	434.0	474.0	702.0
1955	490.0	513.0	566.0	599.0	622.0	901.0	908.0	952.0	1220.0	1240.0	1230.0
1956	292.0	300.0	311.0	336.0	372.0	393.0	414.0	428.0	546.0	608.0	777.0
1957	352.0	356.0	375.0	405.0	434.0	451.0	521.0	578.0	628.0	829.0	1340.0
1958	578.0	593.0	604.0	617.0	622.0	637.0	655.0	692.0	749.0	856.0	1260.0
1959	720.0	730.0	767.0	797.0	1250.0	2450.0	2370.0	2630.0	2590.0	2850.0	4390.0
1960	1080.0	1090.0	1100.0	1110.0	1150.0	1260.0	1300.0	1350.0	1430.0	1560.0	1710.0
1961	810.0	810.0	810.0	814.0	836.0	927.0	1110.0	1460.0	1850.0	1900.0	2170.0
1962	770.0	770.0	789.0	841.0	955.0	1340.0	1380.0	1600.0	1590.0	1660.0	1820.0
1963	600.0	610.0	615.0	654.0	706.0	952.0	1040.0	1130.0	1200.0	1260.0	1450.0
1964	1480.0	1510.0	1560.0	1660.0	1720.0	1880.0	3120.0	4340.0	4670.0	5490.0	5580.0

surface water records. The daily flows for the period of the reconnaissance are listed in table 9.

Except for periods of heavy local runoff, there is no appreciable percentage increase of surface-water inflow downstream from the Givhans gaging station (Cummings, 1968). For this investigation, therefore, no additional discharge is assumed to have occurred in this reach of the river.

Correlation of saltwater intrusion with freshwater inflow

The probable location on the Edisto estuary of the saltwater interface at high tide may be estimated by graphically correlating the measured river-mile locations of the greatest penetration of the interface with the concurrent freshwater inflows (Edisto River near Givhans, mile 59.9) (see fig. 9). An arbitrary value of 250 mg/l chloride has been selected to represent the saltwater interface because that is the maximum amount allowable in the domestic-use standards set by the U.S. Public Health Service in 1962. In order to eliminate local eccentricities and to allow for time-of-travel to the estuarine zone, the freshwater component is taken as an average of five successive days flow, beginning one week prior to the day of chloride measurement. In the same manner, the river mile locations of other concentrations of dissolved chloride may be made with reference to freshwater inflow. This has been done for selected chloride concentrations in both the Edisto and Ashepoo estuaries and is illustrated in figures 10 and 11.

During average river-flow conditions, the saltwater interface penetrates the Edisto estuary to mile 19.5 and the Ashepoo estuary to mile 24 at high tide; the interface recedes to mile 14 on the Edisto and mile 20 on the Ashepoo at low tide. At high tides during periods of very low flow such as the 7-day 10-year low flow (see table 8), the interface can penetrate to mile 32 (near Jacksonboro) on the Edisto River and the Ashepoo River would be brackish or salty to about mile 38.

Table 9. Discharge at Edisto River near Givhans, S. C. in cubic feet per second, July 1974 to June 1975

