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Report No. 5

Low-Flow Characteristics Of Streams In The Inner Coastal Plain Of South Carolina

By

William M. Bloxham

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

The Inner Coastal Plain lies diagonally across the center of South Carolina. It consists of primary coastal plain sediments of well-developed relief and receives an average annual rainfall of about 45 inches. Streamflow, in dry weather, is sustained with moderate to generous yields. The low-flow potential at 74 sites is shown by a display of annual minimum 7-day values on a map of the study area. In some areas, there is conformance to a general pattern but, overall, a wide variability in low-flow characteristics is evident. The primary factors involved are believed to be varying combinations of depth of stream valley incisement, area of recharge to the aquifers, and variability of aquifer yields. Their effect on low flow is not well defined from basin characteristics, and regionalization as a method of estimating low-flow characteristics is not recommended for the Inner Coastal Plain. Except for their general acidic nature and high iron content, the water quality of the streams is excellent.

INTRODUCTION

The abundance of surface water in the Inner Coastal Plain is evident in dry weather. Streams, as they recede to their lowest levels, are relatively well sustained in comparison with most dry weather flow in South Carolina. Within the Inner Coastal Plain, however, there are wide variations in low-flow with respect to time and location as determined by climate, geology and physiography.

Surface water in the Inner Coastal Plain is used for municipal and industrial supplies, for the dilution and transportation of waste, for cooling water for a steam-electric plant and other industries, and for recreation and occasional irrigation. In many cases, the design of these and future water-use projects depends on the low-flow characteristics and the chemical and physical properties of the streams. The purpose of this report is to present data on the low-flow characteristics including water quality, of ungaged and generally unregulated streams in the Inner Coastal Plain in a form that can be readily utilized for long-range planning of water use and development.

The report is based on the correlation of low-flow at selected continuous-record sites with low-flow measurements made at many additional sites within the Inner Coastal Plain. Data presented for specific sites consist of estimated annual minimum 7-day discharges that occur at average intervals of 2 years and 10 years and a compilation of the common chemical constituents of the streams during low-flow.

Metric Conversion Factors

The English units of measurement used in this report may be converted to those of the International System of units (SI) as follows:

multiply English units	by	to obtain SI units
inches (in)	25.4	millimetres (mm)
feet (ft)	.3048	metres (m)
miles (mi)	1.609	Kilometres (km)
square miles (mi^2)	2.590	square kilometres (km^2)
cubic feet per second (ft^3/s)	.02832	cubic metres per second (m^3s)
cubic feet per second per square mile [(ft^3/s)/mi^2]	.01093	cubic metres per second per square kilometre [(m^3/s)/k^2]

DESCRIPTION OF THE INNER COASTAL PLAIN

Physiographic Location

The Inner Coastal Plain extends diagonally across the middle of the State (figure 1), ranging in width from 20 to 50 miles. Its' upper boundary coincides with the Fall Line which marks the transition from Piedmont to Coastal Plain and where clayey residual soils of crystalline bedrock give way to sand, gravel, and clay of the sediments. The lower boundary generally coincides with the Citronelle Escarpment (Doering,1960) which marks the innermost sea-cut terraces of the Coastal Plain.

Topography and Drainage

The interstream surface is generally characterized by gradual slopes and rounded summits although there are several areas of intensely irregular terrain. Where the soil is more compact, the slopes are

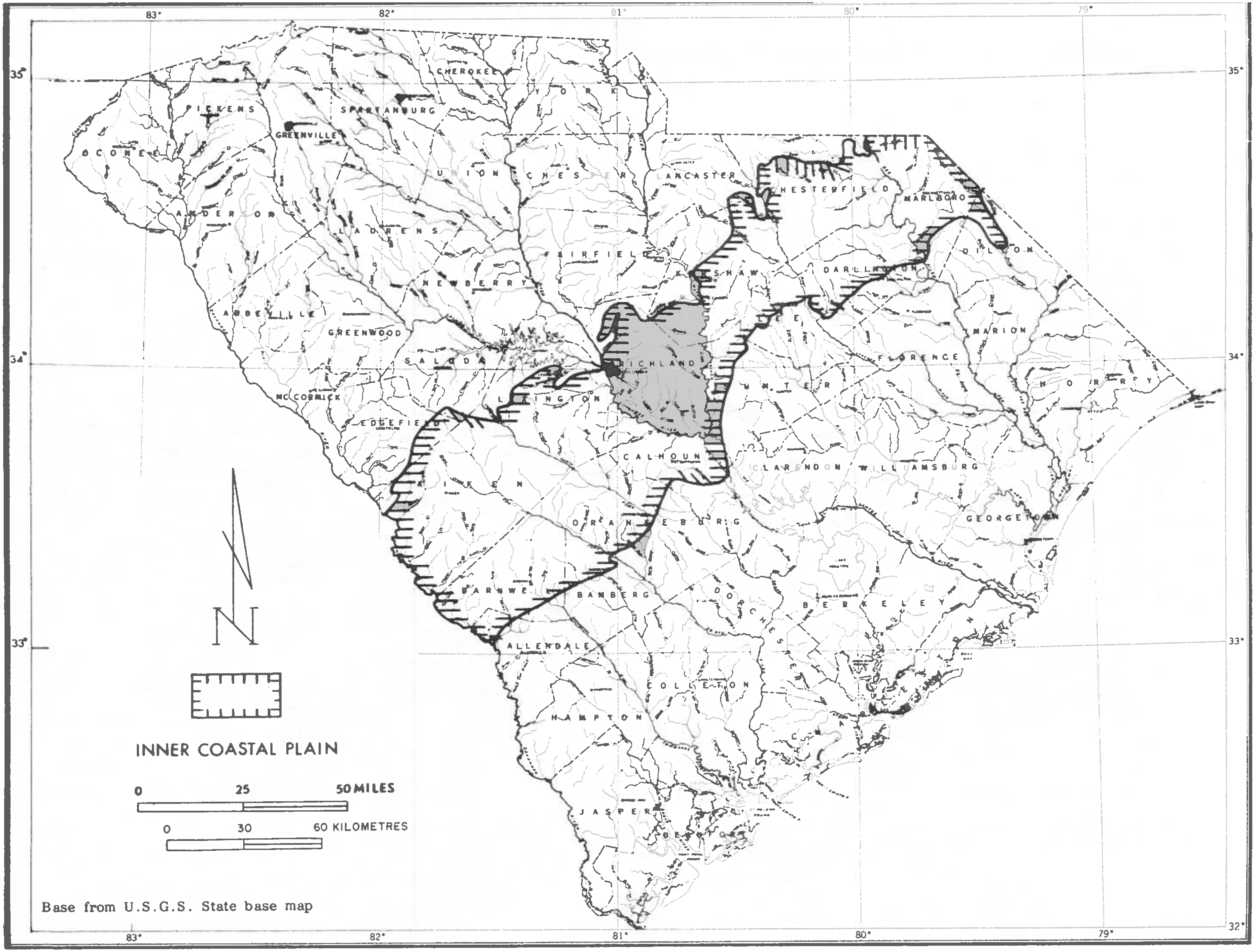

Figure 1. Map Showing Location of the Inner Coastal Plain in South Carolina

steeper and lead upward to broad, gently sloping plains. Some hilltop altitudes exceed 700 feet at the Fall Line while the majority are less than 200 feet at the lower boundary. The land - surface slope decreases in relation to the distance from the Fall Line and the topographic features develop an increasingly moderate relief in the southeasterly direction. Extensive swamps and very wide flood plains are common to the four large through-flowing rivers.

About 60 percent of the Inner Coastal Plain drains to the Savannah, Congaree, Wateree or Pee Dee Rivers while most of the remaining drainage is to five secondary stream systems. The entire tributary network includes more than 200 streams that range in basin size from about 2 square miles to over 150 square miles. A large number of relatively small streams limits the average basin size to about 30 square miles. Tributaries in the northeastern part of the Inner Coastal Plain are fewer in number and the drainage pattern is less well defined - more random in appearance.

Hydrologic Characteristics

Geologic rather than unusual climatic factors produce relatively well - sustained base flows in the Inner Coastal Plain. The mean annual rainfall (about 45 inches) distribution during the year and the basic evapotranspiration rate are little different than in the neighboring areas of adjoining physiographic provinces; however, the generally moderate recessions experienced in the Inner Coastal Plain are in direct contrast to the dry or non-flowing stream conditions that occur in the Coastal Plain and lower Piedmont. The characteristics of the ground

Water aquifers and their depths in relation to the stream channels are particularly important factors in this respect. A majority of streams in the Inner Coastal Plain are underlain by a sequence of unconsolidated and semi-consolidated cross-bedded sand and gravel interspersed with clayey sands and clays. 1/ Many of the streams have incised the highly permeable sand and gravel aquifers which provide the dependable dry-weather yields.

Ground-water recharge occurs to a large extent on the broad, sandy ridges of the Inner Coastal Plain. The eventual base flow is dependent on topographic features to the degree to which they influence the area of recharge to a specific basin and the hydraulic gradient. A more persistent rate of seepage to the streams occur in the more deeply incised valleys than in those of moderate relief. As a rule, an accretive inflow is characteristic of a majority of Inner Coastal Plain streams. Among the differences in low-flow characteristics between one site and another are those attributed to local differences in the hydrology such as variations in the transmissivity of the aquifer underlying the stream or changes in the permeability of the streambed material (Siple,1967).

A singular group of streams east of Columbia, that drain into the Congaree River, originate in an area of red, clayey sand - an isolated outcrop of the relatively impermeable Black Mingo Formation. A limited sustained flow is characteristic of the streams in this area.

1/ Tuscaloosa Formation of local usage.

LOW FLOW CHARACTERISTICS

Low-flow frequency analyses have been made at continuous-record stations in South Carolina (Stallings, 1967) with the method described by Riggs (1965). Six were selected as index stations for the Inner Coastal Plain on the following basis:

1. They reflect what are believed to be representative recession characteristics of subareas of the Inner Coastal Plain.
2. The flow is unregulated, affected only by natural hydrologic factors.
3. The records include, or were extended by a regression relation to include, the severe drought of 1954.

The index stations are described in table 1 and identified on Plate 1 as site numbers 1309, 1315, 1325, 1695.5, 1730 and 1735.

