



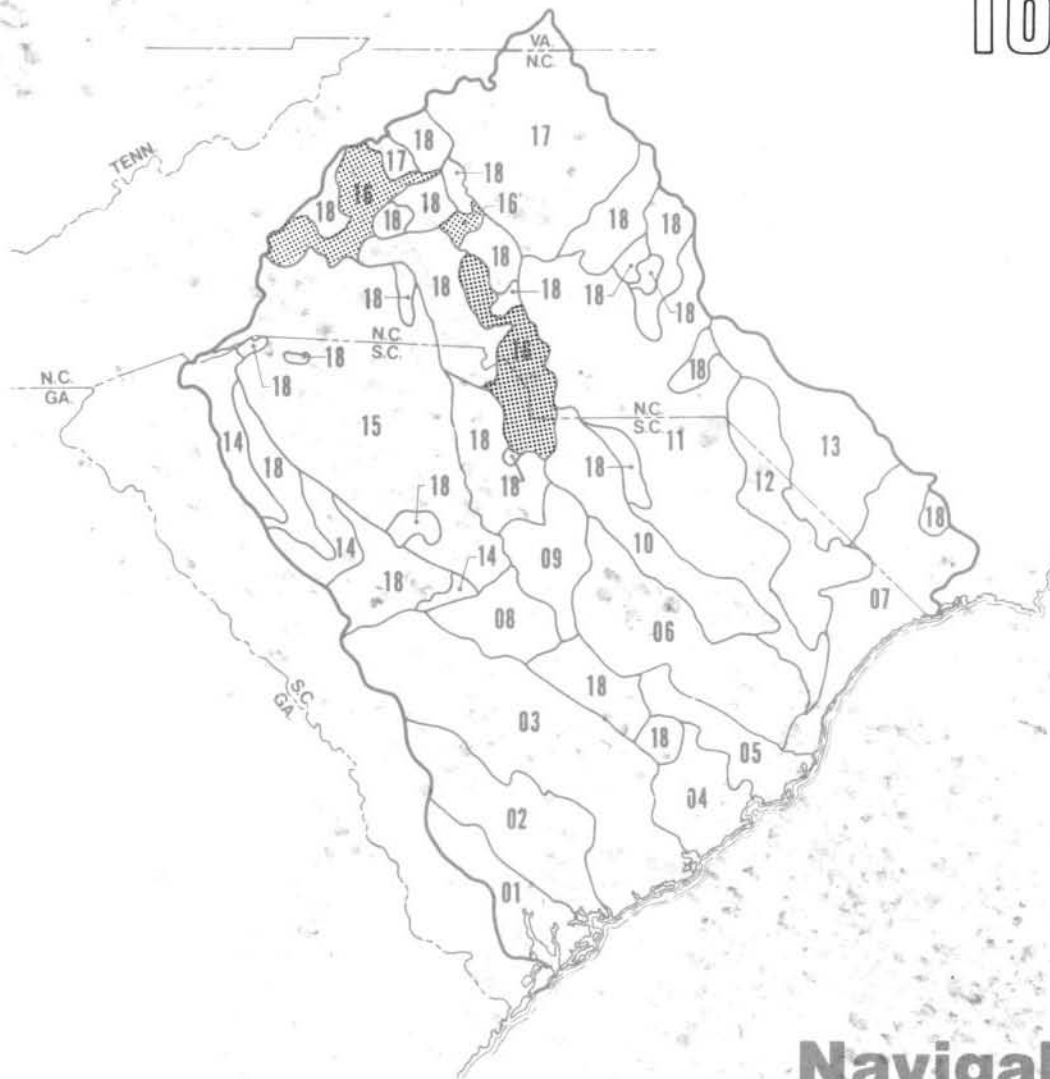
U.S. ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
Charleston, South Carolina



CATAWBA RIVER BASIN

Report No.

16



**Navigability
Study
1977**



STANLEY CONSULTANTS

CONTENTS

	<u>Page</u>
SECTION 1 - INTRODUCTION	16-1
Purpose	16-1
Scope	16-1
Related Reports	16-2
Acknowledgements and Data Sources	16-3
SECTION 2 - PHYSICAL CHARACTERISTICS	16-5
SECTION 3 - NAVIGATION IMPROVEMENT PROJECTS	16-8
Federal Navigation Projects	16-8
Other Navigation Projects	16-8
SECTION 4 - INTERSTATE COMMERCE	16-9
Past	16-9
Present	16-12
Future Potential	16-12
SECTION 5 - LEGAL AUTHORITY	16-13
General	16-13
Navigability Interpretations	16-13
General Federal Court Cases	16-14
Specific Federal Court Cases	16-16
South Carolina State Court Cases	16-18
North Carolina State Court Cases	16-21
Recent Federal Litigation	16-21
Federal Agency Jurisdiction	16-21
SECTION 6 - NAVIGATION OBSTRUCTIONS AND CLASSIFICATIONS	16-24
Navigation Classification Procedures	16-24
Navigation Classification Categories	16-28
Present Navigable Waters of the U. S.	16-28
Historically Navigable Waters	16-28
Recommended Navigable Waters of the U. S.	16-29
Recommended Practical Navigable Waters of the U. S.	16-29
Waters of the U. S.	16-29
SECTION 7 - CONCLUSIONS AND RECOMMENDATIONS	16-30

CONTENTS (continued)

	<u>Page</u>
BIBLIOGRAPHY	16-31
Cited References	16-31
Other Background Information	16-33
APPENDIX A - STREAM CATALOG	16-A1
APPENDIX B - SUMMARY OF 10 TO 1,000 ACRE LAKES	16-B1

TABLES

<u>Number</u>		<u>Page</u>
1	Physical Characteristics.....	16-6
2	Key Stream Gaging Stations	16-7

FIGURES

<u>Number</u>		<u>Page</u>
1	Navigability Decision Diagram	16-25

PLATES

<u>Number</u>		<u>Follows Page</u>
16-1	Location Map	16-33
16-2	Significant Features	16-33
16-3	Significant Features	16-33
16-4	Significant Features	16-33
16-5	Significant Features	16-33

SECTION 1 - INTRODUCTION

Purpose

The purpose of this study is to collect, develop, and evaluate information on waterbodies within the boundaries of the Charleston District, Corps of Engineers, for establishing the classification of "navigable waters of the U. S." and "waters of the U. S." (During the course of this study the term "navigable waters" was changed to "waters of the U. S." Herein references to "navigable waters" are synonymous with "waters of the U. S.") Study objectives include definition of the present head of navigation, the historic head of navigation, the potential head of navigation, and the headwaters of all waterbodies within the district.

The information generated as a part of the study will be utilized by the Charleston District in administration of its programs dealing with water resource project construction permits in "navigable waters of the U. S." (River and Harbor Act of 1899), and the deposition of dredge or fill material in "navigable waters" or their contiguous wetlands (Section 404 of PL 92-500).

Scope

The scope of this project is generally summarized by the following:

1. Outline drainage areas, locate headwater points where mean flow is five cubic feet per second (cfs), summarize lake data (10 to 1,000 acres), establish stream mileage for "navigable waters of the U. S.", and prepare a stream catalog summary for the district.
2. Conduct field surveys of waterbodies to establish mean water levels and obstruction clearances for evaluating the potential head of navigation.
3. Analyze available hydrological data to estimate mean, maximum, and minimum discharge rates at obstructions and other selected locations.
4. Conduct a literature review to identify past, present, and future uses of waterbodies for interstate commerce.

5. Conduct a legal search to identify Federal and state court cases which impact on navigation classifications.
6. Prepare plan and profile drawings, maps of the district showing significant physical features, and a map delineating the recommended navigation classifications.
7. Prepare reports on all major river basins and large lakes (greater than 1,000 acres) including information on physical characteristics, navigation projects, interstate commerce, court decisions, navigation obstructions, and recommended classification of waterbodies for navigation.
8. Prepare a summary report outlining navigation-related information for the entire district as well as the methodology, procedures, and other factors pertinent to the development of each of the river basin reports.

Conduct of this study relies heavily upon available information. Compilation and evaluation of existing data from many sources and development of field survey information are the main contributions to the new water resource data base represented by this study.

Related Reports

Information pertaining to this navigability study for the Charleston District has been compiled into a series of reports, one of which is represented by this document. A complete listing of the reports is presented below to facilitate cross referencing.

<u>Number</u>	<u>Title</u>
--	Summary Report
01	Coosawhatchie River Area
02	Combahee River Area
03	Edisto River Area
04	Cooper River Area
05	Santee River Basin
06	Black River Area
07	Waccamaw River Basin
08	Congaree River Basin
09	Wateree River Basin

<u>Number</u>	<u>Title</u>
10	Lynches River Basin
11	Great Pee Dee River Basin
12	Little Pee Dee River Basin
13	Lumber River Basin
14	Saluda River Basin
15	Broad River Basin
16	Catawba River Basin
17	Yadkin River Basin
18	Lakes - Greater Than 1,000 Acres
--	Coastal Supplement

The eighteen reports covering various drainage areas in the district present information for the specific basins. The Summary Report provides an overview of the entire study of district waterbodies and presents information applicable to all waters in the district. Reference should be made to both the individual drainage area reports as well as the Summary Report to obtain a thorough understanding of the study approach and results.

Acknowledgements and Data Sources

The contribution of many project team members within the Corps of Engineers, Charleston District, and Stanley Consultants is gratefully acknowledged by Stanley Consultants. In addition to the legal search and other evaluations and input from Charleston District staff, several others made significant contributions to this study effort. Dr. John W. Gordon, Assistant Professor in the Department of History, The Citadel, prepared the narrative and literature review information for past and present interstate commerce.

Several state water resource, transportation, utility, and planning agencies also cooperated and provided useful data for compiling these reports. Federal water resource and regulatory agencies and private utilities provided information along with public and private operators of large reservoirs.

Specific numbered data sources are referenced in the reports in parentheses. These data sources are listed in the Bibliography of each report of the navigation study.

SECTION 2 - PHYSICAL CHARACTERISTICS

As shown on Plate 16-1, the Catawba River basin is located in the north central portion of South Carolina and the southwestern portion of North Carolina, and comprises part of the Santee-Cooper River system. The headwaters of the basin are located in the Blue Ridge Mountains. The river flows east for 90 miles, then turns south for 130 miles where it originally joined with Big Wateree Creek to form the Wateree River at river mile (R.M.) 92.0 (river miles in the Catawba basin have been continued from the Wateree River; river miles noted - 110 = mileage at start of Catawba). However, in the early 1900's a series of dams, including Wateree Lake Dam, Great Falls Dam, Dearborn Dam, and Fishing Creek Dam were constructed below this confluence (Wateree Lake Dam is the first one at R.M. 76.1) and continuing to approximately R.M. 110. As a result, the reservoir pools ran together inundating the original mouth of the Catawba River and displacing, for all practical purposes, the mouth of the Catawba River to the upstream end of Fishing Creek Reservoir at approximately R.M. 110. Additional information on the dams and lakes, as well as the Santee, Cooper, and Wateree Rivers is presented in Reports 18, 05, 04, and 09, respectively.

The Catawba River is the largest river in the basin. There are no major tributaries in the basin. The river flows the length of the basin changing from a small mountain stream in the upper reaches to a wide, uniformly channeled river in the lower reaches. However, many large dams regulate flow on the river consequently changing channel depth, embankment height, and vegetation levels on a daily basis, and distorting to some degree the general characteristics of the river.

The dams are located at intervals along the river and are primarily used for power generation and flood control. The larger dams are identified below (Report 18 provides additional information on these): Wateree Lake Dam (18-06), Fishing Creek Dam (18-08), Lake Wylie (Lake Catawba) Dam (18-11), Mountain Island Lake Dam (18-12),

Lake Norman Dam (18-19), Lookout Shoals Lake Dam (18-21), Lake Hickory Dam (18-22), Rhodhiss Lake Dam (18-23), and Lake James Dam (18-24). (1) (2)

Plates 16-2 through 16-5 are detailed maps indicating significant features in the basin. Table 1 further describes selected physical characteristics, such as approximate drainage area, length, and elevation change for the Catawba River. The methodology used in developing many of these characteristics is defined in the Summary Report. Table 2 presents information on the USGS gaging stations located along the Catawba River.