Day	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1	1,010	1,060	1,160	1,710	785	1,400	3,080	5,120	8,350	6,120	2,630	2,930
2	980	1,150	1,140	1,560	788	1,510	3,000	5,070	7,880	5,920	2,540	2,640
3	956	1,210	1,110	1,420	788	1,470	2,910	4,940	7,350	5,720	2,480	2,530
4	960	1,250	1,080	1,290	791	1,440	2,860	4,830	6,820	5,500	2,520	2,480
5	960	1,380	1,060	1,190	791	1,400	2,810	4,820	6,280	5,310	2,670	2,450
6	1,000	1,660	1,120	1,110	797	1,400	2,750	4,860	5,730	5,180	2,900	2,420
7	1,200	2,270	1,270	1,050	804	1,440	2,670	4,860	5,240	5,070	3,310	2,460
8	1,290	2,570	1,350	989	821	1,500	2,620	4,810	4,860	4,990	3,790	2,540
9	1,360	2,730	1,390	940	842	1,580	2,630	4,800	4,570	4,950	3,970	2,570
10	1,350	2,900	1,430	989	867	1,580	2,650	4,800	4,380	4,930	3,980	2,550
11	1,290	3,240	1,450	867	888	1,580	2,670	4,810	4,220	4,920	3,980	2,540
12	1,240	3,300	1,490	842	905	1,600	2,710	4,890	4,130	4,920	4,030	2,520
13	1,240	3,470	1,540	825	912	1,640	2,900	4,990	4,060	4,990	4,110	2,520
14	1,250	3,900	1,590	811	926	1,730	3,180	4,940	4,010	5,130	4,180	2,460
15	1,240	4,520	1,620	804	933	1,780	3,460	4,780	3,970	5,500	4,390	2,420
16	1,190	4,940	1,640	804	937	1,850	3,700	4,580	3,950	5,870	4,710	2,430
17	1,140	5,090	1,640	814	937	1,980	4,020	4,510	4,000	6,060	4,980	2,440
18	1,110	4,910	1,690	818	965	1,950	4,450	4,600	4,130	6,060	5,090	2,450
19	1,140	4,530	1,760	811	986	1,980	4,890	4,970	4,440	5,980	5,160	2,570
20	1,070	4,160	1,810	811	1,000	1,980	5,250	5,450	4,880	5,910	5,500	2,720
21	972	3,760	1,930	807	1,060	2,090	5,470	5,980	5,520	5,780	5,990	2,840
22	921	3,440	2,240	804	1,100	2,260	5,550	6,660	6,110	5,600	6,360	2,860
23	914	3,200	2,730	800	1,200	2,380	5,420	7,370	6,580	5,340	6,450	2,840
24	900	2,990	3,150	794	1,200	2,490	5,240	8,160	7,010	4,990	6,220	2,850
25	890	2,770	3,220	794	1,200	2,620	5,070	9,040	7,640	4,590	5,870	2,910
26	897	2,490	3,030	791	1,200	2,770	4,980	9,520	8,020	4,210	5,470	2,900
27	925	2,140	2,730	791	1,300	2,920	4,890	9,450	7,880	3,860	5,000	2,720
28	1,030	1,780	2,410	788	1,300	3,050	4,820	8,920	7,440	3,500	4,500	2,410
29	1,030	1,530	2,130	782	1,330	3,150	4,870	-----	6,980	3,160	4,000	2,090
30	1,020	1,360	1,910	779	1,350	3,190	4,980	-----	6,610	2,880	3,580	1,780
31	1,020	1,240	-----	782	-----	3,160	5,080	-----	6,340	-----	3,300	-----