The annual minimum discharge for seven consecutive days is customarily used in low-flow studies because of its greater stability than the flow for a minimum day. Frequency curves of annual minimum 7-day flows are shown in figure 2 for three index stations. The data have been prepared in terms of unit discharge for comparison of shape and plotting position. On the assumption that sampling was representative of the true distribution of that parameter at each site, the divergence of the curves is largely due to dissimilar basin characteristics. Several general properties of Inner Coastal Plain streams are therefore indicated:

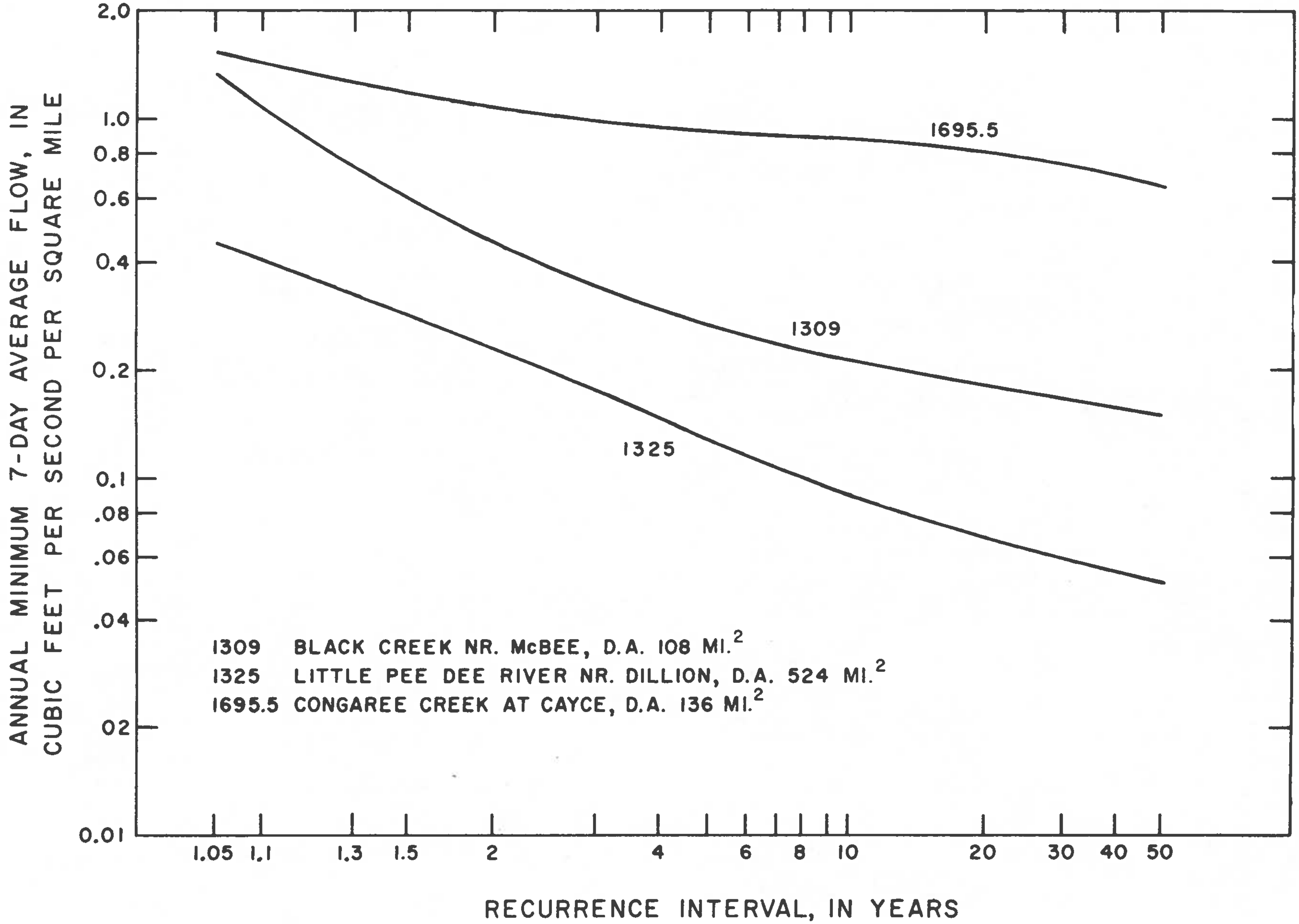

Figure 2. Low-flow Frequency of Three Inner Coastal Plain Streams.

1. The annual minimum 7-day discharge at any given recurrence interval varies considerably in magnitude irrespective of drainage basin size.
2. The slope of the curves are moderately flat to moderately steep giving an indication that some streams will reflect a wider range in low-flow characteristics than others.
3. The Inner Coastal Plain is not a homogeneous region with respect to low-flow characteristics. Continuous records alone are insufficient for reliable estimates at other than gaged sites.

It is not feasible to define a large portion of the low-flow probability range with any means less than the continuous record since the reliability of extending frequency curves based on natural flows is closely related to the length of record used. Accordingly, at ungaged sites, two focal points of low-flow frequency have been selected as the characteristics to be shown in this report:

1. 7-day Q_2 the annual minimum 7-day low flow that does not exceed itself in magnitude at average intervals of 2 years or has a 50 percent chance of not exceeding its' magnitude in any one year. It is a fairly stable parameter; as a median value, it is a good measure of normal conditions; and it frequently serves as one of the limits of natural flow with which storage supplements are calculated.

2. 7-day Q_{10} the annual minimum 7-day low flow that does not exceed itself in magnitude at average intervals of 10 years or has a 10 percent chance of not exceeding its' magnitude in any one year. It represents the practical limit to which low-flow frequency values can be projected at ungaged sites with the data obtained during this study; it is a good indicator of drought - flow variability; and, in South Carolina, is a legal index for pollution control.

Low-flow characteristics are commonly estimated at an ungaged site by plotting the discharge at different stages of several flow recessions against the concurrent daily flow at an index site (Riggs, 1965). For example, the correlations shown in figure 3 were used to transfer frequency characteristics from the gaging station to the sites where discharge measurements were obtained. The 7 day Q_{10} of the index stream, North Fork Edisto River, has been established from a low-flow frequency analysis of its' record to be 232 ft^3/s. A transferrance of this through the relation of Big Beaver Creek gives a comparable value (in terms of frequency of occurrence) of 5.6 ft^3/s. for Lightwood Knot Creek, 3.1 ft^3/S; and Gills Creek, 6.6 ft^3/s.

This procedure was applied in developing low-flow frequency values for 54 of the partial record and miscellaneous-measurement sites in the network shown on Plate 1 and described in table 1.

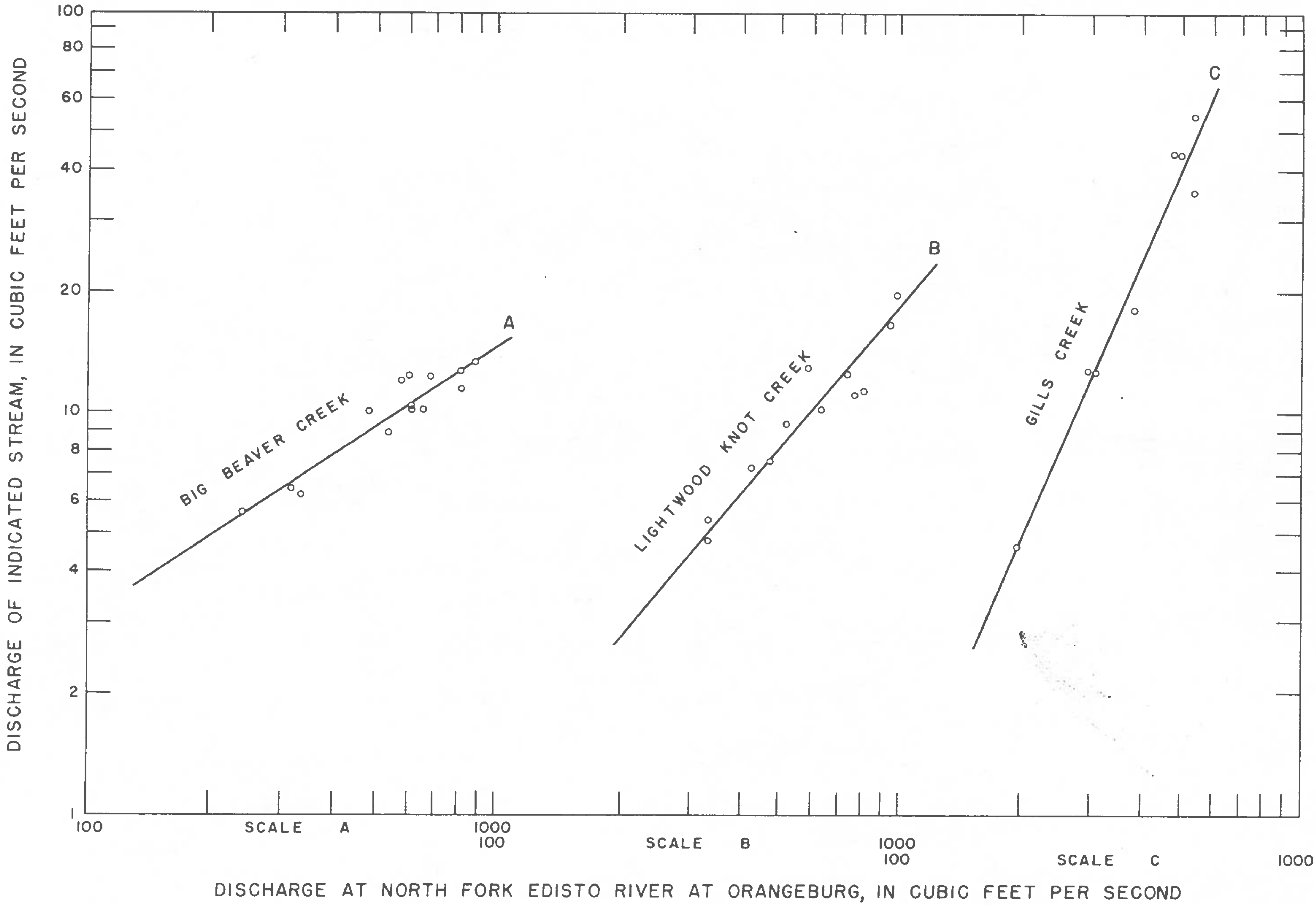

Figure 3. Curves Showing Relationships of Measured Discharge of Three Streams to Concurrent Daily Discharge at One Index Station

Although, base-flow conditions existed in the entire study area, satisfactory correlations were not established at 8 sites (see table 1, however, for the minimum flows measured). At 4 sites, zero flow occurred at estimated recurrence intervals of greater than 2 years but less than 10 years. In addition to 6 index stations, the network includes 10 continuous-record stations where the values shown were extracted from curves of low-flow frequency.

It can be seen from the relationships in figure 3 that low flows are better sustained where the curve of relation is flat and less well sustained where the curve is steep. Although the estimated 7-day Q_{10} for Big Beaver Creek and Gills Creek is similar, a quantitative comparison of these values is misleading because Gills Creek, with 6 times as large a basin, is the far less productive stream on basis of discharge per square mile. For this reason,low-flow characteristics of the Inner Coastal Plain are shown on Plate 1 in terms of unit discharges whereby the extremes of flow variability are more easily identified.

LOW-FLOW VARIABILITY

The variability of low-flow characteristics in the Inner Coastal Plain, suggested by figure 2, is verified by the data shown on Plate 1. Lack of homogeneity in the factors that effect low-flow is also shown by the dispersion of plotted data in figure 4. A more closely defined relationship would have occurred if all characteristics except drainage area had been limited to narrow

