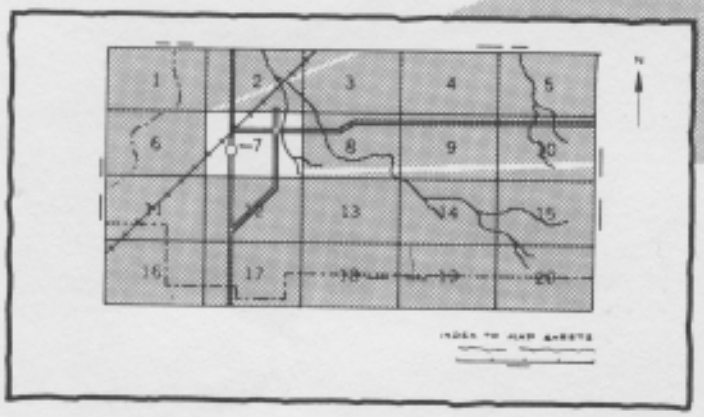
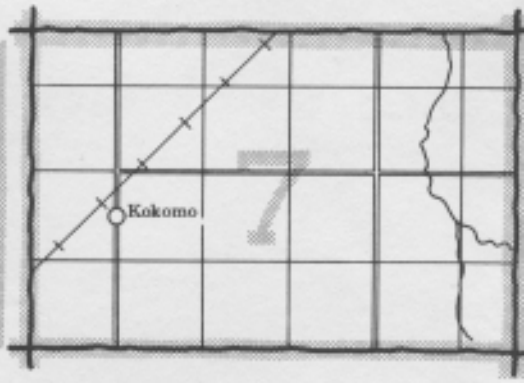
Soil survey of
Currituck County, North Carolina

United States Department of Agriculture, Soil Conservation Service
in cooperation with North Carolina Department of Natural Resources and Community Development,
North Carolina Agricultural Research Service, North Carolina Agricultural Extension Service,
and the Currituck County Board of Commissioners

HOW TO US

1. Locate your area of interest on the "Index to Map Sheets" (the last page of this publication).





2. Note the number of the map sheet and turn to that sheet.

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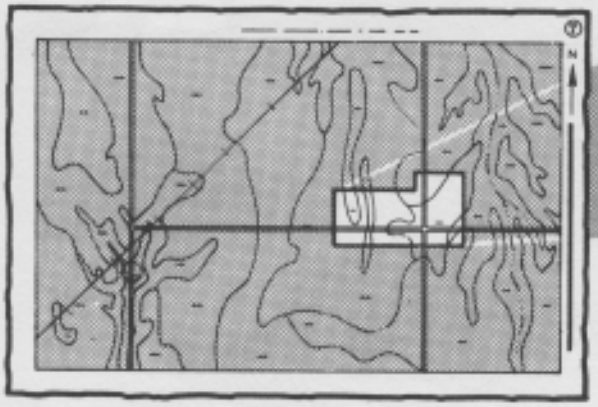
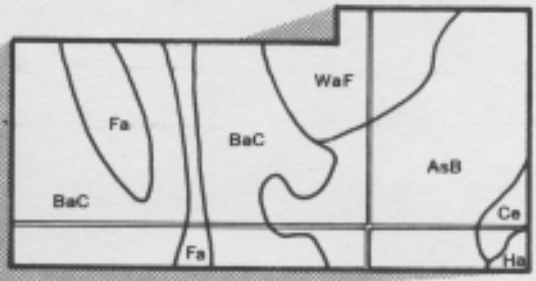
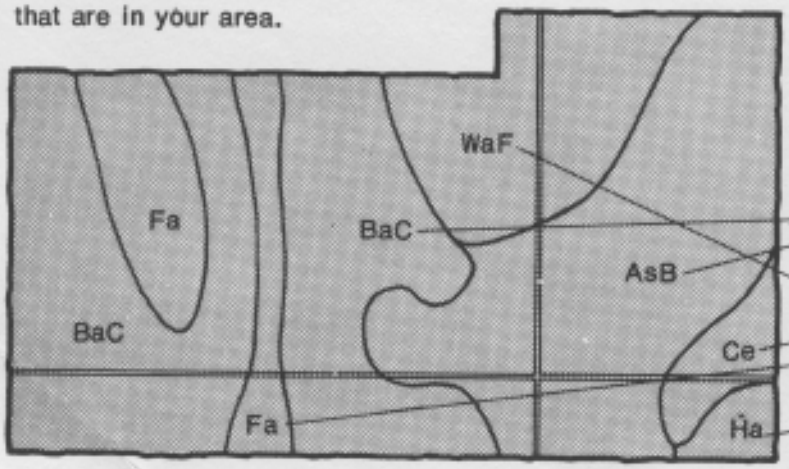




4. List the map unit symbols that are in your area.



Symbols

AsB
BaC
Ce
Fa
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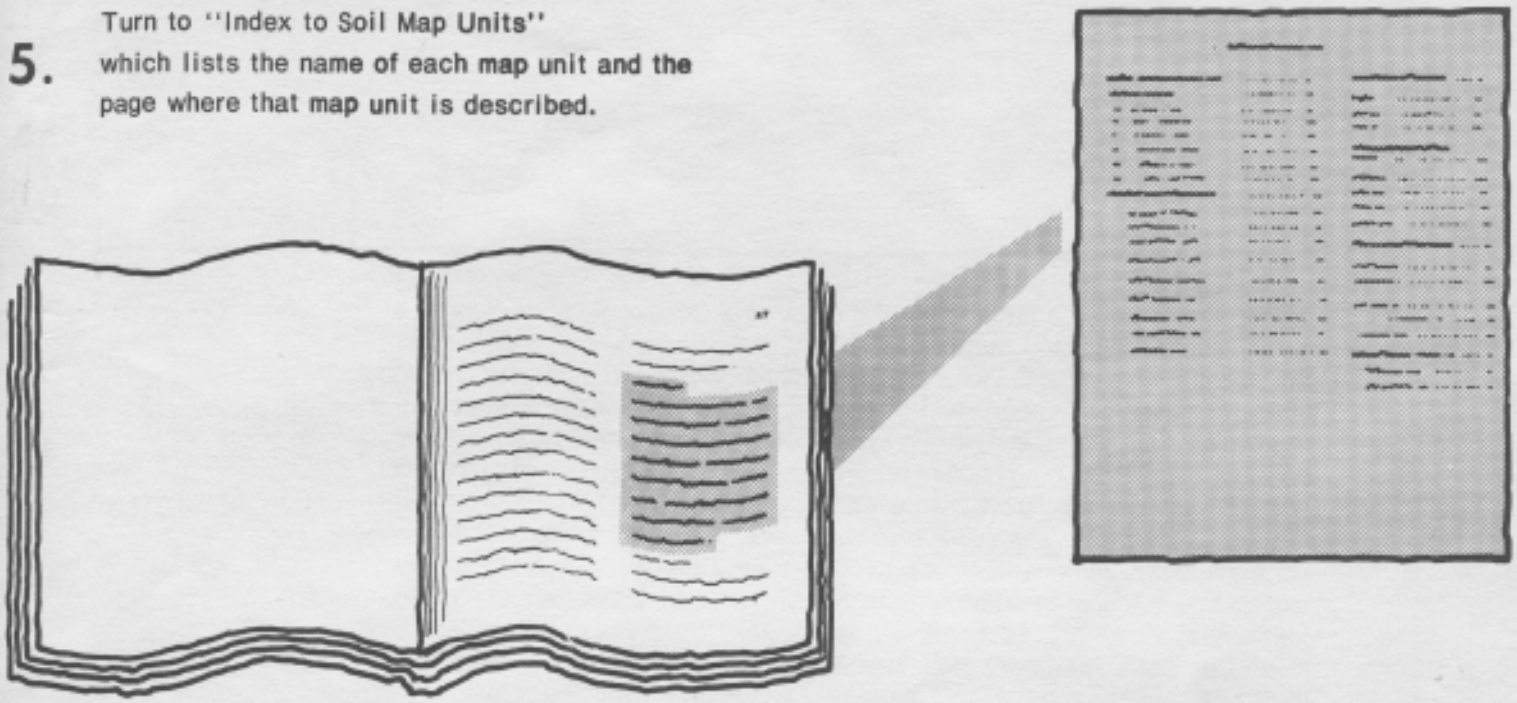
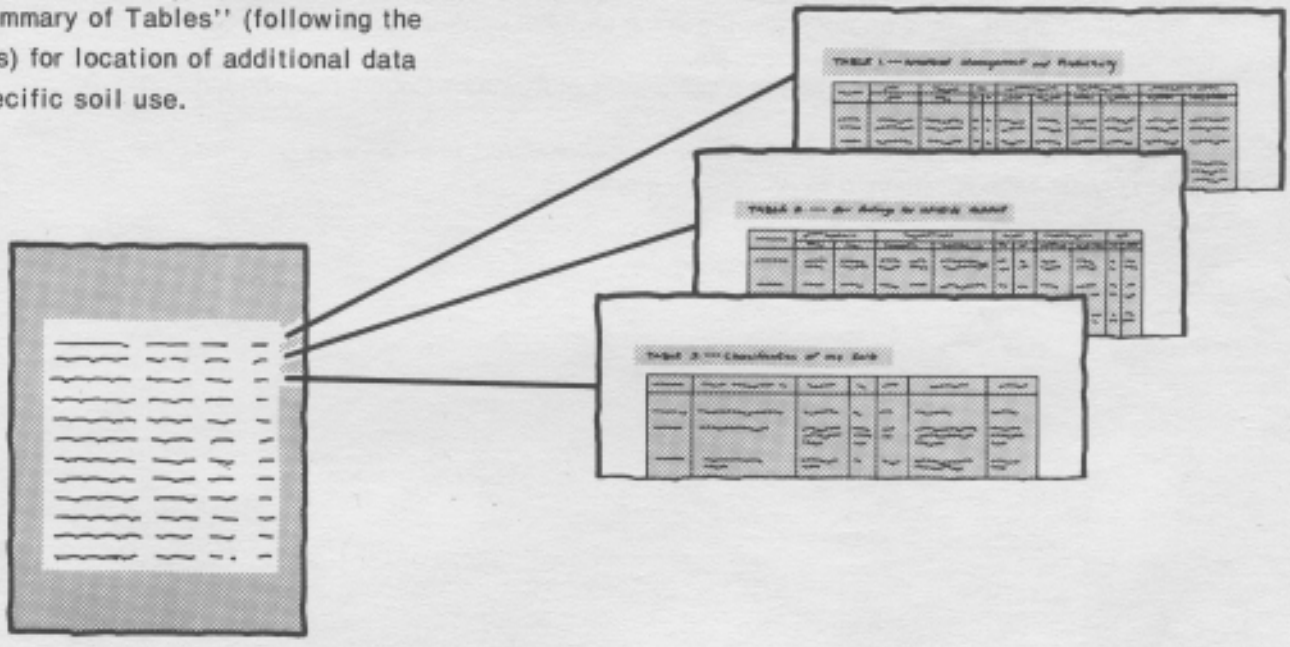
WaF

THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Research Service, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was performed in the period 1973-79. Soil names and descriptions were approved in 1980. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1979. This survey was made cooperatively by the Soil Conservation Service and the North Carolina Department of Natural Resources and Community Development, the North Carolina Agricultural Research Service, the North Carolina Agricultural Extension Service, and the Currituck County Board of Commissioners. It is part of the technical assistance furnished to the Albemarle Soil and Water Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

This soil survey supersedes a soil survey of Currituck County published in 1923.

Cover: The Corolla Lighthouse on the Outer Banks in an area of Beaches-Newhan association, 0 to 25 percent slopes.

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Issued August 1982

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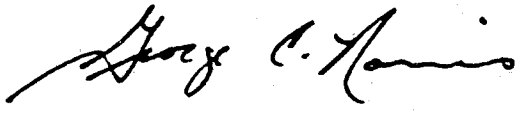
Foreword

This soil survey contains information that can be used in land-planning programs in Currituck County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

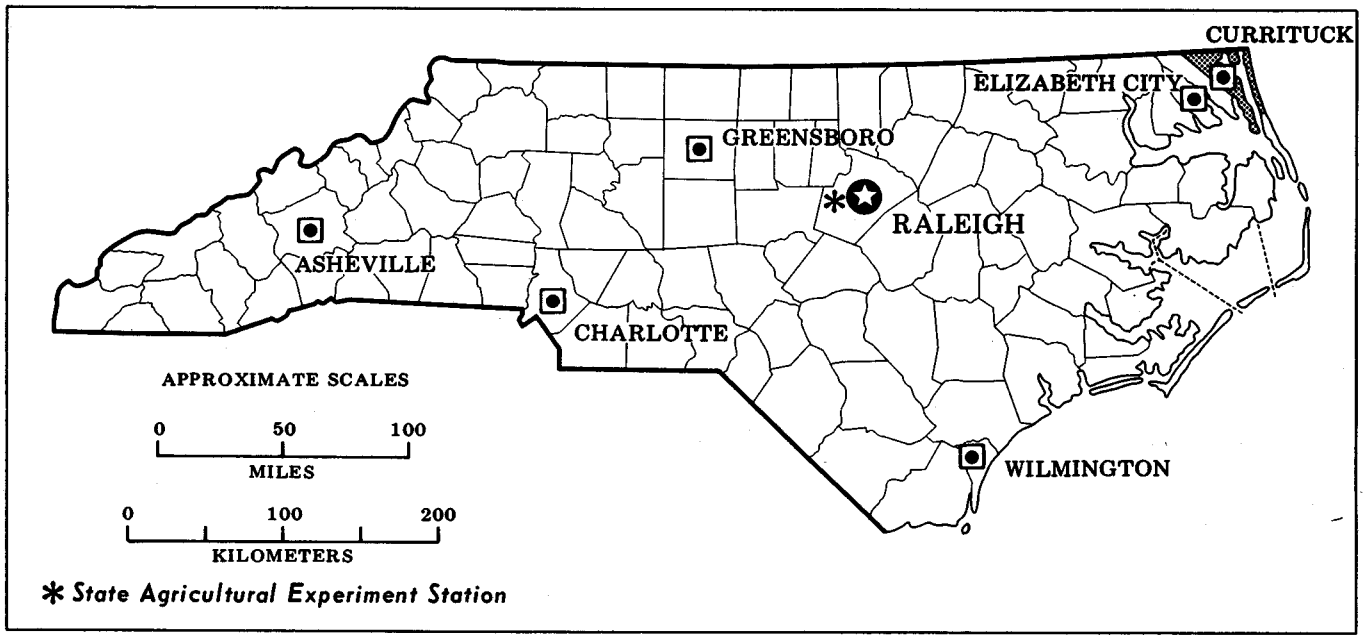
This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.



George C. Norris
State Conservationist
Soil Conservation Service



Location of Currituck County in North Carolina.

Soil survey of Currituck County, North Carolina

By Phillip L. Tant, Soil Conservation Service

Soils surveyed by Phillip L. Tant, Joe P. Covington, and Robert H. Ranson,
Soil Conservation Service,
and John M. Scott and Colin Hogan,
North Carolina Department of Natural Resources and Community Development

United States Department of Agriculture, Soil Conservation Service
in cooperation with
North Carolina Department of Natural Resources and Community Development,
North Carolina Agricultural Research Service,
North Carolina Agricultural Extension Service, and the
Currituck County Board of Commissioners

CURRITUCK COUNTY is in the extreme northeastern part of North Carolina. Currituck is said to be derived from "coratank," an Indian word for wild geese. The 1970 census reported a population of 6,976 for the county. The population is considered completely rural. There are no incorporated towns within the county, but there are four townships—Poplar Branch, Crawford, Fruitville, and Moyock.

The county consists of a mainland part and an offshore strand. The mainland is drained by the North, Northwest, and North Landing Rivers and by Currituck Sound. At Coinjock, the mainland is traversed by the Intracoastal Waterway. The offshore strand, a part of the Outer Banks, is bordered by the Atlantic Ocean on the east and Currituck Sound on the west.

Currituck's early north-south trade route was the Intracoastal Waterway via Coinjock. The waterway connects Currituck Sound in the eastern part of the county and Albemarle Sound to the west.

General nature of the county

This section gives general information about the county's water supply and climate and about the soils, landscape, and vegetation of the Outer Banks.

Water supply

Ground water is the source of the county's water supply. The depth to freshwater is generally less than 100 feet. The freshwater is contained in sands and clays of the upper sandy aquifer, which is capable of yielding up to 50 gallons per minute. The maximum available ground water is estimated at 1 million gallons per day per square mile. The water from deeper wells in the freshwater zone tends to be hard and may contain excessive iron. Water from shallow wells may be hard or soft and may also contain excessive iron (*5*).

Climate

Prepared by the National Climatic Center, Asheville, N.C.

Currituck County is hot and humid in the summer, but the coast is frequently cooled by sea breezes. Winter is cool, with occasional brief cold spells. Rain falls throughout the year and is fairly heavy. Every few years a hurricane crosses the area.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Elizabeth City, N.C., from 1951 to 1973. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 43° F, and the average daily minimum temperature is 33°. The lowest temperature on record, which occurred at Elizabeth City on January 13, 1962, is 4°. In summer the average temperature is 76°, and the average daily maximum temperature is 86°. The highest recorded temperature, which occurred on July 23, 1957, is 103°.

Growing degree days are shown in table 2. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50° F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 28 inches. Of this, 15 inches, or 55 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 24 inches. The heaviest 1-day rainfall during the period of record was 6.7 inches at Elizabeth City on October 20, 1968. Thunderstorms occur on about 40 days each year, and most occur in summer.

Snowfall is rare. Average seasonal snowfall is 3 inches. The greatest snow depth at any one time during the period of record was 4 inches. Days when at least 1 inch of snow is on the ground are extremely rare. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 65 percent of the time possible in summer and 60 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 10 miles per hour, in spring.

Soils, landscape, and vegetation of the Outer Banks

The Outer Banks, in the eastern part of Currituck County, is part of the barrier island chain that extends from Virginia to South Carolina. This chain is an area of great biological activity and significance (*9*).

Several factors interact to determine the soil types and vegetation that are on the Outer Banks. The major soil differences are determined by relief, which affects drainage; vegetation; and the length of time required for soil development. Relief, drainage, and location near and adjacent to the ocean are major factors concerning vegetation. Wind is an important environmental factor influencing coastal vegetation (*4*). The wind carries salt spray from the ocean, which kills susceptible plants, and it carries sand that is abrasive to plants and can bury them. Winds also cause flooding and erosion by water (*3*).

The Outer Banks can be divided into four vegetative categories or zones: foredune-beach, shrub, maritime forest, and marsh (fig. 1). The foredune-beach zone is constantly changed by the deposition of sand and by ocean waves. The beach does not have vegetation except just above the high tide line where scattered clumps of sea-oats, seashore elder, and sea rocket grow. Newhan soils are on the foredunes. They formed in wind-deposited sand and have little or no profile development. The foredunes are built by grasses that trap the blowing sand. The major plants are American beachgrass, sea-oats, bitter panicum, and seashore elder. The North Carolina coast serves as a transitional zone between American beachgrass and sea-oats; Currituck County is the southern limit of the natural range for American beachgrass as well as the northern

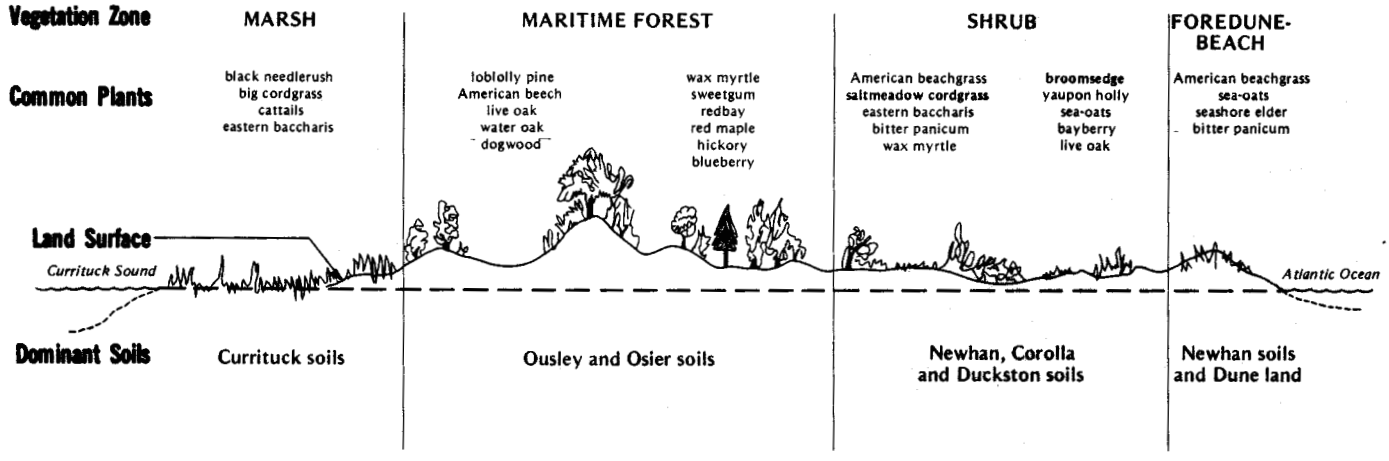


FIGURE 1 - THE RELATIONSHIP OF SOILS, LANDSCAPE AND DOMINANT PLANTS ON THE OUTER BANKS, CURRITUCK COUNTY, NORTH CAROLINA

Figure 1.—Landscape and dominant plants on soils on the Outer Banks.

limit for sea-oats. Shore birds such as the black-bellied plover, ruddy turnshore, and knot and semipalmated sandpipers are commonly seen on the beaches. Rabbits, opossums, and foxes frequent the dunes.

The shrub zone, characterized by grasses and scattered shrubs, grades into a shrub thicket as distance from the ocean increases. The soils mapped in this zone are the Newhan, Corolla, and Duckston soils. The criterion that differentiates these soils from each other is drainage. The well drained Newhan soils are in the higher, drier areas; the moderately well drained Corolla soils are in the intermediate areas; and the poorly drained Duckston soils are in the lower lying, wet areas. The Newhan soils support American beachgrass, sea-oats, bitter panicum, live oak, and yaupon holly. The Corolla soils support live oak, northern bayberry, waxmyrtle, broom sedge, and saltmeadow cordgrass. The Duckston soils support a thick growth of saltmeadow cordgrass, eastern baccharis, and waxmyrtle. Wildlife in the shrub zone includes rabbits, foxes, hawks, and several species of songbirds such as mockingbirds and wood thrushes.

The maritime forest grows at a greater distance from the ocean, where the effects of salt spray decrease. Maritime forest is dominated by live oak, loblolly pine, yaupon holly, and redbay. The soils in the forest areas exhibit better soil profile development and more accumulation of organic matter on the surface. Representative soils are Osier fine sand in the wet, nearly level areas and Ousley fine sand in the gently sloping areas. The maritime forest provides good habitat for wildlife species such as quail, rabbits, foxes, and songbirds. Snakes, hawks, and rodents are also quite common.

The marsh zone, on the sound side of the Outer Banks, includes many of the small islands in the sound. This is mostly a freshwater marsh. The main soil is Currituck mucky peat. It consists of organic material, 16 to about 38 inches thick, over sandy marine sediments. Flooding is frequent. The dominant plants are black needlebrush, big cordgrass, and eastern baccharis. In isolated, landlocked depressions, the vegetation is mainly cattails, sawgrass, waxmyrtle, and willow. Furbearers such as raccoon, muskrat, and nutria are abundant in these marshes. Also common are waterfowl, rails, and other estuarine and marsh birds.

How this survey was made

Soil scientists made this survey to learn what soils are in the survey area, where they are, and how they can be used. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; and the kinds of native plants or crops. They dug many holes to study soil profiles. A profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the parent material, which has been changed very little by leaching or by plant roots.

The soil scientists recorded the characteristics of the profiles they studied and compared those profiles with others in nearby counties and in more distant places. They classified and named the soils according to nationwide uniform procedures. They drew the boundaries of the soils on aerial photographs. These photographs show trees, buildings, fields, roads, and other details that help in drawing boundaries accurately. The soil maps at the back of this publication were prepared from aerial photographs.

The areas shown on a soil map are called map units. Most map units are made up of one kind of soil. Some are made up of two or more kinds. The map units in this survey area are described under "General soil map units" and "Detailed soil map units."

While a soil survey is in progress, samples of some soils are taken for laboratory measurements and for engineering tests. All soils are field tested to determine their characteristics. Interpretations of those characteristics may be modified during the survey. Data are assembled from other sources, such as test results, records, field experience, and state and local specialists. For example, data on crop yields under defined management are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it can be used by farmers, woodland managers, engineers, planners, developers and builders, home buyers, and others.

This soil survey supersedes the soil survey of Currituck County published in 1923. This survey provides additional information and contains larger maps that show the soils in greater detail.

General soil map units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Descriptions of the general soil map units follow.

1. Conetoe-Dragston-Munden

Nearly level and gently sloping, well drained, somewhat poorly drained, and moderately well drained soils that have a sandy surface layer and a loamy subsoil

The soils of this map unit are on slightly rounded low ridges scattered throughout the county, mainly from Tull Bay to Point Harbor. This unit makes up about 16 percent of the county. It is about 33 percent Conetoe soils, 14 percent Dragston soils, 7 percent Munden soils, and 46 percent soils of minor extent. The minor soils include Augusta, Altavista, Wando, State, Nimmo, Bojac, and Wahee soils.

The nearly level to gently sloping Conetoe soils are well drained. Typically, the surface layer is grayish brown loamy sand. The subsurface layer is light yellowish brown loamy sand. The upper part of the subsoil is strong brown sandy clay loam and sandy loam, and the lower part is light yellowish brown loamy sand. The underlying material is yellow and very pale brown sand.

The nearly level Dragston soils are somewhat poorly drained. Typically, the surface layer is dark brown loamy fine sand. The upper part of the sandy loam subsoil is light yellowish brown, the middle part is light yellowish brown, and the lower part is light gray. The underlying material is light gray loamy sand.

The nearly level Munden soils are moderately well drained. Typically, the surface layer is dark grayish brown loamy sand. The subsurface layer is light yellowish brown loamy sand. The upper part of the sandy loam subsoil is yellowish brown, and the lower part is pale brown. The underlying material is olive yellow sand.

The major soils in this unit are used mainly as cropland and to a lesser extent as pasture and woodland. Wetness, leaching of plant nutrients, soil blowing, and droughtiness are the main limitations to use and management.

The major soils in this unit are well suited or suited to crops, pasture, and woodland. Conetoe soils are well suited to most recreation and urban uses. Dragston soils are poorly suited to such uses. Munden soils are suited to most recreation uses but are poorly suited to most urban uses.

2. Roanoke-Tomotley

Nearly level, poorly drained soils that have a loamy surface layer and a loamy or clayey subsoil

The soils in this map unit are on broad flats and in slightly depressed drainageways. The unit makes up about 22 percent of the county. It is about 76 percent Roanoke soils, 19 percent Tomotley soils, and 5 percent soils of minor extent. The minor soils include Pasquotank, Cape Fear, Portsmouth, and Nimmo soils.

Typically, the surface layer of the Roanoke soils is dark grayish brown fine sandy loam. The upper part of the subsoil is gray silty clay loam, the middle part is gray silty clay, and the lower part is gray sandy clay loam. The underlying material is gray sand.

Typically, the surface layer of the Tomotley soils is very dark grayish brown fine sandy loam. The subsurface layer is light brownish gray fine sandy loam. The upper part of the subsoil is gray sandy clay loam, and the lower part is light gray fine sandy loam. The underlying material is light gray loamy fine sand.

The major soils in this unit are used mainly for cropland. Small acreages are used for pasture and woodland. Wetness and flooding are the main limitations to use and management.

The major soils in this unit are well suited to cropland, pasture, and woodland, if drained. They are poorly suited to most urban and recreation uses.

3. Portsmouth-Cape Fear-Wasda

Nearly level, very poorly drained soils that have a loamy or mucky surface layer and a loamy or clayey subsoil

The soils of this map unit are on broad flats and in depressions. The unit makes up about 14 percent of the county. It is about 32 percent Portsmouth soils, 26 percent Cape Fear soils, 23 percent Wasda soils, and 19 percent soils of minor extent. The minor soils include the Conaby, Roanoke, and Tomotley soils.

Typically, the surface layer of the Portsmouth soils is very dark gray fine sandy loam. The upper part of the subsoil is dark gray sandy clay loam, and the lower part is dark gray sandy loam. The underlying material is light brownish gray sand.

Typically, the surface layer of the Cape Fear soils is black loam. The upper part of the subsoil is dark gray clay loam, and the lower part is gray clay. The underlying material is light brownish gray loamy sand.

Typically, the surface layer of the Wasda soils is black muck. The underlying mineral layers are dark grayish brown clay loam in the upper part, dark grayish brown clay loam and grayish brown sandy clay loam in the middle part, and grayish brown sandy loam in the lower part. Below that, the underlying material is light brownish gray sand.

The major soils in this unit are used mainly as cropland and woodland. Wetness is the main limitation to use and management.

The major soils in this unit, if drained, are well suited to cropland, pasture, and woodland. They are poorly suited to most urban and recreational uses.

4. Dare-Ponzer

Nearly level, very poorly drained soils that have a mucky surface layer and sandy or loamy underlying material

The soils of this unit are on broad flats. The unit makes up about 16 percent of the county. It is about 49 percent Dare soils, 48 percent Ponzer soils, and 3 percent soils of minor extent. The minor soils include Wasda, Conaby, and Dorovan soils.

Typically, the surface layer of the Dare soils is black muck and is covered by a layer of undecomposed leaves and twigs. The material below the surface layer is dark reddish brown muck. Underlying the organic layers, which extend to a depth of about 70 inches, are mineral layers of very dark grayish brown fine sand and dark gray and gray loamy fine sand.

Typically, the surface layer of the Ponzer soils is muck that is black in the upper part, very dark brown in the middle part, and very dark grayish brown in the lower part. Below the organic layers, which extend to a depth of about 26 inches, are mineral layers of loam. The upper part is mottled dark brown, very dark gray, light yellowish brown, and light brownish gray, and the lower part is dark gray.

The major soils in this unit are used mainly as woodland. A few acres have been cleared and drained and are used for crops. Wetness and the high percentage of stumps, wood, and logs in the Dare soils are the main limitations to use and management.

The Dare soils are poorly suited to agricultural, woodland, and urban and recreation uses. The Ponzer soils, if drained, are well suited to crops. They are poorly suited to urban and recreation uses.

5. Currituck

Nearly level, very poorly drained soils that have a mucky surface layer and sandy underlying material

The soils in this map unit are in broad, flat marshes along the Currituck and Albemarle Sounds. They are also on small islands in the Currituck Sound. This unit makes up 18 percent of the county. It is about 94 percent Currituck soils and 6 percent is soils of minor extent. The minor soils include the Dorovan and Duckston soils.

Typically, the surface layer is very dark grayish brown mucky peat about 28 inches thick. The underlying mineral layer is greenish gray sand.

These soils are used mainly as a habitat for wildlife because of the landscape position, wetness, and frequent flooding by tides for long periods. The wildlife includes certain fur-bearing animals, marsh birds, some migrating waterfowl, and snakes.

6. Dorovan

Nearly level, very poorly drained soils that have a mucky surface layer and sandy mineral layers

The soils in this map unit are on the flood plains of the sounds and major streams. The unit makes up about 8 percent of the county. It is about 90 percent Dorovan soils and 10 percent soils of minor extent. The minor soils include Conaby, Currituck, and Dare soils.

Typically, the mucky surface and subsurface layers to a depth of about 84 inches are black and very dark gray. The underlying mineral layer is stratified fine sand and loamy fine sand.

These soils are used mainly as habitat for woodland wildlife because of landscape position, wetness, and frequent flooding from overflow of adjacent streams.

The major soils in this unit are poorly suited to cropland, urban, and recreation uses.

7. Newhan-Corolla-Duckston

Nearly level to sloping, excessively drained, moderately well drained, somewhat poorly drained, and poorly drained soils that are sandy throughout

The soils of this map unit are on the Outer Banks, on broad flats, on gently sloping to sloping ridges, and in depressions. The unit makes up about 6 percent of the

county. It is about 29 percent Newhan soils, 26 percent Corolla soils, 22 percent Duckston soils, and 23 percent soils of minor extent. The minor soils include Dune land, Osier and Ousley soils, and Beaches.

The nearly level to sloping Newhan soils are excessively drained and are on dune ridges. Typically, the surface layer is grayish brown fine sand. The underlying material is light gray fine sand and sand.

The nearly level to gently sloping Corolla soils are somewhat poorly drained and moderately well drained and are on the broad flats between the dunes. Typically, the surface layer is grayish brown fine sand. The underlying material is very pale brown fine sand and light brownish gray sand in the upper part, dark grayish brown sand in the middle part, and gray sand in the lower part.

The nearly level Duckston soils are poorly drained and in depressions and flats. Typically, the surface layer is grayish brown fine sand. The subsurface layer is dark grayish brown fine sand. The underlying material is gray fine sand.

The major soils in this unit are used mainly for recreation activities associated with the beach and as habitat for wildlife. Sandiness, droughtiness, wetness, flooding during strong wind, and tides are the main limitations.

The major soils in this unit are poorly suited to cropland, pasture, and most urban and recreation uses except those associated with beach activities. They are not suited to commercial woodland.

Detailed soil map units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and management of the soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, State fine sandy loam is one phase in the State series.

Some map units are made up of two or more major soils. These map units are called soil complexes or soil associations.

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Newhan-Corolla complex, 0 to 10 percent slopes, is an example.

A *soil association* is made up of two or more geographically associated soils that are shown as one unit on the maps. Because of present or anticipated soil uses in the survey area, it was not considered practical or necessary to map the soils separately. The pattern and relative proportion of the soils are somewhat similar. Beaches-Newhan association, 0 to 25 percent slopes, is an example.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Descriptions of the detailed soil map units follow.

AaA—Altavista fine sandy loam, 0 to 2 percent slopes. This is a moderately well drained soil on smooth ridges near small streams and rivers. This soil is most common in the eastern and southern parts of the county. Areas are irregular in shape and range from 5 to 30 acres.

Typically, the surface layer is grayish brown fine sandy loam 9 inches thick. The subsoil extends to a depth of 42 inches. The upper part is light yellowish brown fine sandy loam. The middle part is brownish yellow sandy clay loam that has strong brown and light gray mottles in the lower part. The lower part of the subsoil is mottled light gray, strong brown, and very pale brown sandy loam. The underlying material to a depth of 80 inches is mottled light gray, yellowish brown, and very pale brown sandy loam.

Permeability is moderate, and the available water capacity is medium. The soil is strongly acid to medium acid throughout except where the surface layer has been limed. The high water table fluctuates between depths of about 1 1/2 and 2 1/2 feet late in winter and early in spring.

Included with this soil in mapping are small areas of the wetter Augusta soils in the slight depressional areas and the better drained State soils on the slightly higher lying areas or slightly convex areas, or both. Also included are small areas of Munden soils that have less clay in the subsoil than Altavista soils. The included soils make up about 15 percent of the map unit.

Most of the acreage of this soil is used for cultivated crops. The rest is mainly in pasture or woodland.

This soil is well suited to most locally grown crops. The main crops are corn and soybeans. Seasonal wetness is a limitation for some specialty crops, such as peanuts. Winter cover crops, minimum tillage, and returning crop residue to the soil help maintain tilth and production. No-till planting, field borders, and rotating cultivated crops with close-growing crops help conserve soil and water. This soil is well suited to pasture forages.

The dominant native trees are black tupelo, elm, yellow-poplar, sweetgum, hickory, red maple, American

beech, willow oak, white oak, post oak, southern red oak, water oak, and loblolly pine. The understory includes dogwood, sweetbay, sourwood, American holly, waxmyrtle, and sassafras. Wetness is the main limitation for woodland use and management.

This soil is suited to recreation uses and to urban uses such as dwellings without basements. It is poorly suited to most other urban uses because of wetness.

This Altavista soil is in capability subclass IIw and in woodland group 2w.

At—Augusta fine sandy loam. This is a nearly level, somewhat poorly drained soil on smooth, slightly convex ridges near or adjacent to small streams and rivers. Areas are irregular in shape and range from 5 to 50 acres.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil extends to a depth of about 48 inches. The upper part is yellowish brown sandy clay loam that has brownish yellow and dark grayish brown mottles. The middle part is light brownish gray clay loam that has brownish yellow, grayish brown, and yellowish brown mottles. The lower part is mottled brownish yellow and light gray sandy clay loam. The underlying material to a depth of 60 inches is gray sandy loam that has brownish yellow and yellowish brown mottles.

Permeability is moderate, and the available water capacity is medium. This soil is very strongly acid to medium acid throughout unless the surface layer has been limed. The seasonal high water table fluctuates between 1 foot and 2 feet of the surface.

Included with this soil in mapping are small areas of Altavista, Tomotley, and Dragston soils. Tomotley soils are in slight depressions and along drainageways. Altavista soils are on slightly elevated ridges. Dragston soils are near the outer edge of the map unit. The included soils make up about 10 to 20 percent of the map unit.

Most of the acreage of this soil is used for cultivated crops. The rest is mainly in pasture or woodland.

This soil is well suited to most locally grown crops. The main crops are corn and soybeans. Wetness is the main limitation for cultivation. Winter cover crops, minimum tillage, and returning crop residue to the soil help maintain tilth and production. This soil is well suited to pasture forages.

The dominant native trees are loblolly pine, sweetgum, red maple, yellow-poplar, willow oak, water oak, black cherry, and American beech. The major understory includes dogwood, sourwood, sweetbay, sassafras, and briers and reeds. Wetness is the main limitation to woodland use and management.

This soil is poorly suited to most urban and recreation uses because of wetness. Installing an extensive drainage system and modifying the site improve the use of this soil for dwellings that have septic tank absorption fields.

This Augusta soil is in capability subclass IIIw and woodland group 2w.

BN—Beaches-Newhan association, 0 to 25 percent slopes. This map unit consists of Beaches and excessively drained Newhan soils along the ocean side of the Outer Banks and islands; however, a few areas are adjacent to the inlets. Beaches are in the smooth, nearly level positions. Newhan soils are in moderately steep positions. The landscape includes the foredunes that have short, complex slopes that range up to about 25 percent. The areas of this map unit are long and narrow and parallel the ocean. They range from 100 to about 400 feet in width and up to several miles in length.

The Beaches part of this unit makes up about 60 percent of the map unit. It is sand that ranges from fine to very coarse in size but is chiefly fine. The content of shell fragments ranges widely. The back portion of the beach (berm) contains fragments of shell and various sizes of sand. The berm portion is quite variable and, in places, is practically nonexistent.

The Beaches part is low-lying and is flooded daily by tidal action. The back portion of the beach (berm) is slightly higher and is less affected by normal tidal action. The soft, fluffy, loose sand is susceptible to severe blowing, particularly in the broader areas. The Beaches part has no vegetation.

The excessively drained Newhan soils are in the higher foredune positions, and they make up about 35 percent of this map unit. Typically, the surface layer is grayish brown fine sand 3 inches thick. The underlying material to a depth of 75 inches is light gray fine sand in the upper part and light gray sand in the lower part.

Permeability is very rapid, and the available water capacity is low. The soil is neutral or mildly alkaline. Most of the Newhan soils are covered with vegetation, mainly American beachgrass, sea-oats, coastal panicgrass, and bitter panicum.

Included in mapping and making up 5 percent of this unit are Duckston and Corolla soils. These included soils are in narrow depressions and troughs between the foredunes. Duckston soils are in the wetter, slightly lower depressions.

Tidal flooding of Beaches is a severe limitation to all uses other than beach related recreation activities. The Newhan soils are subject to excessive erosion by wind and wave action unless vegetation can be established and maintained. This area is poorly suited to urban use or to timber production.

This unit is in capability subclass VIIIs. It is not assigned to a woodland suitability group.

BoA—Bojac loamy sand, 0 to 3 percent slopes. This is a well drained soil on low ridges near or adjacent to streams and the Currituck Sound. The major portion of this unit is in the southern part of the county. Areas are oblong and irregular in width, and they range from 5 to 20 acres.

Typically, the surface layer is brown loamy sand 10 inches thick. The subsoil extends to a depth of 34 inches. It is yellowish brown sandy loam in the upper part and reddish brown sandy loam in the lower part. The underlying material to a depth of 72 inches is strong brown and yellowish brown sand.

Permeability is moderately rapid, and the available water capacity is low. The soil ranges from very strongly acid to slightly acid in the surface layer and subsoil. The underlying material ranges from very strongly acid to medium acid. The seasonal high water table is below a depth of 4 feet.

Included with this soil in mapping are small areas of Conetoe, Munden, and State soils. The Conetoe soils are loamy sand to a depth of 20 to 40 inches. The slightly wetter Munden soils are in depressions. The State soils have more clay in the subsoil than the Bojac soils. Most of the included soils are near the outer edge of the map unit. They make up about 15 percent of the unit.

Most of the acreage of this soil is used for cultivated crops. The rest is mainly in pasture and woodland.

This soil is well suited to most locally grown crops. The main crops are corn and soybeans. Leaching of plant nutrients, droughtiness, and wind erosion are the main limitations. Winter cover crops, minimum tillage, and returning crop residue to the soil help control erosion. No-till planting, field borders, and crop rotations that include close-growing crops help reduce soil blowing. This soil is well suited to pasture.

The dominant native trees are loblolly pine, hickory, American elm, black cherry, American beech, southern red oak, water oak, and white oak. The understory includes mainly dogwood, sassafras, sourwood, and southern waxmyrtle. There are no major limitations to woodland use and management.

This soil is well suited to most urban uses. The sandy material provides a good support base for most structures. However, sandy surfaces are subject to soil blowing, and they are droughty when rainfall is inadequate. This soil is suited to recreation uses, but grass is difficult to maintain on play areas. The main limitation is the sandy, droughty condition of the soil.

This Bojac soil is in capability subclass IIs and in woodland group 3o.

Ca—Cape Fear loam. This is nearly level, very poorly drained soil on broad flats, narrow strips adjacent to small drainageways, and slightly lower lying, oval-shaped depressions. This soil is mainly in the northwestern part of the county. Areas are irregular in shape and range from 5 to more than 100 acres.

Typically, the surface layer is black loam 12 inches thick. The subsoil extends to a depth of 42 inches. It is dark gray clay loam in the upper part and gray clay that has brownish yellow and dark brown mottles in the lower part. The underlying material to a depth of 60 inches is light brownish gray loamy sand that has light yellowish brown mottles.

Permeability is slow, and the shrink-swell potential is moderate. The soil is very strongly acid to medium acid, unless the surface layer has been limed. The seasonal high water table is at or near the surface. The soil is subject to rare flooding for brief periods.

Included with this soil in mapping are small areas of Portsmouth soils that have less clay in the subsoil than Cape Fear soils. Also included are small areas of slightly higher lying Roanoke soils that do not have a thick, dark colored surface layer. The included soils make up about 20 percent of the map unit.

Most of the acreage of this soil is in woodland. The rest is mainly in pasture or used for cultivated crops.

If properly drained and protected from flooding, this soil is well suited to corn, soybeans, and small grains. This soil is poorly suited to tobacco, cotton, and peanuts. Wetness and flooding are the main limitations. Tillage may be delayed in spring because of wetness. Poor outlets and slow permeability are limitations to a drainage system. This soil is well suited to pasture forages such as fescue and ladino clover.

The dominant native trees are baldcypress, water tupelo, pond pine, loblolly pine, red maple, green ash, hickory, sweetgum, swamp tupelo, elm, river birch, water oak, willow oak, and swamp white oak. The understory includes cedar, American holly, sweetbay, sourwood, reeds, and waxmyrtle. Wetness and flooding are the main limitations to woodland use and management.

This soil is poorly suited to most urban and recreation uses because of flooding, wetness, slow permeability, and low strength.

This Cape Fear soil is in capability subclass IIIw and in woodland group 1w.

Cb—Conaby muck. This is a nearly level, very poorly drained soil on low-lying broad flats and in slightly depressed drainageways. Areas are irregular in shape and range from 10 to 350 acres.