RIVER-MILE LOCATION OF DESIGNATED CHLORIDE CONCENTRATIONS

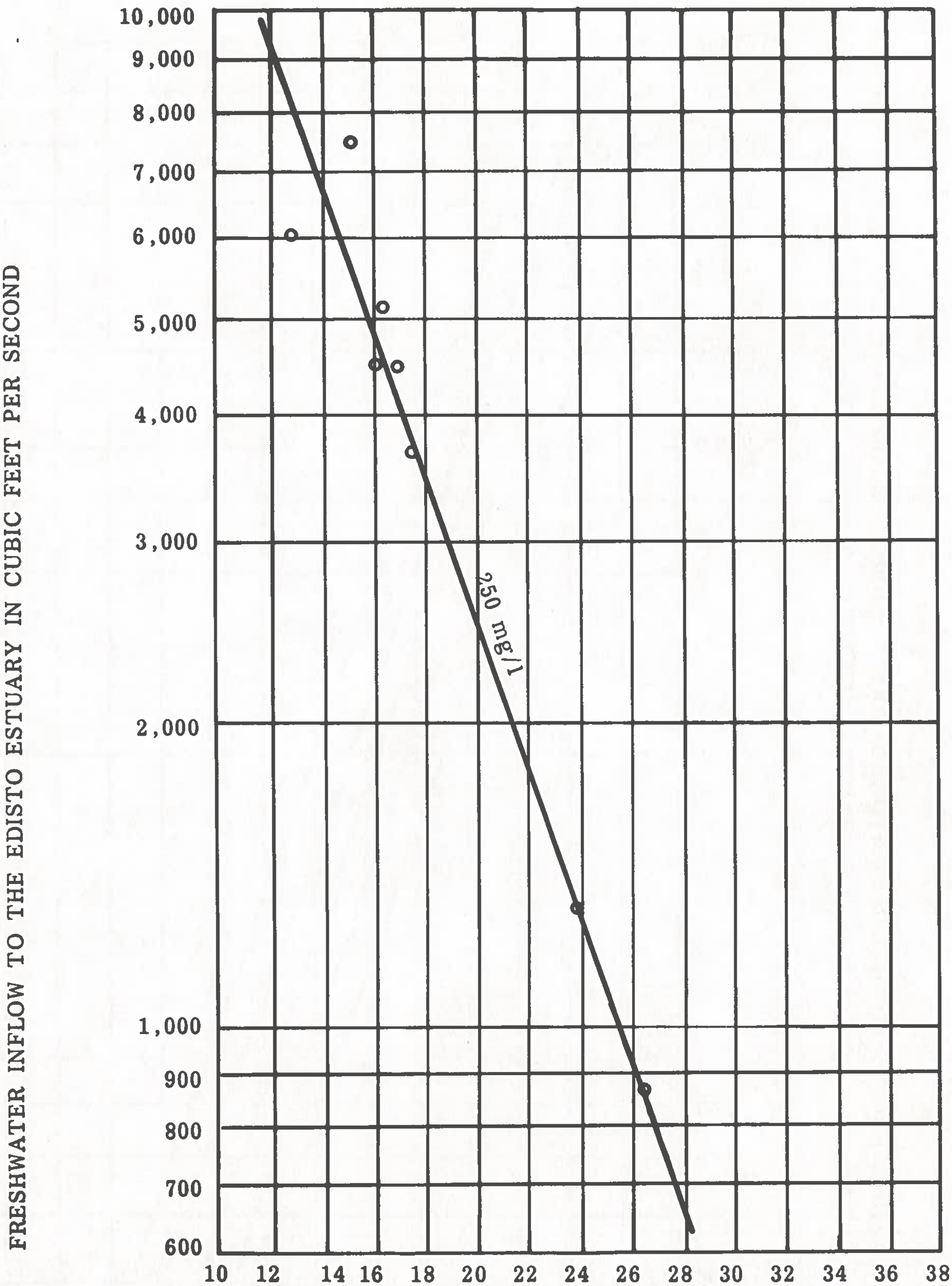


Figure 9. Location at high tide of 250 mg/l chloride concentration in the Edisto estuary versus freshwater inflow to the Edisto estuary.