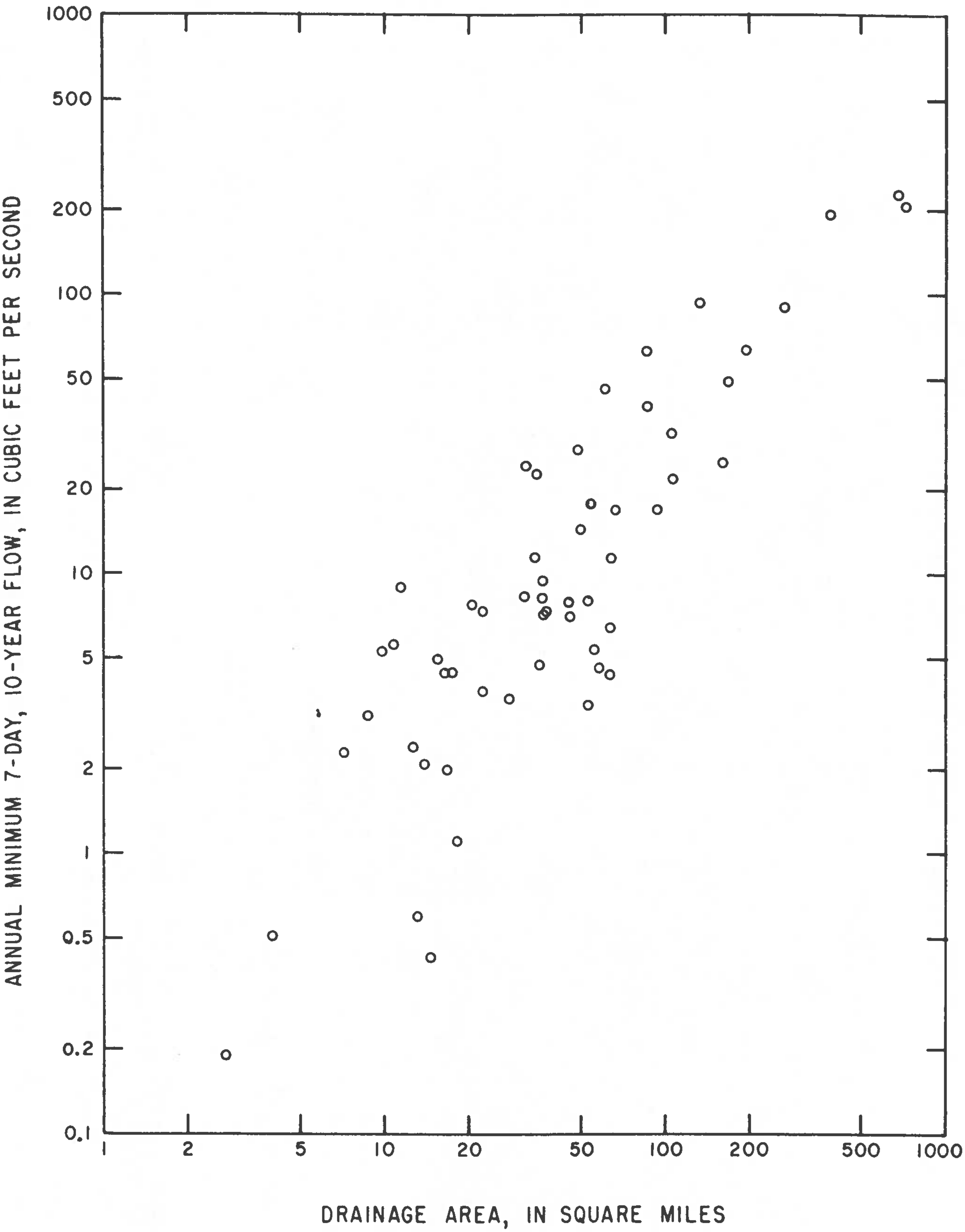

Figure 4. Relationship of a Low-flow Characteristic to Drainage Area.

range. High-yield streams plot to the left and low-yield streams to the right indicating, within broad categories, some similarities in the interrelation of basin characteristics; however, it is difficult to estimate low-flow characteristics in relation to basin characteristics in the Inner Coastal Plain. Armbruster (1970) found that stream length (L), basin storage (St), mean annual precipitation (P_A), and soil index (Si) were the most significant factors affecting low-flows. A multiple-regression analysis of those four factors with the values of 7-day Q_2 and 7-day Q_{10} for the six index stations in the Inner Coastal Plain yeilds the following equations:

$$\text{7-day } Q_2 = 3.4\ (10^{-8})\quad L^{.90}\ St^{-1.40}\ P_A{}^{5.07}\ Si^{2.59}$$

$$\text{7-day } Q_{10} = 54.45\ L^{.93}\ St^{-2.04}\ P_A{}^{-1.28}\ Si^{2.29}$$

In the brief summary given below, the dispersion of the data is evident as shown by the standard error of estimate despite the high association of the variables indicated by the regression coefficients. Thus, the reliability of a specific estimate of low-flow derived from basin characteristics would be uncertain.

Characteristic	Mean in ft^3/s	Regression coefficient	Std. error of estimate in percent
7-day Q_2	188	.89	50
7-day Q_{10}	118	.87	161

The inconsistancies in these relationships are probably due to unaccounted for differences in geology. Without an adequate description of the effect of geology on low flow, in terms of a quantitative ndex, a regionalized expression of a low-flow characteristic in inconclusive.

The difficulty in formulating an index is compounded by certain streams of the Inner Coastal Plain which exhibit exceedingly well-sustained low-flows when compared with those in adjoining basins. Their high unit runoff indicates that aquifer capacity and yield are so proportioned that a major recharge to the aquifer in one year may be released to a stream over a period of several years with little variability of base flow. The recharge area of these high-yield streams, which are generally deeply incised, is believed to extend beyond their topographic basin boundaries as described by Siple (1960) in the Savannah River basin.

ESTIMATING LOW-FLOW CHARACTERISTICS AT OTHER SITES

The available techniques for obtaining reliable estimates require either a series of discharge measurements during several low-flow periods or a sufficient network of measurement sites within a homogeneous region to allow interpolation of information. The later method is not applicable to Inner coastal Plain streams because inconsistencies in aquifer yields are generally concealed by the accumulated inflows in larger streams while small streams are sensitive to local hydrologic factors. Transferring a given low-flow characteristic value to another point on the same stream or establishing a value for a stream of unknown flow characteristics should entail the following considerations:

1. The primary procedure should be to obtain discharge measurements that clearly describe a significant flow recession in relation to daily discharges at a continuous record site, correlate the two variables, and estimate the required discharge by transferrance through the curve of relation. It should be determined if the recession is natural or subject to artificial restrictions whereby the estimate would be a function of the regulatory pattern.
2. The transfer of a low-flow characteristic value to another site on the same stream should preferably be substantiated by method (1); however, a transfer by ration of drainage areas, for instance, is at the discretion of the user (see figure 4). Few measurements were made at more than one location on individual tributaries although no naturally abrupt changes in hydrologic factors are believed to exist within individual basins. On the larger streams, an interpolation between sites where low-flow characteristic values are given should prove fairly reliable except where impoundments are a factor. In interpolating, it should be recognized that the 7-day Q_{10} does not occur simultaneously on each stream in a large basin. If the time differential is significant, the sum of

7-day Q_{10} for two branches of a stream need not approximate the actual value below their confluence. the effect may be further modified if one branch is subject to artificial control.

3. The extrapolation of data given on Plate 1 to other streams is not feasible. Because of the variation in the low-flow characteristics that are shown, it can not be assumed which value may be applicable to a neighboring stream. Without quantitative evidence of the combined effect of the factors affecting low flow, the basis from which to predict a low-flow characteristics is indistinct. Method (1) should be employed in this circumstance.

4. Discharge of the four large, through-flowing rivers (Savannah, Congaree, Wateree and Pee Dee) is largely controlled from reservoirs. Because of power generation, the pattern of release is short term rather than altogether seasonal. The minimum release required to maintain fish and wildlife activities and for dilution of wastes often is less than the natural flow in wet seasons and may exceed the natural minimum flow in the dry season. Therefore, the low-flow characteristics as determined by the regulation pattern (Stallings, 1967) may not resemble those of the natural flow-recession sequence.

5. A ponded area, presenting a broad surface for evaporation, may modify the estimated low-flow characteristics of a stream if the reduction in outflow is measureable in comparison with the natural in-flow. In general, a ponded area diminishes the flow of a stream during extended droughts.

QUALITY OF STREAMFLOW

The chemical constituents in a natural stream tend to vary inversely with the flow rate - the higher concentrations occurring at low flow. Water quality at low flow is essentially the same as that of the aquifers contributing water to the streams because there is little or no surface runoff that might dilute or contribute to the chemical content of the water, although water quality under these conditions may be altered slightly by the solution of mineral solids in the streambed and in suspension.

The chemical and physical properties of 58 streams during a period of low-flow are listed in table 2. The natural water quality is characterized by a low dissolved solids content and low concentrations of individual dissolved substances. The water is very soft, has a high natural iron content, and is generally acidic. Most natural constituents are well within the limits of water-quality requirements for industries and the various processes as detailed by the U.S. Federal Water Pollution Control Administration 2/ (1968).

2/ Now the Environmental Protection Agency

There are no distinctive characteristics for classifying the streams in relation to geologic units of the Inner Coastal Plain on the basis of chemical quality. The range of mineral content among various samples from the same unit was frequently greater than the range in content of those from different geologic units. However, the excellent chemical qualities of the natural water were affected by apparent industrial wastes in several streams near Columbia and in Kershaw County. The resulting increase of dissolved solids ranged from about 20 to 100 mg/l (milligrams per litre) and increases of calcium, sodium, bicarbonate, sulfate and chloride were observed in relation to much lower concentrations in nearby streams.

A high iron content is common in all Inner Coastal Plain streams and is probably the least desirable quality characteristic. Iron oxides in residual soils and in the clays and silts of clastic sediments are apparently the major source of iron in the water. The maximum concentration of 0.3 mg/l recommended for drinking and cooking use by the U.S. Public Health Service (1962), as well as the limit set for many industrial processing requirements, are exceeded in most of the analyses.

The acidic characteristics can be attributed mainly to acids of degenerating organic compounds and to a depletion of calcium carbonate by leaching of the sedimentary material. Although the pH ranges from 4.0 to 7.0 units in the anaylses, the dispersion of individual values about the mean of 5.7 is generally moderate, with 76 percent within 0.6 of a unit.

Specific conductance is directly related to the dissolved-solids content of water and in many instances may be correlated with individual ions in solution. From specific-conductance values observed in these analyses, the dissolved-solids content could have been estimated with a standard error of about ± 2.5 mg/l by the linear relation:

Dissolved solids = 5.18 + (0.63 x specific conductance).

Given below are some statistical data for selected constituents. From an evaluation of the relationships given in the last two columns, it is evident that most of the parameters are

	Concentration, in mg/l except as indicated				Correlation coef. with spec. cond.	Std. error in mg/l
	Max.	Min.	Mean.	Std Dev.		
Specific conductance (micromhos at 25°C)	185	10	36	38	1.000	-
Silica	25	1.7	6.2	3.8	.112	10.2
Iron	2.4	.15	.73	.45	.029	.44
Calcium	14.0	.1	2.0	3.6	.627	2.7
Magnesium	3.4	.1	.6	.6	.686	.4
Sodium	42	1.0	4.2	6.3	.857	3.2
Potassium	3.8	.1	.6	.8	.899	.4
Bicarbonate	90	0	10	16	.843	8.8
Sulfate	14.0	0	2.1	2.7	.814	1.5
Chloride	24	1.3	4.6	3.9	.802	2.3
Nitrate	9.1	.3	1.1	1.3	.549	1.1
Dissolved solids	123	10	27	24	.978	5.0
Hardness	60	2	10	14	.783	8.4