TABLE 1
PHYSICAL CHARACTERISTICS (3) (4) (5) (6)*

Length to Headwaters ¹⁾	202 miles
Elevation Change to Headwaters ¹⁾	1,470 feet
Drainage Area of Basin	3,780 square miles
Mean Discharge at Mouth	6,680 cfs (R.M. 110)
Limit of Tidal Influence	None
Length of Present Navigable Waters of the U.S. ²⁾	53.5 miles (R.M. 110 to 163.5) ³⁾

-
- 1) From end of Fishing Creek Reservoir to headwaters (point where mean annual flow is 5 cfs) of Catawba River.
 - 2) Classification of R.M. 0.0 to R.M. 110 presented in Reports 09 and 18.
 - 3) River mileage on the Catawba River has been continued from the Wateree River (river miles presented - 110 = mileage from start of Catawba).

* See Bibliography for these references.

TABLE 2

KEY STREAM GAGING STATIONS (3) (5) (7) (8)

<u>Stream</u>	<u>USGS Gaging Station Number</u>	<u>Location Description</u>	<u>Drainage Area (sq.mi.)</u>	<u>Mean Flow (cfs)</u>	<u>Minimum Flow¹⁾ (cfs)</u>	<u>Maximum Flow²⁾ (cfs)</u>
Catawba River	02138000	Located near Marion, N.C., McDowell Co. on U. S. Highway 221 bridge, 0.2 miles downstream from Tom Creek	171	340	105	560
Catawba River	02146000	Located near Rockhill, S. C., York Co. on U. S. Highway 21 bridge 3.5 miles downstream from Lake Wylie Dam	3,050	4,559	1,000	8,200
Catawba River	02147000 ³⁾	Located near Catawba, S. C., York Co. on SCL RR bridge 200 feet downstream from Twelve Mile Creek	3,530	6,242	N/A	N/A

1) Exceeded or equaled 90 percent of the time.

2) Exceeded or equaled 10 percent of the time.

3) Period of record 1968 - current.

SECTION 3 - NAVIGATION IMPROVEMENT PROJECTS

Federal Navigation Projects

No Federal navigation projects have been authorized for the Catawba River basin. (9) (10)

Other Navigation Projects

No modern-day navigation improvement projects have been identified in the basin. As discussed in Section 4, several legislative efforts were directed toward the Catawba River in the late 1700's by the state of South Carolina, however, evidence of any improvements has ceased to exist.

Inquiries made at various state and Federal agencies indicate no projects are now planned or under construction which would improve or substantially benefit navigation on the Catawba River.

SECTION 4 - INTERSTATE COMMERCE

Past

One of the first white men to visit the Catawba River basin was the Englishman, John Lawson, who traveled the region in 1700. However, a Pennsylvanian named John Lederer may have seen the region some thirty years previously, and various Spanish expeditions may also have penetrated to the Catawba even before that. (11) The Charleston-based "Carolina traders" lost no time in establishing commercial ties with the several tribes who lived along the banks of the Catawba. As with other regions of North and South Carolina, various groups of European settlers, principally English and Scotch-Irish, arrived in the Catawba basin in the early and mid-18th Century to establish permanent homes.

These settlers could not have enjoyed a free, uninterrupted use of the Catawba to move surplus crops down to the coast; both the Catawba and its lower stretch, the Wateree, were blocked at several points by rock ledges which prevented uninterrupted navigation. One historical source is sure that the products which were moved out of the region and sent to Charleston went by wagon, not by water. (12) Not until 1787 did the General Assembly of South Carolina move to open the navigation of the Catawba River by establishing a company for that purpose. (13) While other rivers received more attention and funds from the state of South Carolina, it was hoped that the Catawba project would nonetheless prove successful. In 1788, North Carolina also moved by passing "An Act to establish a company for opening the Navigation of the Catawba Rivers," from the South Carolina line (approximately R.M. 154) "as far up both branches of the Catawba Rivers as may be found practicable, by means of canals, dams, and locks." (14) Eight years later, the North Carolina General Assembly repealed its 1788 act because "the Company" had failed to live up to the terms of the act, having removed no obstructions and constructed no dams, locks, canals, or done anything to make the Catawba navigable. (15)

Such failure notwithstanding, in 1801 North Carolina passed still another "Act to improve the Navigation of the Catawba River, from the

South Carolina line, as far up as the same may be practicable." (16) This new company, so vested and styled the "North Carolina Catawba Company," could announce by 1808 that it had "fully complied with the regulations of the act," and had made considerable progress "in rendering said river navigable." (17) Still other acts for navigational improvement followed in 1816 and in 1849. (18) Nearly fifty years later, an act of 1897 sought "to keep the Catawba River open as a highway for floatage," and noted that "certain portions of the Catawba River and Johns River are floatable streams and navigable highways for the purpose of floatage." (19)

These various acts indicate the efforts of both Carolinas to create a system of inland navigation, a project which enjoyed its prosperity in the first three decades of the 19th Century. Ulrich B. Phillips, a historian, noted in 1824 that some \$1,780 was spent on the Catawba Canal. (20) Yet the job of making the Catawba a navigable stream could not have been an easy one. When South Carolina's Civil and Military Engineer, John Wilson, examined the stream in 1818, he noted that "The navigation of the Catawba River, above Wateree Creek, is obstructed by rapids and falls, and will require extensive works to render it navigable." He also indicated that "The importance of this river to the trade of the interior will warrant any expense," and that the "state of North Carolina has improved the navigation above the boundary line in the expectation that the works below the line would be carried on with corresponding spirit." (21)

In that "corresponding spirit," South Carolina completed, in 1823, the Catawba Canal. While "boats carrying 40 bales of cotton" apparently plied the river, it was later reported that the Catawba Canal "was little used in consequence of the length of portage at Rocky Mount." (22) But by 1827, the South Carolina General Assembly's committee on internal improvements could announce that the Catawba-Wateree River was navigable "from Camden to the North Carolina line" (R.M. 154). (23) This statement may not have been completely in line with the facts; soon the legislature grew weary of expensive devices to effect a system of navigation which, in fact and all too often, proved non-navigable. Although

Robert Mills and other promoters of the inland navigation scheme had believed that a navigable watercourse could be made of the Catawba all the way from Morganton, N. C. (R.M. 257) down to Charleston, S. C., "the great trade ... predicted ... [had] failed to develop." (24) By 1836, the various canals on the Catawba were in poor condition, and navigation may have ceased by about 1840.

S. T. Albert, a Civil Engineer working for the U. S. Army Corps of Engineers, examined the Catawba thirty-five years later. The act of March 3, 1875 had appropriated funds for Albert's examination. He reported that "The natural obstructions of the river between Old Fort and the [North Carolina-South Carolina] State line are so formidable, that it cannot be navigated in its present unimproved condition." His report further indicated that the Catawba's "trade is consequently nothing, and any future trade which is contingent on its improvement must be confined to timber, iron ore, and agricultural products." (25)

Writing in 1876, Albert was altogether pessimistic about the river's potential for improvement, and was not even sure that the Catawba could be adapted to log rafting and barges. The "Resources of trade," he noted, "are undeveloped." (26) Twelve years later, these views were echoed by Captain W. H. Bixby, Corps of Engineers, who examined the Catawba River and submitted an unfavorable report on the river's potential development for navigation. (27)

In various reports compiled around the end of the 19th Century and in the first two decades of the 20th Century, the Catawba-Wateree was viewed as being navigable as far up as Camden, S. C. (28) Waterborne Commerce of the United States, 1953 contained no listing of interstate commerce for the Catawba, nor did the volume for the year 1975.

Commencing in the second decade of the 20th Century, Duke Power Company constructed a series of dams and lakes on the Catawba River for the production of hydroelectric power. These lakes included Lake Allisons, near Statesville, N. C., and Lake Catawba and Lake James, built in 1919. Other lakes were Lookout Shoals, constructed

in 1915; Mountain Island Lake, built in 1923; and Lakes Hickory and Rhodhiss, built in 1928 and 1924, respectively. (29)

Present

The Catawba River is not currently being used for purposes of waterborne interstate commerce. (30)

During the period 1823 to about 1838, the Catawba River seems to have been navigable from Camden, S. C. (on the Wateree) to Morganton, N. C., if the statements of some of the proponents of inland navigation are to be believed. The period when the Catawba River was navigable was short -- the difficulty of keeping the canals and channels maintained, and the advent of railway transportation, led to the eventual abandonment of the river as an artery for moving commodities.

In 1965, the Catawba was described as follows: "Trib. of Wateree River. Non-navigable." (31)

Future Potential

Comprehensive analysis of the regional economics (income, education, employment, community facilities, transportation systems, and similar factors), which would indicate growth patterns and the services needed to sustain various types of industrial and commercial activities, is beyond the scope of this study. Thus, the potential use of the Catawba River and its tributaries for interstate commerce in future years is difficult to predict.

The river has the potential to be utilized for interstate shipment of goods since it flows through two states and is also connected with the Santee-Cooper River system. However, future potential interstate commerce is not anticipated to be significant due in part to heavy dependence by industrial and commercial establishments on other forms of transportation including the interstate highway system, railroads, and air transport, as well as physical limitations imposed by the river channel and man-made structures crossing the river.

SECTION 5 - LEGAL AUTHORITY

General

This section presents information pertaining to the legal aspects of the navigability investigation. Such Federal and state court decisions as apply to the specific basin reported on herein are outlined. The Summary Report presents more complete documentation and references to the court cases dealing with navigation classifications and legal jurisdiction.

Navigability Interpretations

The term "navigable waters of the U. S." is used to define the scope and extent of the regulatory powers of the Federal government. Precise definitions of "navigable waters" or "navigability" are ultimately dependent on judicial interpretation, and are not made conclusively by administrative agencies.

Definitions of "navigability" are used for a wide variety of purposes and vary substantially between Federal and state courts. Primary emphasis must therefore be given to the tests of navigability which are used by the Federal courts to delineate Federal powers. Statements made by state courts, if in reference to state tests of navigability, are not authoritative for Federal purposes.

Federal courts may recognize variations in definition of navigability or its application where different Federal powers are under consideration. For instance, some tests of navigability may include:

1. Questions of title to beds underlying navigable waters.
2. Admiralty jurisdiction.
3. Federal regulatory powers.

This study is concerned with Federal regulatory powers. Unfortunately, courts often fail to distinguish between the tests, and instead rely on precedents which may be inapplicable. Thus, a finding that waters are "navigable" in a question dealing with land title may have a somewhat different meaning than "navigable waters of the U. S." which pertains to Federal regulatory functions.

In this study, the term "navigable waters of the U. S." is used to define the extent and scope of certain regulatory powers of the Federal government (River and Harbor Act); this is distinguished from the term "navigable waters" which refers to other Federal regulatory powers (Section 404 of PL 92-500).

Administratively, "navigable waters of the U. S." are determined by the Chief of Engineers and they may include waters that have been used in the past, are now used, or are susceptible to use as a means to transport interstate commerce landward to their ordinary high water mark and up to the head of navigation. "Navigable waters of the U. S." are also waters subject to the ebb and flow of the tide shoreward to their mean high water mark. These waters are deemed subject to a Federal "navigation servitude". The term "navigable waters of the U. S." defines the more restricted jurisdiction which pertains to the River and Harbor Acts -- particularly the one of 1899 which specifically defined certain regulatory functions for the Corps of Engineers.

In contrast, the term "navigable waters" defines the new broader jurisdiction with respect to Section 404 of the Federal Water Pollution Control Act Amendments of 1972. Accordingly, "navigable waters" not only include those waters subject to the navigation servitude, but adjacent or contiguous wetlands, tributaries, and other waters, as more fully defined in revised Corps of Engineers Regulations.

Although this navigability study covers both "navigable waters of the U. S." and "navigable waters", the analysis of judicial interpretation has only focused upon determining "navigable waters of the U. S." to the head of navigation. Due to common usages in court cases, the terms "navigability" and "navigable waters" may herein appear interchangeably with the term "navigable waters of the U. S." However, the summary of court cases is directed at the Federal regulatory jurisdiction of the River and Harbor Acts, and not necessarily regulatory jurisdiction under the Federal Water Pollution Control Act.

General Federal Court Cases

Powers of the Federal government over navigable waters stem from the Commerce Clause of the U. S. Constitution (Art. I, §8). Pursuant

to its powers under the Commerce Clause, Congress enacted the River and Harbor Act of 1899 which particularly specifies regulatory powers of the Federal government in "navigable waters of the U. S."

The well-established Federal test of navigability is whether a body of water is used or is capable of being used in conjunction with other bodies of water to form a continuous highway upon which commerce with other states or countries might be conducted.

Several Federal court decisions make it clear that a waterway which was navigable in its natural or improved state retains its character as "navigable in law" even though it is not presently used for commerce. The test of navigability is not whether the particular body of water is in fact being used for any form of commerce but whether it has the capacity for being used for some type of commerce. Several cases substantiate this (see the Summary Report for details on the court decisions).