Typically, the surface layer is muck 13 inches thick. It is very dark gray in the upper part, black in the middle part, and very dark grayish brown in the lower part. The underlying mineral soil to a depth of 73 inches is grayish brown sand in the upper part, very dark gray sandy loam mottled olive brown and light olive brown in the middle part, and dark greenish gray stratified sand and sandy loam in the lower part.

The surface layer is made up of highly decomposed organic matter. Permeability is moderate or moderately slow in the organic layers and moderately rapid in the mineral layers. The soil ranges from extremely acid to strongly acid in the upper part of the surface layer and medium acid to mildly alkaline in the lower part. The seasonal high water table is at or near the surface. Flooding is rare.

Included with this soil in mapping are small areas of Portsmouth soil, which does not have sufficient organic matter for an organic surface layer. This included soil commonly is on slightly higher lying areas within the map

unit. Also included near the outer edge of the map unit are small areas of Wasda soils that have more clay in the mineral layers than Conaby soils. The included soils make up 10 to 20 percent of the map unit.

Most of the acreage of this soil is used for cultivated crops. The rest is mainly in woodland.

If drained, this soil is well suited to cultivated crops. The main crops are corn and soybeans. Wetness is the main limitation. Spring tillage and fall harvest can be delayed because of the wetness. Initially, large amounts of lime are necessary for crop production. During spring planting, soil blowing is a hazard. Minimum tillage, field borders, and windbreaks reduce the hazard of soil blowing.

The dominant native species are red maple, sweetgum, baldcypress, blackgum, loblolly pine, and sweetbay. The understory includes swamp cyrilla, sweetbay, sphagnum moss, titi, gallberry, waxmyrtle, pawpaw, fetterbush, and switchcane. Wetness is the main limitation.

This soil is poorly suited to most urban and recreation uses because of wetness and low soil strength.

This Conaby soil is in capability subclass IIIw and in woodland group 2w.

CnA—Conetoe loamy sand, 0 to 3 percent slopes. This is a well drained soil on smooth to slightly rounded low ridges along streams and the Currituck and Albemarle Sounds. The major portion of this unit is in the southern part of the county. Areas are irregular in shape and range from 5 to 100 acres.

Typically, the surface layer is grayish brown loamy sand 8 inches thick. The subsurface layer is light yellowish brown loamy sand to a depth of 23 inches. The subsoil extends to a depth of 50 inches. The upper part is strong brown sandy clay loam and sandy loam, and the lower part is light yellowish brown loamy sand. The underlying material to a depth of 80 inches is yellow and very pale brown sand.

Permeability is moderately rapid, and the available water capacity is low. The soil is very strongly acid to medium acid throughout except for surface layers that have been limed.

Included with this soil in mapping are small areas of Altavista, Bojac, and State soils. Altavista soils are in slight depressions or adjacent to drainageways. Bojac and State soils are near the outer edge of the map unit. The included soils make up about 10 to 20 percent of the map unit.

Most of the acreage of this soil is used for cultivated crops. The rest is mainly in woodland or pasture.

This soil is well suited to peanuts (fig. 2). It is suited to most locally grown crops. The main crops are peanuts, corn, and soybeans. The main limitations are leaching of plant nutrients, soil blowing, and droughtiness. Blowing sand can damage young plants. Alternate planting of small grains and row crops can help prevent the damage to young tender plants. Winter cover crops, minimum tillage, and returning crop residue to the soil help conserve moisture and protect the soil from wind erosion. Fertilizers, particularly nitrogen, should be added in split applications. This soil is well suited to pasture forages such as Coastal bermudagrass and bahiagrass.

The dominant native trees are loblolly pine, longleaf pine, red maple, hickory, sweetgum, black tupelo, southern red oak, white oak, and post oak. The understory includes dogwood, sassafras, American holly, and sourwood. The low available water capacity is the main limitation to woodland use and management.

This soil is well suited to most urban uses. The thick sandy material provides a good support base for most structures. However, unprotected sandy surfaces are subject to soil blowing, and they are droughty when rainfall is inadequate. This soil is suited to recreation uses. The main limitation is the sandy surface layer.

This soil is in capability subclass IIs and woodland group 3s.

CoB—Corolla fine sand, 0 to 6 percent slopes. This is a moderately well drained and somewhat poorly drained soil on the Outer Banks. It is commonly in low areas or troughs behind the foredunes. Areas are irregular in shape and range from 5 to 100 acres.

Typically, the surface layer is grayish brown fine sand 3 inches thick. The underlying material extends to a depth of 60 inches. The upper part is very pale brown fine sand and light brownish gray sand that has yellowish red mottles. The middle part is dark grayish brown sand that has grayish brown mottles. The lower part is gray sand.

Permeability is very rapid, and the available water capacity is low. The soil is medium acid through mildly alkaline. The seasonal high water table fluctuates between 1 1/2 and 3 feet of the surface. Flooding is rare. It occurs during periods of strong wind tides or hurricanes.

Included with this soil in mapping are small areas of Duckston and Newhan soils. The poorly drained Duckston soils are in the wetter troughs and depression areas. The excessively drained Newhan soils are on the slightly higher lying areas. The included soils make up about 25 percent of the map unit.

Most of the acreage of this soil is in natural vegetation.

This soil is not suited to agricultural uses because of its position on the landscape, the hazard of flooding, and salt spray from the ocean.

This soil is not suited to commercial tree production. The dominant vegetation includes saltmeadow cordgrass, bitter panicum, and silverleaf croton in areas that receive high amounts of salt spray. Plants in areas less affected by the salt spray include largeleaf pennywort, seaside goldenrod, waxmyrtle, yaupon holly, northern bayberry, eastern baccharis, stunted live oak, loblolly pine, blueberry, wild olive, seacoast bluestem, seashore elder, and sea rocket.

Figure 2.—Peanuts on Conetoe loamy sand, 0 to 3 percent slopes.

This soil is poorly suited to urban and recreation uses because of wetness, flooding, and sandy material.

This Corolla soil is in capability subclass VIIw. It is not assigned to a woodland group.

CrB—Corolla-Duckston complex, 0 to 6 percent slopes. This map unit is on the Outer Banks. It is made up of Corolla and Duckston soils that are in areas so intricately mixed or so small that mapping them separately was not practical. These soils commonly are just inland from some of the frontal dunes. The Corolla soil is on the flats and the small hummocks. The Duckston soil is in the wetter, slightly lower, depressional areas. Areas are irregular in shape and range from 5 to 100 acres.

The moderately well drained and somewhat poorly drained Corolla soil makes up about 60 percent of this map unit. Typically, the surface layer is grayish brown fine sand 3 inches thick. The underlying material extends to a depth of 60 inches. The upper part is very pale brown fine sand and light brownish gray sand that has yellowish red mottles. The middle part is dark grayish brown sand that has grayish brown mottles. The lower part is gray sand.

In the Corolla soil, permeability is very rapid, and the available water capacity is low. The soil is medium acid to mildly alkaline. The seasonal high water table fluctuates between 1 1/2 and 3 feet below the surface. This soil is rarely flooded.

The poorly drained Duckston soil makes up about 25 percent of this map unit. Typically, the surface layer is grayish brown fine sand 10 inches thick. The subsurface layer to about 18 inches is dark grayish brown fine sand. The underlying material to a depth of 72 inches is gray fine sand.

In the Duckston soil, permeability is very rapid above the water table, and the available water capacity is low. The soil ranges from medium acid to moderately alkaline. The seasonal high water table fluctuates between 1 foot and 2 feet below the surface. This soil is subject to frequent flooding for brief periods.

Included with this unit in mapping are small areas of Newhan soils. These areas are in higher positions commonly near the ocean side of the map unit. The included soils make up about 15 percent of the unit.

These soils are not suited to agricultural uses because of the hazard of flooding and salt spray from the ocean. They are poorly suited to urban and recreation uses because of flooding.

These soils are not suited to commercial tree production. The natural vegetation of the Corolla soil

consists of sparse stands of saltmeadow cordgrass, northern bayberry, eveningprimrose, largeleaf pennywort, scrubby live oak, blueberry, wild olive, persimmon, ragweed, and Virginia creeper. The natural vegetation of the Duckston soil consists of dense stands of saltmeadow cordgrass, waxmyrtle, and northern bayberry in areas affected by salt spray. Vegetation in areas further from the influence of salt spray include greenbrier, eastern baccharis, scattered black willow, blueberry, wild olive, and persimmon.

The Corolla and Duckston soils are in capability subclass VIIw. They are not assigned to a woodland group.

Cu—Currituck mucky peat. This is a nearly level, very poorly drained soil on broad flat marshes along the Currituck and Albemarle Sounds. It is also on small islands in the Currituck Sound. Areas are irregular in shape and range from 10 to several hundred acres.

Typically, the surface layer is 28 inches thick. It is very dark grayish brown. The upper part is mucky peat, and the lower part is muck. The underlying material to a depth of 60 inches is greenish gray sand.

The surface layer is highly decomposed organic matter. Permeability is moderate to moderately rapid. The soil ranges from very strongly acid to medium acid in the organic layers and extremely acid to medium acid in the mineral layers. The seasonal high water table is at or near the surface. This soil is flooded frequently by changing tides for very long periods.

Included with this soil in mapping are areas where the underlying mineral layers contain more silt and clay than is typical for Currituck mucky peat. Also, the muck layer is less than 16 inches thick. These included areas are common on Knotts Island and adjacent islands and along the sound side of the Outer Banks near the State line. Also included are deep muck areas. These commonly are along the Northwest River and along the west side of the North Landing River that extends to the state line.

Most of the acreage of this soil is in natural vegetation.

This soil is not suited to agricultural uses. It is not suitable for use as cropland because of landscape position, wetness, and frequent flooding.

This soil is not suited to commercial tree production. The dominant native vegetation is black needlerush, big cordgrass, maidencane, sawgrass, eastern baccharis, waxmyrtle, willow, and cattail. Wetness, flooding, and poor trafficability are the main limitations to woodland use and management.

This soil is not suited to urban and recreation uses because of frequent flooding and low strength.

This Currituck soil is in capability subclass VIIIw. It is not assigned to a woodland group.

Da—Dare muck. This is a nearly level, very poorly drained soil in the northwestern part of the county in the Dismal Swamp. Areas are irregular in shape and range from 50 to 500 acres.

Typically, the surface layer is undecomposed leaves and twigs 4 inches thick. The underlying organic material to a depth of 70 inches is black muck in the upper part and dark reddish brown muck in the lower part. The underlying mineral material to a depth of 96 inches is very dark grayish brown fine sand in the upper part and dark gray and gray loamy fine sand in the lower part.

The surface layer consists of highly decomposed organic matter. Permeability is slow. The soil is extremely acid throughout except where the surface layer has been limed. Many logs, roots, and stumps are present throughout the profile. The seasonal high water table is at or near the surface. This soil is subject to frequent flooding for brief periods.

Included with this soil in mapping are small areas of Ponzer soils that have an organic layer less than 51 inches thick. The included soils are throughout the unit with no apparent change in landscape to indicate their presence.

Most of the acreage of this soil is in woodland.

This soil is poorly suited to agricultural uses. The many logs, stumps, and roots in the soil and the depth of organic matter severely limit suitability for cultivation. Wetness is also a limitation. Spring tillage and fall harvest can be delayed because of wetness.

The soil is poorly suited to commercial tree production. The dominant native trees are pond pine, baldcypress, water tupelo, sweetgum, red maple, and sweetbay. The understory includes inkberry, sphagnum moss, titi, gallberry, fetterbush lyonia, greenbrier, and huckleberry. Wetness is the main management concern for woodland use.

This soil is not suited to urban and recreation uses because of wetness and low strength.

This Dare soil is in capability subclass IVw, if drained, and in woodland group 5w.

Do—Dorovan mucky peat. This is a nearly level, very poorly drained soil on the flood plains along the North River, the Currituck Sound, and major streams and their tributaries. The areas are oblong, and most are about 1,000 acres in size.

Typically, the surface layer is black mucky peat 10 inches thick. The subsurface layer to about 84 inches is very dark gray muck in the upper part and black muck in the lower part. The underlying mineral layers to a depth of 96 inches are very dark grayish brown stratified fine sand and loamy fine sand.

This soil is highly decomposed organic matter. Permeability is moderate. The soil is extremely acid in the organic layers. The seasonal high water table is at or near the surface. The soil is frequently flooded for long periods.

Included with this soil in mapping are small areas of Currituck soil. The Currituck soil is on the outer edge of the map unit where the thickness of organic layers is less than 51 inches.

Most of the acreage of this soil is wooded.

This soil is poorly suited to agricultural uses. Landscape position, wetness, and frequent flooding make it unsuitable for use as cropland.

This soil is poorly suited to commercial tree production. The dominant trees are ash, pond pine, baldcypress, swamp tupelo, water tupelo, and red maple. The understory includes redbay, greenbrier, and waxmyrtle. Wetness and poor trafficability are the main limitations to woodland use and management.

This soil is not suited to urban and recreation uses because of frequent flooding, wetness, and low strength.

This Dorovan soil is in capability subclass VIIw and in woodland group 4w.

Ds—Dragston loamy fine sand. This is a nearly level, somewhat poorly drained soil on low ridges along the streams that flow into the Currituck Sound. A major portion of this unit is in the southern part of the county. Areas are irregular in shape and range from 5 to 40 acres.

Typically, the surface layer is dark brown loamy fine sand 8 inches thick. The subsoil is sandy loam that extends to a depth of 42 inches. The upper part is light yellowish brown and has gray and brownish yellow mottles. The middle part is light yellowish brown and has yellowish brown and light gray mottles. The lower part is light gray and has yellowish brown mottles. The underlying material to a depth of 60 inches is light gray loamy sand that has yellowish red and strong brown mottles.

Permeability is moderately rapid, and the available water capacity is medium. The soil is very strongly acid or strongly acid throughout except where the surface layer has been limed. The seasonal high water table fluctuates between 1 foot and 2 1/2 feet below the surface.

Included with this soil in mapping are small areas of the slightly more clayey Augusta soils, the better drained Munden soils on the slightly elevated knolls, and the wetter Nimmo soils in the lower depressional areas. These included soils are throughout the unit.

Most of the acreage of this soil is used for cultivated crops. The rest is mainly in woodland.

This soil is well suited to most locally grown crops. The main crops are peanuts, corn, and soybeans (fig. 3). Wetness is the main limitation for cultivation. This soil is well suited to pasture forages.

The dominant native trees are loblolly pine, sweetgum, red maple, yellow-poplar, willow oak, water oak, black cherry, and American beech. The main understory

Figure 3.—Soybeans planted in wheat stubble on Dragston loamy fine sand.

includes dogwood, sourwood, sweetbay, and sassafras as well as briers and reeds. Wetness is the main limitation to woodland use and management.

This soil is poorly suited to most urban and recreational uses because of wetness. Extensive drainage and site modifications improve the potential for dwellings that require septic tank absorption fields.

This Dragston soil is in capability subclass IIw and in woodland group 2w.

Dt—Duckston fine sand. This is a nearly level, poorly drained soil on the Outer Banks. It is on flats and in slight depressions on the ocean side. Areas are irregular in shape and range from 5 to 50 acres.

Typically, the surface layer is grayish brown fine sand 10 inches thick. The subsurface layer to about 18 inches is dark grayish brown fine sand. The underlying material to a depth of 72 inches is gray fine sand.

The organic matter content of the surface layer is low. Permeability is very rapid above the water table. The soil ranges from medium acid to moderately alkaline. The seasonal high water table fluctuates between 1 foot and 2 feet below the surface. This soil is subject to frequent flooding by storm tides for brief periods.

Included with this soil in mapping are small areas of the somewhat poorly drained Corolla soils and the excessively drained Newhan soils. The Corolla soils are on the low knolls and the Newhan soils are on the higher lying knolls.

Most of the acreage of this soil is in natural vegetation.

This soil is not suited to farming. Landscape position and flooding make it unsuitable for use as cropland.

This soil is not suited to commercial tree production. The dominant vegetation is determined by proximity to the ocean. Saltmeadow cordgrass and waxmyrtle are in areas affected by salt spray. As the distance from the ocean spray increases, less salt-tolerant grasses and sedges occur as well as greenbrier, eastern baccharis, black willow, redbay, three-square rush, cattail, sawgrass, blueberry, wild olive, and Virginia creeper.

This soil is poorly suited to urban and recreation uses because of wetness and flooding.

This Duckston soil is in capability subclass VIIw. It is not assigned to a woodland group.

Du—Dune land. This miscellaneous area is made up of large areas of sands that are subject to severe blowing and shifting with the wind. The dunes are on the Outer Banks. The surface has less than 15 percent vegetative cover. The dunes range in height from a few feet to more than 100 feet. Some are elongated mounds, and others are oval or crescent-shaped hills of loose sand. The water table is at a depth of more than 6 feet. Dune land is extremely droughty.

This unit is in capability subclass VIIIs. It is not assigned to a woodland group.

DwD—Dune land-Newhan complex, 2 to 40 percent slopes. This complex consists of Dune land and Newhan soils on the Outer Banks parallel to the ocean. The areas were mapped as one unit because mapping them separately was not practical. Dune land is essentially bare of vegetation. It is mainly in the steeper positions. The Newhan soil is vegetated, but plant density is variable. Areas are irregular in shape and range from 10 to 100 acres.

The Dune land makes up 65 percent of this map unit. It consists of sands that are subject to severe blowing and shifting with the wind and that have less than 15 percent vegetative cover. Water moves very rapidly through the sand. The capacity of the sand to hold water for plant growth is very low.

The excessively drained Newhan soil makes up about 35 percent of this map unit. Typically, the surface layer is grayish brown fine sand 3 inches thick. The underlying material to a depth of 75 inches is light gray fine sand and sand.

Permeability is very rapid, and the available water capacity is low. The soil is neutral or mildly alkaline.

Dune land and Newhan soil are poorly suited to farming and to woodland use.

The blowing sand is the main limitation to urban and recreation uses. Structures and plants in these areas are subject to being either undermined or covered by the sand.

Areas of Dune land and Newhan soil should be stabilized before use as homesites and recreation areas is considered. If these areas are stabilized, the soil characteristics and use would be the same as those for the Newhan soil.

Only the most drought-tolerant plants should be used to stabilize these areas. American beachgrass, panicgrass, and bitter panicum are suited to this purpose (fig. 4). After stabilization has been accomplished, shrubs can be planted in areas protected from salt spray. The adapted species are waxmyrtle, northern bayberry, yaupon holly, and flameleaf sumac. The shrubs provide a more permanent cover than the grasses. Shrubs also help provide an environment within which other native plants can become established.

Dune land and Newhan soil are in capability subclass VIIIs. The map unit is not assigned to a woodland group.

Mu—Munden loamy sand. This is a nearly level, moderately well drained soil on smooth low ridges, mainly in the southern part of the county. Areas are irregular in shape and range from 5 to 30 acres.

Typically, the surface layer is dark grayish brown loamy sand 9 inches thick. The subsurface layer is light yellowish brown loamy sand 5 inches thick. The subsoil is sandy loam that extends to a depth of 32 inches. The upper part is yellowish brown and has strong brown mottles. The lower part is pale brown and has brownish yellow and light brownish gray mottles. The underlying material to a depth of 60 inches is olive yellow sand that has strong brown and light gray mottles.

Figure 4.—An area of Dune land-Newhan complex, 2 to 40 percent slopes. The plants include panicgrass and bayberry shrubs. Penny Hill, the largest dune in the county, is in the background.

Permeability is moderate in the subsoil and moderately rapid in the underlying material. The available water capacity is low. This soil ranges from very strongly acid to medium acid except where the surface layer has been limed. The seasonal high water table fluctuates between depths of 1 1/2 and 2 1/2 feet.

Included with this soil in mapping are small areas of well drained Bojac soils, somewhat poorly drained Dragston soils, and poorly drained Nimmo soils. These included soils are common throughout most of the map unit.

Most of the acreage of this soil is used for cultivated crops. The rest is mainly in woodland.

This soil is well suited to most locally grown crops. The main crops are peanuts, corn, and soybeans. Wetness is the main limitation for cultivation. No-till planting, field borders, and rotating cultivated crops and close-growing crops also help conserve soil and water. This soil is well suited to pasture forages.

The dominant native trees are loblolly pine, sweetgum, red maple, yellow-poplar, willow oak, water oak, black cherry, and American beech. The major understory includes dogwood, sourwood, sweetbay, and sassafras as well as briers and reeds. Wetness is the main limitation for woodland use and management.

This soil is poorly suited to most urban uses because of wetness. Extensive drainage and site modification improve the area for dwellings that require septic tank absorption fields. This soil is suited to most recreation uses. Wetness is the main limitation.

This Munden soil is in capability subclass IIw and in woodland group 2w.

NeC—Newhan fine sand, 0 to 10 percent slopes. This is an excessively drained soil on the Outer Banks. It commonly is inland next to the Beaches-Newhan complex. It is within the salt spray zone and supports salt-tolerant vegetation. Areas are oblong and range from 5 to 30 acres.

Typically, the surface layer is grayish brown fine sand 3 inches thick. The underlying material to a depth of 75 inches is light gray fine sand and sand.

Permeability is very rapid, and the available water capacity is low. The soil is neutral or mildly alkaline.

Included with this soil in mapping are small areas of Duckston and Corolla soils. These included soils are in the lower, wetter troughs or depressions, and they are common throughout the map unit.

Most of this soil is covered with salt-tolerant grasses

Figure 5.—American beachgrass, on Newhan fine sand, 0 to 10 percent slopes, has helped to stabilize the area and prevents soil blowing.

and shrubs. Some areas are used for beach cottages and recreation, and as wildlife habitat.

This soil is not suited to farming. Landscape position, salt spray, and droughtiness are the main limitations.

This soil is not suited to commercial tree production. The dominant vegetation is American beachgrass, seashore elder, sea rocket, sea oats, smooth cordgrass, bitter panicum, bluestem, and other species adapted to the effects of salt spray, blowing sand, and droughty soil conditions (fig. 5).

This soil is poorly suited to urban and recreation uses. Areas that do not have a vegetative cover are subject to severe blowing. A vegetative cover must be established and maintained to stabilize the areas of this soil. Some areas may be subject to erosion by ocean waves. Contamination of ground water by poorly filtered seepage from septic tanks is possible.

This Newhan soil is in capability subclass VIIIs. It is not assigned to a woodland group.

NhC—Newhan-Corolla complex, 0 to 10 percent slopes. This complex consists of Newhan and Corolla soils on the Outer Banks. The areas of these soils are in such an intricate pattern that mapping them separately was not practical. In many places, these soils are in a transitional zone between the soils along the ocean and the flat, wet soils along the sound side of the Outer Banks. The landscape is one of gently sloping to sloping low dunes separated by flat basins. The Newhan soil is on the low dunes, and the Corolla soil is in the flat basins. The mapped areas are irregular in shape and range from 5 to 100 acres in size.

The excessively drained Newhan soil makes up 70 percent of this map unit. Typically, the surface layer is grayish brown fine sand 3 inches thick. The underlying material to a depth of 75 inches is light gray fine sand.

In the Newhan soil, permeability is very rapid, and the available water capacity is low. The soil is neutral or mildly alkaline.

The moderately well drained to somewhat poorly drained Corolla soil makes up 20 percent of this map unit. Typically, the surface layer is grayish brown fine sand 3 inches thick. The underlying material extends to a depth of 60 inches. The upper part is very pale brown fine sand and light brownish gray sand that has yellowish red mottles. The middle part is dark grayish brown sand that has grayish brown mottles. The lower part is gray sand.

In the Corolla soil, permeability is very rapid, and the available water capacity is low. The soil is medium acid to mildly alkaline. The seasonal high water table fluctuates between 1 1/2 and 3 feet below the surface. This soil is subject to rare flooding.

Included with these soils in mapping are small areas of the poorly drained Duckston soils. They are in slightly

depressional areas. Also included are soils on short side slopes that have slopes of more than 10 percent. The included soils make up about 10 percent of the map unit.

The soils making up this complex are not suited to agricultural, recreation, woodland, and urban uses.

Vegetation common on the Newhan soil includes American beachgrass, seacoast bluestem, coastal panicgrass, bitter panicum, largeleaf pennywort, and ragweed. Vegetation common on the Corolla soil includes saltmeadow cordgrass, live oak, waxmyrtle, seashore elder, sea rocket, eveningprimrose, and largeleaf pennywort.

Areas that do not have sufficient protective vegetative cover are subject to soil blowing. To stabilize and prevent the soils from blowing, a vegetative cover must be established and maintained. American beachgrass and bitter panicum are suitable for this purpose. After stabilization has been accomplished, shrubs can be planted in areas protected from salt spray. Suitable species are waxmyrtle, northern bayberry, yaupon holly, ragweed, flameleaf sumac, and seacoast bluestem. The shrubs will provide not only a more permanent cover than the grass but also an environment within which other plants can become established.

These Newhan and Corolla soils are in capability subclass VIIIs. They are not assigned to a woodland group.

No—Nimmo loamy sand. This is a nearly level, poorly drained soil on low, smooth ridges and in depressions. This soil is mainly in the southern part of the county and in the vicinity of Shawboro. Areas are irregular in shape and range from 5 to 40 acres.

Typically, the surface layer is dark grayish brown loamy sand 9 inches thick. The subsoil is sandy loam that extends to a depth of 30 inches. The upper part is light brownish gray and has light yellowish brown mottles. The lower part is gray and has light yellowish brown mottles. The underlying material to a depth of 60 inches is light brownish gray sand and pale yellow sand.

Permeability is moderate in the upper part and moderately rapid in the underlying material. The soil ranges from extremely acid to strongly acid except where the surface layer has been limed. The seasonal high water table is at or near the surface.

Included with this soil in mapping are small areas of the slightly better drained Dragston soils and the more clayey Tomotley soils. The Dragston soils are in slightly higher areas and have a slightly convex surface. The Tomotley soils have a sandy loam surface layer.

Most of the acreage of this soil is used for cultivated crops. The rest is mainly in woodland.

The soil is well suited to most of the locally grown crops. The main crops are potatoes, corn, and soybeans. Wetness is the main limitation. This soil is well suited to pasture forages.

The dominant native trees are loblolly pine, sweetgum, red maple, yellow-poplar, willow oak, water oak, black cherry, and American beech. The understory includes dogwood, sourwood, sweetbay, and sassafras as well as briers and reeds. Wetness is the main limitation to woodland use and management.

This soil is poorly suited to urban and recreation uses because of wetness.

This Nimmo soil is in capability subclass IIIw and in woodland group 2w.

Os—Osier fine sand. This is a nearly level, poorly drained soil on low flats along the edge of the freshwater marshes and in small depressions on the sound side of the Outer Banks. This soil is dominantly out of the salt spray zone, and it supports trees. Areas are irregular in shape and range from 5 to 50 acres.

Typically, the surface layer is covered with 3 inches of pine needles, leaves, and twigs. The surface layer is very dark grayish brown fine sand 5 inches thick. The underlying material to a depth of 60 inches is sand that is grayish brown in the upper part, olive gray in the middle part, and greenish gray in the lower part.

Permeability is rapid or very rapid. The soil ranges from very strongly acid to medium acid. The seasonal high water table is at or near the surface. This soil is commonly flooded for brief periods. This soil is protected from salt spray and blowing sand.

Included with this soil in mapping are soils on small knolls. The soils on these sandy knolls are better drained than the Osier soil.

Most of the acreage of this soil is in woodland.

This soil is poorly suited to agricultural uses because of landscape position and flooding.

The dominant vegetation is loblolly pine, water oak, sweetgum, redbay, greenbrier, red maple, and blackgum.

This soil is poorly suited to urban and recreation uses because of wetness and flooding.

This Osier soil is in capability subclass Vw and in woodland group 3w.

OuB—Ousley fine sand, 0 to 6 percent slopes. This is a moderately well drained soil on flats near the sound side of the Outer Banks. It is well back from the frontal ocean side and out of the main salt spray zone. Areas are irregular in shape and range from 5 to 50 acres.

Typically, the surface layer is covered with decomposed forest litter. The surface layer is 7 inches thick. The upper part is dark gray fine sand, and the lower part is gray fine sand. The underlying material to a depth of 60 inches is yellowish brown fine sand in the upper part and very pale brown fine sand in the lower part.

Permeability is rapid, and the available water capacity is low. The soil is very strongly acid to neutral. The seasonal high water table fluctuates between 1 1/2 and 3 feet below the surface. Some of these soils are subject to flooding during hurricanes or exceptionally strong wind tides.

Included with this soil in mapping are small areas of Duckston and Newhan soils. The excessively drained

Newhan soils are on the slightly elevated ridges, and the poorly drained Duckston soils are in the wetter trough and depression areas.

Most of the acreage of this soil is in woodland. This soil is poorly suited to agricultural use.

The dominant vegetation is live oak, persimmon, water oak, loblolly pine, sweetgum, yaupon holly, Virginia creeper, and blueberry. Wetness is the main limitation for woodland use and management.

This soil is poorly suited to urban and recreation uses because of wetness, flooding, and sandy material.

This Ousley soil is in capability subclass IIIw and in woodland group 3w.

Pa—Pasquotank silt loam. This is a nearly level, poorly drained soil in broad flat areas mainly in the northern part of the county. Areas are irregular in shape and range from 30 to 1,000 acres.

Typically, the surface layer is grayish brown silt loam 7 inches thick. The subsoil is silt loam and extends to a depth of 45 inches. The upper part is light brownish gray, the middle part is grayish brown and has light yellowish brown mottles, and the lower part is light gray and has light yellowish brown mottles. The underlying material to a depth of 60 inches is gray fine sand.

Permeability is moderate. This soil is very strongly acid or strongly acid except where the surface has been limed. Surface crusting and shallow ponding are common after rains. The seasonal high water table fluctuates between depths of 1 foot and 2 feet.

Included with this soil in mapping are small areas of loamy Tomotley soils, clayey Roanoke soils, and dark-surfaced Portsmouth soils. Tomotley soils commonly are in slightly higher areas. Roanoke and Portsmouth soils generally are near the outer edge of the mapped areas where they adjoin mapped areas of other Roanoke and Portsmouth soils.

Most of the acreage of this soil has been cleared and is used for cultivated crops. The rest is mainly in pasture or woodland.

The soil is well suited to most locally grown crops. The main crops are corn, potatoes, and soybeans. Establishing field borders and rotating cultivated crops and close-growing crops help conserve soil and water. The soil is well suited to pasture forages.

The dominant native trees are loblolly pine, sweetgum, willow oak, water oak, yellow-poplar, and red maple. The understory includes gallberry, dogwood, sweetbay, and sassafras as well as briers and reeds. Wetness is the main limitation to woodland use and management.

This soil is poorly suited to most urban and recreation uses because of wetness. Extensive drainage and site modification are needed if this soil is used for dwellings that require septic tank absorption fields.

This Pasquotank soil is in capability subclass IIIw and in woodland group 2w.

Po—Ponzer muck. This is a nearly level, very poorly drained soil in the western part of the county in the Dismal Swamp. Areas are broad and irregular in shape and range up to about 1,000 acres.

Typically, the muck is 26 inches thick. The upper part is black, the middle part is very dark brown, and the lower part is very dark grayish brown. The underlying mineral material to a depth of 60 inches is mottled dark brown, very dark gray, light yellowish brown, and light brownish gray loam in the upper part and dark gray loam in the lower part.

The surface layer is highly decomposed organic matter. Permeability is slow in undrained areas. In drained areas, permeability is moderate in organic layers and moderately slow in mineral layers. The organic layers are extremely acid throughout unless the surface has been limed. The mineral layers range from extremely acid to slightly acid. The seasonal high water table is at or near the surface. This soil is subject to rare flooding.

Included with this soil in mapping are small areas of Wasda and Dare soils. The Wasda soils have a muck layer that is less than 16 inches thick. They commonly are near the outer edge of the mapped areas. Dare soils have a muck layer more than 51 inches thick. They commonly are near the center of the mapped areas. The included soils make up about 15 percent of the map unit.

Most of the acreage of this soil is used for cultivated crops. The rest is mainly in woodland.

If drained, this soil is well suited to crops. The main crops are corn and soybeans. Wetness is the main limitation to cultivation. Spring tillage and fall harvest may be delayed because of wetness. Large initial applications of lime are necessary for crops. During spring planting soil blowing is a hazard. Minimum tillage, field borders, and windbreaks help reduce soil blowing.

The dominant native vegetation includes red maple, sweetbay, baldcypress, blackgum, loblolly pine, pond pine, Atlantic white-cedar, and sweetgum. The understory includes swamp cyrilla, sphagnum moss, titi, gallberry, waxmyrtle, pawpaw, fetterbush, and switchcane. Wetness is the main limitation to woodland use and management.

This soil is poorly suited to most urban and recreation uses because of wetness.

This Ponzer soil is in capability subclass IVw and in woodland group 4w.

Pt—Portsmouth fine sandy loam. This is a nearly level, very poorly drained soil on broad flats mainly along the eastern edge of the Dismal Swamp. Small areas are in the Great Swamp and in an area northwest of Jarvisburg. Areas are irregular in shape and range from 5 to more than 100 acres.

Typically, the surface layer is very dark gray fine sandy loam 16 inches thick. The subsoil extends to a depth of 38 inches. The upper part is dark gray sandy clay loam that has yellowish brown mottles, and the lower part is dark gray sandy loam. The underlying material to a depth of 80 inches is light brownish gray sand that has yellowish brown mottles.

Permeability is moderate in the surface layer and subsoil and rapid or very rapid in the underlying material. The surface layer and the subsoil range from extremely acid to strongly acid except where the surface has been limed. The sandy underlying material ranges from extremely acid to medium acid. The seasonal high water table is at or near the surface. This soil is subject to rare flooding.

Included with this soil in mapping are small areas of the Tomotley soils, which have a dark colored surface layer that is less than 10 inches thick. Also included are areas of the more clayey Cape Fear soils. The included soils make up 10 to 20 percent of the map unit.

Most of the acreage of this soil is drained and used for cultivated crops. The rest is mainly in woodland and pasture.

If drained, this soil is well suited to corn, soybeans, and small grains. It is poorly suited to tobacco, cotton, and peanuts. Wetness is the main limitation. Tillage can be delayed in spring because of wetness. Poor outlets are a limitation to the installation of drainage systems. This soil is well suited to pasture forages, such as fescue and ladino clover.

The dominant trees are baldcypress, pond pine, red maple, green ash, sweetgum, black tupelo, swamp tupelo, elm, yellow-poplar, river birch, water oak, and willow oak. The understory includes cedar, American holly, sweetbay, sourwood, reeds, and waxmyrtle. Wetness is the main limitation to woodland use and management.

This soil is poorly suited to most urban and recreation uses because of wetness.

This Portsmouth soil is in capability subclass IIIw and in woodland group 1w.

Ro—Roanoke fine sandy loam. This is a nearly level, poorly drained soil on broad flats and in slightly depressed drainageways. Most areas of this soil are north of Shawboro. The areas are 5 to more than 100 acres in size.

Typically, the surface layer is dark grayish brown fine sandy loam 8 inches thick. The subsoil extends to a depth of 45 inches. The upper part is gray silty clay loam that is mottled dark grayish brown and dark gray. The middle part is gray silty clay that is mottled dark gray and strong brown, and the lower part is gray sandy clay loam that is mottled dark grayish brown and grayish brown. The underlying material to a depth of 80 inches is gray sand.

Permeability is slow, and the shrink-swell potential is moderate. The subsoil is very strongly acid or strongly acid. The seasonal high water table is at or near the surface. This soil is frequently flooded for brief periods.

Included with this soil in mapping are small areas of Cape Fear and Wahee soils. The dark colored Cape Fear soils are in slight depressions. The slightly better drained Wahee soils are on the slightly higher lying areas in the map unit. Near the State line the soil is similar to this Roanoke soil except that it has more silt and less clay. The included soils make up about 15 percent of the map unit.

Most of the acreage of this soil is used for cultivated crops. The rest is mainly in pasture or woodland.

If drained and protected from flooding, this soil is well suited to corn, soybeans, and small grain. Wetness and flooding are the main limitations (fig. 6). Minimum tillage, cover crops, and including grasses and legumes in the cropping system help maintain tilth and production. Tillage can be delayed in spring because of wetness. Poor outlets and slow permeability are limitations to the installation of drainage systems. It is well suited to pasture forages, such as fescue and ladino clover.

The dominant native trees are baldcypress, pond pine, loblolly pine, red maple, green ash, hickory, sweetgum, blackgum, elm, river birch, water oak, overcup oak, and willow oak. The understory includes eastern redcedar, American holly, sweetbay, sourwood, reeds, and waxmyrtle. Wetness and flooding are the main limitations to woodland use and management.

This soil is poorly suited to most urban and recreation uses because of flooding, wetness, slow permeability, and low strength.

This Roanoke soil is in capability subclass IIIw and in woodland group 2w.

StA—State fine sandy loam, 0 to 2 percent slopes. This is a well drained soil on low ridges along the Currituck and Albemarle Sounds and their tributaries. Areas are irregular in shape and range from 5 to 75 acres.

Typically, the surface layer is dark yellowish brown fine sandy loam 8 inches thick. The subsoil extends to a depth of 43 inches. It is yellowish brown sandy loam in the upper part, yellowish brown sandy clay loam in the middle part, and brownish yellow sandy loam in the lower part. The underlying material extends to a depth of 65 inches. The upper part is very pale brown loamy sand that is mottled strong brown and yellowish brown, and the lower part is brownish yellow sand that is mottled very pale brown.

Permeability is moderate, and the available water capacity is medium. The soil is very strongly acid or strongly acid in the upper part unless the surface has been limed, and it is very strongly acid to medium acid in the lower part. The seasonal high water table fluctuates between depths of 4 and 6 feet.

Included with this soil in mapping are small areas of the moderately well drained Altavista soils and the somewhat poorly drained Augusta soils. These soils are in slight depressions. Also included are areas of Conetoe soils, which have a thick loamy sand surface layer, and Bojac soils, which have less clay in the subsoil than this State soil. The Conetoe soils generally are in slightly higher areas than those of the State soil, and the Bojac soils are intermingled throughout the areas of the map

Figure 6.—Corn on Roanoke fine sandy loam, which is frequently flooded for brief periods.

unit. The included soils make up about 10 percent of the map unit.

Most of the acreage of this soil is used for cultivated crops. The rest is mainly in woodland and pasture.

This soil is well suited to corn, soybeans, peanuts, tobacco, small grains, and pasture forages.

The dominant native trees are loblolly pine, red maple, hickory, yellow-poplar, black tupelo, American elm, American beech, southern red oak, water oak, and white oak. The understory includes dogwood, sassafras, sourwood, and waxmyrtle. There are no major limitations to woodland use and management.

This soil is suited to most urban and recreation uses. Wetness is the main limitation.

This State soil is in capability class I and in woodland group 1o.

StB—State fine sandy loam, 2 to 6 percent slopes. This is a well drained soil on slightly rounded ridges along the Currituck and Albemarle Sounds and their tributaries. Areas are oblong in shape and range from 5 to 40 acres.

Typically, the surface layer is dark yellowish brown fine sandy loam 8 inches thick. The subsoil extends to a depth of 43 inches. It is yellowish brown sandy loam in the upper part, yellowish brown sandy clay loam in the middle part, and brownish yellow sandy loam in the lower part. The underlying material extends to a depth of 65 inches. The upper part is very pale brown loamy sand that is mottled strong brown and yellowish brown, and the lower part is brownish yellow sand that has very pale brown mottles.

Permeability is moderate, and the available water capacity is medium. The soil is very strongly acid or strongly acid in the upper part unless the surface layer has been limed, and it is very strongly acid to medium acid in the lower part. The seasonal high water table fluctuates between depths of 4 and 6 feet.

Included with this soil in mapping are small areas of the moderately well drained Altavista soils in slight depressions. Also included are areas of Conetoe soils, which have a thick loamy sand surface layer, and Bojac soils, which have less clay in the subsoil than this State soil. These two included soils commonly are near the outer edge of the mapped areas. The included soils make up about 15 percent of the map unit.

Most of the acreage of this soil is used for cultivated crops. The rest is mainly in woodland and pasture.

This soil is well suited to corn, soybeans, peanuts, tobacco, and small grains. If row crops are grown, runoff and a moderate erosion hazard on the gentle slopes are concerns in management. Field borders, rotating row crops and close-growing crops, and returning crop residue to the soil help conserve soil and water and aid in pest control. This soil is well suited to pasture forages.

The dominant native trees are loblolly pine, red maple, hickory, yellow-poplar, black tupelo, American elm, American beech, southern red oak, water oak, and white

oak. The understory includes dogwood, sassafras, sourwood, and waxmyrtle. There are no major limitations for woodland use and management.

This soil is suited to most urban and recreation uses. Wetness is the main limitation.

This State soil is in capability subclass IIe and in woodland group 1o.

To—Tomotley fine sandy loam. This is a nearly level, poorly drained soil on broad flats and in slight depressions along drainageways. Most of this soil is in the north-central part of the county. Areas are irregular in shape and range from 10 to 150 acres.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsurface layer to a depth of 10 inches is light brownish gray fine sandy loam that is mottled dark gray. The subsoil extends to a depth of 50 inches. The upper part is gray sandy clay loam that is mottled yellowish brown and strong brown, the middle part is gray sandy clay loam that is mottled red, yellowish brown, and strong brown, and the lower part is light gray fine sandy loam that is mottled strong brown and yellowish brown. The underlying material to a depth of 60 inches is light gray loamy fine sand that is mottled strong brown and light yellowish brown.

Permeability is moderate to moderately slow. The soil ranges from extremely acid to strongly acid in the upper part unless the surface has been limed. Below about 50 inches, this soil ranges from extremely acid to medium acid. The seasonal high water table is at or near the surface.

Included with this soil in mapping are small areas of Augusta, Portsmouth, and Roanoke soils. The Augusta soils are in the slightly higher areas. Portsmouth soils, which have a thick, dark colored surface layer, are in the lower, wetter depressional areas. The clayey Roanoke soils generally are near the outer edge of the mapped areas. The included soils make up 10 to 20 percent of the map unit.

Most of the acreage of this soil is used for cultivated crops. The rest is mainly in pasture or woodland.

This soil is well suited to most locally grown crops. The main crops are corn, potatoes, and soybeans. Wetness is the main limitation for cultivation. Tillage can be delayed in spring because of wetness. This soil is well suited to pasture forages.

The dominant native trees are loblolly pine, sweetgum, red maple, yellow-poplar, willow oak, water oak, black cherry, and American beech. The understory includes dogwood, sourwood, sweetbay, sassafras, and briers and reeds. Wetness is the main limitation to woodland use and management.

This soil is poorly suited to most urban and recreation uses because of wetness. Extensive drainage and site modification are needed for dwellings that require septic tank absorption fields.

This Tomotley soil is in capability subclass IIIw and in woodland group 2w.

Ud—Udorthents, loamy. This map unit consists of areas where the surface layer and most of the subsoil have been removed, areas of fill or dredged material, and areas of landfill. Most or all of the natural soil has been disturbed or covered.

The borrow pits are excavated areas from which the soil material has been removed for use as fill for construction. The cuts are from 3 to 15 feet deep. The base slope in these cuts is level to gently sloping. Most cuts have two or more short, nearly vertical side slopes. The exposed surface layer consists mainly of loamy marine deposits. The borrow pits range from 3 to about 25 acres in size. Small borrow pits of less than 3 acres are shown on the detailed maps by a special symbol.

Included in mapping are small areas of ponded water and mounds of fill material.

Some of the borrow pits have been reclaimed and seeded to grass. A few areas are naturally reseeded to wild grasses, weeds, and shortleaf pine. The areas are poorly suited to plant growth because of the unfavorable properties of the soil, the low fertility, and the low available water capacity.

The fill and dredged areas are commonly near the built-up areas. The fill areas generally are elevated with loamy material to help prepare them for a more intensive use such as building sites. The dredged spoils adjacent to water areas generally are sandy. Slopes are nearly level and gently sloping. Most areas are suitable for plant growth. The properties of the soil, natural fertility, and the available water capacity are variable. The dredged spoils commonly have poor filtering capacity for septic tank effluent, and this may create a hazard of pollution in the ground water and marshes.

The landfill consists of areas where the natural soil has been altered by landfill operations. The excavated trenches are filled with alternate layers of solid refuse and soil material. A final cover of about 2 feet of soil is on the surface. After the final cover is added, the surface ranges from nearly level to gently sloping.