RIVER-MILE LOCATION OF DESIGNATED CHLORIDE CONCENTRATIONS

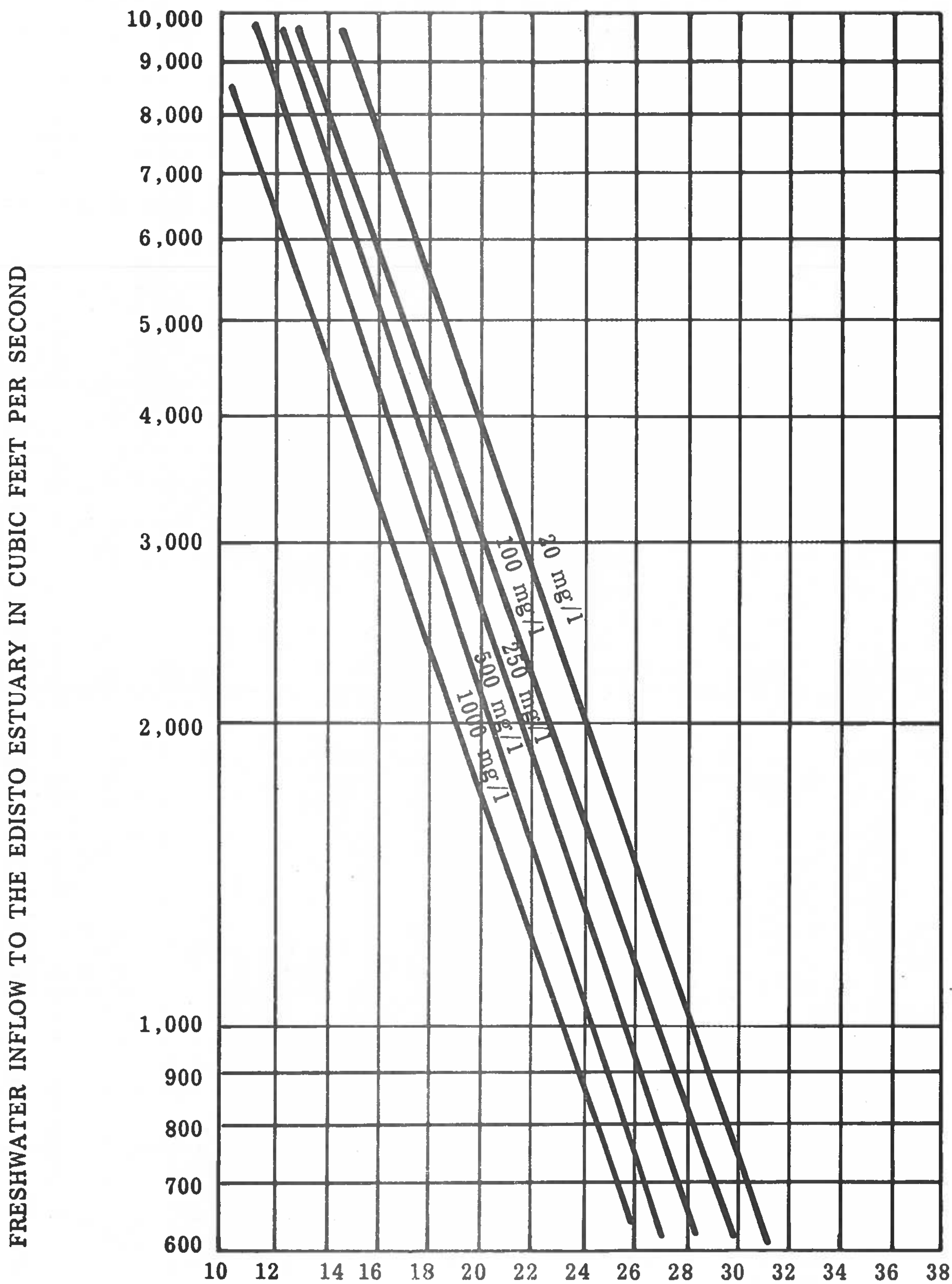


Figure 10. Location of high tide of selected chloride concentrations in the Edisto Estuary versus freshwater inflow to the Edisto Estuary.