The ebb and flow of the tide is another test which remains a constant rule of navigability in tidal areas, even though it has sometimes been disfavored as a test of Federal jurisdiction. Several cases note that ebb and flow should not be the sole criterion of navigability, but that extension of Federal jurisdiction into the major non-tidal inland waters is possible by an examination of the waters "navigable character". The ebb and flow test, however, remains valid as a rule of navigability in tidal areas; it is merely no longer a restriction for non-tidal areas. For bays and estuaries, this extends to the entire surface and bed of all waterbodies subject to tidal action, even though portions of the waterbody may be extremely shallow or obstructed by shoals, vegetation, or other barriers as long as such obstructions are seaward of the mean high tidal water line. Marshlands and similar areas are thus considered "navigable in law" insofar as they are subject to inundation by the mean high waters. The relevant test is therefore the presence of the mean high tidal waters. Navigable waters are considered navigable laterally over the entire surface regardless of depth.

Another factor relevant to navigability determinations is land title. Whatever title a party may claim under state law, the private ownership of the underlying lands has no bearing on the existence or

extent of the dominant Federal jurisdiction over "navigable waters of the U. S." Ownership of a river or lake bed will vary according to state law; however, the Supreme Court has consistently held that title to the bottomlands is subordinate to the public right of navigation.

Specific Federal Court Cases

Navigability, in the sense of actual usability for navigation or as a legal concept embracing both public and private interests, is not defined or determined by a precise formula which fits every type of stream or body of water under all circumstances and at all times. A general definition or test which has been formulated for Federal purposes is that rivers or other bodies of water are navigable when they are used, or are susceptible of being used, in their ordinary condition as highways for commerce over which trade and travel are or may be conducted in the customary modes of trade and travel on water.

The question of navigability of water when asserted under the Constitution of the U. S., as is the case with "navigable waters of the U. S.", is necessarily a question of Federal law to be determined according to the general rule recognized and applied in the Federal courts.

A review of legal documentation indicates two Federal court decisions which apply to navigation in the Catawba River basin. (6) These cases are briefly summarized below.

In Re Houser's Petition* - The court found that the Catawba River "... is not in any sense considered to be a navigable stream by any authority of the United States above Catawba Dam [mile 138.5] ... (and that) preferably a fair determination would be that it in no way is considered as navigable other than below Camden, South Carolina [mile 67]**. However, the court failed to apply the usual tests of navigability set forth by the various Supreme Court decisions in reaching this position. Instead, the court's basis for the holding was that it "is a human impossibility" to presently traverse the waters in a boat.

* 227 F. Supp. 81 (W.D.N.C. 1964).

** Below R.M. 76.1 the Catawba River becomes the Wateree River.

The legal and factual context in which this decision was entered should also be noted. The petitioner in this case sought to invoke the Admiralty jurisdiction so as to limit his potential liability with respect to a boat accident his craft was involved in and which was the subject of the lawsuit. This invocation was dependent on a judicial determination that the waterway in question was a "navigable water of the U. S.", which determination was not forthcoming. The question thus presented is, would a court confronted with the question of whether or not the same area was a "navigable water of the U. S." in a case where the United States was asserting regulatory jurisdiction, pursuant to the Commerce Clause, be bound by the holding in this case? It is submitted that, although the holding would be accorded great weight, the purposes embodied in the Admiralty Acts vis a vis those of 33 U.S.C. 403 are so manifestly dissimilar that a court could feel justified in handing down two rulings seemingly inconsistent, which rulings would have two different bases, one stemming from admiralty jurisdiction, the other from the regulatory power of the United States pursuant to the Commerce Clause.

Additionally, as a practical matter, although the decision held that the Catawba is not navigable above mile 138.5, the facts of the case concerned Lake Hickory, which, at mile 222, is some 58.5 river miles above the furthest limit of navigability, as set out in the 1975 opinion by OCE.

United States v. Mecklenburg Abattoir and Locker Plant, Inc.* - The U. S. District Court for the Western District of North Carolina, the same court which decided the Houser case, supra, held in this case that the Catawba River "is a 'navigable water of the U. S.' descending to the Sea". The basis for this holding was not set out, inasmuch as no formal opinion was entered, only a Judgment and Commitment. However, in light of the Houser Court's finding of non-navigability having been based on a strictly factual examination of whether the river was then navigable in fact, instead of the Supreme Court's test of past, present, or future possibility of navigability, it is more than likely that the

* (W.D.N.C. 1975).

Mecklenburg Court took this opportunity to re-evaluate the Houser decision, at least insofar as regulatory jurisdiction is concerned, and employed in this re-evaluation the standard tests of navigability that a water is a "navigable water of the U. S." if it was used in the past, is presently used, or is susceptible to use in the future as an instrument to transport interstate commerce. Especially important is the legal contest in which this case arose. Unlike the Houser case, which concerned navigability for admiralty jurisdiction, this case was an action by the United States against the defendant for violation of 33 U.S.C. 407, and as such is directly concerned with navigability for regulatory jurisdiction. Consequently, the Mecklenburg decision may be interpreted as reversing the Houser case, at least as to navigability for regulatory jurisdiction, and is thus consonant with the 1975 opinion by OCE which states that the Catawba River is a "navigable water of the U. S." from mile 163.5 to the sea.

South Carolina State Court Cases

The current South Carolina legislative enactment defining navigability and requiring freedom from obstruction may be found in Section 70-1 of the South Carolina Code of Laws. This Section essentially provides that all streams which can float rafts of lumber or timber are considered navigable by state law.

Many of the South Carolina state cases reported are primarily concerned with state ownership questions. While the majority of states actually own their streams and exercise control over their navigable waters, the ultimate authority has been granted to the Federal government by the Commerce Clause of the Constitution. The general rule, then, is that the states both own and control the navigable streams within their borders, subject to exercise of the superior right of control by the U. S. Although case histories show that state and Federal concepts of navigability do not always agree, when Federal interests are at stake, the Federal test will govern.

There are exceptions, however, to the "overwhelming majority rule of state ownership of lands beneath navigable waters," and South Carolina is in the minority. In the minority states, it was considered that property rights were vested at the time of independence from England and that the state took title only to tidal-navigable streams while riparian owners took title to all stream beds, both navigable and non-navigable, if non-tidal. Even in the minority states, however, the private ownership of the bed will not affect the rights of the public to the use of navigable waters.

A review of legal documentation indicates two South Carolina state court decisions which apply to navigation in the Catawba River basin. (6) These cases are briefly summarized below.

Jackson v. Lewis* - In this case dealing with the Catawba River, the South Carolina Supreme Court was asked and refused to decide whether there could be private ownership in the bed of a navigable stream and whether a stream could be navigable in part and non-navigable at the edge. The plaintiff had a "fishing stand" located between an island and the west bank of the Catawba River, a portion "never used for boating". He also claimed title to the land on both banks. The defendant also claimed both banks and destroyed the fishing stand. The trial court felt that it was immaterial whether the part of the river in question was navigable or not and let the case go to the jury, reserving the question of whether there could be ownership of the bed, i.e., the fishing stand. The jury found for the plaintiff since he had better title to the banks. In refusing to answer the question reserved to it, the Supreme Court held that, if the plaintiff's grant extended to the bed of the stream, he had exclusive fishing rights and, if it did not, he had the public right to fish; and in neither event could the defendant interfere.

McCullough v. Wall** - This was a fishing stand case in the Catawba River. In upholding a five dollar verdict for trespass by the defendant, the court at great length reviewed the navigability-

* Cheves 259 (S. C. 1840).

** 4 Rich 68, 53 Am. Doc. 715 (S. C. 1850).

property problem without appreciably clarifying it. The narrow question before the court was whether the plaintiff had valid title to a rock in the river trespassed upon by the defendant. The plaintiff's claim stemmed from his alleged title in one bank. The defendant, of course, claimed that the river was navigable which negated any title to rocks or the bed of the river and gave him the right to fish, as a member of the public, from any place in the river, rock or otherwise. The thrust of the defendant's argument was that the legislature, beginning in 1795, had declared that the river "be made navigable" and that it had been. Without necessarily agreeing that it had, the court found that the plaintiff's right to the bed accrued under a grant of 1772 and that the jury had found as a fact that the river was not then navigable and so any legislation as to improving navigation would be ineffective to alter title to the bed. The court stated:

"By the common law, only those rivers were deemed navigable in which the tide ebbs and flows: and 'grants of land bounded on rivers ... above tide water, carry the exclusive right and title of the grantee to the centre of the stream ... and the public, in cases where the river is navigable for boats and rafts, have an easement therein, or a right of passage as a public highway.'"

It is noted that the court also said:

"The occasion does not require any exact definition to be now given of a navigable river, according to the law of this State, in which the ownership of the soil shall not belong to the riparian proprietors; perhaps the principal occasion of dispute on the subject has been the use of the term navigable, which has a popular signification different from the technical one which is given to it by the common law."

Accordingly, the case found that the common law definition of navigable rivers (those in which the tide ebbs and flows) had not been changed by any authoritative decision in the state. Under the case, the courts were not likely to extend the rules which applied to rivers technically navigable, to any rivers above the falls which naturally obstructed any serviceable use of the water for transportation; above the falls, at any rate, the common law, as to the ownership of the soil, and the right of fishing incident thereto, subsisted unchanged.

North Carolina State Court Cases

The issue of navigability has arisen in a number of actions in the state courts of North Carolina. However, most of these cases concern coastal areas not within the boundary of the Charleston District.

Basically, the English common-law rule that streams are navigable only as far as tidewater extends is not the rule in North Carolina. Thus, unlike South Carolina as discussed previously, North Carolina conforms to the majority rule within the U. S.

A review of legal documentation indicates one North Carolina state court decision which applies to navigation in the Catawba River basin. (6) This case is briefly summarized below.

Commissioners of Burke County v. Catawba Lumber Co.* - This case dealing with the Catawba and Johns Rivers held that the river was a floatable stream, in which the public had an easement, the reasonable use of which was paramount to the rights of riparian owners. The case also held that floatable rivers are navigable highways, in which the public has an easement paramount to the rights of riparian owners; and, in order to establish such easement, it is unnecessary to show that the river is susceptible to use continuously during the whole year, but it is sufficient if it appears that businessmen may calculate that, with tolerable regularity as to seasons, the water will rise and remain at such height as will enable them to make it profitable as a highway for transporting logs to mills or markets lower down.

Recent Federal Litigation

A review of recent Federal regulatory litigation concerning the Charleston District reveals no court actions pertaining to the Catawba River basin.

Federal Agency Jurisdiction

The delineation of "navigable waters of the U. S.", as discussed earlier, in essence, defines the Federal navigation servitude and is

* 116 N. C. 731, 21 S. E. 941 (1895).

applicable to Federal jurisdiction generally (not merely applicable to the Corps of Engineers). No matter which Federal agency or activity may be involved, the assertion of "navigability" ("navigable waters of the U. S.") arises under the U. S. Constitution, or under application of Federal statute.

By virtue of the Commerce Clause of the Federal Constitution, and the clause empowering Congress to make all laws necessary to carry into execution the Federal judicial power in admiralty and maritime matters, "navigable waters of the U. S." are under the control of Congress, which has the power to legislate with respect thereto. It is for Congress to determine when and to what extent its power shall be brought into activity. It may be exercised through general or special laws, by Congressional enactments, or by delegation of authority.

Thus, Congress has power which is paramount to that of the states to make improvements in the navigable streams of the U. S. and for this purpose to determine and declare what waters are navigable. The Federal government also has the power to regulate the use of, and navigation on, navigable waters.

The above presents the basis upon which Federal jurisdiction in "navigable waters of the U. S." is established. The basic definition or jurisdictional concept of "navigable waters of the U. S." remains consistent, irrespective of which department or office of the Federal government may be delegated particular responsibility. For instance, the safety, inspection, and marine working functions of the U. S. Coast Guard embrace vessel traffic within "navigable waters of the U. S." as previously defined.

With specific reference to agency regulation of construction or work within "navigable waters of the U. S.", other than by the Corps of Engineers, the Department of Transportation Act of 15 October 1966 (PL 89-670) transferred to and vested in the Secretary of Transportation, certain functions, powers, and duties previously vested in the Secretary of the Army and the Chief of Engineers. By delegation of authority from the Secretary of Transportation, the Commandant, U. S. Coast Guard,

has been authorized to exercise certain of these functions, powers, and duties relating to the location and clearances of bridges and causeways in the "navigable waters of the U. S."