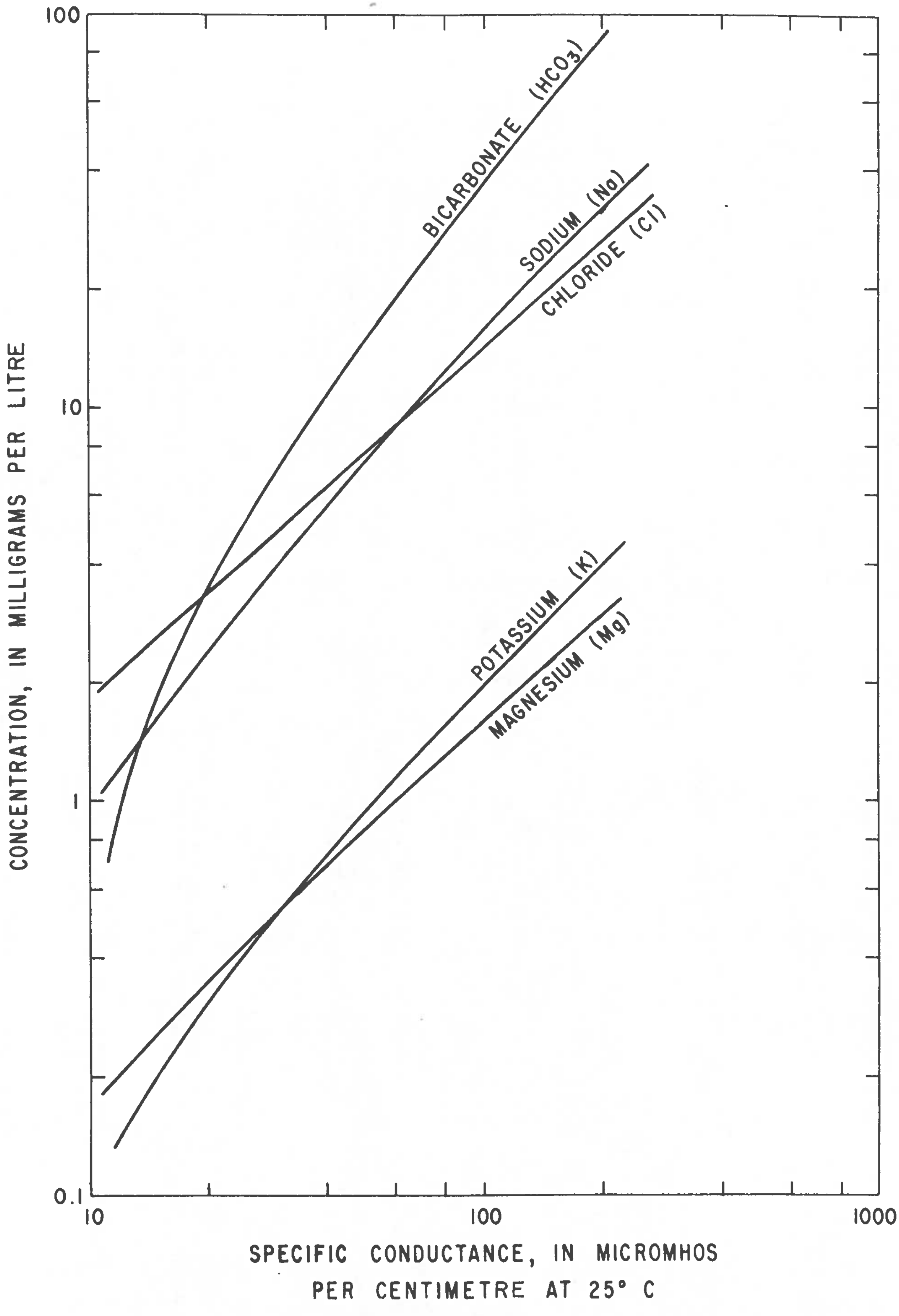

Figure 5. Relationship of Several Chemical Constituents to Specific Conductance.

related to the common variable - specific conductance. In natural streams at low flow, estimates of some of the better correlated constituents may be obtained from specific conductance and the relationships selected, for example, in figure 5. Poor correlation coefficients are shown for silica and iron and their concentrations cannot be estimated from specific conductance.

The chemical analyses presented in table 2 are of dry-weather stream-flow. They provide a relative areal profile of water quality but not the within year or long term variability. Cummings (1969) described the variation and extremes of water quality at several sites in the Inner Coastal Plain.

SUMMARY

Relatively well-sustained flows are common within the Inner Coastal Plain because of the excellent water-bearing properties of the sedimentary deposits in combination with streams that are sufficiently incised to produce a dry-weather yield. A comparison of specific minimum flows, however, shows the yield to be that of a nonhomogeneous region. Despite widespread climatic equalities, differences in basin factors, local characteristics of the storage medium, and degree of stream incisement contribute to the unpredictability of low-flow values.

A multiple-regression analysis of streamflow and basin characteristics indicates that regionalization is not a practical method with which to estimate low-flow characteristics. Recognizable patterns occur in some areas, that is, generally high or low values of unit runoff when a comparison is made on this basis. Nevertheless, the variability is such as to prohibit an effective application of areal coefficients or factors in reliably estimating low-flow characteristics at specific sites. An extrapolation of the low-flow data given in this report should be made in combination with base-flow discharge measurements because of the wide variation in yield. Interpolation between sites where data is given on the same stream is at the discretion of the user.

It is suggested that successive annual events of the more deeply incised streams are, to varying degrees, serially correlated. Following a period of severe ground water reservoir depletion, a year of low flow is likely to follow a year of low flow just as successive years of high flow occur when the reservoir has been gradually replenished.

A sampling of the water quality at low flow indicates that relatively few streams are contaminated. Except for the general acidic nature and a high iron content, the water quality of streams throughout the Inner Coastal Plain is excellent. The streams are characterized by a low-dissolved solids content and low concentrations of individual dissolved substances.

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APPENDIX

Tables 1 and 2

TABLE 1. DISCHARGE MEASUREMENTS MADE AT PROJECT SITES

Site number	Stream	Location	Drainage Area (mi^2)	Date	Discharge ft^3/s
		PEE DEE RIVER BASIN			
1	Big Westfield Creek	Lat 34°46', long 79°57', at bridge on U.S. Hwy 52, 2 1/4 miles above Goodmans Creek and 6 1/4 miles northwest of Cheraw, Chesterfield County.	22.6	3/18/66	37.0
				9/12/66	1.37
				9/25/68	0
				5/12/69	12.3
				7/15/70	0
2	Whites Creek	Lat 34°46', long 79°53', at bridge on U.S. Hwy 1, 1.0 mile above mouth and 2.9 miles northeast of Wallace, Marlboro County.	28	8/26/68	5.79
				9/26/68	2.68
				5/ 9/69	26.0
				10/31/69	23.3
3	Juniper Creek	Lat 34°37', long 79°57', at bridge on county road 20, 1.8 miles above Eureka Lake and 6.4 miles northeast of Patrick, Chesterfield County.	52.8	8/28/68	2.55
				9/25/68	5.34
				5/ 9/69	51.0
				7/15/70	9.44
1305	Juniper Creek	Lat 34°39', long 79°54', at Eureka Lake Dam, 1½ miles above mouth and 3½ miles south of Cheraw, Chesterfield County.	64	Continuous record 1940-58	
				8/28/68	4.81
				9/25/68	5.62
4	Naked Creek	Lat 34°42', long 79°44', at bridge on county road 55, 6.5 miles northwest of Bennettsville, Marlboro County.	12	9/26/68	2.25
				5/12/69	17.9
				10/30/69	9.59
				7/17/70	4.80
1305.3	Naked Creek	Lat 34°40'30", long 79°45'20", at bridge on State Hwy 9, 4.1 miles above Herndon Branch and 6.2 miles northwest of Bennettsville, Marlboro County.	16	7/13/60	20.9
				10/27/60	17.8
				10/25/61	8.70
				5/ 2/62	11.2
				4/23/63	14.0
				8/28/63	15.2
				10/29/63	8.92
5	Crooked Creek	Lat 34°42', long 79°40', at bridge on county road 63, 5.8 miles north of Bennettsville, Marlboro County.	30	9/28/68	10.2
				7/17/70	22.2
1306	Cedar Creek	Lat 34°31'30", long 79°51'05", at old bridge, 100 yds below U.S. Hwy 52, 0.3 mile above SCL Railroad, at Society Hill, Darlington County.	55	5/31/49	58.6
				11/28/49	99.1
				2/27/50	68.0
				4/25/50	48.4
				6/ 1/50	82.1
				6/26/50	23.2
				11/22/50	56.9
				5/11/51	34.8
				9/12/51	27.5
				5/27/52	27.1
				4/24/53	63.7
				6/23/53	40.8
				10/29/53	23.3
				4/29/54	67.8
				9/ 3/54	18.9
				5/26/55	32.9
				11/ 3/55	36.7
				9/19/56	29.3
				6/20/57	43.2
				9/ 4/57	22.3
				5/21/58	79.3
				5/18/59	56.9
				5/16/60	89.1
				10/27/60	52.2
				6/14/61	72.2
				10/26/61	39.0
				4/25/62	37.4
				9/ 5/62	40.5
				5/16/63	43.0
				8/20/63	35.4
				10/29/63	45.2
				5/18/65	42.4
				8/28/68	16.4
				9/25/68	8.85
				5/ 9/69	46.9
				10/31/69	42.4
				7/ 8/70	12.6
				Continuous record since Oct. 1970	

Site number	Stream	Location	Drainage Area (mi²)	Date	Discharge ft³/s
		PEE DEE RIVER BASIN--Continued			
6	Three Creeks	Lat 34°30', long 79°39', at bridge on State Hwy 38 at Blenheim, Marlboro County.	76	8/26/68	0
7	Black Creek	Lat 34°41'06", long 80°18'30", at bridge on State Hwy 265, 0.1 mile below Little Ruddy Branch and 5.1 miles northeast of Jefferson, Chesterfield County.	18.8	9/26/68	1.42
				5/ 8/69	13.4
				10/29/69	22.9
				7/14/70	1.85
8	Black Creek	Lat 34°37'55", long 80°10'53", at bridge on State Hwy 145, 1.0 mile below Horse-pen Branch, and 8.9 miles southwest of Chesterfield, Chesterfield County.	56.1	8/28/68	6.96
				9/24/68	5.06
				5/ 8/69	51.1
				7/14/70	8.73
1309	Black Creek	Lat 34°30'50", long 80°11'00", at bridge on U.S. Hwy 1, 0.2 mile upstream from Little Alligator Creek and 5.8 miles northeast of McBee, Chesterfield County.	108	11/ 2/55	86.0
				9/18/56	19.9
				6/18/57	93.6
				5/20/58	151
				9/26/58	70.9
				4/17/59	303
				9/30/59	438
				Continuous record since Oct. 1959	
1309.1	Black Creek	Lat 34°23'50", long 80°09'00", 1,000 ft below Lake Robinson, 2.1 miles above Beaverdam Creek, and 4.6 miles west of Hartsville, Darlington County.	173	Continuous record since Oct. 1960	
9	Black Creek	Lat 34°23'08", long 79°54'12", at bridge on U.S. Hwy 52, 0.5 mile above SCL Rail-road, and 1.2 miles south of Dovesville, Darlington County.	270	4/ 7/52	412
				4/23/52	260
				3/28/57	543
				4/17/57	481
				8/12/57	148
				9/18/57	323
				4/ 8/58	560
				6/ 5/58	325
				5/13/59	286
				5/21/59	287
10	Jeffries Creek	Lat 34°15'38", long 80°00'28", at bridge on county road 13, 1.8 miles above SCL Railroad, and 7.5 miles southwest of Darlington, Darlington County.	20	7/14/60	3.17
				10/31/60	3.52
				10/26/61	3.22
				4/26/62	4.77
				9/ 6/62	2.80
				5/17/63	2.83
				8/21/63	2.15
				10/30/63	0.79
				5/19/65	3.25
11	Swift Creek	Lat 34°18'36", long 79°58'17", at bridge on county road 13, 4.2 miles above Indian Creek, and 5.8 miles west of Darlington, Darlington County.	15.1	5/14/69	45.0
				7/16/70	2.05
12	Little Fork Creek	Lat 34°38'14", long 80°24'21", at bridge on State Hwy 265, 0.4 mile above Fork Creek, and 0.9 mile southwest of Jeffer-son, Chesterfield County.	15.0	9/26/68	1.46
				5/ 8/69	8.57
				10/28/69	3.43
				7/14/70	1.33
13	Buffalo Creek	Lat 34°33'35", long 80°25'23", at bridge on State Hwy 157, 1.7 miles above Little Creek, and 9 miles east of Kershaw County.	18.2	8/26/68	3.09
				9/27/68	2.23
				5/14/69	16.2
				10/31/69	10.9
				7/13/70	2.07