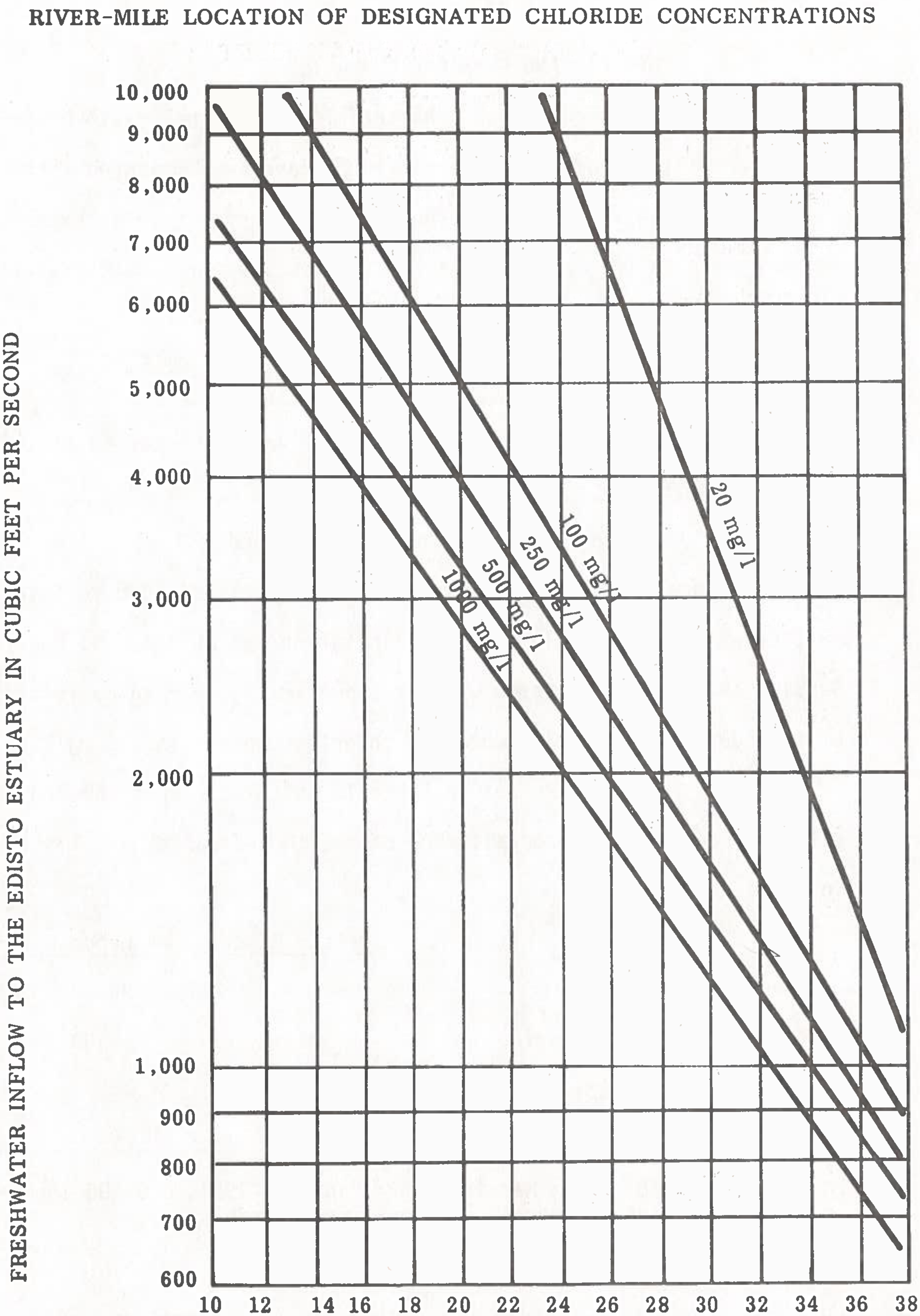


Figure 11. Location at high tide of selected chloride concentrations in the Ashepoo estuary versus freshwater inflow to the Edisto estuary.

CHEMICAL AND PHYSICAL CHARACTERISTICS OF WATER

The chemical and physical characteristics of the Edisto River in the reach of the study area above mile 25 have been measured with some regularity since 1958 and published by or in cooperation with the Survey.1/ Measurements in the Ashepoo River during the study indicate a similarity in freshwater quality of the two estuaries.

General Water Quality

Table 10 gives the maximum and minimum values of the constituents sampled in the Edisto River in this reach from 1958 to 1975 in locations where chloride concentration was not greater than 270 mg/l. The Ashepoo River analyses also fall within this range. The dissolved solids concentration which is slightly over the limitation set by the U.S. Public Health Service in 1962 for domestic use, is shown in figure 7 to be less than that of the 500 mg/l limitation when the chloride content is 250 mg/l or below.

Other substances are not in table 10 which were spot sampled above the saltwater during the reconnaissance of the two estuaries are listed below in mg/l.

	Edisto River	Ashepoo River
Carbon total organic	15	26
Phosphate dissolved ortho	.03	.03
Methylene Blue active substance	13	--

1/ Cummings, 1968, 1969; Harris, 1962; Pauszek, 1951; U.S. Geological Survey's series of annual water quality reports.

Table 10. Maximum and minimum values of dissolved substances and physical properties of the Edisto River at high tide above the salt water wedge 1958 to 1975, (spot tests in the Ashepoo River also fall within these ranges.) (Concentrations in mg/l, except as indicated.)

	Minimum	Maximum
Silica (SiO_2)	1.3	10
Iron (Fe)	.02	.54
Calcium (Ca)	2.4	38
Magnesium (Mg)	.3	19
Sodium (Na)	2.2	142
Potassium (K)	.2	6.4
Bicarbonate (HCO_3)	2	142
Sulfate (SO_4)	.6	27
Chloride (Cl)	.8	270
Fluoride (F)	.0	.2
Nitrate (NO_3)	.1	4.2
Dissolved solids (residue at 180°C)	28	552
Hardness (as $CaCO_3$)	9	102
Noncarbonate hardness (as $CaCO_3$)	0	94
Specific conductance (micromhos per centimeter at 25°C)	35	996
pH (in pH units)	5.4	7.5
Color (in color units)	30	240

Suspended Sediment

Integrated suspended sediment samples were obtained during the reconnaissance on two occasions in each river at several points of different conductivity and are shown in figures 12 and 13. These give a general indication of the sediment concentration that may be expected for a given conductivity. More specific sediment data for the lower Edisto River is obtainable in the reported data for Edisto River near Givhans to be found in the Survey's annual publication, Water Resources Data for South Carolina, part 2, Water Quality Records.

Dissolved Oxygen

Hourly measurements of dissoved oxygen (DO) were made at U.S. Highway 17 bridges on the two rivers during daylight hours Feb. 11, 12 and June 24, 1975. The earlier series on the Edisto River ranged from a DO concentration of 9.1 mg/l to 10.1 mg/l with a range of saturation from 81 to 92 percent. The later series on the Edisto River ranged from a DO concentration of 6.0 to 6.2 mg/l with a range of saturation from 71 to 75 percent.

Dissolved Herbicides and Pesticides

No herbicides or pesticides were found in two analyses made during the spring and autumn in the water of both rivers above the saltwater. The following list denotes the constituents tested and the findings in ug/l (micrograms per liter).