An additional agency of particular interest concerning work or construction within "navigable waters of the U. S." is the Federal Power Commission. The Federal Power Act, Title 16, United States Code, Sections 791 et. seq., contemplates the construction and operation of water power projects on navigable waters in pursuance of licenses granted by the Federal Power Commission. The statute was enacted to develop, conserve, and utilize the navigation and water power resources of the nation. The act provides for the improvement of navigation, development of water power, and use of public lands to make progress with the development of the water power resources of the nation.

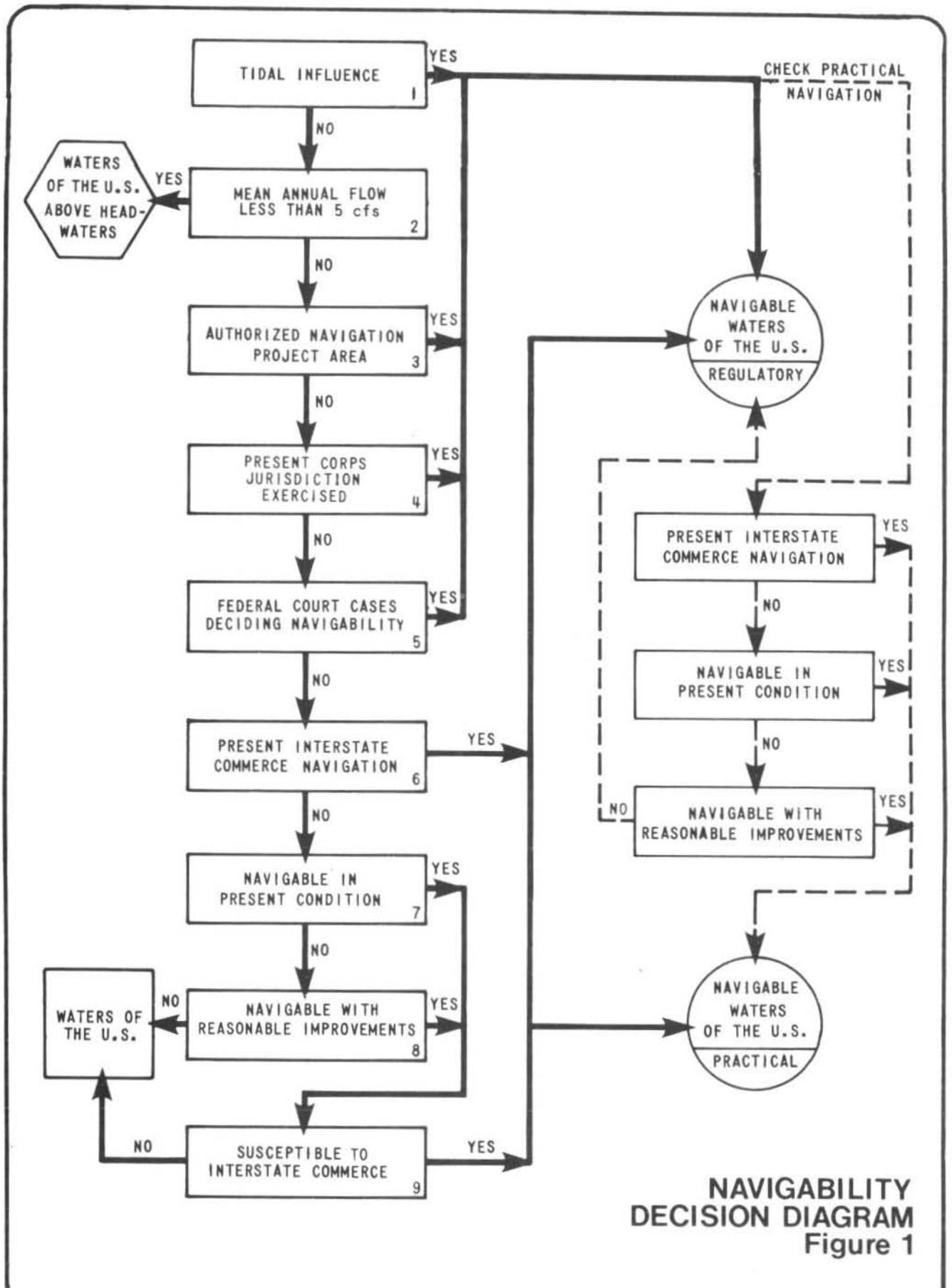
SECTION 6 - NAVIGATION OBSTRUCTIONS AND CLASSIFICATIONS

Navigation Classification Procedures

As noted in Section 5, definition of navigability is not subject to a single precise formula which applies to every circumstance. Many factors including stream physical characteristics (depth, width, flow, slope, etc.), presence of obstructions, court decisions, authorized navigation projects, potential for reasonable improvements, and susceptibility of a stream to interstate commerce activities, play a role in the decision-making process for classifying waterbodies in the Charleston District. In an effort to make the analytical process concerning stream classifications as systematic as possible, a "Navigability Decision Diagram" has been developed and is presented in Figure 1. This diagram has been utilized as a guide in assessing the various navigation classifications for streams in the Charleston District. The Summary Report includes a detailed presentation on the methodology and approaches used in the analysis; however, the following presents a brief synopsis of the techniques as indicated in Figure 1.

Tidal Influenced Areas - Tidal areas (see Item 1 in Figure 1) which are affected by mean high water are classified "navigable waters of the U. S." according to various legislative and judicial actions. The "navigable waters of the U. S." are subject to regulatory jurisdiction by the Corps of Engineers and other agencies. Even though all tidal areas are so classified and subject to regulatory procedures, many are not practically navigable based upon past and/or present requirements for vessels. Figure 1 shows that some additional "check" analyses are necessary to distinguish those tidal waters which are actually capable of practical navigation. Investigation of the tidal areas is beyond the scope of this study; however, drawings showing the "plan" of major rivers to their mouth, often tidal influenced, are presented in the interest of continuity.

Waters of the U. S. Above Headwaters - Section 404 of PL 92-500 considers the headwaters of waterbodies to be the point at which the mean annual flow is five cfs. Waterbodies or portions of waterbodies



**NAVIGABILITY
DECISION DIAGRAM
Figure 1**

located upstream of the headwaters are nationally permitted by law and will not require an individual application for dredge or fill discharge permits provided the proposed work will meet certain conditions.

However, these waters are classified "waters of the U. S." and are within Corps of Engineers jurisdiction as applicable to Section 404. Item 2 in Figure 1 shows the testing procedure for the five cfs point.

Authorized Navigation Project Area - Any streams which currently have authorized Federal projects to aid navigation are classified as "navigable waters of the U. S." (Item 3 in Figure 1). Many of the projects thus authorized were based upon conditions which are not currently applicable (for example, use of pole boats or steamboats for justifying the navigation benefits). Consequently, many of the streams having older authorized projects will not allow passage of present-day commercial navigation vessels without some additional improvement. Thus, some portions of the authorized project areas are not considered practical for navigation. Figure 1 shows the additional "check" procedure which has been followed to assess the practical limit of "navigable waters of the U. S."

Present Corps Jurisdiction Exercised - The Corps of Engineers is exercising jurisdiction on several non-tidal waterbodies which are not covered by authorized projects (Item 4 in Figure 1). (31) Determinations previously made on these waterbodies under the River and Harbor Act indicated use for interstate commerce and hence the current classification as "navigable waters of the U. S." Some of these streams are not currently navigable by present-day commercial vessels and thus have practical limits. Figure 1 shows the "check" used to assess the practical limits of "navigable waters of the U. S."

Federal Court Decisions - As noted in Section 5, Federal case law is the predominant indicator which is to be used for establishing Federal jurisdiction over waterbodies in the Charleston District (Item 5 in Figure 1). Several decisions have been rendered which classify certain streams in the district as "navigable waters of the U. S." However, some of these court decisions have been arrived at under different circumstances or without the benefit of the data developed as a part of this investigation. Therefore, even though some of the

streams are classified by judicial review as "navigable waters of the U. S.", they are not practical for navigation with present-day vessels. Figure 1 shows the steps necessary to "check" those portions of the "navigable waters of the U. S." which are capable of practical navigation.

Present Interstate Commerce Navigation - Any rivers currently involved in interstate commerce activities are classified as "navigable waters of the U. S." from both the regulatory and practical standpoint (see Item 6 in Figure 1).

Waters of the U. S. Below Headwaters - For those streams, or portions of streams, not subject to authorized projects, court cases, or present interstate commerce navigation, several additional tests for determining navigability are required (Items 7 and 8 in Figure 1). If the waterbody is not judged to be navigable in its present state or with reasonable improvements, then it is beyond the limit of "navigable waters of the U. S." and is termed "waters of the U. S." over the remaining length. These "waters of the U. S." (as well as the "navigable waters of the U. S.") up to the headwaters (five cfs points) of the streams are subject to jurisdiction under Section 404 of PL 92-500. A general or individual permit is required for discharge of dredged or fill material below the headwaters (five cfs point) of "waters of the U. S." Discharges above the headwaters are discussed in the previous subsection, "Waters of the U. S. Above Headwaters."

Interstate Commerce - Some non-tidal waters in the district are not now subject to authorized projects, court decisions, or interstate commerce navigation, but can be navigated under present or reasonably improved conditions. These streams may be considered for classification as "navigable waters of the U. S." if they are susceptible to interstate commerce activities (past, present, or future). A combined judgment considering both "reasonable improvement" factors (Item 8 in Figure 1) and "interstate commerce" factors (Item 9 in Figure 1) has often been utilized in arriving at the conclusions and recommendations concerning navigability of waterbodies in the Charleston District. The Summary Report provides further details on these factors.

Navigation Classification Categories

This study classifies streams into several different categories, each of which is discussed subsequently:

1. Present "navigable waters of the U. S." (by regulatory procedures).
2. Historically navigable waters (based on literature review).
3. Recommended "navigable waters of the U. S." (based upon data developed as a part of this investigation).
4. Recommended waters for practical navigation (within "navigable waters of the U. S.").
5. Headwaters for all waterbodies (five cfs points).

The first four navigation classifications are displayed on the plates presented later in this report. The headwater limits are summarized in Appendix A.

Present Navigable Waters of the U. S.

Currently the Catawba River is classified as "navigable waters of the U. S." to Mountain Island Lake Dam (R.M. 163.5). (6) This classification is based on the Federal court decision presented in Section 5 and includes the entire Wateree River and part of the Catawba River as well as all of the reservoirs located downstream of R.M. 163.5. Plate 16-3 presents the map location. A five-mile discrepancy between river mileage shown on the plate and mileage presented in this section exists. As discussed in the Summary Report, the source of river mileage used for graphical presentation in this study sometimes differs from river mileage referred to in court decisions.

Historically Navigable Waters

As discussed in Section 4, the Catawba River was historically interpreted to be navigable as far as Morganton, North Carolina (R.M. 257). Plate 16-3 presents the map location of this limit.

Recommended Navigable Waters of the U. S.

The recommended limit of "navigable waters of the U. S." on the Catawba River is at Mountain Island Lake Dam (R.M. 163.5). This is the same limit as the present classification and is based on the Federal court decision presented in Section 5 (see Plate 16-3 for map location).

Recommended Practical Navigable Waters of the U. S.

The Catawba River is not recommended to be classified as "practical navigable waters of the U. S." This recommendation is based on the absence of navigable locks or passages through the dams located on the river and the significant magnitude of work required to install these types of facilities. The recommended limit of practical navigation is at Wateree Lake Dam (R.M. 76.1), several miles below the mouth of the Catawba River (see Reports 09 and 18).

Waters of the U. S.

"Waters of the U. S." are considered to be all streams beyond the recommended limits of "navigable waters of the U. S." "Waters of the U. S." with more than five cfs mean annual flow require a permit for discharge of dredged or fill material. "Waters of the U. S." with less than five cfs mean annual flow are nationally permitted by law and will not require an application for dredge or fill discharge permits provided the proposed work will meet certain conditions.

Appendix A lists all the five cfs flow points within the Catawba River basin. Each point is located by stream code, stream name, latitude and longitude, and a mileage reference.

Appendix B lists the lakes located in the Catawba River basin which have surface areas between 10 and 1,000 acres. The lake summary identifies the stream basin code, lake name or owner, county location, and where data is available, the surface area and gross storage.

SECTION 7 - CONCLUSIONS AND RECOMMENDATIONS

Five classifications of navigation on streams in the Catawba River basin have been determined and are presented below. The first two are classifications developed from historical evidence and current Federal stream classifications. Classification 3 is based on field measurements, observations, and data analysis for the river. Classification 4 is based on review of all previously determined limits with a recommendation of the most upstream location with supporting evidence of navigability. The fifth classification accounts for all streams not otherwise classified and was determined based on the drainage area and hydrological aspects of the stream.