Site number	Stream	Location	Drainage Area (mi2)	Date	Discharge ft3/s
		PEE DEE RIVER BASIN--Continued			
1314.4	Lynches River	Lat 34°26', long 80°19', at bridge on U.S. Hwy 1, 1.9 miles northeast of Bethune, and 2.5 miles downstream from Cedar Creek, Kershaw County.	380	6/24/53	156
				10/29/53	111
				4/26/54	116
				9/ 2/54	27.4
				5/ 4/55	59.1
				6/23/55	96.3
				11/ 2/55	44.3
				6/11/56	27.6
				9/18/56	24.1
				10/16/56	67.7
				6/18/57	88.9
				9/ 4/57	74.3
				5/20/58	151
				5/18/59	190
				5/16/60	350
				10/26/60	229
				6/13/61	366
				10/31/61	150
				5/ 2/62	275
				4/17/63	312
				8/20/63	72.3
				5/20/64	196
				6/ 3/65	165
				5/23/66	280
				9/12/66	73.9
				8/28/68	65.0
				9/27/68	62.5
				10/ 4/68	59.2
				5/ 8/69	261
				10/29/69	179
				7/ 9/70	89.0
				7/13/70	83.9
14	Neds Creek	Lat 34°32'39", long 80°31'39", at bridge on county road 413, 1.0 mile above Little Lynches River, and 3.2 miles east of Kershaw, Kershaw County.	4.0	8/26/68	1.00
				9/27/68	.81
				5/14/69	3.74
				10/31/69	1.90
				7/13/70	.24
1314.8	Little Lynches River	Lat 34°24', long 80°23', at bridge on U.S. Hwy 1, 2.5 miles southwest of Bethune, and 3.0 miles above Bell Branch, Kershaw County.	163	5/ 8/51	102
				10/18/51	43.9
				3/10/52	253
				5/27/52	52.2
				3/18/53	253
				6/23/53	96.0
				10/29/53	71.3
				4/26/54	53.5
				9/ 2/54	11.1
				5/ 4/55	45.2
				6/23/55	65.4
				11/ 2/55	36.5
				6/11/56	59.5
				9/18/56	30.2
				10/16/56	45.9
				6/18/57	42.5
				9/ 4/57	32.6
				5/20/58	123
				9/26/58	73.0
				5/18/59	71.8
				5/16/60	126
				10/26/60	104
				6/13/61	207
				10/31/61	67.8

Site number	Stream	Location	Drainage Area (mi^2)	Date	Discharge ft^3/s
		PEE DEE RIVER BASIN--Continued			
1314.8	L. Lynches River--Cont.			5/ 2/62	134
				4/17/63	165
				8/20/63	38.4
				10/29/63	58.2
				5/20/64	116
				6/ 3/65	93.5
				9/27/65	114
				8/28/68	40.6
				9/27/68	29.3
				5/ 8/69	134
				6/29/69	71.5
				7/ 9/70	31.1
				7/13/70	22.3
1315	Lynches River	Lat 34°15'00", long 80°13'00", at bridge on U.S. Hwy 15, 1.0 mile above Seaboard Coastline Railroad, 2.9 miles northeast of Bishopville, and 3.3 miles below Bells Branch, Lee County.	675	Continuous record since May 1942	
15	Little Pee Dee River	Lat 34°37', long 79°30', at bridge on State Hwy 83, 1.0 mile below confluence of Beaverdam Creek and Gum Swamp, and 3.3 miles northeast of Clio, Marlboro County.	170	8/26/68	58.8
				10/ 1/68	49.9
				5/13/69	153
				7/17/70	162
16	Little Pee Dee River	Lat 34°29'13", long 79°23'42", at bridge on county road 23, 0.3 mile below Sweet Swamp, and 0.9 mile northeast of Little Rock, Dillon County.	445	6/23/54	134
				6/29/54	73.0
				8/27/68	70.3
				10/ 1/68	49.4
				5/13/69	219
				7/17/70	191
1325	Little Pee Dee River	Lat 34°24'17", long 79°20'25", at bridge on State Hwy 9, 1.9 miles southeast of Dillon, and 3.1 miles upstream from Maple Swamp, Dillon County.	524	Continuous record 1939-71	
17	Beaverdam Creek	Lat 34°09'52", long 80°21'02", at bridge on county road 242, 3.0 miles above mouth, and 6.9 miles southwest of Bishopville, Lee County.	17.0	8/29/68	2.33
				9/30/68	2.29
				5/15/69	5.99
				7/16/70	1.62
1353	Scape Ore Swamp	Lat 34°09'02", long 80°18'18", at bridge on U.S. Hwy 15, 0.1 mile below Beaverdam Creek, and 5.8 miles southwest of Bishopville, Lee County.	70	Continuous record since July 1968	
		SANTEE RIVER BASIN			
18	Gum Swamp Creek Tributary	Lat 34°21'50", long 80°34'48", at culvert on county road, 0.4 mile above Gum Swamp Creek, and 1.3 miles southeast of De Kalb, Kershaw County.	2.79	8/26/68	0.42
				10/ 3/68	0.69
				"	0.62
				5/ 8/69	3.58
				10/31/69	1.52
19	Sanders Creek	Lat 34°20'05", long 80°33'29", at bridge on county road 26, 4.2 miles above Gum Swamp Creek, and 6.6 miles north of Camden, Kershaw County.	10.8	8/26/68	6.84
				9/26/68	6.82
				5/ 8/69	12.9
				10/31/69	10.4

Site number	Stream	Location	Drainage Area (mi^2)	Date	Discharge ft^3/s
		SANTEE RIVER BASIN--Continued			
20	Twentyfive Mile Creek	Lat 34°14'37", long 80°40'25", at bridge on county road 5, 1.6 miles above mouth, and at Lugoff, Kershaw County.	123	8/ 1/52	7.91
				9/26/52	33.0
				10/27/52	23.9
				11/28/52	34.6
				12/30/52	39.9
				1/28/53	79.7
				9/24/53	7.28
				8/26/68	14.0
				9/26/68	9.06
				5/13/69	49.0
				10/30/69	22.9
				7/16/70	8.31
21	Big Pine Tree Creek	Lat 34°15'17", long 80°32'11", at bridge on county road 131, 0.6 mile above Hermitage Mill Pond, and 1.0 mile east of Camden, Kershaw County.	35	8/27/68	43.4
				9/26/68	37.1
				5/13/69	51.5
				10/31/69	46.1
22	Swift Creek	Lat 34°08'36", long 80°45'27", at bridge on U.S. Hwy 521, 3.7 miles below Little Swift Creek, and 2.1 miles northeast of Boykin, Kershaw County.	37.1	8/28/68	59.4
				9/26/68	12.3
				5/13/69	17.8
				10/31/69	15.5
				7/16/70	4.96
23	Rafting Creek	Lat 34°02'22", long 80°34'10", at bridge on county road 37, 1.1 miles north of Hagood, and 1.6 miles above Swift Creek, Sumter County.	52.5	8/13/63	14.0
				8/28/68	8.83
				9/25/68	9.67
				7/16/70	30.5
24	Spears Creek	Lat 34°07'39", long 80°42'19", at bridge on county road 47, 0.7 mile below Hags Creek, and 5.8 miles southeast of Elgin, Kershaw County.	34.8	8/27/68	23.3
				9/26/68	12.4
				5/13/69	19.6
				10/30/69	22.8
				7/16/70	12.5
1483	Colonels Creek	Lat 34°00'25", long 80°43'58", at bridge on State Hwy 262, 0.2 mile above Jumping Run Creek, and 1.9 miles southwest of Leesburg, Richland County.	38.1	9/ 7/60	51.5
				9/26/61	35.5
				10/31/61	39.5
				5/ 7/62	35.2
				10/31/62	30.2
				4/17/63	30.0
				11/20/63	23.8
				9/29/64	36.5
				11/18/64	56.9
				Continuous record since Sept. 1966	
25	Smith Branch	Lat 34°01'49", long 81°02'57", at culvert on Sunset Blvd. at Columbia, 1.6 miles above mouth, Richland County.	6.14	8/26/68	1.83
				9/24/68	.90
				5/14/69	2.81
				10/29/69	1.27
				7/17/70	1.11
26	Twelvemile Creek	Lat 33°59'40", long 81°16'50", at bridge on county road 204, 2.0 miles below Long Creek, and 3.2 miles west of Red Bank, Lexington County.	22.8	8/27/68	27.5
				9/25/68	7.69
				5/ 8/69	17.5
				10/28/69	12.1
				7/13/70	5.20
27	Sixmile Creek	Lat 33°56'35", long 81°04'45", at bridge on U.S. Hwy 21 at Cayce, and 2.2 miles above mouth, Lexington County.	11.9	5/13/53	9.04
				5/26/53	2.69
				10/13/54	0.33
				8/22/68	2.37
				9/30/68	2.73
				5/14/69	5.02
				10/29/69	3.40
				7/15/70	2.86

Site number	Stream	Location	Drainage Area (mi^2)	Date	Discharge ft^3/s
		SANTEE RIVER BASIN--Continued			
28	Savana Branch	Lat 33°55'47', long 81°07'05", at bridge on State Hwy 215, 0.9 mile above mouth, and at Pineridge, Lexington County.	7.2	8/27/68	4.23
				9/30/68	4.29
				5/14/69	7.87
				10/29/69	4.35
				5/25/70	3.48
				7/14/70	3.45
29	Congaree Creek	Lat 33°55'00", long 81°07'55", at bridge on State Hwy 215, 0.6 mile above First Creek, and at South Congaree, Lexington County.	74.3	8/27/68	108
				9/30/68	88.7
				5/14/69	96.9
				10/28/69	89.4
				5/25/70	98.1
				7/15/70	95.6
1695.5	Congaree Creek	Lat 33°56'15", long 81°04'40", at bridge on U.S. Hwy 21 at Cayce, 2.0 miles above Sixmile Creek, Lexington County.	136	8/31/25	123
				6/27/44	117
				3/30/49	252
				11/23/49	242
				4/24/50	199
				1/26/51	216
				5/17/51	162
				9/12/51	149
				4/16/52	198
				6/25/52	145
				4/ 2/53	142
				6/17/53	147
				9/24/53	129
				5/12/54	136
				9/10/54	85.2
				10/13/54	106
				5/10/55	73.2
				6/17/55	91.0
				11/ 3/55	113
				5/17/57	116
				6/17/57	103
				9/ 5/57	96.7
				6/10/58	141
				5/29/59	176
				Continuous record since Oct. 1959	
1695.7	Gills Creek	Lat 33°59'22", long 80°58'28", at bridge on Devine St. (U.S. Hwy 76 and 378) at Columbia, and 0.75 mile below Lake Katherine, Richland County.	59.6	9/15/53	16.6
				9/16/53	12.0
				9/18/53	13.6
				9/ 3/54	9.95
				9/27/54	5.74
				10/22/54	5.55
				Continuous record since Sept. 1966	
30	Gills Creek	Lat 33°56'52", long 80°59'21", at bridge on State Hwy 48, 4.6 miles above mouth, and 4.5 miles south of Columbia, Richland County.	65.7	6/ 7/49	38.4
				6/14/50	35.9
				5/17/51	18.4
				10/15/51	12.1
				4/16/52	55.8
				6/25/52	44.4
				4/ 2/53	30.8
				6/17/53	44.3
				5/ 4/54	55.1
				6/21/54	18.2
				9/10/54	4.27
				5/10/55	12.3
31	Savany Hunt Creek	Lat 33°51'30", long 81°00'45", at bridge on U.S. Hwy 21, 1.7 miles above mouth, and 5.9 miles northeast of Gaston, Calhoun County.	11.3	10/12/54	10.2
				8/27/68	13.0
				9/26/68	13.0
				5/14/69	18.1
				7/14/70	12.5