Aldrin Total	0.00	Heptachlor Total	0.00
Chlordane Total	0.0	Lindane Total	0.00
DDD Total	0.00	PCB Total	0.0

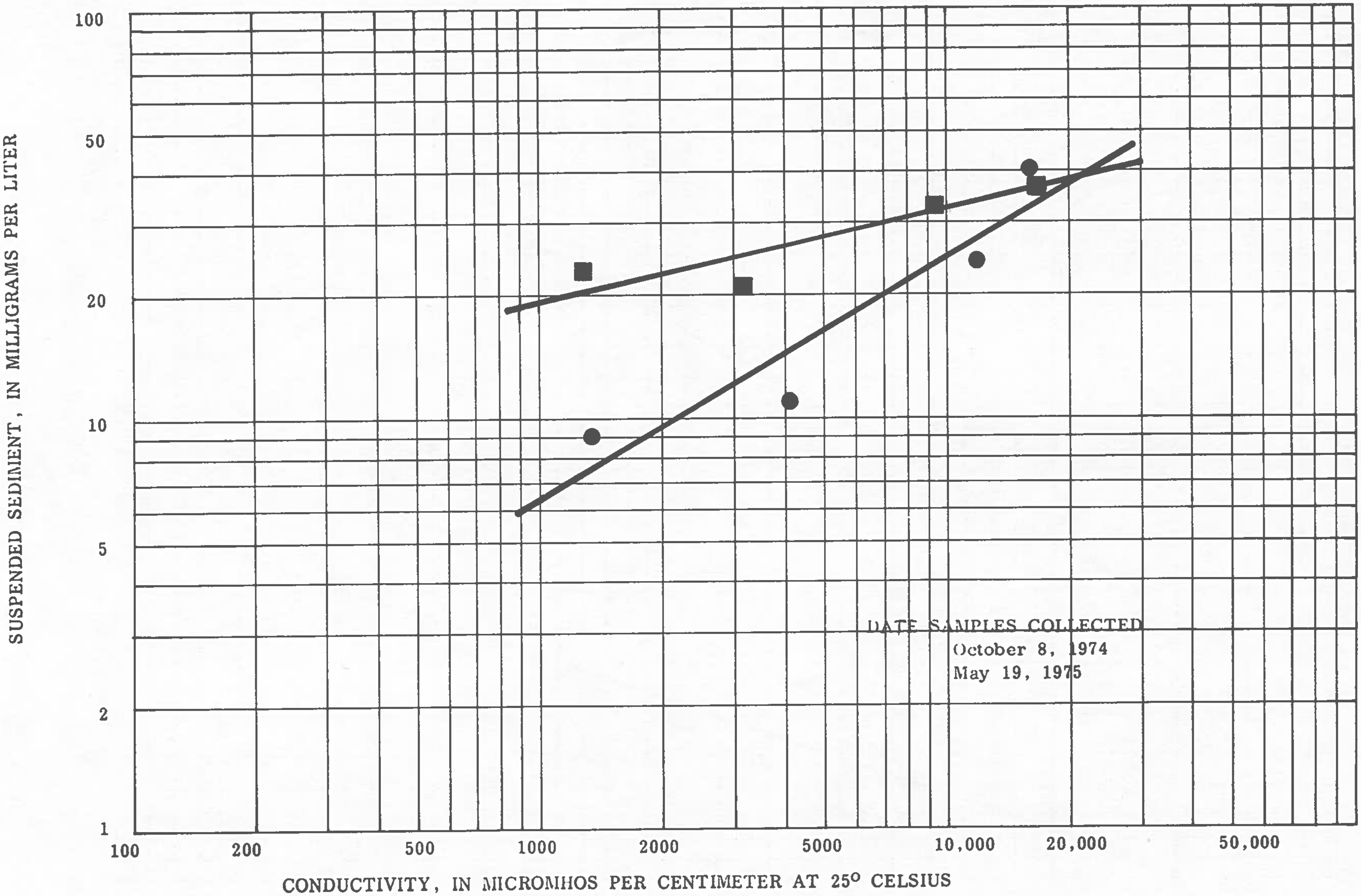


Figure 12. Suspended sediment versus conductivity in the Edisto estuary.