Included in mapping is a small acreage of undisturbed soil. These areas are suited to plant growth. Natural fertility and the available water capacity are generally low. Permanent vegetative cover protects these areas from erosion.

The characteristics of the soil material within the mapped areas vary to such a degree that interpretative statements cannot be made without onsite examination of the individual areas.

This map unit is not assigned to a capability subclass or woodland suitability group.

Wa—Wahee fine sandy loam. This is a nearly level, somewhat poorly drained soil on low ridges along streams and rivers that flow into the Currituck and Albemarle Sounds. Areas are irregular in shape and range from 5 to 50 acres.

Typically, the surface layer is dark grayish brown fine sandy loam 7 inches thick. The subsoil extends to a

depth of 60 inches. The upper part is light yellowish brown clay loam that is mottled strong brown and light gray, the middle part is gray clay or clay loam that is mottled yellowish brown and strong brown, and the lower part is gray sandy clay loam that has yellowish brown mottles. The underlying material to a depth of 99 inches is light gray sand that has yellowish brown mottles.

Permeability is slow, the available water capacity is high, and the shrink-swell potential is moderate. The subsoil is very strongly acid or strongly acid throughout except where the surface layer has been limed. The seasonal high water table fluctuates between 1/2 foot and 1 1/2 feet below the surface.

Included with this soil in mapping are small scattered areas of Augusta soils, which have less clay in their subsoil than Wahee soils. Also included are small areas of Roanoke soils in the lower lying, wetter depressions. Most of the included soils are near the outer edge of the map unit. The included soils make up about 10 percent of the map unit.

Most of the acreage of this soil is used for cultivated crops. The rest is mainly in woodland.

This soil is well suited to most locally grown crops. The main crops are corn and soybeans. Wetness is the main limitation. Spring tillage and fall harvest can be delayed because of wetness. The slow permeability is a limitation to the installation of drainage systems. This soil is well suited to pasture forages, such as fescue and ladino clover.

The dominant native trees are pond pine, loblolly pine, red maple, green ash, hickory, sweetgum, black tupelo, elm, river birch, American sycamore, water oak, and willow oak. The understory includes cedar, American holly, sweetbay, sourwood, reeds, and waxmyrtle. Wetness and flooding are the main limitations to woodland use and management.

This soil is poorly suited to most urban and recreation uses because of wetness, slow permeability, and low strength.

This Wahee soil is in capability subclass IIIw and in woodland group 2w.

WnB—Wando loamy fine sand, 0 to 5 percent slopes. This is an excessively drained soil in the southern part of the county. It is on low broad ridges. Areas are irregular in shape and range from 10 to 100 acres.

Typically, the surface layer is dark brown loamy fine sand, 3 inches thick. The underlying material to a depth of 99 inches is light yellowish brown fine sand in the upper part, brownish yellow fine sand in the middle part, and yellow fine sand in the lower part.

Permeability is rapid, and the available water capacity is low. This soil ranges from medium acid to neutral except where the surface has been limed.

Included with this soil in mapping are small areas of Bojac and Conetoe soils. These soils have slightly more clay and more pronounced subsoil development than the Wando soil. These soils commonly are near the outer edge of the mapped areas. Also included are small areas of soils in small depressions that have a seasonal water table within about 4 feet of the surface. The included soils make up about 10 to 20 percent of the map unit.

Most of the acreage of this soil is used for cultivated crops. The rest is mainly in woodland.

This soil is suited to peach orchards and to a few crops, such as peanuts and soybeans. It does not have sufficient moisture for most crops during the growing season. Leaching of plant nutrients, the hazard of soil blowing, and the low available water capacity are the main limitations. Blowing sand can damage young plants. Minimum tillage, returning crop residue to the soil, windbreaks, and including close-growing grasses and legumes in the cropping system help control soil blowing and conserve moisture. Fertilizers, particularly nitrogen, should be added in split applications. This soil is suited to pasture forages such as Coastal bermudagrass and bahiagrass.

The dominant native trees are loblolly pine, longleaf pine, sweetgum, southern red oak, blackjack oak, white oak, post oak, and red maple. The understory includes dogwood, sassafras, and American holly. The low available water capacity is the main limitation to woodland use and management.

This soil is well suited to most urban uses. The thick sand provides a good support base for most structures. However, unprotected sandy surfaces are subject to soil blowing, and they are droughty when rainfall is limited. Seepage from septic tank filter field lines can be a limitation. The soil is well suited or suited to recreation uses.

This Wando soil is in capability subclass IIIs and in woodland group 3s.

Ws—Wasda muck. This is a nearly level, very poorly drained soil on broad flats. Areas are irregular in shape and range from 20 to 200 acres.

Typically, the surface layer is black muck 12 inches thick. The underlying mineral layer extends to 50 inches. The upper part is dark grayish brown clay loam, the middle part is dark grayish brown clay loam that has yellowish brown mottles and grayish brown sandy clay loam, and the lower part is grayish brown sandy loam that has yellowish brown mottles. The underlying material to a depth of 60 inches is light brownish gray sand.

The surface layer consists of highly decomposed organic matter. Permeability is moderate. The soil ranges from extremely acid to strongly acid in the upper part and medium acid to mildly alkaline in the lower part. The seasonal high water table is at or near the surface. This soil is subject to rare flooding.

Included with this soil in mapping are small areas of Ponzer soils, which have a thicker organic layer than the Wasda soil. Also included are small areas of Portsmouth

soils, which have a dark colored surface layer but do not have sufficient organic matter to be organic soils. The included soils are intermingled throughout and make up about 20 percent of the map unit.

Most of the acreage of this soil is used for cultivated crops. The rest is mainly in woodland.

If drained, this soil is well suited to most locally grown crops. The main crops are corn and soybeans. Wetness is the main limitation to cultivation. Spring tillage and fall harvest may be delayed because of wetness. Large initial applications of lime are necessary for crop production. During spring planting, soil blowing can be a hazard. Minimum tillage, field borders, and windbreaks reduce the hazard of soil blowing.

The dominant native trees are red maple, sweetbay, baldcypress, blackgum, loblolly pine, pond pine, Atlantic white-cedar, and sweetgum. The understory includes swamp cyrilla, sphagnum moss, titi, gallberry, waxmyrtle, pawpaw, fetterbush, and switchcane. Wetness is the main limitation to use and management.

This soil is poorly suited to most urban and recreation uses because of wetness and high organic matter content.

This Wasda soil is in capability subclass IIIw and in woodland group 1w.

Prime farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in providing the Nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, must encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to economically produce a sustained high yield of crops when it is treated and managed using acceptable farming methods. Prime farmland produces the highest yields with minimal inputs of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland may now be in crops, pasture, woodland, or other land, but not urban and built-up land or water areas. It must either be used for producing food or fiber or be available for these uses.

Prime farmland usually has an adequate and dependable supply of moisture from precipitation or irrigation. It also has favorable temperature and growing season, acceptable acidity or alkalinity. It has few or no rocks and is permeable to water and air. Prime farmland is not excessively erodible or saturated with water for long periods and is not flooded during the growing season. The slope ranges mainly from 0 to 6 percent. For more detailed information on the criteria for prime farmland consult the local staff of the Soil Conservation Service.

About 10,362 acres, or nearly 6 percent, of Currituck County meets the soil requirements for prime farmland. Areas are scattered throughout the county but are mainly in map unit 1 of the general soil map.

The soils in Currituck County identified as prime farmland soils are:

Altavista fine sandy loam, 0 to 2 percent slopes
Bojac loamy sand, 0 to 3 percent slopes
Munden loamy sand
State fine sandy loam, 0 to 2 percent slopes
State fine sandy loam, 2 to 6 percent slopes

Important farmland

Some soils in Currituck County are important to agriculture locally and at the state level. In one or more ways, their characteristics do not meet the requirements of prime farmland. These soils are naturally wet or droughty. Yet, they are productive soils with good yield potential under good management.

State and locally important soils in Currituck County make up about 85,381 acres, nearly 49 percent of the county. The soils in Currituck County identified as having state and local importance are:

Augusta fine sandy loam
Cape Fear loam
Conetoe loamy sand, 0 to 3 percent slopes
Dragston loamy fine sand
Pasquotank silt loam
Ponzer muck
Portsmouth fine sandy loam
Roanoke fine sandy loam
Tomotley fine sandy loam

Use and management of the soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand, roadfill, and topsoil. They can use it to identify areas where wetness or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and pasture

Foy D. Hendrix, conservation agronomist, and Rodney W. Johnson, district conservationist, Soil Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed soil map units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

In 1978, more than 38,000 acres was used for crops and pasture, according to the 1978 Land Utilization Survey of the North Carolina Crop and Livestock Reporting Service. Of this total, 308 acres was used for permanent pasture and 37,463 acres for harvested cropland; 1,082 acres was idle cropland.

The major crops include corn, soybeans, potatoes, peanuts, and small grains. Truck crops are grown on smaller acreages.

Many of the soils are well suited to vegetable crops. The latest information on growing special crops can be obtained from local offices of the Cooperative Extension Service and the Soil Conservation Service.

Farming has been Currituck County's principal source of income. It will continue to have an important role in the county's economy.

The soils suitable for farming can be divided into two major groups—those that have a light-colored surface layer and those that have a black or dark-colored surface layer. The soils that have a light-colored surface layer have a lower organic matter content. They are commonly on higher lying landscapes adjacent to the Albemarle Sound and the Currituck Sound. The soils that have a black surface layer have a higher content of organic matter. They are on the lower, wetter landscapes.

Soils that have a light-colored surface layer

Farming started early on the well drained sandy soils along the Currituck and Albemarle Sounds. Many of these soils are still used for farm crops.

Truck crops are grown on the somewhat poorly drained, well drained, and moderately well drained, nearly level to gently sloping Altavista, Augusta, Bojac, Dragston, Munden, and State soils. These soils are in the southern part of Currituck County. Truck crops include watermelon, sweet corn, cantaloupe, cucumbers, tomatoes, and squash. Artificial drainage may be needed on the Altavista, Munden, Dragston, and Augusta soils. Several peach orchards are on the sandy Conetoe and

Wando soils. Wind erosion is a potential hazard on these soils. Maintaining surface mulch or roughing the surface by tillage helps control erosion.

Corn, soybeans, and potatoes are commonly grown on such poorly drained soils as Roanoke, Pasquotank, Tomotley, and Nimmo soils. Potatoes are not grown on Roanoke soils because of the clayey subsoil. A drainage system is needed that consists of a primary system of canals, a secondary system of surface field ditches, and surface shaping and leveling. Surface field ditches are generally 200 to 300 feet apart on cropland and about 600 feet or more apart on woodland (fig. 7).

Other practices common in areas of soils that have a light-colored surface layer are field borders, winter cover crops, and conservation tillage. Crops respond to lime and fertilizer.

Soils that have a black surface layer

Soils that have a black surface layer are locally called "blackland" soils. They include both mineral and organic soils. The soils are the very poorly drained mineral soils such as Portsmouth and Cape Fear soils; those that have an organic surface layer and a mineral subsoil such as Conaby and Wasda soils; and the organic soils such as Ponzer and Dorovan soils.

The very poorly drained mineral soils were generally the first to be used for crops, mainly corn, soybeans, and small grains. Most of the other soils were in cutover forest or savannah type swamp until the 1950's. As a result of modern machinery, new technology, and a general increase in land values, most of the blackland soils have been developed rapidly for farming. Dorovan soils, however, which are in wet, wooded swamps, have not been developed for farming.

Practices applicable to the farming of blackland soils are described in the following paragraphs. *An onsite evaluation should be made to determine if the particular practice is ecologically desirable.*

Field drainage. Soils such as Wasda and Ponzer soils are the easiest to develop if drainage canals are installed. These soils require extensive drainage to provide at least a minimum of aerated soil in the upper profile for plant roots to grow in. Such drainage requires a primary system consisting of catch canals, a secondary system consisting of surface field ditches, and surface shaping and leveling for farmland. Field ditches are generally 1/2 mile long and 200 to 330 feet apart in farmland and about 660 feet or more apart in woodland.

Surface drainage is necessary to remove much of the excess water because most of these soils, mineral and organic alike, have very poor internal drainage. A workable surface drainage system includes surfaces with not more than 1/2 percent slope from the ditch upward

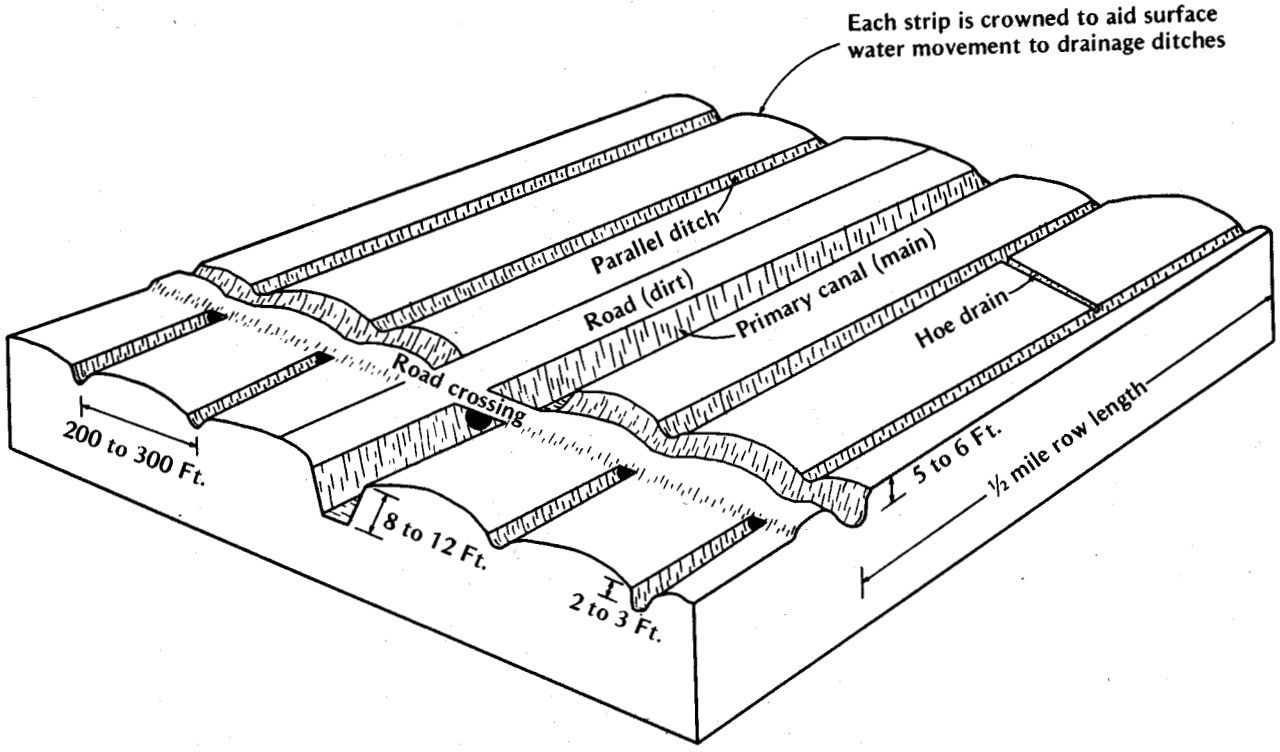


Figure 7.—Drainage system commonly used on wet soils in Currituck County.

toward the center of the field. Fields are leveled to remove depressional areas that pocket excess surface water.

Canals for adequate water removal generally require a minimum of about 1/2 foot elevation drop per mile. If less than this is available at a given site, pump drainage is generally necessary.

The rate of water flow in canals is almost always less than 1.8 feet per second because of the low elevations and gentle relief throughout the county. The slow flow rates allow most of the sand- and silt-sized materials that may erode from the land to settle in ditches and canals. Because of this, the sand and silt load moving into the outlets and estuaries remains low. The ditches and canals, however, require frequent cleaning to remove the sediment.

Control of erosion. Surface runoff from high intensity rains may cause soil loss even on fields that are nearly level. Most of the runoff erosion occurs around "hoedrains" or cross drains that are used across fields from ditch to ditch. The bulk of the eroded soil settles in field ditches and canals, closing outlets and necessitating more frequent and costly cleanouts. Erosion can be reduced by field shaping and leveling to reduce the number of cross drains, by minimum tillage, by leaving crop residue on the surface, and by stabilizing ditch and canal banks with plant cover.

Wind erosion may occur if the soils are bare, if the surface is smooth, or if the surface layer is dry. Soils that have a tendency to erode are high in organic matter and have a loose, very friable surface layer. Such sandy soils as Conetoe and Wando tend to erode in the spring. In some areas, windblown soil has partly filled ditches and canals, requiring more frequent cleaning of the ditches for drainage. The most effective control for wind erosion on cropland is to leave crop residue on the surface and to use bedding rows. Bedding leaves the surface rough, reducing the hazard of wind erosion.

Windbreaks also help control wind erosion. To be effective, they need to be perpendicular to the wind. Their area of effective control is 10 times the height of the trees or shrubs in the break. Windbreaks provide a good habitat for wildlife and add to the esthetics of large, cleared areas.

Soil fertility. None of the soils in Currituck County have enough natural fertility to produce economic returns on crops. They are naturally acid and require additions of lime to make them usable for most crops.

Liming requirements are of primary concern because the acidity level in the soil affects the availability of many of the nutrient elements for plants, and it affects the activity of beneficial bacteria. Lime also provides calcium, and when dolomitic lime is used, magnesium is also provided. The addition of lime neutralizes exchangeable aluminum and thereby counteracts the adverse effects aluminum has on crops.

The liming requirements differ depending upon the soil properties, past liming practices, and crops to be grown. In general, the soils that have a light-colored surface layer require less lime at the initial application than soils that have a black surface layer. However, the maintenance rates are commonly higher for the soils that have a light-colored surface layer. Also, low levels of magnesium are more common for the light-colored surface soils, which require more use of dolomitic lime. Soil tests should be used in determining liming needs and rates.

Nitrogen is necessary for most crops. The exception is legumes such as peanuts, clovers, soybeans, and alfalfa after it has been established. The amount of nitrogen to apply is determined by the potential yield desired. Appropriate rates are discussed in the "Yields per acre" section. Because nitrogen can be readily leached from sandy soils, applying nitrogen on these soils more than once during the growing season may be necessary.

The need for phosphorus can be determined by soil tests. A soil test on each field to determine the phosphate level is particularly important in Currituck County because phosphorus from past applications can build up in the soil.

Potassium requirements are also determined by soil tests.

Most organic soils, such as Dare, Ponzer, and Dorovan soils, have deficiencies of such micronutrients as copper, manganese, zinc, and boron. However, in Currituck County, copper is the only micronutrient that is regularly deficient. When soils are initially cultivated, an application of 2 1/2 to 4 pounds of elemental copper per acre is often suggested. This application is adequate for about 3 years, and subsequent applications should be made according to soil tests. If windrows or stump piles are removed or the surface is reshaped during sloping and leveling procedures, the exposed soils generally need to be treated with copper and lime as when they are initially cultivated. If soils are overlimed, deficiencies in zinc and manganese may occur. Once the soils are cultivated, rates of lime and fertilizer should be made according to soil test results.

The organic soils of the blacklands tend to be cold because of their high moisture content and the insulating effect of the organic matter. Consequently, these soils frost a few days later in the spring and a few days earlier in the fall than mineral soils in the same area. Therefore, planting dates for corn on the organic soils should be adjusted to avoid potential frost damage. Early maturing varieties of soybeans should be used for late plantings to avoid potential damage by early frost in the fall. The rate of growth for corn seedlings is slow in the spring because of cool soil temperatures. Seedling growth is greatly increased if fertilizer containing ammonium nitrogen and phosphorus is applied in bands. This contributes significantly to strong, fast growing stands even in cold, wet springs.

Chemical weed control. The use of herbicides for weed control on cropland is a common practice in Currituck

County. Successful use reduces the amount of tillage necessary. The content of organic matter, the texture of the surface layer, and other soil properties determine the rate of herbicide application. Table 16 gives the general range of organic matter content for each soil in the county, and table 15 gives the surface texture.

In some places, the organic matter content of a soil may be outside the range shown in the table. Higher ranges may occur in places that have received high amounts of animal or manmade waste. Soils recently brought into cultivation may have a higher content of organic matter in the surface layer than similar soils that have been in cultivation for a long time. Conservation tillage may also increase the organic matter content in the surface layer. Lower levels of organic matter are common in soils where the surface layer has been partly or completely removed by erosion or land smoothing.

In sandy soils that have less than 2 percent organic matter, rapid leaching of herbicides may damage young plants or prevent normal seed germination. The effectiveness of herbicides commonly decreases if the organic matter level exceeds 6 to 10 percent.

For specific herbicide rates, based on organic matter content and surface texture, read the manufacturer's label.

Yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, animal manure, and green-manure crops; and harvesting that insures the smallest possible loss.

The amount of nitrogen to apply depends on the potential yield of the crop. For example, nitrogen rates for corn on soils that have a yield potential of between 125 and 150 bushels per acre should be 140 to 160 pounds of nitrogen per acre. If the yield potential is 100 bushels per acre, then rates of 100 to 120 pounds of nitrogen per acre are needed. Application of nitrogen in excess of what the crop can use to obtain the potential yield is not practical. If corn or cotton is planted after soybeans and peanuts have been grown and harvested, nitrogen rates can be reduced 20 to 30 pounds per acre.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land capability classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. These levels are defined in the following páragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have slight limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow or droughty; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

Woodland management and productivity

Edwin J. Young, forester, Soil Conservation Service, helped prepare this section.

Forests are of economic, social, recreational, and environmental importance in Currituck County. Commercial forests cover 50 percent of the land area, or about 77,876 acres. Forests provide habitat suitable for wildlife as well as esthetic value to the area.

Commercial forest land is producing or is capable of producing crops for industrial wood products. Much of the timber harvested is high grade or is cut for limited products. More than half of the forest acreage harvested annually in the county receives no reforestation consideration. Often the resulting growth is a poorly stocked residual stand of timber.

Four forest type groups are identified in the county (*7*). They are:

Loblolly-shortleaf pine, which covers about 32,395 acres, is made up of 50 percent pine, and the rest is associated oak, hickory, and gum.

Oak-pine, which covers about 7,339 acres, is made up of 50 percent oak and pine, and the rest is associated hardwoods. On the uplands, pine makes up 25 to 50 percent of the forest; the rest includes oak, gum, hickory, and yellow-poplar.

Oak-hickory, which covers about 6,327 acres on uplands, is made up of 50 percent oak or hickory; common associated trees include elm, maple, yellow-poplar, and black walnut.

Oak-gum-cypress, which covers about 3,115 acres on bottom lands, is made up of water tupelo, blackgum, sweetgum, oak, and baldcypress. Common associated trees include cottonwood, willow, ash, elm, hackberry, and maple.

Table 6 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination (woodland suitability) symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *w*, excessive water in or on the soil; *d*, restricted root depth; *c*, clay in the upper part of the soil; *s*, sandy texture; and *r*, steep slopes. The letter *o* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: w, d, c, s, and r.

In table 6, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. Site index was determined at age 30 years for eastern cottonwood, 35 years for American sycamore, and 50 years for all other species. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suited to the soils and to commercial wood production.

Site index ranges for commonly grown trees are given in table 7. The site indices were assigned to a woodland suitability class for each species.

Recreation

The soils of the survey area are rated in table 8 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 8, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface absorbs rainfall readily, but it remains firm and is not dusty when dry. Strong slopes can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is firm after rains and is not dusty when dry.

Paths and trails for hiking, horseback riding, and bicycling should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife habitat

John P. Edwards, biologist, Soil Conservation Service, helped prepare this section.

Habitat for wildlife in Currituck County ranges from coastal marsh to upland hardwoods. Wetland habitat (fig. 8) includes coastal saline, coastal fresh, and inland fresh areas. Table 9 relates the wetland types and soils with vegetation in the county.

Woodland and openland habitats for deer, quail, and ducks are plentiful, and long-term predictions indicate that these conditions will remain about the same. Habitat for other wildlife such as bear, rabbits, doves, and geese is fair. Squirrel and furbearer habitat is rated as poor and fair, but the quality and quantity of that habitat is decreasing.

The Knotts Island part of the county provides good habitat for small game. The many small fields have an abundance of hedgerows. This combination creates excellent "edge" habitat, which is important to small game species. The dominant soils in this area are Conetoe, Dragston, and Munden soils.

Most of the large farms in the county are on Cape Fear, Ponzer, Roanoke, and Tomotley soils. On these farms, large-scale land clearing results in big fields and a minimum of edge. Habitat for wildlife in such areas is generally fair to poor. Shelterbelts, windbreaks, field borders, and minimum tillage can reduce the effects of land clearing on wildlife populations.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are

Figure 8.—Habitat for wetland wildlife in a wooded area of Dorovan mucky peat.

suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, barley, sorghum, millet, buckwheat, and soybeans.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, switchgrass, clover, trefoil, and crownvetch.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil

properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are goldenrod, beggarweed, partridge pea, and pokeweed.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, the available water capacity, and wetness. Examples of these plants are oak, poplar, dogwood, hickory, and autumn-olive. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are oak, hickory, dogwood, autumn-olive, and poplar.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine and cedar.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, and slope. Examples of wetland plants are smartweed, wild millet, cutgrass, cattail, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are wetness, slope, and permeability. Examples of shallow water areas are marshes, beaver ponds, waterfowl feeding areas, and wildlife ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include quail, mourning doves, cottontail, red foxes, and many songbirds.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include woodpeckers, squirrels, and gray foxes.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, raccoon, redwing blackbirds, and muskrat.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building site development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by a very firm dense layer, soil texture, and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, and depth to a high water table affect the traffic supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary facilities

Table 12 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, and flooding affect absorption of the effluent.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to effectively filter the effluent. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold

the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, flooding, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope can cause construction problems.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, slope, and flooding affect both types of landfill. Texture, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction materials

Table 13 gives information about the soils as a source of roadfill, sand, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by a high water table and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand. They have at least 5 feet of suitable material, low shrink-swell potential, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential and slopes of 15 to 25 percent. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand is a natural aggregate suitable for commercial use with a minimum of processing. Sand is used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand is gradation of grain sizes (as indicated by the engineering classification of the soil) and the thickness of suitable material. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or a layer of sand that is up to 12 percent silty fines. This material must be at least 3 feet thick.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope and a water table.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They have slopes of less than 8 percent. They are naturally fertile or crops respond well to fertilizer and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for embankments, dikes, levees, and aquifer-fed ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of organic matter. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; and subsidence of organic layers. Excavating and grading and the stability of ditchbanks are affected by slope and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The performance of a system is affected by the depth of the root zone and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope and wetness affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity.

Wetness and slope affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering index properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil series and their morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as Pt. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits

extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and chemical properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and water features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and

soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years (fig. 9). The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table—that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 17.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An *artesian* water table is under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium

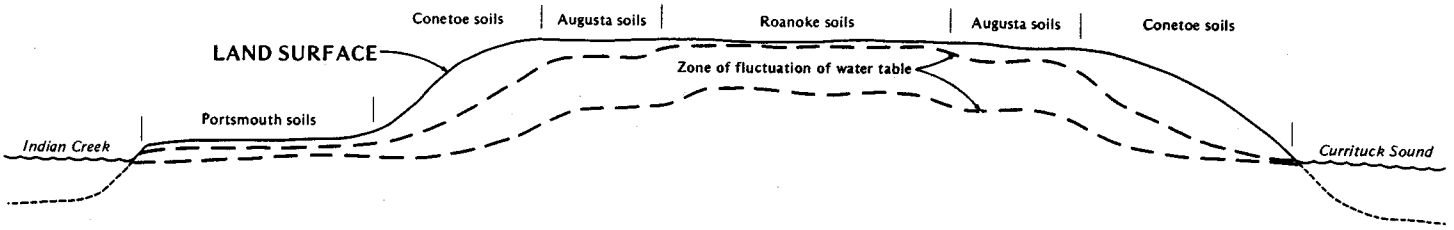


Figure 9.—Relationship of the landscape and the water table on the mainland in Currituck County.

content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosior than steel in installations that are entirely within one kinc of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*8*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. In table 18, the soils of the survey area are classified according to the system. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Ultisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquult (*Aqu*, meaning water, plus *ult*, from Ultisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Ochraquults (*Ochr*, meaning ochric epipedon, plus *aquult*, the suborder of the Ultisols that have an udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Ochraquults.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, thermic, Typic Ochraquults.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil series and their morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described (fig. 10). The detailed description of each soil horizon follows standards in the Soil Survey Manual (*6*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*8*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed soil map units."

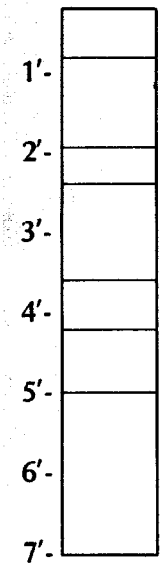
Altavista series

The Altavista series consists of moderately well drained, moderately permeable soils that formed in loamy marine and fluvial sediments. These soils are on smooth, low ridges near small streams and rivers. The soils are mainly in the eastern and southern parts of the county. Slopes range from 0 to 2 percent.

A typical pedon of Altavista fine sandy loam, 0 to 2 percent slopes, in a field, 190 feet east of the intersection of State Roads 1222 and 1239:

Ap—0 to 9 inches; grayish brown (10YR 5/2) fine sandy loam; weak medium granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

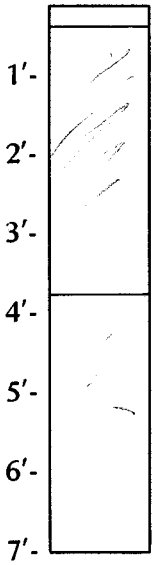
Profile of Conetoe series



Ap 0-8" Grayish brown loamy sand
A2 8-23" Light yellowish brown loamy sand
B21t 23-29" Strong brown sandy clay loam
B22t 29-43" Strong brown sandy loam
B3 43-50" Light yellowish brown loamy sand
C1 50-60" Yellow sand
C2 60-80" Very pale brown sand

Main use: Peanuts, truck crops
Limitations: Droughtiness, leaching, wind erosion

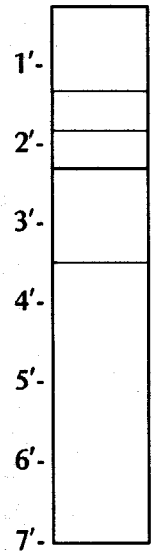
Profile of Newhan series



A1 0-3" Grayish brown fine sand
C1 3-45" Light gray fine sand
C2 45-75" Light gray sand

Main use: Recreation, wildlife
Limitations: Salt spray, droughtiness, wind erosion

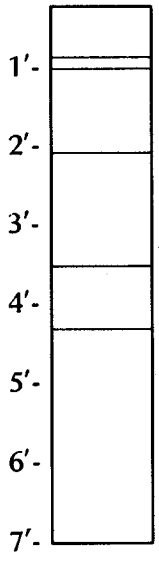
Profile of Ponzer series



Oa1 0-14" Black muck
Oa2 14-20" Very dark brown muck
Oa3 20-26" Very dark grayish brown muck
IIC1g 26-40" Mottled loam
IIC2g 40-52" Dark gray loam

Main use: Corn and soybeans
Limitations: Wetness

Profile of Tomotley series



Ap 0-8" Very dark grayish brown fine sandy loam
A2 8-10" Light brownish gray fine sandy loam
B21tg 10-23" Gray sandy loam
B22tg 23-40" Gray sandy clay loam
B3g 40-50" Light gray fine sandy loam
Cg 50-60" Light gray loamy fine sand

Main use: Corn and soybeans
Limitations: Wetness

Figure 10.—Some soil properties, major uses, and limitations of four contrasting soils.

B1—9 to 15 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak fine granular structure; friable; strongly acid; abrupt smooth boundary.
B21t—15 to 26 inches; brownish yellow (10YR 6/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine flakes of mica; medium acid; clear wavy boundary.
B22t—26 to 38 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium distinct strong brown (7.5YR 5/8) and light gray (10YR 7/1) mottles; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine flakes of mica; medium acid; gradual smooth boundary.
B3—38 to 42 inches; mottled light gray (10YR 7/1), strong brown (7.5YR 5/8), and very pale brown (10YR 7/4) sandy loam; weak medium subangular blocky structure; very friable; few fine and medium flakes of mica and grains of feldspar; strongly acid; clear wavy boundary.
C—42 to 80 inches; mottled light gray (10YR 7/1), yellowish brown (10YR 5/8), and very pale brown (10YR 7/4) sandy loam that has pockets of loamy sand; massive; few fine and medium flakes of mica; strongly acid.

Altavista soils have A and B horizons that range from 35 to 50 inches in thickness. Reaction ranges from very strongly acid to medium acid. Mica flakes range from few to common throughout the lower part of the profile.

The Ap or A1 horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 to 4. The A2 horizon, if present, has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 3 or 4.

The B1 horizon, if present, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 8. It is fine sandy loam, sandy loam, or loam. The B2t horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 5 to 8. It is sandy clay loam or clay loam. In some places, the lower Bt horizons have hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. The B3 horizon is similar in color to the B2 horizon, or it is mottled light gray, strong brown, very pale brown, or yellowish red sandy loam, sandy clay loam, or loamy sand.

The C horizon is sandy or loamy material, and in some places, this horizon has thin strata of clay.

Augusta series

The Augusta series consists of somewhat poorly drained, moderately permeable soils that formed in loamy marine and fluvial sediments. These soils are on slightly convex ridges near or adjacent to small streams and rivers. Slopes range from 0 to 2 percent.

A typical pedon of Augusta fine sandy loam, in a field, 100 feet west of the intersection of State Road 1241 and North Carolina Highway 34:

Ap—0 to 8 inches; dark brown (10YR 4/3) fine sandy loam; weak fine granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.
B21t—8 to 13 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct brownish yellow (10YR 6/6) and dark grayish brown (2.5Y 4/2) mottles; weak medium subangular blocky structure; friable; strongly acid; gradual smooth boundary.
B22t—13 to 34 inches; light brownish gray (10YR 6/2) clay loam; common medium distinct brownish yellow (10YR 6/6), grayish brown (10YR 5/2), and yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; slightly sticky and slightly plastic; few fine flakes of mica and grains of feldspar; strongly acid; clear smooth boundary.
B3—34 to 48 inches; mottled brownish yellow (10YR 6/6) and light gray (10YR 7/1) sandy clay loam; weak medium subangular blocky structure; friable; few fine grains of feldspar; strongly acid; abrupt wavy boundary.
Cg—48 to 60 inches; gray (10YR 6/1) sandy loam; common medium distinct brownish yellow (10YR 6/6) and yellowish brown (10YR 5/8) mottles; massive; very friable; few fine flakes of mica and grains of feldspar; strongly acid.

Augusta soils have a loamy Bt horizon that ranges from 20 to 40 inches in thickness. Reaction ranges from medium acid to very strongly acid unless the surface has been limed.

The Ap or A1 horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. The A2 horizon, if present, has hue of 10YR to 5Y, value of 6 or 7, and chroma of 2 or 4.

The B1 horizon, if present, and the B21t horizon have hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. Texture is sandy clay loam, fine sandy loam, or sandy loam. In some places, the horizons have a few olive yellow or brownish yellow mottles. The B22t horizon has hue of 10YR to 5Y, value of 5 or 6, and chroma of 1 or 2. It is clay loam or sandy clay loam that has mottles in shades of brown and yellow. The B3 horizon has colors similar to those of the B2 horizon, and it is fine sandy loam or sandy clay loam that has pockets of sandy loam in some pedons.

The C horizon has hue of 10YR or 5Y, or hue is neutral; value is 5 to 7, and chroma is 1 or 2. It is sand, loamy sand, or sandy loam.

Bojac series

The Bojac series consists of well drained soils that have moderately rapid permeability. These soils formed in loamy fluvial and marine sediments. They are on low ridges near or adjacent to streams and the Currituck Sound. They are mainly in the southern part of the county. Slopes range from 0 to 3 percent.

A typical pedon of Bojac loamy sand, 0 to 3 percent slopes, in a field, 1.5 miles south of Coinjock Intracoastal Waterway Bridge, 150 feet east of U.S. Highway 158, 30 feet north of farm path, and 60 feet east of cemetery:

Ap—0 to 10 inches; brown (10YR 4/3) loamy sand; weak fine granular structure; very friable; many fine roots; slightly acid; abrupt smooth boundary.
B21t—10 to 14 inches; yellowish brown (10YR 5/6) sandy loam; weak fine subangular blocky structure; very friable; common fine roots; about 12 percent of sand grains bridged and coated with clay; slightly acid; clear smooth boundary.
B22t—14 to 20 inches; reddish brown (5YR 5/4) sandy loam; weak medium subangular blocky structure; very friable; few fine roots; about 35 percent of sand grains bridged and coated with clay; medium acid; clear smooth boundary.
B23t—20 to 34 inches; reddish brown (5YR 5/4) sandy loam; weak medium subangular blocky structure; very friable; few fine roots; about 13 percent of sand grains are bridged and coated with clay; strongly acid; gradual smooth boundary.
C1—34 to 47 inches; strong brown (7.5YR 5/8) sand; single grained; loose; medium acid; clear smooth boundary.
C2—47 to 57 inches; yellowish brown (10YR 5/8) sand; single grained; loose; medium acid; clear smooth boundary.
C3—57 to 72 inches; yellowish brown (10YR 5/4) sand; single grained; loose; medium acid.

Bojac soils have a B horizon that ranges from 22 to 50 inches in thickness. Reaction of the A and B horizons ranges from very strongly acid to slightly acid. The C horizon ranges from very strongly acid to medium acid.

The A horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 or 4.

The B1 horizon, if present, has hue of 10YR to 2.5Y, value of 4 to 7, and chroma of 3 to 6. It is sandy loam or loamy sand. The Bt horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. The Bt horizon is sandy loam or fine sandy loam.

The C horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 4 to 8. It is sand, fine sand, or loamy sand.

Cape Fear series

The Cape Fear series consists of very poorly drained, slowly permeable soils that formed in clayey fluvial and marine sediments. These soils are on broad flats and in slightly depressed drainageways and oval depressions. They are mainly in the northwestern part of the county. Slopes range from 0 to 2 percent.

A typical pedon of Cape Fear loam, in a field, 3,400 feet southwest of North Carolina Highway 168 and 900 feet north of the intersection of North Carolina Highway 168 and State Road 1221:

Ap—0 to 12 inches; black (10YR 2/1) loam; weak fine granular structure; friable; slightly acid; clear smooth boundary.
B21tg—12 to 20 inches; dark gray (10YR 4/1) clay loam; weak fine subangular blocky structure; firm, slightly sticky and slightly plastic; few fine roots; strongly acid; clear smooth boundary.
B22tg—20 to 42 inches; gray (10YR 5/1) clay; common medium distinct brownish yellow (10YR 6/6) and dark brown (10YR 4/3) mottles; massive; very firm, sticky and plastic; few fine flakes of mica; strongly acid; clear smooth boundary.
IICg—42 to 60 inches; light brownish gray (10YR 6/2) loamy sand; common medium distinct light yellowish brown (10YR 6/4) mottles; weak medium granular structure; friable; few fine flakes of mica; few grains of feldspar; strongly acid.

Cape Fear soils have A and B horizons that range from 21 to more than 42 inches in thickness. Reaction ranges from very strongly acid to medium acid, unless the surface has been limed.

The Ap or A1 horizon has hue of 10YR to 2.5Y, value of 2 or 3, and chroma of 1 or 2.

The B1g horizon, if present, has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 1 or 2. It is clay loam or sandy clay loam. The B2tg horizon has hue of 10YR or 2.5Y, value or 4 to 7, and chroma of 1 or 2. It is clay, sandy clay, or clay loam. Most pedons have few to common mottles of higher chroma. The B3g horizon, if present, has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is sandy clay loam or clay loam.

The IICg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is sand or loamy sand.

Conaby series

The Conaby series consists of very poorly drained soils that have moderate or moderately slow permeability in the organic layers and moderately rapid permeability in the mineral layers. These soils formed under extremely wet conditions in a mantle of organic soil material about 8 to 16 inches thick and in underlying sandy and loamy marine sediments. These soils are on broad flats and in slightly depressed drainageways. Slopes range from 0 to 2 percent.

A typical pedon of Conaby muck, in woodland, 1,320 feet north of the western end of State Road 1122 and 660 feet east of sand beach along Albemarle Sound:

Oa1—0 to 7 inches; very dark gray (10YR 3/1) broken face and rubbed; muck; less than 1 percent fiber rubbed and unrubbed; moderate medium granular structure; very friable; common fibers; very strongly acid; clear smooth boundary.
Oa2—7 to 11 inches; black (10YR 2/1) broken face and rubbed; muck; about 6 percent fiber unrubbed, less than 1 percent rubbed; moderate medium

subangular blocky structure; friable; few clean sand grains; extremely acid; clear smooth boundary.
Oa3—11 to 13 inches; very dark grayish brown (10YR 3/2) broken face and rubbed; muck; about 2 percent fiber unrubbed, less than 1 percent rubbed; weak fine subangular blocky structure; very friable; common clean grains of sand; extremely acid; clear smooth boundary.
A1—13 to 21 inches; grayish brown (10YR 5/2) sand; single grained; loose; few fine roots; very strongly acid; clear smooth boundary.
B2g—21 to 33 inches; very dark gray (5Y 3/1) sandy loam; few medium distinct olive brown (2.5Y 4/4) and light olive brown (2.5Y 5/6) mottles; weak medium subangular blocky structure; friable; few fine roots; few fine flakes of mica; very strongly acid; gradual smooth boundary.
IICg—33 to 73 inches; dark greenish gray (5GY 4/1) stratified sand and sandy loam; massive; friable; few fine roots; few fine flakes of mica; medium acid.

The combined thickness of the O, A, and B layers ranges from 20 to 40 inches. They overlie a stratified sandy and loamy CIIg horizon. Reaction of the soil ranges from extremely acid to strongly acid in the upper part of the control section and medium acid to mildly alkaline in the lower part of the control section and in the IICg horizon. Few to common flakes of mica are in most horizons of the mineral portion of the soil. Reaction in the organic horizons ranges from extremely acid to strongly acid (in .01 M of calcium chloride).

The Oap or Oa1 horizon has hue of 5YR to 2.5Y, value of 2 or 3, and chroma of 1 or 2. The Oa2 and Oa3 horizons have hue of 2.5YR or 2.5Y, value of 2 or 3, and chroma of 1 or 4 in some pedons. In undisturbed layers, the unrubbed fiber content ranges from 2 to 15 percent and the rubbed fiber content is less than 2 percent. Charcoal fragments and pockets of ash range from none to common in the organic horizons.

The A1 horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 2 to 4. Texture is sand, loamy sand, fine sand, or loamy fine sand.

The B2g horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 1 or 2. It is sandy loam, fine sandy loam, or loam. In most places, few to common fine and medium mottles of higher chroma are present.

The IICg horizon is gleyed and stratified sand, loamy sand, or sandy loam.

Conetoe series

The Conetoe series consists of well drained soils that have moderately rapid permeability. These soils formed in loamy marine and fluvial sediments. They are on slightly rounded ridges along streams and the Currituck and Albemarle Sounds. These soils are mainly in the southern part of the county. Slopes range from 0 to 3 percent.

A typical pedon of Conetoe loamy sand, 0 to 3 percent slopes, in a field, 1,320 feet east of State Road 1118 and 330 feet south of Webster Creek:

Ap—0 to 8 inches; grayish brown (10YR 5/2) loamy sand; weak fine granular structure; very friable; many fine and medium roots; slightly acid; abrupt smooth boundary.
A2—8 to 23 inches; light yellowish brown (10YR 6/4) loamy sand; weak fine granular structure; very friable; common fine roots; neutral; gradual smooth boundary.
B21t—23 to 29 inches; strong brown (7.5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable; sand grains are bridged and coated with clay; few fine roots; very strongly acid; abrupt smooth boundary.
B22t—29 to 43 inches; strong brown (7.5YR 5/6) sandy loam; weak medium subangular blocky structure; very friable; sand grains bridged and coated with clay; few fine roots; few fine and medium opaque sand grains; very strongly acid; gradual smooth boundary.
B3—43 to 50 inches; light yellowish brown (10YR 6/4) loamy sand; weak medium subangular blocky structure; very friable; sand grains bridged and coated with clay; few fine and medium opaque sand grains; very strongly acid; gradual smooth boundary.
C1—50 to 60 inches; yellow (10YR 7/6) sand; single grained; loose; common medium opaque sand grains; very strongly acid; gradual smooth boundary.
C2—60 to 80 inches; very pale brown (10YR 7/4) sand; single grained; loose; common medium opaque sand grains; very strongly acid.