Site number	Stream	Location	Drainage Area (mi^2)	Date	Discharge ft^3/s
		SANTEE RIVER BASIN--Continued			
1696.1	Sandy Run	Lat 33°48'00", long 80°58'15", at bridge on U.S. Hwy 21, 3.9 miles above mouth, and 7.6 miles east of Gaston, Calhoun County.	32	10/12/54	25.4
				9/ 5/57	27.9
				6/16/60	43.7
				11/ 2/60	45.7
				9/27/61	41.2
				10/20/61	43.6
				4/30/62	54.8
				10/16/62	40.3
				4/22/63	51.3
				10/28/63	30.2
				5/18/64	45.8
				5/10/65	51.9
				9/30/65	51.3
				8/28/68	48.2
				10/ 2/68	34.2
				5/14/69	38.0
				10/29/69	35.9
				5/25/70	45.6
				7/14/70	29.1
1696.15	Mill Creek	Lat 33°56'36", long 80°54'45", at spillway of Caughmans Pond, 0.3 mile below U.S. Hwy 76, and 3.3 miles northwest of Hopkins, Richland County.	12.7	Continuous record since Dec. 1967	
1696.3	Big Beaver Creek	Lat 33°44'12", long 80°57'30", at bridge on U.S. Hwy 21, 0.1 mile below Rock Branch, and 11.6 miles northwest of St. Matthews, Calhoun County.	10.0	10/12/54	5.62
				9/ 7/60	12.3
				11/ 2/60	11.9
				9/27/61	10.3
				10/20/61	8.84
				4/30/62	11.4
				10/16/62	10.3
				4/22/63	9.94
				10/28/63	10.0
				5/18/64	12.5
				5/10/65	13.3
				9/30/65	12.1
				Continuous record since July 1966	
32	Cedar Creek	Lat 33°51'25", long 80°49'48", at bridge on State Hwy 48, 1.0 mile below Clarkson Pond, and 3.6 miles west of Gadsden, Richland County.	31.3	10/ 9/67	38.6
				8/27/68	33.2
				9/24/68	26.0
				10/30/69	15.4
				7/15/70	20.7
33	Cedar Creek	Lat 33°50'23", long 80°51'38", at bridge on county road 734, just below Myers Creek, and 4.6 miles south of Hopkins, Richland County.	66.9	8/27/68	38.3
				9/24/68	23.1
				10/30/69	28.3
				7/15/70	21.3
34	Dry Branch	Lat 33°50'42", long 80°48'58", at bridge on county road 734, 1.8 miles above Weston Lake, and 2.8 miles west of Gadsden, Richland County.	15.9	8/27/68	0
				9/24/68	0
35	Toms Creek	Lat 33°54'46", long 80°45'27", at bridge on county road 1307, 1.2 miles above SCL Railroad, and 2.4 miles east of Congaree, Richland County.	13.0	8/27/68	0.95
				9/24/68	0.83
				10/29/69	1.04
				7/15/70	0.68
36	Griffins Creek	Lat 33°50'12", long 80°41'03", at bridge on State Hwy 48, 2.2 miles above Southern Railroad, and 3.4 miles northwest of Wateree, Richland County.	8.4	8/27/68	0
				9/24/68	0
37	Halfway Swamp	Lat 33°36'18", long 80°38'30", at bridge on State Hwy 33, 0.8 miles northeast of Creston, and 4.8 miles above mouth, Calhoun County.	45.6	8/28/68	13.6
				9/27/68	12.0
				5/14/69	16.4
				10/29/69	22.3
				7/15/70	20.0

Site number	Stream	Location	Drainage Area (mi^2)	Date	Discharge ft^3/s
		EDISTO RIVER BASIN			
38	McTier Creek	Lat 33°45'12", long 81°36'07", at bridge on county road 209, 1.1 miles above Gully Creek, and 6.3 miles south of Monetta, Aiken County.	15.3	8/28/68	12.3
				9/25/68	7.84
				5/13/69	13.1
				10/30/69	9.88
				7/14/70	6.86
1725	South Fork Edisto River	Lat 33°34'35", long 81°30'50", at bridge on State Hwy 215, 0.4 mile above Cedar Creek, and 7.6 miles northeast of Montmorenci, Aiken County.	198	Continuous record 1939-65	
39	Shaw Creek	Lat 33°42'14", long 81°46'21", at bridge on State Hwy 191, 0.9 mile below Hall Branch, and at Eureka, Aiken County.	38	6/ 9/52	21.9
				11/ 5/52	20.3
				12/17/52	23.7
				11/ 4/53	20.1
				7/30/54	17.1
				9/28/54	10.8
				11/21/55	17.8
				11/21/56	14.4
				8/28/68	41.8
				9/25/68	15.5
				5/15/69	27.5
				10/30/69	16.2
				7/15/70	14.6
1725.2	Shaw Creek	Lat 33°39'30", long 81°43'05", at bridge on county road 153, 0.3 mile above Southern Railroad, and 3.7 miles southeast of Eureka, Aiken County.	50	9/24/46	41.0
				11/ 1/48	57.8
				5/23/49	43.1
				12/12/49	47.8
				4/24/50	29.7
				5/23/50	37.4
				6/16/50	28.3
				11/10/50	32.0
				6/14/51	39.1
				10/30/51	34.2
				11/16/53	29.6
				7/30/54	22.1
				9/10/54	19.8
				11/21/55	24.3
				11/20/56	20.6
				5/ 1/57	24.7
				9/ 5/57	11.5
				6/11/58	27.1
				5/19/59	28.8
				3/28/60	77.2
				6/15/61	33.0
				9/27/61	29.9
				10/26/61	29.3
				5/ 1/62	55.3
				10/30/62	30.8
				5/ 8/63	42.2
				10/22/63	28.8
				5/21/64	56.9
				5/18/65	52.1
				8/28/68	45.3
				9/25/68	22.0
				5/13/69	36.1
				10/30/69	26.8
				7/15/70	21.4
40	Shaw Creek	Lat 33°34'36", long 81°36'11", at bridge on State Hwy 215, 1.25 miles below Clearwater Branch, and 3.8 miles north of Montmorenci, Aiken County.	103	6/ 9/52	57.4
				11/ 5/52	55.6
				12/17/52	72.4
				11/ 4/53	61.4
				7/30/54	42.9
				9/10/54	27.2
				11/14/55	46.2
				11/20/56	57.7
				9/ 5/57	25.9
				8/28/68	79.7
				9/27/68	61.9
				5/13/69	78.0
				10/30/69	68.9
				7/16/70	84.3

Site number	Stream	Location	Drainage Area (mi^2)	Date	Discharge ft^3/s
		EDISTO RIVER BASIN--Continued			
41	Yarrow Branch	Lat 33°28'20", long 81°22'32", at bridge on county road 161, 1.3 miles above mouth, and 5.7 miles northeast of Williston, Barnwell County.	16.6	8/26/68	7.68
				9/26/68	6.40
				5/13/69	7.68
				10/29/69	8.74
				7/13/70	5.82
42	Spur Branch	Lat 33°27'36", long 81°18'53", at bridge on State Hwy 37, 1.9 miles above mouth, and 7.2 miles northeast of Williston, Barnwell County.	18.9	8/26/68	0.81
				9/26/68	0.65
				5/13/69	2.95
				10/29/69	3.50
				7/14/70	2.34
43	Dean Swamp Creek	Lat 33°33'56", long 81°19'42", at bridge on State Hwy 394, 0.4 mile below Abrams Branch, and at Salley, Aiken County.	49.2	8/28/68	52.4
				9/26/68	34.2
				5/ 8/69	39.6
				10/28/69	38.4
				7/13/70	32.7
44	Goodland Creek	Lat 33°29'33", long 81°14'45", at bridge on State Hwy 4, 0.1 mile below Tampa Creek, and 2.9 miles east of Springfield, Orangeburg County.	36.9	8/26/68	15.7
				9/26/68	15.8
				5/ 8/69	24.8
				10/28/69	23.7
				7/13/70	17.8
45	Willow Swamp	Lat 33°26'52", long 81°07'54", at bridge on State Hwy 332, at Norway, and 3.6 miles above mouth, Orangeburg County.	14.9	9/26/68	1.07
				5/ 8/69	5.42
				10/28/69	3.40
				7/13/70	1.63
1730	South Fork Edisto River	Lat 33°23'35", long 81°08'00", at bridge on U.S. Hwy 321, 1.8 miles below Little River, and 4.8 miles north of Denmark, Orangeburg County.	720	Continuous record since Aug. 1931	
46	Roberts Swamp	Lat 33°23'13", long 81°02'16", at bridge on State Hwy 70, 2.0 miles west of Cope, and 3.0 miles above mouth, Orangeburg County.	31.3	8/26/68	21.6
				9/26/68	.05
				5/ 8/69	4.58
				10/29/69	5.09
				7/16/70	3.43
1731.5	Lightwood Knot Creek	Lat 33°52'35", long 81°26'50", at bridge on county road 34, 1.4 miles above Hell-hole Creek, and 4.8 miles southeast of Leesville, Lexington County.	8.7	11/ 2/48	11.0
				11/23/49	19.2
				5/18/59	8.36
				12/10/59	19.6
				5/17/60	16.6
				11/16/60	12.8
				6/ 8/61	12.4
				10/23/61	9.36
				4/30/62	13.6
				10/15/62	10.2
				4/22/63	8.35
				10/28/63	7.48
				5/18/64	11.3
				11/17/64	17.1
				9/25/68	5.37
				10/31/69	7.20
				5/25/70	15.4
				7/13/70	4.76
47	North Fork Edisto River	Lat 33°46'59", long 81°26'45", at bridge on county road 19, 0.5 mile west of Steedman, and 1.2 miles below confluence of Chinquapin Creek and Lightwood Knot Creek, Lexington County.	82.5	8/27/68	94.7
				9/25/68	20.5
				5/13/69	46.7
				10/31/69	68.1
				7/13/70	19.6
48	Black Creek	Lat 33°45'12", long 81°19'10", at bridge on U.S. Hwy 178, 0.2 mile below Smith Branch, and 4.3 miles west of Pelion, Lexington County.	61.3	9/ 5/56	53.4
				10/20/56	48.9
				8/27/68	110
				9/26/68	75.2
				10/31/69	78.0
				7/14/70	72.4

Site number	Stream	Location	Drainage Area (mi^2)	Date	Discharge ft^3/s
		EDISTO RIVER BASIN--Continued			
49	Cedar Creek	Lat 33°42'38", long 81°14'50", at bridge on county road 74, 1.8 miles above mouth, and 3.7 miles south of Pelion, Lexington County.	36.6	8/29/68	22.8
				9/26/68	18.8
				10/31/69	23.2
				7/14/70	16.5
50	Hollow Creek	Lat 33°39'01", long 81°12'36", at bridge on county road 14, 0.7 mile above mouth, and 6.0 mile east of Perry, Aiken County.	17.7	8/26/68	5.56
				9/26/68	6.72
				5/ 8/69	9.24
				10/28/69	9.92
				7/14/70	7.20
1733	North Fork Edisto River	Lat 33°35'25", long 81°06'20", at bridge on U.S. Hwy 321, 0.9 mile below Big Beaver Creek, and 1.75 miles south of North, Orangeburg County.	396	6/14/50	384
				1/31/51	451
				5/ 1/51	561
				9/12/51	344
				4/ 8/52	829
				4/15/53	634
				11/ 5/53	375
				8/30/54	240
				5/12/55	221
				11/ 8/55	241
				9/19/56	188
				6/19/57	422
				6/ 5/58	325
				5/28/59	555
				9/21/59	576
				6/14/60	429
				11/ 4/60	485
				5/24/61	530
				10/20/61	396
				9/11/62	357
				10/16/62	389
				5/13/63	345
				5/19/64	541
				5/20/65	577
				8/29/68	372
				9/27/68	407
				5/13/69	380
				10/30/69	459
51	Bull Swamp Creek	Lat 33°34'55", long 81°02'25", at bridge on county road 97, 0.4 mile above mouth, and 4.3 miles southeast of North, Orangeburg County.	96.4	9/27/68	37.8
				7/17/70	38.2
52	Limestone Creek	Lat 33°33'40", long 80°57'03", at bridge on U.S. Hwy 178, 2.5 miles above mouth, and 2.5 miles southeast of Wolfton, Orangeburg County.	18.9	8/29/68	3.08
				9/27/68	4.72
				5/14/69	5.87
				7/15/70	3.64
53	Caw Caw Swamp	Lat 33°35'22", long 80°52'32", at bridge on unpaved county road, 0.8 mile above Saddler Swamp, and 3.4 miles west of Jamison, Orangeburg County.	45.8	9/26/68	12.2
				5/14/69	17.5
				10/30/69	24.0
				7/13/70	15.9
1735	North Fork Edisto River	Lat 33°29'00", long 80°52'25", at bridge on U.S. Hwy 301, 0.5 mile above SCL Railroad, and 1.5 miles below Caw Caw Swamp, Orangeburg County.	683	Continuous record since Oct. 1938	