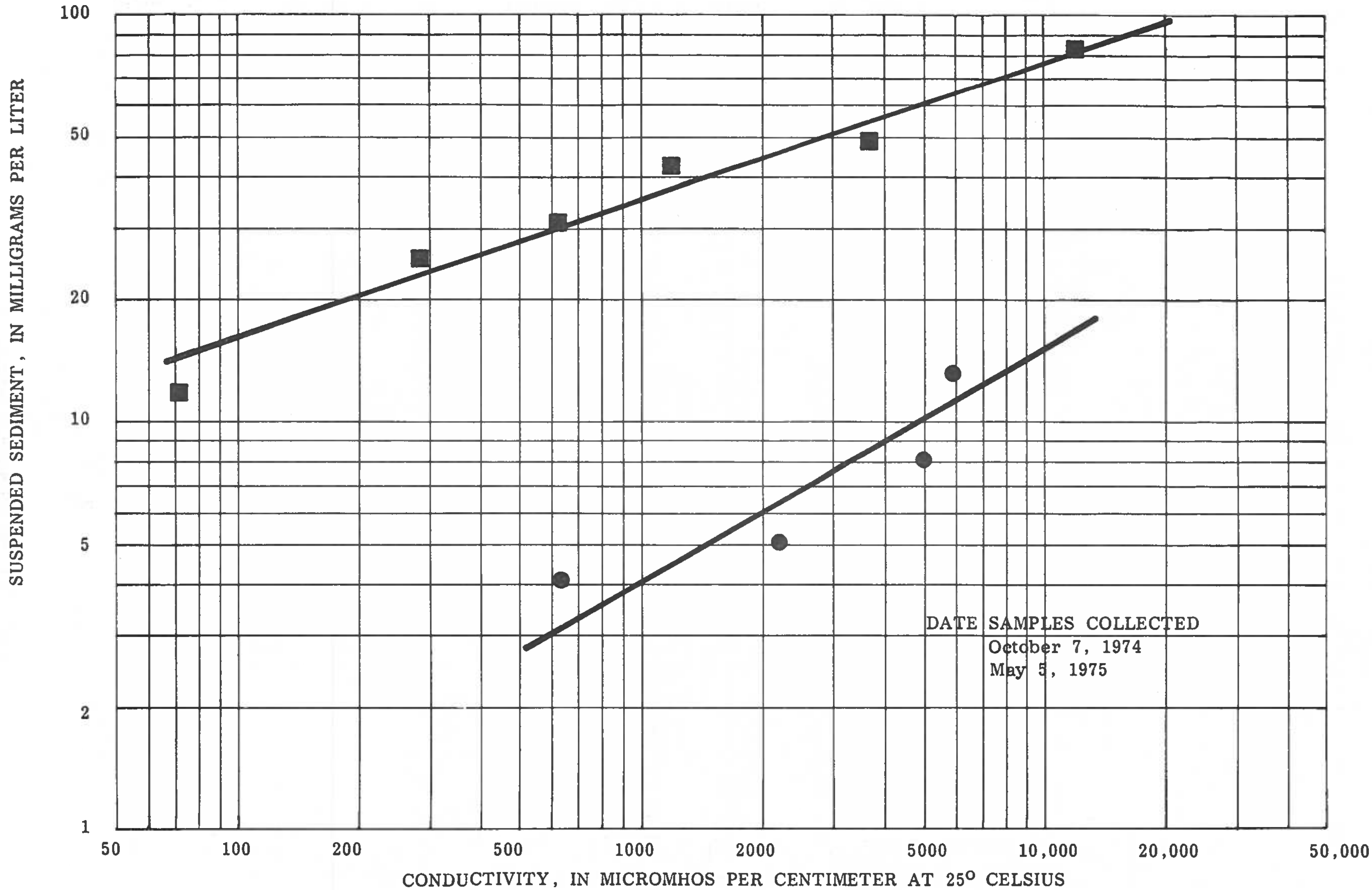


Figure 13. Suspended sediment versus conductivity in the Ashepoo estuary.

Dissolved Herbicides and Pesticides con't.

DDE Total	0.00	PCN Total	0.0
DDT Total	0.00	Silvex Total	0.00
Dieldrin Total	0.00	Toxaphene Total	0
Endrin Total	0.00	2,4-D Total	0.00
Hept Epox Total	0.00	2,4-DP Total	0.00
		2,4,5-T Total	0.00

Bottom Sediments

The bottom sediment from mile 24.5 of the Edisto River was analyzed one time for the same herbicide and pesticide contents listed above. The results were negative with the exception of finding of 0.3 ug/kg (micrograms per kilogram) of DDD. The same analyses were made of the sediments from mile 19.5 of the Ashepoo River. The results were also negative except for the low levels of 1.9 ug/kg of DDD and 0.7 ug/kg of DDE.

Bottom sediments from the same locations on the Edisto and Ashepoo Rivers were also analyzed for arsenic and metals. The results were inconsequential except for the relatively high iron concentration. The results are listed below in ug/g (micrograms per gram).