1. The Catawba River is presently classified "navigable waters of the U. S." from the upstream end of Fishing Creek Reservoir (R.M. 110) to Mountain Island Lake Dam (R.M. 163.5). The classification from R.M. 0.0 to 110 is "navigable waters of the U. S." as discussed in Reports 09 and 18.
2. Historically the Catawba River has been interpreted to be navigable to Morganton, North Carolina (R.M. 257).
3. The Catawba River is not recommended to be classified as "practical navigable waters of the U. S." due to the significant dam obstructions which would require extensive improvements for river navigation.
4. Based upon a Federal court case, it is recommended that the Catawba River be classified "navigable waters of the U. S." from its mouth (R.M. 110) to Mountain Island Lake Dam (R.M. 163.5). Recommendation for areas downstream of R.M. 110 are given in Reports 09 and 18.
5. All streams not recommended for classification as "navigable waters of the U. S." are recommended for classification as "waters of the U. S." throughout their entire length.

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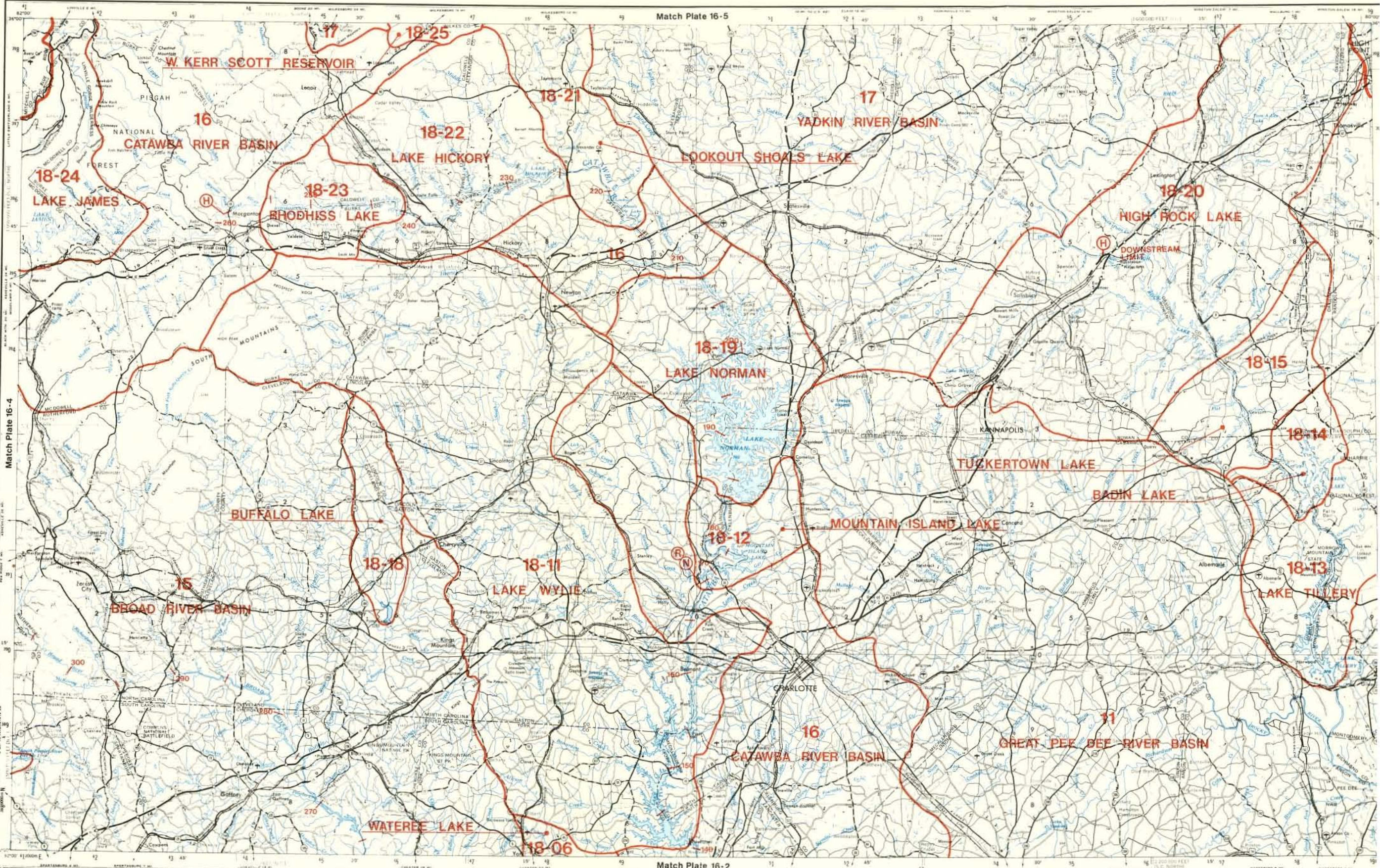
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NEW ORLEANS
CHARLOTTE
CHARLESTON
CHARLESTON
CHARLESTON

USGS BASE MAP
CHARLOTTE, N.C.; S.C.
1953, Revised 1974
NI 17-2



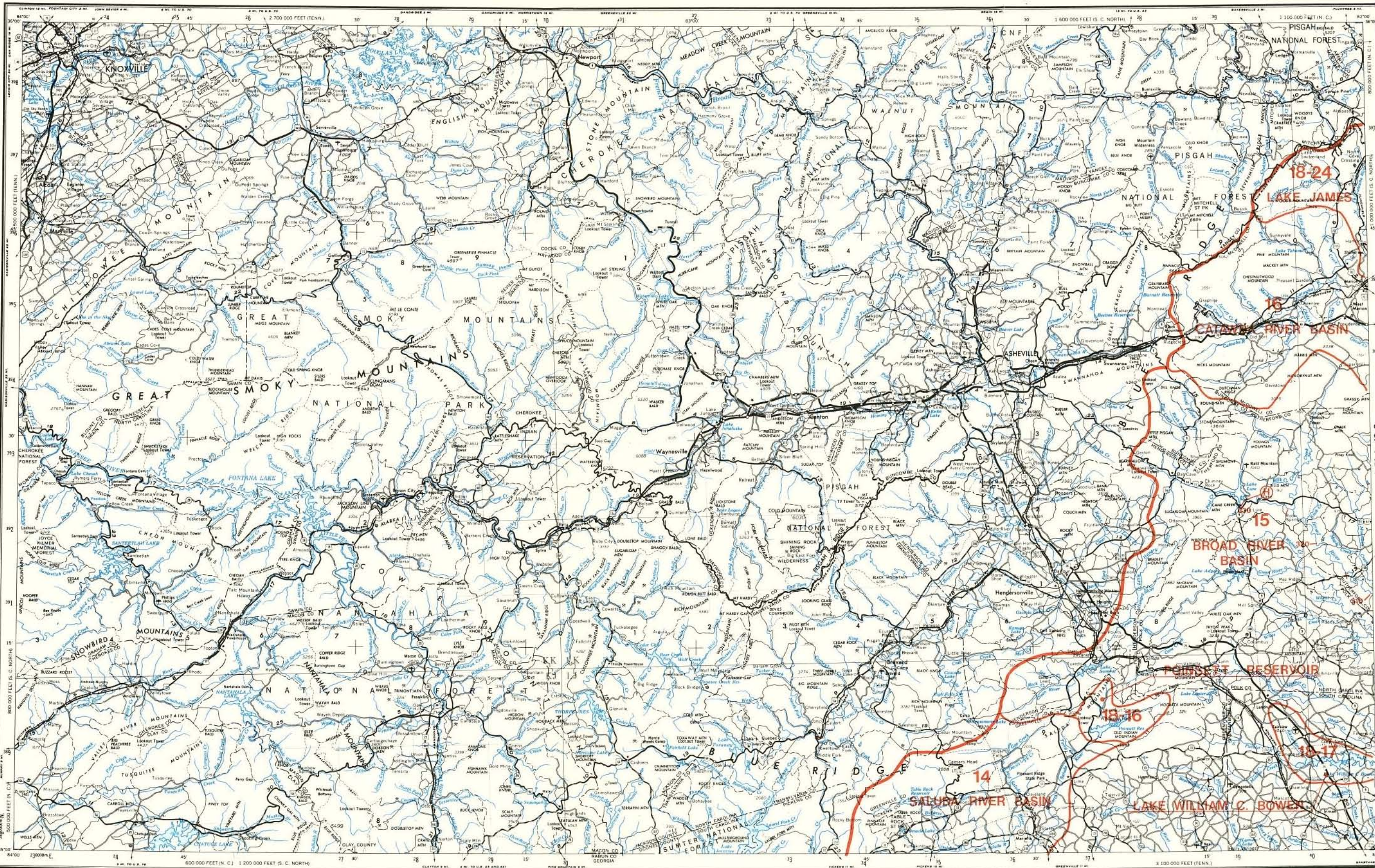
LEGEND:
N PRESENT LIMIT OF NAVIGABLE WATERS OF THE U.S.
H HISTORIC LIMIT OF NAVIGATION
P PRACTICAL LIMIT OF NAVIGATION (RECOMMENDED)
R LIMIT OF NAVIGABLE WATERS OF THE U.S. (RECOMMENDED)
70 RIVER MILE



U.S. ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
Charleston, South Carolina
STANLEY CONSULTANTS

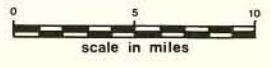
SIGNIFICANT FEATURES
CATAWBA RIVER BASIN
Report No. 11, 15, 16, 17, 18
NAVIGABILITY STUDY
Plate 16-3

1977



NEW ORLEANS CHARLOTTE	
1:50,000	1:50,000
1:100,000	1:100,000
1:250,000	1:250,000
1:500,000	1:500,000
1:1,000,000	1:1,000,000
1:2,000,000	1:2,000,000
1:5,000,000	1:5,000,000
1:10,000,000	1:10,000,000
1:25,000,000	1:25,000,000
1:50,000,000	1:50,000,000
1:100,000,000	1:100,000,000
1:250,000,000	1:250,000,000
1:500,000,000	1:500,000,000
1:1,000,000,000	1:1,000,000,000

USGS BASE MAP
KNOXVILLE, TENN., N.C., S.C.
1957 Revised 1972
NI 17-1



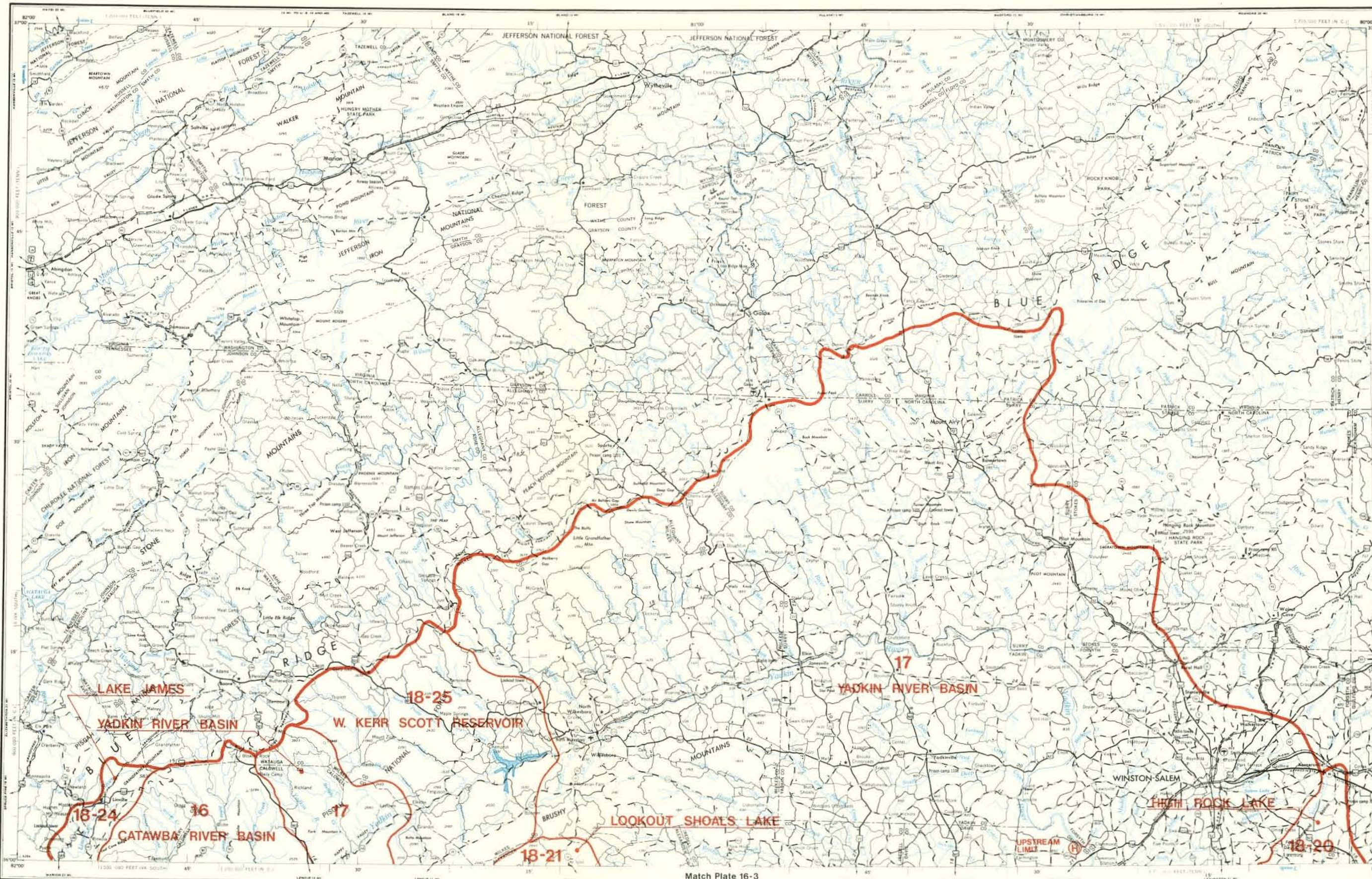
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 - (H) HISTORIC LIMIT OF NAVIGATION
 - (P) PRACTICAL LIMIT OF NAVIGATION (RECOMMENDED)
 - (R) LIMIT OF NAVIGABLE WATERS OF THE U.S. (RECOMMENDED)
 - 20 RIVER MILE