Conetoe soils have a loamy Bt horizon that ranges from 10 to 25 inches in thickness. Reaction ranges from very strongly acid to medium acid in all horizons unless the surface layer has been limed.

The Ap or A1 horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 to 3. The A2 horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 4 to 8.

The B horizon has hue of 7.5YR to 10YR, value of 5 to 7, and chroma of 4 to 8. The B1 horizon, if present, is sandy loam or loamy sand. The B2t horizon is sandy loam or sandy clay loam. The B3 horizon is sandy loam or loamy sand.

The C horizon has hue of 7.5YR to 2.5Y, value of 6 or 7, and chroma of 3 to 8. It is loamy sand or sand.

Corolla series

The Corolla series consists of moderately well drained to somewhat poorly drained soils that have very rapid permeability. These soils formed in sandy marine sediments. They are in nearly level to gently sloping positions behind the foredunes and in troughs between the foredunes. Slopes range from 0 to 6 percent.

A typical pedon of Corolla fine sand, 0 to 6 percent slopes, about 2.5 miles south of the Virginia State line and 0.4 mile west of the Atlantic Ocean:

A1—0 to 3 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; few to many fine roots; neutral; clear wavy boundary.
C1—3 to 15 inches; very pale brown (10YR 7/3) fine sand; few medium distinct yellowish red (5YR 4/6) mottles; single grained; loose; uncoated; neutral; gradual wavy boundary.
C2—15 to 26 inches; light brownish gray (10YR 6/2) sand; few fine distinct yellowish red (5YR 4/6) mottles and fine streaks; single grained; loose; uncoated; common dark opaque grains; neutral; clear smooth boundary.
A1b—26 to 32 inches; dark grayish brown (10YR 4/2) sand; many medium faint grayish brown (10YR 5/2) mottles; single grained; loose; coated; few fine roots; slight hydrogen sulfide odor; neutral; gradual wavy boundary.
C3g—32 to 72 inches; gray (5Y 6/1) sand; single grained; loose; uncoated; few fine roots; slight hydrogen sulfide odor; neutral.

The combined thickness of the A and C horizons is 72 inches or more. Silt plus clay in the 10- to 40-inch control section is 5 percent or less. The soil is medium acid through mildly alkaline. In some places, small calcareous shell fragments are present. The soil contains few to many grains of black, red, pink, dark brown, or white minerals. In some places, a slight to moderate sulfur odor is perceptible below the surface horizon.

The A1 horizon has hue of 10YR or 2.5Y, or hue is neutral; value is 3 to 5; and chroma is 0 to 2.

The C horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 4. Streaks and mottles in shades of brown, gray, and yellow may be present. Gray or light gray mottles may be present within a depth of 25 to 40 inches. This horizon is fine sand or sand.

If present, the A1b horizon is at a depth of 24 to 72 inches and is similar in color to the A1 horizon. In some places, this horizon contains few to common pieces of undecomposed plant material.

The Cg horizon has hue of 10YR to 5Y, or hue is neutral; value is 5 to 7; and chroma is 0 to 2. This horizon is sand or fine sand.

Currituck series

The Currituck series consists of nearly level, very poorly drained soils that have moderate to moderately rapid permeability. The soils are frequently flooded for very long periods. The organic layers are 16 to 51 inches thick over sandy sediment. These soils are on broad, flat marshes along the Currituck and Albemarle Sounds and on small islands in the Currituck Sound. Slopes are 0 to 1 percent.

A typical pedon of Currituck mucky peat, in marsh, 4.5 miles south of Corolla, 1.1 miles northwest of Currituck Shoot Club Hunting Lodge, 0.8 mile west of the Atlantic Ocean, 450 feet west of woods, and 50 feet north of hunting path:

Oe1—0 to 14 inches; very dark grayish brown (10YR 3/2) broken face and rubbed mucky peat; about 80 percent fibers unrubbed, 36 percent fibers rubbed; massive; friable; many fine to coarse roots, mainly of black needlerush; herbaceous material; mineral content about 55 percent; very strongly acid; gradual wavy boundary.
Oa1—14 to 28 inches; very dark grayish brown (2.5Y 3/2) broken face and rubbed muck; about 36 percent fibers unrubbed, 4 percent fibers rubbed; massive; very friable; common medium and coarse roots, mainly of black needlerush; herbaceous material; mineral content about 60 percent; very strongly acid; clear wavy boundary.
IICg—28 to 60 inches; greenish gray (5GY 5/1) sand; single grained; loose; common medium flakes of mica; common fine opaques; extremely acid.

The thickness of the organic material ranges from 16 to 51 inches. Reaction ranges from very strongly acid to medium acid in the organic horizons (in .01 M calcium chloride) and extremely acid through medium acid in the mineral horizons. Exchangeable sodium and magnesium is less than 5 parts per thousand and sulfur content is less than 0.01 percent throughout the control section. Organic material is mainly derived from herbaceous plants.

The surface tier is either hemic or sapric, or a combination of both, depending on history of vegetative succession. Mineral content ranges from 40 to 65 percent. The surface tier has hue of 7.5YR, 10YR, and 2.5Y; value of 2 to 4; and chroma of 1 to 3.

The subsurface tier consists of sapric material. The subsurface tier has colors similar to those of the surface tier and also includes dark olive gray (5Y 3/2), greenish gray (5GY 5/1), and dark greenish gray (5GY 4/1). Mineral content ranges from 40 to 65 percent. The bottom tier, if present, is similar to the subsurface tier in color and texture.

The IICg horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 1 or 2. In some places, it is greenish gray (5GY 6/1, 5/1; 5G 5/1) or dark greenish gray (5GY 4/1; 5G 4/1). The horizon is sand or loamy sand. Flakes of mica and opaques range from few to common. In some places there are a few shell fragments.

Dare series

The Dare series consists of very poorly drained organic soils that have slow permeability. These soils have significant amounts of stumps, tree roots, and logs. The organic layers are more than 51 inches thick over

sandy marine and fluvial sediments. The organic material is pastelike when wet. These soils are in the northwestern part of the county in the Dismal Swamp. Slopes range from 0 to 1 percent.

A typical pedon of Dare muck, 5 miles west of Moyock, in a wooded area on the east side of State Road 1218 and 300 feet north of the Camden-Currituck County line:

Oi—0 to 4 inches; undecomposed layer of leaves and twigs; many medium and coarse roots and many stumps; abrupt smooth boundary.

Oa1—4 to 16 inches; black (N2/0, broken face and rubbed) muck; about 5 percent fibers, less than 1 percent rubbed; weak medium granular structure; very friable; many medium roots; few coated and clean sand grains; many stumps and logs; many fine to medium granules of charcoal; extremely acid; abrupt smooth boundary.

Oa2—16 to 60 inches; dark reddish brown (5YR 2/2, broken face and rubbed) muck; about 15 percent fibers, less than 1 percent rubbed; weak medium subangular blocky structure; friable; paste-like or greasy feeling (colloidal) when wet; few medium roots; few fine granules of charcoal; many stumps and logs; extremely acid; gradual smooth boundary.

Oa3—60 to 70 inches; dark reddish brown (5YR 2/2, broken face and rubbed) muck; about 20 percent fibers, less than 5 percent rubbed; massive; friable; sticky; few fine and medium roots, not destroyed on rubbing; many organic coated medium and fine grains of sand; pastelike or greasy feel; extremely acid; clear smooth boundary.

IIC1g—70 to 76 inches; very dark grayish brown (10YR 3/2) fine sand; single grained; loose; few fibers and fine roots; extremely acid; gradual smooth boundary.

IIC2g—76 to 96 inches; dark gray (10YR 4/1) and gray (10YR 5/1) loamy fine sand; massive; slightly sticky; few fibers and fine roots; extremely acid.

Thickness of the organic deposit ranges from 51 inches to more than 90 inches. The soil is extremely acid except where the surface has been limed. Stumps, logs, and tree roots make up about 35 percent, by volume, of the surface and subsurface tiers. Charcoal granules range from common in the surface layer to few in subsurface horizons.

The surface tier has hue of 5YR or 10YR, or hue is neutral; value is 2, and chroma is 0 to 2. The subsurface tier has hue of 2.5YR to 10YR, value of 2 or 3, and chroma of 1 or 2. The subsurface tier has hue of 5YR to 2.5YR to a depth of 10 inches or more. The structure is massive if this soil is not drained. If drained, the organic material forms weak subangular blocky structure. When this material dries, it reabsorbs moisture very slowly.

The IIC horizons have hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 or 2. They are loamy sand, fine sand, loamy fine sand, or sand. Reaction ranges from extremely acid to medium acid.

Dorovan series

The Dorovan series consists of very poorly drained organic soils that have moderate permeability. The organic layers are more than 51 inches thick over unconsolidated fluvial sediments. These soils are on the flood plains of the Currituck and Albemarle Sounds and major streams and their tributaries. Slopes range from 0 to 1 percent.

A typical pedon of Dorovan mucky peat, in woodland, 1 mile northeast of the intersection of North Carolina Highway 1142 and U.S. Highway 158 and 1,600 feet east of Intracoastal Waterway:

Oe—0 to 10 inches; black (10YR 2/1) mucky peat consisting of partly decomposed moss, leaves, roots, and twigs mixed with small amounts of well decomposed organic matter; 50 percent fiber after rubbing; slightly sticky; extremely acid; gradual wavy boundary.

Oa1—10 to 30 inches; very dark gray (10YR 3/1) muck containing about 30 percent fiber unrubbed and less than 5 percent rubbed; fibers remaining after rubbing are partly decomposed wood 1 millimeter to 2 millimeters in size; massive; nonsticky; common medium roots and partly decomposed limbs; extremely acid; diffuse wavy boundary.

Oa2—30 to 84 inches; black (10YR 2/1) muck that remains black (10YR 2/1) when rubbed and pressed; about 30 percent fiber unrubbed and less than 5 percent rubbed; fibers remaining after rubbing are partly decomposed wood 1 millimeter to 2 millimeters in size; massive; nonsticky; few fine and medium roots; decomposed limbs and twigs; few logs and stumps; extremely acid; gradual wavy boundary.

IICg—84 to 96 inches; very dark grayish brown (10YR 3/2) stratified fine sand and loamy fine sand; single grained; loose; few partly decayed small fragments of wood; very strongly acid.

The thickness of the organic material ranges from 51 to more than 80 inches. The organic layers are extremely acid. Logs and wood fragments make up 0 to 5 percent of the organic layers. Organic layers are underlain by sandy or loamy mineral material. The mineral layer is very strongly acid to strongly acid.

The Oa1 horizon of the surface tier has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. A layer of root mats and fibric litter commonly overlies the Oa1 layer. Fiber content is 15 to 40 percent unrubbed and 2 to 6 percent rubbed. Mineral content ranges from 10 to 30 percent in the Oa1 horizon.

The subsurface tier has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1. Fiber content is 10 to 30 percent unrubbed and commonly 5 percent or less rubbed. Mineral content ranges from 5 to 20 percent.

The IIC horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. It is stratified sandy or loamy fluvial deposits.

Dragston series

The Dragston series consists of somewhat poorly drained soils that have moderately rapid permeability. These soils formed in loamy marine and fluvial sediments. They are on low ridges along streams that flow into the Currituck and Albemarle Sounds. Slopes range from 0 to 2 percent.

Typical pedon of Dragston loamy fine sand, in an orchard, 0.2 mile southeast of intersection of U.S. Highway 158 and State Road 1107 and 200 feet northeast of U.S. Highway 158:

Ap—0 to 8 inches; dark brown (10YR 4/3) loamy fine sand; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

B21t—8 to 18 inches; light yellowish brown (10YR 6/4) sandy loam; few fine faint gray (10YR 6/1) and brownish yellow (10YR 6/6) mottles; weak medium granular structure; friable; very strongly acid; gradual smooth boundary.

B22t—18 to 30 inches; light yellowish brown (2.5Y 6/4) sandy loam; many medium distinct light gray (10YR 7/1) and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; very strongly acid; gradual smooth boundary.

B23t—30 to 42 inches; light gray (10YR 7/1) sandy loam; many medium distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; very strongly acid; gradual smooth boundary.

Cg—42 to 60 inches; light gray (10YR 7/1) loamy sand; many coarse distinct yellowish red (5YR 5/8) and strong brown (7.5YR 5/6) mottles; massive; very friable; strongly acid.

Dragston soils have a loamy Bt horizon that ranges from 12 to 40 inches in thickness. Reaction is very strongly acid or strongly acid unless the surface layer has been limed.

The Ap horizon has hue of 10YR or 2.5Y, value of 2 to 5, and chroma of 1 to 4. The A2 horizon, if present, has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 2 to 4.

The upper part of the Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 8. The lower part has hue of 10YR to 2.5Y, value of 4 to 7, and chroma of 1 to 4 and is mottled in shades of yellow and brown. The Bt horizon is sandy loam or fine sandy loam. The B3 horizon, if present, has colors similar to those of the lower Bt horizons. It is fine sandy loam, sandy loam, or loamy fine sand.

The C horizon has hue of 10YR to 2.5Y, value of 4 to 7, and chroma of 1 to 4. It is sand, loamy sand, or loamy fine sand. In some places, this horizon has thin lenses of sandy loam.

Duckston series

The Duckston series consists of poorly drained soils that have very rapid permeability above the water table. These soils formed in sandy marine sediments. They are on flats and in slight depressions on the ocean side of the Outer Banks. They commonly extend inland from the frontal dunes. Slopes range from 0 to 2 percent.

A typical pedon of Duckston fine sand, on the Outer Banks, 600 feet northwest of Corolla Post Office and 200 feet west of the main road:

A1—0 to 10 inches; grayish brown (10YR 5/2) fine sand; few medium bodies of dark grayish brown (10YR 4/2); single grained; loose; common pieces of undecomposed plant materials; neutral; gradual wavy boundary.

A1b—10 to 18 inches; dark grayish brown (10YR 4/2) fine sand; common coarse bodies of grayish brown (10YR 5/2); single grained; loose; common fine and coarse pieces of undecomposed plant material; few fine roots; common dark mineral grains; neutral; gradual wavy boundary.

C1g—18 to 30 inches; gray (5Y 5/1) fine sand; common coarse dark grayish brown (10YR 4/2) organic stains; single grained; loose; uncoated; common dark and few strong brown and pink mineral grains; neutral; gradual wavy boundary.

C2g—30 to 72 inches; gray (5Y 5/1) fine sand; single grained; loose; uncoated; many dark and common pink, red, strong brown, and whitish mineral grains; neutral.

The thickness of the A and C horizons is 72 inches or more. The soils range from medium acid through moderately alkaline. In some places, few to common fine to medium brownish organic stains and grayish or whitish mottles are present. The 10- to 40-inch control section contains less than 5 percent silt plus clay. In some places, small calcareous shell fragments are present. The soil contains few to common grains of black, red, pink, dark brown, and white minerals. In some pedons, a slight to strong sulfur odor is present below the surface horizon.

The A horizon has hue of 10YR to 5Y, value of 3 to 8, and chroma of 0 to 2. The A1b horizon, if present, is 4 to 24 inches below the surface and has few to common pieces of undecomposed plant materials.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 8, and chroma of 0 to 2, or it has hue of 5GY, value of 5 or 6, and chroma of 1.

Munden series

The Munden series consists of moderately well drained soils that have moderate permeability in the A

and B horizons and moderately rapid permeability in the C horizon. The soils formed in loamy marine and fluvial sediments. These soils are on smooth low ridges and are mainly in the southern part of the county. Slopes range from 0 to 2 percent.

A typical pedon of Munden loamy sand, in a field, 0.4 mile west of intersection of U.S. Highway 158 and State Road 1123 and 50 feet south of State Road 1123:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) loamy sand; weak medium granular structure; very friable; many fine and very fine roots; slightly acid; abrupt smooth boundary.

A2—9 to 14 inches; light yellowish brown (10YR 6/4) loamy sand; weak medium granular structure; very friable; few medium roots; common dark opaques; medium acid; clear smooth boundary.

B21t—14 to 24 inches; yellowish brown (10YR 5/4) sandy loam; common medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; common dark opaques; strongly acid; clear smooth boundary.

B22t—24 to 32 inches; pale brown (10YR 6/3) sandy loam; common medium distinct brownish yellow (10YR 6/8) and common fine faint light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; common dark opaques; strongly acid; clear smooth boundary.

C—32 to 60 inches; olive yellow (2.5Y 6/6) sand; common medium distinct strong brown (7.5YR 5/8) and light gray (10YR 7/1) mottles; single grained; loose; strongly acid.

The thickness of the loamy Bt horizon ranges from 15 to 39 inches. The soils range from very strongly acid to medium acid unless the surface has been limed.

The Ap or A1 horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 to 4. The A2 horizon, if present, has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 3 to 6.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 through 8. Few to common low chroma mottles commonly are below the upper 10 inches of the B2t horizon. Texture is sandy loam or fine sandy loam. In some places, this horizon has thin layers of sandy clay loam. The B3 horizon, if present, has colors similar to those of the Bt horizon, or it is mottled in shades of red, olive, gray, brown, and yellow. Texture is fine sandy loam, sandy loam, or loamy sand.

The C horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 2 to 8, or it is mottled in shades of red, yellow, brown, or gray. It is loamy sand, loamy fine sand, sand, or fine sand.

Newhan series

The Newhan series consists of excessively drained soils that have very rapid permeability. The soils formed in sandy marine sediments. These soils are in long ridges on dunes that parallel the ocean. Slopes range from 0 to 10 percent.

A typical pedon of Newhan fine sand, 0 to 10 percent slopes, on the Outer Banks, 2.2 miles north of the south border of Currituck County and 300 feet north of the main lodge of the Pine Island Hunt Club:

A1—0 to 3 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; few fine roots; mildly alkaline; clear wavy boundary.

C1—3 to 45 inches; light gray (10YR 7/2) fine sand; single grained; loose; common fine fragments of marine shells; uncoated; about 5 percent of the grains are black and dark brown; mildly alkaline; gradual wavy boundary.

C2—45 to 75 inches; light gray (10YR 7/1) sand; single grained; loose; uncoated; about 5 percent of the grains are black and dark brown; common small, medium, and large fragments of marine shells; few whole shells; mildly alkaline.

The thickness of the A and C horizons is 72 inches or more. Content of silt plus clay is less than 5 percent. The soil is neutral or mildly alkaline. Fragments of calcareous shells, mostly sand-sized, make up 0 to 25 percent of the volume. The soil has few to common grains of dark minerals.

The A horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2.

The C horizon has hue of 10YR, value of 7 or 8, and chroma of 0 to 2.

Nimmo series

The Nimmo series consists of poorly drained soils that have moderate permeability in the A and B horizons and moderately rapid permeability in the C horizon. The soils formed in loamy marine and fluvial sediments. These soils are on low, smooth ridges and in depressions. The soils are mainly in the southern part of the county in the vicinity of Shawboro. Slopes range from 0 to 2 percent.

A typical pedon of Nimmo loamy sand, 0.3 mile west of U.S. Highway 168 and State Road 1207, 100 feet north of State Road 1207, and 100 feet west of railroad track:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) loamy sand; weak medium granular structure; very friable; few fine and medium roots; medium acid; clear smooth boundary.

B21tg—9 to 20 inches; light brownish gray (2.5Y 6/2) sandy loam; common medium distinct light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; friable; very strongly acid; clear smooth boundary.

B22tg—20 to 30 inches; gray (10YR 6/1) sandy loam; common medium distinct light yellowish brown

(10YR 6/4) mottles; weak medium subangular blocky structure; friable; very strongly acid; clear smooth boundary.
IIC1—30 to 36 inches; light brownish gray (10YR 6/2) sand; weak fine granular structure; very friable; very strongly acid; clear smooth boundary.
IIC2—36 to 60 inches; pale yellow (2.5Y 7/4) sand; single grained; loose; very strongly acid.

Nimmo soils have a loamy Bt horizon that is 20 to 40 inches thick. These soils range from extremely acid to strongly acid throughout except where the surface layer has been limed.

The Ap or A1 horizon has hue of 10YR to 2.5Y, value of 2 to 5, and chroma of 1 or 2. If value is 2 or 3, the horizon is less than 6 inches thick.

The B2tg horizon has hue of 10YR to 2.5Y, value of 4 to 7, and chroma of 1 or 2. Mottles of higher chroma are common. Texture is sandy loam or fine sandy loam. In some places, thin layers of sandy clay loam are present.

The IIC horizon has hue of 7.5YR to 2.5Y, or hue is neutral; value is 3 to 8, and chroma is 0 to 8. It is sand, fine sand, or loamy sand.

Osier series

The Osier series consists of poorly drained soils that have rapid permeability. The soils formed in sandy marine sediments. These soils are on flats along the bay side of the islands near the edge of the freshwater marshes and in small depressions. Slopes range from 0 to 2 percent.

A typical pedon of Osier fine sand, approximately 3,500 feet west of the Atlantic Ocean and 50 feet south of the North Carolina-Virginia State line at marker:

Oi1—3 inches to 0; layer of pine needles, leaves, and twigs.
A1—0 to 5 inches; very dark grayish brown (10YR 3/2) fine sand; moderate medium granular structure; very friable; common fine roots; common clean sand grains; very strongly acid; clear smooth boundary.
C1—5 to 9 inches; grayish brown (10YR 5/2) sand; single grained; loose; few fine roots; few organic stains and coatings; very strongly acid; clear smooth boundary.
C2—9 to 17 inches; olive gray (5Y 5/2) sand; single grained; loose; common fine prominent reddish brown (5YR 4/4) concretions; few opaques; strongly acid; gradual wavy boundary.
C3g—17 to 60 inches; greenish gray (5GY 5/1) sand; single grained; loose; common opaques; medium acid.

The thickness of the sandy A and C horizons is 60 inches or more. Reaction ranges from very strongly acid to medium acid throughout.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2.

The C horizon has hue of 10YR to 5Y or 5GY, or hue is neutral; value is 3 to 8, and chroma is 0 to 2. The lower part of the C horizon may be gleyed. The C horizon is fine sand or sand.

Ousley series

The Ousley series consists of moderately well drained soils that have rapid permeability. These soils formed in sandy marine sediments. They are on flats close to the sound and on narrow landscapes between sand dunes. Slopes range from 0 to 6 percent.

A typical pedon of Ousley fine sand, 0 to 6 percent slopes, 0.75 mile south of the Virginia State line and 0.5 mile west of the Atlantic Ocean:

O1—1 inch to 0; partly decomposed forest litter.
A11—0 to 3 inches; dark gray (10YR 4/1) fine sand; single grained; loose; few to many fine roots; neutral; clear wavy boundary.
A12—3 to 7 inches; gray (10YR 6/1) fine sand; common medium distinct light brownish gray (10YR 6/2) mottles; single grained; loose; uncoated; neutral; clear wavy boundary.
C1—7 to 17 inches; yellowish brown (10YR 5/6) fine sand; few fine prominent strong brown (7.5YR 5/6) mottles; single grained; loose; coated; neutral; gradual wavy boundary.
C2—17 to 80 inches; very pale brown (10YR 7/3) fine sand; single grained; loose; uncoated; neutral; clear wavy boundary.

The thickness of the sandy A and C horizons is 80 inches or more.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 7, and chroma of 1 or 2.

The C1 and C2 horizons have hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 3 to 6. The C horizon is fine sand or sand.

These soils are considered taxadjuncts to the Ousley series because they have neutral reaction throughout. This difference does not significantly affect use and management of the soils.

Pasquotank series

The Pasquotank series consists of poorly drained soils that have moderate permeability. The soils formed in loamy marine and fluvial sediments. These soils are on broad flats, mainly in the northern part of the county. Slopes range from 0 to 2 percent.

A typical pedon of Pasquotank silt loam, in a field, 1.5 miles north of the intersection of State Road 1202 and U.S. Highway 168 and 50 feet west of State Road 1212:

Ap—0 to 7 inches; grayish brown (10YR 5/2) silt loam; weak fine granular structure; very friable; few fine roots; slightly acid; clear smooth boundary.

B21g—7 to 17 inches; light brownish gray (2.5Y 6/2) silt loam; weak fine subangular blocky structure; friable, slightly sticky; few fine roots; few fine flakes of mica; strongly acid; clear smooth boundary.
B22g—17 to 31 inches; grayish brown (2.5Y 5/2) silt loam; common medium faint light yellowish brown (2.5Y 6/4) mottles; weak fine subangular blocky structure; friable, slightly sticky; few fine flakes of mica; strongly acid; clear smooth boundary.
B23g—31 to 45 inches; light gray (N7/) silt loam; few common distinct light yellowish brown (2.5Y 6/4) mottles; weak fine subangular blocky structure; friable, slightly sticky; few fine flakes of mica; very strongly acid; clear wavy boundary.
Cg—45 to 60 inches; gray (10YR 6/1) fine sand; massive; friable; few fine flakes of mica; strongly acid.

The thickness of the loamy A and B horizons ranges from 40 to 60 inches. The soil is very strongly acid or strongly acid in all horizons unless the surface layer has been limed. Flakes or bits of mica and other weatherable minerals are few to common in the B and C horizons.

The A1 or Ap horizon has hue of 10YR to 5Y, or hue is neutral; value is 3 to 6, and chroma is 0 to 2.

The B horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2, or N/7. It is loam, silt loam, or very fine sandy loam.

The C horizon is similar in color to the B horizon. It is loamy sand, sand, loamy fine sand, or fine sand. In some places, thin strata of loam, sandy loam, or silt loam are present.

Ponzer series

The Ponzer series consists of very poorly drained organic soils that have slow permeability in undrained areas. In drained areas, permeability is moderate in organic layers and moderately slow in mineral layers. The organic layers are 16 to 51 inches thick over loamy marine and fluvial sediments. These soils are mainly on broad flats in the northwestern part of the county. Slopes range from 0 to 1 percent.

A typical pedon of Ponzer muck, in a forest, 1.8 miles west of Barco and 1,500 feet south of Currituck Central School:

Oa1—0 to 14 inches; black (10YR 2/1) muck; about 10 percent fibers, less than 1 percent rubbed; moderate medium granular and moderate medium subangular blocky structure; friable, slightly sticky; extremely acid; clear wavy boundary.
Oa2—14 to 20 inches; very dark brown (10YR 2/2) muck; about 15 percent fibers, less than 1 percent rubbed; weak medium subangular blocky structure; friable, slightly sticky; extremely acid; abrupt wavy boundary.
Oa3—20 to 26 inches; very dark grayish brown (10YR 3/2) muck; about 20 percent fibers, less than 1 percent rubbed; massive; friable, slightly sticky; extremely acid; clear wavy boundary.
IIC1g—26 to 40 inches; mottled dark brown (10YR 4/3), very dark gray (10YR 3/1), light yellowish brown (2.5Y 6/4), and light brownish gray (10YR 6/2) loam; massive; friable, slightly sticky and slightly plastic; very strongly acid; gradual wavy boundary.
IIC2g—40 to 60 inches; dark gray (5Y 4/1) loam; massive; friable, slightly sticky; very strongly acid.

Thickness of the organic materials ranges from 16 to 51 inches. The organic materials are extremely acid except where the surface has been limed. The underlying mineral horizons range from extremely acid to slightly acid. Logs, stumps, and fragments of wood make up 0 to 10 percent of the organic layers.

The Oa horizons have hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 0 to 2. Fiber content of the organic tiers is 5 to 25 percent unrubbed and less than 10 percent rubbed. The organic tiers are typically massive under natural wet conditions. Upon drainage and cultivation, a granular or blocky structure develops in all parts of the organic tiers, depending upon the nature and depth of the organic material as well as duration of drainage.

The IICg horizons are loamy and have hue of 10YR or 2.5Y, but the range includes 7.5YR and 5Y.

Portsmouth series

The Portsmouth series consists of very poorly drained soils that have moderate permeability in the upper layers and rapid or very rapid in the lower layers. The soils formed in loamy fluvial and marine sediments. These soils are on broad flats and in depressions. Slopes range from 0 to 2 percent.

A typical pedon of Portsmouth fine sandy loam, in a field, 2,000 feet northwest of the intersection of North Carolina Highway 34 and State Road 1245:

Ap—0 to 9 inches; very dark gray (10YR 3/1) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; medium acid; clear smooth boundary.
A12—9 to 16 inches; very dark gray (10YR 3/1) fine sandy loam; weak medium granular structure; very friable; common fine roots; very strongly acid; clear wavy boundary.
B2tg—16 to 32 inches; dark gray (10YR 4/1) sandy clay loam; few fine and medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few thin clay films on faces of peds; very strongly acid; clear wavy boundary.
B3g—32 to 38 inches; dark gray (10YR 4/1) sandy loam; few pockets of loamy sand; weak medium subangular blocky structure; very friable; very strongly acid; gradual wavy boundary.
IICg—38 to 80 inches; light brownish gray (10YR 6/2) sand; common medium faint dark gray (10YR 4/l)

organic stains and few fine distinct yellowish brown (10YR 5/6) mottles; weak fine granular structure; very friable; common medium grains of feldspar; very strongly acid.

The thickness of the loamy A and B horizons is 24 to 40 inches. Reaction ranges from extremely acid to strongly acid unless the surface layer has been limed. The sandy C horizons range from extremely acid to medium acid.

The A1 or Ap horizon has hue of 10YR, or hue is neutral; value is 2 or 3, and chroma is 1 to 3. The A2 horizon, if present, has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2.

The B1 horizon, if present, has hue of 10YR to 5Y, or hue is neutral; value is 4 to 6, and chroma is 1 or 2. This horizon typically has mottles in shades of brown and yellow. It is sandy loam, fine sandy loam, or loam. The B2t horizon has hue of 10YR to 5Y, or hue is neutral; value is 4 to 7, and chroma is 1 or 2. Mottles, if present, are in shades of brown, yellow, and red. This horizon is sandy clay loam, loam, or clay loam. In some places, strata or pockets and lenses of sandy clay and sandy loam are present. The B3 horizon, if present, is similar in color to the B2t horizon. It is loamy sand or sandy loam.

The IIC horizon has hue of 10YR or 5Y, or hue is neutral; value is 5 to 7, and chroma is 1 or 2. Mottles are in shades of gray, brown, and yellow. This horizon is sand or loamy sand. In some places, thin strata or pockets of sandy loam, clay loam, or sandy clay loam are present.

Roanoke series

The Roanoke series consists of poorly drained soils that have slow permeability. The soils formed in clayey marine and fluvial sediments. These soils are on broad flats and in slightly depressed drainageways. Slopes range from 0 to 2 percent.

A typical pedon of Roanoke fine sandy loam, in a field, 800 feet north of the intersection of State Road 1231 and State Road 1222 and 100 feet west of State Road 1231:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; slightly acid; abrupt smooth boundary.

B21tg—8 to 11 inches; gray (10YR 5/1) silty clay loam; many coarse faint dark grayish brown (10YR 4/2) and few medium faint dark gray (10YR 4/1) mottles; weak medium subangular blocky structure; firm, sticky and plastic; common fine roots; common thin clay films on faces of peds; few fine and very fine flakes of mica; very strongly acid; clear smooth boundary.

B22tg—11 to 36 inches; gray (10YR 5/1) silty clay; many medium faint dark gray (10YR 4/1) and common medium prominent strong brown (7.5YR 5/8) mottles; moderate medium angular blocky structure; very firm, sticky and plastic; common moderately thick clay films on faces of peds; common fine roots; few fine and very fine mica flakes; common medium grains of feldspar; very strongly acid; gradual wavy boundary.

B3g—36 to 45 inches; gray (10YR 6/1) sandy clay loam; common coarse faint dark grayish brown (10YR 4/2) and grayish brown (10YR 5/2) mottles; common pockets of sandy clay and loamy sand; mostly massive but some parts have weak medium subangular blocky structure; friable; few fine roots; few fine and very fine mica flakes; many medium grains of feldspar; very strongly acid; clear wavy boundary.

IICg—45 to 80 inches; gray (10YR 6/1) sand; single grained; loose; common rounded pebbles of quartz; few fine mica flakes; many medium and coarse grains of feldspar; strongly acid.

Roanoke soils have a clayey Bt horizon that ranges from 21 to 39 inches in thickness. Reaction is very strongly acid or strongly acid unless the surface layer has been limed.

The Ap or A1 horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 or 2. The A2 horizon, if present, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2.

The B1g horizon, if present, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. It is clay loam or silty clay loam. The B2tg horizon has hue of 10YR to 2.5Y, value of 4 to 6, and chroma of 1 or 2. Mottles in shades of yellow and brown are common. It is clay, clay loam, silty clay loam, or silty clay. The B3g horizon is similar in color to the B2t horizon. It is silty clay loam, clay loam, or sandy clay loam.

The Cg horizon is similar in color to the B horizon. It consists of sandy or loamy material.

State series

The State series consists of well drained soils that have moderate permeability. The soils formed in loamy marine and fluvial sediments. These soils are on low ridges along the Currituck and Albemarle Sounds and their tributaries. Slopes range from 0 to 6 percent.

A typical pedon of State fine sandy loam, 0 to 2 percent slopes, in a field, 1 mile north of Currituck Courthouse, 2,200 feet east of State Road 1222, and 50 feet south of farm path:

Ap—0 to 8 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium granular structure; very friable; few fine and medium roots; strongly acid; abrupt smooth boundary.

B1—8 to 11 inches; yellowish brown (10YR 5/4) sandy loam; weak fine subangular blocky structure; very

friable; few medium roots; strongly acid; clear smooth boundary.

B2t—11 to 37 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few very thin clay films on faces of peds; common fine flakes of mica; strongly acid; gradual wavy boundary.

B3—37 to 43 inches; brownish yellow (10YR 6/8) sandy loam; weak fine subangular blocky structure; friable; common fine flakes of mica; strongly acid; gradual wavy boundary.

C1—43 to 57 inches; very pale brown (10YR 7/3) loamy sand; few fine prominent strong brown (7.5YR 5/6) and common medium distinct yellowish brown (10YR 5/6) mottles; single grained; loose; common fine flakes of mica; strongly acid; gradual wavy boundary.

C2—57 to 65 inches; brownish yellow (10YR 6/8) sand; common medium distinct very pale brown (10YR 7/3) mottles; single grained; loose; common flakes of mica; strongly acid.

The thickness of the loamy A and B horizons ranges from 35 to 60 inches. Reaction ranges from very strongly acid to strongly acid throughout unless the surface layer has been limed. Reaction ranges from very strongly acid to medium acid in the C horizon.

The Ap or A1 horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 2 to 6. The A2 horizon, if present, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8.

The B1 horizon, if present, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam or fine sandy loam. The B2t horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy clay loam or clay loam. The B3 horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 6 to 8. In some places, the B3 and lower B2t horizons are mottled.

The C horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 3 to 8. It is fine sand, sand, or loamy sand.

Tomotley series

The Tomotley series consists of poorly drained soils that have moderate to moderately slow permeability. The soils formed in loamy fluvial and marine sediments. These soils are on broad flats and in slightly depressed drainageways. These soils are mainly in the north-central part of the county. Slopes range from 0 to 2 percent.

A typical pedon of Tomotley fine sandy loam, in a field, 1.5 miles west of Moyock and 300 feet north of State Road 1227:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; very friable; few fine roots; very strongly acid; clear smooth boundary.

A2—8 to 10 inches; light brownish gray (2.5Y 6/2) fine sandy loam; common medium distinct dark gray (10YR 4/1) mottles; weak medium subangular blocky structure; very friable; common fine roots; common fine uncoated sand grains; very strongly acid; clear smooth boundary.

B21tg—10 to 23 inches; gray (10YR 6/1) sandy clay loam; common fine distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; thin patchy clay films in old root channels and on faces of some peds; common fine roots; few fine lenses of light gray loamy fine sand; very strongly acid; gradual wavy boundary.

B22tg—23 to 40 inches; gray (10YR 6/1) sandy clay loam; common medium prominent red (10R 4/8), common medium distinct yellowish brown (10YR 5/6), and common fine distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable; thin patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

B3g—40 to 50 inches; light gray (5Y 7/1) fine sandy loam; common medium prominent strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; thin patchy clay films on faces of some peds; few fine lenses of light gray loamy fine sand; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Cg—50 to 60 inches; light gray (2.5Y 7/2) loamy fine sand; common medium distinct strong brown (7.5YR 5/8) and common medium faint light yellowish brown (2.5Y 6/4) mottles; massive; friable; few fine flakes of mica; very strongly acid.

The thickness of the loamy A and B horizons ranges from 40 to 60 inches. Reaction ranges from extremely acid to strongly acid in the upper part unless the surface layer has been limed. Below about 50 inches, reaction ranges from extremely acid to medium acid.

The Ap or A1 horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 or 2. The A2 horizon, if present, has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. In some places, the A horizon is mottled in shades of yellow, red, gray, or brown.

The B1 horizon, if present, has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is fine sandy loam or sandy loam. The B2tg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It is sandy clay loam or clay loam. The B3g horizon is similar in color to the B2tg horizon. It is fine sandy loam or sandy clay loam. The B horizon is mottled in shades of red, olive, yellow, brown, and gray.

The C horizon has hue of 10YR to 5GY, value of 6 or 7, and chroma of 1 or 2. It is loamy or sandy.

Wahee series

The Wahee series consists of somewhat poorly drained soils that have slow permeability. The soils formed in clayey fluvial and marine sediments. These soils are on low ridges along streams and rivers that flow into the Currituck and Albemarle Sounds. Slopes range from 0 to 2 percent.

A typical pedon of Wahee fine sandy loam, in a field, 0.3 mile northwest of the intersection of State Road 1222 and 1213 and 0.2 mile west of State Road 1213:

Ap—0 to 7 inches; dark grayish brown (2.5Y 4/2) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; medium acid; clear smooth boundary.

B21t—7 to 14 inches; light yellowish brown (10YR 6/4) clay loam; common medium distinct strong brown (7.5YR 5/6) and few medium faint light gray (10YR 7/1) mottles; weak medium subangular blocky structure; firm; common fine roots; very strongly acid; clear wavy boundary.

B22tg—14 to 42 inches; gray (10YR 6/1) clay; many medium prominent yellowish brown (10YR 5/6) mottles; moderate fine and medium angular blocky structure; very firm; few fine roots; thin continuous clay films on faces of peds and coating large pores; very strongly acid; clear wavy boundary.

B23tg—42 to 53 inches; gray (10YR 6/1) clay loam; common fine prominent strong brown (7.5YR 5/6) mottles; weak coarse subangular blocky structure; firm, sticky and plastic; very strongly acid; gradual wavy boundary.

B3g—53 to 60 inches; gray (5Y 6/1) sandy clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; massive; friable; common medium grains of feldspar; common lenses and pockets of loamy sand and clay loam; very strongly acid; abrupt wavy boundary.

IICg—60 to 99 inches; light gray (10YR 7/1) sand; medium distinct yellowish brown (10YR 5/6) mottles; massive; loose; very strongly acid.

Wahee soils have a clayey Bt horizon that is 25 to 60 inches thick. Reaction is strongly acid or very strongly acid unless the surface has been limed.

The Ap or A1 horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 or 2. The A2 horizon, if present, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 4.

The B1 horizon, if present, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 6. It is clay loam or sandy clay loam. The B2t horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 to 6. It is clay, clay loam, or silty clay loam. The B3 horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It is sandy clay loam or clay loam. The B2t and B3 horizons have mottles in shades of red, brown, and yellow.

The C horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It is sand, loamy sand, or sandy clay loam. In some places, the C horizon has mottles in shades of red, brown, and yellow.

Wando series

The Wando series consists of excessively drained soils that have rapid permeability. The soils formed in sandy marine and fluvial sediments. These soils are dominantly in the southern part of the county on low broad ridges. Slopes range from 0 to 5 percent.

A typical pedon of Wando loamy fine sand, 0 to 5 percent slopes, 0.3 mile west of intersection of State Road 1122 and U.S. Highway 158 and 300 feet south of State Road 1122:

A1—0 to 3 inches; dark brown (10YR 4/3) loamy fine sand; weak fine granular structure; very friable; many fine roots; slightly acid; clear smooth boundary.

C1—3 to 30 inches; light yellowish brown (10YR 6/4) fine sand; weak fine granular structure; loose; few fine roots; slightly acid; gradual wavy boundary.

C2—30 to 42 inches; brownish yellow (10YR 6/8) fine sand; weak fine granular structure; loose; common black opaque grains; slightly acid; gradual wavy boundary.

C3—42 to 83 inches; brownish yellow (10YR 6/6) fine sand; single grained; loose; common black opaque grains; slightly acid; gradual wavy boundary.

C4—83 to 99 inches; yellow (10YR 7/6) fine sand; single grained; loose; common black opaque grains; slightly acid.

The thickness of the sandy material is 80 inches or more. Reaction ranges from medium acid to neutral unless the surface layer has been limed.

The A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4.

The C horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 3 to 8. It is loamy fine sand or fine sand to a depth of 40 to 60 inches. Below that, it is fine sand or sand.

Wasda series

The Wasda series consists of very poorly drained soils that have moderate permeability. The soils formed under very wet conditions in loamy fluvial and marine sediments. These soils are on broad flats. Slopes range from 0 to 2 percent.

A typical pedon of Wasda muck, in a wooded area, 0.5 mile north of Coinjock Canal Bridge and 500 feet west of U.S. Highway 158:

Oap—0 to 6 inches; black (10YR 2/1) muck; about 10 percent fiber, 3 percent rubbed; weak medium

granular structure; very friable; few fine pieces of charcoal; many fine roots; strongly acid; clear smooth boundary.

Oa2—6 to 12 inches; black (10YR 2/1) muck; about 30 percent fiber, 3 percent rubbed; weak fine subangular blocky structure; friable, slightly sticky; many fine roots; extremely acid; abrupt wavy boundary.

A1g—12 to 18 inches; dark grayish brown (10YR 4/2) clay loam; massive; slightly sticky and slightly plastic; many fine roots; strongly acid; abrupt smooth boundary.

B21g—18 to 26 inches; dark grayish brown (10YR 4/2) clay loam that has few gray (10YR 5/1) pockets of clay; few fine distinct yellowish brown (10YR 5/6) mottles; massive; slightly sticky and slightly plastic; common fine roots; very strongly acid; abrupt wavy boundary.

B22g—26 to 40 inches; grayish brown (10YR 5/2) sandy clay loam that has lenses of sand; massive; slightly sticky and slightly plastic; very strongly acid; abrupt wavy boundary.

B23g—40 to 50 inches; grayish brown (10YR 5/2) sandy loam that has thin lenses of sand; common medium distinct yellowish brown (10YR 5/6) mottles; massive; slightly sticky and slightly plastic; strongly acid; gradual wavy boundary.

Cg—50 to 60 inches; light brownish gray (10YR 6/2) sand that has thin lenses of sandy loam; single grained; loose; medium acid.

The thickness of the Oa, A, and B horizons ranges from 40 to 60 inches. Reaction ranges from extremely acid to strongly acid in the upper part of the control section and from medium acid to mildly alkaline in the lower part and in the C horizon. Reaction of the organic horizons ranges from extremely acid to strongly acid (in 0.1 M calcium chloride).

The Oa horizons have hue of 2.5YR to 5Y, value of 2 or 3, and chroma of 0 to 2.

The A and B horizons have hue of 10YR to 5Y, value of 2 to 5, and chroma of 1 or 2. In some places, few to common mottles are in the middle and lower B horizons. The B horizon commonly is clay loam, but in some places it ranges to sandy loam or sandy clay loam. The B horizon commonly has thin lenses of sand and clay.

The C horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2, or greenish gray or dark greenish gray. The C horizon is sand, loamy sand, loam, or sandy loam.