	Edisto River	Ashepoo River
Arsenic	10	10
Cadmium	<10	<10
Cromium tot	10	20
Copper	<10	<10
Iron	6200	12000
Lead	<10	<10

Bottom Sediments con't.

	Edisto River	Ashepoo River
Manganese	120	230
Mercury	0.10	.20
Nickel	<10	<10
Zinc	20	30

Suitability of Water for Use

The suitability of a water for use depends largely on the chemical characteristics and physical properties of the water. Water suitable for one use may not be suitable for another, and thus water must be judged by criteria appropriate to the intended use. The degree to which a water fails to meet appropriate criteria usually determines the treatment required. If extensive treatment is necessary, use of a water supply may not be economically feasible.

Chemical-quality standards for water used for drinking and culinary purposes on interstate-commerce carriers have been established by the U. S. Public Health Service (1962). These standards have been endorsed by the American Water Works Association, and are commonly used to evaluate water intended for human consumption. Some of the maximum concentration limits of significance to the evaluation of water in the report area are, in mg/l: iron, 0.3; chloride, 250; and dissolved-solids concentratioon, 500. A maximum color of 15 units also has been recommended. Although specific limits have not been set for organic matter, even small amounts are unacceptable to most consumers.

Hardness, a measure of the ability of water to consume soap, has been arbitrarily classified in parts per million, as follows: 60 or less, soft; 61-120, moderately hard; 121-180, hard; and 181 or more, very hard.

Using these criteria, if 250 mg/l dissolved chloride is considered to be the freshwater limit, the estuarine water upstream from the wedge is usually soft, of good quality, and suitable for domestic and general industrial use at all times, providing it is treated when necessary to remove iron and color.

SUMMARY

The estuarine zones of the Edisto and Ashepoo Rivers have similar characteristics although the Edisto River drains about 3000 sq mi while the Ashepoo River drains only about 375 sq mi. Both channels meander from U. S. Highway 17 to St. Helena Sound and are connected by Fenwick Cut a few miles above the coast. On outgoing tides, water in Fenwick Cut flows southwestward to the Ashepoo River and on the incoming tide, water flows northeastward to the Edisto River. This shows the mixing of the water from both rivers in the lower reaches and could, under adverse conditions, be detrimental to the quality of either.

The time of tidal lag is similar from the coast to U.S. Highway 17 on each river. The water quality above the saltwater interface is very nearly the same for both rivers and the bed sediments are similar in quality to each other.

The Edisto channel is about a mile wide at the mouth and narrows to about 400 ft at mile 30; the greatest channel depth is 43 ft and was recorded at mile 16. The Ashepoo channel is about half a mile wide at the mouth and narrows to about 200 ft at mile 32; the greatest channel depth is 36 ft and was recorded at mile 16.

Three tide gages were established for data collection and all were compared with NOS tide predictions for Savannah River Entrance which was used as a base station for tidal-time differences and tidal-range variation. The Edisto River at Fenwick Cut (mile 6.4) has very nearly the same tidal times and ranges as the base station. The Ashepoo River at Ashepoo (mile 32.5) lags the base station high tide by 4 hours 15 minutes; it lags the base station low tide by 3 hours 55 minutes. The tidal range is about 30 percent of that of the base station. The Edisto River at West Bank Landing (mile 30.8) lags the base station high tide by 2 hours 10 minutes; it lags the base station low tide by 2 hours 55 minutes. The tidal range is about 50 percent of that of the base station.

The freshwater inflow as measured at Edisto River near Givhans (mile 59.9) was correlated with the saltwater intrusion into both the Ashepoo and the Edisto estuaries at high and low tides. During average freshwater inflow conditions, the interface at high tide penetrates the Edisto estuary to mile 19.5 and the Ashepoo estuary to mile 24; the interface at low tide recedes to mile 14 on the Edisto and mile 20 on the Ashepoo. At high tide during periods of very low freshwater inflow the interface might penetrate to mile 32 on the Edisto estuary; the Ashepoo estuary would be brackish or salty during a very low-flow period to about mile 38.

The chemical analyses of water above the saltwater interface revealed practically no herbicides or pesticides and indicated that iron and color were the only undesirable constituents tested which were considered to be excessive. Analyses of bed sediments for metals, herbicides and pesticides revealed only iron to be relatively high. Usually, the water upstream from the interface is soft, of good quality, and suitable for domestic and general industrial use at all times, providing it is treated, when necessary, to remove iron and color.

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