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Charleston, South Carolina
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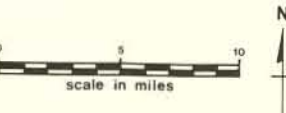
SIGNIFICANT FEATURES
CATAWBA RIVER BASIN
Report No. 14, 15, 16, 18
NAVIGABILITY STUDY
Plate 16-4

1977

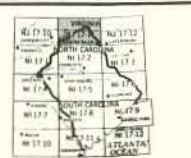


NEW ORLEANS CHARLOTTE CHARLESTON	
1:50,000	Primary, all water, high surface
1:100,000	Secondary, all water, high surface
1:50,000	Left bank, all water, channel surface
1:100,000	Right bank, all water, channel surface
1:50,000	Left bank, all water, channel surface
1:100,000	Right bank, all water, channel surface
1:50,000	Left bank, all water, channel surface
1:100,000	Right bank, all water, channel surface
1:50,000	Left bank, all water, channel surface
1:100,000	Right bank, all water, channel surface

USGS BASE MAP
WINSTON SALEM, N.C.; VA.; TENN.
1953 Revised 1972
NJ-17-11



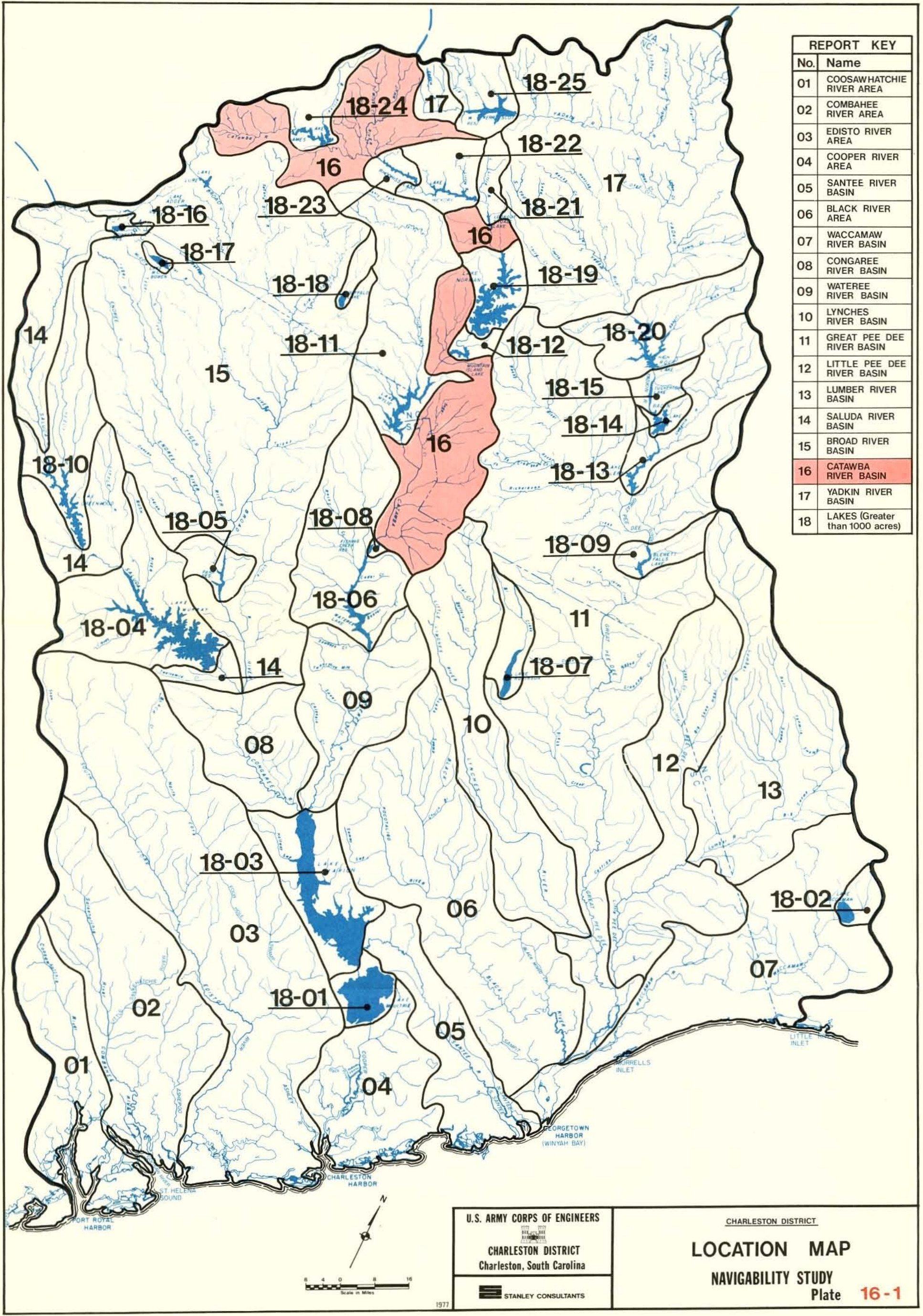
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- (N) PRESENT LIMIT OF NAVIGABLE WATERS OF THE U.S.
 - (H) HISTORIC LIMIT OF NAVIGATION
 - (P) PRACTICAL LIMIT OF NAVIGATION (RECOMMENDED)
 - (R) LIMIT OF NAVIGABLE WATERS OF THE U.S. (RECOMMENDED)
 - 20 RIVER MILE



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SIGNIFICANT FEATURES
CATAWBA RIVER BASIN
Report No. 16, 17, 18
NAVIGABILITY STUDY
Plate 16-5

1977



REPORT KEY	
No.	Name
01	COOSAWHATCHIE RIVER AREA
02	COMBAHEE RIVER AREA
03	EDISTO RIVER AREA
04	COOPER RIVER AREA
05	SANTEE RIVER BASIN
06	BLACK RIVER AREA
07	WACCAMAW RIVER BASIN
08	CONGAREE RIVER BASIN
09	WATEREE RIVER BASIN
10	LYNCHES RIVER BASIN
11	GREAT PEE DEE RIVER BASIN
12	LITTLE PEE DEE RIVER BASIN
13	LUMBER RIVER BASIN
14	SALUDA RIVER BASIN
15	BROAD RIVER BASIN
16	CATAWBA RIVER BASIN
17	YADKIN RIVER BASIN
18	LAKES (Greater than 1000 acres)

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 Charleston, South Carolina
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CHARLESTON DISTRICT
LOCATION MAP
 NAVIGABILITY STUDY
 Plate 16-1

APPENDIX A
STREAM CATALOG

This appendix presents a coded listing of all streams located in the Catawba River basin having a mean annual flow greater than or equal to five cfs. This summary does not include secondary streams in the drainage area for Wateree Lake (18-06), Fishing Creek Reservoir (18-08), Lake Wylie (Lake Catawba) (18-11), Mountain Island Lake (18-12), Lake Norman (18-19), Lookout Shoals Lake (18-21), Lake Hickory (18-22), Rhodhiss Lake (18-23), or Lake James (18-24). These stream codes are presented in Report 18.

In order to provide a sequential stream catalog along the Wateree-Catawba River network, cataloging on the Catawba River has been started at the confluence of Big Wateree Creek and the Catawba River (R.M. 92.0).

The points where flow is approximately equal to five cfs (headwaters) are defined by approximate longitude and latitude, and river miles from the nearest named tributary, major highway, railroad, or other similar reference point. Some streams listed in the tabulation may not have headwater locations identified. This occurs when the name of a stream changes at a confluence where the flow immediately downstream is greater than five cfs. Thus, the headwater locations for streams with more than one name are associated with the appropriate upstream name found on USGS quadrangle maps. Some streams in this appendix listing are also coded in other reports for this study. Cross-references to specific reports are noted.

The coding system shown in the tabulation uses a procedure developed by the Charleston District, Corps of Engineers. Streams are summarized from the mouth of the major river upstream to the report boundary.

USGS data was used to identify the location where the mean annual stream flow is five cfs. Flow records from gaging stations throughout the Charleston District were evaluated and an isoflow map developed to indicate variations in runoff (cfs per square mile). These runoff

values were then applied to the appropriate stream drainage areas (as determined from USGS quadrangle maps) so that a flow of five cfs was approximated.

APPENDIX A
STREAM CATALOG

REPORT NUMBER	STREAM CODE					STREAM NAME	HEADWATER LOCATION (Mean Flow = 5 cfs)					
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER		FIFTH ORDER	LATITUDE (° ' ")	LONGITUDE (° ' ")	STREAM MILES		FROM
										UP	DOWN	
16	01					Catawba River # ##	35 36 25	82 14 45			Confluence-Chestnut Branch	
		01				Rocky Creek #	34 44 35	81 10 20	0.3		S.C. 72 & 121 Highway Bridge	
		02				Fishing Creek #	35 00 45	81 13 00			At U.S. 49 Highway Bridge	
		03				Camp Creek #	34 37 10	80 44 35	1.9		S.C. 19 Secondary Highway Bridge	
		04				Cedar Creek #	34 34 40	80 45 50	2.5		Bell Branch	
		05				Cane Creek	34 50 15	80 39 55	2.7		Booger Branch	
			01			Rum Creek	34 40 55	80 48 25	2.6		Cane Creek	
			02			Bear Creek	34 40 50	80 41 10	2.4		Dry Creek	
				01		Gills Creek	34 43 40	80 39 35	9.7		Bear Creek	
					01	Hannahs Creek	34 43 35	80 45 25	0.5		Gills Creek	
					02	Turkey Quarter Creek	34 40 50	80 44 50	1.8		Bear Creek	
					03	Camp Creek						
					01	North Prong	34 47 00	80 41 05	1.2		Camp Creek	

Dual code in Report 18.

Dual code in Report 09.

APPENDIX A
STREAM CATALOG

REPORT NUMBER	STREAM CODE					STREAM NAME	HEADWATER LOCATION (Mean Flow = 5 cfs)					
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER		FIFTH ORDER	LATITUDE (° ' ")	LONGITUDE (° ' ")	STREAM MILES		FROM
										UP	DOWN	
16	01	06					34 52 55	80 41 15	0.7		N.C. Secondary 1126 Highway Bridge	
		07										
			01					34 54 45	80 48 15			At S.C. 75 Highway Bridge
			02					35 02 15	80 45 50	2.4		Flat Branch
				01				34 57 30	80 48 12	1.2		Long Branch
			03					35 01 50	80 40 40	0.9		N.C. Secondary 1346 Highway Bridge
			04					35 00 05	80 39 50	1.4		Molly Mine Creek
				01				34 56 45	80 44 25	0.7		East Fork-Twelvemile Creek
				02				34 57 00	80 39 40	1.8		N.C. Secondary 1329 Highway Bridge
				03				35 01 50	80 40 40			Confluence-Davis Mine Creek
	08					34 53 55	80 54 30	3.7		Catawba River		

APPENDIX A
STREAM CATALOG

REPORT NUMBER	MAJOR RIVER	STREAM CODE					STREAM NAME	HEADWATER LOCATION (Mean Flow = 5 cfs)				
		PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER	FIFTH ORDER		LATITUDE (° ' '')	LONGITUDE (° ' '')	STREAM MILES		FROM
										UP	DOWN	
16	01	09				Sugar Creek						
			01			Steele Creek	35 07 00	80 57 10	1.6			Walker Branch
			02			McAlpine Creek	35 10 55	80 43 00	2.0			U.S. 74 Highway Bridge
				01		McMullen Creek	35 08 50	80 48 50	0.6			Sharon View Road
				02		Fourmile Creek	35 06 00	80 44 25	2.3			N.C. 16 Highway Bridge
				03		Irwins Creek	35 09 45	80 41 55	0.2			N.C. Secondary 3143 Highway Bridge
				04		Campbell Creek	35 10 45	80 44 10	1.3			McAlpine Creek
			03			Little Sugar Creek	35 15 00	80 48 35	0.4			Southern Railroad Bridge
				01		Brier Creek	35 14 10	80 46 20	2.4			U.S. 74 Highway Bridge
				04		Coffey Creek	35 10 45	80 56 15				Confluence-Eagle Lake
				05		Taggart Creek	35 12 05	80 55 15	0.8			Sugar Creek

APPENDIX A
STREAM CATALOG

REPORT NUMBER	STREAM CODE						STREAM NAME	HEADWATER LOCATION (Mean Flow = 5 cfs)				
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER	FIFTH ORDER		LATITUDE (° ' '')	LONGITUDE (° ' '')	STREAM MILES		FROM
										UP	DOWN	
16	01	09	06				Irwin Creek	35 15 45	80 50 10	0.1		U.S. 21 Highway Bridge
				01			Stewart Creek	35 15 15	80 51 55	0.1		Seaboard Coast Line Railroad Bridge
		10					Burgis Creek	35 56 20	80 54 35	0.9		Catawba River
		11					Manchester Creek	35 56 50	80 58 20	1.6		Catawba River
		12					Big Dutchman Creek	35 00 00	81 02 15	1.8		Little Dutchman Cr
			01				Little Dutchman Creek	34 58 40	81 01 00	0.4		Big Dutchman Creek
		13					Allison Creek #	35 05 15	81 14 50	1.5		Morris Branch
		14					Crowders Creek #	35 14 30	81 17 25	2.2		Abernethy Creek
		15					Mill Creek #	35 07 15	81 05 05	0.2		N.C. 274 Highway Bridge
		16					Catawba Creek #	35 14 00	81 08 45			Confluence-Shoal Br
		17					South Fork Catawba R #					
		18					Paw Creek #	35 15 35	80 56 20	2.4		U.S. 85 Highway Bridge
		19					Long Creek	35 21 40	80 51 50			Confluence-Dixon Br

16-A6

Dual code in Report 18.

APPENDIX A
STREAM CATALOG

REPORT NUMBER	STREAM CODE					STREAM NAME	HEADWATER LOCATION (Mean Flow = 5 cfs)					
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER		FIFTH ORDER	LATITUDE (° ' ")	LONGITUDE (° ' ")	STREAM MILES		FROM
										UP	DOWN	
16	01	20				Dutchmans Creek						
			01			Stanley Creek	35 22 00	80 04 25	1.4			N.C. Secondary 1918 Highway Bridge
			02			Killian Creek	35 31 10	81 03 05	0.2			N.C. Secondary 1373 Highway Bridge
				01		Forney Creek	35 28 15	81 00 45	1.6			N.C. 73 Highway Bridge
				02		Anderson Creek						
					01	Ballard Creek	35 30 25	80 05 35	0.5			N.C. Secondary 1373 Highway Bridge
					03	Wingate Creek	35 30 50	80 04 20				Confluence-Wilkinson Creek
			03			Leepers Creek						
				01		Lippard Creek	35 33 05	81 08 15	1.3			N.C. Secondary 1343 Highway Bridge
		21				Johnson Creek #	35 24 15	80 59 10	1.1			Seaboard Coast Line Railroad Bridge
		22				McDowell Creek #	35 26 45	80 52 45	2.9			Torrence Creek

16-A7

Dual code in Report 18.

APPENDIX A
STREAM CATALOG

REPORT NUMBER	STREAM CODE					STREAM NAME	HEADWATER LOCATION (Mean Flow = 5 cfs)					
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER		FIFTH ORDER	LATITUDE (° ' ")	LONGITUDE (° ' ")	STREAM MILES		FROM
										UP	DOWN	
16	01	23										
		24				Mountain Creek #						
		25				Balls Creek #	35 39 55	81 05 50	0.3			Murrays Mill Lake
		26				Norwood Creek #	35 41 15	80 56 45				Confluence-Powder Spring Branch
		27				Buffalo Shoals Creek	35 46 50	81 03 45	0.1			N.C. Secondary 1526 Highway Bridge
						Lyle Creek	35 43 40	81 14 50				Confluence-Herman Br
			01			McLin Creek	35 40 20	81 09 55	1.8			Long Creek
				01		Hagan Fork	35 40 35	81 08 05	0.2			N.C. 10 Highway Bridge
				02		Mull Creek	35 43 50	81 08 50	0.8			Lyle Creek
				03		Bakers Creek	35 45 35	81 11 10	1.3			Lyle Creek
				04		Unnamed Tributary	35 44 30	81 11 50	0.5			Lyle Creek
		28				Elk Shoal Creek #	35 47 45	81 08 20				Confluence-Dellinger Creek
		29				Lower Little River #	35 59 45	81 14 05				Confluence-East Prong
		30				Elks Shoals Creek #	35 49 55	81 04 50	0.2			Guys Branch

Dual code in Report 18.

APPENDIX A
STREAM CATALOG

REPORT NUMBER	STREAM CODE					STREAM NAME	HEADWATER LOCATION (Mean Flow = 5 cfs)					
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER		FIFTH ORDER	LATITUDE (° ' '')	LONGITUDE (° ' '')	STREAM MILES		FROM
										UP	DOWN	
16	01	31				Horseford Creek #	35 44 55	81 21 40			Confluence-Frye & Cripple Creeks	
		32				Drowning Creek #	35 44 45	81 27 45	1.6		N.C. Secondary 1621 Highway Bridge	
		33				Gunpowder Creek #	35 51 50	81 29 50	0.2		Angley Creek	
		34				Upper Little River #	35 54 20	81 26 05			Confluence-McRary Cr	
		35				Middle Little River #						
		36				Island Creek #	35 45 50	81 30 45	1.6		Catawba River	
		37				Hoyle Creek #	35 45 15	81 32 30			Confluence-Micol Cr	
		38				McGalliard Creek #	35 44 55	81 35 00			Confluence-Double Br	
		39				Howard Creek #	35 46 20	81 35 10			Confluence-Secrets Creek	
		40				Lower Creek #	35 56 45	81 28 30	2.3		N.C. 90 Highway Bridge	
		41				Smokey Creek #	35 49 05	81 35 10	4.2		Catawba River	
		42				Stafford Creek #	35 47 40	81 33 10	1.4		Catawba River	
		43				Freemason Creek #	35 47 55	81 30 00	2.0		Catawba River	

16-A9

Dual code in Report 18.

APPENDIX A
STREAM CATALOG

REPORT NUMBER	STREAM CODE						STREAM NAME	HEADWATER LOCATION (Mean Flow = 5 cfs)							
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER	FIFTH ORDER		LATITUDE (° ' ")	LONGITUDE (° ' ")	STREAM MILES		FROM			
										UP	DOWN				
16	01	44	01				Johns River	36 05 40	81 41 00			Confluence-Honey Br			
							Parks Creek	35 52 40	81 44 30			Confluence-Carroll Cr			
							Wilson Creek	36 04 15	81 47 20			Confluence-Little Wilson Creek			
						01				Harper Creek	35 59 00	81 49 35	2.3		Confluence-Hull Br
										North Harper Creek	36 00 00	81 49 30			Harper Creek
										Estes Mill Creek	35 59 25	81 45 40			Confluence-Thorps Cr
						03				Lost Cove Creek	36 01 45	81 50 30			Confluence-Sassafras Creek
										Rockhouse Creek	36 01 30	81 46 50			1.5
									02	Gragg Prong-Lost Cove Creek	36 02 10	81 48 30			Confluence-Webb Cr
						03				Andrews Creek	36 03 55	81 47 40	0.5		Wilson Creek
										Mulberry Creek	36 03 15	81 38 45			Confluence-Amos Cr
										Little Mulberry Creek	35 58 45	81 36 55			Confluence-Spencer Branch
			02				Boone Fork-Mulberry Cr	36 00 30	81 37 45			Confluence-Laurel Fork			

16-A10

APPENDIX A
STREAM CATALOG

REPORT NUMBER	STREAM CODE						STREAM NAME	HEADWATER LOCATION (Mean Flow = 5 cfs)				
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER	FIFTH ORDER		LATITUDE (° ' ")	LONGITUDE (° ' ")	STREAM MILES		FROM
										UP	DOWN	
16	01	44	04				Gragg Prong-Johns River					
				01			Anthony Creek	36 04 05	81 44 35	0.7		Big Branch
				02			Racket Creek	36 06 20	81 44 50			Confluence-Ballew Cr & White Spring Br
			05				Thunderhole Creek	36 06 35	81 41 50			Confluence-China Cr
		45					Hunting Creek	35 42 10	81 40 45	4.3		East Prong-Hunting Cr
			01				East Prong-Hunting Cr	35 44 10	81 39 35	0.4		Fiddlers Run Creek
		46					Warrior Fork					
			01				Irish Creek	35 51 15	81 50 45	1.4		Reedys Fork
				01			Roses Creek	35 52 20	81 50 30	4.9		Simpson Creek
			02				Upper Creek	35 57 35	81 52 10	3.5		Burnhouse Branch
				01			Steels Creek	35 55 50	81 50 50			Confluence-Gingercake Creek
		47					Silver Creek	35 37 20	81 49 15			Confluence-Brindle Creek
			01				Bailey Fork	35 41 55	81 43 00			At U.S. 64 Highway Bridge

16-A11

APPENDIX A
STREAM CATALOG

REPORT NUMBER	STREAM CODE						STREAM NAME	HEADWATER LOCATION (Mean Flow = 5 cfs)					
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER	FIFTH ORDER		LATITUDE (° ' ")	LONGITUDE (° ' ")	STREAM MILES		FROM	
										UP	DOWN		
16	01	47	02				Little Silver Creek	35 43 35	81 45 00	1.1		Silver Creek	
			03				Clear Creek	35 39 35	81 45 45			Confluence-Sutter-white Creek	
				01			Double Branch	35 40 50	81 45 15	0.3		Clear Creek	
			04				Hall Creek	35 37 35	81 48 00	0.2		U.S. 64 Highway Branch	
			48				Canoe Creek	35 47 35	81 49 15	3.4		N.C. 126 Highway Bridge	
			49				Muddy Creek						
			01				Old Catawba River						
			01				Shadrick Creek	35 42 55	81 52 35				Confluence-Nix Br
			02				North Muddy Creek	35 37 40	81 59 55	0.9			U.S. 221 Highway Bridge
			01				Thompsons Fork	35 42 00	81 55 20	1.7			Hemphill Creek
			02				Youngs Fork	35 39 15	81 57 55	0.4			Jacktown Creek
			03				Goose Creek	35 36 20	81 59 30	0.4			U.S. 221 Highway Bridge

APPENDIX A
STREAM CATALOG

REPORT NUMBER	STREAM CODE						STREAM NAME	HEADWATER LOCATION (Mean Flow = 5 cfs)				
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER	FIFTH ORDER		LATITUDE (° ' '')	LONGITUDE (° ' '')	STREAM MILES		FROM
										UP	DOWN	
16	01	49	03				South Muddy Creek	35 33 10	81 55 30	1.4		Moore's Branch
				01			Hoppers Creek	35 35 45	81 51 40			Confluence-South Fork Hoppers Creek
		50					North Fork Catawba R #	35 55 45	81 56 25	3.1		Laurel Branch
		51					Dales Creek #	35 46 25	81 57 10	1.1		Lake James
		52					Paddy Creek #	35 48 25	81 57 10			Confluence-Yellow Fork
		53					Linville River #	36 06 15	81 51 00			Confluence-Big Grassy Creek
		54					Tom Creek	35 46 20	82 03 20			Confluence-Harris Cr
		55					Nicks Creek	35 40 45	82 02 35	1.4		Catawba Creek
		56					Buck Creek	35 44 45	82 09 00			Confluence-Single Cat Branch
				01			Little Buck Creek	35 45 10	82 05 50			Confluence-Deerstand Creek
				02			Licklog Creek	35 44 20	82 09 05			Confluence-Sugar Cove Creek

Dual code in Report 18.