References

(1) American Association of State Highway [and Transportation] Officials. 1970. Standard specifications for highway materials and methods of sampling and testing. Ed. 10, 2 vol., illus.

(2) American Society for Testing and Materials. 1974. Method for classification of soils for engineering purposes. ASTM Stand. D 2487-69. *In* 1974 Annual Book of ASTM Standards, Part 19, 464 pp., illus.

(3) Dolan, R. and L. Vincent. 1970. Shoreline changes along the Outer Banks of North Carolina. U.S. Department of the Interior, Technical Report 70-5.

(4) Graetz, Karl E. 1973. Seacoast plants of the Carolinas for conservation and beautification. U.S. Department of Agriculture, Soil Conservation Service, Raleigh, N.C. and Columbia, S.C. 206 pp., illus.

(5) Robison, T. M. 1977. Public water supplies of North Carolina, Northern Coastal Plain. U.S. Department of the Interior, Part 4, pp. 49-50.

(6) United States Department of Agriculture. 1951. Soil survey manual. U.S. Department of Agriculture Handbook 18, 503 pp., illus. [Supplements replacing pp. 173-188 issued May 1962]

(7) United States Department of Agriculture. 1974. Forest statistics for the Northern Coastal Plain of North Carolina. Forest Service, Southeastern Forest Experiment Station Resource Bulletin SE-31.

(8) United States Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. Soil Conservation Service, U.S. Department of Agriculture Handbook 436, 754 pp., illus.

(9) United States Department of Agriculture. 1977. Soil survey of the Outer Banks, North Carolina. Soil Conservation Service. Part I, 113 pp., illus.

Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Available water capacity-medium (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Medium	6 to 9
High	9 to 12
Very high	More than 12

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—
Loose.—Noncoherent when dry or moist; does not hold together in a mass.
Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.
Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.
Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.
Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.
Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.
Soft.—When dry, breaks into powder or individual grains under very slight pressure.
Cemented.—Hard; little affected by moistening.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:
Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.
Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the

water they receive is lost as runoff. All are free of the mottling related to wetness.
Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.
Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.
Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.
Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.
Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:
O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.
A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.
B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.
C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Irrigation. Application of water to soils to assist in production of crops.

Sprinkler irrigation.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

No-tillage system. Crop is planted directly into a seedbed without tillage since harvest of the previous crop.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that

water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.20 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slow intake (in tables). The slow movement of water into the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 mm in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and

granular. Structureless soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in 1951-78 at Elizabeth City, N.C.]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[1]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	50.4	32.0	41.2	76	11	39	3.70	2.31	4.95	7	1.6
February---	53.5	33.9	43.7	77	15	27	3.72	2.33	4.96	7	1.0
March------	59.7	40.0	49.9	84	25	118	3.74	2.42	4.93	7	.8
April------	70.1	48.7	59.4	90	31	282	2.94	1.63	4.08	6	.0
May--------	76.7	57.4	67.1	93	40	530	4.13	2.26	5.78	7	.0
June-------	83.8	65.5	74.7	97	49	741	4.02	2.24	5.58	7	.0
July-------	87.2	69.6	78.4	97	57	880	5.26	2.89	7.34	8	.0
August-----	86.1	69.1	77.6	95	55	856	5.82	3.15	8.16	8	.0
September--	80.9	63.0	72.0	94	46	660	4.10	1.45	6.28	5	.0
October----	71.5	52.3	61.9	88	31	369	3.28	1.16	5.03	5	.0
November---	62.4	41.9	52.2	81	23	121	2.79	1.28	4.08	5	.0
December---	53.6	34.3	44.0	76	15	63	3.21	1.72	4.52	7	.8
Yearly:											
Average--	69.7	50.6	60.2	---	---	---	---	---	---	---	---
Extreme--	---	---	---	99	11	---	---	---	---	---	---
Total----	---	---	---	---	---	4,686	46.71	42.38	51.65	79	4.2

[1]A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in 1951-73 at Elizabeth City, N.C.]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 30	April 7	April 21
2 years in 10 later than--	March 20	April 1	April 17
5 years in 10 later than--	March 2	March 20	April 8
First freezing temperature in fall:			
1 year in 10 earlier than--	November 6	October 26	October 20
2 years in 10 earlier than--	November 13	November 1	October 25
5 years in 10 earlier than--	November 27	November 13	November 3

TABLE 3.--GROWING SEASON

[Recorded in 1951-78 at Elizabeth City, N.C.]

Probability	Length of growing season if daily minimum temperature is--		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	260	223	198
8 years in 10	271	233	205
5 years in 10	293	251	219
2 years in 10	314	269	233
1 year in 10	325	278	241

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
AaA	Altavista fine sandy loam, 0 to 2 percent slopes	2,852	1.6
At	Augusta fine sandy loam	3,878	2.2
BN	Beaches-Newhan association, 0 to 25 percent slopes	1,286	0.7
BoA	Bojac loamy sand, 0 to 3 percent slopes	2,430	1.4
Ca	Cape Fear loam	6,532	3.7
Cb	Conaby muck	1,814	1.0
CnA	Conetoe loamy sand, 0 to 3 percent slopes	9,385	5.4
CoB	Corolla fine sand, 0 to 6 percent slopes	1,314	0.8
CrB	Corolla-Duckston complex, 0 to 6 percent slopes	1,136	0.7
Cu	Currituck mucky peat	29,863	17.1
Da	Dare muck	13,937	8.0
Do	Dorovan mucky peat	12,757	7.3
Ds	Dragston loamy fine sand	4,165	2.4
Dt	Duckston fine sand	1,289	0.7
Du	Dune land	746	0.4
DwD	Dune land-Newhan complex, 2 to 40 percent slopes	996	0.6
Mu	Munden loamy sand	2,059	1.2
NeC	Newhan fine sand, 0 to 10 percent slopes	1,556	0.9
NhC	Newhan-Corolla complex, 0 to 10 percent slopes	1,164	0.6
No	Nimmo loamy sand	2,147	1.2
Os	Osier fine sand	554	0.3
OuB	Ousley fine sand, 0 to 6 percent slopes	415	0.2
Pa	Pasquotank silt loam	1,486	0.9
Po	Ponzer muck	13,779	7.9
Pt	Portsmouth fine sandy loam	7,977	4.6
Ro	Roanoke fine sandy loam	30,205	17.3
StA	State fine sandy loam, 0 to 2 percent slopes	3,021	1.7
StB	State fine sandy loam, 2 to 6 percent slopes	484	0.3
To	Tomotley fine sandy loam	7,974	4.6
Ud	Udorthents, loamy	350	0.2
Wa	Wahee fine sandy loam	872	0.5
WnB	Wando loamy fine sand, 0 to 5 percent slopes	445	0.3
Ws	Wasda muck	5,852	3.3
	Total	174,720	100.0

TABLE 5.--YIELDS PER ACRE OF CROPS

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Corn	Soybeans	Wheat	Irish potatoes
	Bu	Bu	Bu	Bu
AaA---- Altavista	130	45	55	---
At---- Augusta	110	40	---	415
BN*: Beaches.				
Newhan----	---	---	---	---
BoA---- Bojac	95	35	40	---
Ca---- Cape Fear	125	45	---	---
Cb---- Conaby	100	40	50	---
CnA---- Conetoe	80	25	---	---
CoB---- Corolla	---	---	---	---
CrB---- Corolla-Duckston	---	---	---	---
Cu---- Currituck	---	---	---	---
Da---- Dare	100	25	---	---
Do---- Dorovan	---	---	---	---
Ds. Dragston	125	40	---	---
Dt---- Duckston	---	---	---	417
Du*. Dune land				
DwD---- Dune land-Newhan	---	---	---	---
Mu---- Munden	120	40	45	384
NeC---- Newhan	---	---	---	---
NhC---- Newhan-Corolla	---	---	---	---
No---- Nimmo	135	40	50	417
Os---- Osier	---	---	---	---

See footnote at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS--Continued

Soil name and map symbol	Corn	Soybeans	Wheat	Irish potatoes
	Bu	Bu	Bu	Bu
OuB---------- Ousley	50	20	---	---
Pa---------- Pasquotank	135	40	60	475
Po---------- Ponzer	130	40	55	---
Pt---------- Portsmouth	130	40	60	475
Ro---------- Roanoke	140	40	45	---
StA---------- State	110	40	60	---
StB---------- State	110	40	60	---
To---------- Tomotley	135	40	---	475
Ud*. Udorthents				
Wa---------- Wahee	100	40	---	---
WnB---------- Wando	50	20	---	---
Ws---------- Wasda	130	45	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordination symbol	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	
AaA---- Altavista	2w	Slight	Moderate	Slight	Loblolly pine----	91	Loblolly pine, yellow-poplar, black walnut, sweetgum, American sycamore, cherrybark oak.
					Longleaf pine----	84	
					Shortleaf pine----	77	
					Sweetgum----	84	
					White oak----	---	
At---- Augusta	2w	Slight	Moderate	Slight	Loblolly pine----	90	Loblolly pine, sweetgum, American sycamore, yellow-poplar, cherrybark oak.
					Sweetgum----	90	
					American sycamore----	90	
					White oak----	80	
					Southern red oak----	80	
					Water oak----	---	
					Shortleaf pine----	---	
BoA---- Bojac	3o	Slight	Slight	Slight	Northern red oak----	70	Loblolly pine, sweetgum.
					Virginia pine----	75	
					Loblolly pine----	80	
					Sweetgum----	80	
Ca---- Cape Fear	1w	Slight	Severe	Severe	Sweetgum----	---	Loblolly pine, water tupelo, American sycamore, sweetgum.
					Loblolly pine----	100	
					Water oak----	---	
					Water tupelo----	---	
					Baldcypress----	---	
Cb---- Conaby	2w	Slight	Severe	Severe	Loblolly pine----	94	Loblolly pine, sweetgum, baldcypress.
					Pond pine----	80	
					Sweetgum----	---	
					Baldcypress----	---	
					Red maple----	---	
CnA---- Conetoe	3s	Slight	Moderate	Moderate	Loblolly pine----	80	Loblolly pine.
					Longleaf pine----	65	
Da---- Dare	5w	Slight	Severe	Severe	Pond pine----	55	Loblolly pine.
					Baldcypress----	---	
					Water tupelo----	---	
Do---- Dorovan	4w	Slight	Severe	Severe	Blackgum----	70	Baldcypress.
					Sweetbay----	---	
Ds---- Dragston	2w	Slight	Moderate	Slight	Northern red oak----	80	Loblolly pine, sweetgum, yellow-poplar.
					Loblolly pine----	85	
					Sweetgum----	90	
					Yellow-poplar----	90	
Mu---- Munden	2w	Slight	Moderate	Slight	Loblolly pine----	90	Loblolly pine.
					Sweetgum----	90	
					White oak----	75	
No---- Nimmo	2w	Slight	Severe	Severe	Loblolly pine----	95	Loblolly pine, sweetgum.
					Sweetgum----	95	
					White oak----	80	
Os---- Osier	3w	Slight	Severe	Severe	Loblolly pine----	87	Loblolly pine.
					Longleaf pine----	69	
OuB---- Ousley	3w	Slight	Moderate	Moderate	Loblolly pine----	80	Loblolly pine.
					Longleaf pine----	70	

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	
Pa Pasquotank	2w	Slight	Severe	Severe	Loblolly pine Green ash Sweetgum Water oak	94 80 90 90	Loblolly pine, sweetgum, American sycamore.
Po Ponzer	4w	Slight	Severe	Severe	Pond pine Water tupelo Baldcypress Loblolly pine Sweetgum Swamp tupelo Sweetbay Redbay	60 60 --- 70 --- --- --- ---	Loblolly pine.
Pt Portsmouth	1w	Slight	Severe	Severe	Loblolly pine Sweetgum Red maple Water oak Willow oak Sweetbay Redbay	96 --- --- --- --- --- ---	Loblolly pine, sweetgum.
Ro Roanoke	2w	Slight	Severe	Severe	Loblolly pine Virginia pine Willow oak Yellow-poplar	86 76 76 90	Loblolly pine, sweetgum, yellow-poplar.
StA, StB State	1o	Slight	Slight	Slight	Southern red oak Yellow-poplar Virginia pine Loblolly pine	75 95 80 85	Black walnut, yellow-poplar, loblolly pine.
To Tomotley	2w	Slight	Severe	Severe	Loblolly pine Sweetgum Water tupelo	94 90 ---	Loblolly pine, sweetgum, American sycamore.
Wa Wahee	2w	Slight	Moderate	Moderate	Loblolly pine Sweetgum	86 90	Loblolly pine, sweetgum, American sycamore, water oak.
WnB Wando	3s	Slight	Moderate	Moderate	Longleaf pine Loblolly pine	70 80	Loblolly pine, longleaf pine.
Ws Wasda	1w	Slight	Severe	Severe	Loblolly pine Water tupelo Sweetgum Water oak Baldcypress Pond pine	96 --- --- 95 --- 80	Loblolly pine, water tupelo, sweetgum.

TABLE 7.--WOODLAND SUITABILITY CLASSES

Forest type or species	1 Very high	2 High	3 Moderately high	4 Moderate	5 Low
	Site Index				
Eastern cottonwood[1]	106+	96-105	86-95	76-85	75-
Yellow-poplar[2]	106+	96-105	86-95	76-85	75-
Sweetgum[3]	96+	86-95	76-85	66-75	65-
Water oak[4]	96+	86-95	76-85	66-75	65-
Loblolly pine[5]	96+	86-95	76-85	66-75	65-
Longleaf pine[6]	86+	76-85	66-75	56-65	55-
Southern red oak[7]	86+	76-85	66-75	56-65	55-
Water tupelo[8]	86+	76-85	66-75	56-65	55-
Eastern redcedar[9]	66+	56-65	46-55	35-45	35-

[1]Broadfoot, W. M. 1960. Field guide for evaluating cottonwood sites. U.S. Forest Service Paper 178 (Fig. 4).

[2]Doolittle, W. T. 1957. Site index curves for yellow-poplar in southern Appalachians. Southeastern Forest Experiment Station Research Note 122. U.S. Forest Service.

[3]Broadfoot, W. M. 1959. Guide for evaluating sweetgum sites. U.S. Forest Service Paper 176 (Fig. 4).

[4]Broadfoot, W. M. 1963. Guide for evaluating water oak sites in the Mid-South. U.S. Forest Service Research Paper SO-1 (Fig. 4).

[5]Coile, T.S. and F.X. Schumacher. 1953. Journal of Forestry 53: 432-453 (Fig. 4).

[6]U.S. Forest Service. 1929. Volume, yield, and stand tables for second growth southern pines. U.S. Department of Agriculture. Miscellaneous Publication 50 (Fig. 2, 3, 4).

[7]Olson, D. G. 1959. Site curves for upland oaks in the southern Appalachians. U.S. Forest Service, Southeastern Forest Experiment Station Research Note 125.

[8]Applequist, M. D. 1959. Soil-site studies, southern hardwoods (Fig. 7).

[9]Tennessee Valley Authority. 1943. Site curves, eastern redcedar. TVA, Knoxville, Tenn.

TABLE 8.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AaA Altavista	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
At. Augusta	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
BN*: Beaches.					
Newhan	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
BoA Bojac	Slight	Slight	Slight	Slight	Moderate: droughty.
Ca Cape Fear	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Cb Conaby	Severe: flooding, wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness.	Severe: wetness, excess humus.	Severe: wetness, excess humus.
CnA Conetoe	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
CoB Corolla	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
CrB*: Corolla	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
Duckston	Severe: flooding, wetness, too sandy.	Severe: too sandy.	Severe: too sandy, wetness, flooding.	Severe: too sandy.	Severe: droughty, flooding.
Cu Currituck	Severe: flooding, excess humus.	Severe: excess humus.	Severe: excess humus, flooding.	Severe: excess humus.	Severe: flooding. excess humus.
Da Dare	Severe: flooding, wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness.	Severe: wetness, excess humus.	Severe: excess humus, wetness.
Do Dorovan	Severe: flooding, excess humus.	Severe: excess humus.	Severe: excess humus, flooding.	Severe: excess humus.	Severe: flooding, excess humus.
Ds Dragston	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
Dt Duckston	Severe: flooding, wetness, too sandy.	Severe: too sandy.	Severe: too sandy, wetness, flooding.	Severe: too sandy.	Severe: droughty, flooding.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Du*. Dune land					
DwD*: Dune land.					
Newhan	Severe: too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty, slope.
Mu Munden	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
NeC Newhan	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
NhC*: Newhan	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
Corolla	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
No Nimmo	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Os Osier	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.
OuB Ousley	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy, flooding.	Severe: too sandy.	Severe: droughty, flooding.
Pa Pasquotank	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Po Ponzer	Severe: flooding, wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness.	Severe: wetness, excess humus.	Severe: wetness, excess humus.
Pt Portsmouth	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ro Roanoke	Severe: flooding, wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
StA State	Slight	Slight	Slight	Slight	Slight.
StB State	Slight	Slight	Moderate: slope.	Slight	Slight.
To Tomotley	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ud*. Udorthents					
Wa Wahee	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
WnB--- Wando	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Ws--- Wasda	Severe: flooding, wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness.	Severe: wetness, excess humus.	Severe: wetness, excess humus.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--RELATIONSHIP OF WETLAND TYPES, SOILS, AND VEGETATION

Wetland type[1] and dominant soils	Dominant vegetation
Seasonally flooded basins or flats (Type 1) Roanoke	Sweetgum, red maple, water oak, willow oak, overcup oak.
Wooded swamps (Type 7) Cape Fear Conaby Wasda Dorovan	Baldcypress, water tupelo, sweetgum, green ash, red maple, greenbrier.
Bogs (Type 8) Organic soils Dare Ponzer Conaby Wasda Mineral soils[2] Cape Fear Pasquotank Portsmouth Tomotley	Sphagnum moss, titi, pond pine, waxmyrtle, Atlantic white-cedar, redbay, sweetbay, gallberry.
Coastal shallow fresh marsh (Type 12) Currituck Duckston	Big cordgrass, maidencane, cattail, black needlerush, sawgrass, three-square rush.

[1]U.S. Department of Interior, "Wetlands of the United States," Shaw and Fredine, U.S. Fish and Wildlife Circular 39, 1956.

[2]Cape Fear, Pasquotank, Portsmouth, and Tomotley soils may have sufficient wetness to support the wetland plant community as described. In Currituck County, however, most areas have been cleared and are in agricultural production, but in some areas the dominant plant community is planted loblolly pine and volunteer sweetgum.

TABLE 10.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AaA---- Altavista	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
At---- Augusta	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
BN*: Beaches.										
Newhan----	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
BoA---- Bojac	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ca---- Cape Fear	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Cb---- Conaby	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
CnA---- Conetoe	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CoB---- Corolla	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Very poor.	Very poor.
CrB*: Corolla----	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Very poor.	Very poor.
Duckston----	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Very poor.	Poor.
Cu---- Currituck	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Very poor.	Very poor.	Very poor.	Poor.
Da---- Dare	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Do---- Dorovan	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Ds---- Dragston	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
Dt---- Duckston	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Very poor.	Very poor.
Du*. Dune land										
DwD*: Dune land.										
Newhan----	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
Mu---- Munden	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
NeC---------- Newhan	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
NhC*:										
Newhan----------	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
Corolla----------	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Very poor.	Very poor.
No---------- Nimmo	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Os---------- Osier	Very poor.	Poor	Fair	Fair	Fair	Fair	Good	Poor	Fair	Fair.
OuB---------- Ousley	Poor	Fair	Good	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
Pa---------- Pasquotank	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Po---------- Ponzer	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Pt---------- Portsmouth	Very poor.	Poor	Poor	Poor	Poor	Good	Fair	Poor	Poor	Fair.
Ro---------- Roanoke	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
StA, StB---------- State	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
To---------- Tomotley	Poor	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair.
Ud*. Udorthents										
Wa---------- Wahee	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
WnB---------- Wando	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
Ws---------- Wasda	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AaA---------- Altavista	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
At---------- Augusta	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: low strength, wetness.	Moderate: wetness.
BN: Beaches.						
Newhan----------	Severe: cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty.
BoA---------- Bojac	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty.
Ca---------- Cape Fear	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness.	Severe: wetness.
Cb---------- Conaby	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, excess humus.
CnA---------- Conetoe	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
CoB---------- Corolla	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: flooding, wetness.	Severe: droughty.
CrB: Corolla----------	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: flooding, wetness.	Severe: droughty.
Duckston---------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: droughty, flooding.
Cu---------- Currituck	Severe: cutbanks cave, excess humus, wetness.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness.	Severe: wetness, flooding, excess humus.
Da---------- Dare	Severe: excess humus, wetness.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness.	Severe: flooding, wetness, low strength.	Severe: wetness, low strength.	Severe: excess humus, wetness.
Do---------- Dorovan	Severe: excess humus, wetness.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness.	Severe: wetness, flooding, excess humus.
Ds---------- Dragston	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
Dt---------- Duckston	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: droughty, flooding.
Du. Dune land						

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
DwD: Dune land.						
Newhan	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
Mu Munden	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
NeC Newhan	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
NhC:						
Newhan	Severe: cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty.
Corolla	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: flooding, wetness.	Severe: droughty.
No Nimmo	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Os Osier	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
OuB Ousley	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: droughty, flooding.
Pa Pasquotank	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Po Ponzer	Severe: excess humus, wetness.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness.	Severe: flooding, wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, excess humus.
Pt Portsmouth	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.
Ro Roanoke	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
StA State	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Moderate: low strength.	Slight.
StB State	Severe: cutbanks cave.	Slight	Moderate: wetness.	Moderate: slope.	Moderate: low strength.	Slight.
To Tomotley	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ud. Udorthents						
Wa Wahee	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
WnB Wando	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Ws---------- Wasda	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, excess humus.

TABLE 12.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AaA---- Altavista	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
At---- Augusta	Severe: wetness.	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness.	Fair: wetness.
BN*: Beaches.					
Newhan----	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
BoA---- Bojac	Moderate: wetness.	Severe: seepage.	Severe: wetness, seepage.	Severe: seepage.	Fair: thin layer.
Ca---- Cape Fear	Severe: wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: wetness, too clayey.	Severe: seepage, wetness.	Poor: too clayey, hard to pack, wetness.
Cb---- Conaby	Severe: wetness.	Severe: seepage, flooding, excess humus.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness, thin layer.
CnA---- Conetoe	Slight----	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage.
CoB---- Corolla	Severe: wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: wetness, seepage.	Severe: seepage, wetness.	Poor: seepage, too sandy.
CrB*: Corolla----	Severe: wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: wetness, seepage.	Severe: seepage, wetness.	Poor: seepage, too sandy.
Duckston----	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness, too sandy.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
Cu---- Currituck	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
Da---- Dare	Severe: wetness, percs slowly.	Severe: flooding, excess humus, wetness.	Severe: seepage, wetness, excess humus.	Severe: wetness.	Poor: excess humus, wetness.
Do---- Dorovan	Severe: flooding, wetness, poor filter.	Severe: flooding, excess humus, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness, excess humus.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ds---------- Dragston	Severe: wetness, poor filter.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Poor: wetness, thin layer.
Dt---------- Duckston	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness, too sandy.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
Du*. Dune land					
DwD*: Dune land.					
Newhan----------	Severe: poor filter, slope.	Severe: seepage.	Severe: slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
Mu---------- Munden	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Fair: wetness, thin layer.
NeC---------- Newhan	Severe: poor filter.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
NhC*: Newhan----------	Severe: poor filter.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Corolla----------	Severe: wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: wetness, seepage.	Severe: seepage, wetness.	Poor: seepage, too sandy.
No---------- Nimmo	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness, thin layer.
Os---------- Osier	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
OuB---------- Ousley	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy.
Pa---------- Pasquotank	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
Po---------- Ponzer	Severe: wetness, percs slowly.	Severe: flooding, excess humus, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Pt---------- Portsmouth	Severe: wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ro---------- Roanoke	Severe: flooding, percs slowly, wetness.	Severe: flooding.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: hard to pack, too clayey, wetness.
StA, StB---------- State	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness.	Moderate: wetness.	Fair: too clayey, thin layer.
To---------- Tomotley	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Ud*. Udorthents					
Wa---------- Wahee	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
WnB---------- Wando	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage.
Ws---------- Wasda	Severe: wetness.	Severe: flooding, excess humus, wetness.	Severe: wetness, seepage.	Severe: wetness.	Poor: wetness, excess humus.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," and "probable." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Topsoil
AaA---------- Altavista	Fair: wetness, thin layer.	Improbable: excess fines.	Good.
At---------- Augusta	Fair: wetness.	Improbable: excess fines.	Fair: small stones.
BN*: Beaches.			
Newhan----------	Good----------	Probable----------	Poor: too sandy.
BoA---------- Bojac	Good----------	Improbable: thin layer.	Fair: thin layer.
Ca---------- Cape Fear	Poor: low strength, wetness.	Improbable: excess fines.	Poor: thin layer, wetness.
Cb---------- Conaby	Poor: wetness.	Improbable: excess fines.	Poor: excess humus, wetness.
CnA---------- Conetoe	Good----------	Probable----------	Fair: too sandy.
CoB---------- Corolla	Fair: wetness.	Probable----------	Poor: too sandy.
CrB*: Corolla----------	Fair: wetness.	Probable----------	Poor: too sandy.
Duckston----------	Fair: wetness.	Probable----------	Poor: too sandy.
Cu---------- Currituck	Poor: wetness.	Probable----------	Poor: excess humus, wetness.
Da---------- Dare	Poor: wetness, low strength.	Improbable: excess fines.	Poor: excess humus, wetness.
Do---------- Dorovan	Poor: wetness.	Probable----------	Poor: excess humus, wetness.
Ds---------- Dragston	Fair: wetness.	Probable----------	Fair: thin layer.
Dt---------- Duckston	Fair: wetness.	Probable----------	Poor: too sandy.
Du*. Dune land			
DwD*: Dune land.			

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Topsoil
DwD*: Newhan	Fair: slope.	Probable	Poor: too sandy, slope.
Mu Munden	Fair: wetness.	Probable	Fair: thin layer.
NeC Newhan	Good	Probable	Poor: too sandy.
NhC*: Newhan	Good	Probable	Poor: too sandy.
Corolla	Fair: wetness.	Probable	Poor: too sandy.
No Nimmo	Poor: wetness.	Probable	Poor: wetness.
Os Osier	Poor: wetness.	Probable	Poor: too sandy, wetness.
OuB Ousley	Fair: wetness.	Probable	Poor: too sandy.
Pa Pasquotank	Fair: wetness.	Improbable: excess fines.	Good.
Po Ponzer	Poor: wetness, low strength.	Improbable: excess fines.	Poor: excess humus, wetness.
Pt Portsmouth	Poor: wetness.	Probable	Poor: wetness.
Ro Roanoke	Poor: low strength, wetness.	Improbable: excess fines.	Poor: thin layer, wetness.
StA, StB State	Fair: low strength.	Improbable: thin layer.	Fair: too clayey.
To Tomotley	Poor: wetness.	Improbable: excess fines.	Poor: wetness.
Ud*. Udorthents			
Wa Wahee	Poor: low strength, wetness.	Improbable: excess fines.	Poor: thin layer, wetness.
WnB Wando	Good	Probable	Fair: too sandy.
Ws Wasda	Poor: wetness.	Improbable: excess fines.	Poor: excess humus, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Limitations for--		Features affecting--			
	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
AaA--- Altavista	Moderate: wetness.	Moderate: deep to water.	Favorable---	Wetness---	Wetness---	Favorable.
At--- Augusta	Severe: piping, wetness.	Moderate: slow refill.	Favorable---	Wetness---	Wetness---	Wetness.
BN*: Beaches.						
Newhan---	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Too sandy---	Droughty.
BoA--- Bojac	Severe: piping.	Severe: cutbanks cave.	Deep to water	Fast intake, soil blowing.	Soil blowing---	Droughty.
Ca--- Cape Fear	Severe: hard to pack, wetness.	Slight---	Percs slowly---	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Cb--- Conaby	Severe: piping, wetness.	Slight---	Subsides---	Wetness---	Wetness---	Wetness.
CnA--- Conetoe	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake.	Too sandy---	Droughty.
CoB--- Corolla	Severe: seepage, wetness, piping.	Severe: cutbanks cave.	Slope, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy.	Droughty.
CrB*: Corolla---	Severe: seepage, wetness, piping.	Severe: cutbanks cave.	Slope, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy.	Droughty.
Duckston---	Severe: seepage, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.
Cu--- Currituck	Severe: seepage, piping.	Severe: cutbanks cave.	Flooding, subsides.	Wetness, rooting depth, flooding.	Wetness, too sandy.	Wetness, rooting depth.
Da--- Dare	Severe: excess humus, wetness.	Slight---	Percs slowly, subsides.	Percs slowly, wetness.	Percs slowly, wetness.	Wetness, percs slowly.
Do--- Dorovan	Severe: excess humus.	Severe: cutbanks cave.	Flooding, subsides.	Wetness, flooding.	Wetness---	Wetness.
Ds--- Dragston	Severe: piping, wetness, seepage.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness---	Wetness, droughty.
Dt--- Duckston	Severe: seepage, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Du*. Dune land						
DwD*: Dune land.						
Newhan	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Slope, too sandy.	Slope, droughty.
Mu---------- Munden	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Fast intake, soil blowing.	Wetness, too sandy, soil blowing.	Favorable.
NeC---------- Newhan	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Too sandy------	Droughty.
NhC*: Newhan----------	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Too sandy------	Droughty.
Corolla----------	Severe: seepage, wetness, piping.	Severe: cutbanks cave.	Slope, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy.	Droughty.
No---------- Nimmo	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, fast intake.	Wetness, too sandy.	Wetness.
Os---------- Osier	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, flooding.	Wetness, too sandy.	Wetness, droughty.
OuB---------- Ousley	Severe: seepage, piping.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty.	Wetness, too sandy.	Droughty.
Pa---------- Pasquotank	Severe: piping, wetness.	Slight---------	Favorable------	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
Po---------- Ponzer	Severe: wetness.	Slight---------	Percs slowly, subsides.	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Pt---------- Portsmouth	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness--------	Wetness, too sandy.	Wetness.
Ro---------- Roanoke	Severe: hard to pack, wetness.	Severe: slow refill.	Percs slowly	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
StA---------- State	Moderate: thin layer, piping.	Severe: cutbanks cave.	Deep to water	Soil blowing---	Soil blowing---	Favorable.
StB---------- State	Moderate: thin layer, piping.	Severe: cutbanks cave.	Deep to water	Soil blowing, slope.	Soil blowing---	Favorable.
To---------- Tomotley	Severe: piping, wetness.	Severe: slow refill.	Favorable------	Wetness, soil blowing.	Wetness, soil blowing.	Wetness.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Ud*. Udorthents						
Wa---------- Wahee	Severe: wetness.	Severe: slow refill.	Percs slowly---	Wetness, soil blowing, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
WnB---------- Wando	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Soil blowing---	Droughty.
Ws---------- Wasda	Severe: wetness.	Slight---------	Subsides-------	Wetness--------	Wetness--------	Wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
AaA---------- Altavista	0-15	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	95-100	90-100	65-99	35-60	<23	NP-7
	15-42	Clay loam, sandy clay loam, loam.	CL, CL-ML, SC, SM-SC	A-4, A-6, A-7	0	95-100	95-100	60-99	45-75	20-45	5-28
	42-80	Variable----------	---	---	0	---	---	---	---	---	---
At---------- Augusta	0-8	Fine sandy loam	SM, SM-SC	A-2, A-4	0	90-100	75-100	50-80	30-50	<25	NP-7
	8-48	Sandy clay loam, clay loam, loam.	CL, CL-ML	A-4, A-6, A-7	0	90-100	75-100	75-95	51-80	20-45	5-25
	48-60	Sandy loam, loamy sand, sand.	SM, SP-SM	A-2, A-4	0	90-100	75-100	51-100	10-50	<25	NP
BN*: Beaches.											
Newhan----------	0-75	Fine sand--------	SP	A-3	0	95-100	95-100	60-75	0-5	---	NP
BoA---------- Bojac	0-10	Loamy sand--------	SM	A-2	0	95-100	95-100	50-100	15-30	<20	NP
	10-34	Fine sandy loam, loam, sandy loam.	ML, SM	A-2, A-4	0	95-100	95-100	55-100	20-60	<35	NP-10
	34-72	Stratified loamy fine sand to coarse sand.	SM, SP, SW-SM	A-2, A-1, A-3	0	80-100	75-100	12-100	2-35	<20	NP
Ca---------- Cape Fear	0-12	Loam----------	ML, CL-ML, CL	A-4, A-6	0	100	95-100	85-100	60-90	20-40	3-15
	12-42	Clay loam, clay, silty clay.	ML, CL, MH, CH	A-7	0	100	95-100	90-100	60-85	41-65	15-35
	42-60	Sand, loamy sand.	SM, SP-SM	A-2, A-3	0	95-100	90-100	50-76	5-35	---	NP
Cb---------- Conaby	0-13	Muck----------	PT	---	---	---	---	---	---	---	---
	13-21	Sand, loamy sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	96-100	65-85	5-25	---	NP
	21-33	Sandy loam, fine sandy loam, loam.	SM, SM-SC	A-2, A-4	0	100	96-100	70-85	20-45	<20	NP-7
	33-73	Variable----------	---	---	---	---	---	---	---	---	---
CnA---------- Conetoe	0-23	Loamy sand--------	SM, SP-SM	A-2, A-3	0	100	100	50-95	5-30	---	NP
	23-43	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4	0	100	100	50-95	20-40	<30	NP-10
	43-80	Loamy sand, sand	SM, SP, SP-SM	A-2, A-3, A-1	0	100	100	40-95	4-30	---	NP
CoB---------- Corolla	0-72	Fine sand--------	SW, SP-SM, SP	A-2, A-3	0	100	98-100	60-75	3-12	---	NP
CrB*: Corolla----------	0-72	Fine sand--------	SW, SP-SM, SP	A-2, A-3	0	100	98-100	60-75	3-12	---	NP
Duckston--------	0-72	Fine sand--------	SP-SM, SP	A-3	0	100	95-100	60-75	3-10	---	NP
Cu---------- Currituck	0-14	Muck----------	PT	A-8	---	---	---	---	---	---	---
	14-28	Muck----------	PT	A-8	---	---	---	---	---	---	---
	28-60	Loamy sand, sand	SM, SP-SM	A-2, A-3	0	95-100	90-100	50-75	5-35	---	NP
Da---------- Dare	0-70	Muck----------	PT	---	0	---	---	---	---	---	NP
	70-96	Fine sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	90-100	60-80	5-30	---	NP

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Do---------- Dorovan	0-10	Mucky-peat--------	PT	---	0	---	---	---	---	---	---
	10-84	Muck----------	PT	---	0	---	---	---	---	---	---
	84-96	Variable---------	---	---	---	---	---	---	---	---	---
Ds---------- Dragston	0-8	Loamy fine sand--	SM	A-2	0	100	95-100	50-90	15-35	10-18	NP-7
	8-42	Fine sandy loam, sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2, A-4	0	100	95-100	60-85	30-50	18-25	NP-10
	42-60	Loamy sand, loamy fine sand, sand.	SM, SP-SM	A-2, A-3	0	95-100	85-100	35-70	5-30	17-18	NP-7
Dt---------- Duckston	0-72	Fine sand--------	SP-SM, SP	A-3	0	100	95-100	60-75	3-10	---	NP
Du*. Dune land											
DwD*: Dune land.											
Newhan----------	0-75	Fine sand--------	SP	A-3	0	95-100	95-100	60-75	0-5	---	NP
Mu---------- Munden	0-14	Loamy sand--------	SM, SM-SC	A-2, A-4	0	100	98-100	55-85	15-45	<18	NP-7
	14-32	Sandy loam, loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	100	98-100	60-95	30-75	<30	NP-15
	32-60	Loamy sand, fine sand, sand.	SM, SP-SM	A-2, A-3	0	100	98-100	50-90	5-35	<18	NP-7
NeC---------- Newhan	0-75	Fine sand--------	SP	A-3	0	95-100	95-100	60-75	0-5	---	NP
NhC*: Newhan----------	0-75	Fine sand--------	SP	A-3	0	95-100	95-100	60-75	0-5	---	NP
Corolla---------	0-72	Fine sand--------	SW, SP-SM, SP	A-2, A-3	0	100	98-100	60-75	3-12	---	NP
No---------- Nimmo	0-9	Loamy sand--------	SM, SM-SC	A-2, A-4	0	100	95-100	55-85	15-45	<18	NP-7
	9-30	Loam, fine sandy loam, sandy loam.	SM, SC, ML, CL	A-2, A-4, A-6	0	100	95-100	60-95	30-75	<30	NP-15
	30-60	Loamy sand, fine sand, sand.	SM, SP-SM	A-2, A-3	0	100	95-100	50-80	5-35	<18	NP-7
Os---------- Osier	0-5	Fine sand--------	SP-SM	A-2, A-3	0	100	98-100	60-85	5-12	---	NP
	5-60	Sand, loamy sand, loamy fine sand.	SP-SM, SM	A-2, A-3	0	100	95-100	65-90	5-20	---	NP
OuB---------- Ousley	0-7	Fine sand--------	SP-SM, SM	A-2, A-3	0	100	100	70-100	5-25	---	NP
	7-80	Sand, fine sand, coarse sand.	SP-SM, SM, SP	A-1, A-2, A-3	0	100	95-100	36-99	2-15	---	NP
Pa---------- Pasquotank	0-7	Silt loam--------	CL-ML, ML	A-4	0	100	100	90-100	65-95	<25	NP-7
	7-45	Loam, very fine sandy loam, silt loam.	CL-ML, ML	A-4	0	100	100	90-98	65-95	<25	NP-7
	45-60	Loamy sand, loamy fine sand, fine sand.	SM, SP-SM	A-2	0	100	100	50-80	11-30	---	NP
Po---------- Ponzer	0-26	Muck----------	PT	---	---	---	---	---	---	---	---
	26-60	Loam, sandy clay loam, silt loam.	SM, ML, SC, CL	A-2, A-4, A-6	0	100	100	60-95	30-95	<40	NP-20

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Pt Portsmouth	0-16	Fine sandy loam	SM, SM-SC, ML	A-2, A-4	0	98-100	98-100	65-95	30-65	<30	NP-7
	16-32	Loam, sandy clay loam, clay loam.	SC, CL-ML, CL	A-4, A-6	0	98-100	98-100	75-95	36-70	18-40	7-18
	32-38	Loamy sand, sandy loam.	SM	A-2	0	98-100	98-100	50-70	13-35	<18	NP-4
	38-80	Coarse sand to loamy sand.	SP-SM, SP, SM	A-1, A-2, A-3	0	98-100	98-100	45-65	3-25	---	NP
Ro Roanoke	0-8	Fine sandy loam	SM-SC, CL-ML, CL, SC	A-6, A-4	0	95-100	85-100	60-100	35-90	25-40	5-16
	8-45	Clay, silty clay loam, silty clay, sandy clay loam.	CH, CL	A-7	0	90-100	85-100	85-100	65-95	45-60	22-36
	45-80	Sand, sandy clay, clay.	CL-ML, GM-GC, CH	---	0-5	40-100	35-100	25-95	15-90	10-60	NP-40
StA, StB State	0-11	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-4	0	95-100	95-100	65-100	40-85	<35	NP-7
	11-37	Loam, clay loam, sandy clay loam.	CL, SC	A-4, A-6	0	95-100	95-100	75-100	35-80	24-40	8-25
	37-65	Variable	---	---	---	---	---	---	---	---	---
To Tomotley	0-10	Fine sandy loam	SM	A-2, A-4	0	98-100	95-100	75-98	25-50	<30	NP-7
	10-50	Fine sandy loam, sandy clay loam, clay loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6	0	98-100	95-100	75-98	30-70	20-40	6-18
	50-60	Fine sandy loam, sandy clay loam, loamy fine sand.	SM-SC, SC, CL-ML, CL	A-4, A-6, A-7	0	98-100	95-100	75-98	36-75	20-45	6-22
Ud*. Udorthents											
Wa Wahee	0-7	Fine sandy loam	SM, SM-SC	A-2, A-4	0	100	95-100	50-85	30-50	<28	NP-7
	7-60	Clay, clay loam, sandy clay loam, silty clay.	CL, CH	A-7, A-6	0	100	100	85-100	50-90	38-60	18-32
	60-99	Variable	---	---	---	---	---	---	---	---	---
WnB Wando	0-3	Loamy fine sand	SP-SM, SM	A-2, A-3	0	96-100	95-100	60-98	5-25	---	NP
	3-99	Sand, fine sand	SP, SP-SM, SM	A-2, A-3	0	98-100	98-100	51-98	2-20	---	NP
Ws Wasda	0-12	Muck	PT	---	0	---	---	---	---	---	NP
	12-40	Clay loam, sandy clay loam, sandy loam.	ML, CL, CL-ML	A-4	0	98-100	95-100	75-95	50-80	<25	NP-10
	40-50	Sandy loam, loam	ML, SM, CL-ML, SM-SC	A-4	0	98-100	95-100	75-95	45-70	<25	NP-7
	50-60	Sand	SP-SM, SM	A-2, A-3	0	100	100	55-75	5-15	---	NP

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
						K	T	
	In	In/hr	In/in	pH				Pct
AaA--- Altavista	0-15	2.0-6.0	0.12-0.20	4.5-6.0	Low	0.20	4	.5-3
	15-42	0.6-2.0	0.12-0.20	4.5-6.0	Low	0.24		
	42-80	---	---	4.5-6.0	Low	---		
At--- Augusta	0-8	2.0-6.0	0.10-0.15	4.5-6.0	Low	0.15	4	.5-2
	8-48	0.6-2.0	0.12-0.18	4.5-6.0	Low	0.24		
	48-60	2.0-6.0	0.06-0.12	4.5-6.0	Low	0.24		
BN*: Beaches.								
Newhan---	0-75	>20	<0.05	6.6-7.8	Low	0.10	5	---
BoA--- Bojac	0-10	6.0-20	0.05-0.08	4.5-6.5	Low	0.28	3	.5-1
	10-34	2.0-6.0	0.08-0.17	4.5-6.5	Low	0.28		
	34-72	>6.0	0.02-0.08	4.5-6.0	Low	0.28		
Ca--- Cape Fear	0-12	0.6-6.0	0.15-0.22	4.5-6.5	Low	0.15	5	5-15
	12-42	0.06-0.2	0.12-0.22	4.5-6.0	Moderate	0.32		
	42-60	6.0-20	0.02-0.06	4.5-6.0	Low	0.10		
Cb--- Conaby	0-13	0.2-2.0	0.20-0.26	3.6-5.5	Low	---	---	20-60
	13-21	2.0-6.0	0.04-0.10	3.6-5.5	Low	0.10		
	21-33	2.0-6.0	0.10-0.14	3.6-5.5	Low	0.15		
	33-73	---	---	---	---	---		
CnA--- Conetoe	0-23	6.0-20	0.05-0.10	4.5-6.0	Low	0.15	5	.5-2
	23-43	2.0-6.0	0.10-0.15	4.5-6.0	Low	0.15		
	43-80	6.0-20	0.05-0.10	4.5-6.0	Low	0.10		
CoB--- Corolla	0-72	>20	0.01-0.03	5.6-7.8	Low	0.10	5	<.5
CrB*: Corolla---	0-72	>20	0.01-0.03	5.6-7.8	Low	0.10	5	<.5
Duckston---	0-72	>20	0.02-0.05	5.6-8.4	Low	0.10	5	.5-1
Cu--- Currituck	0-14	0.6-6.0	0.25-0.35	4.5-6.0	Low	---	---	20-60
	14-28	0.6-6.0	0.25-0.35	4.5-6.0	Low	---		
	28-60	6.0-20	0.04-0.09	3.6-6.0	Low	---		
Da--- Dare	0-70	0.06-0.2	0.20-0.26	3.6-4.4	Low	---	---	20-95
	70-96	6.0-20	0.04-0.09	3.6-6.0	Low	0.15		
Do--- Dorovan	0-10	0.6-2.0	0.25-0.50	3.6-4.4	---	---	---	20-60
	10-84	0.6-2.0	0.25-0.50	3.6-4.4	---	---		
	84-96	6.0-20	0.05-0.08	4.5-5.5	Low	---		
Ds--- Dragston	0-8	>6.0	0.06-0.11	4.5-5.5	Low	0.17	4	.5-1
	8-42	2.0-6.0	0.08-0.16	4.5-5.5	Low	0.17		
	42-60	>6.0	0.04-0.08	4.5-5.5	Low	0.17		
Dt--- Duckston	0-72	>20	0.02-0.05	5.6-8.4	Low	0.10	5	.5-1
Du*. Dune land								
DwD*: Dune land.								
Newhan---	0-75	>20	<0.05	6.6-7.8	Low	0.10	5	---