Site number	Stream	Location	Drainage Area (mi^2)	Date	Discharge ft^3/s
		COMBAHEE RIVER BASIN			
1752	Salkehatchie River	Lat 33°14'25", long 81°24'30", at bridge on State Hwy 64, 2.7 miles west of Barnwell, and 4.0 miles above Turkey Creek, Barnwell County.	64.6	1/31/44	56.4
				11/28/45	66.6
				2/27/46	58.4
				6/10/52	20.2
				11/ 6/52	29.8
				12/18/52	33.8
				11/ 5/53	25.9
				8/30/54	22.1
				4/28/59	43.3
				6/ 1/61	50.4
				9/28/61	24.5
				10/17/61	29.0
				5/17/62	107
				10/16/62	42.8
				4/19/63	37.3
				10/17/63	22.3
				5/18/65	50.9
				8/26/68	33.4
				9/25/68	16.2
				5/13/69	17.5
				10/29/69	22.5
				7/15/70	19.2
54	Turkey Creek	Lat 33°17'05", long 81°21'46", at bridge on county road 168, 0.5 mile below Long Branch, and 2.8 miles north of Barnwell, Barnwell County.	22.8	8/26/68	12.3
				9/25/68	10.9
				5/13/69	11.5
				10/29/69	18.3
				7/15/70	13.4
55	Toby Creek	Lat 33°14'55", long 81°18'53", at bridge on county road 29, 1.4 miles above Jordan Branch, and 3.0 miles east of Barnwell, Barnwell County.	20.5	8/26/68	9.32
				9/25/68	9.03
				5/ 8/69	15.8
				10/29/69	11.5
				7/13/70	10.8
56	Little Salkehatchie River	Lat 33°15'41", long 81°10'12", at bridge on county road 47, 1.6 miles below confluence of Ghents Branch and Gall Branch, and 4.5 miles south of Denmark, Bamberg County.	35.4	4/28/59	19.9
				9/26/68	5.83
				5/ 8/69	11.0
				10/20/69	19.9
				7/15/70	7.71
57	Lemon Creek	Lat 33°16'05", long 81°02'40", at bridge on U.S. Hwy 601, 0.5 mile below Halfmoon Branch, and 2.1 miles south of Bamberg, Bamberg County.	28.5	11/30/64	21.2
				8/28/68	4.08
				9/26/68	4.38
				5/ 8/69	6.74
				10/28/69	9.56
				7/15/70	5.20
		SAVANNAH RIVER BASIN			
1971	Hollow Creek	Lat 33°21'35", long 81°48'40", at bridge on State Hwy 125, 1.0 mile below Town Creek, and 2.2 miles northeast of Kathwood, Aiken County.	87	6/10/52	68.8
				11/ 6/52	65.8
				12/18/52	72.0
				11/ 5/53	63.4
				11/10/55	81.7
				11/ 8/56	58.4
				9/11/59	117
				9/ 7/60	80.6
				11/15/60	88.1
				5/ 1/62	123
				10/30/62	83.1
				5/ 8/63	83.8
				11/22/63	76.4
				5/21/64	97.8
				5/18/65	100
				8/27/68	97.0
				9/26/68	69.9
				5/ 8/69	62.2
				10/28/69	70.1
				7/16/70	63.1
1973	Upper Three Runs	Lat 33°23'05", long 81°37'00", at bridge on U.S. Hwy 278, 0.4 mile above Johnson Fork Creek, and 4.6 miles southeast of New Ellenton, Aiken County.	87	Continuous record since June 1966	

TABLE 2. CHEMICAL ANALYSES OF INNER COASTAL PLAIN STREAMS

Results in milligrams per litre except as indicated. Analyses by U.S. Geological Survey 7

Site No.	Stream	Date	Discharge ft^3/s	Temperature (°C)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe) 1/	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Orthophosphate (PO_4)	Dissolved Solids		Hardness as $CaCO_3$		Specific conductance (micromhos at 25°C)	pH	Alkalinity as $CaCO_3$	Color (units) 2/
																				Calculated	Residue on evaporation at 180°	Calcium, Magnesium	Noncarbonate				
	PEE DEE RIVER BASIN																										
2	Whites Creek nr Wallace	9/26/68	2.68	-	1.7	0.2	0.64	0.02	0.4	0.3	2.7	0.3	3	0	1.6	3.7	0.0	0.7	0.02	13	23	2	0	19	5.9	2	50
3	Juniper Creek nr Patrick	9/25/68	5.34	-	6.1	-	1.00	.00	.2	.2	1.2	.1	1	0	1.8	2.5	.0	.4	.00	14	11	2	1	13	4.9	1	40
1305	Juniper Creek nr Cheraw	9/25/68	5.62	27	4.1	.2	1.20	.00	.3	.3	1.5	.2	1	0	1.6	2.6	.0	.6	.00	14	19	2	1	16	4.8	-	30
4	Naked Creek nr Wallace	9/26/68	2.25	23	2.3	.1	.67	.01	.4	.5	4.2	.3	6	0	2.4	5.0	.0	2.0	.00	21	21	3	0	29	6.2	-	20
1305.3	Naked Creek nr Bennettsville	9/26/68	3.20	-	2.6	.1	.50	.05	.6	.5	5.1	.4	6	0	2.4	5.6	.0	1.5	.03	22	27	4	0	32	5.9	5	20
5	Crooked Creek nr Bennettsville	9/28/68	10.2	23	4.3	.0	.22	.01	.3	.4	3.7	.3	5	0	.2	4.8	.0	1.7	.00	18	19	2	0	24	5.9	-	15
1306	Cedar Creek nr Society Hill	9/25/68	8.85	-	5.1	.2	.62	.00	.3	.2	1.9	.3	1	0	.8	3.0	.0	.5	.05	14	14	2	1	15	5.3	1	40
7	Black Creek nr Jefferson	9/26/68	1.42	22	4.8	.2	1.20	.03	1.1	.8	3.3	.6	8	0	.6	4.5	.1	1.5	.00	23	22	6	0	29	6.2	-	20
8	Black Creek nr Chesterfield	9/26/68	5.06	-	3.8	.2	.76	.02	.6	.4	1.9	.4	4	0	.8	3.8	.0	.5	.00	15	14	3	0	18	5.5	3	50
1309	Black Creek nr McBee	9/26/68	23.8	-	5.0	.2	.41	.01	.3	.2	1.3	.2	2	0	.8	2.0	.0	.9	.00	12	18	2	0	11	5.4	2	20
12	L. Fork Creek nr Jefferson	9/26/68	1.46	-	25.0	.2	1.10	.02	2.4	.8	5.2	1.0	13	0	6.2	5.0	.1	.5	.17	54	42	10	0	47	5.9	11	30
1314.4	Lynches River nr Bethune	10/02/68	59.0	18	7.3	-	.60	.00	1.2	.9	42.0	3.4	90	0	7.6	9.8	.1	3.3	.41	120	123	6	0	185	6.4	74	30
14	Neds Creek nr Kershaw	10/03/68	-	18	19.0	.0	.78	.13	8.3	3.1	6.5	2.6	48	0	3.0	4.3	.0	.7	.00	72	67	33	0	89	6.4	-	10
1314.8	L. Lynches River nr Bethune	10/02/68	-	17	6.2	.1	.80	.06	1.0	.6	2.1	.4	4	0	3.0	3.3	.0	.8	.02	20	21	5	2	21	5.4	-	15
15	Little Pee Dee River nr Clio	10/01/68	49.9	24	4.8	.2	.75	.05	.5	.5	2.9	.4	6	0	2.4	3.3	.0	.4	.00	19	26	3	0	22	5.8	-	20
16	L. Pee Dee River at L. Rock	10/01/68	-	-	5.2	.2	.42	.03	.7	.5	3.4	.4	5	0	3.4	3.8	.0	.9	.17	21	29	4	0	24	5.7	4	45
1325	L. Pee Dee River nr Dillon	10/01/68	42.1	-	4.9	.1	.64	.05	.7	.4	4.0	.6	5	0	2.2	4.0	.0	1.1	.35	21	28	3	0	29	5.9	4	45
17	Beaver Dam Cr nr Bishopville	10/02/68	-	17	7.9	.2	2.10	.06	1.1	.7	3.4	.3	5	0	.8	4.4	.0	1.2	.01	24	26	6	2	26	5.5	-	25
	SANTEE RIVER BASIN																										
18	Gum Swamp Cr Trib nr De Kalb	10/03/68	0.62	16	8.7	-	.15	.00	.2	.3	1.3	.1	0	0	.4	2.8	.0	.7	.00	15	26	2	2	14	4.2	0	50
19	Sanders Creek nr Camden	9/26/68	6.32	17	6.1	.1	.18	.00	.1	.3	1.7	.2	2	0	.4	2.8	.0	1.0	.00	14	16	2	0	14	5.5	-	20
20	Twentyfive Mile Cr at Lugoff	9/26/68	9.06	18	5.0	.1	.82	.08	.8	.7	1.9	.3	7	0	.8	3.1	.0	.7	.00	17	18	5	0	20	6.1	-	15
21	Big Pine Tree Creek nr Camden	10/02/68	-	19	4.7	.1	.35	.03	.5	.4	2.4	.3	3	0	1.2	1.4	.0	.4	.00	12	12	3	0	18	5.4	-	10
23	Raffing Creek nr Hagood	9/25/68	9.67	19	7.5	.1	1.60	.08	.6	.5	3.8	.6	4	0	2.4	5.8	.1	.9	.00	26	31	4	0	29	5.6	3	40
24	Spears Creek nr Elgin	9/26/68	12.4	18	6.6	.1	.67	.01	.4	.4	9.5	.2	0	0	4.8	13.0	.3	2.4	3.00	42	46	2	2	65	4.0	-	15
1483	Colonels Creek nr Leesburg	9/24/68	17.6	19	5.2	-	.32	.00	.2	.2	1.0	.1	1	0	2.0	2.6	.0	.4	.00	13	8	2	1	10	5.0	1	10
25	Smith Branch at Columbia	9/24/68	.90	24	14.0	.0	.99	.02	10.0	3.4	22.0	3.8	48	0	14.0	24.0	.4	4.9	.89	122	123	39	0	177	7.0	-	5
26	Twelvemile Creek nr Red Bank	10/01/68	-	22	3.5	.2	.59	.02	.8	.7	2.7	.7	5	0	.6	4.0	.0	.6	.01	16	13	5	1	25	5.7	-	25
27	Six Mile Creek at Cayce	10/01/68	-	19	4.7	.5	1.30	.04	5.1	1.2	14.0	2.2	18	0	8.2	10.0	.3	9.1	1.10	67	68	18	2	95	5.6	-	20
28	Savana Branch at Pineridge	10/01/68	4.30	22	2.2	-	.65	.00	.5	.4	1.9	.3	6	0	1.2	3.0	.0	.4	.00	14	16	2	0	19	6.4	5	20
29	Congaree Cr at S. Congaree	10/01/68	88.0	22	4.5	-	.41	.00	.3	.2	1.1	.2	1	0	1.8	2.0	.0	.3	.00	12	12	2	1	12	4.9	1	10
1695.7	Gills Creek at Columbia	9/25/68	12.0	25	5.7	.4	.80	.09	6.6	1.0	14.0	3.6	13	0	12.0	19.0	.1	.9	1.40	72	86	20	10	145	5.4	11	80
31	Savany Hunt Creek nr Gaston	10/01/68	-	21	4.5	.1	.43	.04	.6	.3	1.0	.2	2	0	1.0	1.9	.0	.3	.00	11	13	3	2	10	5.3	-	10
1696.1	Sandy Run nr Gaston	10/02/68	34.2	18	6.1	-	.57	.00	.2	.2	1.2	.2	2	0	.8	1.3	.0	.3	.00	12	11	2	0	13	5.1	2	10
1696.15	Mill Creek nr Hopkins	9/24/68	6.88	24	3.7	.1	1.00	.04	.7	.4	1.8	.3	4	0	1.0	3.2	.0	.4	.00	15	12	3	0	16	5.7	3	15
32	Cedar Creek nr Gadsden	9/24/68	26.0	20	4.8	.0	.74	.04	.5	.3	2.0	.4	3	0	1.0	3.0	.0	1.2	.00	15	13	2	0	18	5.4	2	20
33	Cedar Creek nr Hopkins	9/24/68	23.1	23	3.9	.0	.76	.04	.5	.3	1.6	.2	4	0	.4	2.6	.0	.7	.01	13	16	2	0	15	5.4	3	15
35	Toms Creek nr Congaree	9/24/68	.83	21	3.5	.4	.48	.06	.7	.5	2.5	.6	4	0	.0	4.6	.1	1.2	.00	17	18	4	0	24	5.7	-	5

[Results in milligrams per litre except as indicated. Analyses by U. S. Geological Survey]

Site No.	Stream	Date	Discharge ft³/s	Temperature (°C)	Silica (SiO_2)	Aluminum (Al)	Iron (Fe) 1/	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Orthophosphate (PO_4)	Dissolved Solids: Calculated	Dissolved Solids: Residue on evaporation at 180°	Hardness as $CaCO_3$: Calcium, Magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Alkalinity as $CaCO_3$	Color (units) 2/
	EDISTO RIVER BASIN																										
38	McTier Cr. nr Monetta	9/25/68	7.84	19	4.0	0.0	0.50	0.00	0.3	0.4	3.1	0.2	5	0	0.6	3.5	0.1	0.7	0.00	15	20	2	0	21	6.0	-	30
39	Shaw Creek at Eureka	9/25/68	15.5	19	-	.1	.52	.05	-	-	-	-	7	-	-	5.8	-	-	-	-	-	14	-	32	6.5	-	-
1725.2	Shaw Creek nr Eureka	9/25/68	22.0	18	5.8	.1	.54	.00	.4	.5	3.5	.3	6	0	2.2	3.4	.1	1.4	.00	21	19	3	0	26	6.1	-	7
40	Shaw Creek nr Montmorenci	10/01/68	-	21	5.5	-	.92	.00	.4	.4	2.4	.2	5	0	.8	3.8	.0	.4	.00	17	10	2	0	19	5.9	4	15
41	Yarrow Branch nr Williston	10/01/68	-	18	9.1	-	.51	.02	2.6	.4	1.9	.3	8	0	2.8	3.2	.0	.3	.05	25	19	8	2	29	6.1	6	5
42	Spur Branch nr Williston	10/01/68	-	17	6.7	.3	.82	.04	8.2	1.1	4.0	.8	28	0	2.4	4.8	.0	.3	.04	44	47	25	2	58	6.6	-	15
43	Dean Swamp Creek nr Salley	10/01/68	-	18	5.6	-	.70	.00	.4	.4	2.3	.2	2	0	.6	3.2	.0	1.6	.00	16	12	2	1	19	5.2	2	5
44	Goodland Cr nr Springfield	10/01/68	-	17	8.9	-	.44	.00	1.3	.5	2.5	.2	5	0	.2	4.0	.0	1.3	.00	22	19	5	1	26	5.3	4	5
45	Willow Swamp at Norway	10/01/68	-	17	7.7	-	.66	.00	14.0	.8	2.8	.5	47	0	1.2	4.3	.1	.5	.00	56	62	38	0	89	6.2	38	10
1730	S. Fk Edisto River nr Denmark	10/01/68	342	20	6.4	-	.61	.00	.9	.5	2.1	.3	4	0	.8	3.2	.0	.3	.00	16	20	4	1	21	5.8	3	20
46	Roberts Swamp nr Cope	10/01/68	-	-	6.0	-	.52	.00	2.6	.9	9.0	.6	15	0	1.4	10.0	.0	2.1	.00	40	34	10	0	63	6.3	12	30
1731.5	Lightwood Knot Cr nr Leesville	10/01/68	-	21	2.4	.1	.63	.03	.8	.5	2.3	.5	4	0	1.8	3.1	.0	1.2	.01	15	21	4	0	21	5.6	3	20
47	N. Fk Edisto River at Steedman	9/25/68	20.5	20	4.4	.2	1.00	.02	.5	.5	2.6	.5	4	0	.8	4.2	.0	1.0	.00	18	20	3	0	22	6.2	-	30
48	Black Creek nr Pelion	10/01/68	-	19	4.4	.0	.25	.03	.8	.5	1.3	.2	2	0	.8	2.6	.0	.3	.01	12	12	4	2	12	5.2	-	10
49	Cedar Creek nr Pelion	10/01/68	-	21	6.0	.0	.48	.02	1.0	.1	1.2	.2	2	0	2.0	2.1	.0	.5	.02	15	14	3	2	11	5.2	-	10
50	Hollow Creek nr Perry	10/01/68	-	20	4.1	.0	2.40	.03	1.0	.2	2.4	.3	4	0	.6	3.7	.1	.4	.02	15	12	4	0	18	5.4	-	10
51	Bull Swamp Cr nr North	10/01/68	-	21	4.6	-	.85	.00	.5	.5	2.8	.3	5	0	1.2	3.7	.0	.7	.00	17	14	3	0	22	5.7	4	10
53	Caw Caw Swamp nr Jamison	10/02/68	-	18	8.4	-	.45	.02	2.8	.5	2.3	.2	11	0	.4	3.9	.0	.3	.00	24	22	9	0	32	6.0	9	5
	COMBAHEE RIVER BASIN																										
54	Turkey Creek at Barnwell	9/25/68	10.9	19	9.5	.0	.29	.02	16.0	.4	1.9	.4	47	0	2.0	2.6	.0	1.2	.01	57	52	40	2	81	6.6	38	5
55	Toby Creek nr Barnwell	9/25/68	9.03	20	9.6	.1	.21	.02	12.0	.4	1.7	.3	41	0	.4	2.7	.1	.4	.00	48	45	32	0	69	7.0	-	5
	SAVANNAH RIVER BASIN																										
1971	Hollow Creek nr Kathwood	10/01/68	-	20	6.8	-	2.00	.00	.4	.3	1.3	.2	3	0	.8	2.6	.0	.3	.00	18	11	2	0	13	5.8	2	5

1/ In solution when analyzed.

2/ Based on platinum-cobalt scale (Hazen, 1892)

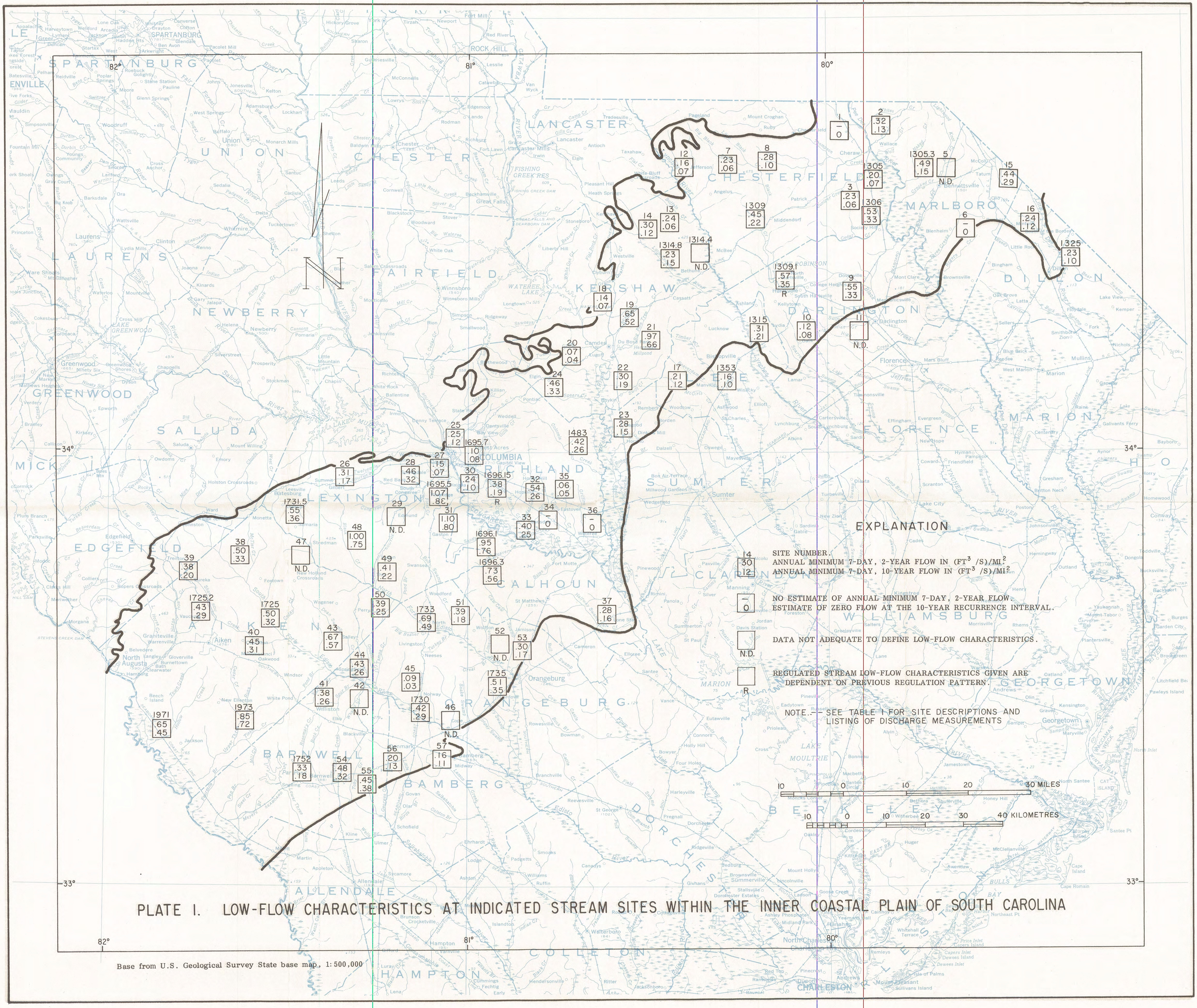

PLATE I. LOW-FLOW CHARACTERISTICS AT INDICATED STREAM SITES WITHIN THE INNER COASTAL PLAIN OF SOUTH CAROLINA