APPENDIX A
STREAM CATALOG

16-A14

REPORT NUMBER	STREAM CODE						STREAM NAME	HEADWATER LOCATION (Mean Flow = 5 cfs)				
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FOURTH ORDER	FIFTH ORDER		LATITUDE (° ' '')	LONGITUDE (° ' '')	STREAM MILES		FROM
										UP	DOWN	
16	01	57					Clear Creek	35 42 55	82 05 30	1.3		U.S. 70 Highway Bridge
		58					Mackey Creek	35 41 15	82 09 15	1.0		Laurel Creek
		59					Cane Creek	35 39 15	82 07 40	1.5		Catawba River
		60					Crooked Creek	35 34 10	82 13 00			Confluence-Bird Br
			01				Camp Creek	35 34 45	82 09 00	0.5		Crooked Creek
			02				Little Crooked Creek	35 34 55	82 11 15			Confluence-Clarks Br
		61					Curtis Creek	35 42 15	82 11 30			Confluence-Licklog Br
			01				Newberry Creek	35 41 25	82 13 35			Confluence-Chute Br & Right Prong Newberry
		62					Mill Creek	35 40 40	82 16 05			Confluence-Left Prong & Right Prong Mill Cr
			01				Jarrett Creek	35 39 15	82 13 00	2.2		Mill Creek

APPENDIX B
SUMMARY OF 10 TO 1,000 ACRE LAKES

This appendix is a compilation of lakes from 10 to 1,000 acres which are contained in the Catawba River basin.

This inventory was compiled from the following sources:

1. Inventory of Lakes in South Carolina Ten Acres or More in Surface Area.
2. Hydrologic Information Storage and Retrieval System, Register of Dams for North Carolina (computer printout).
3. USGS Quadrangle Maps.

The USGS quadrangle maps were used to locate and to detect lakes that were not listed in the other sources. Actual surface area and gross storage information is supplied where available. The lakes were coded by major stream basin in accordance with other procedures developed for identifying streams. The map data from Source 1 above generally does not permit detailed location of the small lakes. Thus, lakes are coded by basin only as far as the secondary order.

APPENDIX B
SUMMARY OF 10 TO 1,000 ACRE LAKES

REPORT NUMBER	STREAM CODE					LAKE NAME OR OWNER	SURFACE AREA (acres)	GROSS STORAGE (acre-ft)	LOCATION BY COUNTY (SOUTH CAROLINA)
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FIFTH ORDER				
16	01	04				Efird Pond #	13	--	Lancaster
16	01	04				Nesbit Pond #	24	200	Lancaster
16	01					Unnamed Lake	--	--	Lancaster
16	01	07				Unnamed Lake	--	--	Lancaster
16	01	07				Unnamed Lake	--	--	Lancaster
16	01	05	02			Unnamed Lake	--	--	Lancaster
16	01	05	02			Unnamed Lake	--	--	Lancaster
16	01					Rock & Cedar Creek Reservoir #	800	23,000	Lancaster
16	01	03				Bridges Pond #	11	66	Lancaster
16	01	03				Bridges Pond #	13	78	Lancaster
16	01	05	02			Old City Reservoir	35	252	Lancaster
16	01	05	02			Lancaster Co. Water Works	40	160	Lancaster
16	01	05	02			Betheas Pond	12	62	Lancaster
16	01	05	02			Betheas Pond	15	102	Lancaster
16	01	05	02			Harpers Pond	15	108	Lancaster
16	01	05	02			Parkers Pond	20	192	Lancaster

16-B2

Dual code in Report 18.

APPENDIX B
SUMMARY OF 10 TO 1,000 ACRE LAKES

REPORT NUMBER	STREAM CODE					LAKE NAME OR OWNER	SURFACE AREA (acres)	GROSS STORAGE (acre-ft)	LOCATION BY COUNTY (SOUTH CAROLINA)
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FIFTH ORDER				
16	01	05				Cedar Pine Lake	30	204	Lancaster
16	01	05	02			Burnetts' Pond	13	84	Lancaster
16	01	05	03			Cave Creek Watershed Structure No. 16	21	171	Lancaster
16	01	05	03			Cave Creek Watershed Structure No. 7	35	280	Lancaster
16	01	05	03			Rowels Pond	11	48	Lancaster
16	01	05	03			Belks Pond	15	102	Lancaster
16	01	06				Sherrells Pond	17	136	Lancaster
16	01	06				Culps Pond (Culps Lake)	13	104	Lancaster
16	01	06				Andrew Jackson State Park Lake	18	115	Lancaster
16	01					Bowers Pond	16	102	Lancaster
16	01	13				Arthur Neeley II #	10	72	York
16	01	02				Fishing Creek Watershed Structure No. 1 #	70	420	York
16	01	02	08			Fishing Creek Watershed Structure No. 2 #	32	100	York
16	01	02	05			Cameron Farms #	13	79	York

Dual code in Report 18.

APPENDIX B
SUMMARY OF 10 TO 1,000 ACRE LAKES

REPORT NUMBER	STREAM CODE					LAKE NAME OR OWNER	SURFACE AREA (acres)	GROSS STORAGE (acre-ft)	LOCATION BY COUNTY (SOUTH CAROLINA)
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FIFTH ORDER				
16	01	02	05			Grady Daves #	25	153	York
16	01	02				Fishing Creek Watershed Structure No. 50 #	18	57	York
16	01	02				Fishing Creek Watershed Structure No. 4 #	14	45	York
16	01	02	06			Rock Hill Country Club #	10	40	York
16	01	02	05			Cameron Farms #	10	61	York
16	01	02				Lamar Cloaninger #	20	160	York
16	01	13				Jennings S. Edmonds #	18	108	York
16	01	02	06			Arnold E. Marshall #	10	61	York
16	01	02	08			James L. & Joseph R. Moss and York County Home Farm #	15	92	York
16	01					Bowaters	15	92	York
16	01					Bowaters	15	92	York
16	01					Bowaters	18	110	York
16	01					Bowaters (Ind. Waste Pond)	110	671	York
16	01	09	01			Springs Farms	12	48	York
16	01	09	01			Springs Farms	25	200	York

Dual code in Report 18.

APPENDIX B
SUMMARY OF 10 TO 1,000 ACRE LAKES

REPORT NUMBER	STREAM CODE					LAKE NAME OR OWNER	SURFACE AREA (acres)	GROSS STORAGE (acre-ft)	LOCATION BY COUNTY (SOUTH CAROLINA)
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FIFTH ORDER				
16	01					Springs Farms	12	73	York
16	01	09				Superior Stone	39	238	York
16	01	11				Winthrop College Farm	10	61	York
16	01	09	01			Unnamed Lake	--	--	York
16	01	14	02			Unnamed Lake #	--	--	York
16	01	09	01			Forest Lake	--	--	York
16	01					Dearborn, Great Falls Pond #	450	16,000	Chester
16	01	01				Walker M. Atkinson #	13	52	Chester
16	01	02	04			Lake Oliphant #	40	225	Chester
16	01	02	02			Tinkers Creek RC&D Project No. 21#	55	2,815	Chester
									(NORTH CAROLINA)
16	01	14	02			Sparrow Springs Lake #	--	--	Gaston
16	01	09	04			Eagle Lake	--	--	Mecklenburg
16	01	09	04			Moody Lake	--	--	Mecklenburg
16	01	09	04			Johnson Lake	--	--	Mecklenburg
16	01	09	04			Whippoorwill Lake	--	--	Mecklenburg

Dual code in Report 18.

APPENDIX B
SUMMARY OF 10 TO 1,000 ACRE LAKES

REPORT NUMBER	STREAM CODE					LAKE NAME OR OWNER	SURFACE AREA (acres)	GROSS STORAGE (acre-ft)	LOCATION BY COUNTY (NORTH CAROLINA)
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FIFTH ORDER				
16	01	09	02			Unnamed Lake	--	--	Mecklenburg
16	01	09	02			Unnamed Lake	--	--	Mecklenburg
16	01	18	09			Unnamed Lake #	--	--	Catawba
16	01	25				Murrays Mill Lake #	--	--	Catawba
16	01	18	09			Unnamed Lake #	--	--	Catawba
16	01					Harwood Lakes	--	--	Catawba
16	01					Brinkleys Twin Lakes	--	--	Mecklenburg
16	01	07	03			Aero Plantation Pond	30	--	Union
16	01	17	02			Bessemer City Reservoir #	18	--	Gaston
16	01	20	03			Cross Country Camp Ground Pond	12	--	Catawba
16	01	49	03			Dysartsville, Flood Control (Muddy Creek Watershed) Lake 20	33	295	McDowell
16	01	09	02			Forest Lake	10	--	Mecklenburg
16	01	53	03			Grandfather Mountain Lake #	30	--	Avery
16	01	33				Gunpowder Lake 01 (Duke Power Company) #	126	--	Caldwell
16	01	33				Gunpowder Lake 02 (Duke Power Company) #	15	--	Caldwell

Dual code in Report 18.

APPENDIX B
SUMMARY OF 10 TO 1,000 ACRE LAKES

REPORT NUMBER	STREAM CODE					LAKE NAME OR OWNER	SURFACE AREA (acres)	GROSS STORAGE (acre-ft)	LOCATION BY COUNTY (NORTH CAROLINA)
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FIFTH ORDER				
16	01	34				Icard Lake #	125	--	Caldwell & Alexander
16	01	17	12			Jacobfork Creek Lake #	52	153	Catawba
16	01	53				Land Harbors Lake #	65	--	Avery
16	01	17				Lincolnton Lake Long Shoals Cottonmill #	125	--	Lincoln
16	01	34				Little River Lake (Duke Power Company) #	162	--	Caldwell & Alexander
16	01	53				Loch Dorie Lake #	35	--	Avery
16	01	17				Mirror Lake #	10	--	Lincoln
16	01	54				Morgan Lake	16	128	McDowell
16	01	49	02			Muddy Creek Watershed Lake 03 (Will Geer, C. W. Ward)	19	186	McDowell
16	01	49	02			Muddy Creek Watershed Lake 06A (Fred Holick)	26	396	McDowell
16	01	49	02			Muddy Creek Watershed Lake 08 (Edwin Daniels)	63	876	McDowell
16	01	49	03			Muddy Creek Watershed Lake 15 (Ernest Pittman)	28	372	McDowell

Dual code in Report 18.

APPENDIX B
SUMMARY OF 10 TO 1,000 ACRE LAKES

REPORT NUMBER	STREAM CODE					LAKE NAME OR OWNER	SURFACE AREA (acres)	GROSS STORAGE (acre-ft)	LOCATION BY COUNTY (NORTH CAROLINA)
	MAJOR RIVER	PRIMARY	SECONDARY	TERTIARY	FIFTH ORDER				
16	01	49	03			Muddy Creek Watershed Lake 16 (W. B. Mangus)	130	1,732	McDowell
16	01	49	03	01		Muddy Creek Watershed Lake 19 (Rudolf Albert)	28	410	McDowell
16	01	19				Rankin Lake (City of Gastonia)	87	--	Gastonia
16	01	17	04			Robinson Lake #	18	--	Gastonia
16	01	18				Robinwood Lake #	35	--	Gastonia
16	01	14	02			Short Lake #	15	--	Gastonia
16	01	17				Spencer Mountain Lake (Duke Power Company) #	68	3,000	Gastonia
16	01	07	03			Aero Plantation Pond	30	--	Union
16	01	30				Alsbaugh Dam Carolina Glove Co. #	35	--	Alexander
16	01	17				Carpenters Lake #	--	--	Lincoln
16	01					Superior Cable Pond #	15	--	Catawba
16	01	56				Tahoma Lake (Duke Power Company)	161	--	McDowell
16	01	49	02			Taylor's Lake	10	--	McDowell
16	01	09	02			Tull Lake (Challis Lake)	14	--	Mecklenburg
16	01					Zacks Ford Creek Lake (Town of Lenior)	95	--	Caldwell

Dual code in Report 18.