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
						K	T	
	In	In/hr	In/in	pH				Pct
Mu----------	0-14	2.0-6.0	0.06-0.10	4.5-6.0	Low----------	0.20	4	.5-1
Munden	14-32	0.6-2.0	0.08-0.17	4.5-6.0	Low----------	0.17		
	32-60	>2.0	0.04-0.08	4.5-6.0	Low----------	0.17		
NeC----------	0-75	>20	<0.05	6.6-7.8	Low----------	0.10	5	---
Newhan								
NhC*:								
Newhan----------	0-75	>20	<0.05	6.6-7.8	Low----------	0.10	5	---
Corolla---------	0-72	>20	0.01-0.03	5.6-7.8	Low----------	0.10	5	<.5
No----------	0-9	2.0-6.0	0.06-0.10	3.6-5.5	Low----------	0.17	4	1-2
Nimmo	9-30	0.6-2.0	0.08-0.17	3.6-5.5	Low----------	0.17		
	30-60	>2.0	0.04-0.08	3.6-5.5	Low----------	0.17		
Os----------	0-5	6.0-20	0.03-0.10	4.5-6.0	Low----------	0.10	5	2-5
Osier	5-60	6.0-20	0.03-0.10	4.5-6.0	Low----------	0.10		
OuB----------	0-7	6.0-20	0.05-0.10	6.6-7.3	Low----------	0.15	5	<.5
Ousley	7-80	6.0-20	0.02-0.06	6.6-7.3	Low----------	0.15		
Pa----------	0-7	0.6-2.0	0.18-0.26	4.5-6.0	Low----------	0.43	5	2-5
Pasquotank	7-45	0.6-2.0	0.15-0.20	4.5-5.5	Low----------	0.43		
	45-60	2.0-6.0	0.05-0.10	4.5-5.5	Low----------	0.32		
Po----------	0-26	0.06-2.0	0.35-0.45	3.6-4.4	Low----------	----	---	25-60
Ponzer	26-60	0.06-2.0	0.10-0.24	3.6-6.5	Low----------	0.24		
Pt----------	0-16	0.6-6.0	0.12-0.18	3.6-5.5	Low----------	0.24	5	3-15
Portsmouth	16-32	0.6-2.0	0.14-0.20	3.6-5.5	Low----------	0.28		
	32-38	2.0-6.0	0.06-0.10	3.6-5.5	Low----------	0.17		
	38-80	6.0-20	0.02-0.05	3.6-6.0	Low----------	0.17		
Ro----------	0-8	0.6-2.0	0.14-0.20	4.5-5.5	Low----------	0.37	4	.5-3
Roanoke	8-45	0.06-0.2	0.10-0.19	4.5-5.5	Moderate-------	0.24		
	45-80	0.06-20	0.04-0.14	4.5-5.5	Moderate-------	0.24		
StA, StB---------	0-11	0.6-6.0	0.10-0.20	4.5-5.5	Low----------	0.28	4	<2
State	11-37	0.6-2.0	0.14-0.19	4.5-5.5	Low----------	0.28		
	37-65	>2.0	0.02-0.10	4.5-6.0	Low----------	0.17		
To----------	0-10	2.0-6.0	0.10-0.15	3.6-5.5	Low----------	0.20	5	1-6
Tomotley	10-50	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.20		
	50-60	0.2-2.0	0.12-0.18	3.6-6.0	Low----------	0.20		
Ud*.								
Udorthents								
Wa----------	0-7	0.6-2.0	0.10-0.15	4.5-6.0	Low----------	0.28	5	.5-5
Wahee	7-60	0.06-0.2	0.12-0.20	4.5-5.5	Moderate-------	0.28		
	60-99	0.2-0.6	0.12-0.20	4.5-5.5	Moderate-------	0.28		
WnB----------	0-3	6.0-20	0.05-0.08	5.6-7.3	Low----------	0.10	5	<1
Wando	3-99	6.0-20	0.03-0.07	5.6-7.3	Low----------	0.10		
Ws----------	0-12	0.2-0.6	0.20-0.25	3.6-5.5	----------	----	---	20-50
Wasda	12-40	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.20		
	40-50	0.6-2.0	0.12-0.18	5.6-7.8	Low----------	0.24		
	50-60	6.0-20	0.02-0.06	5.6-7.8	Low----------	0.15		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," and "apparent" are explained in the text. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
AaA---------- Altavista	C	None--------	---	---	1.5-2.5	Apparent	Dec-Mar	Moderate	Moderate.
At---------- Augusta	C	None--------	---	---	1.0-2.0	Apparent	Jan-May	High-----	Moderate.
BN*: Beaches.									
Newhan----------	A	None--------	---	---	>6.0	---	---	High-----	Low.
BoA---------- Bojac	B	None--------	---	---	>4.0	Apparent	Sep-Jul	Low------	High.
Ca---------- Cape Fear	D	Rare--------	---	---	0-1.5	Apparent	Dec-Apr	High-----	High.
Cb---------- Conaby	B/D	Rare--------	---	---	0-1.5	Apparent	Dec-May	High-----	High.
CnA---------- Conetoe	A	None--------	---	---	>6.0	---	---	Low------	High.
CoB---------- Corolla	D	Rare--------	---	---	1.5-3.0	Apparent	Nov-May	Low------	Low.
CrB*: Corolla----------	D	Rare--------	---	---	1.5-3.0	Apparent	Nov-May	Low------	Low.
Duckston---------	D	Frequent----	Brief-----	Jan-Dec	1.0-2.0	Apparent	Jan-Dec	Low------	Low.
Cu---------- Currituck	D	Frequent----	Long------	Jan-Dec	0-1.0	Apparent	Jan-Dec	High-----	High.
Da---------- Dare	D	Frequent----	Brief-----	Nov-Apr	0-1.0	Apparent	Nov-May	High-----	High.
Do---------- Dorovan	D	Frequent----	Long------	Jan-Dec	0-0.5	Apparent	Jan-Dec	High-----	High.
Ds---------- Dragston	C	None--------	---	---	1.0-2.5	Apparent	Nov-Apr	Low------	High.
Dt---------- Duckston	D	Frequent----	Brief-----	Jan-Dec	1.0-2.0	Apparent	Jan-Dec	Low------	Low.
Du*. Dune land									
DwD*: Dune land.									
Newhan----------	A	None--------	---	---	>6.0	---	---	High-----	Low.
Mu---------- Munden	B	None--------	---	---	1.5-2.5	Apparent	Dec-Apr	Low------	High.
NeC---------- Newhan	A	None--------	---	---	>6.0	---	---	High-----	Low.
NhC*: Newhan----------	A	None--------	---	---	>6.0	---	---	High-----	Low.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
NhC*: Corolla	D	Rare	---	---	1.5-3.0	Apparent	Nov-May	Low	Low.
No Nimmo	B/C	None	---	---	0-0.5	Apparent	Dec-Apr	Low	High.
Os Osier	D	Common	Brief	Jan-Dec	0-1.0	Apparent	Nov-Mar	High	High.
OuB Ousley	C	Common	Brief	Jan-Dec	1.5-3.0	Apparent	Dec-May	Low	High.
Pa Pasquotank	B/D	None	---	---	1.0-2.0	Apparent	Dec-Mar	High	Moderate.
Po Ponzer	D	Rare	---	---	0-1.0	Apparent	Dec-May	High	High.
Pt Portsmouth	D	Rare	---	---	0-1.0	Apparent	Dec-Apr	High	High.
Ro Roanoke	D	Frequent	Brief	Nov-Apr	0-1.0	Apparent	Nov-May	High	High.
StA, StB State	B	None	---	---	4.0-6.0	Apparent	Dec-Jun	Moderate	High.
To Tomotley	B/D	None	---	---	0-1.0	Apparent	Dec-Mar	High	High.
Ud*. Udorthents									
Wa Wahee	D	None	---	---	0.5-1.5	Apparent	Dec-Mar	High	High.
WnB Wando	A	None	---	---	>6.0	---	---	Low	Moderate.
Ws Wasda	B/D	Rare	---	---	0-1.0	Apparent	Dec-May	High	High.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--CLASSIFICATION OF THE SOILS

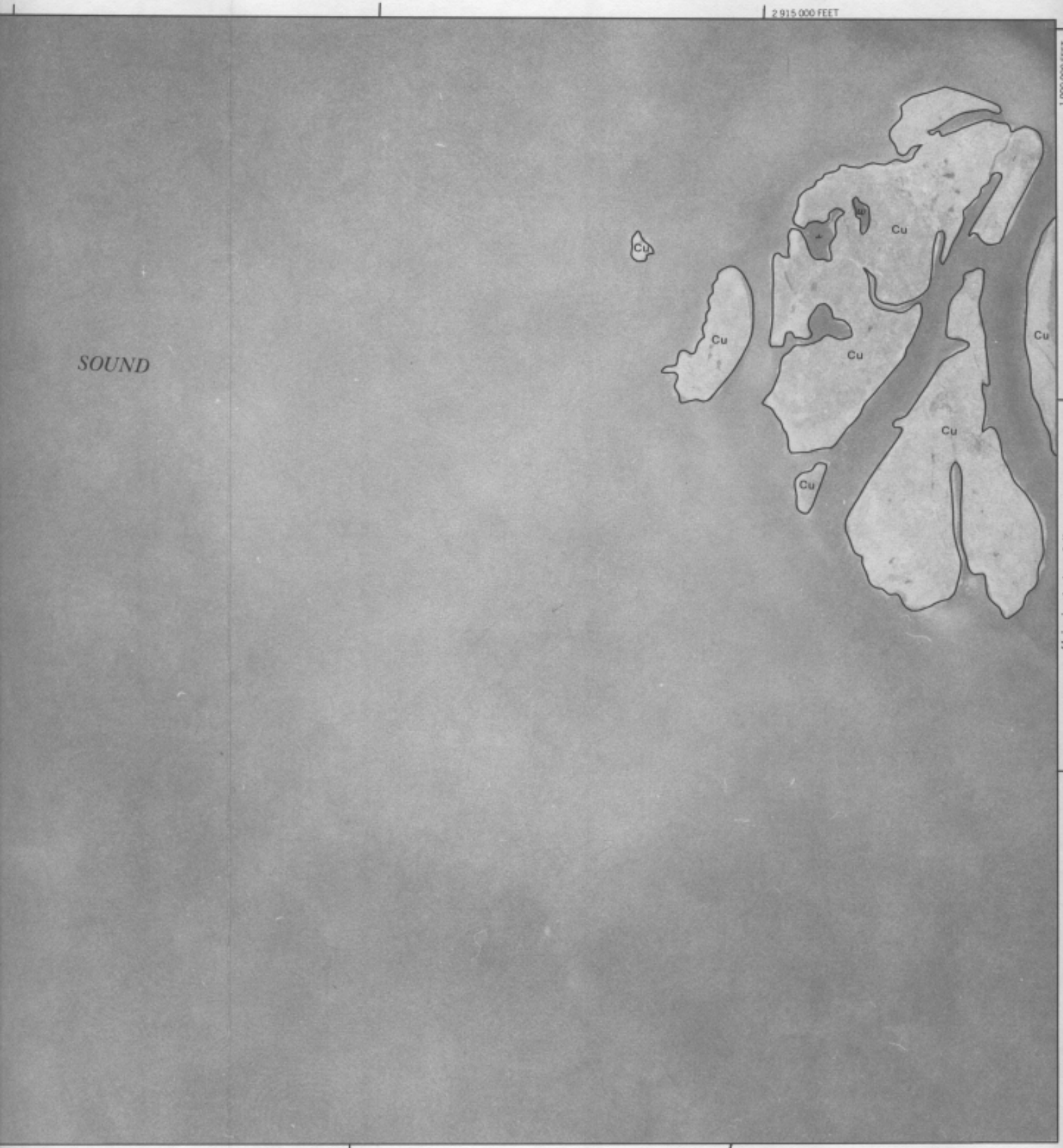
Soil name	Family or higher taxonomic class
Altavista	Fine-loamy, mixed, thermic Aquic Hapludults
Augusta	Fine-loamy, mixed, thermic Aeric Ochraquults
Bojac	Coarse-loamy, mixed, thermic Typic Hapludults
Cape Fear	Clayey, mixed, thermic Typic Umbraquults
Conaby	Coarse-loamy, mixed, nonacid, thermic Histic Humaquepts
Conetoe	Loamy, mixed, thermic Arenic Hapludults
Corolla	Thermic, uncoated Aquic Quartzipsamments
Currituck	Sandy or sandy-skeletal, mixed, euic, thermic Terric Medisaprists
Dare	Dysic, thermic Typic Medisaprists
Dorovan	Dysic, thermic Typic Medisaprists
Dragston	Coarse-loamy, mixed, thermic Aeric Ochraquults
Duckston	Siliceous, thermic Typic Psammaquents
Munden	Coarse-loamy, mixed, thermic Aquic Hapludults
Newhan	Mixed, thermic Typic Udipsamments
Nimmo	Coarse-loamy over sandy or sandy-skeletal, mixed, thermic Typic Ochraquults
Osier	Siliceous, thermic Typic Psammaquents
*Ousley	Thermic, uncoated Aquic Quartzipsamments
Pasquotank	Coarse-silty, mixed, acid, thermic Typic Haplaquepts
Ponzer	Loamy, mixed, dysic, thermic Terric Medisaprists
Portsmouth	Fine-loamy over sandy or sandy-skeletal, mixed, thermic Typic Umbraquults
Roanoke	Clayey, mixed, thermic Typic Ochraquults
State	Fine-loamy, mixed, thermic Typic Hapludults
Tomotley	Fine-loamy, mixed, thermic Typic Ochraquults
Wahee	Clayey, mixed, thermic Aeric Ochraquults
Wando	Mixed, thermic Typic Udipsamments
Wasda	Fine-loamy, mixed, nonacid, thermic Histic Humaquepts

* The soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.

* U.S. GOVERNMENT PRINTING OFFICE: 1982 O - 352-621 : QL 3

N
(Joins sheet 7)
(Joins sheet 9)
1245
StA
To
StB
CnA
Cb
Cu
Mu
BoA
NeC
Bell Island
Ds
Bradley Camp Ground
Coinjock Bay
At
Pt
Ro
985 000 FEET
2 885 000 FEET
(Joins sheet 13)

CURRITUCK
SOUND
Cu
Cu
To
CnA
Hampton
Lodge
Camp
Ground
BoA
1142
Cu
Church Island
CnA
Cb
1142
1245
5000 4000 3000 2000 1000 0 5000
1 .5 0 1 Kilometer
Scale - 1:20000



5 000 Feet
1 Kilometer

CURR

(Joins

2 790 000 FEET

1 025 000 FEET

Da

CAMDEN

COUNTY

5 000 4 000 300

1

(Joins inset, sheet 8)
Ro
1214
Chesapeake Hunt Club
To
Universal Trailer Park
At
Ro
To
1218
Po
At
COUNTY
Da
(Joins sheet 2)
980 000 FEET
1 015 000 FEET
2 805 000 FEET
5000 4000 3000 2000 1000 0 5000 Feet
1 .5 0 1 Kilometer
Scale - 1:20000

N

2 835 000 FEET
(Joins sheet 8)
Ro
Ws
Pt
Pa
Ws
Po
Ro
Ca
1201
Pt
Pt
Run
CAMDEN
Po
At
Ro
(Joins sheet 12)
Cb
Strength
Ds
COUNTY
1201
268
Cb
1148
Da
Ro
168
Gregory
1148
SOUTHERN
970 000 FEET
Cb
At
Canal
NORFOLK
Da
Cb
2 845 000 FEET
(Joins sheet 15)

N
(Joins sheet 9)
(Joins sheet 11)
(Joins sheet 15)
970 000 FEET
2 850 000 FEET
NORFOLK SOUTHERN
Shawboro
Gregory
1202
1203
1147
1148
158
168
Pa
Ro
Pt
Ca
No
Mu
Ds
BoA
AaA
At
To
Cb
Oa

New Providence
1203
Po
Ro
Ro
boro
At
1204
To
At
To
1204
Pt
BoA
To
AaA
Pt
To
BoA
Ro
GREAT
AaA
BoA
To
To
To
Ca
BoA
1200
BoA
To
Mu
Mu
StB
BoA
1200
1148
BoA
To
To
Ro
StB
Pt
Mu
Mu
Pt
BoA
To
To
BoA
Mu
BoA
Ca
Mu
1147
1148
5000
4000
3000
2000
1000
0
1
.5
0
1 Kilometer
Scale - 1:20000

2 880 000 FEET
980 000 FEET
(Joins sheet 13)
Maple
Maple Flight Strip
SWAMP
Da
Ws
Po
Cb
Ds
StA
To
BoA
Ro
CnA
AaA
StB
No
Mu
At
NeC
Pt
Cu
WnB
5 000 Feet
1 Kilometer

2 885 000 FEET
980 000 FEET
(Joins sheet 12)
Barco
5 000
4 000

CURRITUCK COUNTY, NORTH CAROLINA — SHEET NUMBER 13

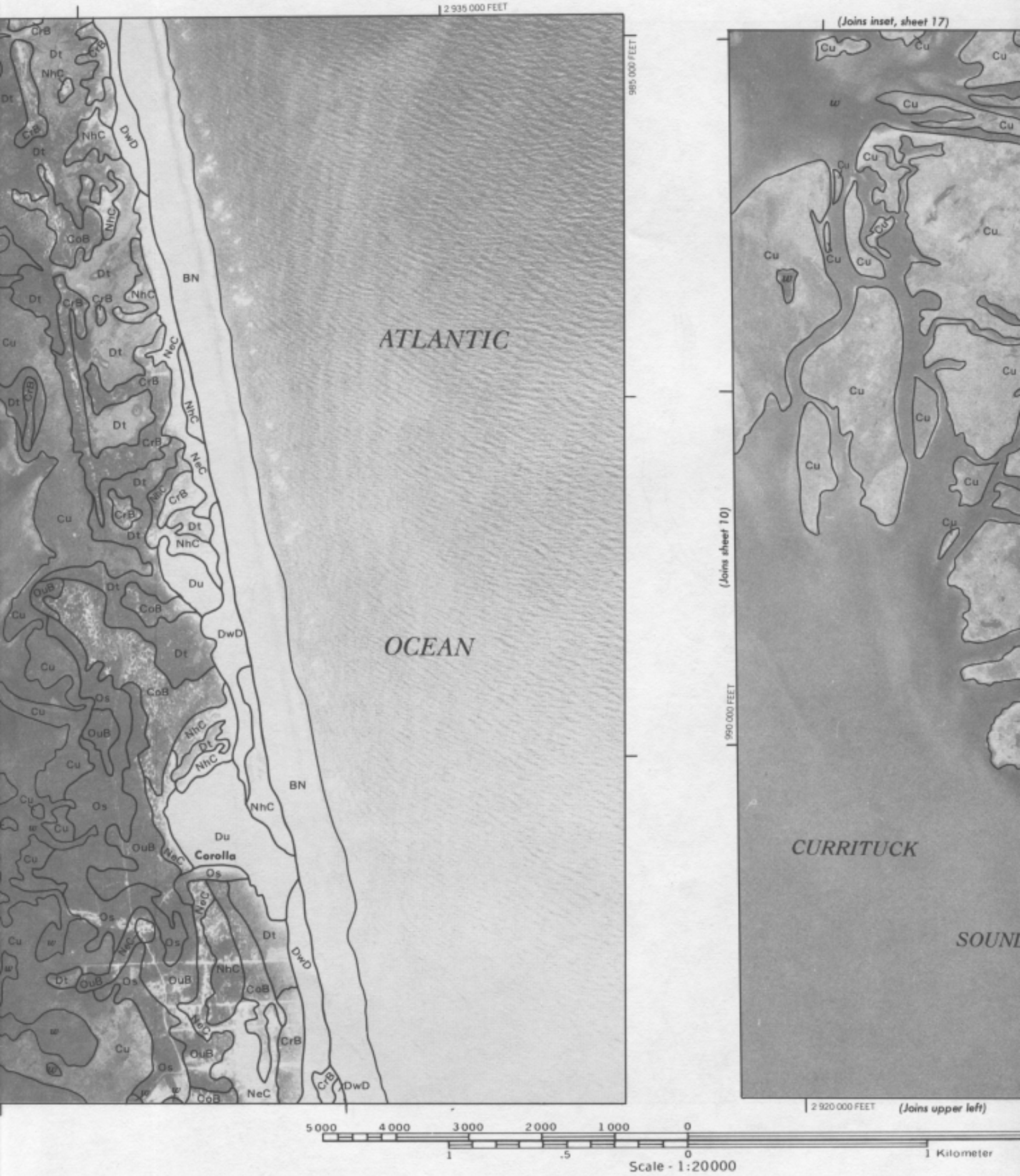
5000 4000 3000 2000 1000 0 5000 Feet

1 .5 0 1 Kilometer

Scale - 1:20000

13
N
(Joins sheet 10)
CURRITUCK
SOUND
WnB
Cb
(Joins sheet 14)
970 000 FEET
(Joins sheet 16)
2 920 000 FEET

N
(Joins lower right)
CURRITUCK
SOUND
(Joins sheet 13)
970 000 FEET
2 920 000 FEET
(Joins sheet 17)
Cu
CrB
Dt
CoB
NhC
DwD
OuB
Os
NeC
BN


2 935 000 FEET
985 000 FEET
(Joins inset, sheet 17)
ATLANTIC
OCEAN
CURRITUCK
SOUND
Corolla
(Joins sheet 10)
990 000 FEET
2 920 000 FEET
(Joins upper left)
5 000 4 000 3 000 2 000 1 000 0
1 .5 0 1 Kilometer
Scale - 1:20000

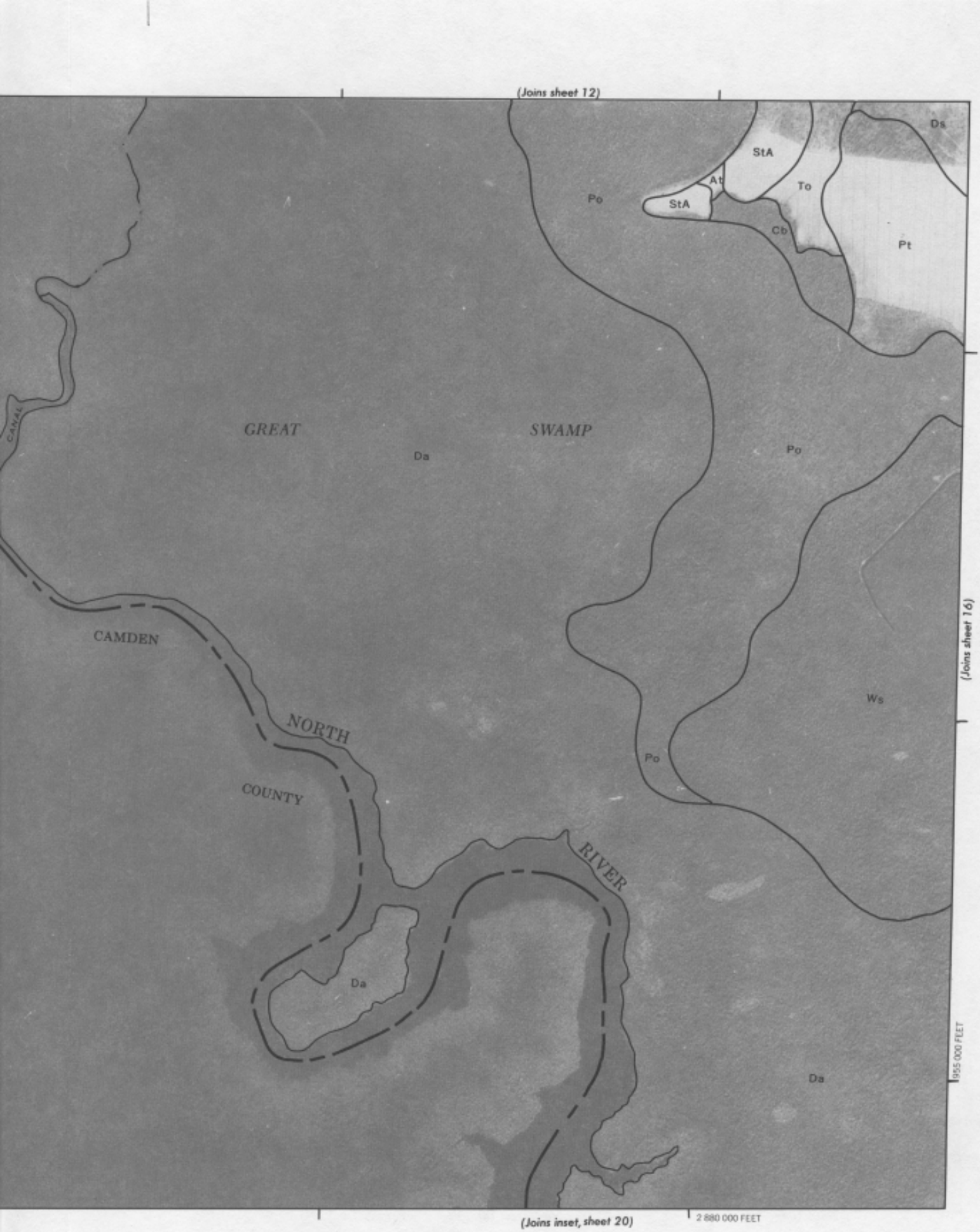
2 930 000 FEET
1 000 000 FEET
ATLANTIC
OCEAN
SOUND
Cu
Dt
Os
CoB
NeC
NhC
DwD
CrB
Du
BN
w
oper left)
5 000 Feet
Kilometer

(Joins sheet 11)
2 850 000 FEET
965 000 FEET
AaA
At
Cb
Pa
Da
Ro
Ca
BoA
Pt
To
Wa
Cb.
Run
Swamp
Canal
CAMDEN
Jordan
Creek
COUNTY
1148
1149
1147
158
5 000

5000 4000 3000 2000 1000 0 5000 Feet

1 .5 0 1 Kilometer

Scale - 1:20000


(Joins sheet 12)
Ds
StA
At
To
Po
StA
Cb
Pt
CANAL
GREAT
SWAMP
Da
Po
CAMDEN
NORTH
COUNTY
RIVER
Ws
Po
Da
Da
(Joins sheet 16)
955 000 FEET
(Joins inset, sheet 20)
2 880 000 FEET

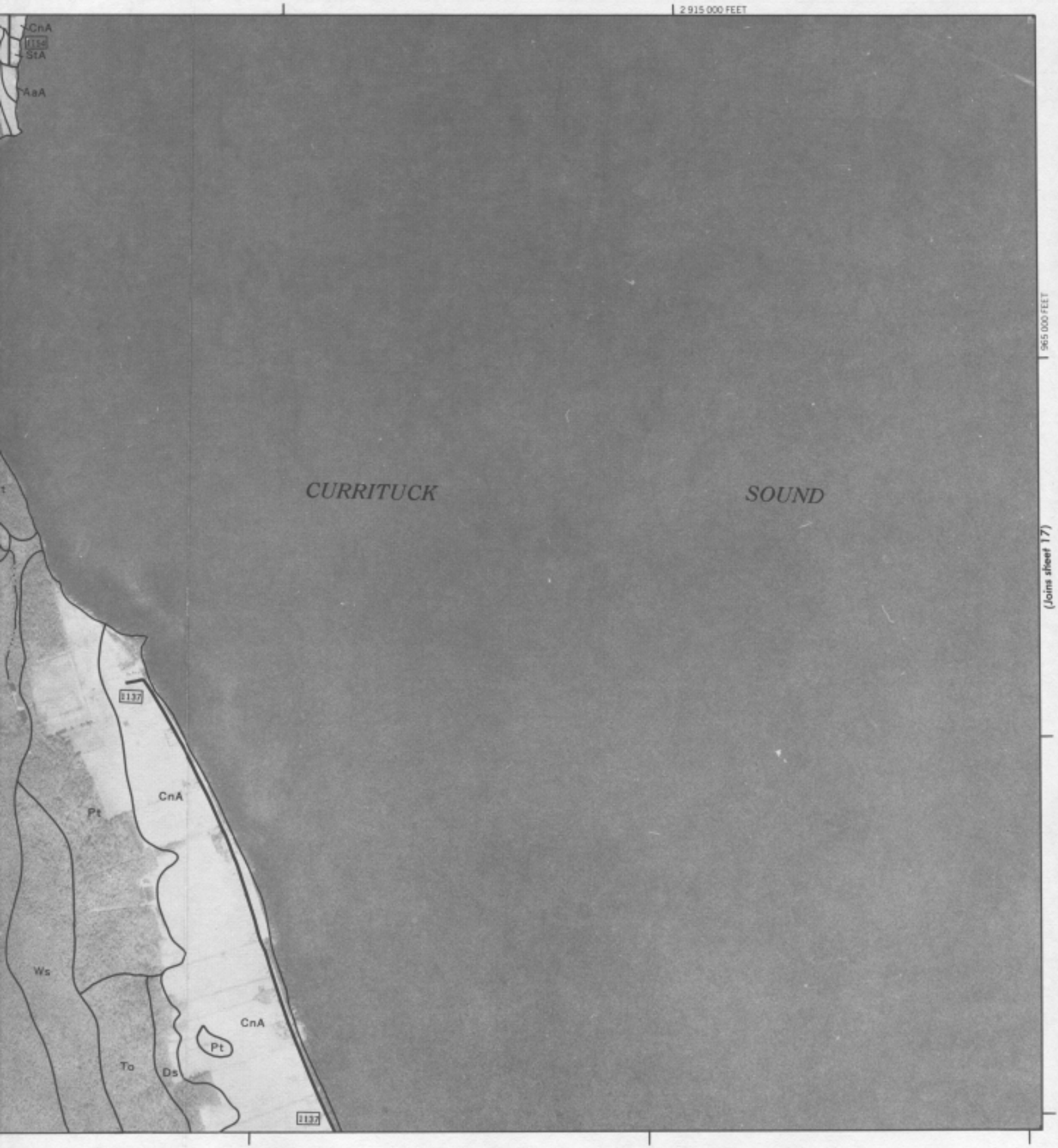
N

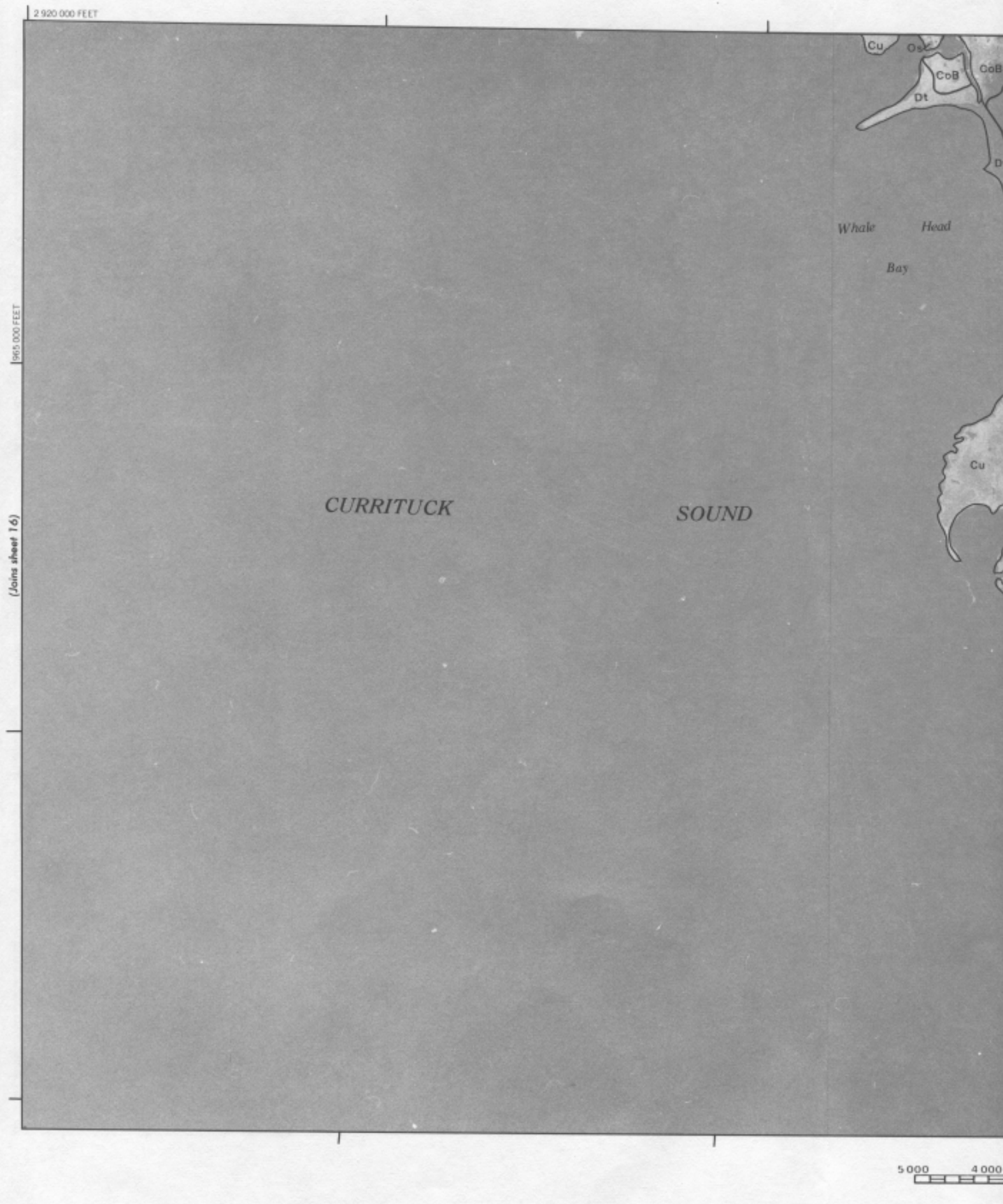
N
(Joins sheet 13)
(Joins sheet 15)
955 000 FEET
2 885 000 FEET
(Joins sheet 18)
Ds
BoA
WnB
CnA
Cb
Po
No
Pt
Mu
Pl
Ws
At
To
158
StA
AaA
Da
Do
Cu

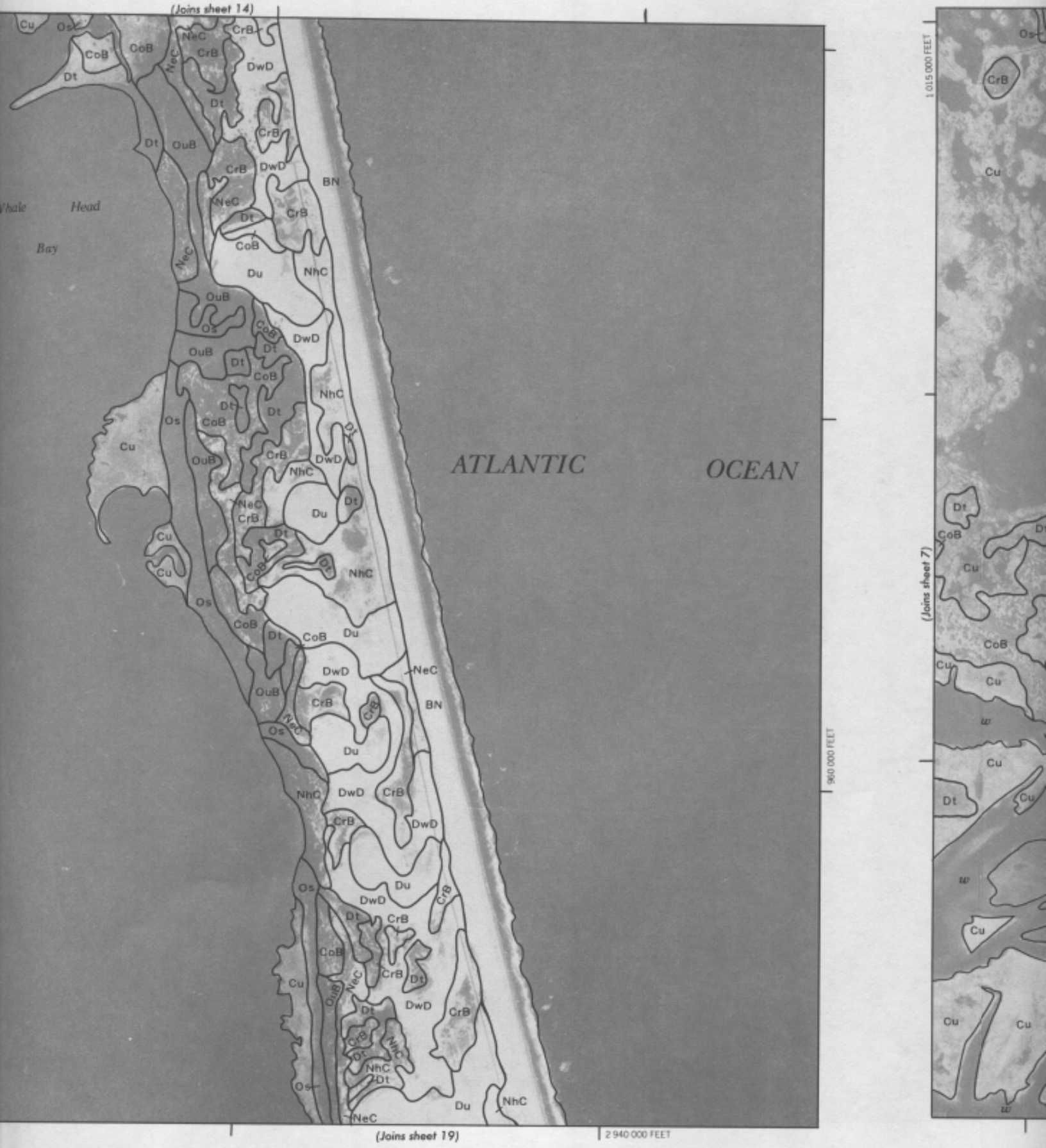
5000 4000 3000 2000 1000 0 5000

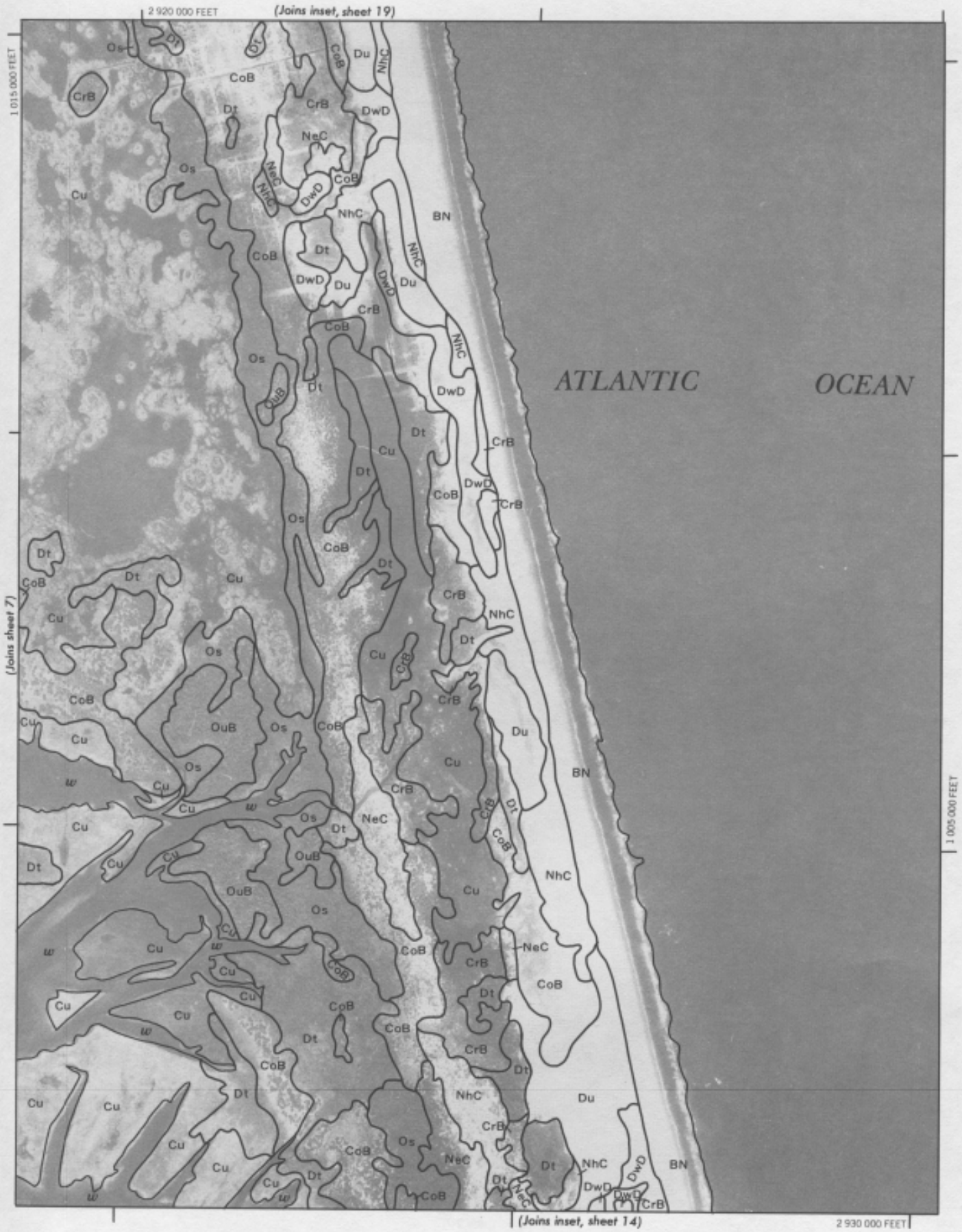
1 .5 0 1 Kilometer

Scale - 1:20000


2 915 000 FEET
965 000 FEET
(Joins sheet 17)
CnA
StA
AaA
CURRITUCK
SOUND
3137
CnA
Pt
Ws
CnA
Pt
To
Ds
3137
5000 Feet


2 920 000 FEET
965 000 FEET
(Joins sheet 16)
Cu
Os
CoB
CoB
Dt
D
Whale
Head
Bay
Cu
CURRITUCK
SOUND
5 000
4 000


(Joins sheet 14)
Whale Head Bay
ATLANTIC OCEAN
1 015 000 FEET
960 000 FEET
2 940 000 FEET
(Joins sheet 7)
(Joins sheet 19)
Cu
Os
CoB
NeC
CrB
DwD
Dt
OuB
BN
NhC
Du
5000 4000 3000 2000 1000 0 5000 Feet
1 .5 0 1 Kilometer
Scale - 1:20000


N
2 920 000 FEET
(Joins inset, sheet 19)
1 015 000 FEET
(Joins sheet 7)
ATLANTIC OCEAN
1 005 000 FEET
(Joins inset, sheet 14)
2 930 000 FEET
Os
Dt
CoB
Du
NhC
CrB
DwD
NeC
Cu
BN
OuB
w

N
(Joins sheet 16)
Da
Do
Cu
water
Ws
INTRACOASTAL WATERWAY
NeC
D
(Joins inset, sheet 20)
NORTH
CAMDEN
COUNTY
RIVER
940 000 FEET
2 885 000 FEET
(Joins sheet 20)

5000 4000 3000 2000 1000 0 5000

1 .5 0 1 Kilometer

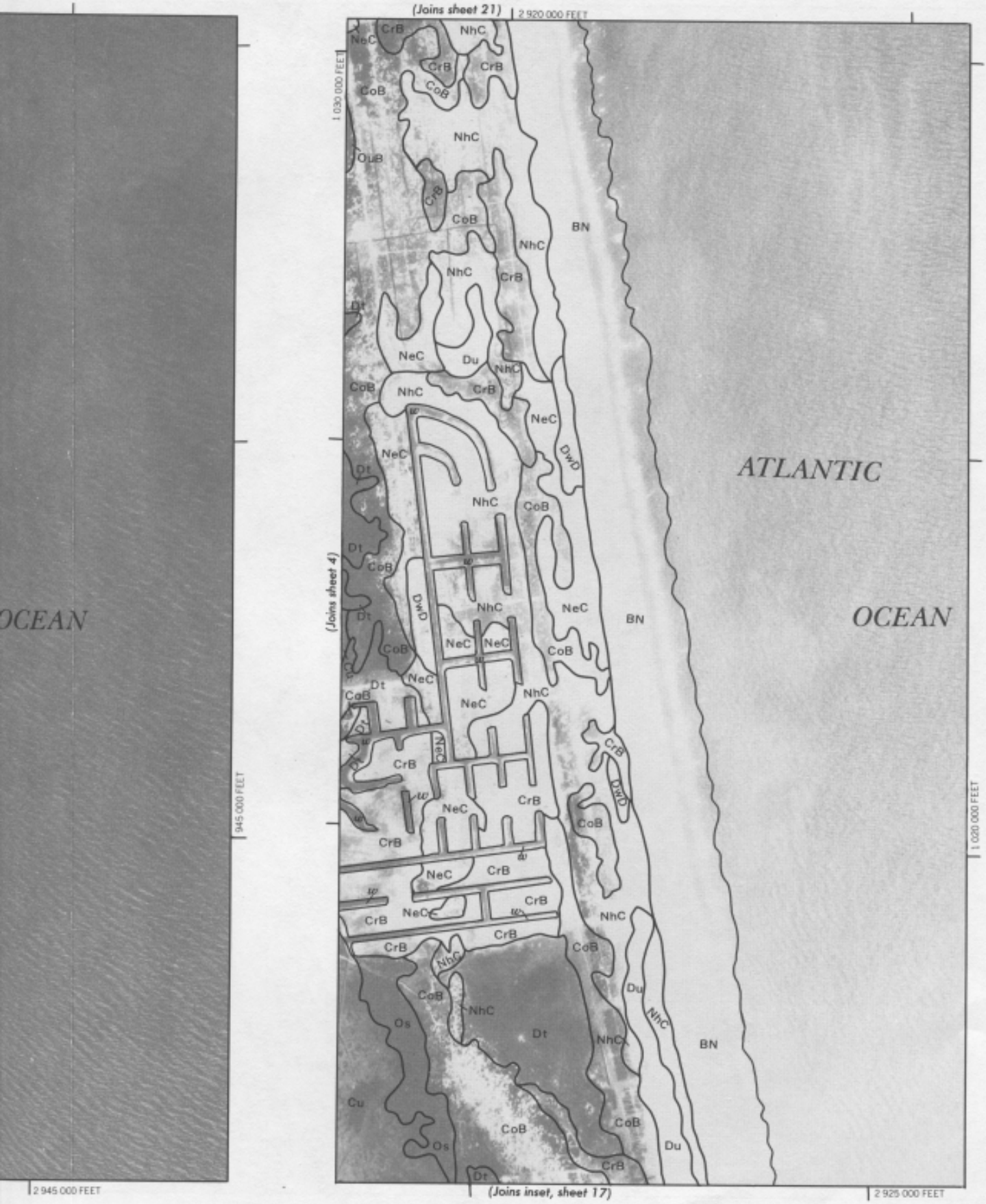
Scale - 1:20000

2 920 000 FEET
950 000 FEET
(Joins sheet 19)
CURRITUCK
SOUND
Aydlett
1137
1160
1159
1148
1150
1139
1139
1138
1158
1162
1137
To
Ws
Ds
CnA
Mu
StB
BoA
StA
Pt
Po
Cu
5 000 Feet
Kilometer

2 925 000 FEET
950 000 FEET
(Joins sheet 18)
CURRITUCK
SOUND
water
Cu
w
5 000
4 000

(Joins sheet 17)
ATLANTIC
OCEAN
water
water
Du
Dt
NeC
OuB
NhC
Cu
Os
DwD
CoB
CrB
BN
w
(Joins sheet 21)
2 945 000 FEET
5000 4000 3000 2000 1000 0 5000 Feet
1 .5 0 1 Kilometer
Scale - 1:20000

N


(Joins sheet 21)
2 920 000 FEET
1 030 000 FEET
(Joins sheet 4)
ATLANTIC
OCEAN
OCEAN
945 000 FEET
1 020 000 FEET
2 945 000 FEET
(Joins inset, sheet 17)
2 925 000 FEET
NeC
CrB
NhC
CoB
Du
Dt
BN
DwD
Os
Cu

2 885 000 FEET
1 033 000 FEET
(Joins inset A)
VIRGINIA
Bay
Back
GREAT
MARSH
GREAT
To
Ro
Cu
AaA
BoA
Pa
615
2 845 000 FEET
1 032 000 FEET
CHESAPEAKE
COUNTY
VIRGINIA
(Joins lower right)
VIRGINIA
NORTH WEST
RIVER MARSH
GAME
LAND
Ro
Da
Cu
At
AaA
Pt
Po
1248
1250
2 810 000 FEET
1 030 000 FEET
(Joins inset, sheet 8)
CHESAPEAKE
U.S. Navy
Radio Station
AaA
1218
At
To
Ro
Ca
StA
Ds
5 000
4 000

CURRITUCK COUNTY, NORTH CAROLINA — SHEET NUMBER 1

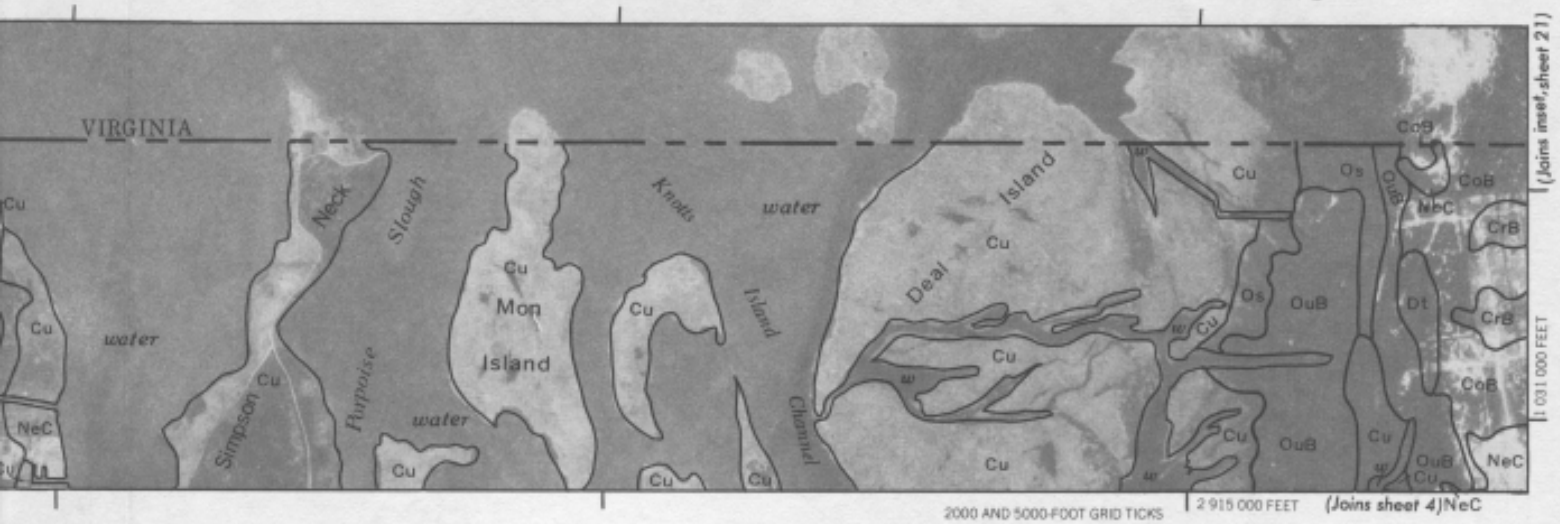
3000 2000 1000 0 5000 Feet

1 .5 0 1 Kilometer

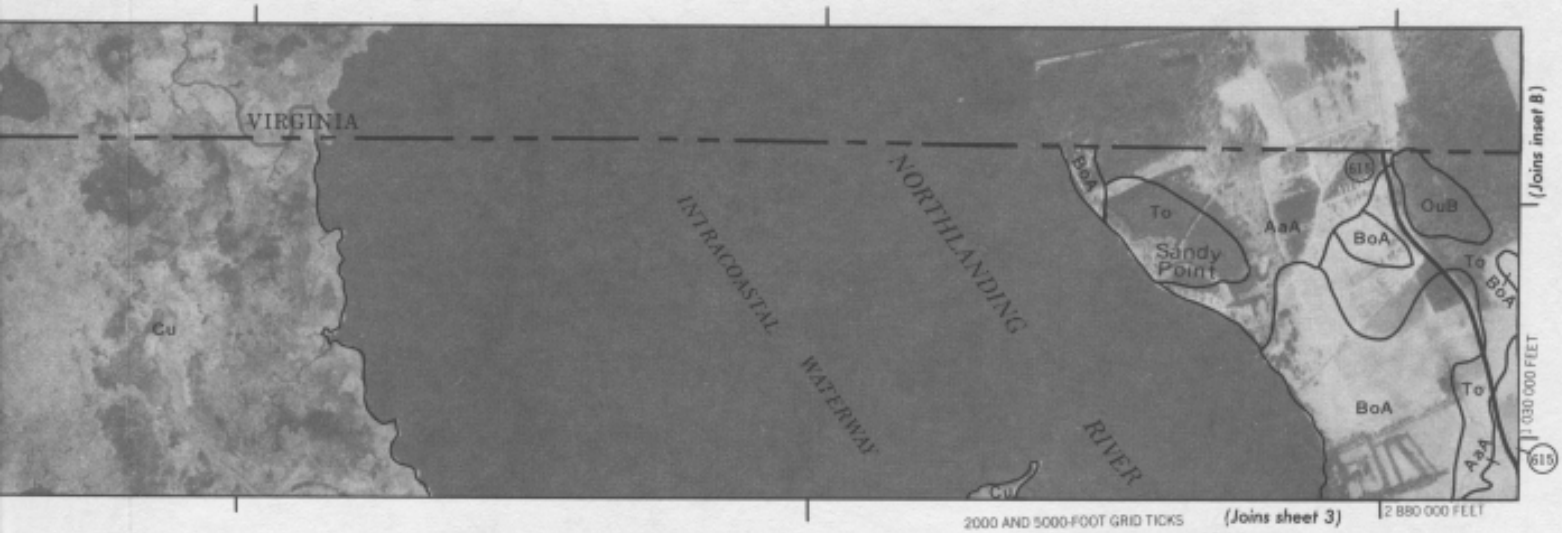
Scale - 1:20000

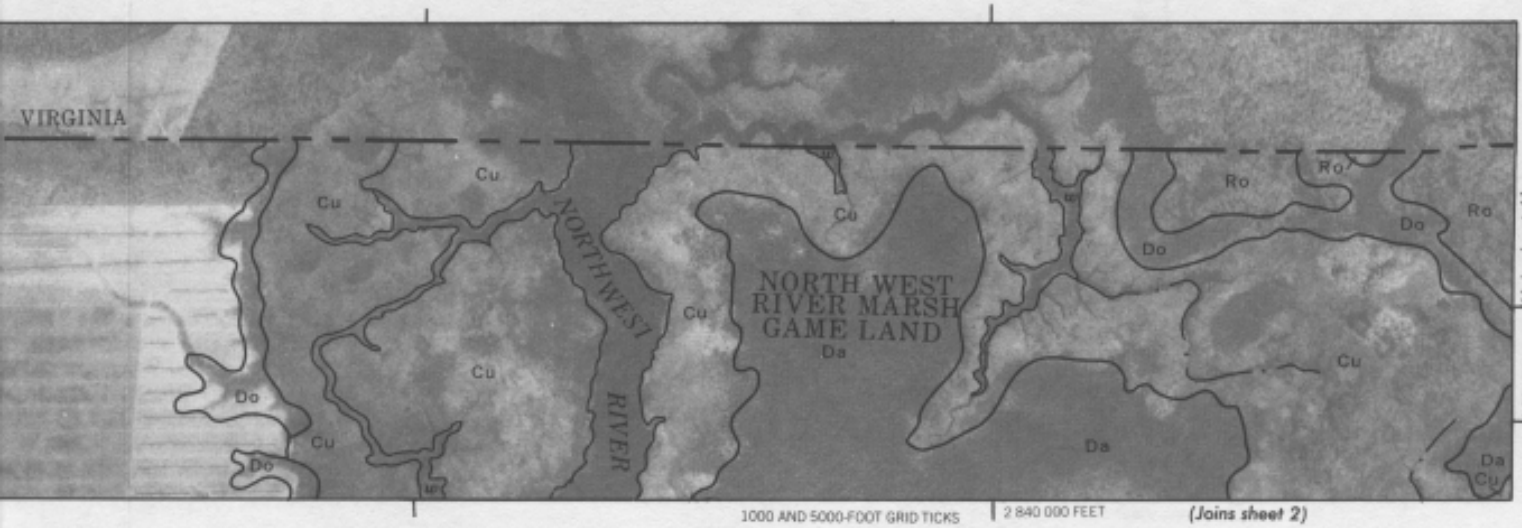
N

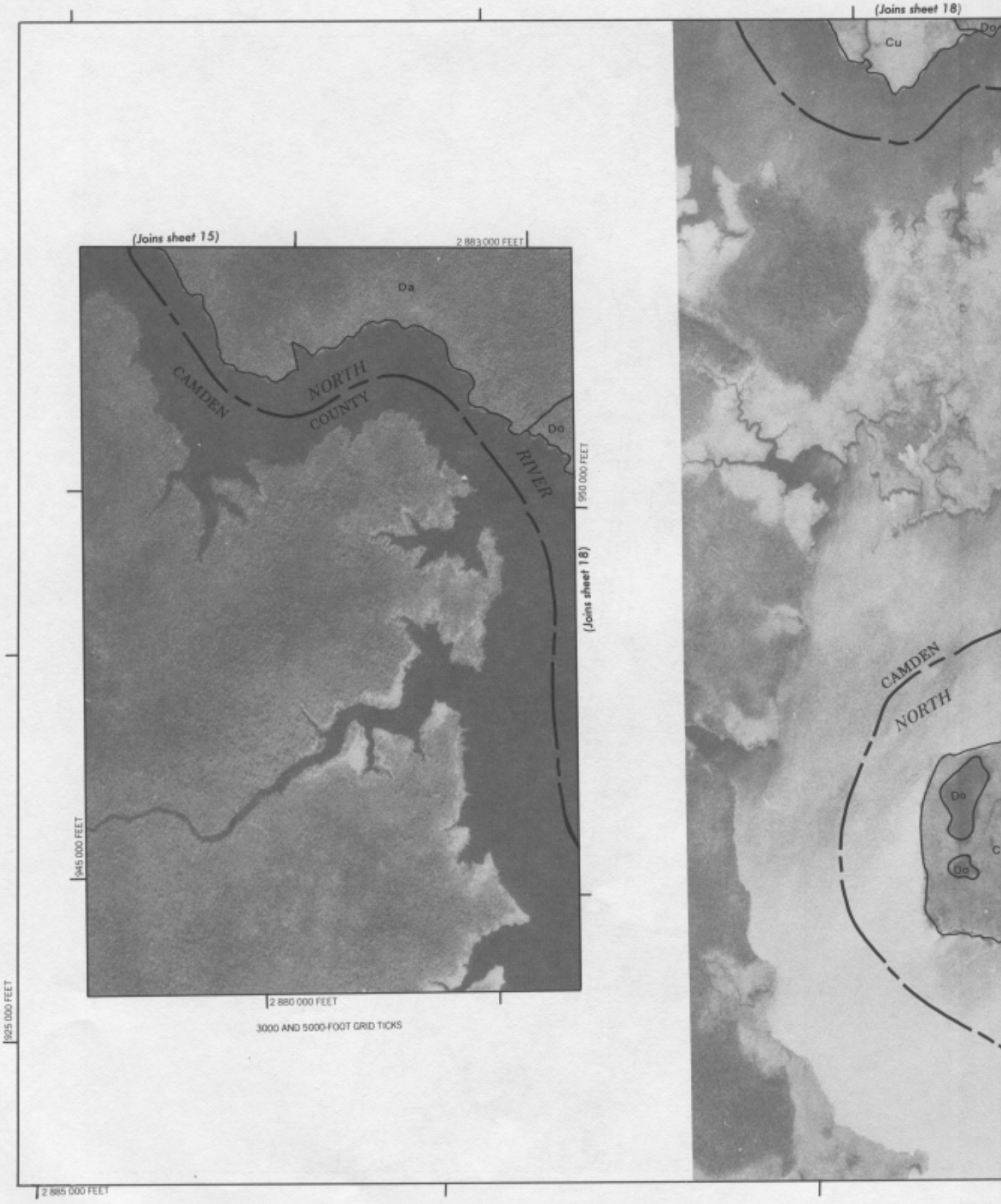
INSET B



INSET A





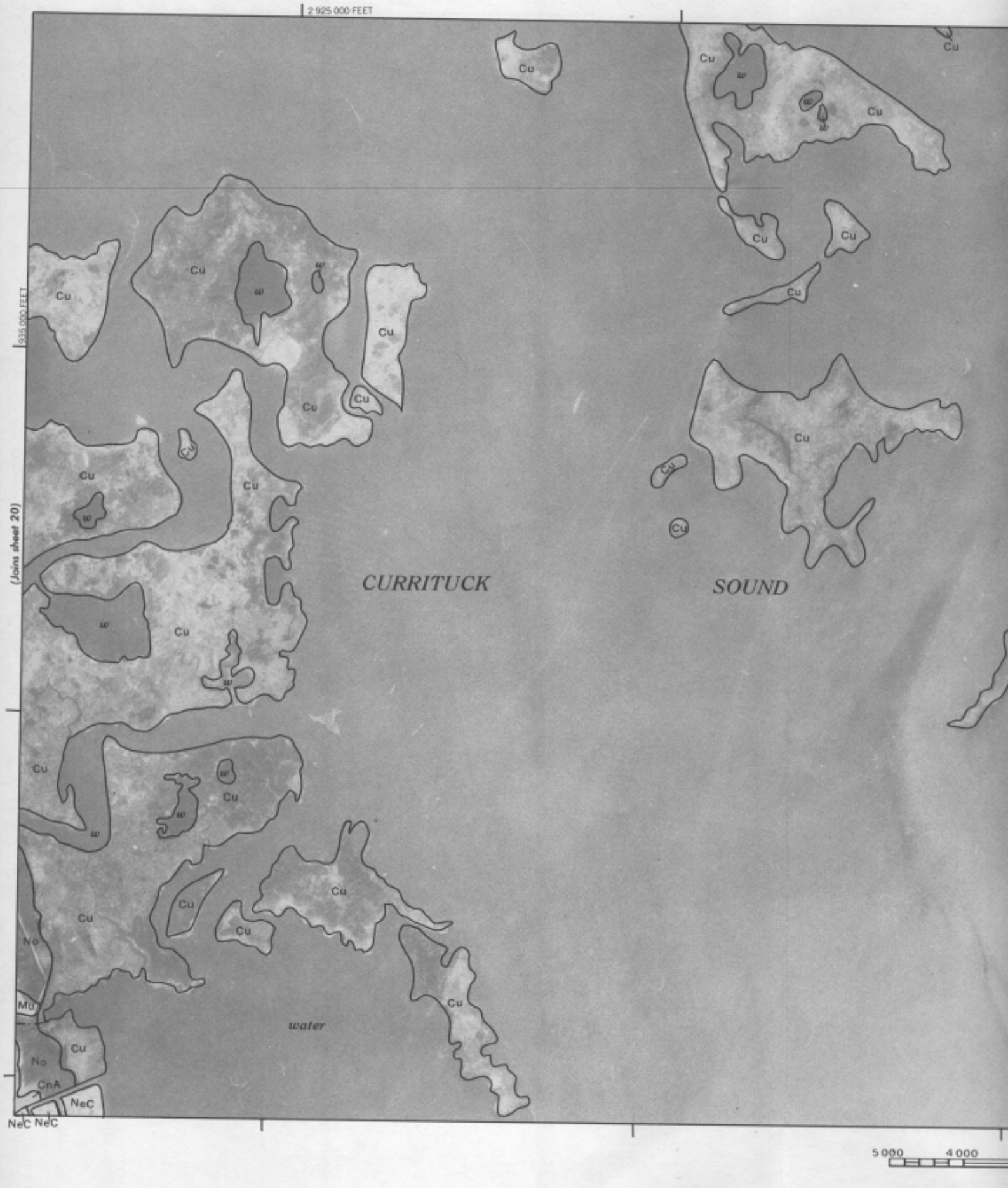

N
(Joins sheet 18)
Cu
Do
(Joins sheet 15)
2 883 000 FEET
Da
CAMDEN
NORTH
COUNTY
Do
RIVER
950 000 FEET
(Joins sheet 18)
CAMDEN
NORTH
Do
Do
945 000 FEET
925 000 FEET
2 880 000 FEET
3000 AND 5000-FOOT GRID TICKS
2 885 000 FEET

5000 4000 3000 2000 1000 0 5000

1 .5 0 1 Kilometer

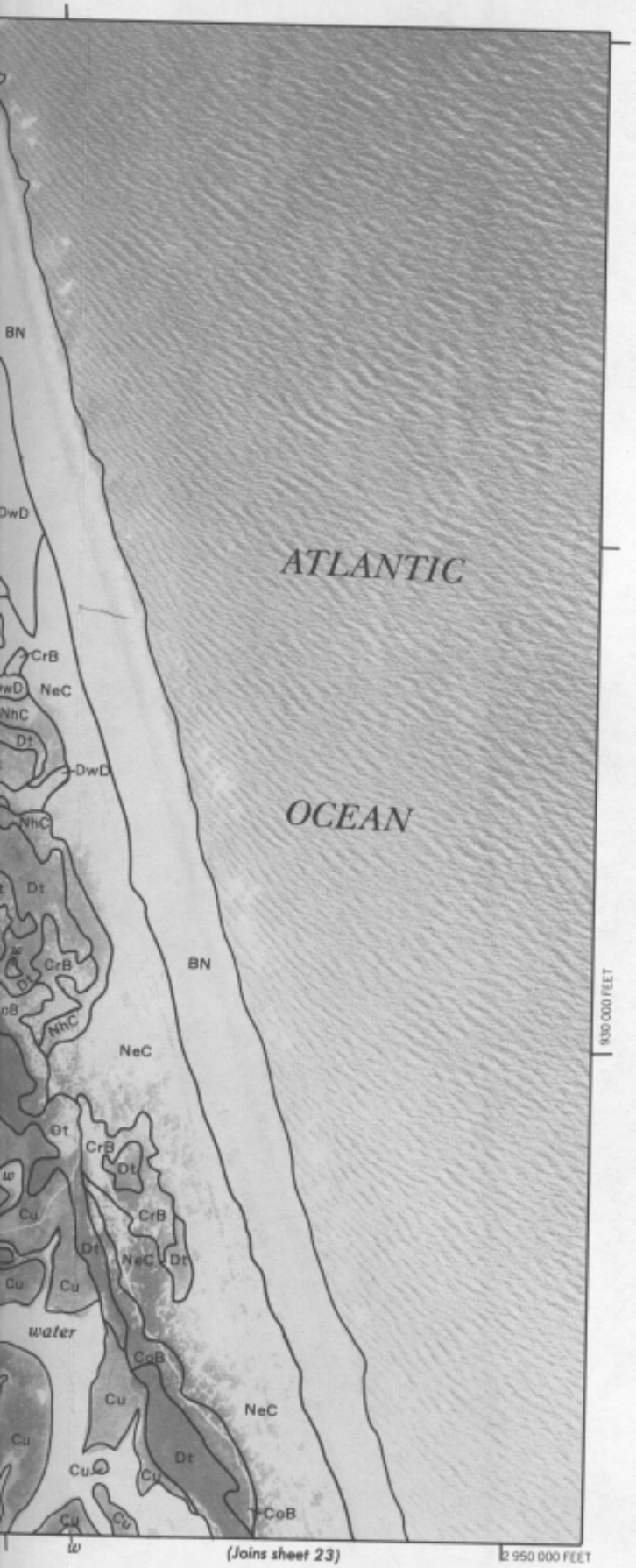
Scale - 1:20000

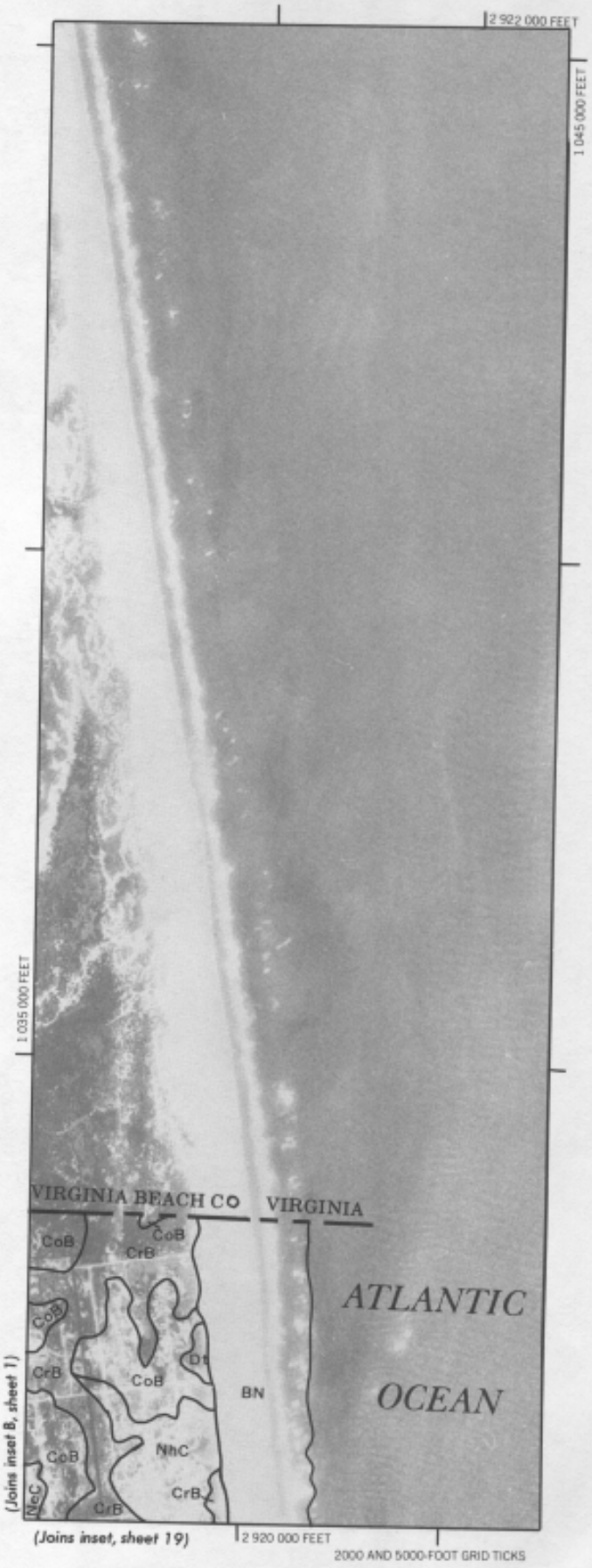
2 920 000 FEET
935 000 FEET
CURRITUCK
SOUND
Poplar Branch
Bertha
NORTH RIVER
water
(Joins sheet 21)
5 000 Feet
lometer


2 925 000 FEET
935 000 FEET
(Joins sheet 20)
CURRITUCK
SOUND
water
Cu
w
No
Mu
CnA
NeC
5 000
4 000

CURRITUCK COUNTY, NORTH CAROLINA — SHEET NUMBER 21

N

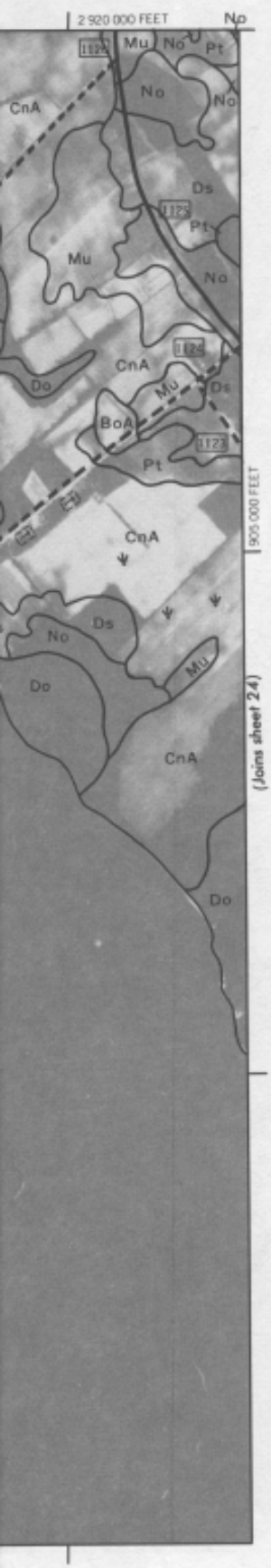

ATLANTIC
OCEAN
BN
DwD
CrB
NeC
NhC
Dt
Cu
CoB
water
930 000 FEET
(Joins sheet 23)
2 950 000 FEET

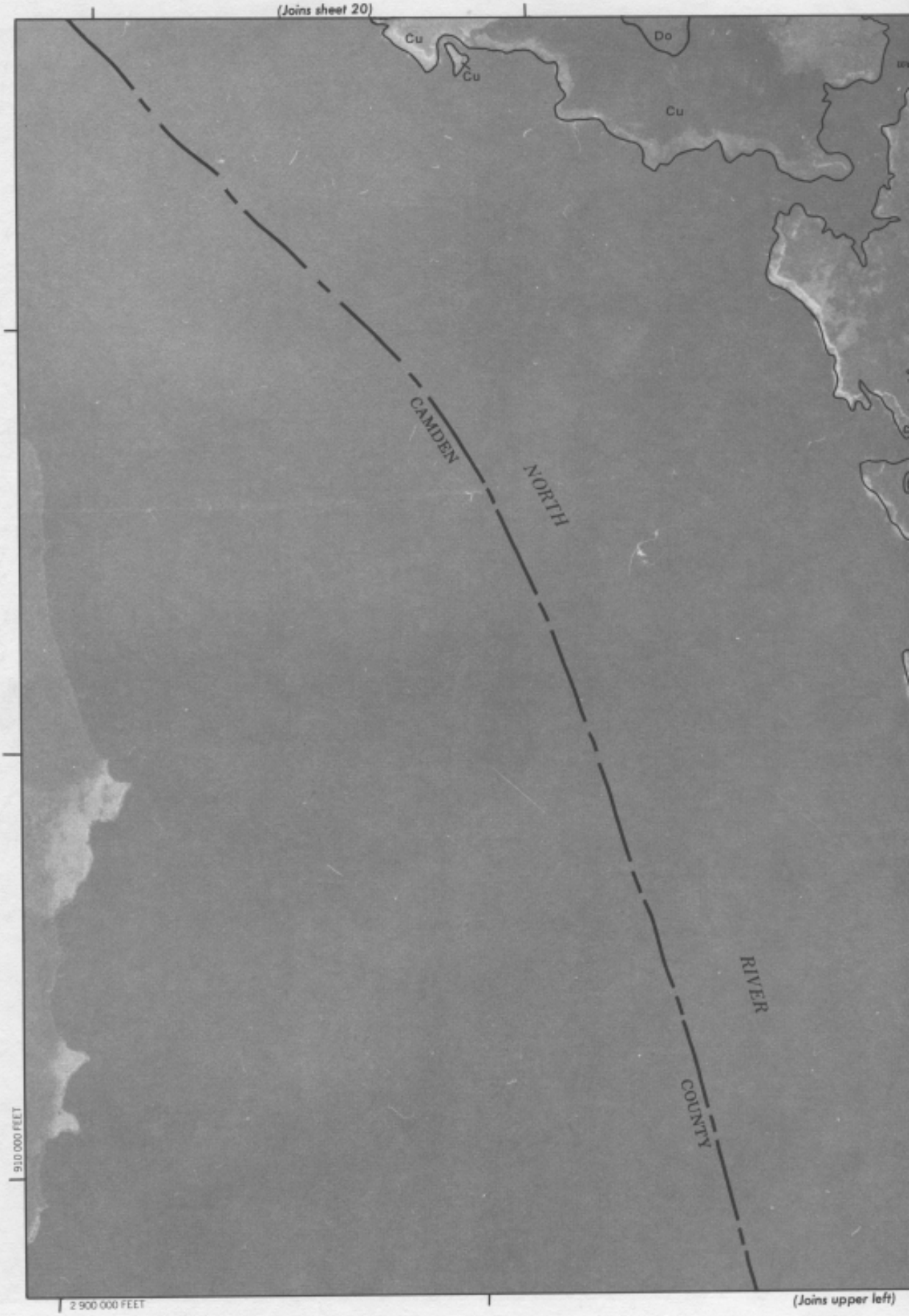

2 922 000 FEET
1 045 000 FEET
1 035 000 FEET
VIRGINIA BEACH CO
VIRGINIA
ATLANTIC
OCEAN
BN
CoB
CrB
Dt
NhC
NeC
(Joins inset B, sheet 1)
(Joins inset, sheet 19)
2 920 000 FEET
2000 AND 5000-FOOT GRID TICKS

22

N

(Joins lower right)
2 920 000 FEET
900 000 FEET
2 910 000 FEET
CAMDEN
NORTH
RIVER
COUNTY
Cu
Do
No
Ds
Mu
CnA
BoA
Pt
1124
1125
1126
1123





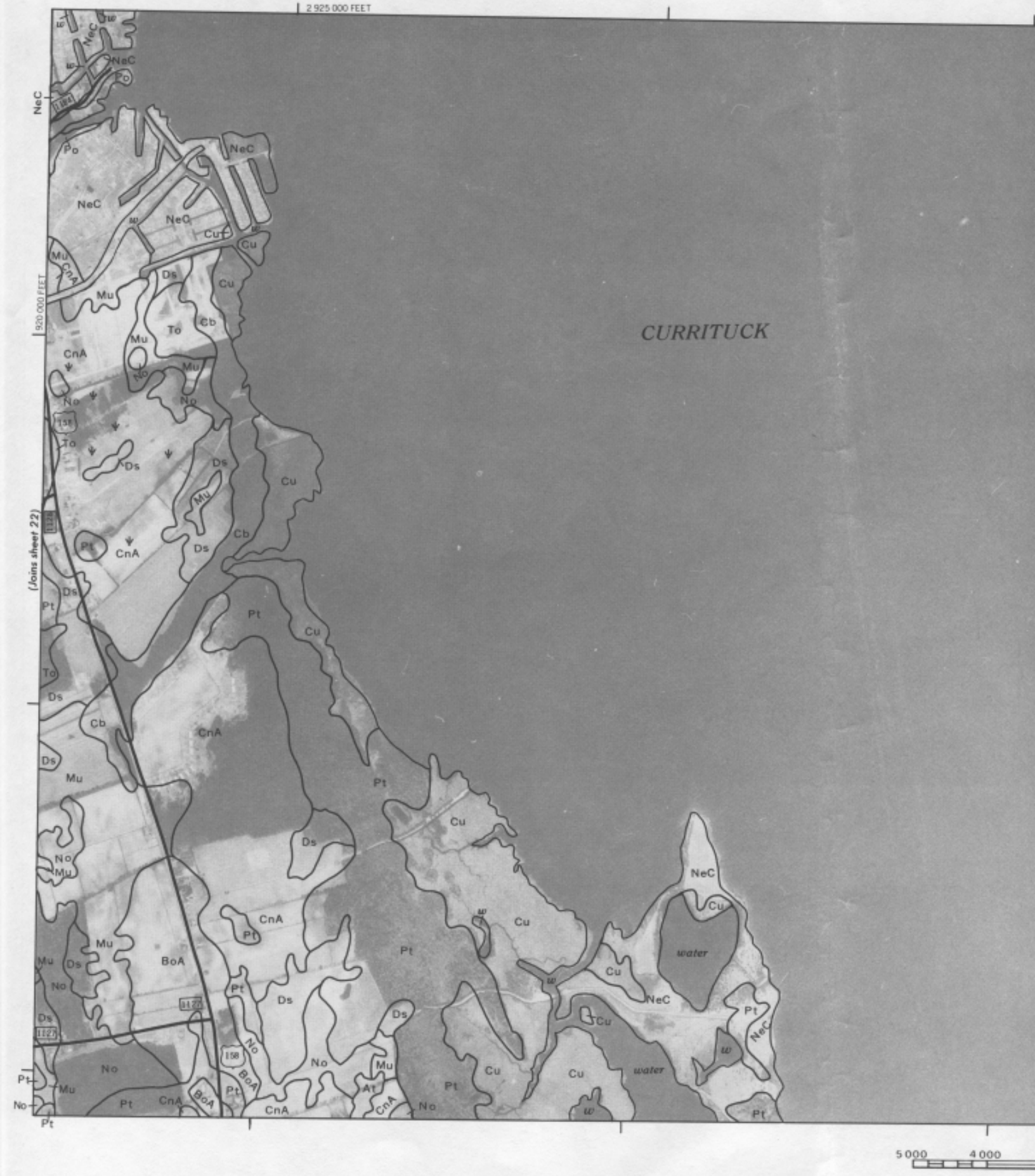
5000 4000 3000 2000 1000 0 5000

1 .5 0 1 Kilometer

Scale - 1:20000

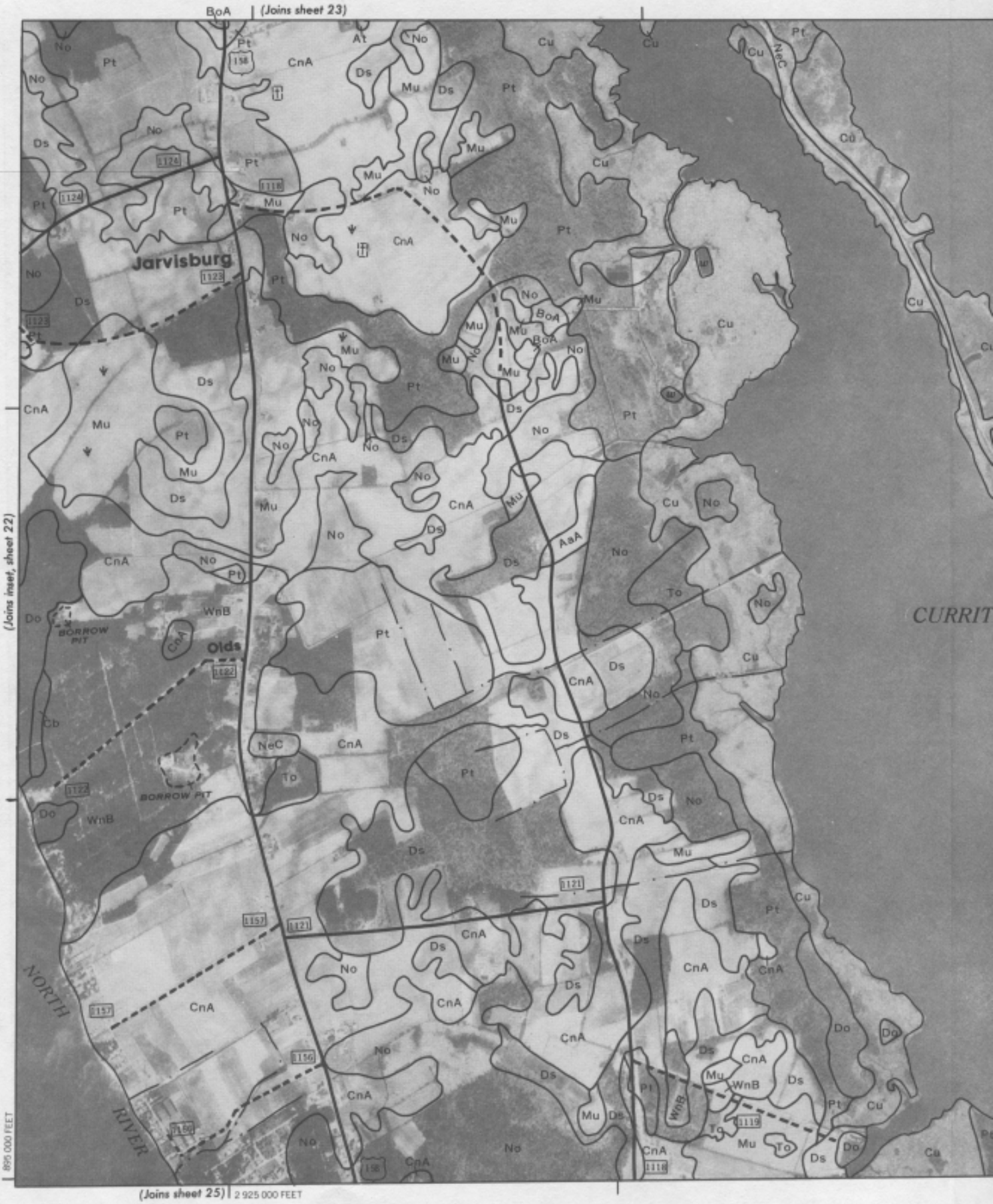
5 000 Feet

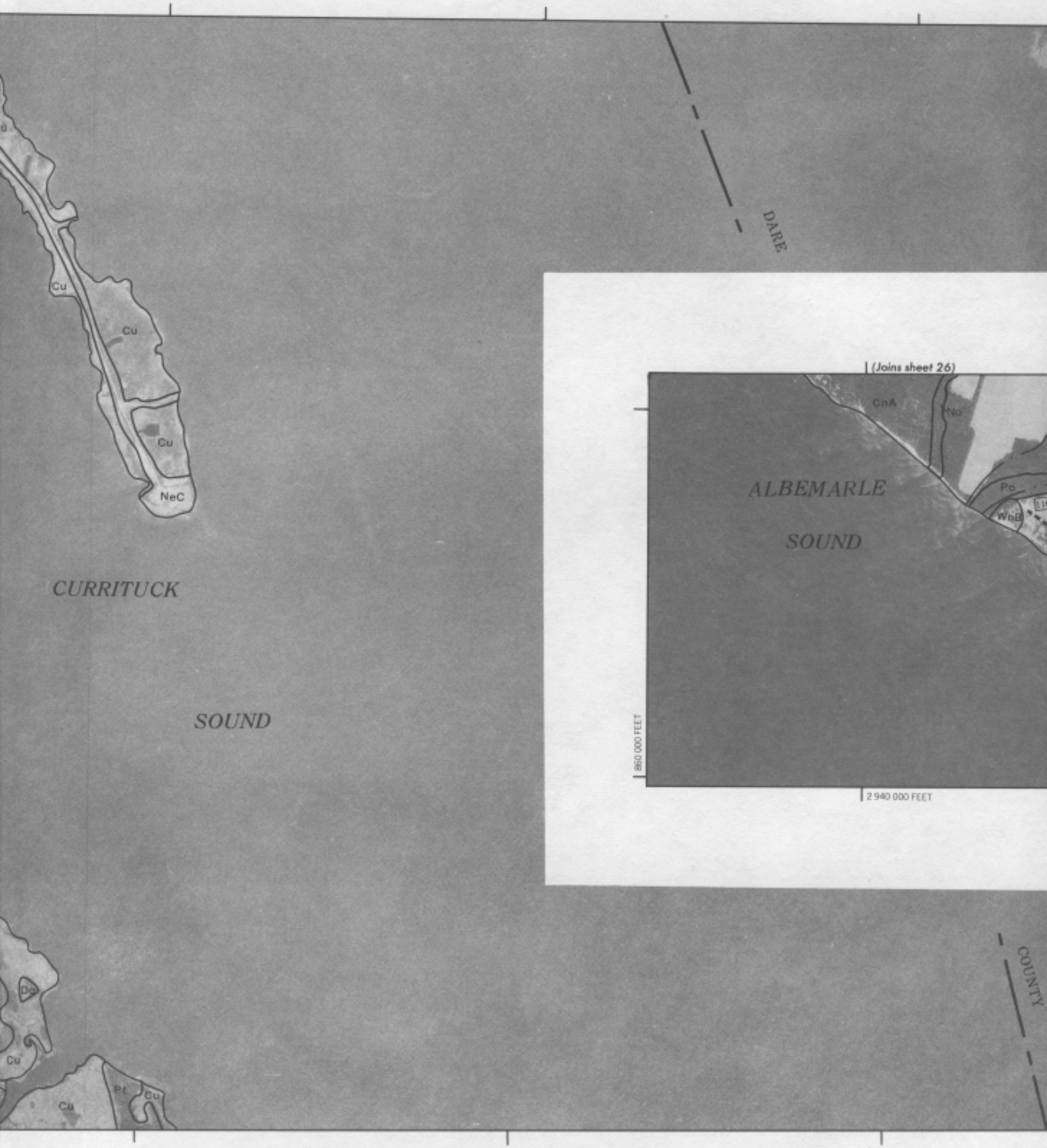
Kilometer


2 925 000 FEET
920 000 FEET
(Joins sheet 22)
CURRITUCK
water
5 000
4 000

SOUND
DARE
water
water
Cu
(Joins sheet 24)
5000 4000 3000 2000 1000 0 5000 Feet
1 .5 0 1 Kilometer
Scale - 1:20000

(Joins sheet 21)
N
ATLANTIC
OCEAN
COUNTY
water
Cu
Dt
NeC
CoB
BN
DwD
915 000 FEET
2 965 000 FEET


N
(Joins sheet 23)
(Joins inset, sheet 22)
(Joins sheet 25)
2 925 000 FEET
895 000 FEET
Jarvisburg
Olds
BORROW PIT
BORROW PIT
NORTH
RIVER
CURRIT
158
1124
1118
1123
1122
1121
1157
1156
1159
1119
BoA
CnA
Ds
Mu
Pt
No
Cu
NeC
AaA
WnB
Do
Cb
To
At


DARE
Cu
Cu
Cu
NeC
CURRITUCK
SOUND
(Joins sheet 26)
CnA
Na
ALBEMARLE
SOUND
Po
WnB
860 000 FEET
2 940 000 FEET
COUNTY
Dg
Cu
Pt
Cu
Cu
5 000
4 000
3 000
2 000
1 000
0
5 000 Feet
1
.5
0
1 Kilometer
Scale - 1:20000

2 955 000 FEET
910 000 FEET
(Joins sheet 26)
2 950 000 FEET
Point Harbor
WRIGHT MEMORIAL BRIDGE
CURRITUCK SOUND
865 000 FEET
940 000 FEET
COUNTY
5000 Feet
Kilometer

2 925 000 FEET
895 000 FEET
Powells Point
Newbern Landing
ALBEMARLE
SOUND
Mamie
BORROW PIT
158
1120
1118
1117
1116
1115
1114
1113
No
Ds
CnA
Mu
Do
Cu
Cb
Pt
To
WnB
Ws
CoB
Po
StA
At
BoA
5 000
400

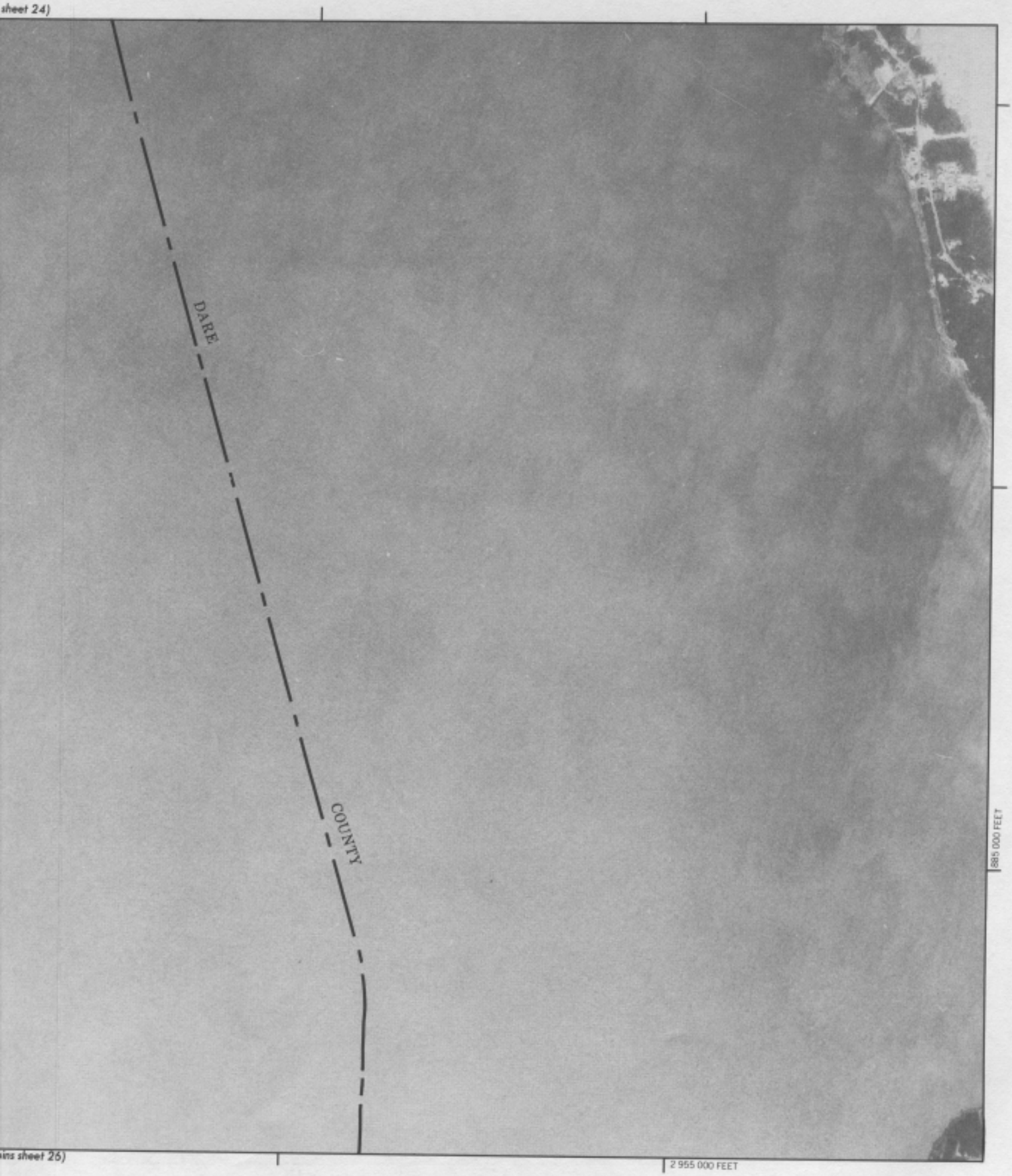
5000 4000 3000 2000 1000 0 5000 Feet

1 .5 0 1 Kilometer

Scale - 1:20000

N

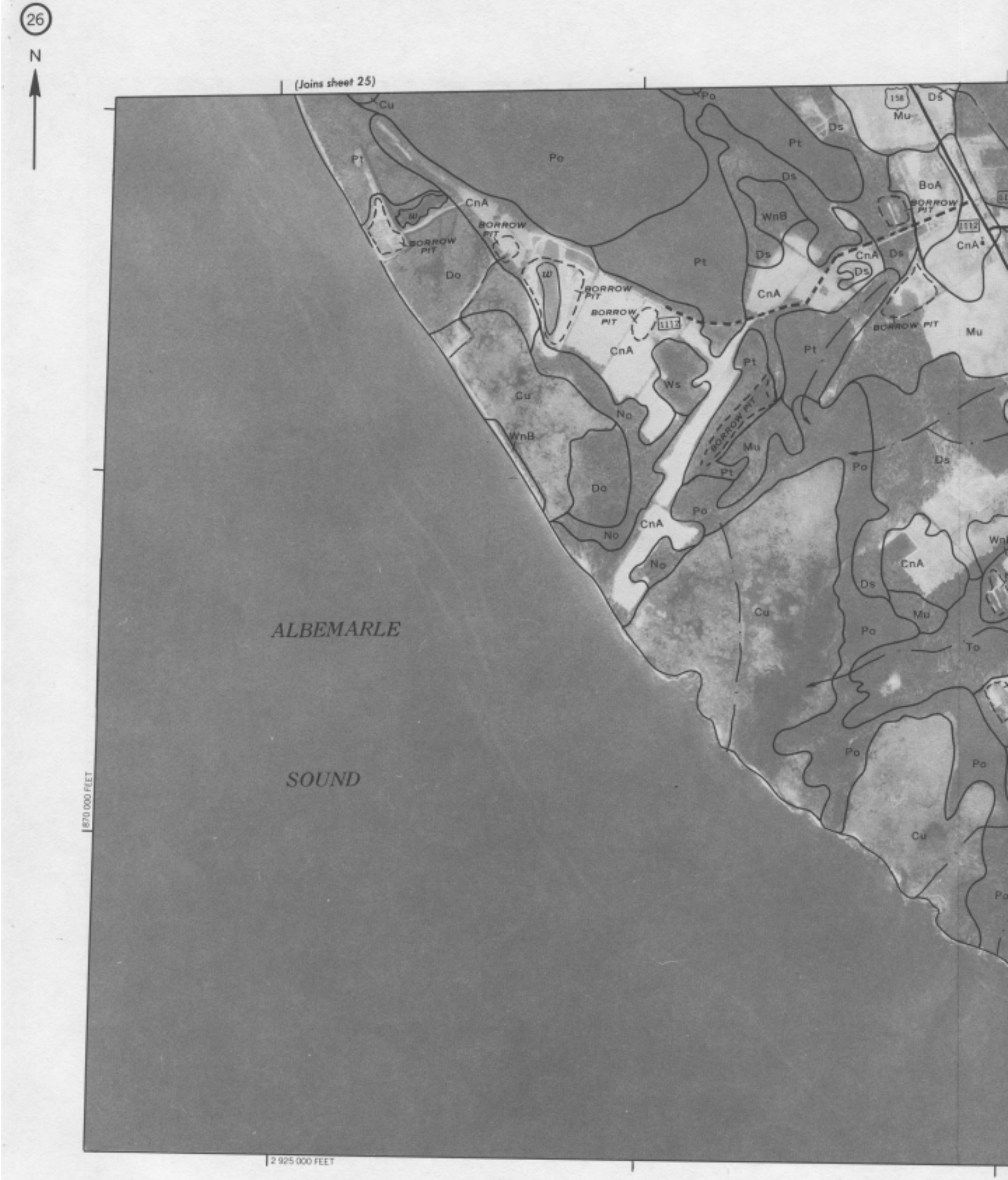
sheet 24)



885 000 FEET

2 955 000 FEET

ins sheet 26)

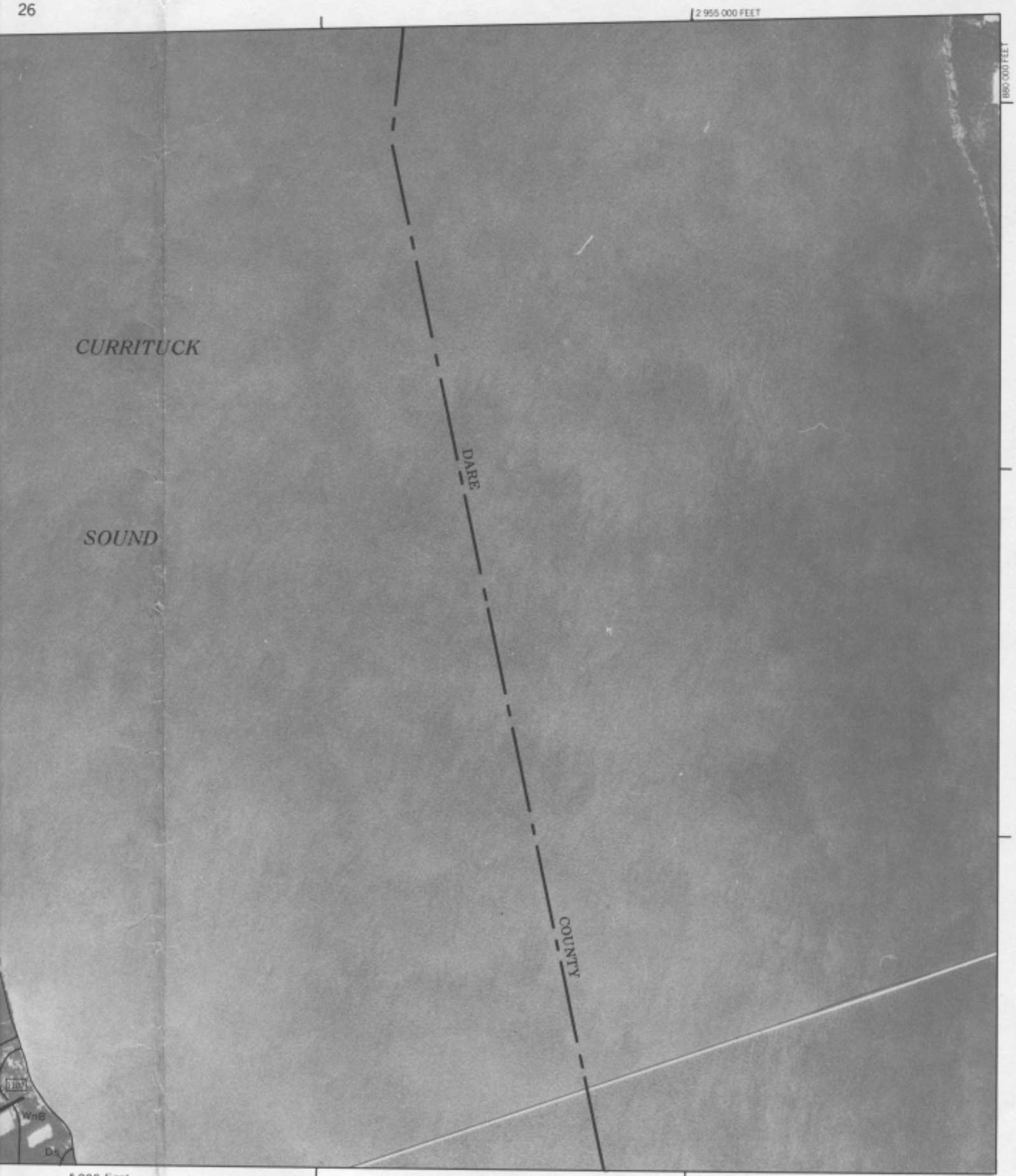

26
N
(Joins sheet 25)
ALBEMARLE
SOUND
870 000 FEET
2 925 000 FEET
BORROW PIT
Cu
Po
Pt
Ds
Mu
BoA
WnB
CnA
Do
Ws
No
To
158
1112

(Joins inset, sheet 24)

5000 4000 3000 2000 1000 0 5000 Fe

1 .5 0 1 Kilometer

Scale - 1:20000


2 955 000 FEET
880 000 FEET
CURRITUCK
SOUND
DARE
COUNTY
WnB
Ds
5 000 Feet

2
N
(Joins sheet 1)
(Joins inset, sheet 11)
1 015 000 FEET
2 810 000 FEET
(Joins sheet 5)
1218
1217
8227
Universal Trailer Park
LAND FILL
Guinea Mill Run
Ro
Ca
To
At
Ds
StA
AaA
Pt
Ws
Po
Cb
Mu
BoA
Da

5000 4000 3000 2000 1000 0 5000

1 .5 0 1 Kilometer

Scale - 1:20000

MBER 2

2 840 000 FEET
1 025 000 FEET
NORTH WEST
RIVER MARSH
GAME LAND
NORTH
WEST
RIVER
Creek
Landing
Panther
Landing
Panther
Landing
1231
1221
1222
1215
Morse
NORFOLK
SOUTHERN
168
(Joins sheet 3)
At
Ro
Cb
Cu
Da
Do
Wa
StA
AaA
Ds
To
Ca
5 000 Feet
1 Kilometer

2 845 000 FEET
1 025 000 FEET
(Joins sheet 2)
NORTH WEST RIVER MARSH GAME LAND
Peter Dozies Pond
Buck Island Pond
Nellie Bell Pond
NORTH
WEST
RIVER
1248
1249
1250
1222
1213
1214
Da
Ro
Cu
Cb
At
AaA
Po
Do
Wa
To
StA
5 000
4 000

CURRITUCK COUNTY, NORTH CAROLINA — SHEET NUMBER 3

5000 4000 3000 2000 1000 0 5000 Feet

1 .5 0 1 Kilometer

Scale - 1:20000

(Joins inset A, sheet 1)
Cu
Faraby Island
Cu
BoA
To
AaA
Ro
Cu
Cu
Ro
Cu
AaA
1253
Gibb Point
AaA
Ro
At
StA
Do
NORTHLANDING
INTRACOASTAL
Cb
Cu
WATERWAY
RIVER
Cu
Troublesome Point
The Launch
At
Ro
StA
(Joins sheet 4)
(Joins sheet 6)
2 880 000 FEET
3
N

(Joins inset B, sheet 1)
N
635
AaA
Cu
Back
Bay
NeC
Corys
BoA
Ro
StA
Ro
AaA
Cu
No
Cu
GREAT
Cu
BoA
StA
RIVER
Cu
Duck
Pond
Cu
NORTHLANDING
ISLAND
Ro
Ro
Cu
Ro
MACKAY
Os
CnA
(Joins sheet 3)
1 015 000 FEET
2 885 000 FEET
(Joins sheet 7)

5000 4000 3000 2000 1000 0 5000 F

1 .5 0 1 Kilometer

Scale - 1:20000

2 915 000 FEET
1 030 000 FEET
(Joins inset, sheet 19)
Deal Island
Knotts Island Channel
Knotts Island Bay
Woodleigh
ISLAND
water
1257
1258
1259
5 000 Feet
1 Kilometer

2 810 000 FEET
1 010 000 FEET
Pt
Guinea
Po
Ca
Da
Ws
Lat. "A"
CAMDEN
Lat. "B"
Da
COUNTY
Lat. "C
5 000
4 000

CURRITUCK COUNTY, NORTH CAROLINA — SHEET NUMBER 5

5000 4000 3000 2000 1000 0 5000 Feet

1 .5 0 1 Kilometer

Scale - 1:20000

(Joins sheet 2)
NORFOLK SOUTHERN
Run
(Joins sheet 6)
(Joins sheet 8)
2 845 000 FEET
1 000 000 FEET
N
5
Ro
To
Ds
StA
Ca
No
Do
At
Cb
Wa
Po
Ws
Pt
168
1214

6

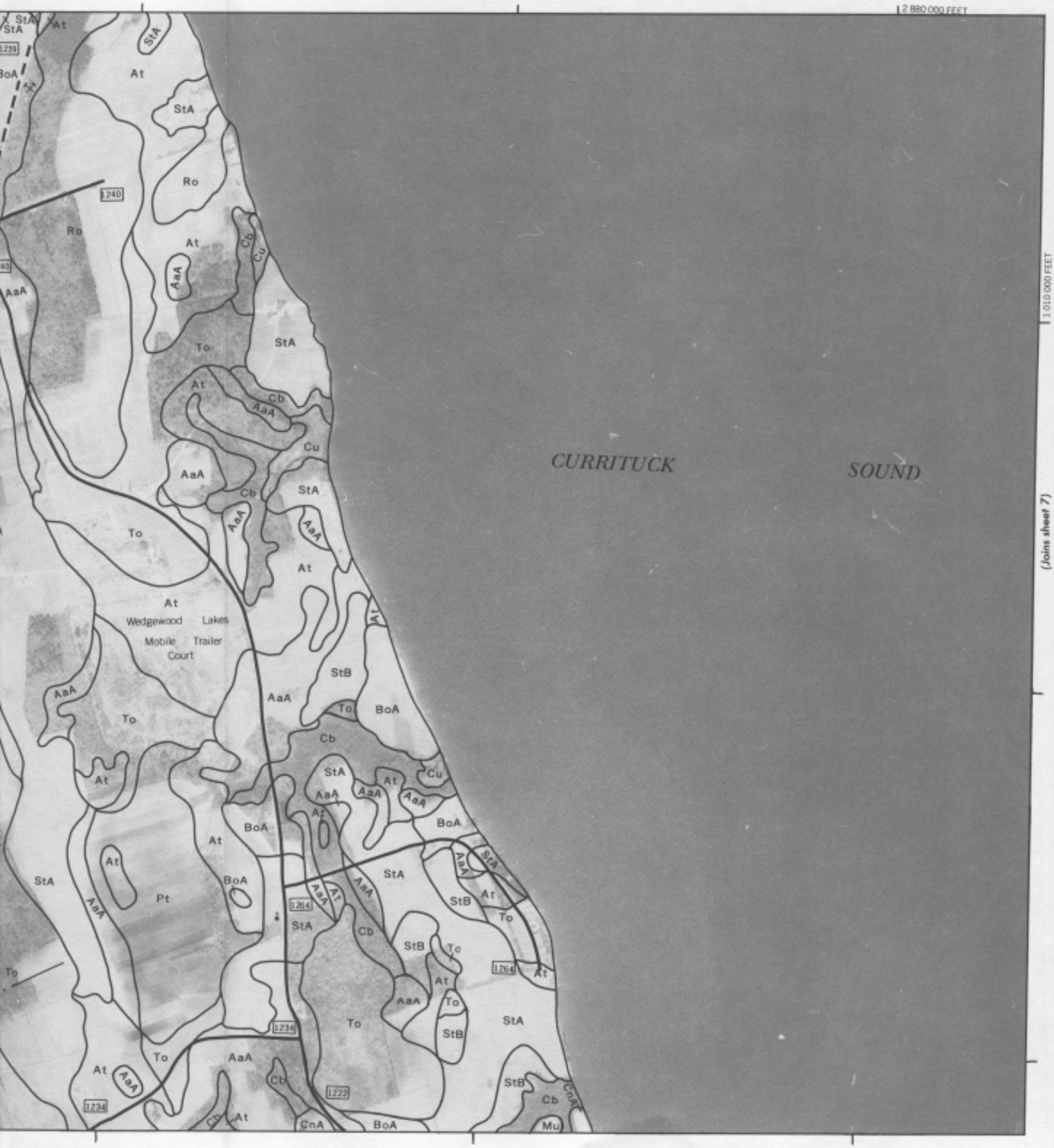
N

(Joins sheet 3)
(Joins sheet 5)
(Joins sheet 9)
1 000 000 FEET
2 850 000 FEET
Snowden
NORFOLK SOUTHERN
Tull Creek
1214
1222
1281
1202
1272
168
Wa
Ro
At
StA
Do
AaA
To
Cu
Cb
Mu
NeC
Ca

5000 4000 3000 2000 1000 0

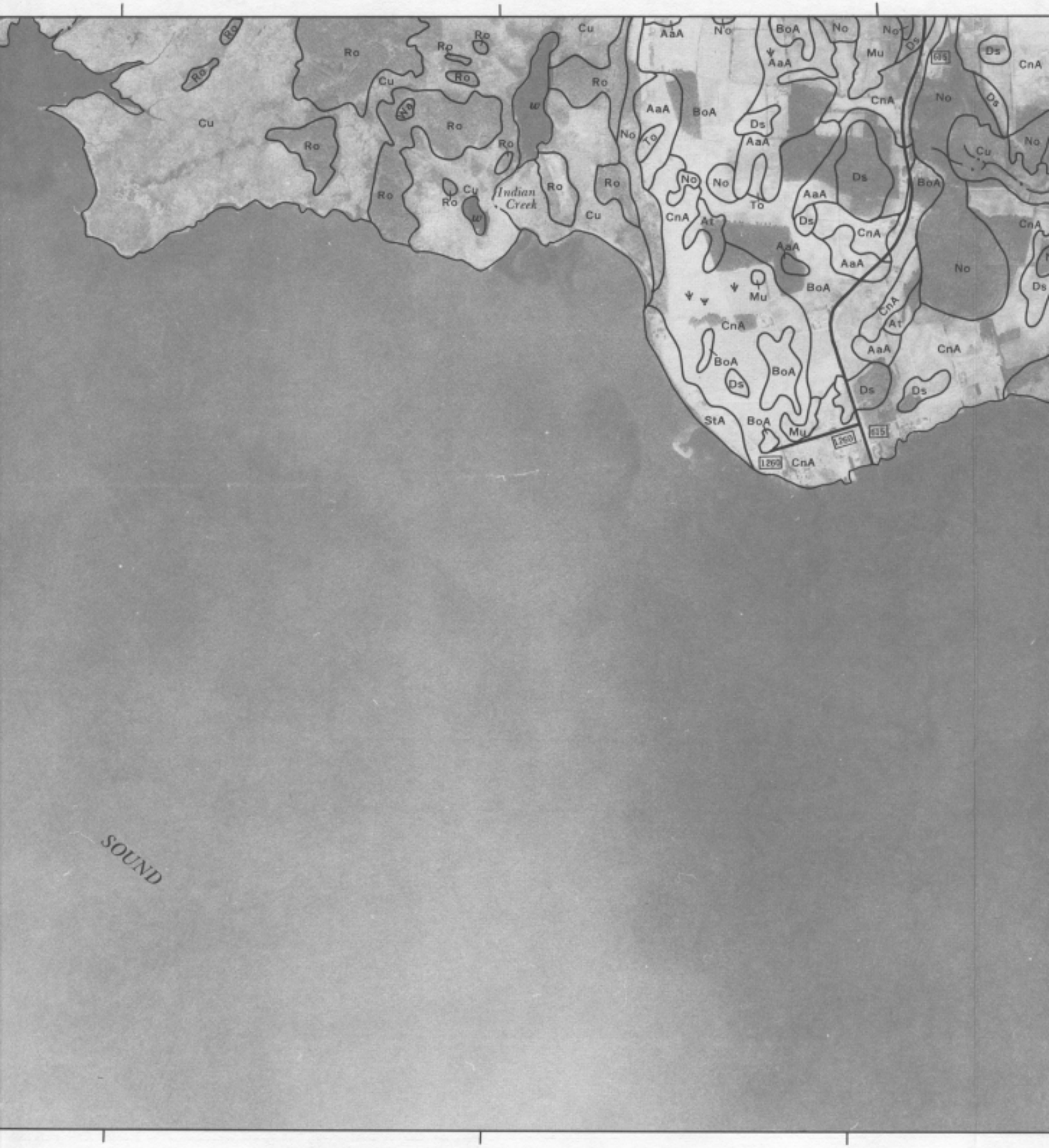
1 .5 0 1 Kilometer

Scale - 1:20000


2 880 000 FEET
1 010 000 FEET
(Joins sheet 7)
CURRITUCK
SOUND
Wedgewood Lakes Mobile Trailer Court
1240
1239
1264
1234
1222
StA
At
Ro
AaA
Cb
Cu
To
StB
BoA
Pt
CnA
Mu
5 000 Feet
1 Kilometer

2 885 000 FEET
1 010 000 FEET
(Joins sheet 6)
CnA
Os
MACKAY ISLAND
Ro
Cu
BoA
Wa
Ro
Cu
Cu
CURRITUCK
SOUN
5 000
4 000

CURRITUCK COUNTY, NORTH CAROLINA — SHEET NUMBER 7

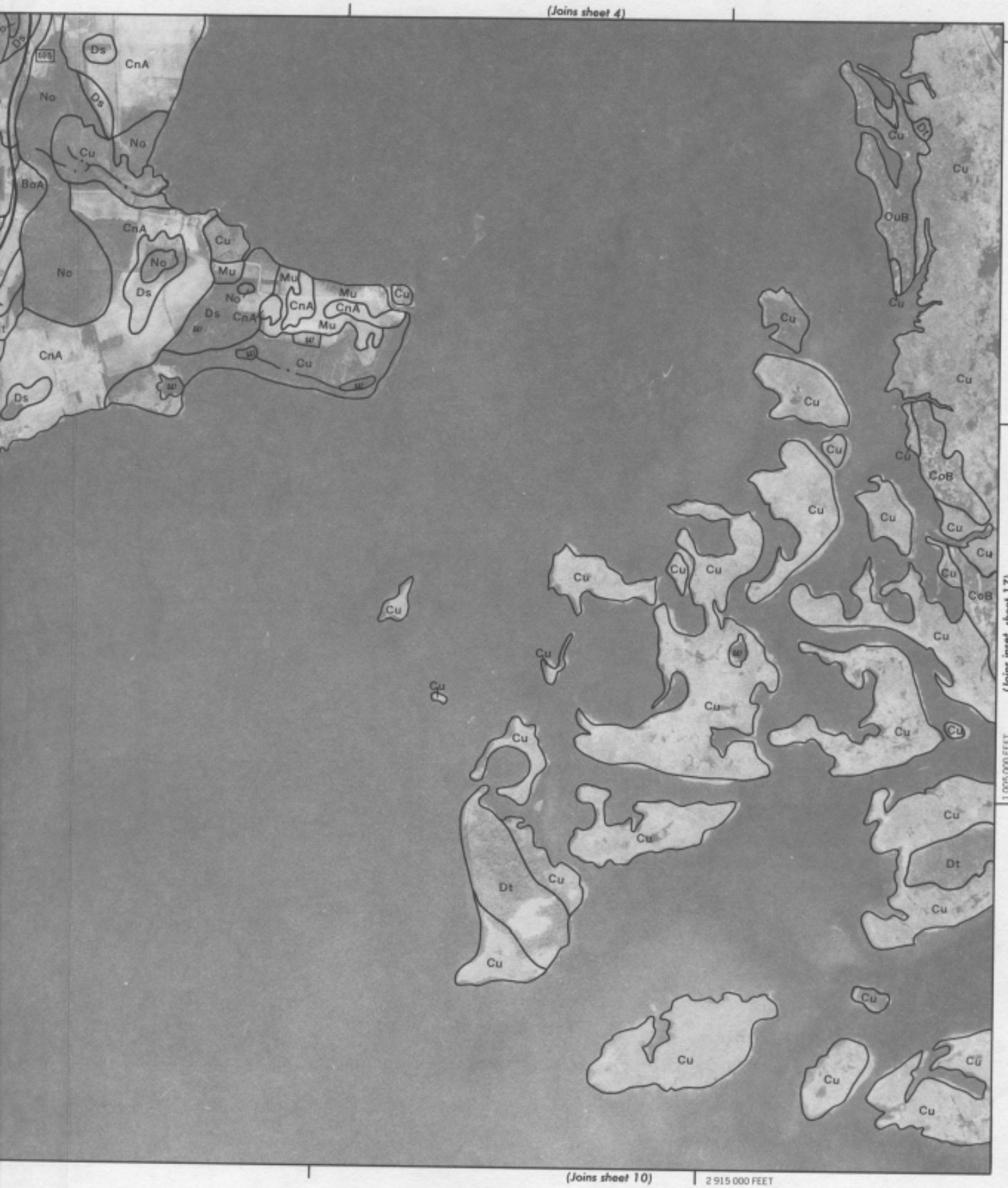


5000 4000 3000 2000 1000 0 5000 Feet

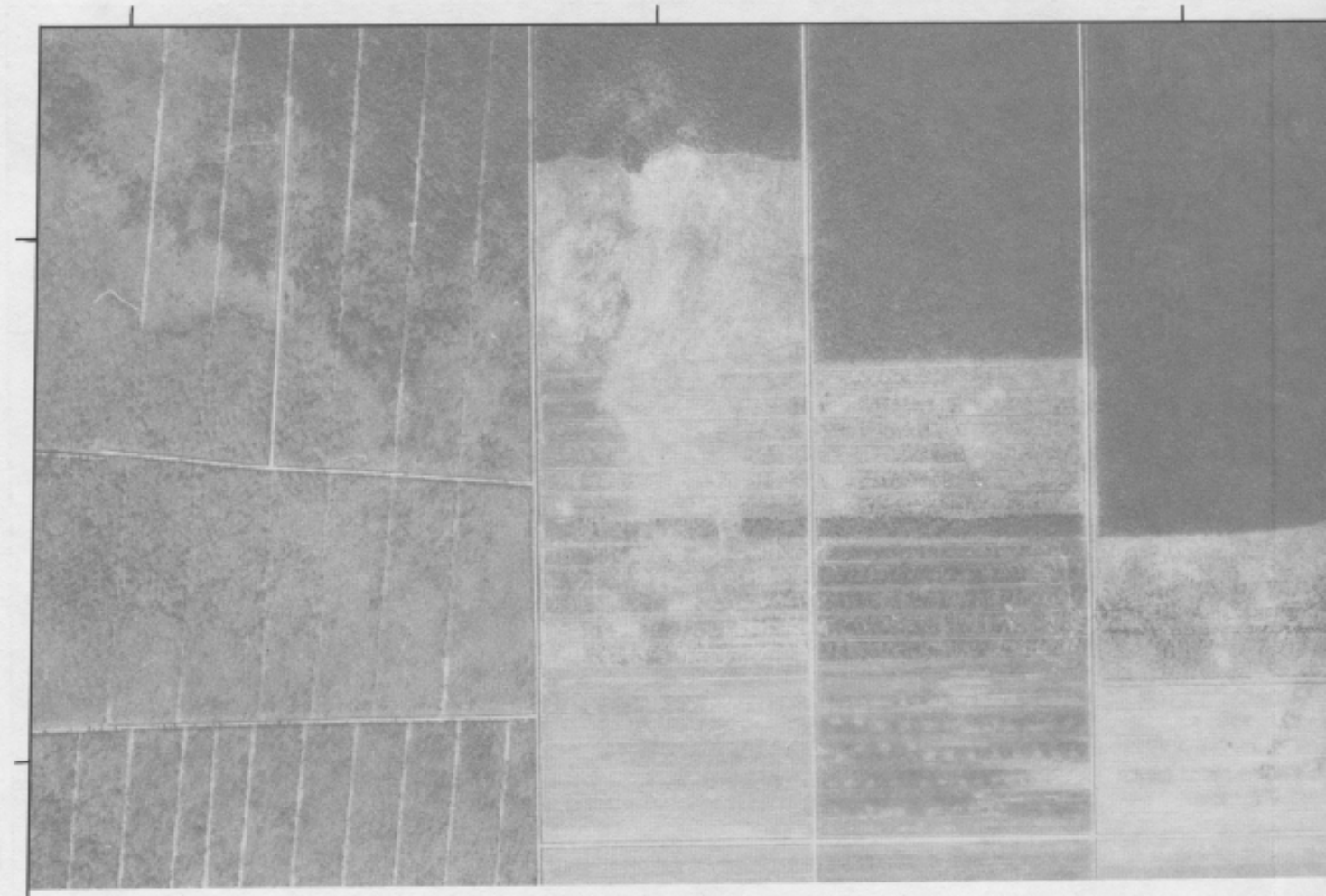
1 .5 0 1 Kilometer

Scale - 1:20000

N


(Joins sheet 4)
Ds
CnA
No
Cu
BoA
Mu
OuB
CoB
Dt
(Joins inset, sheet 17)
1 005 000 FEET
(Joins sheet 10)
2 915 000 FEET

N



CHESAPEAKE COUNTY VIRGINIA

CAMDEN COUNTY

Da

989 000 FEET

1 025 000 FEET

2 790 000 FEET

2 810 000 FEET

(Joins inset, sheet 11)

(Joins sheet 5)
Da
DUCK POND ROAD
Po
Da
Dismal
CAMDEN
COUNTY
Po
2 805 000 FEET
IRGINIA
U.S. Navy Radio Station
1 030 000 FEET
(Joins sheet 1)
Ro
To
2000 AND 5000-FOOT GRID TICKS
5 000
4 000
3 000
2 000
1 000
0
5 000
1
.5
0
1 Kilometer
Scale - 1:20000

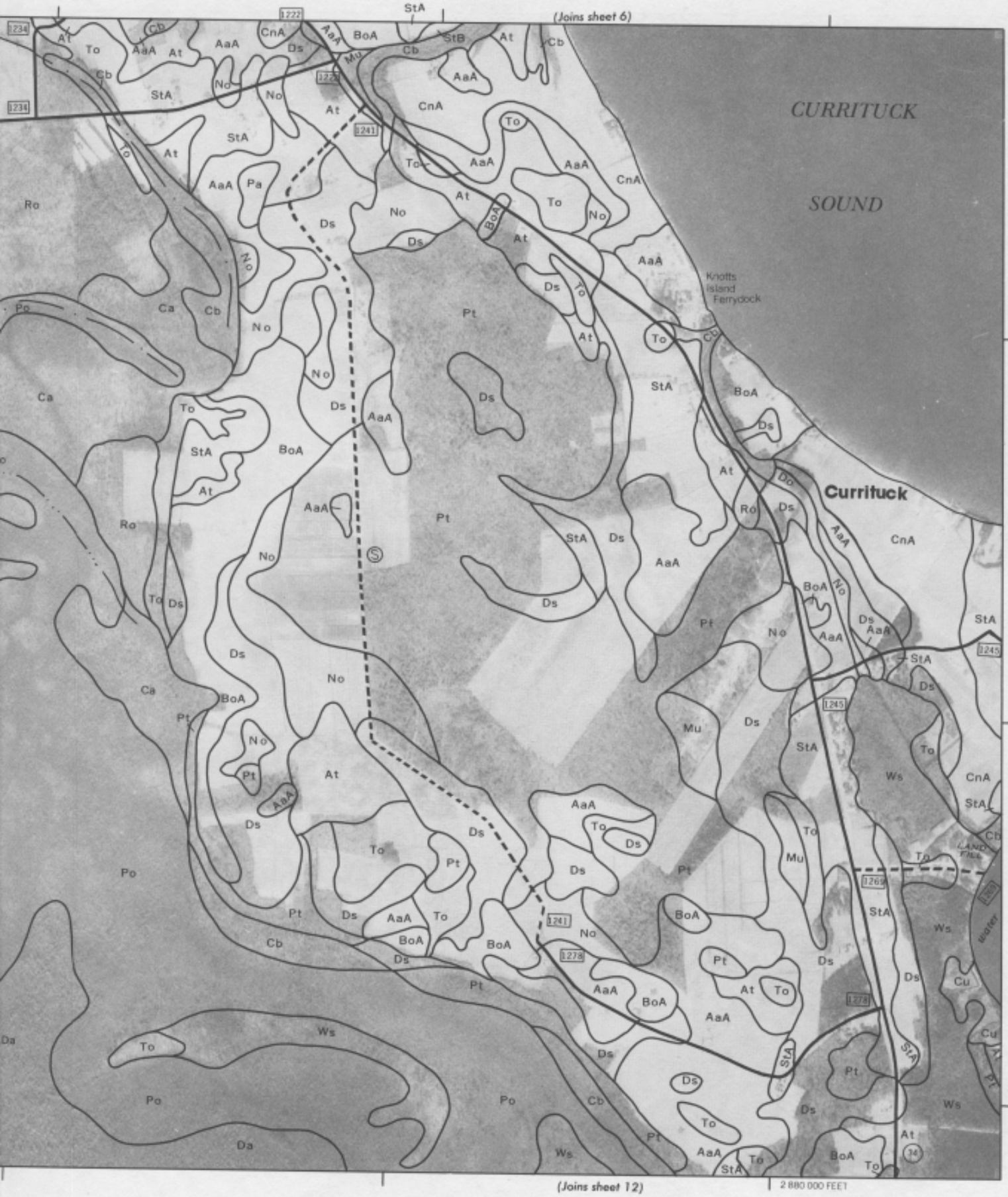
2 845 000 FEET
995 000 FEET
Po
Ws
Pt
Ro
Ds
Da
Dismal
Swamp
No
1211
1213
(Joins sheet 9)
Pa
1202
1202
Run Swamp Canal
(Joins sheet 11)
5 000 Feet
1 Kilometer

2 850 000 FEET
995 000 FEET
(Joins sheet 8)
Snowden
Gum Corner
NORFOLK
SOUTHERN
1202
1212
1210
1211
168
Ro
Ds
No
Pt
To
Cb
Pa
At
Ca
Mu
BoA
5 000
4 000

5000 4000 3000 2000 1000 0 5000 Feet

1 .5 0 1 Kilometer

Scale - 1:20000


N
(Joins sheet 6)
(Joins sheet 10)
(Joins sheet 12)
CURRITUCK
SOUND
Currituck
Knotts Island Ferrydock
LAND FILL
water
985 000 FEET
2 880 000 FEET
1234
1222
1241
1245
1269
1278
34

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

LEGEND

1 CONETOE-DRAGSTON-MUNDEN: Nearly level and gently sloping, well drained, somewhat poorly drained, and moderately well drained soils that have a sandy surface layer and a loamy subsoil

2 ROANOKE-TOMOTLEY: Nearly level, poorly drained soils that have a loamy surface layer and a loamy or clayey subsoil

3 PORTSMOUTH-CAPE FEAR-WASDA: Nearly level, very poorly drained soils that have a loamy or mucky surface layer and a loamy or clayey subsoil

4 DARE-PONZER: Nearly level, very poorly drained soils that have a mucky surface layer and sandy or loamy underlying material

5 CURRITUCK: Nearly level, very poorly drained soils that have a mucky surface layer and sandy underlying material

6 DOROVAN: Nearly level, very poorly drained soils that have a mucky surface layer and sandy mineral layers

7 NEWHAN-COROLLA-DUCKSTON: Nearly level to sloping, excessively drained, moderately well drained, somewhat poorly drained, and poorly drained soils that are sandy throughout

Compiled 1981

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
NORTH CAROLINA AGRICULTURAL RESEARCH SERVICE
NORTH CAROLINA AGRICULTURAL EXTENSION SERVICE
CURRITUCK COUNTY BOARD OF COMMISSIONERS

GENERAL SOIL MAP

CURRITUCK COUNTY, NORTH CAROLINA

Scale 1:253,440

SOIL LEGEND

The first letter of the map symbol, always a capital, is the initial letter of the soil name. The second letter is a capital if the mapping unit is broadly defined 1/; otherwise, it is a small letter. The third letter, if used, is always a capital and shows the slope. Symbols without slope letters are those of nearly level soils or miscellaneous areas.

SYMBOL	NAME
AaA	Altavista fine sandy loam. 0 to 2 percent slopes
At	Augusta fine sandy loam
BN	Beaches-Newhan association. 0 to 25 percent slopes
BoA	Bojac loamy sand. 0 to 3 percent slopes
Ca	Cape Fear loam
Cb	Conaby muck
CnA	Conetoe loamy sand. 0 to 3 percent slopes
CoB	Corolla fine sand. 0 to 6 percent slopes
CrB	Corolla-Duckston complex. 0 to 6 percent slopes
Cu	Currituck mucky peat
Da	Dare muck
Do	Dorovan mucky peat
Ds	Dragston loamy fine sand
Dt	Duckston fine sand
Du	Dune land
DwD	Dune land-Newhan complex. 2 to 40 percent slopes
Mu	Munden loamy sand
NeC	Newhan fine sand. 0 to 10 percent slopes
NhC	Newhan-Corolla complex. 0 to 10 percent slopes
No	Nimmo loamy sand
Os	Osier fine sand
OuB	Ousley fine sand. 0 to 6 percent slopes
Pa	Pasquotank silt loam
Po	Ponzer muck
Pt	Portsmouth fine sandy loam
Ro	Roanoke fine sandy loam
StA	State fine sandy loam. 0 to 2 percent slopes
StB	State fine sandy loam. 2 to 6 percent slopes
To	Tomotley fine sandy loam
Ud	Udorthents. loamy
Wa	Wahee fine sandy loam
WnB	Wando loamy fine sand. 0 to 5 percent slopes
Ws	Wasda muck

1/ The composition of these units is more variable than that of others in the survey area, but mapping has been controlled well enough to be interpreted for the expected use of the soils.

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label) — Hedley Airstrip

Small airport, airfield, park, oilfield, cemetery, or flood pool — FLOOD POOL LINE

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate — 21
- Federal — 173
- State — 28
- County, farm or ranch — 1283

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small — water, w

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label) — Indian Mound
- Located object (label) — Tower
- Tank (label) — Gas
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) — CANAL
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial — water, w
- Intermittent — int, i

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS — CnB, WaC2

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

DEPRESSION OR SINK

SOIL SAMPLE SITE (normally not shown) — S

MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot