United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with North Carolina Department of Environment, Health, and Natural Resources; North Carolina Agricultural Research Service; North Carolina Cooperative Extension Service; Beaufort Soil and Water Conservation District; and Beaufort County Board of Commissioners

Soil Survey of Beaufort County, North Carolina

How To Use This Soil Survey

General Soil Map

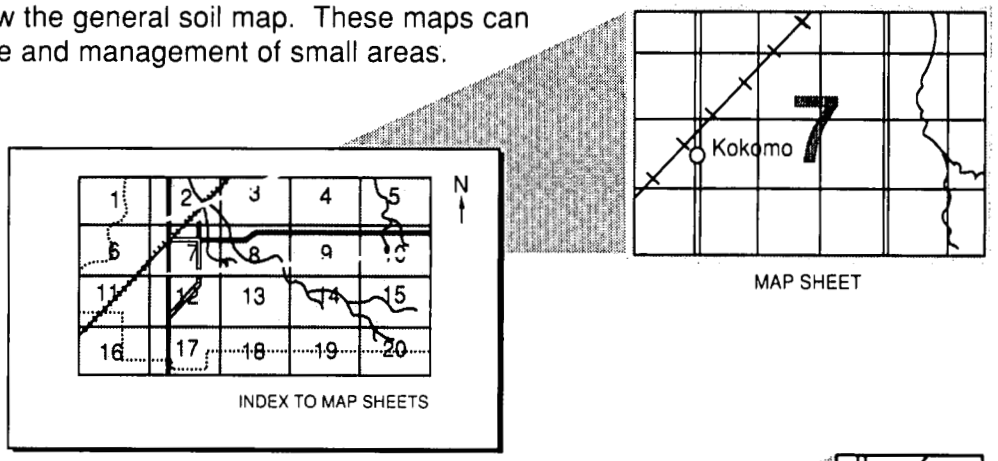
The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

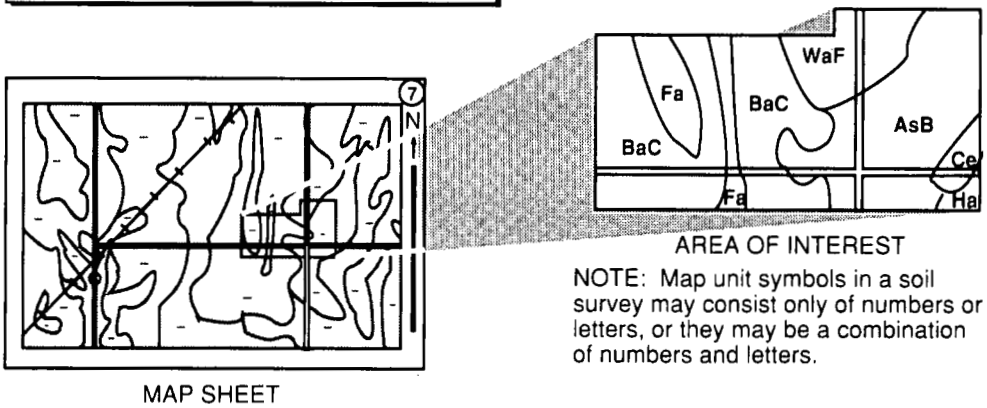
Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.



Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

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 North Carolina Agricultural Research Service, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1983. Soil names and descriptions were approved in 1985. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1983. This soil survey was made cooperatively by the Natural Resources Conservation Service; the North Carolina Department of Environment, Health, and Natural Resources; the North Carolina Agricultural Research Service; the North Carolina Cooperative Extension Service; the Beaufort Soil and Water Conservation District; and the Beaufort County Board of Commissioners. The survey is part of the technical assistance furnished to the Beaufort Soil and Water Conservation District. The Beaufort County Board of Commissioners provided financial assistance for the survey.

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.

The first soil survey of Beaufort County was published in 1919 by the U.S. Department of Agriculture. This survey updates the first survey, provides more detailed maps on aerial photographs, and contains more interpretive information *(5)*.

All programs and services of the Natural Resources Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

Cover: The Bonner House, which was built in the early 1830's by Joseph Bonner, grandson of James Bonner, founder of Washington, North Carolina. The house is in Historic Bath, the first incorporated township in North Carolina. The map unit is Altavista-Urban land complex, 0 to 2 percent slopes.

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Issued September 1995

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Foreword

This soil survey contains information that can be used in land-planning programs in Beaufort 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 ensure 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 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 Natural Resources Conservation Service or the North Carolina Cooperative Extension Service.

Richard A. Gallo
State Conservationist
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Soil Survey of Beaufort County, North Carolina

By Robert M. Kirby, Natural Resources Conservation Service

Soils surveyed by Edwin H. Karnowski and Robert M. Kirby, Natural Resources Conservation Service; Steven Stokes and Robert Raimo, North Carolina Department of Environment, Health, and Natural Resources; and B. Burton Floyd, Beaufort County

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
North Carolina Department of Environment, Health, and Natural Resources; North Carolina Agricultural Research Service; North Carolina Cooperative Extension Service; Beaufort Soil and Water Conservation District; and Beaufort County Board of Commissioners

BEAUFORT COUNTY is in the eastern part of North Carolina (fig. 1). It is bordered on the north by Martin and Washington Counties, on the east by Hyde County, on the south by Pamlico and Craven Counties, and on the west by Pitt County. Washington, the county seat, is about 110 miles east of Raleigh, the State capital.

The county is irregular in shape. Its boundaries are formed in part by streams and embankments. It is about 40 miles long from east to west and 33 miles wide from north to south at its widest point. It has a land area of 528,704 acres, or about 826 square miles, and a water area of 84,275 acres, or about 132 square miles.

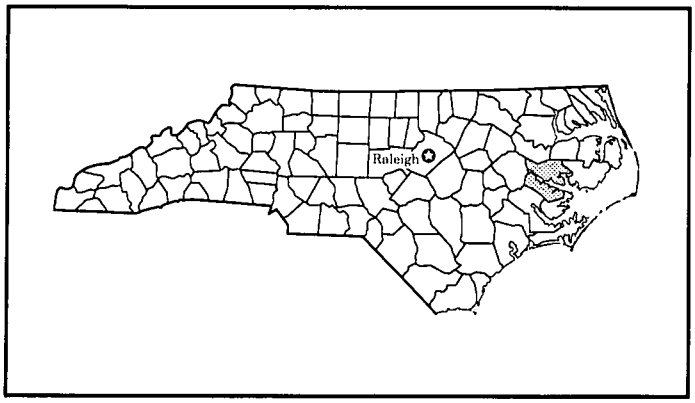

Figure 1.—Location of Beaufort County in North Carolina.

General Nature of the County

This section provides general information concerning the county. It describes history and development; physiography, relief, and drainage; water supply; and climate.

History and Development

In 1741, Beaufort County was organized from Bath County, which no longer exists. In 1992, the population of Beaufort County was 42,972 *(11)*.

The major trading and educational centers in the county are Washington, Chocowinity, Belhaven, and Aurora. Beaufort County Community College is east of Washington. East Carolina University is about 18 miles west of Washington in Greenville.

A major system of Federal and State roads transverses the county from north to south and east to west. It connects the county with Norfolk, Virginia, to the north; Raleigh, the State capital, to the west; the Atlantic coast to the east; and New Bern to the south. Railroad tracks cross the county from north to south and east to Aurora. The railroad is used to transport agricultural produce, minerals, and heavy machinery. The Pamlico River, the Pungo River, and the Inland

Coastal Waterway also are used for transportation.

Beaufort County has a diverse economy. Farming is a major industry. Tobacco, corn, wheat, and soybeans are important crops. Industrial manufacturing in the Washington area produces lumber and timber products, boats, metal products, automotive and hydraulic assembly parts, truck bodies, household appliances and utensils, furniture, clothing, and yarn. Commercial fishing, mail processing, and mining also occur in the Washington area. Phosphate mining near Aurora is a major source of industrial chemicals. Commercial forests owned by wood products companies cover about 30 percent of the county. A tree farm and one of the largest tree nurseries in the nation are near Washington. Sport hunting, fishing, and boating are recreational enterprises.

Physiography, Relief, and Drainage

Beaufort County is in the lower Coastal Plain physiographic province of North Carolina. It is divided by the Suffolk Scarp into two distinct sections. The Suffolk Scarp is an old beach front passing north to south through the county at an elevation of about 25 feet above sea level. The scarp is parallel with North Carolina Highways 32 and 306 and State Road 1334. It is locally known as the "Minesott Ridge." To the east of the scarp is the Pamlico Surface, which is in the Tidewater Area major land resource area. To the west of the scarp is the Talbot Surface, which is in the Atlantic Coast Flatwoods major land resource area.

The county is also divided into two parts by the Pamlico River, which is a wide, tidewater stream or estuary. The river has irregular shorelines.

The surface of the county is low and generally level. In the western part, the county has undulating or gently rolling areas near streams.

Numerous streams, creeks, and rivers flow into the Pamlico River in the county. In some places along the south side of the Pamlico River, the uplands terminate in low bluffs at the edge of the river and relatively steep valley slopes have formed where small streams have cut rather deep channels.

The larger level areas in the western part of the county occur as swamps, or pocosins, having a relatively high elevation. The most important of these are the Great Swamp and the Dismal Swamp, which are to the west and east of Pinetown in the north-central part of the county, and the Big Pocosin, which is south of Chocowinity. The former extend north into Washington and Martin Counties, and the latter extends south into Craven County.

The topography of the Pamlico terrace in the eastern part of the county is partially level. Some undulating areas are along the rivers and some of the small streams, but in many places the soil is level to the edge of the water. In some places the streams are bordered by areas of tidal marsh or swamp. Very few areas are lower than the adjacent uplands. In some places, however, higher, intermittent strips of soils are between the level uplands and the water. These soils generally are sandy.

The flood plains in the county are narrow, swampy strips along streams. They are chiefly in the western half of the county.

The surface of the land in the northern part of the county generally slopes in the same direction as the course of the Pamlico River. The highest point in the county north of the river is at an elevation of 61 feet above sea level. It is at Batts Crossroads, near the Martin County line. From that point the elevation drops eastward toward the Pungo River. The elevation at Washington is about 10 feet. The elevation in the extreme eastern part of the county, in the vicinity of Belhaven and Leechville, ranges from 2 to 5 feet above sea level.

South of the Pamlico River, the surface of the land generally slopes eastward. In the extreme western part of the county, however, it slopes northward toward the river. The highest point in the county south of the river is 67 feet above sea level. It is about 3.0 miles north of the Craven County line on U.S. Highway 17. The lowest points south of the river are 2 to 5 feet above sea level. They are near Aurora and at Goose Creek gameland reserve.

The soils in most areas in the county are poorly drained. Strips of well drained soils are near streams, especially in the western part of the county, but the soils become less well drained within a short distance from the stream.

Drainage in the county is affected by the Pamlico River and its tributaries. The most important tributaries are the Pungo River, which forms part of the eastern border of the county; Pantego and Pungo Creeks, which are in turn tributaries of the Pungo River; North, Bath, Upper Goose, Broad, and Tranters Creeks, which flow into the Pamlico River from the north; Goose Creek, which forms another part of the eastern border; and South, Durham, Blount, and Chocowinity Creeks, which flow into the Pamlico River from the south. The streams are comparatively short and slow moving. The rivers and the lower parts of the creeks are broad. They have channels that are sufficiently deep to accommodate boats of various sizes. Tidewater reaches as far west as Washington and flows a significant distance up most of the creeks.

In most of the county, elevation is so low and slope is so nearly level that a drainage system is necessary

for farming. Most farms use small ditches for drainage. In some sections, such as East Dismal, Pantego, and Jackson Swamps, drainage districts provide outlets for drainage systems and assist local land managers.

Federal and State regulations require that any area designated as wetlands cannot be altered without prior approval. Contact the local office of the Natural Resources Conservation Service for identification of hydric soils and potential wetlands.

Water Supply

Water is plentiful throughout the county. The municipal water supplies for the major towns are drawn from Tranters Creek or from deep wells. Well water is obtained in parts of the county at a depth of 90 to 150 feet.

Climate

Beaufort County is generally hot and humid in the summer, but sea breezes frequently cool the coastal areas. Winter is cool and occasionally has brief cold spells. Rain occurs throughout the year and is fairly heavy. Snowfall is rare. Annual precipitation is adequate for most of the crops commonly grown in the county.

Table 1 gives data on temperature and precipitation for the survey area as recorded at New Holland, North Carolina, in the period 1951 to 1981. 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 46 degrees F and the average daily minimum temperature is 35 degrees. The lowest temperature on record, which occurred at New Holland on January 13, 1981, is 6 degrees. In summer, the average temperature is 77 degrees and the average daily maximum temperature is 86 degrees. The highest recorded temperature, which occurred at New Holland on July 22, 1952, is 100 degrees.

Growing degree days are shown in table 1. 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 degrees 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 about 53 inches. Of this, 30 inches, or about 55 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 25 inches. The heaviest 1-day rainfall during the period of record was 10.7 inches at New Holland on September 5, 1979. Thunderstorms occur on about 43 days each year.

The average seasonal snowfall is about 2 inches. The greatest snow depth at any one time during the period of record was 10 inches.

The average relative humidity in midafternoon is about 65 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 60 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 13 miles per hour, in winter.

Severe local storms, including tornadoes, occasionally strike in or near the area. They are short of duration. Damage from these storms varies and is spotty. Every few years, a hurricane crosses the area.

How This Survey Was Made

This survey was made to provide information about the soils in Beaufort County. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; and the kinds of crops and native plants growing on the soils. They studied many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the unconsolidated material from which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Soils occur in an orderly pattern that results from the combined influence over time of climate, parent material, relief, and plants and animals. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils and relating their position to specific segments of the landscape, soil scientists develop a concept, or model, of how the soils were formed. This model enables the soil scientists to predict with a considerable degree of accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify

predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, distribution of plant roots, reaction, and other features that enable them to identify the soils. After describing the soils and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area are generally collected for laboratory analyses and for engineering tests. The data from these analyses and tests and from field-observed characteristics and soil properties are used to predict behavior of the soils under different uses. Interpretations are field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a relatively high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will be at a specific level in the soil on a specific date.

Soil boundaries are drawn on aerial photographs and each delineation is identified as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in accurately locating boundaries.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by two or three kinds of soils. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. In the detailed soil map units, these latter soils are called inclusions or included soils. In the general soil map units, they are called minor soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are identified in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soils on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

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, it 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 another 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 a 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.

1. Leaf-Lenoir-Craven

Nearly level to strongly sloping, poorly drained to moderately well drained soils that have a loamy surface layer and a predominantly clayey subsoil; on uplands

These soils are on broad interstream flats, on smooth upland ridges, and in shallow depressions on uplands. This map unit is in an area west of North Carolina Highway 32, or the Suffolk Scarp north of the Pamlico River, and in an area west of North Carolina Highway 306, or the Minesott Ridge south of the Pamlico River.

This map unit makes up about 17 percent of the county. It is about 30 percent Leaf soils, 30 percent Lenoir soils, 20 percent Craven soils, and 20 percent soils of minor extent.

The nearly level, poorly drained Leaf soils are on broad interstream flats and in shallow depressions in the uplands. The surface layer is very dark gray silt loam. The subsurface layer is gray silt loam. In sequence downward, the subsoil is light gray silty clay that has mottles in shades of yellow and brown; light gray clay that has mottles in shades of red and yellow; light gray clay that has mottles in shades of red, yellow, and gray; and dark gray clay that has mottles in shades of yellow.

The nearly level, somewhat poorly drained Lenoir soils are on broad interstream flats and in shallow depressions in the uplands. The surface layer is very dark gray loam. The subsurface layer is dark gray loam. In sequence downward, the subsoil is brownish yellow clay loam that has mottles in shades of gray and brown, gray clay that has mottles in shades of yellow, gray sandy clay that has mottles in shades of yellow, and light gray clay that has lenses of sandy clay.

The nearly level to strongly sloping, moderately well drained Craven soils are on broad, smooth or slightly rounded ridges and on side slopes in the uplands. The surface layer is brown fine sandy loam. In sequence downward, the subsoil is light yellowish brown clay loam, olive yellow clay that has mottles in shades of red, olive yellow clay that has mottles in shades of gray and red, and gray clay that has mottles in shades of yellow and red. The upper part of the underlying material is gray clay loam that has mottles in shades of yellow and red. The lower part is gray sandy clay loam that has mottles in shades of brown and red.

The soils of minor extent in this map unit are the very poorly drained Bayboro and Pantego soils, the somewhat poorly drained Lynchburg soils, the poorly drained Muckalee and Rains soils, and the moderately well drained Winton soils. All of these soils except for the Muckalee and Winton soils are intermingled with areas of the major soils. Muckalee soils are on flood plains, and Winton soils are on the steeper side slopes adjacent to the flood plains.

Most areas of the major soils are wooded. Some areas are used as cropland, especially areas of the Craven soils. The Leaf and Lenoir soils have a water table that is at or near the surface during much of the year. Wetness is a limitation affecting cultivated areas of the major soils. Erosion-control measures are needed in cultivated areas of the Craven soils.

2. Augusta-Altavista-Tomotley

Nearly level, moderately well drained to poorly drained soils that have a loamy surface layer and a loamy subsoil; on stream terraces and marine terraces

These soils are on broad flats, on smooth ridges, and in shallow depressions on the Pamlico marine terrace. This map unit is in several widely separated areas on both sides of the Pamlico River. It is mostly in areas east of North Carolina Highways 32 and 306.

This map unit makes up about 9 percent of the county. It is about 33 percent Augusta soils, 17 percent Altavista soils, 15 percent Tomotley soils, and 35 percent soils of minor extent.

The somewhat poorly drained Augusta soils are on broad flats and in shallow depressions on the Pamlico marine terrace. The surface layer is dark grayish brown fine sandy loam. The subsurface layer is light yellowish brown fine sandy loam that has mottles in shades of yellow. The upper part of the subsoil is brownish yellow sandy clay loam that has mottles in shades of gray. The next part is light gray sandy clay loam that has mottles in shades of yellow. The lower part is gray sandy clay loam that has pockets of sandy loam and mottles in shades of yellow throughout. The underlying material is gray loamy sand that has pockets of sandy clay loam and mottles in shades of brown throughout.

The moderately well drained Altavista soils are on smooth ridges on stream and marine terraces. The surface layer is dark gray fine sandy loam. The subsurface layer is yellowish brown sandy loam. In sequence downward, the subsoil is yellow sandy clay loam; very pale brown sandy clay loam that has mottles in shades of yellow; mottled gray, brown, yellow, and red sandy clay loam; and mottled gray, yellow, and brown sandy loam that has thin lenses of sandy clay loam. The upper part of the underlying material is light brownish gray sandy loam that has mottles in shades of yellow and brown. The lower part is mottled gray and yellow loamy sand.

The poorly drained Tomotley soils are on broad flats and in shallow depressions on stream and marine terraces. They are subject to rare flooding. The surface layer is dark gray fine sandy loam. The subsurface layer is dark grayish brown fine sandy loam. The subsoil is sandy clay loam. In the upper part, it is gray and has mottles in shades of brown. In the next part, it is gray and has mottles in shades of brown and red. In the lower part, it is light gray and has mottles in shades of yellow. The underlying material is light gray sandy loam that has mottles in shades of yellow.

The soils of minor extent in this map unit are the somewhat poorly drained Dragston and Wahee soils, the poorly drained Muckalee soils, and the very poorly drained Arapahoe and Portsmouth soils. All of these soils, except for the Muckalee soils, are intermingled with areas of the major soils. Muckalee soils are on flood plains.

Most areas of the major soils are used as cropland. The rest are used mainly as woodland. Wetness is the main limitation in areas used as cropland.

3. Lynchburg-Rains-Goldsboro

Nearly level, poorly drained to moderately well drained soils that have a loamy surface layer and a predominantly loamy subsoil; on uplands

These soils are on broad interstream divides, on smooth ridges, and in shallow depressions near streams draining into the Pamlico River. This map unit is in several widely separated areas west of the Suffolk Scarp or North Carolina Highway 32 on the north side of the Pamlico River and west of North Carolina Highway 306 on the south side of the river.

This map unit makes up about 10 percent of the county. It is about 40 percent Lynchburg soils, 30 percent Rains soils, 20 percent Goldsboro soils, and 10 percent soils of minor extent.

The somewhat poorly drained Lynchburg soils are on broad interstream divides and in shallow depressions in the uplands. The surface layer is dark gray fine sandy loam. The subsurface layer is dark brown fine sandy loam that has mottles in shades of yellow. In sequence downward, the subsoil is yellowish brown sandy clay loam that has mottles in shades of gray, light brownish gray sandy clay loam that has mottles in shades of brown, gray sandy clay loam that has mottles in shades of brown, gray clay loam that has mottles in shades of brown, and gray sandy clay that has pockets of sandy clay loam and mottles in shades of brown throughout.

The poorly drained Rains soils are on broad interstream divides and in shallow depressions in the uplands. The surface layer is dark gray fine sandy loam. In sequence downward, the subsoil is gray sandy clay loam that has mottles in shades of yellow and red, gray sandy clay loam that has mottles in shades of brown and yellow, light gray sandy clay loam that has pockets of sandy clay and mottles in shades of red and yellow throughout, and light gray sandy clay that has pockets of sandy clay loam and mottles in shades of brown and yellow throughout.

The moderately well drained Goldsboro soils are on broad interstream divides and on smooth ridges in the uplands. The surface layer is dark grayish brown fine sandy loam. In sequence downward, the subsoil is brownish yellow sandy clay loam, brownish yellow sandy clay loam that has mottles in shades of brown and gray, brownish yellow sandy clay loam that has

mottles in shades of gray, light yellowish brown sandy clay loam that has pockets of sandy loam and mottles in shades of gray and brown throughout, and pale brown sandy clay loam that has mottles in shades of gray.

The soils of minor extent in this map unit are the moderately well drained Craven soils, the somewhat poorly drained Lenoir soils, and the poorly drained Muckalee soils. Craven and Lenoir soils are intermingled with areas of the major soils. Muckalee soils are on flood plains.

Most areas of the major soils are used as cropland. Some areas are used as pasture or woodland. Wetness is the main limitation. A drainage system has been installed in most areas that are used as cropland.

4. Tomotley-Roanoke-Portsmouth

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

These soils are on broad flats and in shallow depressions on the Pamlico marine terrace. This map unit is in areas east of North Carolina Highway 32, north of the Pamlico River, and in areas east of North Carolina Highway 306, south of the Pamlico River.

This map unit makes up about 17 percent of the county. It is about 30 percent Tomotley soils, 30 percent Roanoke soils, 22 percent Portsmouth soils, and 18 percent soils of minor extent.

The poorly drained Tomotley soils are on broad flats and in shallow depressions on river and stream terraces. They are subject to rare flooding. The surface layer is dark gray fine sandy loam. The subsurface layer is dark grayish brown fine sandy loam. The subsoil is sandy clay loam. In the upper part, it is gray and has yellowish brown mottles. In the next part, it is gray and has strong brown and red mottles. In the lower part, it is light gray and has brownish yellow mottles. The underlying material is light gray sandy loam that has brownish yellow mottles.

The poorly drained Roanoke soils are on broad flats and in shallow depressions on river and stream terraces. The surface layer is grayish brown fine sandy loam. In sequence downward, the subsoil is gray clay that has mottles in shades of yellow and brown; gray clay that has mottles in shades of brown; mottled dark gray, light gray, brownish yellow, and strong brown clay loam that has pockets of sandy clay loam; and light gray sandy clay loam that has pockets of clay and mottles in shades of yellow and brown throughout. The underlying material is mottled light gray and brownish yellow sandy loam that has lenses of sandy clay loam.

The very poorly drained Portsmouth soils are on broad flats and in shallow depressions on river and stream terraces. The upper part of the surface layer is very dark brown loam. The lower part is very dark grayish brown loam. The upper part of the subsoil is dark grayish brown sandy clay loam that has lenses of sandy clay and mottles in shades of brown throughout. The next part is gray sandy clay loam that has lenses of clay and mottles in shades of brown throughout. The lower part is dark grayish brown sandy loam that has lenses of sandy clay and mottles in shades of brown throughout. The upper part of the underlying material is gray loamy sand that has mottles in shades of olive. The lower part is gray loamy sand that has lenses of fine sandy loam and clay loam.

The soils of minor extent in this map unit are the very poorly drained Belhaven, Cape Fear, Dorovan, and Torhunta soils, the moderately well drained Dogue soils, and the poorly drained Perquimans soils. Belhaven, Cape Fear, Torhunta, and Perquimans soils are intermingled with areas of the major soils. Dorovan soils are on flood plains. Dogue soils are on slightly convex ridges.

Most areas of the Tomotley and Roanoke soils are used as cropland or woodland. Most areas of the Portsmouth soils are used as woodland. Wetness is the main limitation. The major soils have a water table that is at or near the surface during much of the year. A drainage system has been installed in most areas of the Tomotley and Roanoke soils that are used as cropland.

5. Bayboro-Leaf-Croatan

Nearly level, poorly drained and very poorly drained soils that have a loamy or mucky surface layer and a loamy and clayey subsoil or a loamy subsoil; on broad flats and in depressions

These soils are on broad flats and in shallow depressions in areas of the Great Swamp in the northern part of the county and in areas of the Big Pocosin in the southern part of the county.

This map unit makes up about 17 percent of the county. It is about 33 percent Bayboro soils, 18 percent Leaf soils, 12 percent Croatan soils, and 37 percent soils of minor extent.

The very poorly drained Bayboro soils are on broad flats and in shallow depressions in the uplands. The upper part of the surface layer is black loam. The lower part is very dark gray loam. The upper part of the subsoil is dark gray clay loam. The next part is gray clay that has mottles in shades of brown. The lower part is gray clay that has mottles in shades of brown and gray.

The poorly drained Leaf soils are on broad interstream flats and in shallow depressions in the

uplands. The surface layer is very dark gray silt loam. The subsurface layer is gray silt loam. In sequence downward, the subsoil is light gray silty clay that has mottles in shades of yellow and brown; light gray clay that has mottles in shades of red and yellow; light gray clay that has mottles in shades of red, yellow, and gray; and dark gray clay that has mottles in shades of yellow.

The very poorly drained Croatan soils are in shallow depressions in the swamps. They are subject to rare flooding. The surface layer is black muck. Below this is black loam. The underlying material is clay loam that has mottles in shades of brown. It is dark gray in the upper part and gray in the lower part.

The soils of minor extent in this map unit are the very poorly drained Currituck, Ponzer, Pantego, Cape Fear, and Dare soils. Currituck soils are in brackish marshes. Ponzer, Pantego, Cape Fear, and Dare soils are intermingled with areas of the major soils.

Most areas of the major soils are wooded. Some areas are used as cropland. The seasonal high water table is at or near the surface during much of the year. A drainage system has been installed in cultivated areas. Wetness is the main limitation affecting woodland management. Poor trafficability also is a limitation in areas of the Croatan soils.

6. Arapahoe-Ponzer-Dare

Nearly level, very poorly drained soils that have a loamy or mucky surface layer and a loamy or sandy subsoil or underlying material; on broad flats and in depressions on the Pamlico marine terrace

The major soils in this map unit are on broad flats and in shallow depressions. This map unit is mostly in areas of the Pantego swamp, in the northeastern part of the county, and in areas of the Gum Swamp, in the southeastern part of the county.

This map unit makes up about 11 percent of the county. It is about 30 percent Arapahoe soils, 25 percent Ponzer soils, 15 percent Dare soils, and 30 percent soils of minor extent.

Arapahoe soils are on broad flats and in shallow depressions in the uplands. They are subject to rare flooding. The surface layer is black fine sandy loam. The subsoil is dark grayish brown fine sandy loam that has mottles in shades of brown. The underlying material is grayish brown loamy sand.

Ponzer soils are on broad flats and in shallow depressions in the uplands. They are subject to rare flooding. The surface layer is black muck. Below this is another layer of black muck. Next is dark brown fine sandy loam. The upper part of the underlying material is dark gray fine sandy loam. The lower part is dark grayish brown loamy fine sand.

Dare soils are in shallow depressions in the uplands. They are subject to rare flooding. The surface layer is black muck. Below this is very dark brown muck. Next is dark reddish brown muck. The underlying material is mottled gray and dark brown loamy sand stratified with sandy loam.

The soils of minor extent in this map unit are the poorly drained Roanoke soils and the very poorly drained Cape Fear, Hyde, Pantego, and Wasda soils. Roanoke soils are on river and stream terraces. Cape Fear, Hyde, Pantego, and Wasda soils are intermingled with areas of the major soils.

Most areas of the major soils are used as cropland. Many of the remaining areas are wooded. Wetness is the main limitation in areas used as cropland. The water table is at or near the surface during much of the year. A drainage system has been installed in most areas that are used as cropland. Soil blowing is a hazard during spring in cultivated areas of the Ponzer and Dare soils.

7. Muckalee-Dorovan-Currituck

Nearly level, poorly drained and very poorly drained soils that have a loamy, mucky peat, or mucky surface layer and loamy, mucky, or sandy underlying material; on flood plains

These soils are in brackish marshes and on flood plains along the Pamlico and Pungo Rivers and their tributaries.

This map unit makes up about 9 percent of the county. It is about 45 percent Muckalee soils, 17 percent Dorovan soils, 15 percent Currituck soils, and 23 percent soils of minor extent.

The poorly drained Muckalee soils are on flood plains along small streams that flow into the Pamlico River. They are frequently flooded. The surface layer is dark grayish brown loam that has mottles in shades of brown. The underlying material is gray sandy loam. In the upper part, it has thin lenses of loamy sand and sandy clay loam and yellowish brown mottles throughout. In the lower part, it has thin lenses of sandy clay loam and sand and very dark gray mottles throughout.

The very poorly drained Dorovan soils are in low, swampy areas on the flood plains along the Pamlico River and its tributaries. They are frequently flooded. The surface layer is very dark brown mucky peat. Below this is black muck. The underlying material is gray sand having small fragments of partially decayed wood.

The very poorly drained Currituck soils are in brackish marshes on both sides of the Pamlico River and along the major streams flowing into the Pamlico and Pungo Rivers. They are frequently flooded because

of wind and tidal action. The surface layer is very dark gray muck. The underlying material is dark grayish brown sand.

The soils of minor extent in this map unit are the very poorly drained Cape Fear and Pantego soils. These soils are on broad flats and in shallow depressions on uplands.

Most areas of the major soils are wooded. The Currituck soils mainly support rushes and other herbaceous plants. Frequent flooding and a water table that is at or near the surface during much of the year are limitations.

8. Torhunta-Leon-Bonneau

Nearly level and gently sloping, very poorly drained, poorly drained, and well drained soils that have a loamy or sandy surface layer and subsoil; on uplands

These soils are on broad, smooth or slightly rounded ridges, on broad flats, and in shallow depressions on uplands in the southern part of the county. The largest area of these soils is on Minnesott Ridge, along North Carolina Highway 306.

This map unit makes up about 4 percent of the county. It is about 40 percent Torhunta soils, 25 percent Leon soils, 10 percent Bonneau soils, and 25 percent soils of minor extent.

The nearly level, very poorly drained Torhunta soils are on broad flats and in shallow depressions in the uplands. The upper part of the surface layer is black sandy loam. The lower part is very dark brown sandy loam. The upper part of the subsoil is dark gray sandy loam. The lower part is grayish brown sandy loam that has pockets of loamy sand. The underlying material is light brownish gray loamy sand that has mottles in shades of brown and pockets of gray sandy clay loam.

The nearly level, poorly drained Leon soils are on broad, smooth ridges in the uplands. The surface layer is black sand. The subsurface layer is dark grayish brown sand. The upper part of the subsoil is dark brown sand that has mottles in shades of brown. The next part of the subsoil also is dark brown sand that has mottles in shades of brown. The lower part is brown sand. The underlying material is pale brown sand.

The nearly level and gently sloping, well drained Bonneau soils are on broad, smooth or slightly rounded ridges in the uplands. The surface layer is very dark grayish brown loamy sand. The subsurface layer is light yellowish brown loamy sand. The upper part of the subsoil is olive yellow sandy clay loam. The next part is light olive brown sandy clay loam that has mottles in shades of gray. The lower part is mottled light olive brown and light gray sandy clay loam.

The soils of minor extent in this map unit are the somewhat excessively drained Tarboro soils and the moderately well drained Goldsboro soils. Tarboro soils are on smooth or slightly rounded ridges on river and stream terraces. Goldsboro soils are intermingled with areas of the major soils.

Most areas of the major soils are wooded. Some areas, especially areas of the Bonneau soils, are used as cropland. The seasonal high water table, ponding in depressions, and leaching of plant nutrients are limitations in areas used as cropland.

9. Tarboro-Seabrook-State

Nearly level and gently sloping, somewhat excessively drained to moderately well drained soils that have a sandy or loamy surface layer and subsoil; on stream terraces

These soils are in several areas on stream terraces adjacent to the Pamlico river and its tributaries.

This map unit makes up about 6 percent of the county. It is about 22 percent Tarboro soils, 20 percent Seabrook soils, 9 percent State soils, and 49 percent soils of minor extent.

The nearly level and gently sloping, somewhat excessively drained Tarboro soils are on smooth or slightly rounded ridges on river and stream terraces. The surface layer is dark yellowish brown sand. In sequence downward, the underlying material is strong brown sand, strong brown sand that has mottles in shades of white, brownish yellow sand, and yellow sand.

The nearly level, moderately well drained Seabrook soils are on smooth ridges on river and stream terraces. They are subject to rare flooding. The surface layer is light gray loamy sand. The upper part of the underlying material is light olive brown loamy sand that has mottles in shades of yellow and gray. The next part is pale yellow loamy sand that has mottles in shades of brown and gray. The lower part is light gray sand.

The nearly level, well drained State soils are on smooth ridges on river and stream terraces. They are subject to rare flooding. The surface layer is very dark grayish brown sandy loam. The subsurface layer is light yellowish brown sandy loam. The upper part of the subsoil is yellowish brown sandy clay loam that has mottles in shades of red. The lower part is yellowish brown sandy clay loam that has mottles in shades of brown. The underlying material is light yellowish brown sandy loam that has lenses of sandy clay and mottles in shades of gray in the lower part.

The soils of minor extent in this map unit are the well drained Conetoe soils, the moderately well drained

Altavista and Goldsboro soils, and the somewhat poorly drained Augusta soils. Conetoe and Goldsboro soils are on smooth or slightly rounded ridges on uplands. Altavista and Augusta soils are intermingled with areas of the major soils.

Most areas of the major soils are used as cropland. Some areas are used as woodland or urban land. Droughtiness, soil blowing, and leaching of plant nutrients are limitations in areas used as cropland. Ground-water contamination is a hazard affecting septic tank absorption fields.

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 is given under the heading "Use and Management of the Soils."

The map units on the detailed soil maps represent areas on the landscape and consist mainly of one or more soils for which the units are named.

Symbols identifying the soils precede the map unit names in the map unit descriptions. The descriptions include general facts about the soils and give 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, stoniness, salinity, 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 named as phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Craven fine sandy loam, 0 to 1 percent slopes, is a phase of the Craven series.

Some map units are made up of two or more major soils or miscellaneous land types. These map units are called soil complexes. A *soil complex* consists of two or more dominant soils, or miscellaneous land areas, 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. Altavista-Urban land complex, 0 to 2 percent slopes, is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils may be identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Urban land is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

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 suitabilities for many uses. The "Glossary" defines many of the terms used in describing the soils.

AaA—Altavista fine sandy loam, 0 to 2 percent slopes. This nearly level, moderately well drained soil is on smooth ridges on stream and marine terraces along the Pamlico River and Bath, South, and Broad Creeks. It is throughout the county. Slope ranges from 0 to 2 percent. Individual areas are long and narrow and range from 4 to 20 acres in size.

Typically, the surface layer is dark gray fine sandy loam 6 inches thick. The subsurface layer is yellowish brown sandy loam 4 inches thick. The subsoil extends to a depth of 47 inches. In sequence downward, it is yellow sandy clay loam; very pale brown sandy clay loam that has brownish yellow mottles; mottled light brownish gray, strong brown, reddish yellow, and yellowish red sandy clay loam; and mottled light brownish gray, reddish yellow, and yellowish brown sandy loam that has thin lenses of sandy clay loam. The underlying material extends to a depth of 62 inches. In the upper part, it is light brownish gray sandy loam that has reddish yellow and yellowish brown mottles. In the lower part, it is mottled light gray and yellow loamy sand.

Permeability is moderate. Available water capacity

also is moderate. The shrink-swell potential is low. The seasonal high water table is at a depth of 1.5 to 2.5 feet during winter and early spring.

Included with this soil in mapping are small areas of the well drained Conetoe and State soils and the somewhat poorly drained Augusta soils. Conetoe and State soils are on the higher knolls. Augusta soils are in shallow depressions. Included soils make up about 15 percent of most mapped areas.

Most of the acreage of the Altavista soil is used as cropland. The rest is used mainly as woodland.

The major crops are corn, soybeans, tobacco, and small grain. Wetness is the main limitation in cultivated areas. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and productivity. Minimum tillage, no-till planting, field borders, and a cropping system that includes close-growing crops conserve soil and water. A drainage system generally is necessary to prevent damage to tobacco during wet periods.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, shortleaf pine, sweetgum, yellow-poplar, white oak, and southern red oak. Understory species are dogwood, red maple, sassafras, and American holly. Slight limitations affect woodland management. Seedlings and the seeds of trees survive and grow well if competing vegetation is controlled or removed by properly preparing the site, spraying, cutting, or girdling.

Wetness is the main limitation affecting most urban and recreational uses. It can be reduced by a drainage system consisting of perforated drain tile, ditches, or both. Rare flooding is a hazard in a few low areas.

The land capability subclass is IIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9A.

AbA—Altavista-Urban land complex, 0 to 2 percent slopes. This map unit occurs as areas of a nearly level, moderately well drained Altavista soil and areas of Urban land. It is about 50 percent Altavista soil and 30 to 40 percent Urban land. The Altavista soil and Urban land occur as areas too small or too intricately mixed to be mapped separately at the scale used. This unit is in the cities of Washington, Belhaven, and Aurora. Slope ranges from 0 to 2 percent. Individual areas are rectangular or irregular in shape and range from 10 to 150 acres in size.

Typically, the surface layer of the Altavista soil is dark gray fine sandy loam 6 inches thick. The subsurface layer is yellowish brown sandy loam 4 inches thick. The subsoil extends to a depth of 47 inches. In sequence downward, it is yellow sandy clay loam; very pale brown sandy clay loam that has brownish yellow mottles; mottled light brownish gray, strong brown, reddish yellow, and yellowish red sandy clay loam; and mottled light brownish gray, reddish yellow, and yellowish brown sandy loam that has thin lenses of sandy clay loam. The underlying material extends to a depth of 62 inches. In the upper part, it is light brownish gray sandy loam that has reddish yellow and yellowish brown mottles. In the lower part, it is mottled light gray and yellow loamy sand.

Permeability is moderate in the Altavista soil. Available water capacity also is moderate. The shrink-swell potential is low. The seasonal high water table is at a depth of 1.5 to 2.5 feet during winter and early spring.

Urban land consists of areas where the original soil has been cut, filled, graded, paved, or otherwise modified. Most of the soil properties have been so altered that a soil series is not recognizable. These areas are used as sites for parking lots, shopping centers, factories, municipal buildings, apartment complexes, or other closely spaced buildings. Slope generally has been modified. The extent of site modification varies greatly. Many areas have been subject to only minor disturbance, whereas others have been extensively graded or filled.

Included in this unit in mapping are small areas of the well drained Conetoe and State soils and the poorly drained Tomotley soils. Conetoe and State soils are on the higher knolls. Tomotley soils are in shallow depressions. Included soils make up about 10 to 20 percent of most mapped areas.

Most of the acreage of the Altavista soil and Urban land is used for urban development. This unit is not used as cropland or woodland.

Wetness is the main limitation affecting urban development in areas of the Altavista soil. It can be reduced by a drainage system consisting of perforated drain tile, ditches, or both. Rare flooding is a hazard in a few low areas. Onsite investigation generally is necessary before use and management of these areas can be planned.

The land capability subclass of the Altavista soil is IIw, and that of the Urban land is VIIIs. This map unit has not been assigned a woodland ordination symbol.

Ap—Arapahoe fine sandy loam. This nearly level, very poorly drained soil is on broad flats and in shallow depressions on uplands in the eastern part of the county. Slope ranges from 0 to 2 percent. Individual areas are irregular in shape and range from 20 to 100 acres in size.

Typically, the surface layer is black fine sandy loam 22 inches thick. The subsoil extends to a depth of 42 inches. It is dark grayish brown fine sandy loam that

Figure 2.—Soybeans in an area of Arapahoe fine sandy loam.

has dark yellowish brown mottles. The underlying material extends to a depth of 60 inches. It is grayish brown loamy sand.

Permeability is moderately rapid. Available water capacity is moderate. The shrink-swell potential is low. The seasonal high water table is within a depth of 1 foot during winter and early spring.

Included with this soil in mapping are small areas of Portsmouth soils. These soils have more clay in the subsoil than the Arapahoe soil. They are intermingled with areas of the Arapahoe soil. Also included are areas where the surface layer and subsurface layer are more than 24 inches thick and areas that are subject to rare flooding. Included soils make up about 25 percent of most mapped areas.

Most of the acreage of the Arapahoe soil is used as cropland or woodland.

In drained areas the major crops are corn, soybeans (fig. 2), and small grain. Wetness is the main limitation in cultivated areas. In some areas establishing suitable

drainage outlets is difficult. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and productivity.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, sweetgum, red maple, water oak, willow oak, swamp chestnut oak, yellow-poplar, and pond pine. Understory species are greenbrier, sourwood, American holly, inkberry, switchcane, and blueberry. Wetness is the main limitation affecting woodland management. Using standard wheeled and tracked equipment when the soil is wet results in ruts, compacts the soil, and damages the roots of trees. A drainage system facilitates the use of equipment, reduces the extent of the soil damage caused by forestry activities, and improves tree growth.

Wetness is the main limitation affecting most urban and recreational uses. It can be reduced by a drainage system consisting of perforated drain tile, ditches, or both.

The land capability subclass is IIIw in drained areas and VIw in undrained areas. Based on loblolly pine as the indicator species, the woodland ordination symbol is 10W.

At—Augusta fine sandy loam. This nearly level, somewhat poorly drained soil is on broad flats and in shallow depressions on stream and marine terraces along the Pamlico River and Bath, South, and Broad Creeks. It is throughout the county. Slope ranges from 0 to 2 percent. Individual areas are irregular in shape and range from 5 to more than 50 acres in size.

Typically, the surface layer is dark grayish brown fine sandy loam 7 inches thick. The subsurface layer is 5 inches thick. It is light yellowish brown fine sandy loam that has brownish yellow mottles. The subsoil extends to a depth of 45 inches. In the upper part, it is brownish yellow sandy clay loam that has light brownish gray mottles. In the next part, it is light gray sandy clay loam that has brownish yellow mottles. In the lower part, it is gray sandy clay loam that has brownish yellow mottles and pockets of sandy loam. The underlying material extends to a depth of 65 inches. It is gray loamy sand that has yellowish brown and strong brown mottles and pockets of sandy clay loam.

Permeability is moderate. Available water capacity also is moderate. The shrink-swell potential is low. The seasonal high water table is at a depth of 1 to 2 feet during winter and early spring.

Included with this soil in mapping are small areas of the moderately well drained Altavista soils. These soils are on the slightly higher ridges. Also included are some low areas that are subject to rare flooding for brief periods. Included soils make up about 10 to 15 percent of most mapped areas.

Most of the acreage of the Augusta soil is used as cropland. The rest is used mainly as pasture or woodland.

The major crops are corn and soybeans. Wetness is the main limitation in cultivated areas. A drainage system that removes surface and subsurface water generally is necessary to prevent crop damage in the spring. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and productivity. Minimum tillage, no-till planting, field borders, and a cropping system that includes close-growing crops conserve soil and water.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, sweetgum, yellow-poplar, white oak, water oak, and American beech. Understory species are dogwood, sassafras, American holly, and sweetbay. Wetness is the main limitation affecting woodland management. Using standard wheeled and tracked equipment when the soil is wet results in ruts, compacts the soil, and damages the roots of trees. A drainage system facilitates the use of equipment, reduces the extent of the soil damage caused by forestry activities, and improves tree growth. The wetness can be reduced by a drainage system consisting of perforated drain tile, ditches, or both.

Wetness is the main limitation affecting most urban and recreational uses. It can be reduced by a drainage system consisting of perforated drain tile, ditches, or both. Rare flooding is a hazard in a few low areas.

The land capability subclass is IIIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9W.

Ba—Bayboro loam. This nearly level, very poorly drained soil is on broad flats and in shallow depressions on uplands. It is mainly in the western part of the county. Slope ranges from 0 to 2 percent. Individual areas are oblong and range from 20 to more than 100 acres in size.

Typically, the surface layer is loam 14 inches thick. It is black in the upper part and very dark gray in the lower part. The subsoil extends to a depth of 64 inches. In the upper part, it is dark gray clay loam. In the next part, it is gray clay that has strong brown mottles. In the lower part, it is gray clay that has strong brown and light gray mottles.

Permeability is slow. Available water capacity is high. The shrink-swell potential is moderate. The seasonal high water table is within a depth of 1 foot during winter and early spring.

Included with this soil in mapping are small areas of the poorly drained Leaf soils. These soils are intermingled with areas of the Bayboro soil. They make up about 25 percent of most mapped areas.

Most of the acreage of the Bayboro soil is used as cropland or woodland.

In drained areas the major crops are corn, soybeans, and small grain. Wetness is the main limitation in cultivated areas. Conservation tillage, cover crops, and a cropping system that includes grasses and legumes can help to maintain tilth and productivity. Tillage is often delayed in spring because of the wetness. A lack of suitable outlets and the slow permeability limit the effectiveness of drainage systems.

Forested areas support mixed hardwoods and pine. Common species include water oak, willow oak, swamp chestnut oak, sweetgum, yellow-poplar, pond pine, red maple, and loblolly pine. Understory species are sourwood, greenbrier, switchcane, and American holly. Wetness is the main limitation affecting woodland management. Using standard wheeled and tracked equipment when the soil is wet results in ruts, compacts the soil, and damages the roots of trees. A drainage system facilitates the use of equipment, reduces the extent of the soil damage caused by forestry activities, and improves tree growth. The wetness can be reduced by a drainage system consisting of perforated drain tile, ditches, or both.

Wetness and the slow permeability are the main limitations affecting urban and recreational uses. The wetness can be reduced by a drainage system consisting of perforated drain tile, ditches, or both.

The land capability subclass is IIIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 10W.

Bb—Belhaven muck. This very poorly drained, nearly level soil is on broad flats and in shallow depressions on low marine terraces in the eastern part of the county. Slope is 0 to 1 percent. Individual areas are oblong and range from 50 to 100 acres in size.

Typically, the surface layer is black muck 9 inches thick. Below this to a depth of 46 inches is dark reddish brown muck that has a high content of fiber and woody materials. The underlying material extends to a depth of 65 inches. It is grayish brown sandy clay loam.

Permeability is moderately rapid in the muck and moderately slow in the underlying material. Available water capacity is high. The shrink-swell potential is low. The seasonal high water table is within a depth of 1 foot during winter and spring. This soil is subject to rare flooding.

Included with this soil in mapping are small areas where the organic material is more than 51 inches thick or less than 16 inches thick. These soils are intermingled with areas of the Belhaven soil. They make up about 20 percent of most mapped areas.

Most of the acreage of the Belhaven soil is used as woodland. A few areas have been cleared of trees and drained and are used as cropland.

In drained areas the major crops are corn, soybeans, and small grain. Winter cover crops and windbreaks help to prevent excessive soil blowing. Wetness, subsidence, and poor trafficability are the main limitations in cultivated areas.

Forested areas mainly are loblolly pine plantations. Other common species include red maple, sweetgum, blackgum, and pond pine. Understory species mainly are waxmyrtle, bitter gallberry, holly, greenbrier, redbay, sweetbay, titi, and fetterbush. Wetness and poor trafficability are the main limitations affecting woodland management. Using standard wheeled and tracked equipment when the soil is wet results in ruts, compacts the soil, and damages the roots of trees. A drainage system facilitates the use of equipment, reduces the extent of the soil damage caused by forestry activities, and improves tree growth.

The seasonal high water table, flooding, and subsidence are the main limitations affecting most urban and recreational uses. A better suited site should be chosen.

The land capability subclass is VIIw in undrained areas and IVw in drained areas. Based on loblolly pine as the indicator species, the woodland ordination symbol is 6W.

BoB—Bonneau loamy sand, 0 to 4 percent slopes. This nearly level and gently sloping, well drained soil is on broad, smooth or slightly rounded ridges in the western part of the county at the higher elevations. Slope ranges from 0 to 4 percent. Individual areas are elliptical and range from 4 to more than 50 acres in size.

Typically, the surface layer is very dark grayish brown loamy sand 9 inches thick. The subsurface layer is light yellowish brown loamy sand 13 inches thick. The subsoil extends to a depth of 60 inches. It is sandy clay loam. In the upper part, it is olive yellow. In the next part, it is light olive brown and has gray mottles. In the lower part, it is mottled light olive brown and light gray.

Permeability is moderate. Available water capacity is low or moderate. The shrink-swell potential is low. The seasonal high water table is at a depth of 3.5 to 5.0 feet during winter and early spring.

Included with this soil in mapping are small areas of the moderately well drained Goldsboro soils. These soils are in the lower areas. Also included are small areas of soils that are sandy throughout. Included soils make up about 15 percent of most mapped areas.

Most of the acreage of the Bonneau soil is used as cropland. The rest is used mainly as woodland.

The major crops are corn, soybeans, tobacco, and

small grain. Wind erosion and droughtiness are the major limitations in cultivated areas. Blowing sand may damage young plants. Winter cover crops, conservation tillage, windbreaks, and crop residue management help to maintain tilth and conserve moisture. Fertilizers, particularly nitrogen, should be added in split applications.

Forested areas are dominantly loblolly pine. Common species include loblolly pine and longleaf pine. Understory species are little bluestem, switchgrass, and large gallberry. Seedling mortality is a management concern because of the thick, sandy surface layer. Pines that have been established grow well if competing vegetation is controlled or removed by properly preparing the site, spraying, cutting, or girdling. The use of planting and harvesting equipment is moderately limited because of the thick, sandy surface layer.

Slight limitations affect most urban uses. The thick, sandy surface layer is a limitation affecting recreational uses.

The land capability subclass is IIs. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8S.

Cf—Cape Fear fine sandy loam. This nearly level, very poorly drained soil is on broad flats and in shallow depressions on low marine terraces, mainly in the eastern part of the county, east of North Carolina Highways 306 and 32. Slope ranges from 0 to 2 percent. Individual areas are irregular in shape and range from 120 to more than 200 acres in size.

Typically, the surface layer is black fine sandy loam 14 inches thick. The subsoil extends to a depth of 48 inches. In the upper part, it is dark gray clay loam. In the next part, it is dark grayish brown clay that has yellowish brown mottles. In the lower part, it is dark gray sandy clay loam that has brown and yellowish brown mottles and pockets of loamy sand. The underlying material extends to a depth of 65 inches. It is light brownish gray loamy sand that has yellowish brown mottles and pockets of sandy loam.

Permeability is slow. Available water capacity is moderate or high. The shrink-swell potential is moderate. The seasonal high water table is within a depth of 1.5 feet during winter and early spring.

Included with this soil in mapping are small areas of Arapahoe soils, the moderately well drained Augusta soils, and the poorly drained Roanoke soils. Arapahoe and Augusta soils have less clay in the subsoil than the Cape Fear soil. Arapahoe and Roanoke soils are intermingled with areas of the Cape Fear soil. Augusta soils are on the higher parts of the landscape. Also included are a few small areas that are subject to rare flooding. Included soils make up about 10 to 25 percent of most mapped areas.

Most of the acreage of the Cape Fear soil is used as woodland. The rest is used mainly as cropland.

Most areas of this soil that are used for cultivated crops have been drained. The major crops are corn (fig. 3) and soybeans. Wetness is the main limitation in cultivated areas. Conservation tillage, cover crops, and a cropping system that includes grasses and legumes can help to maintain tilth and productivity. Tillage is commonly delayed in spring because of the wetness. A lack of suitable outlets and the slow permeability limit the effectiveness of drainage systems.

Forested areas support mixed hardwoods and pine. Common species include water tupelo, willow oak, water oak, sweetgum, baldcypress, and loblolly pine. Understory species are American holly, southern bayberry, switchcane, inkberry, and greenbrier. Wetness is the main limitation affecting woodland management. Using standard wheeled and tracked equipment when the soil is wet results in ruts, compacts the soil, and damages the roots of trees. A drainage system facilitates the use of equipment, reduces the extent of the soil damage caused by forestry activities, and improves tree growth. The wetness can be reduced by a drainage system consisting of perforated drain tile, ditches, or both.

Wetness and the slow permeability are the main limitations affecting most urban and recreational uses. The wetness can be reduced by a drainage system consisting of perforated drain tile, ditches, or both.

The land capability subclass is IIIw in drained areas and VIw in undrained areas. Based on loblolly pine as the indicator species, the woodland ordination symbol is 11W.

CnB—Conetoe loamy sand, 0 to 5 percent slopes. This nearly level and gently sloping, well drained soil is on smooth or slightly rounded ridges on stream and marine terraces. It is adjacent to the larger creeks and along the Pamlico River. Slope ranges from 0 to 5 percent. Individual areas are elliptical and range from 5 to 25 acres in size.

Typically, the surface layer is dark brown loamy sand 8 inches thick. The subsurface layer is yellowish brown loamy sand 14 inches thick. The subsoil extends to a depth of 46 inches. In the upper part, it is brownish yellow sandy loam. In the next part, it is brownish yellow sandy clay loam. In the lower part, it is strong brown loamy sand. The underlying material extends to a depth of 62 inches. It is mottled very pale brown and reddish yellow sand.

Permeability is moderately rapid. Available water capacity is low or moderate. The shrink-swell potential

Figure 3.—Harvesting corn in an area of Cape Fear fine sandy loam.

is low. The seasonal high water table is at a depth of more than 6 feet.

Included with this soil in mapping are small areas of the excessively drained Tarboro soils and the well drained State soils. Tarboro and State soils are intermingled with areas of the Conetoe soil. Also included are low areas that are subject to rare flooding. Included soils make up about 20 percent of most mapped areas.

Most of the acreage of the Conetoe soil is used as cropland. The rest is used mainly as woodland.

The major crops are corn, soybeans, tobacco, and small grain. Wind erosion and droughtiness are the major limitations in cultivated areas. Blowing sand may damage young plants. Winter cover crops, conservation tillage, and crop residue management help to maintain the content of organic matter and conserve moisture. Minimum tillage, no-till planting, windbreaks, and a cropping system that includes close-growing crops conserve soil and water. Fertilizers, particularly nitrogen, should be added in split applications.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, white oak, southern red oak, hickory, sweetgum, American beech, and red maple. Understory species are dogwood, sassafras, waxmyrtle, and American holly. The hazard of seedling mortality is moderate because of the thick, sandy surface layer. Seedlings and the seeds of trees survive and grow well if competing vegetation is controlled or removed by properly preparing the site,

spraying, cutting, or girdling. The use of planting and harvesting equipment is moderately limited because of the thick, sandy surface layer.

Few limitations affect most urban uses. The thick, sandy surface layer is a moderate limitation affecting recreational uses.

The land capability subclass is IIs. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8S.

CrA—Craven fine sandy loam, 0 to 1 percent slopes. This nearly level, moderately well drained soil is on broad, smooth ridges in the uplands, mostly in the western part of the county. Slopes are 0 to 1 percent. Individual areas are elliptical and range from 5 to more than 50 acres in size.

Typically, the surface layer is brown fine sandy loam 7 inches thick. The subsoil extends to a depth of 41 inches. In sequence downward, it is light yellowish brown clay loam; olive yellow clay that has red and yellowish red mottles; olive yellow clay that has light gray, yellowish red, and red mottles; and gray clay that has brownish yellow, red, and yellowish red mottles. The underlying material extends to a depth of 61 inches. In the upper part, it is gray clay loam that has brownish yellow and red mottles. In the lower part, it is gray sandy clay loam that has light yellowish brown and red mottles.

Permeability is slow. Available water capacity is moderate. The shrink-swell potential also is moderate. The seasonal high water table is at a depth of 2 to 3 feet.

Included with this soil in mapping are small areas of Goldsboro soils and the somewhat poorly drained Lenoir soils. Goldsboro soils have less clay in the subsoil than the Craven soil. They are intermingled with areas of the Craven soil. Lenoir soils are in shallow depressions. Included soils make up about 15 percent of most mapped areas.

Most of the acreage of the Craven soil is used as cropland. The rest is used mainly as woodland.

The major crops are corn, soybeans, tobacco, and small grain. Wetness is the main limitation. Proper bedding is necessary to prevent damage to tobacco during wet periods. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and productivity. No-till planting, field borders, and a cropping system that includes close-growing crops conserve moisture and help to prevent compaction of the subsoil. The slow permeability in the subsoil should be considered when drainage systems are installed.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, sweetgum, white oak, red maple, and southern red oak. Understory species are American holly, dogwood, sourwood, and bayberry. Seedlings and the seeds of trees survive and grow well if competing vegetation is controlled or removed by properly preparing the site, spraying, cutting, or girdling. The use of planting and harvesting equipment is moderately limited because of a high content of clay, especially during wet periods.

Wetness and the slow permeability are the main limitations affecting most urban and recreational uses. The wetness can be reduced by a drainage system consisting of perforated drain tile, ditches, or both.

The land capability subclass is IIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9C.

CrB—Craven fine sandy loam, 1 to 4 percent slopes. This gently sloping, moderately well drained soil is on slightly rounded ridges in the uplands, mostly in the western part of the county. Slope ranges from 1 to 4 percent. Individual areas are elliptical and range from 10 to more than 70 acres in size.

Typically, the surface layer is brown fine sandy loam 7 inches thick. The subsoil extends to a depth of 41 inches. In sequence downward, it is light yellowish brown clay loam; olive yellow clay that has red and yellowish red mottles; olive yellow clay that has light gray, yellowish red, and red mottles; and gray clay that has brownish yellow, red, and yellowish red mottles. The underlying material extends to a depth of 61 inches. In the upper part, it is gray clay loam that has brownish yellow and red mottles. In the lower part, it is gray sandy clay loam that has light yellowish brown and red mottles.

Permeability is slow. Available water capacity is moderate. The shrink-swell potential also is moderate. The seasonal high water table is at a depth of 2 to 3 feet.

Included with this soil in mapping are small areas of Goldsboro soils. These soils have less clay in the subsoil than the Craven soil. They are intermingled with areas of the Craven soil. Also included are small eroded areas that have a surface layer of clay loam and a few areas that have shallow rills caused by concentrated waterflow. Included soils make up about 10 percent of most mapped areas.

Most of the acreage of the Craven soil is used as cropland. The rest is used mainly as woodland.

The major crops are corn, soybeans, tobacco, and small grain. Erosion is the main hazard. Minimum tillage and crop residue management help to control runoff and erosion and maintain good tilth. Minimum tillage, no-till planting, field borders, and a cropping system that includes close-growing crops conserve soil and water.

The slow permeability in the subsoil limits the effectiveness of drainage systems.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, sweetgum, white oak, southern red oak, and red maple. Understory species are American holly, dogwood, sourwood, and blueberry. Seedlings and the seeds of trees survive and grow well if competing vegetation is controlled or removed by properly preparing the site, spraying, cutting, or girdling. The use of planting and harvesting equipment is moderately limited because of a high content of clay, especially during wet periods.

Wetness and the slow permeability are the main limitations affecting most urban and recreational uses. The wetness can be reduced by a drainage system consisting of perforated drain tile, ditches, or both.

The land capability subclass is IIIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9C.

CsC2—Craven clay loam, 4 to 12 percent slopes, eroded. This moderately well drained, strongly sloping soil is on ridges and side slopes in the uplands, mostly in the western part of the county. Slope ranges from 4 to 12 percent. Individual areas are long and narrow and range from 5 to 40 acres in size.

Typically, the surface layer is brownish yellow clay loam 7 inches thick. The subsoil extends to a depth of 41 inches. In sequence downward, it is light yellowish brown clay loam; olive yellow clay that has red and yellowish red mottles; olive yellow clay that has light gray, yellowish red, and red mottles; and gray clay that has brownish yellow, red, and yellowish red mottles. The underlying material extends to a depth of 61 inches. In the upper part, it is gray clay loam that has brownish yellow and red mottles. In the lower part, it is gray sandy clay loam that has light yellowish brown and red mottles.

Permeability is slow. Available water capability is moderate. The shrink-swell potential also is moderate. The seasonal high water table is at a depth of 2 to 3 feet.

Included with this soil in mapping are small areas of Winton soils. These soils have less clay in the subsoil than the Craven soil. They are intermingled with areas of the Craven soil on side slopes. Also included are areas where the surface layer consists entirely of subsoil material and some areas that have deep rills. Included soils make up about 10 to 20 percent of most mapped areas.

Most of the acreage of the Craven soil is used as woodland. The rest is used mainly as cropland.

The major crops are corn, soybeans, tobacco, and small grain. Slope, surface runoff, erosion, and poor tilth are the main limitations in cultivated areas. Conservation tillage and crop residue management help to control runoff and erosion and improve tilth. Sodded drainageways, terraces and diversions, stripcropping, field borders, and a cropping system that includes close-growing crops conserve soil and water.

Forested areas support mixed hardwoods and pine. Common species include sweetgum, red maple, willow oak, white oak, southern red oak, and loblolly pine. Understory species are dogwood, sweetbay, sourwood, American holly, southern waxmyrtle, and sassafras. A high content of clay in the surface layer and subsoil can result in a higher than normal rate of seedling mortality for transplanted seedlings and can limit the use of planting and harvesting equipment, especially during wet periods.

Slope, the slow permeability, the moderate shrink-swell potential, and low strength are the main limitations affecting most urban uses. The slope and the texture of the surface layer are limitations affecting recreational uses.

The land capability subclass is VIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8C.

Ct—Croatan muck. This nearly level, very poorly drained soil is in shallow depressions in swamps, mostly in the north-central part of the county. Slope is 0 to 1 percent. Individual areas are oblong and range from 50 to 100 acres in size.

Typically, the surface layer is black muck 24 inches thick. Below this is black loam 5 inches thick. The underlying material extends to a depth of 89 inches. In the upper part, it is dark gray clay loam that has yellowish brown mottles. In the lower part, it is gray clay loam that has strong brown mottles.

Permeability is slow to moderately rapid in the organic material and moderate or moderately slow in the mineral material. Available water capacity is high. The shrink-swell potential is low. The seasonal high water table is within a depth of 1 foot during winter and early spring.

Included with this soil in mapping are small areas where the organic material is more than 51 inches thick. Also included are a few areas that are subject to rare flooding. Included soils make up 10 to 20 percent of most mapped areas.

Most of the acreage of the Croatan soil is used as woodland.

Corn, soybeans, and small grain can be grown if a drainage system is installed. Wetness, subsidence, and poor trafficability are the main limitations in cultivated areas. Also, logs and stumps in the muck commonly

interfere with tillage. Winter cover crops and windbreaks help to prevent excessive soil blowing. Land grading and open ditches remove surface and subsurface water.

Forested areas mainly are loblolly pine plantations. Common species include pond pine. Understory species are bayberry, holly, greenbrier, and switchcane. Wetness and poor trafficability are the main limitations affecting woodland management. Using standard wheeled and tracked equipment when the soil is wet results in ruts, compacts the soil, and damages the roots of trees. A drainage system facilitates the use of equipment, reduces the extent of the soil damage caused by forestry activities, and improves tree growth.

The seasonal high water table and the instability of the organic material are the main limitations affecting most urban and recreational uses. A better suited site should be chosen.

The land capability subclass is VIIw in undrained areas and IVw in drained areas. Based on loblolly pine as the indicator species, the woodland ordination symbol is 6W.

Cu—Currituck muck, frequently flooded. This nearly level, very poorly drained soil is in brackish marshes on both sides of the Pamlico River and along the major streams flowing into the Pamlico and Pungo Rivers. Slope is 0 to 1 percent. Individual areas are narrow to broad bands and range from 25 to 1,000 acres in size.

Typically, the surface layer is very dark gray muck 12 inches thick. Below this is very dark gray muck to a depth of 30 inches. The underlying material extends to a depth of 62 inches. It is dark grayish brown sand.

Permeability is moderate or moderately rapid. Available water capacity is moderate or high. The shrink-swell potential is low. The seasonal high water table is 1 foot above to 1 foot below the surface. This soil is frequently flooded for very long periods by river water because of wind and tidal action.

Included with this soil in mapping are a few areas of Wasda soils. These soils are organic to a depth of less than 16 inches. Also included are areas where the soil is sandy throughout. Included soils make up about 10 percent of the map unit.

Most of the acreage of the Currituck soil supports natural vegetation.

This soil is not used as cropland. Wetness and flooding are the main limitations in cultivated areas.

This soil is not used as woodland. The natural vegetation is mainly black needlerush, big cordgrass, narrowleaf cattail, southern bayberry, and scattered black willow (fig. 4). Wetness and flooding are the main limitations affecting woodland management.

This soil is not used for most types of urban development. Wetness and flooding are the main limitations affecting most urban and recreational uses. A better suited site should be chosen.

The land capability subclass is VIIIw. This soil has not been assigned a woodland ordination symbol.

Da—Dare muck. This nearly level, very poorly drained soil is in shallow depressions on uplands, mostly east of North Carolina Highways 306 and 32, north and south of the Pamlico River. Slope is 0 to 1 percent. Individual areas are irregular in shape and range from 5 to 200 acres in size.

Typically, the surface layer is black muck 12 inches thick. Below this to a depth of 61 inches also is muck. In the upper part, this muck is very dark brown. In the lower part, it is dark reddish brown. The underlying material extends to a depth of 73 inches. It is mottled gray and dark brown loamy sand stratified with sandy loam.

Permeability is slow. Available water capacity is very high. The shrink-swell potential is low. The seasonal high water table is within a depth of 1 foot during winter and early spring.

Included with this soil in mapping are small areas of Wasda, Belhaven, and Ponzer soils. These soils are intermingled with areas of the Dare soil. Wasda soils are organic to a depth of less than 16 inches. Belhaven and Ponzer soils are organic to a depth of less than 51 inches. Also included are areas that are subject to rare flooding. Included soils make up about 20 percent of most mapped areas.

Most of the acreage of the Dare soil is used as woodland. Some large areas have been cleared of trees and drained and are used as cropland.

In drained areas the major crops are corn and soybeans. Wetness, subsidence, and low strength are the main limitations in cultivated areas. Spring tillage and fall harvest may be delayed because of the wetness. Large applications of lime are necessary to prepare the soil for crop production. The burning of windrows must be carefully monitored because the soil is flammable when it is not saturated. Soil blowing is a hazard during spring planting. Conservation tillage, field borders, and windbreaks reduce the hazard of soil blowing.

Forested areas support mixed hardwoods and pine. Common species include water tupelo, baldcypress, pond pine, and loblolly pine. Understory species include red maple, southern bayberry, holly, greenbrier, and inkberry. Wetness and low strength are the main limitations affecting woodland management. Using standard wheeled and tracked equipment when the soil is wet results in ruts, compacts the soil, and damages the roots of trees. A drainage system facilitates the use

Figure 4.—An area of Currituck muck, frequently flooded. The natural vegetation is black needlerush, big cordgrass, and scattered black willow.

of equipment, reduces the extent of the soil damage caused by forestry activities, and improves tree growth.

Wetness and a high content of organic matter are the main limitations affecting most urban and recreational uses. A better suited site should be chosen.

The land capability subclass is IVw in drained areas and VIIw in undrained areas. Based on loblolly pine as the indicator species, the woodland ordination symbol is 5W.

DgB—Dogue fine sandy loam, 1 to 4 percent slopes. This gently sloping, moderately well drained soil is on slightly rounded ridges on marine terraces in the eastern part of the county, north and south of the Pamlico River. Slope ranges from 1 to 4 percent. Individual areas are elliptical and range from 10 to more than 70 acres in size.

Typically, the surface layer is light olive brown fine sandy loam 7 inches thick. The subsoil extends to a depth of 50 inches. In sequence downward, it is brownish yellow sandy clay that has pale brown and strong brown mottles, brownish yellow sandy clay that has light gray and yellowish red mottles, brownish yellow clay that has light gray and yellowish red mottles, and mottled brownish yellow, light gray, and yellowish brown sandy clay loam that has pockets of clay loam. The underlying material extends to a depth of 64 inches. It is light gray sandy clay loam that has yellowish brown and strong brown mottles.

Permeability is moderately slow. Available water

capacity is moderate or high. The shrink-swell potential is moderate. The seasonal high water table is at a depth of 1.5 to 3.0 feet during winter and early spring.

Included with this soil in mapping are small areas of the somewhat poorly drained Wahee soils. These soils are intermingled with areas of the Dogue soil. Also included are a few areas that are subject to rare flooding. Included soils make up about 10 percent of most mapped areas.

Most of the acreage of the Dogue soil is used as cropland. The rest is used mainly as woodland.

The major crops are corn, soybeans, tobacco, and small grain. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and productivity. Minimum tillage, no-till planting, field borders, and a cropping system that includes close-growing crops conserve soil and water. The moderately slow permeability in the subsoil limits the effectiveness of drainage systems.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, sweetgum, white oak, yellow-poplar, and southern red oak. Understory species are American holly, dogwood, sourwood, and blueberry. Wetness is the main limitation affecting woodland management. Seedlings and the seeds of trees survive and grow well if competing vegetation is controlled or removed by properly preparing the site, spraying, cutting, or girdling. The use of planting and harvesting equipment is limited by a high content of clay in the subsoil, especially during wet periods.

Wetness and the slow permeability are the main limitations affecting most urban and recreational uses. The wetness can be reduced by a drainage system.

The land capability subclass is IIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9C.

Do—Dorovan mucky peat, frequently flooded. This nearly level, very poorly drained organic soil is in wooded areas on the flood plains along the Pamlico River and its tributaries. Slope is 0 to 1 percent. Individual areas are irregular in shape and range from 25 to more than 100 acres in size.

Typically, the surface layer is very dark brown mucky peat 3 inches thick. Below this to a depth of 63 inches is black muck. The underlying material extends to a depth of 80 inches. It is gray sand and has fragments of partially decayed wood.

Permeability is moderate. Available water capacity is very high. The shrink-swell potential is low. The seasonal high water table ranges from 1.0 foot above the surface to 0.5 foot below, but usually is at or above the surface. This soil is frequently flooded for very long periods.

Included with this soil in mapping are small areas of Currituck soils. These soils are organic to a depth of less than 51 inches. Also included are a few areas that have a thin layer of mineral material over the mucky peat. Included soils make up about 10 to 20 percent of most mapped areas.

All areas of the Dorovan soil are used as woodland.

This soil is not used as cropland. Flooding and wetness are the main limitations affecting cultivation. A lack of suitable outlets limits the effectiveness of drainage systems.

Native species include red maple, blackgum, sweetgum, and baldcypress. Wetness, flooding, and low strength are the main limitations affecting woodland management. The seedling mortality rate can be very high. The use of planting and harvesting equipment is very limited because of the wetness and the instability of the organic material.

Wetness, flooding, and the instability of the organic matter are the main limitations affecting most urban and recreational uses. A better suited site should be chosen.

The land capability subclass is VIIw. Based on sweetgum as the indicator species, the woodland ordination symbol is 5W.

Ds—Dragston fine sandy loam. This nearly level, somewhat poorly drained soil is on smooth flats on stream and marine terraces throughout the county. Slope is 0 to 1 percent. Individual areas are oblong and range from 5 to 25 acres in size.

Typically, the surface layer is dark grayish brown fine sandy loam 6 inches thick. The subsurface layer is 4 inches thick. It is light yellowish brown fine sandy loam that has light brownish gray mottles. The subsoil extends to a depth of 42 inches. In the upper part, it is light yellowish brown sandy loam that has light brownish gray mottles. In the lower part, it is light brownish gray sandy loam that has olive yellow mottles. The underlying material extends to a depth of 60 inches. It is light gray loamy sand that has light yellowish brown mottles and pockets of sandy loam.

Permeability is moderately rapid. Available water capacity is low or moderate. The shrink-swell potential is low. The seasonal high water table is at a depth of 1.0 to 2.5 feet during winter and early spring.

Included with this soil in mapping are small areas of Augusta soils. These soils have more clay in the subsoil than the Dragston soil. They are intermingled with areas of the Dragston soil. They make up about 20 percent of most mapped areas.

Most of the acreage of the Dragston soil is used as cropland. The rest is used mainly as woodland.

The major crops are corn, soybeans, tobacco, and

small grain. Wetness is the main limitation in cultivated areas. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and productivity. Minimum tillage, no-till planting, field borders, and a cropping system that includes close-growing crops conserve soil and water. A drainage system generally is necessary to prevent damage to tobacco during wet periods.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, sweetgum, southern red oak, white oak, and yellow-poplar. Understory species are American holly, dogwood, and greenbrier. Slight limitations affect woodland management. Seedlings and the seeds of trees survive and grow well if competing vegetation is controlled or removed by properly preparing the site, spraying, cutting, or girdling. The use of planting and harvesting equipment is moderately limited because of seasonal wetness.

Wetness is the main limitation affecting most urban and recreational uses. It can be reduced by a drainage system consisting of perforated drain tile, ditches, or both.

The land capability subclass is IIw in drained areas and IIIw in undrained areas. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8W.

GoA—Goldsboro fine sandy loam, 0 to 2 percent slopes. This nearly level, moderately well drained soil is on broad interstream divides and smooth ridges in the uplands in the western part of the county, north and south of the Pamlico River. Slope ranges from 0 to 2 percent. Individual areas are oblong and range from 5 to 50 acres in size.

Typically, the surface layer is dark grayish brown fine sandy loam 9 inches thick. The subsoil extends to a depth of 69 inches. In sequence downward, it is brownish yellow sandy clay loam, brownish yellow sandy clay loam that has strong brown and light gray mottles, brownish yellow sandy clay loam that has light gray mottles, light yellowish brown sandy clay loam that has gray and reddish brown mottles and pockets of sandy loam, and pale brown sandy clay loam that has light gray mottles.

Permeability is moderate. Available water capacity also is moderate. The shrink-swell potential is low. The seasonal high water table is at a depth of 2 to 3 feet during winter and early spring.

Included with this soil in mapping are small areas of the somewhat poorly drained Lynchburg soils. These soils are in slight depressions. Also included, mostly in the northwestern part of the county, are some soils that have more silt in the subsoil than the Goldsboro soil. Included soils make up about 10 percent of most mapped areas.

Most of the acreage of the Goldsboro soil is used as cropland. The rest is used mainly as woodland.

The major crops are corn, soybeans, tobacco, and small grain. Wetness and ponding in low areas during periods of heavy rainfall are the main limitations in cultivated areas. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and productivity. Minimum tillage, no-till planting, field borders, and a cropping system that includes close-growing crops conserve soil and water. A drainage system generally is necessary to prevent damage to tobacco during wet periods.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, sweetgum, southern red oak, red maple, and white oak. Understory species are American holly, dogwood, and greenbrier. Slight limitations affect woodland management. Seedlings and the seeds of trees survive and grow well if competing vegetation is controlled or removed by properly preparing the site, spraying, cutting, or girdling.

Wetness is the main limitation affecting most urban and recreational uses. It can be reduced by a drainage system consisting of perforated drain tile, ditches, or both.

The land capability subclass is IIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9A.

Hy—Hyde loam. This nearly level, very poorly drained soil is on marine terraces and in shallow depressions in the eastern part of the county, north and south of the Pamlico River. Slope is 0 to 1 percent. Individual areas are irregular in shape and range from 10 to 500 acres in size.

Typically, the surface layer is very dark grayish brown loam 14 inches thick. The subsoil extends to a depth of 50 inches. In sequence downward, it is grayish brown loam, grayish brown silty clay loam that has dark gray mottles, dark grayish brown silty clay loam that has brown mottles, and grayish brown silty clay loam that has yellowish brown mottles. The underlying material extends to a depth of 60 inches. It is light brownish gray sandy loam.

Permeability is moderately slow. Available water capacity is high. The shrink-swell potential is low. The seasonal high water table is within a depth of 1.5 feet during winter and early spring.

Included with this soil in mapping are small areas of Cape Fear and Portsmouth soils. Cape Fear soils have more clay in the subsoil than the Hyde soil. Portsmouth soils have less silt in the subsoil than the Hyde soil.

The Cape Fear and Portsmouth soils are intermingled with areas of the Hyde soil. Included soils make up about 20 percent of most mapped areas.

Most of the acreage of the Hyde soil is used as cropland. The rest is used mainly as woodland.

In drained areas the major crops are corn, wheat, and soybeans. Wetness is the main limitation in cultivated areas. Winter cover crops, conservation tillage, cover crops, and a cropping system that includes grasses and legumes can help to maintain tilth and productivity. Tillage may be delayed in spring because of the wetness. A lack of suitable outlets and the moderately slow permeability limit the effectiveness of drainage systems.

Forested areas support mixed hardwoods and pine. Common species include blackgum, water oak, sweetgum, baldcypress, pond pine, and loblolly pine. Understory species are American holly, southern bayberry, sweetbay, giant cane, switchcane, red maple, and greenbrier. Wetness is the main limitation affecting woodland management. Using standard wheeled and tracked equipment when the soil is wet results in ruts, compacts the soil, and damages the roots of trees. A drainage system facilitates the use of equipment, reduces the extent of the soil damage caused by forestry activities, and improves tree growth.

Wetness and the moderately slow permeability are the main limitations affecting most urban and recreational uses. The wetness can be reduced by a drainage system consisting of perforated drain tile, ditches, or both.

The land capability subclass is IIIw in drained areas and VIw in undrained areas. Based on loblolly pine as the indicator species, the woodland ordination symbol is 10W.

La—Leaf silt loam. This nearly level, poorly drained soil is on broad interstream flats and in shallow depressions in the uplands in the western part of the county, north and south of the Pamlico River. Slope is 0 to 1 percent. Individual areas are irregular in shape and range from 20 to more than 300 acres in size.

Typically, the surface layer is very dark gray silt loam 4 inches thick. The subsurface layer is gray silt loam 3 inches thick. The subsoil extends to a depth of 64 inches. In sequence downward, it is light gray silty clay that has brownish yellow and strong brown mottles; light gray clay that has yellowish red and reddish yellow mottles; light gray clay that has yellowish red, reddish yellow, and gray mottles; and dark gray clay that has yellow mottles.

Permeability is very slow. Available water capacity is high. The shrink-swell potential also is high. The seasonal high water table is at a depth of 0.5 foot to 1.5 feet during winter and early spring. Some areas are ponded for brief periods.

Included with this soil in mapping are small areas of the somewhat poorly drained Lenoir soils. These soils are on the slightly higher knolls. They make up about 15 percent of most mapped areas.

Most of the acreage of the Leaf soil is used as woodland. The rest is used mainly as cropland.

In drained areas the major crops are corn and soybeans. This soil rarely is used for tobacco. Wetness is the main limitation in cultivated areas. Conservation tillage, cover crops, and a cropping system that includes grasses and legumes can help to maintain tilth and productivity. Tillage may be delayed in spring because of the wetness. A lack of suitable outlets and the very slow permeability limit the effectiveness of drainage systems.

Forested areas support mixed hardwoods and pine. Common species include water oak, sweetgum, and loblolly pine. Understory species are sweetbay, blackberry, and switchcane. Wetness is the main limitation affecting woodland management. Using standard wheeled and tracked equipment when the soil is wet results in ruts, compacts the soil, and damages the roots of trees. A drainage system facilitates the use of equipment, reduces the extent of the soil damage caused by forestry activities, and improves tree growth.

Wetness and the very slow permeability are the main limitations affecting most urban and recreational uses. The wetness can be reduced by a drainage system.

The land capability subclass is VIw in undrained areas and IVw in drained areas. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9W.

Le—Lenoir loam. This nearly level, somewhat poorly drained soil is on broad interstream flats and in shallow depressions on uplands in the western part of the county. Slope is 0 to 1 percent. Individual areas are irregular in shape and range from 10 to 100 acres in size.

Typically, the surface layer is very dark gray loam 3 inches thick. The subsurface layer is dark gray loam 5 inches thick. The subsoil extends to a depth of 75 inches. In sequence downward, it is brownish yellow clay loam that has light brownish gray, pale brown, and light yellowish brown mottles; gray clay that has brownish yellow mottles; gray sandy clay that has brownish yellow mottles; and light gray clay that has lenses of sandy clay.

Permeability is slow. Available water capacity is moderate. The shrink-swell potential also is moderate. The seasonal high water table is at a depth of 1.0 to 2.5 feet during winter and early spring.

Included with this soil in mapping are smalls areas of the poorly drained Leaf soils and the moderately well drained Craven soils. Leaf soils are in shallow depressions. Craven soils are on the slightly higher knolls. Included soils make up about 15 percent of most mapped areas.

Most of the acreage of the Lenoir soil is use as woodland. The rest is used mainly as cropland.

In drained areas the major crops are corn and soybeans. Tobacco is grown only in areas where a drainage system consisting of ditching and land shaping has been installed. Wetness and the slow permeability are the main limitations in cultivated areas. Some of the low areas are subject to flooding during winter and spring. Conservation tillage, cover crops, and a cropping system that includes grasses and legumes can help to maintain tilth and productivity. Tillage may be delayed in spring because of the wetness. A lack of suitable outlets and the slow permeability limit the effectiveness of drainage systems.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, sweetgum, white oak, and southern red oak. Understory species are American holly, dogwood, red maple, and greenbrier. Wetness is the main limitation affecting woodland management. Seedlings have moderate potential for survival and growth if competing vegetation is controlled or removed by properly preparing the site, spraying, cutting, or girdling. The use of planting and harvesting equipment is moderately limited because of the wetness.

Wetness is the main limitation affecting most urban and recreational uses. It can be reduced by a drainage system.

The land capability subclass is IIIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9W.

Lo—Leon sand. This nearly level, poorly drained soil is on broad ridges in the uplands throughout the county. Slope is 0 to 1 percent. Individual areas are oval or irregular in shape and range from 5 to 75 acres in size.

Typically, the surface layer is black sand 9 inches thick. The subsurface layer is dark grayish brown sand 9 inches thick. The subsoil extends to a depth of 44 inches. It is sand. In the upper part, it is dark brown and has dark reddish brown mottles. In the next part, it is dark brown and has very dark grayish brown mottles. In the lower part, it is brown. The underlying material extends to a depth of 72 inches. It is pale brown sand.

Permeability is moderate or moderately rapid. Available water capacity is low. The shrink-swell potential also is low. The seasonal high water table is within a depth of 1 foot during winter and early spring.

Included with this soil in mapping are small areas of the very poorly drained Torhunta soils and the moderately well drained Seabrook soils. Torhunta soils are in shallow depressions. Seabrook soils are on the slightly higher smooth ridges. Included soils make up about 20 percent of most mapped areas.

Most of the acreage of the Leon soil is used as woodland. The rest is used mainly as cropland.

The major crops are corn, soybeans, Irish potatoes, tobacco, and small grain. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and productivity. Minimum tillage, no-till planting, field borders, and a cropping system that includes close-growing crops conserve soil and water. A drainage system generally is necessary to prevent damage to tobacco during wet periods.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, longleaf pine, and water oak. Understory species includes inkberry, creeping bluestem, and greenbrier. Moderate limitations affect woodland management. Seedlings and the seeds of trees survive and grow well if competing vegetation is controlled or removed by properly preparing the site, spraying, cutting, or girdling. The use of planting and harvesting equipment is moderately limited because of wetness.

Wetness is the main limitation affecting most urban and recreational uses. It can be reduced by a drainage system consisting of perforated drain tile, ditches, or both.

The land capability subclass is IVw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 7W.

Ly—Lynchburg fine sandy loam. This nearly level, somewhat poorly drained soil is on broad interstream divides and in shallow depressions on uplands in the western part of the county. Slope is 0 to 1 percent. Individual areas are irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is dark gray fine sandy loam 7 inches thick. The subsurface layer is 3 inches thick. It is dark brown fine sandy loam that has brownish yellow mottles. The subsoil extends to a depth of 70 inches. In sequence downward, it is yellowish brown sandy clay loam that has light brownish gray mottles, light brownish gray sandy clay loam that has brown mottles, gray sandy clay loam that has yellowish brown mottles, gray clay loam that has yellowish brown and strong brown mottles, and gray sandy clay that has yellowish brown and strong brown mottles and pockets of sandy clay loam.

Permeability is moderate. Available water capacity also is moderate. The shrink-swell potential is low. The

seasonal high water table is at a depth of 0.5 foot to 1.5 feet during winter and early spring.

Included with this soil in mapping are small areas of the moderately well drained Goldsboro soils and the poorly drained Rains soils. Goldsboro soils are in the slightly higher areas. Rains soils are in slight depressions. Also included are soils having a sandy surface layer that is more than 20 inches thick. These soils are intermingled with areas of the Lynchburg soil. Included soils make up about 20 percent of most mapped areas.

Most of the acreage of the Lynchburg soil is used as cropland. The rest is used mainly as woodland.

The major crops are corn, soybeans, and small grain. Wetness is the main limitation in cultivated areas. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and productivity. Minimum tillage, no-till planting, field borders, and a cropping system that includes close-growing crops conserve soil and water. A drainage system is needed for crops that are sensitive to wetness.

Forested areas mainly support pine. Some areas support hardwoods. Common species include loblolly pine, yellow-poplar, sweetgum, southern red oak, and white oak. Moderate limitations affect woodland management. Seedlings and the seeds of trees survive and grow well if competing vegetation is controlled or removed by properly preparing the site, spraying, cutting, or girdling. The use of planting and harvesting equipment is moderately limited because of wetness.

Wetness is the main limitation affecting most urban and recreational uses. It can be reduced by a drainage system consisting of perforated drain tile, ditches, or both.

The land capability subclass is IIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9W.

Me—Muckalee loam, frequently flooded. This nearly level, poorly drained soil is on flood plains along small streams that flow into the Pamlico River. Slope is 0 to 1 percent. Individual areas are oblong and range from 5 to 50 acres in size.

Typically, the surface layer is dark grayish brown loam 12 inches thick. The underlying material extends to a depth of 60 inches. In the upper part, it is gray sandy loam that has yellowish brown mottles and thin lenses of loamy sand and sandy clay loam. In the lower part, it is gray sandy loam that has very dark gray mottles and thin lenses of sandy clay loam and sand.

Permeability is moderate. Available water capacity also is moderate. The shrink-swell potential is low. The seasonal high water table is at a depth of 0.5 foot to 1.5 feet during winter and early spring. This soil is frequently flooded for brief periods.

Included with this soil in mapping are small areas of Dorovan soils. These soils have organic layers. Also included are soils that are sandy below the surface layer. Included soils make up about 10 percent of most mapped areas.

All areas of the Muckalee soil are used as woodland.

This soil is not used as cropland. Flooding and wetness are the main limitations affecting cultivation. A lack of suitable outlets limits the effectiveness of drainage systems.

Forested areas support mixed hardwoods and pine. Common species include baldcypress, green ash, sweetgum, water oak, and loblolly pine. Understory species are greenbrier, ironwood, and inkberry. Wetness and flooding are the main limitations affecting woodland management. The seedling mortality rate can be very high. The use of planting and harvesting equipment is very limited because of the wetness and the instability of the soil material.

Flooding and wetness are the main limitations affecting most urban and recreational uses. A better suited site should be chosen.

The land capability subclass is Vw. Based on sweetgum as the indicator species, the woodland ordination symbol is 7W.

Pa—Pantego loam. This nearly level, very poorly drained soil is on broad flats and in shallow depressions on uplands in the western part of the county, north and south of the Pamlico River. Slope is 0 to 1 percent. Individual areas are oblong and range from 10 to more than 100 acres in size.

Typically, the surface layer is very dark brown loam 10 inches thick. The subsoil extends to a depth of 68 inches. It is sandy clay loam. In sequence downward, it is dark grayish brown and has yellowish brown and light gray mottles; gray and has brownish yellow mottles; light gray and has yellowish brown, gray, and red mottles; and light gray and has yellowish brown and red mottles.

Permeability is moderate. Available water capacity is high. The shrink-swell potential is low. The seasonal high water table is within a depth of 1.5 feet during winter and early spring.

Included with this soil in mapping are small areas of the poorly drained Rains soils. These soils are in the slightly higher areas. Also included are soils that have a firm, slowly permeable subsoil. Included soils make up about 20 percent of most mapped areas.

Most of the acreage of the Pantego soil is used as woodland. The rest is used mainly as cropland.

In drained areas the major crops are corn and

soybeans. Wetness is the main limitation in cultivated areas. In some areas installing a drainage system is impractical because of a lack of suitable outlets and severe wetness. Ponding occurs for brief periods in low areas.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, willow oak, and water oak. Pond pine and baldcypress grow in some areas. Understory species are sweetbay, red maple, large gallberry, and southern bayberry. Wetness is the main limitation affecting woodland management. Using standard wheeled and tracked equipment when the soil is wet results in ruts, compacts the soil, and damages the roots of trees. A drainage system facilitates the use of equipment, reduces the extent of the soil damage caused by forestry activities, and improves tree growth.

Wetness is the main limitation affecting most urban and recreational uses. It can be reduced by a drainage system consisting of perforated drain tile, ditches, or both.

The land capability subclass is IIIw in drained areas and VIw in undrained areas. Based on loblolly pine as the indicator species, the woodland ordination symbol is 10W.

Pe—Perquimans silt loam. This nearly level, poorly drained soil is on broad flats and in shallow depressions on uplands in the eastern part of the county, mostly north of the Pamlico River. Slope is 0 to 1 percent. Individual areas are irregular in shape and range from 5 to more than 50 acres in size.

Typically, the surface layer is dark grayish brown silt loam 5 inches thick. The subsurface layer is grayish brown silt loam 3 inches thick. The subsoil extends to a depth of 62 inches. In sequence downward, it is light brownish gray silty clay loam that has dark grayish brown and yellowish brown mottles, light brownish gray silty clay loam that has yellowish brown and pale yellow mottles, light gray silty clay loam that has yellow and yellowish brown mottles, and light gray silt loam that has yellow mottles.

Permeability is moderately slow. Available water capacity is high. The shrink-swell potential is low. The seasonal high water table is within a depth of 1 foot during winter and early spring.

Included with this soil in mapping are small areas of Tomotley soils and the very poorly drained Arapahoe soils. Tomotley soils have less silt in the subsoil than the Perquimans soil. They are intermingled with areas of the Perquimans soil. Arapahoe soils are in shallow depressions. Included soils make up about 15 percent of most mapped areas.

Most of the acreage of the Perquimans soil is used as cropland. The rest is used mainly as woodland.

The major crops are corn, soybeans, tobacco, and small grain. Wetness is the main limitation in cultivated areas. Conservation tillage and cover crops help to maintain tilth and productivity. Tillage may be delayed in spring because of the wetness. In some areas a lack of suitable outlets limits the effectiveness of drainage systems.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, sweetgum, water oak, and green ash. Understory species are giant cane, sweetbay, waxmyrtle, large gallberry, and greenbrier. Wetness is the main limitation affecting woodland management. Using standard wheeled and tracked equipment when the soil is wet results in ruts, compacts the soil, and damages the roots of trees. A drainage system facilitates the use of equipment, reduces the extent of the soil damage caused by forestry activities, and improves tree growth.

Wetness and the moderately slow permeability are the main limitations affecting most urban and recreational uses. It can be reduced by a drainage system consisting of perforated drain tile, ditches, or both.

The land capability subclass is IIIw in drained areas and VIw in undrained areas. Based on loblolly pine as the indicator species, the woodland ordination symbol is 10W.

Pm—Pits, mine. This map unit consists of deep excavated areas from which phosphate rock or material for road fill has been removed. The road fill is used near active mines. Most areas of this map unit are near Aurora in the southeastern part of the county, south of the Pamlico River. Individual areas range from 5 to 1,000 acres in size. Some pits contain large areas of water.

Onsite investigation is needed before the use and management of specific areas are planned.

The land capability subclass is VIIIs. This map unit has not been assigned a woodland ordination symbol.

Po—Ponzer muck. This nearly level, very poorly drained soil is on broad flats and in shallow depressions on uplands in the eastern part of the county, north and south of the Pamlico River. Slope is 0 to 1 percent. Individual areas are oblong and range from 50 to 100 acres in size.

Typically, the surface layer is black muck 7 inches thick. Below this to a depth of 37 inches is black muck. Next is dark brown fine sandy loam. The underlying material extends to a depth of 61 inches. In the upper part, it is grayish brown fine sandy loam. In the lower part, it is dark grayish brown loamy fine sand.

Permeability is moderately slow or slow. Available

water capacity is high. The shrink-swell potential is low. The seasonal high water table is at the surface to 1 foot below the surface during winter and early spring. This soil is subject to rare flooding.

Included with this soil in mapping are small areas of Dare and Wasda soils. Dare soils are organic to a depth of more than 51 inches. Wasda soils are organic to a depth of less than 16 inches. The Dare and Wasda soils are intermingled with areas of the Ponzer soil. They make up about 15 percent of most mapped areas.

Most of the acreage of the Ponzer soil is used as woodland. A few large areas have been cleared of trees and are used as cropland.

In drained areas the major crops are corn, soybeans, and small grain. Wetness and poor trafficability are the main limitations in cultivated areas. Winter cover crops and a properly maintained drainage system conserve soil and water. Windbreaks help to prevent excessive soil blowing.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, pond pine, redbay, red maple, sweetgum, and sweetbay. Understory species are southern bayberry, American holly, greenbrier, and switchcane. Wetness and poor trafficability are the main limitations affecting woodland management. Using standard wheeled and tracked equipment when the soil is wet results in ruts, compacts the soil, and damages the roots of trees. A drainage system facilitates the use of equipment, reduces the extent of the soil damage caused by forestry activities, and improves tree growth.

Wetness, flooding, and the instability of the organic material are the main limitations affecting most urban and recreational uses. A better suited site should be chosen.

The land capability subclass is VIIw in undrained areas and IVw in drained areas. Based on loblolly pine as the indicator species, the woodland ordination symbol is 6W.

Pt—Portsmouth loam. This nearly level, very poorly drained soil is on broad flats and in shallow depressions on river and stream terraces in the eastern part of the county, north and south of the Pamlico River. Slope is 0 to 1 percent. Individual areas are oblong and range from 25 to 300 acres in size.

Typically, the surface layer is 18 inches thick. The upper part is very dark brown loam. The lower part is very dark grayish brown loam. The subsoil extends to a depth of 38 inches. In the upper part, it is dark grayish brown sandy clay loam that has yellowish brown mottles and lenses of sandy clay. In the next part, it is gray sandy clay loam that has brown mottles and lenses of clay. In the lower part, it is dark grayish brown sandy loam that has brown mottles and lenses of sandy clay. The underlying material extends to a depth of 60 inches. In the upper part, it is gray loamy sand that has pale olive mottles. In the lower part, it is gray loamy sand that has lenses of fine sandy loam and clay loam.

Permeability is moderate in the subsoil and rapid in the underlying material. Available water capacity is moderate. The shrink-swell potential is low. The seasonal high water table is within a depth of 1 foot during winter and early spring.

Included with this soil in mapping are small areas of Cape Fear and Arapahoe soils. Cape Fear soils have more clay in the subsoil than the Portsmouth soil and Arapahoe soils have less. These soils are intermingled with areas of the Portsmouth soil. Included soils make up about 15 percent of most mapped areas.

Most of the acreage of the Portsmouth soil is used as woodland or cropland.

In drained areas the major crops are corn, soybeans, and small grain. In many areas installing a drainage system is impractical because of a lack of suitable outlets and severe wetness.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, water oak, sweetgum, red maple, and willow oak. Understory species are redbay, sweetbay, inkberry, switchcane, greenbrier, and southern bayberry. Wetness is the main limitation affecting woodland management. Using standard wheeled and tracked equipment when the soil is wet results in ruts, compacts the soil, and damages the roots of trees. A drainage system facilitates the use of equipment, reduces the extent of the soil damage caused by forestry activities, and improves tree growth.

Wetness is the main limitation affecting most urban and recreational uses. It can be reduced by a drainage system.

The land capability subclass is IIIw in drained areas and VIw in undrained areas. Based on loblolly pine as the indicator species, the woodland ordination symbol is 10W.

Ra—Rains fine sandy loam. This nearly level, poorly drained soil is on broad interstream divides and in shallow depressions on uplands in the western part of the county. Slope is 0 to 1 percent. Individual areas are irregular in shape and range from 4 to more than 50 acres in size.

Typically, the surface layer is dark gray fine sandy loam 10 inches thick. The subsoil extends to a depth of 65 inches. In sequence downward, it is gray sandy clay loam that has reddish yellow and yellowish red mottles, gray sandy clay loam that has reddish brown and reddish yellow mottles, light gray sandy clay loam that has red and brownish yellow mottles and pockets of

sandy clay, and light gray sandy clay that has yellowish brown and yellow mottles and pockets of sandy clay loam.

Permeability is moderate. Available water capacity also is moderate. The shrink-swell potential is low. The seasonal high water table is within a depth of 1 foot during winter and early spring. Some areas are ponded for brief periods.

Included with this soil in mapping are small areas of the somewhat poorly drained Lynchburg soils and the very poorly drained Pantego soils. Lynchburg soils are in the slightly higher areas. Pantego soils are in shallow depressions. Included soils make up about 15 percent of most mapped areas.

Most of the acreage of the Rains soil is used as woodland. The rest is used mainly as cropland.

In drained areas the major crops are corn, soybeans, tobacco, and small grain. Wetness is the main limitation in cultivated areas. Conservation tillage and cover crops help to maintain tilth and productivity. Tillage may be delayed in spring because of the wetness. In some areas a lack of suitable outlets limits the effectiveness of drainage systems.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, sweetgum, red maple, and water oak. Understory species are giant cane, large gallberry, and sweet pepperbush. Wetness is the main limitation affecting woodland management. Using standard wheeled and tracked equipment when the soil is wet results in ruts, compacts the soil, and damages the roots of trees. A drainage system can improve tree growth, facilitate the use of equipment, and reduce the extent of the soil damage caused by forestry activities.

Wetness is the main limitation affecting most urban and recreational uses. It can be reduced by a drainage system consisting of perforated drain tile, ditches, or both.

The land capability subclass is IIIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9W.

Ro—Roanoke fine sandy loam. This nearly level, poorly drained soil is on broad flats and in shallow depressions on river and stream terraces in the eastern part of the county. Slope is 0 to 1 percent. Individual areas are irregular in shape and range from 10 to more than 100 acres in size.

Typically, the surface layer is grayish brown fine sandy loam 6 inches thick. The subsoil extends to a depth of 56 inches. In sequence downward, it is gray clay that has brownish yellow and reddish brown mottles; gray clay that has yellowish brown mottles; mottled dark gray, light gray, brownish yellow, and strong brown clay loam that has pockets of sandy clay loam; and light gray sandy clay loam that has brownish yellow and strong brown mottles and pockets of clay. The underlying material extends to a depth of 65 inches. It is mottled light gray and brownish yellow sandy loam that has lenses of sandy clay loam.

Permeability is slow. Available water capacity is moderate. The shrink-swell potential also is moderate. The seasonal high water table is within a depth of 1 foot during winter and early spring. Low areas are subject to rare flooding.

Included with this soil in mapping are small areas of the somewhat poorly drained Wahee soils. These soils are in the slightly higher areas. Also included near streams are low areas that are subject to flooding. Included soils make up about 25 percent of most mapped areas.

Most of the acreage of the Roanoke soil is used as cropland. The rest is used mainly as woodland.

In drained areas the major crops are corn, soybeans, and small grain. Wetness is the main limitation in cultivated areas. Conservation tillage, cover crops, and a cropping system that includes grasses and legumes can help to maintain tilth and productivity. Tillage may be delayed in spring because of the wetness. A lack of suitable outlets and the slow permeability limit the effectiveness of drainage systems.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, sweetgum, yellow-poplar, willow oak, and water oak. Understory species are greenbrier, American holly, and blueberry. Wetness is the main limitation affecting woodland management. Using standard wheeled and tracked equipment when the soil is wet results in ruts, compacts the soil, and damages the roots of trees. A drainage system can improve tree growth, facilitate the use of equipment, and reduce the extent of the soil damage caused by forestry activities.

Wetness is the main limitation affecting most urban and recreational uses. It can be reduced by a drainage system. Rare flooding is a hazard in a few low areas.

The land capability subclass is IIIw in drained areas and IVw in undrained areas. Based on loblolly pine as the indicator species, the woodland ordination symbol is 10W.

Sb—Seabrook loamy sand. This nearly level, moderately well drained soil is on smooth ridges on river and stream terraces, mostly in the central part of the county. Slope ranges from 0 to 2 percent. Individual areas are irregular in shape and range from 5 to 20 acres in size.

Typically, the surface layer is grayish brown loamy sand 8 inches thick. The underlying material extends to

a depth of 80 inches. In the upper part, it is light olive brown loamy sand that has olive yellow and light gray mottles. In the next part, it is pale yellow loamy sand that has yellowish brown and light gray mottles. In the lower part, it is light gray sand.

Permeability is rapid. Available water capacity is low. The shrink-swell potential also is low. The seasonal high water table is at a depth of 2 to 4 feet during winter and early spring.

Included with this soil in mapping are small areas of the somewhat excessively drained Tarboro soils. These soils are in the slightly higher areas. Also included are a few low areas that are subject to rare flooding. Included soils make up about 10 percent of most mapped areas.

Most areas of the Seabrook soil are used as cropland or woodland.

The major crops are corn, soybeans, tobacco, and small grain. Wetness and leaching of plant nutrients are the main limitations in cultivated areas. The low available water capacity is a limitation during dry periods. Winter cover crops, conservation tillage, field borders, a cropping system that includes close-growing crops, and crop residue management help to maintain tilth and productivity. A drainage system generally is necessary to prevent damage to tobacco during wet periods. Fertilizers, especially nitrogen, should be added in split applications.

Forested areas mainly support pine. Common species include loblolly pine and longleaf pine. Understory species are little bluestem, switchgrass, and large gallberry. Droughtiness is the main limitation affecting woodland management. Seedlings and the seeds of trees survive and grow well if competing vegetation is controlled or removed by properly preparing the site, spraying, cutting, or girdling.

Wetness is the main limitation affecting most urban and recreational uses. It can be reduced by a drainage system consisting of perforated drain tile, ditches, or both.

The land capability subclass is IIIs. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8S.

Se—Seabrook-Urban land complex. This map unit occurs as areas of a nearly level, moderately well drained Seabrook soil and areas of Urban land. It is about 40 percent Seabrook soil and 30 to 40 percent Urban land. The Seabrook soil and Urban land occur as areas too small or too intricately mixed to be mapped separately at the scale used. This unit is on broad, smooth terraces along the Pamlico River in the city of Washington and the town of Washington Park. Slope ranges from 0 to 2 percent. Individual areas are irregular in shape and range from 3 to more than 100 acres in size.

Typically, the surface layer of the Seabrook soil is grayish brown loamy sand 8 inches thick. The underlying material extends to a depth of 80 inches. In the upper part, it is light olive brown loamy sand that has olive yellow and light gray mottles. In the next part, it is pale yellow loamy sand that has yellowish brown and light gray mottles. In the lower part, it is light gray sand.

Permeability is rapid in the Seabrook soil. Available water capacity is low. The shrink-swell potential also is low. The seasonal high water table is at a depth of 2 to 4 feet during winter and early spring.

Urban land consists of areas where the original soil has been cut, filled, graded, paved, or otherwise modified. Most soil properties have been so altered that a soil series is not recognizable. These areas are used as sites for parking lots, roads and streets, sidewalks, apartment complexes, or other closely spaced buildings. The extent of site modification varies greatly. Many areas have been subject to little disturbance, whereas others have been extensively graded or filled.

Included in this unit in mapping are small areas of Altavista soils, the well drained State soils, and the very poorly drained Torhunta soils. Altavista soils are intermingled with areas of the Seabrook soil and Urban land. State soils are on the higher ridges. Torhunta soils are in the lower areas. Also included are a few low areas that are subject to rare flooding. Included soils make up about 10 to 20 percent of most mapped areas.

Most of the acreage of the Seabrook soil and Urban land is used for urban development. This unit is not used as cropland or woodland.

Wetness is the main limitation affecting urban development in areas of the Seabrook soil. It can be reduced by a drainage system consisting of perforated drain tile, ditches, or both. Rare flooding is a hazard in a few low areas. Onsite investigation is generally necessary before the use and management of these areas can be planned.

The land capability subclass of the Seabrook soil is IIIs, and that of the Urban land is VIIIs. This map unit has not been assigned a woodland ordination symbol.

StA—State sandy loam, 0 to 3 percent slopes. This nearly level, well drained soil is on smooth ridges on river and stream terraces. Slope ranges from 0 to 3 percent. Individual areas are oblong and range from 5 to 50 acres in size.

Typically, the surface layer is very dark grayish brown sandy loam 6 inches thick. The subsurface layer is light yellowish brown sandy loam 12 inches thick. The subsoil extends to a depth of 44 inches. It is yellowish

brown sandy clay loam. In the upper part, it has yellowish red mottles. In the lower part, it has pale brown mottles. The underlying material extends to a depth of 60 inches. It is light yellowish brown sandy loam that has lenses of sandy clay and gray mottles in the lower part.

Permeability is moderate. Available water capacity also is moderate. The shrink-swell potential is low. The seasonal high water table is at a depth of 4 to 6 feet during winter and early spring. This soil is subject to rare flooding.

Included with this soil in mapping are small areas of Conetoe, Tarboro, and Altavista soils. Conetoe and Tarboro soils have less clay in the subsoil than the State soil. Altavista soils are moderately well drained. They are in depressions. Also included are a few low areas that are subject to flooding. Included soils make up about 20 percent of most mapped areas.

Most of the acreage of the State soil is used as cropland. The rest is used mainly as woodland.

The major crops are corn, soybeans, tobacco, and small grain. Slight limitations affect cultivated areas. Winter cover crops, conservation tillage, and crop residue management help to control runoff and erosion and maintain tilth and organic matter content. Minimum tillage, no-till planting, field borders, and a cropping system that includes close-growing crops conserve soil and water.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, yellow-poplar, and southern red oak. Understory species are dogwood, blueberry, greenbrier, American holly, and sourwood. Seedlings and the seeds of trees survive and grow well if competing vegetation is controlled or removed by properly preparing the site, spraying, cutting, or girdling. No limitations affect the use of planting and harvesting equipment.

Slight to moderate limitations affect most urban and recreational uses.

The land capability class is I. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9A.

TaB—Tarboro sand, 0 to 5 percent slopes. This nearly level and gently sloping, somewhat excessively drained soil is on smooth or slightly rounded ridges on river and stream terraces, mostly in the central part of the county. Slope ranges from 0 to 5 percent. Individual areas are oblong and range from 10 to more than 50 acres in size.

Typically, the surface layer is dark yellowish brown sand 8 inches thick. The underlying material extends to a depth of 72 inches. In sequence downward, it is strong brown sand, strong brown sand that has white mottles, brownish yellow sand, and yellow sand.

Permeability is rapid. Available water capacity is low. The shrink-swell potential also is low. The seasonal high water table is at a depth of more than 6 feet.

Included with this soil in mapping are small areas of the well drained Conetoe soils and the moderately well drained Seabrook soils. Conetoe soils are intermingled with areas of the Tarboro soil. Seabrook soils are in shallow depressions. Included soils make up about 15 percent of most mapped areas.

Most of the acreage of the Tarboro soil is used as cropland. The rest is used mainly as woodland.

The major crops are tobacco, corn, and soybeans. Droughtiness is the main limitation in cultivated areas. Because of the low available water capacity and leaching of plant nutrients, applications of fertilizer and irrigation are needed for most crops. Blowing sand may damage young plants. Crop residue management and windbreaks are common. Fertilizers, particularly nitrogen, should be added in split applications.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, longleaf pine, southern red oak, blackjack oak, and white oak. Understory species are dogwood, sassafras, and American holly. Droughtiness is the main limitation affecting woodland management. Seedlings and the seeds of trees survive and grow fairly well if competing vegetation is controlled or removed by properly preparing the site, spraying, cutting, or girdling. The use of planting and harvesting equipment is moderately limited because of the thick, loose sandy layers.

The rapid permeability and the thick sandy layers are the main limitations affecting most urban and recreational uses.

The land capability subclass is IIIs. Based on loblolly pine as the indicator species, the woodland ordination symbol is 7S.

To—Tomotley fine sandy loam. This nearly level, poorly drained soil is on broad flats and in shallow depressions on stream and marine terraces in the eastern part of the county. Slope is 0 to 1 percent. Individual areas are irregular in shape and range from 5 to more than 100 acres in size.

Typically, the surface layer is dark gray fine sandy loam 7 inches thick. The subsurface layer is dark grayish brown fine sandy loam 4 inches thick. The subsoil extends to a depth of 50 inches. It is sandy clay loam. In the upper part, it is gray and has yellowish brown mottles. In the next part, it is gray and has strong brown and red mottles. In the lower part, it is light gray and has brownish yellow mottles. The underlying material extends to a depth of 62 inches. It is light gray sandy loam that has brownish yellow mottles.

Permeability is moderate. Available water capacity is moderate or high. The shrink-swell potential is low. The seasonal high water table is within a depth of 1 foot during winter and early spring.

Included with this soil in mapping are small areas of the somewhat poorly drained Augusta soils. These soils are in the slightly higher areas. Also included are soils that are moderately acid in the subsoil, mostly near the Pamlico County line, and a few low areas that are subject to rare flooding. Included soils make up about 20 percent of most mapped areas.

Most of the acreage of the Tomotley soil is used as woodland. The rest is used mainly as cropland.

In drained areas the major crops are corn, soybeans, tobacco, and small grain. Wetness is the main limitation in cultivated areas. Conservation tillage and cover crops help to maintain tilth and productivity. Tillage may be delayed in spring because of the wetness. In some areas a lack of suitable outlets limits the effectiveness of drainage systems.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, sweetgum, and willow oak. Understory species are giant cane, large gallberry, and southern bayberry. Wetness is the main limitation affecting woodland management. Using standard wheeled and tracked equipment when the soil is wet results in ruts, compacts the soil, and damages the roots of trees. A drainage system can improve tree growth, facilitate the use of equipment, and reduce the extent of the soil damage caused by forestry activities.

Wetness is the main limitation affecting most urban and recreational uses. It can be reduced by a drainage system consisting of perforated drain tile, ditches, or both.

The land capability subclass is IIIw in drained areas and IVw in undrained areas. Based on loblolly pine as the indicator species, the woodland ordination symbol is 10W.

Tr—Torhunta sandy loam. This nearly level, very poorly drained soil is on broad flats and in shallow depressions on uplands in the western part of the county. Slope is 0 to 1 percent. Individual areas are oblong and range from 8 to 100 acres in size.

Typically, the surface layer is 16 inches thick. In the upper part, it is black sandy loam. In the lower part, it is very dark brown sandy loam. The subsoil extends to a depth of 40 inches. In the upper part, it is dark gray sandy loam that has pockets of loamy sand and sand. In the lower part, it is grayish brown sandy loam that has pockets of loamy sand. The underlying material extends to a depth of 61 inches. It is light brownish gray loamy sand that has brown mottles and pockets of gray sandy clay loam.

Permeability is moderately rapid. Available water capacity is moderate. The shrink-swell potential is low. The seasonal high water table is at a depth of 0.5 foot to 1.5 feet during winter and early spring.

Included with this soil in mapping are small areas of Pantego soils. These soils have more clay in the subsoil than the Torhunta soil. They make up about 10 percent of most mapped areas.

Most of the acreage of the Torhunta soil is used as woodland. The rest is used mainly as cropland.

In drained areas the major crops are corn, soybeans, and small grain. Wetness is the main limitation in cultivated areas. A drainage system has been installed in most areas that are used for cultivated crops. In some areas establishing suitable drainage outlets is difficult. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and productivity.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, sweetgum, and water tupelo. Understory species are greenbrier, southern bayberry, inkberry, switchcane, and blueberry. Wetness is the main limitation affecting woodland management. Using standard wheeled and tracked equipment when the soil is wet results in ruts, compacts the soil, and damages the roots of trees. A drainage system can improve tree growth, facilitate the use of equipment, and reduce the extent of the soil damage caused by forestry activities.

Wetness is the main limitation affecting most urban and recreational uses. It can be reduced by a drainage system consisting of perforated drain tile, ditches, or both.

The land capability subclass is IIIw in drained areas and VIw in undrained areas. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9W.

Ud—Udorthents, loamy. This map unit consists of landfills. In areas of this unit, most or all of the natural soil has been disturbed or covered.

Landfills are areas where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil. A final cover of soil material is added when the trench is full.

Onsite investigation is needed before the use and management of specific areas are planned.

The land capability subclass is VIIe. This map unit has not been assigned a woodland ordination symbol.

Ur—Urban land. This map unit consists of areas where more than 85 percent of the surface area is covered with streets, buildings, parking lots, or airports.

Areas of Urban land have been greatly altered by cutting, filling, grading, and shaping. The original landscape and topography have been changed. Commonly, the drainage pattern also has been changed. The soils between urban facilities are used for parks, lawns, playgrounds, cemeteries, or drainageways. Most areas of these soils have been altered by cutting and filling. Slope ranges from 0 to 6 percent. Individual areas of this map unit are blocky in shape and range from 5 to 100 acres in size.

All of the acreage of this map unit is in the business district of Washington or around the perimeter of the smaller cities. Isolated areas shown on the detailed soil maps have a minimum size of 5 acres.

The major problem in this unit is excessive surface runoff from roofs, roads, and parking lots. This runoff increases the hazard of flooding. Siltation of waterways is a severe hazard if areas are graded and not immediately stabilized. Onsite investigation is needed before the use and management of specific areas are planned.

The land capability subclass is VIIIs. This map unit has not been assigned a woodland ordination symbol.

Wa—Wahee fine sandy loam. This nearly level, somewhat poorly drained soil is on broad interstream divides and in shallow depressions in the lowlands in the eastern part of the county. Slope is 0 to 1 percent. Individual areas are irregular in shape and range from 10 to 100 acres in size.

Typically, the surface layer is dark gray fine sandy loam 3 inches thick. The subsurface layer is 6 inches thick. It is light yellowish brown fine sandy loam that has light brownish gray mottles. The subsoil extends to a depth of 51 inches. In sequence downward, it is light olive brown clay loam that has light gray mottles, grayish brown clay that has light yellowish brown mottles, dark gray clay that has yellowish brown mottles, and mottled dark gray and yellowish brown sandy clay loam. The underlying material extends to a depth of 64 inches. It is mottled gray and yellowish brown sandy loam.

Permeability is slow. Available water capacity is moderate. The shrink-swell potential also is moderate. The seasonal high water table is at a depth of 0.5 foot to 1.5 feet during winter and early spring.

Included with this soil in mapping are small areas of the poorly drained Roanoke soils and the moderately well drained Dogue soils. Roanoke soils are in shallow depressions. Dogue soils are on the slightly higher knolls. Included soils make up about 15 percent of most mapped areas.

Most of the acreage of the Wahee soil is used as woodland. The rest is used mainly as cropland.

In drained areas the major crops are corn and soybeans. Wetness and the slow permeability are the main limitations in cultivated areas. Conservation tillage, cover crops, and a cropping system that includes grasses and legumes can help to maintain tilth and productivity. Tillage may be delayed in spring because of the wetness. A lack of suitable outlets and the slow permeability limit the effectiveness of drainage systems.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, sweetgum, willow oak, and water oak. Understory species include giant cane, southern bayberry, large gallberry, and common carpetgrass. Seedlings and the seeds of trees survive and grow well if competing vegetation is controlled or removed by properly preparing the site, spraying, cutting, or girdling. The use of planting and harvesting equipment can be moderately limited because of wetness.

Wetness is the main limitation affecting most urban and recreational uses. It can be reduced by a drainage system.

The land capability subclass is IIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9W.

Wd—Wasda muck. This nearly level, very poorly drained soil is on broad flats and in shallow depressions on marine terraces in the eastern part of the county, north and south of the Pamlico River. Slope is 0 to 1 percent. Individual areas are irregular in shape and range from 15 to 400 acres in size.

Typically, the combined thickness of the surface and subsurface layers is 18 inches. The surface layer is black muck. The subsurface layer is grayish brown clay loam. The subsoil extends to a depth of 43 inches. It is grayish brown clay loam. The underlying material extends to a depth of 60 inches. It is olive gray loamy sand that has strata of sand.

Permeability is moderate. Available water capacity also is moderate. The shrink-swell potential is low. The seasonal high water table is within a depth of 1 foot during winter and early spring. This soil is subject to rare flooding.

Included with this soil in mapping are small areas of Ponzer and Portsmouth soils. Ponzer soils are organic to a depth of more than 16 inches. Portsmouth soils do not typically have an organic surface layer. Where they have an organic surface layer, it is less than 8 inches thick. The Ponzer and Portsmouth soils are intermingled with areas of the Wasda soil. They make up about 20 percent of most mapped areas.

Most of the acreage of the Wasda soil is used as woodland. The rest is used mainly as cropland.

In drained areas the major crops are corn and

soybeans. Wetness is the main limitation in cultivated areas. Spring tillage and fall harvest may be delayed because of the wetness. Large applications of lime are necessary to prepare the soil for crop production. The burning of windrows must be carefully monitored because the soil is flammable when it is not saturated. Soil blowing is a hazard during spring planting. Conservation tillage, field borders, and windbreaks reduce the hazard of soil blowing.

Forested areas support mixed hardwoods and pine. Common species include red maple, water oak, baldcypress, pond pine, loblolly pine, and sweetgum. Understory species are sweetbay, southern bayberry, redbay, greenbrier, and giant cane. Wetness is the main limitation affecting woodland management. Using standard wheeled and tracked equipment when the soil is wet results in ruts, compacts the soil, and damages the roots of trees. A drainage system facilitates the use of equipment, reduces the extent of the soil damage caused by forestry activities, and improves tree growth.

Wetness and a high content of organic matter are the main limitations affecting most urban and recreational uses.

The land capability subclass is IIIw in drained areas and VIw in undrained areas. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8W.

WtD—Winton fine sandy loam, 12 to 25 percent slopes. This moderately steep, moderately well drained soil is on short side slopes adjacent to flood plains along major creeks and the Pamlico River. Slope ranges from 12 to 25 percent. Individual areas are narrow bands and range from 30 to 50 acres in size.

Typically, the surface layer is dark grayish brown fine sandy loam 8 inches thick. The subsurface layer is yellowish brown fine sandy loam 5 inches thick. The subsoil extends to a depth of 33 inches. In the upper part, it is yellowish brown sandy clay loam. In the lower part, it is yellowish brown sandy clay loam that has strong brown and yellowish red mottles. The underlying material extends to a depth of 61 inches. It is yellowish brown loamy sand that has strong brown and gray mottles.

Permeability is moderate or moderately slow. Available water capacity is moderate. The shrink-swell potential is low. The seasonal high water table is perched at a depth of 2 to 4 feet during winter and early spring.

Included with this soil in mapping are small areas of clayey soils and areas of soils that are wetter than the Winton soil. The clayey soils are intermingled with areas of the Winton soil. The wetter soils are in seepy spots. Also included are some areas where the slope is more than 25 percent. Included soils make up about 15 percent of most mapped areas.

Most of the acreage of the Winton soil is used as woodland.

This soil is not used as cropland. Slope and a severe hazard of erosion are the main limitations in cultivated areas.

Forested areas support mixed hardwoods and pine. Common species include southern red oak, sweetgum, American beech, and loblolly pine. Understory species are dogwood, sourwood, American holly, and blueberry. Slope is the main limitation affecting woodland management.

Slope is the main limitation affecting most urban and recreational uses.

The land capability subclass is VIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 10R.

YoA—Yeopim silt loam, 0 to 2 percent slopes. This nearly level, moderately well drained soil is on smooth ridges and stream terraces in the eastern part of the county, north and south of the Pamlico River. Slope ranges from 0 to 2 percent. Individual areas are oblong or irregular in shape and range from 5 to 100 acres in size.

Typically, the surface layer is yellowish brown silt loam 5 inches thick. The subsoil extends to a depth of 49 inches. It is silty clay loam. In the upper part, it is yellowish brown and has dark brown mottles. In the next part, it is light yellowish brown and has reddish yellow and light gray mottles. In the lower part, it is light gray and has yellow and very pale brown mottles. The underlying material extends to a depth of 62 inches. It is mottled light gray, very pale brown, yellow, and strong brown sandy loam that has lenses of sandy clay loam and sand.

Permeability is moderate. Available water capacity also is moderate. The shrink-swell potential is low. The seasonal high water table is at a depth of 1.5 to 3.0 feet during winter and early spring.

Included with this soil in mapping are small areas of the poorly drained Perquimans and Tomotley soils. These soils are in shallow depressions. They make up about 10 percent of most mapped areas.

Most of the acreage of the Yeopim soil is used as cropland. The rest is used mainly as woodland.

The major crops are corn, soybeans, tobacco, and small grain. Wetness is the main limitation in cultivated areas. Ponding is a hazard in low areas during periods of heavy rainfall. Winter cover crops, conservation tillage, and crop residue management help to maintain tilth and productivity. Minimum tillage, no-till planting, field borders, and a cropping system that includes

close-growing crops conserve soil and water. A drainage system generally is necessary to prevent damage to tobacco during wet periods.

Forested areas support mixed hardwoods and pine. Common species include loblolly pine, yellow-poplar, sweetgum, southern red oak, and white oak. Understory species are American holly, dogwood, sassafras, red maple, and greenbrier. Slight limitations affect woodland management. Seedlings and the seeds of trees survive and grow well if competing vegetation is controlled or removed by properly preparing the site, spraying, cutting, or girdling.

Wetness is the main limitation affecting most urban and recreational uses. It can be reduced by a drainage system.

The land capability subclass is IIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9A.

Prime Farmland

In this section, prime farmland is defined and the soils in Beaufort County that are considered prime farmland are listed.

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting 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 government at local, State, and Federal levels, as well as individuals, must encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to food, feed, forage, fiber, and oil seed crops. Such soils have properties that favor the economic production of sustained high yields of crops. The soils need only to be treated and managed by acceptable farming methods. The moisture supply must be adequate, and the growing season must be sufficiently long. Prime farmland soils produce the highest yields with minimal expenditure of energy and economic resources. Farming these soils results in the least damage to the environment.

Prime farmland soils may presently be used as cropland, pasture, or woodland or for other purposes. They are used for food or fiber or are available for these uses. Urban or built-up land, public land, and water areas cannot be considered prime farmland. Urban or built-up land is any contiguous unit of land 10 acres or more in size that is used for such purposes as housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water-control structures. Public land is land not available for farming in National forests, National parks, military reservations, and State parks.

Prime farmland soils usually receive an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not frequently flooded during the growing season. The slope ranges mainly from 0 to 5 percent.

The following map units are considered prime farmland in Beaufort County. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each unit is given in table 4. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

Some soils that have a high water table qualify as prime farmland only in areas where this limitation has been overcome by drainage measures. If applicable, the need for these measures is indicated in parentheses after the map unit name in the following list. Onsite evaluation is necessary to determine whether or not this limitation has been overcome by corrective measures.

The soils identified as prime farmland in Beaufort County are:

AaA	Altavista fine sandy loam, 0 to 2 percent slopes
Ap	Arapahoe fine sandy loam (where drained)
At	Augusta fine sandy loam (where drained)
CrA	Craven fine sandy loam, 0 to 1 percent slopes
CrB	Craven fine sandy loam, 1 to 4 percent slopes
DgB	Dogue fine sandy loam, 1 to 4 percent slopes
Ds	Dragston fine sandy loam (where drained)
GoA	Goldsboro fine sandy loam, 0 to 2 percent slopes
Hy	Hyde loam (where drained)
Ly	Lynchburg fine sandy loam (where drained)
Pa	Pantego loam (where drained)
Pe	Perquimans silt loam (where drained)
Pt	Portsmouth loam (where drained)
Ra	Rains fine sandy loam (where drained)
StA	State sandy loam, 0 to 3 percent slopes
To	Tomotley fine sandy loam (where drained)
Tr	Torhunta sandy loam (where drained)
Wd	Wasda muck (where drained)
YoA	Yeopim silt loam, 0 to 2 percent slopes

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 to prevent 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 behavioral 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 for 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 recreational 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 to prevent construction failures caused by unfavorable soil properties.

Generally, the soils in Beaufort County that are well suited to crops also are well suited to urban uses. The data concerning specific soils in the county can be used in planning future land use patterns. The potential for farming should be considered relative to any soil limitations and the potential for nonfarm development.

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 that is in harmony with nature.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where wetness 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

Edwin H. Karnowski, district conservationist, and Bobby G. Brock, conservation agronomist, Natural Resources 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 are identified; the system of land capability classification used by the Natural Resources 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 the heading "Detailed Soil Map Units" and in the tables. Specific information can be obtained from the local office of the Natural Resources Conservation Service or the North Carolina Cooperative Extension Service.

The acreage available for crop production in Beaufort County has increased in recent years. The loss of acreage of cropland and pasture to forestry and urban growth has been offset by land clearing.

In 1991, Beaufort County had about 133,800 acres of cropland and 1,301 acres of pasture and hayland. In 1990, grain corn was grown on 53,000 acres, tobacco on 4,745 acres, soybeans on 66,600 acres, and wheat on 35,600 acres. The pasture and hayland in the county is planted almost entirely to tall fescue.

Cropland

Erosion is a management concern affecting about 3.3 percent of the cropland in the county. It is most serious in areas of Craven soils that have a slope of more than 1 percent. Other soils on which slope affects erosion are Bonneau, Dogue, and State soils. Belhaven, Bonneau, Conetoe, Dare, Ponzer, State, Tarboro, and Wasda soils are subject to wind erosion.

Erosion is costly for various reasons. Productivity decreases and tilth deteriorates as the surface layer is washed away. Costly herbicides, fertilizers, and lime are carried out of the field along with valuable topsoil and organic matter. Social and environmental costs increase

if the eroded materials are deposited into streams, lakes, and rivers. Effective control of erosion increases agricultural productivity and minimizes the public cost of maintaining water quality.

A resource management system that provides a protective surface cover, helps to control runoff, and increases the rate of water infiltration reduces the hazard of erosion. A cropping system that maintains a plant cover for extended periods can keep losses due to erosion to amounts that do not reduce the productive capacity of the soil.

In sloping areas of Bonneau, Craven, Dogue, and State soils, the use of an effective conservation cropping system that leaves a substantial plant cover is imperative to control erosion. Conservation tillage effectively controls erosion in areas of these soils. Terraces and diversions help to control erosion by intercepting excess surface runoff and safely routing water to suitable outlets, such as grassed waterways, which are usually planted to tall fescue. Field borders of fescue help filter sediment from runoff. Contour tillage also is effective on sloping soils.

A compacted traffic pan may form between the surface layer and subsoil in several soils in the county. A traffic pan is most common in Bonneau, Goldsboro, and State soils. It reduces infiltration, root penetration, and permeability. It also increases the hazard of erosion on sloping soils. A conservation tillage system that uses rippers, subsoilers, and chisels is effective in reducing the occurrence of a traffic pan. The occurrence and severity of a traffic pan increase with the number of trips across a field per crop season and with the wetness of the field during tillage. Conservation measures are commonly needed in sloping areas of Bonneau, Craven, and State soils.

Soil blowing is commonly a problem in areas of soils that have a sandy or organic surface layer. In Beaufort County many tons of topsoil are lost from areas of Belhaven, Bonneau, Conetoe, Dare, Ponzer, Tarboro, and State soils each year, often during March, April, and May. Damage from soil blowing can be greatly reduced by using a conservation cropping system that includes cover crops and crop residue management. Tall growing small grain used as a windbreak reduces the damage to young crops. A windbreak consisting of pine, shrub, and understory species reduces soil blowing in large open areas.

Information on the design and applicability of erosion-control measures for each soil type can be obtained from the local office of the Natural Resources Conservation Service.

About 95 percent of the cropland in Beaufort County has a drainage problem. The very poorly drained, poorly drained, and somewhat poorly drained soils require an extensive drainage system to obtain a high level of crop production. Examples are Arapahoe, Augusta, Bayboro, Belhaven, Cape Fear, Dare, Hyde, Leaf, Lenoir, Lynchburg, Pantego, Perquimans, Portsmouth, Ponzer, Rains, Roanoke, Tomotley, Torhunta, Wahee, and Wasda soils.

Federal and State regulations require that any area designated as wetlands cannot be altered without prior approval. Contact the local office of the Natural Resources Conservation Service for identification of hydric soils and potential wetlands.

A combination of tile drainage, open ditches, and land smoothing may be needed for the production of crops, such as corn, soybeans, and small grains. Tobacco is commonly grown in areas of Goldsboro, Lynchburg, and Craven soils that have an adequate system of surface and subsurface drainage. A great majority of the wetter soils could be used for crop production if a drainage system were installed. Some of the soils, however, such as Bayboro, Cape Fear, Craven, Leaf, Lenoir, Roanoke, and Wahee soils, respond less favorably. These soils require an extensive system of open channels and land grading to maintain an acceptable level of crop production.

A water-control structure can be installed at a drainage outlet to control the water level and thus to provide subirrigation (fig. 5). Such a structure raises and lowers the water table in a field by controlling the amount of water in the drainage system. The field can be irrigated by raising the water table into the root zone.

Tilth is an important factor affecting crop production. Seed germination and water infiltration are highly influenced by tilth. Soils that have good tilth have a surface layer that is granular and porous.

The surface layer of most of the soils in the county is loamy sand, sandy loam, or fine sandy loam and has a low content of organic matter. Soils that have a surface layer of loam or silt loam are prone to crusting. Examples are Leaf, Lenoir, and Roanoke soils. Adding crop residue, manures, and mulches to the soil minimizes crusting and improves soil structure and tilth. Conservation tillage, cover crops, and a crop rotation that includes sod also add valuable organic matter.

Because of crusting after fall rains, fall plowing is not a good practice on the soils in the county. The crust that forms is hard, slows the rate of water infiltration, and increases the rate of runoff and erosion during the winter. A protective cover of crop residue or a winter cover crop can help to prevent erosion during winter.

The poorly drained and somewhat poorly drained soils, such as Rains, Leaf, Lenoir, Lynchburg, Roanoke, and Augusta soils, generally have poor tilth because

Figure 5.—A water-control structure in an area of Torhunta sandy loam.

they stay wet until late spring. If these soils are plowed when wet, they tend to be cloddy when dry. The clods make seedbed preparation difficult.

Pasture and Hayland

Tall fescue is the major grass in areas of pasture and hayland in the county. Other species that are better adapted to some of the soils include perennial grasses, such as hybrid bermudagrass, common bermudagrass, and bahiagrass. Producers of livestock should plant the grass that is best adapted to the soils. Growing adapted species and using good management techniques, such as rotation grazing, proper annual applications of fertilizer, weed control, and controlled grazing, improve pasture and hayland.

The deep, well drained and moderately well drained soils, such as Altavista, Craven, Dogue, Goldsboro, and Yeopim soils, are suited to all of the major grasses in the county. Fescue, a mixture of fescue and clover, common bermudagrass, and bahiagrass produce 6 to 9 animal unit months on these soils each year. Hybrid bermudagrass produces an average of 10 animal unit months. An animal unit month is the amount of feed or forage required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

The deep, sandy soils, such as Conetoe, Bonneau,

and Tarboro soils, are not well suited to fescue or clover because of droughtiness and leaching of fertilizer. They are best suited to grasses, such as hybrid bermudagrass, common bermudagrass, and bahiagrass. They produce 5 to 9 animal unit months of these grasses.

The wetter soils, such as Arapahoe, Bayboro, Cape Fear, Hyde, Leaf, Pantego, Perquimans, Portsmouth, Rains, Roanoke, Tomotley, and Torhunta soils, are best suited to fescue or a mixture of fescue and a legume. These soils produce 5 to 9 animal unit months, depending on how they are managed.

A well-rounded management program for pasture and hayland includes species, such as hybrid bermudagrass, that are adapted to the summer and cool-season grasses or grass-legume mixtures. If proper fencing is installed to allow for rotation of grazing stock and an intensive management program for the application of fertilizer is used, pastures can produce sufficient forage for grazing from March through November, and hybrid bermudagrass and field gleanings can be used for hay during the winter. These combinations provide a successful management program for pasture and hayland. Field gleanings should not be used if such use excessively depletes the content of organic matter in the soil or causes deterioration of tilth.

Soil Fertility

The soils in Beaufort County generally are low in natural fertility. They are naturally acid. Additions of lime and fertilizer are needed for the production of most kinds of crops.

Liming requirements are a major concern on cropland. The acidity level in the soil affects the availability of many nutrients to plants and the activity of beneficial bacteria. Lime also neutralizes exchangeable aluminum in the soil and thus counteracts the adverse effects of high levels of aluminum on many crops. Liming adds calcium (from calcitic lime) or calcium and magnesium (from dolomitic lime) to the soil.

A soil test is a guide to what amount and kind of lime should be used. The desired pH levels may differ, depending on the soil properties and the crop to be grown.

Nitrogen fertilizer is required for most crops. It is generally not required, however, for clover, in some rotations of soybeans, or for alfalfa that is established. A reliable soil test is not available for predicting nitrogen requirements. Appropriate rates of nitrogen application are described in the section "Yields per Acre."

Soil tests can indicate the need for phosphorus and potassium fertilizer. They are needed because phosphorus and potassium tend to build up in the soil.

Chemical Weed Control

The use of herbicides for weed control is a common practice on the cropland in Beaufort County. It decreases the need for tillage and is an integral part of modern farming. Selected soil properties, such as organic matter content and texture of the surface layer, affect the rate of herbicide application. Estimates of both of these properties were determined for the soils in this survey area. Table 14 shows a general range of organic matter content in the surface layer of the soils. The texture of the surface layer is shown in the USDA texture column in table 13.

In some areas the organic matter content projected for the different soils is outside the range shown in the table. The content can be higher in soils that have received large amounts of animal or manmade waste. Soils that have recently been brought into cultivation may have a higher content of organic matter in the surface layer than similar soils that have been cultivated for a long time. Conservation tillage can increase the content of organic matter in the surface layer. A lower content of organic matter is common where the surface layer has been partly or completely removed by erosion or land smoothing. Current soil tests should be used for specific organic matter determinations.

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 land capability classification also is shown in the table.

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 also are considered (fig. 6).

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 wastes, and green manure crops; and harvesting that ensures the smallest possible loss.

A high level of management includes maintaining proper soil reaction and fertility levels as indicated by standard soil tests. The application rate of nitrogen for

Figure 6.—A test plot in an area of Torhunta sandy loam used for corn. Test plots provide valuable information about the suitability of selected varieties.

corn on soils that have a yield potential of 125 to 150 bushels per acre should be 140 to 160 pounds per acre. If the yield potential for corn is 100 bushels per acre or less, a rate of 100 to 120 pounds of nitrogen per acre should be used. The application of nitrogen in excess of that required for potential yields generally is not recommended. The excess nitrogen fertilizer that is not utilized by the crop is an unnecessary expense and causes a hazard of water pollution. If corn or cotton is grown after the harvest of soybeans or peanuts, nitrogen rates can be reduced by about 20 to 30 pounds per acre. Because nitrogen can be readily leached from sandy soils, applications may be needed on these soils more than once during the growing season.

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 Natural Resources Conservation Service or

of the North Carolina 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 use as cropland *(8)*. 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 criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include 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 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.

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 few 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 they 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 hazard is the risk of erosion unless a 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, droughty, or stony; 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.

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

The land capability classification of each map unit component is given in the section "Detailed Soil Map Units" and in table 5.

Woodland Management and Productivity

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

Owners of woodland in Beaufort County have many objectives. These objectives include producing timber; conserving wildlife, soil, and water; preserving aesthetic values; and providing opportunities for recreational activities, such as commercial hunting. Public demand for clean water and recreational areas creates pressures and opportunities for owners of woodland.

The landowner interested in timber production is faced with the challenge of producing greater yields from smaller areas. Meeting this challenge requires intensive management and silvicultural practices. Many modern silvicultural techniques resemble those long practiced in agriculture. They include establishing, weeding, and thinning a desirable young stand; propagating the more productive species and genetic varieties (fig. 7); providing short rotations and complete fiber utilization; controlling insects, diseases, and weeds; and improving tree growth by applications of fertilizer and the installation of a drainage system. Even though timber crops require decades to grow, the goal of intensive management is similar to the goal of intensive agriculture. This goal is to produce the greatest yield of the most valuable crop as quickly as possible.

Commercial forests cover 323,964 acres, or about 61 percent of the land area in Beaufort County. For purposes of forest inventory, the predominant forest type groups identified in Beaufort County are described in the following paragraphs *(7)*.

Longleaf-slash pine. This forest type covers 7,376 acres. It is more than 50 percent longleaf pine and slash pine. Commonly included trees are southern red oak, post oak, turkey oak, blackjack oak, sweetgum, and blackgum.

Figure 7.—Good-quality pine seedlings in an area of Tarboro sand, 0 to 5 percent slopes.

Loblolly-shortleaf pine. This forest type covers 203,213 acres. It is more than 50 percent loblolly pine, shortleaf pine, or other southern yellow pines. Commonly included trees are southern red oak, white oak, gum, hickory, and yellow-poplar.

Oak-pine. This forest type covers 36,596 acres. It is more than 50 percent hardwoods, usually oaks. Pines make up 25 to 50 percent of the stand. Commonly included trees are gum, hickory, and yellow-poplar.

Oak-hickory. This forest type covers 30,969 acres. It is more than 50 percent upland oaks and hickory. Commonly included trees are elm, red maple, yellow-poplar, and black walnut.

Oak-gum-cypress. This forest type covers 45,810 acres. It is more than 50 percent tupelo, blackgum, sweetgum, oak, or southern cypress. Commonly included trees are cottonwood, willow, ash, elm, hackberry, and red maple.

Commercial forest is land that is producing or is capable of producing crops of industrial wood and that has not been withdrawn from timber production. Loblolly pine is the most important timber species in the county

because it grows fast, is adapted to the soil and climate, brings the highest average sale value per acre, and is easy to establish and manage.

One of the first steps in planning intensive woodland management is to determine the potential productivity of the soil for several alternative tree species. The most productive and valued trees are then selected for each soil type. Site and yield information enables a forest manager to estimate future wood supplies. These estimates are the basis of realistic decisions concerning expenses and profits associated with intensive woodland management, land acquisition, or industrial investments.

The potential productivity of woodland depends on physiography, soil properties, climate, and the effects of past management. Specific soil properties and site characteristics, including soil depth, texture, structure, and depth to the water table, affect forest productivity primarily by influencing available water capacity, aeration, and root development. The net effects of the interaction of these soil properties and site characteristics determine the potential site productivity.

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to applications of fertilizer than others, and some are more susceptible to erosion after roads are built and timber is harvested. Some soils require special reforestation efforts. In the section "Detailed Soil Map Units," the description of each map unit in the survey area suitable for timber includes information about productivity, limitations in harvesting timber, and management concerns in producing timber. The common forest understory plants also are listed. Table 6 summarizes this forestry information and rates the soils for a number of factors to be considered in management. *Slight, moderate,* and *severe* are used to indicate the degree of the major soil limitations to be considered in forest management.

Table 6 lists the *ordination symbol* for each soil. The first part of the ordination symbol, a number, indicates the potential productivity of a soil for the indicator species in cubic meters per hectare per year. The larger the number, the greater the potential productivity. Potential productivity is based on the site index and the point where mean annual increment is the greatest.

The second part of the ordination symbol, a letter, indicates the major kind of soil limitation affecting use and management. The letter *R* indicates a soil that has a significant limitation because of the slope. The letter *W* indicates a soil in which excessive water, either seasonal or year-round, causes a significant limitation. The letter *C* indicates a soil that has a limitation because of the kind or amount of clay in the upper part of the profile. The letter *S* indicates a dry, sandy soil. The letter *A* indicates a soil having no significant limitations that affect forest use and management. If a soil has more than one limitation, the priority is as follows: R, W, C, and S.

Ratings of the *erosion hazard* indicate the probability that damage may occur if site preparation or harvesting activities expose the soil. The risk is *slight* if no particular preventive measures are needed under ordinary conditions; *moderate* if erosion-control measures are needed for particular silvicultural activities; and *severe* if special precautions are needed to control erosion for most silvicultural activities. Ratings of moderate or severe indicate the need for construction of higher standard roads, additional maintenance of roads, additional care in planning harvesting and reforestation activities, or the use of special equipment.

Ratings of *equipment limitation* indicate limits on the use of forest management equipment, year-round or seasonal, because of such soil characteristics as slope, wetness, and susceptibility of the surface layer to compaction. As slope gradient and length increase, the use of wheeled equipment becomes more difficult. On the steeper slopes, tracked equipment is needed. The rating is *slight* if equipment use is restricted by wetness for less than 2 months and if special equipment is not needed. The rating is *moderate* if slopes are so steep that wheeled equipment cannot be operated safely across the slope, if wetness restricts equipment use from 2 to 6 months per year, or if special equipment is needed to prevent or minimize compaction. The rating is *severe* if wetness restricts equipment use for more than 6 months per year or if special equipment is needed to prevent or minimize compaction. Ratings of moderate or severe indicate a need to choose the best suited equipment and to carefully plan the timing of harvesting and other management activities.

Ratings of *seedling mortality* refer to the probability of the death of the naturally occurring or properly planted seedlings of good stock in periods of normal rainfall, as influenced by kinds of soil or topographic features. Seedling mortality is caused primarily by too much water or too little water. The factors used in rating a soil for seedling mortality are texture of the surface layer, depth to a seasonal high water table, and the length of the period when the water table is high. The mortality rate generally is highest on soils that have a sandy or clayey surface layer. The risk is *slight* if, after site preparation, expected mortality is less than 25 percent; *moderate* if expected mortality is between 25 and 50 percent; and *severe* if expected mortality exceeds 50 percent. Ratings of moderate or severe indicate that it may be necessary to use containerized or larger than usual planting stock or to make special site preparations, such as bedding, furrowing, installing a

surface drainage system, and providing artificial shade for seedlings. Reinforcement planting is often needed if the risk is moderate or severe.

The *potential productivity* of *common trees* on a soil is expressed as a *site index* and a *volume* number. The predominant common trees are listed in table 6 in the order of their observed occurrence. Additional species that commonly occur on the soils may be listed in the detailed soil map unit descriptions. Generally, only two or three tree species dominate. The first tree listed for each soil is the indicator species for that soil. An indicator species is a tree that is common in the area and that is generally the most productive on a given soil.

For soils that are commonly used for timber production, the yield is predicted in cubic feet per acre per year. It is predicted at the point where mean annual increment culminates. The estimates of productivity of the soils in this survey are based mainly on loblolly pine and sweetgum *(3, 4)*.

The *site index* is determined by taking height measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that the trees attain in a specified number of years (50 years in this survey). This index applies to fully stocked, even-aged, unmanaged stands. Productivity of a site can be improved through management practices, such as bedding, ditching, managing water, applying fertilizer, and planting genetically improved species.

The *volume* is the yield likely to be produced by the most important trees, expressed in cubic feet per acre per year.

Trees to plant are those that are used for reforestation or, under suitable conditions, natural regeneration. They are suited to the soils and can produce a commercial wood crop. The desired product, topographic position (such as a low, wet area), and personal preference are three factors among many that can influence the choice of trees for use in reforestation.

Recreation

In table 7, the soils of the survey area are rated according to the 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 sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 7, 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 7 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 10 and interpretations for dwellings without basements and for local roads and streets in table 9.

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 gentle slopes and are not wet or subject to flooding during the period of use. The surface absorbs rainfall readily but 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 and horseback riding 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

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 8, 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 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 ratings in table 8 are intended to be used as a guide and are not site specific. Onsite investigation is needed for individual management plans.

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 flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

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, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, lovegrass, switchgrass, clover, bahiagrass, 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 flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are goldenrod, beggarweed, partridge pea, and pokeberry.

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 hardwoods and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, sweetgum, sweetbay, redbay, titi, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are autumn-olive and crabapple.

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, 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, waterfowl feeding areas, and 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. Wildlife attracted to these areas include bobwhite quail, mourning doves, cottontail

rabbit, deer, red fox, and many species of 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 wild turkey, woodpeckers, squirrels, gray fox, raccoon, white-tailed deer, and black bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, raccoon, muskrat, mink, and beaver.

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. Ratings are given for 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 should 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 kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, the shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and 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 9 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 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 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, shrinking and swelling, and organic layers can cause the movement of footings. The depth to 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 or 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. The depth to 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), the 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, depth to a high water table, and the available water capacity in the upper 40 inches 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. Soil tests are essential to determine liming and fertilizer needs. Help in making soil tests or in deciding what soil additive, if any, should be used can be obtained from the office of the Beaufort Soil and Water Conservation District or the local office of the North Carolina Cooperative Extension Service.

Sanitary Facilities

Table 10 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 10 also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and that 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, depth to 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 filter the effluent effectively. Information concerning the State regulations that control the installation of septic systems can be obtained from the County Health Department.

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. The animal waste lagoons commonly used in farming operations are not considered in the ratings. They are generally deeper than the lagoons referred to in the table and rely on anaerobic bacteria to decompose waste materials.

Table 10 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, depth to a high water table, flooding, and content of organic matter.

Excessive seepage resulting from rapid permeability in 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 should be considered.

The ratings in table 10 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to a water table, slope, and flooding affect both types of landfill. Texture, highly organic layers, and soil reaction affect trench 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 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 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 11 gives information about the soils as a source of roadfill, sand, gravel, 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 and gravel. 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 to 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 depth to 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 the shrink-swell potential.

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

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 11, 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 or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil),

the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. 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 gravel or a layer of sand or gravel that is as much as 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale, siltstone, and weathered granite saprolite, are not considered to be sand and gravel.

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

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are naturally fertile or 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, or have a seasonal high 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 releases a variety of plant nutrients as it decomposes.

Water Management

Table 12 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, and levees and for aquifer-fed excavated 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 the restrictive features that affect each soil for 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 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. The depth to 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 and permeability in the aquifer.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the 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. 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.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to help to control erosion and conserve moisture by intercepting runoff. Slope and wetness affect the construction of terraces and diversions. Maintenance of terraces and diversions is adversely affected by a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability.

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 soil blowing, low available water capacity, 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 *(6)*. 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 to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, 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 13 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 the heading "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, by weight, 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. If the content of particles coarser than sand is as much as 15 percent, by volume, an appropriate modifier is added, for example, "gravelly." 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.

Rock fragments greater 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 ovendry 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.

Physical and Chemical Properties

Table 14 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.

Clay as a soil separate, or component, consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated content of clay in each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence the shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of movement of water through the soil 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 and septic tank absorption fields.

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 in each major soil layer is stated in inches of water per inch of soil. 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. It is the difference between the amount of soil water at field moisture capacity and the amount at wilting point.

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 classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, more 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. Losses are expressed in tons per acre per year. These 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 0.02 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 over a sustained period without affecting crop productivity. The rate is expressed in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 14, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in 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 15 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 are assigned to one of four groups. They are grouped according to the infiltration 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 or very 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 to very 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.

If a soil listed in table 15 is assigned to two hydrologic groups, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary covering of the surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 15 gives the frequency and duration of flooding and the time of year when flooding is most likely to occur.

Frequency, duration, and probable dates of occurrence are estimated. Frequency generally is expressed as *none, rare, occasional,* or *frequent. None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year). *Frequent* means that flooding occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month). The time of year that floods are most likely to occur is expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

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. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 15 are the depth to the seasonal high water table; the kind of water table, that is, *perched* or *apparent*; and the months of the year that the water table commonly is highest. A water table that is seasonally high for less than 1 month is not indicated in table 15.

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. 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.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. Table 15 shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

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 content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind 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 the 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 *(9)*. 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 on laboratory measurements. Table 16 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven 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 Udult (*Ud*, meaning humid climate, 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 Paleudults (*Pale*, meaning excessive development, plus *udults*, the suborder of the Ultisols that occurs in a humid climate).

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 *Aquic* identifies the subgroup that is wet. An example is Aquic Paleudults.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, 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, siliceous, thermic Aquic Paleudults.

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. There can be some variation in the texture of the surface layer or of the underlying material within a series. The Goldsboro series is an example of fine-loamy, siliceous, thermic Aquic Paleudults.

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. The location of the typical pedon is described, and coordinates are identified by the State plane grid system. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" *(10)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(9)*. 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 soils that formed in loamy marine and fluvial sediments. Slopes range from 0 to 2 percent.

Typical pedon of Altavista fine sandy loam, 0 to 2 percent slopes; 2.5 miles southwest of Belhaven on North Carolina Highway 92, about 0.4 mile south on Secondary Road 1752, about 60 feet east of the road, in a cultivated field (State plane coordinates 640,200 feet N., 2,696,000 feet E.):

Ap—0 to 6 inches; dark gray (10YR 4/1) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

E—6 to 10 inches; yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; very friable; few medium roots; strongly acid; abrupt smooth boundary.

BE—10 to 16 inches; yellow (10YR 7/6) sandy clay loam; weak fine subangular blocky structure; friable, slightly sticky; few medium roots; strongly acid; clear wavy boundary.

Bt1—16 to 24 inches; very pale brown (10YR 7/3) sandy clay loam; many fine distinct brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; few fine roots; few fine flakes of mica; strongly acid; clear wavy boundary.

Bt2—24 to 42 inches; mottled light brownish gray (10YR 6/2), strong brown (7.5YR 5/8), reddish yellow (10YR 6/8), and yellowish red (5YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; few fine roots; few fine flakes of mica; strongly acid; gradual wavy boundary.

BCg—42 to 47 inches; mottled light brownish gray (10YR 6/2), reddish yellow (7.5YR 6/8), and yellowish brown (10YR 5/6) sandy loam; thin lenses of sandy clay loam; weak medium subangular blocky structure; friable; few fine flakes of mica; strongly acid; gradual wavy boundary.

Cg1—47 to 56 inches; light brownish gray (10YR 6/2) sandy loam; common medium distinct reddish yellow (7.5YR 6/8) and yellowish brown (10YR 5/6) mottles; massive; very friable; common fine flakes of mica; strongly acid; gradual wavy boundary.

Cg2—56 to 62 inches; mottled light gray (10YR 7/1) and yellow (10YR 7/6) loamy sand; massive; loose; few fine flakes of mica; strongly acid.

The thickness of the solum ranges from 30 to 50 inches. Reaction ranges from very strongly acid to moderately acid throughout the profile, except where the surface layer has been limed. Few or common flakes of mica are in the B and C horizons in most pedons.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 3. The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. It is sandy loam, fine sandy loam, loamy sand, or loamy fine sand.

The Bt horizon has hue of 7.5YR to 2.5Y and value of 5 to 7. It dominantly has chroma of 3 to 8 but commonly has chroma of 2 or less in the lower part. It is sandy clay loam or clay loam.

The BCg horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 1 to 8. It is sandy loam, fine sandy loam, loam, loamy fine sand, or loamy sand.

The Cg or C horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 1 to 8. In some pedons, it is mottled and has no dominant color. It is loamy or sandy.

Arapahoe Series

The Arapahoe series consists of very poorly drained soils that formed in loamy marine and fluvial sediments. Slopes range from 0 to 2 percent.

Typical pedon of Arapahoe fine sandy loam; 3 miles east of Winsteadville on Secondary Road 1722, about 50 feet south of the road, in a cultivated field (State plane coordinates 639,000 feet N., 2,708,000 feet E.):

Ap—0 to 10 inches; black (10YR 2/1) fine sandy loam; weak very fine granular structure; very friable; many fine roots; slightly acid; clear smooth boundary.

A—10 to 22 inches; black (10YR 2/1) fine sandy loam; weak fine granular structure; very friable; few fine roots; moderately acid; gradual wavy boundary.

Bg—22 to 42 inches; dark grayish brown (10YR 4/2) fine sandy loam; common medium distinct dark yellowish brown (10YR 5/4) mottles; weak fine granular structure; very friable; few fine roots; strongly acid; gradual irregular boundary.

Cg—42 to 60 inches; grayish brown (10YR 5/2) loamy sand; massive; very friable; neutral.

The thickness of the solum ranges from 24 to 55 inches. Reaction ranges from strongly acid to extremely acid in the surface layer and the upper part of the control section, except where the surface layer has been limed, and from strongly acid to mildly alkaline in the lower part of the control section and in the underlying material.

The Ap and A horizons have hue of 10YR to 5Y, value of 2 or 3, and chroma of 1 or 2.

The Bg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. In some pedons it has high-chroma mottles. It is fine sandy loam, sandy loam, or loam.

The Cg horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 4 to 7 and chroma of 0 to 2. It is loamy sand or stratified loamy fine sand.

Augusta Series

The Augusta series consists of somewhat poorly drained soils that formed in loamy marine and fluvial sediments. Slopes range from 0 to 2 percent.

Typical pedon of Augusta fine sandy loam; 0.7 mile north of Bath on Secondary Road 1741, about 0.2 mile east on Secondary Road 1743, about 75 feet south of the road, in a cultivated field (State plane coordinates 630,000 feet N., 2,661,000 feet E.):

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; many medium roots; slightly acid; clear smooth boundary.

E—7 to 12 inches; light yellowish brown (2.5YR 6/4) fine sandy loam; few fine distinct brownish yellow (10YR 6/8) mottles; weak fine granular structure; very friable; few small roots; strongly acid; clear smooth boundary.

Bt—12 to 18 inches; brownish yellow (10YR 6/6) sandy clay loam; few fine distinct light brownish gray (2.5Y 6/2) mottles; weak fine and medium subangular blocky structure; friable, slightly sticky and slightly plastic; dominantly light brownish gray (2.5Y 6/2) faces of peds; few faint clay films on faces of peds; many fine roots; strongly acid; gradual wavy boundary.

Btg1—18 to 35 inches; light gray (10YR 7/1) sandy clay loam; common medium prominent brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; many fine roots; many fine pores; strongly acid; gradual wavy boundary.

Btg2—35 to 45 inches; gray (10YR 6/1) sandy clay loam; pockets of sandy loam; few fine prominent brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; few fine pores; strongly acid; gradual wavy boundary.

2Cg—45 to 65 inches; gray (10YR 6/1) loamy sand; pockets of sandy clay loam; common medium prominent yellowish brown (10YR 5/6) and strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; very friable; few flakes of mica; very strongly acid.

The thickness of the solum ranges from 40 to 80 inches. Reaction ranges from very strongly acid to moderately acid throughout the profile, except where the surface layer has been limed. Few or common fine flakes of mica are throughout the profile in some pedons.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 2 to 6. The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 4. It is fine sandy loam, sandy loam, or loam.

The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 3 to 6 in the upper part and chroma of 1 or 2 in the lower part. It has few or common mottles in shades of gray, brown, and yellow throughout. It is sandy clay loam, sandy loam, loam, or clay loam.

The Cg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2, or it is neutral in hue and has value of 5 to 7. It is dominantly loamy sand, loamy fine sand, sandy loam, fine sandy loam, loam, or clay loam. It is commonly stratified and has pockets or layers of sandy clay loam in some pedons.

Bayboro Series

The Bayboro series consists of very poorly drained soils that formed in clayey and loamy marine and fluvial sediments. Slopes range from 0 to 2 percent.

Typical pedon of Bayboro loam; 3.8 miles northwest of Pantego on Secondary Road 1625, about 2.9 miles north on a farm road, in a large field on the east side of the road (State plane coordinates 715,850 feet N., 2,687,400 feet E.):

Ap—0 to 9 inches; black (10YR 2/1) loam; weak and moderate fine granular structure; very friable; many fine and medium roots; high content of organic matter; very strongly acid; clear smooth boundary.

A—9 to 14 inches; very dark gray (10YR 3/1) loam; weak medium granular structure; very friable; many fine and medium roots; stained with organic matter; very strongly acid; gradual smooth boundary.

BAg—14 to 18 inches; dark gray (10YR 4/1) clay loam; weak fine subangular blocky structure; friable, sticky and slightly plastic; common fine and medium roots; some organic matter in root channels; very strongly acid; gradual wavy boundary.

Btg1—18 to 40 inches; gray (10YR 5/1) clay; common medium distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; very hard, very firm, sticky and very plastic; few fine and

medium roots; common distinct clay films on vertical faces of peds; very strongly acid; gradual smooth boundary.

Btg2—40 to 50 inches; gray (10YR 6/1) clay; common medium distinct strong brown (7.5YR 5/8) mottles; weak fine and medium subangular blocky structure; very firm, sticky and very plastic; common distinct clay films on vertical faces of peds; very strongly acid; gradual wavy boundary.

Btg3—50 to 64 inches; gray (N 6/0) clay; common medium distinct strong brown (7.5YR 5/8) and common medium faint light gray (10YR 7/1) mottles; weak fine subangular blocky structure; very firm, very sticky and very plastic; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction ranges from strongly acid to extremely acid, except where the surface layer has been limed.

The Ap and A horizons have hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2.

The BAg horizon has hue of 10YR, value of 3 to 6, and chroma of 1 or 2. It is loam, clay loam, or sandy clay loam.

The Btg horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 4 to 7 and chroma of 0 to 2. It commonly has mottles in shades of brown, yellow, gray, or red. It is clay loam, clay, or sandy clay.

The Cg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma 1 or 2. It is stratified clayey, loamy, or sandy sediments.

Belhaven Series

The Belhaven series consists of very poorly drained, highly decomposed organic soils underlain by loamy marine sediments. Slopes are 0 to 1 percent.

Typical pedon of Belhaven muck; 0.1 mile east of South Creek (east of Aurora) on North Carolina Highway 33, about 3 miles south on Secondary Road 1002 to the Pamlico County line, 150 feet east of the road, in a wooded area (State plane coordinates 540,000 feet N., 2,664,000 feet E.):

Oa1—0 to 9 inches; muck, black (5YR 2/1) broken face and rubbed; about 5 percent fiber, less than 1 percent rubbed; moderate fine granular structure; very friable; extremely acid; common pieces of woody material; gradual wavy boundary.

Oa2—9 to 46 inches; muck, dark reddish brown (5YR 2.5/2) broken face and rubbed; about 15 percent fiber, less than 1 percent rubbed; moderate medium subangular blocky structure; very friable; few medium pieces of charcoal; extremely acid; common pieces of woody material; abrupt wavy boundary.

2Cg—46 to 65 inches; grayish brown (2.5Y 5/2) sandy clay loam; massive; friable; very strongly acid.

The thickness of the organic material ranges from 16 to 51 inches. The organic horizons are extremely acid, except where the surface layer has been limed, and the underlying mineral horizon is extremely acid to moderately alkaline. The content of logs, stumps, and fragments of wood ranges from 0 to 5 percent in the upper organic horizon in cleared, cultivated areas and from about 5 to 35 percent in undrained areas. The content of pieces of charcoal ranges from 2 to 8 percent in the upper tier and is less than 2 percent in the lower tier.

The surface layer has hue of 5YR to 5Y, value of 2 or 3, and chroma of 1 or 2. The lower tier of organic material has hue of 2.5YR to 10YR, value of 2 or 3, and chroma of 1 or 2. It has hue of 5YR or 2.5YR in 10 inches or more. The content of fiber ranges from 15 to 45 percent before rubbing and is less than 10 percent after rubbing. It is highest in the lower tier. In undrained areas the lower tier is pastelike; has a greasy, colloidal consistence; and is massive. In drained areas aeration causes structure to evolve. Excessive drying causes shrinkage and the formation of hard, subangular blocky peds. When these peds dry, they are very slow to rewet unless crushed.

The 2AC or 2A horizon, if it occurs, has hue of 2.5YR to 5Y, value of 2 or 3, and chroma of 1 or 2. It is fine sandy loam, sandy loam, loam, or the mucky analogs of those textures.

The 2Cg horizon has hue of 2.5YR to 5Y, value of 3 to 6, and chroma of 1 or 2. It is loam, clay loam, sandy clay loam, or sandy loam.

Bonneau Series

The Bonneau series consists of well drained soils that formed in sandy and loamy marine and fluvial sediments. Slopes range from 0 to 4 percent.

Typical pedon of Bonneau loamy sand, 0 to 4 percent slopes; 2.3 miles west of Chocowinity on North Carolina Highway 33 to Secondary Road 1163, about 1.5 miles north and west on Secondary Road 1163, about 300 feet north of the road, in a cultivated field (State plane coordinates 658,000 feet N., 2,555,000 feet E.):

Ap—0 to 9 inches; very dark grayish brown (2.5Y 3/2) loamy sand; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

E—9 to 22 inches; light yellowish brown (2.5Y 6/4) loamy sand; weak medium granular structure; very

friable; few fine roots; very strongly acid; clear wavy boundary.
Bt1—22 to 34 inches; olive yellow (2.5Y 6/6) sandy clay loam; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; few fine roots; very strongly acid; clear wavy boundary.
Bt2—34 to 52 inches; light olive brown (2.5Y 5/6) sandy clay loam; common medium distinct gray (10YR 6/1) mottles; weak medium subangular blocky structure; friable, slightly sticky; thin lenses of sandy loam at a depth of 40 inches; sand grains bridged with clay; very strongly acid; clear wavy boundary.
Bt3—52 to 60 inches; mottled light olive brown (2.5Y 5/6) and light gray (10YR 6/1) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky; sand grains bridged with clay; very strongly acid.

The thickness of the solum ranges from 60 to more than 80 inches. Reaction ranges from extremely acid to slightly acid throughout the profile, except where the surface layer has been limed.

The Ap or A horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 1 or 2. The E horizon has hue of 10YR or 2.5Y, value of 4 to 8, and chroma of 2 to 6. It is loamy sand, loamy fine sand, sand, or fine sand.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 3 to 8. In the lower part, it commonly is mottled in shades of red, gray, brown, and yellow. It has mottles with chroma of 2 or less within a depth of 30 to 60 inches. It is dominantly fine sandy loam, sandy loam, or sandy clay loam. In some pedons it is sandy clay in the lower part.

Cape Fear Series

The Cape Fear series consists of very poorly drained soils that formed in loamy and clayey marine and fluvial sediments. Slopes range from 0 to 2 percent.

Typical pedon of Cape Fear fine sandy loam; 2 miles west of Terra Ceia on Secondary Road 1612, about 100 feet north of Secondary Road 1612 (across railroad tracks) on Secondary Road 1617, about 75 feet east of the road, in a cultivated field (State plane coordinates 682,000 feet N., 2,660,000 feet E.):

Ap—0 to 6 inches; black (10YR 2/1) fine sandy loam; weak fine granular structure; friable; few fine roots; slightly acid; abrupt smooth boundary.
A—6 to 14 inches; black (10YR 2/1) fine sandy loam; weak medium granular structure; friable; few fine roots; slightly acid; clear wavy boundary.
BAg—14 to 20 inches; dark gray (10YR 4/1) clay loam; weak fine subangular blocky structure; firm, sticky and plastic; few fine roots; many fine pores; few fine flakes of mica; strongly acid; clear wavy boundary.
Btg—20 to 36 inches; dark grayish brown (10YR 4/2) clay; few fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm, sticky and plastic; few fine pores; many fine flakes of mica; strongly acid; gradual wavy boundary.
BCg—36 to 48 inches; dark gray (10YR 4/1) sandy clay loam; few fine distinct brown (10YR 5/3) and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable and firm, sticky and plastic; few fine flakes of mica; pockets of loamy sand; strongly acid; gradual wavy boundary.
2Cg—48 to 65 inches; light brownish gray (10YR 6/2) loamy sand; few medium distinct yellowish brown (10YR 5/6) mottles; massive; very friable; few flakes of mica; pockets of sandy loam; strongly acid.

The thickness of the solum ranges from 30 to 60 inches. Reaction ranges from extremely acid to medium acid throughout the profile, except where the surface layer has been limed. Few or common flakes of mica are in most pedons.

The Ap and A horizons have hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2.

The BAg horizon has hue of 10YR to 5Y, value of 3 or 4, and chroma of 1 or 2. It is clay loam, silty clay loam, sandy clay loam, or loam.

The Btg horizon has hue of 10YR to 5GY, value of 4 to 7, and chroma of 0 to 2, or it is neutral in hue and has value of 4 to 6. It is clay, clay loam, sandy clay, or silty clay.

The BCg horizon has hue of 10YR to 5GY, value of 4 to 7, and chroma of 0 to 2, or it is neutral in hue and has value of 4 to 7. It is sandy clay loam, clay loam, loam, sandy clay, or sandy loam.

The Cg horizon has colors similar to those of the BCg horizon. It is loamy sand, sandy loam, loam, or sand.

Conetoe Series

The Conetoe series consists of well drained soils that formed in sandy and loamy marine and fluvial sediments. Slopes range from 0 to 5 percent.

Typical pedon of Conetoe loamy sand, 0 to 5 percent slopes; 1.3 miles south of Washington on North Carolina Highway 33, about 2.2 miles east on Secondary Road 1166, about 1 mile east of Secondary Road 1176, about 400 feet north of the road, in a cultivated field (State plane coordinates 649,000 feet N., 2,585,000 feet E.):

Ap—0 to 8 inches; dark brown (7.5YR 4/2) loamy sand; weak medium granular structure; very friable; many fine and medium roots; moderately acid; abrupt smooth boundary.
E—8 to 22 inches; yellowish brown (10YR 5/6) loamy sand; weak medium granular structure; very friable; common fine and medium roots; moderately acid; clear wavy boundary.
Bt1—22 to 33 inches; brownish yellow (10YR 6/8) sandy loam; weak medium subangular blocky structure; very friable; sand grains coated and bridged with clay; few fine roots; strongly acid; clear wavy boundary.
Bt2—33 to 40 inches; brownish yellow (10YR 6/8) sandy clay loam; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; few fine roots; strongly acid; gradual wavy boundary.
BC—40 to 46 inches; strong brown (7.5YR 5/8) loamy sand; friable; few fine flakes of mica; very strongly acid; gradual wavy boundary.
C—46 to 62 inches; mottled very pale brown (10YR 7/4) and reddish yellow (7.5YR 6/6) sand; massive; very friable; very strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. Reaction ranges from very strongly acid to slightly acid, except where the surface layer has been limed.

The Ap or A horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 1 to 3. The E horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 3 to 8. It is loamy sand, loamy fine sand, sand, or fine sand.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or sandy clay loam. The content of clay in the control section averages 10 to 25 percent.

The BC horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 3 to 8. It is sandy loam, fine sandy loam, loamy fine sand, or loamy sand.

The C horizon has hue of 7.5YR to 2.5Y, value of 5 to 8, and chroma of 1 to 8. It is dominantly loamy sand, loamy fine sand, sand, or fine sand, but in some pedons it has lenses of sandy loam, fine sandy loam, or sandy clay loam.

Craven Series

The Craven series consists of moderately well drained soils that formed in loamy and clayey marine and fluvial sediments. Slopes range from 0 to 12 percent.

Typical pedon of Craven fine sandy loam, 0 to 1 percent slopes; 3 miles west of Chocowinity on North Carolina Highway 33, about 0.9 mile south on Secondary Road 1161, about 30 feet east of the road, in a cultivated field (State plane coordinates 651,000 feet N., 2,500,000 feet E.):

Ap—0 to 7 inches; brown (10YR 5/3) fine sandy loam; weak medium granular structure; friable; common fine roots; moderately acid; clear smooth boundary.
BA—7 to 12 inches; light yellowish brown (10YR 6/4) clay loam; weak medium subangular blocky structure; firm, slightly sticky and slightly plastic; common fine roots; few bodies of material from the Ap horizon; few discontinuous clay films on faces of peds; strongly acid; clear wavy boundary.
Bt1—12 to 25 inches; olive yellow (2.5Y 6/6) clay; common fine and medium prominent red (2.5YR 4/8) and yellowish red (5YR 5/6) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; few faint clay films on faces of peds; very strongly acid; gradual smooth boundary.
Bt2—25 to 30 inches; olive yellow (2.5Y 6/6) clay; many medium distinct light gray (10YR 7/1), yellowish red (5YR 5/6), and red (2.5Y 4/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; common distinct clay films on faces of peds; few fine pores; very strongly acid; gradual wavy boundary.
Btg—30 to 41 inches; gray (10YR 6/2) clay; common fine and medium distinct brownish yellow (10YR 6/8), red (2.5YR 4/8), and yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; very strongly acid; gradual wavy boundary.
Cg1—41 to 51 inches; gray (10YR 6/2) clay loam; common medium distinct brownish yellow (10YR 6/6) and red (2.5YR 5/6) mottles; massive; friable, slightly sticky and slightly plastic; very strongly acid; gradual wavy boundary.
Cg2—51 to 61 inches; gray (10YR 6/1) sandy clay loam; few medium distinct light yellowish brown (10YR 6/4) and prominent red (2.5YR 5/6) mottles; massive; friable, sticky and plastic; few lenses of sand; very strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. Reaction ranges from extremely acid to strongly acid throughout the profile, except where the surface layer has been limed.

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

The E horizon, if it occurs, has hue of 10YR to 5Y, value of 5 to 7, and chroma of 2 to 4. It is fine sandy loam, very fine sandy loam, loam, or silt loam.

The BA or BE horizon has hue of 10YR or 2.5Y,

value of 4 to 7, and chroma of 3 to 8. It is clay loam, loam, silty clay loam, or sandy clay loam.

The upper part of the Bt horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 4 to 8. The lower part has colors similar to those in the upper part and has few to many mottles with chroma of 2 or less, or it has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2 and mottles in shades of red, yellow, and brown. The Bt horizon is clay, silty clay, silty clay loam, or clay loam. The average content of clay is 35 to 55 percent. The content of silt plus very fine sand is more than 30 percent.

The C or Cg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 6. Where it dominantly has chroma of 3 or more, it has many mottles with chroma of 2 or less. In most pedons it has mottles in shades of red, brown, and yellow. It is loam, sandy clay loam, sandy loam, or loamy sand.

Croatan Series

The Croatan series consists of very poorly drained, highly decomposed organic soils underlain by loamy marine and fluvial sediments. Slopes are 0 to 1 percent.

Typical pedon of Croatan muck; northwest of Washington, 10 miles to the intersection of the J&W Tram Road with Smithwick Road (in a Weyerhaeuser forest), 45 feet northwest of the intersection, in a forest of cypress and pond pine (State plane coordinates 701,000 feet N., 2,615,000 feet E.):

Oa—0 to 24 inches; black (10YR 2/1) muck; about 15 percent fiber unrubbed, less than 1 percent rubbed; moderate fine subangular blocky structure; very friable; few medium pieces of charcoal; few pieces of cypress; extremely acid; clear wavy boundary.

2Ag—24 to 29 inches; black (10YR 2/1) loam; moderate medium granular structure; friable, slightly sticky; common fine and medium roots; extremely acid; clear smooth boundary.

2Cg1—29 to 79 inches; dark gray (10YR 4/1) clay loam; common medium prominent yellowish brown (10YR 5/8) mottles; massive; firm, sticky and plastic; few medium roots; extremely acid; gradual wavy boundary.

2Cg2—79 to 89 inches; gray (5Y 6/1) clay loam; common medium prominent strong brown (7.5YR 5/8) mottles; massive; firm, sticky and plastic; few medium roots; extremely acid.

The organic material is 16 to 51 inches thick. Reaction is extremely acid in the organic layer and ranges from extremely acid to slightly acid in the underlying mineral layers. The content of logs, stumps, and wood fragments ranges from 0 to 10 percent in the organic layer. The content of fiber in the organic layer is 3 to 30 percent before rubbing and less than 10 percent after rubbing. Charcoal particles and pockets of ash are in some pedons.

The Oa horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2.

The 2Ag horizon has hue of 5YR to 5Y, value of 2 to 7, and chroma of 1 to 3. It is sandy loam, loam, fine sandy loam, or the mucky analogs of those textures.

The 2Cg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. It ranges from sand to clay and typically is loamy in the upper part.

Currituck Series

The Currituck series consists of very poorly drained soils that formed in partially decomposed marsh vegetation underlain by sandy marine deposits. Slopes are 0 to 1 percent.

Typical pedon of Currituck muck, frequently flooded; 3.4 miles west of Burbage Crossroads on North Carolina Highway 92, about 0.5 mile south on a dirt lane, 100 feet east of the road, in a marsh (State plane coordinates 629,000 feet N., 2,669,000 feet E.):

Oa1—0 to 12 inches; muck, very dark gray (10YR 3/1) broken face and rubbed; about 60 percent fiber unrubbed, 15 percent rubbed; massive; friable; many fine to coarse roots; about 55 percent silt and fine sand; very strongly acid; gradual wavy boundary.

Oa2—12 to 30 inches; muck, very dark gray (10YR 3/1) rubbed; about 35 percent fiber unrubbed, 5 percent rubbed; massive; friable; common medium and coarse roots; about 60 percent silt and fine sand; very strongly acid; gradual wavy boundary.

2Cg—30 to 62 inches; dark grayish brown (2.5Y 4/2) sand; single grain; loose; common fine flakes of mica; extremely acid.

The thickness of the organic material ranges from 16 to 51 inches. Reaction ranges from very strongly acid to moderately acid in the surface tier and from extremely acid to moderately acid in the subsurface tier and the mineral horizons.

The surface tier is either hemic material, sapric material, or both, depending on the history of vegetative succession. It is 40 to 65 percent mineral material. It has hue of 7.5YR to 2.5Y, value of 2 to 4, and chroma of 1 to 3.

The subsurface tier is dominantly sapric material. In some pedons, however, it has thin layers of hemic material. It has hue of 7.5YR to 5Y or 5GY, value of 2 to 5, and chroma of 1 or 2.

The A horizon, if it occurs, has hue of 10YR to 5Y, value of 2 or 3, and chroma of 1 or 2. It is sand, loamy sand, or the mucky analogs of those textures.

The 2Cg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. It has few or common flakes of mica. It is sand or loamy sand.

Dare Series

The Dare series consists of very poorly drained, highly decomposed organic soils underlain by sandy marine sediments. Slopes are 0 to 1 percent.

Typical pedon of Dare muck; 0.5 mile north of Pantego on U.S. Highway 264, about 3.6 miles northeast on North Carolina Highway 99, about 2.6 miles southeast on a farm lane, 20 feet east of the road, in a wooded area supporting waxmyrtle and sumac (State plane coordinates 681,200 feet N., 2,713,750 feet E.):

Oi—0 to 1 inch; undecomposed fibric material consisting of leaves, twigs, and stems; abrupt smooth boundary.

Oa1—1 to 12 inches; muck, black (N 2/0) broken face and rubbed; about 2 percent fiber, less than 1 percent rubbed; weak medium granular structure; very friable; many fine and medium roots; extremely acid; clear smooth boundary.

Oa2—12 to 20 inches; muck, very dark brown (10YR 2/2) broken face and rubbed; about 2 percent fiber, less than 1 percent rubbed; weak medium subangular blocky structure; friable; sapric material is pastelike and has greasy consistence when wet; many medium roots; few medium pieces of charcoal; extremely acid; gradual smooth boundary.

Oa3—20 to 61 inches; muck, dark reddish brown (5YR 2.5/2) broken face and rubbed; about 25 percent fiber, less than 5 percent rubbed; massive; friable, sticky; sapric material is pastelike and has greasy consistence; common medium roots; few medium pieces of charcoal; few logs; extremely acid; gradual irregular boundary.

2Cg—61 to 73 inches; mottled gray (10YR 5/1) and dark brown (10YR 4/3) stratified loamy sand to sandy loam; massive; friable; some organic stains; very strongly acid.

The thickness of the organic material ranges from 51 to more than 96 inches. Reaction is extremely acid in the Oa horizon and ranges from extremely acid to moderately acid in the 2Cg horizon. The content of stumps, logs, and roots is about 35 percent in the surface and subsurface layers. The content of charcoal ranges from 2 to 20 percent in the surface layer and from 0 to 2 percent in the subsurface horizons.

The surface tier has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 or 2. The subsurface tier has hue of 2.5YR to 10YR, value of 2 or 3, and chroma of 1 to 4. It has hue of 5YR or 2.5YR in 10 inches or more. The organic material is pastelike, has a greasy consistence when saturated, and is massive when moist. In drained areas aeration causes weak subangular blocky structure to evolve. When this material dries over a short period it does not readily rewet.

The 2Cg horizon has hue of 10YR to 5Y, value of 2 to 5, and chroma of 1 or 2. It is stratified loamy sand, fine sand, or sand.

Dogue Series

The Dogue series consists of moderately well drained soils that formed in loamy and clayey marine and fluvial sediments. Slopes range from 1 to 4 percent.

Typical pedon of Dogue fine sandy loam, 1 to 4 percent slopes; 0.5 mile south of Whitepost on Secondary Road 1334, about 0.4 mile east on Secondary Road 1338, about 400 feet south of the road, in a cultivated field (State plane coordinates 635,000 feet N., 2,640,000 feet E.):

Ap—0 to 7 inches; light olive brown (2.5Y 5/4) fine sandy loam; weak medium granular structure; friable; common fine roots; strongly acid; clear smooth boundary.

Bt1—7 to 23 inches; brownish yellow (10YR 6/6) sandy clay; few fine distinct pale brown (10YR 6/3) and strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; firm, sticky and plastic; few fine roots; common fine pores; few faint clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—23 to 36 inches; brownish yellow (10YR 6/6) sandy clay; common medium distinct light gray (10YR 7/2) and few fine distinct yellowish red (5YR 5/8) mottles; moderate fine subangular blocky structure; firm, sticky and plastic; few fine roots; common distinct clay films on faces of peds; strongly acid; clear smooth boundary.

Bt3—36 to 40 inches; brownish yellow (10YR 6/8) clay; common medium distinct light gray (2.5Y 7/2) and few medium distinct yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine pores; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

BC—40 to 50 inches; mottled brownish yellow (10YR 6/8), light gray (2.5Y 7/2), and yellowish brown (10YR 5/8) sandy clay loam; small pockets of clay loam; moderate fine subangular blocky structure;

firm, sticky and plastic; few fine flakes of mica; very strongly acid; gradual wavy boundary.
Cg—50 to 64 inches; light gray (2.5Y 7/2) sandy clay loam; many medium distinct yellowish brown (10YR 5/8) and few fine distinct strong brown (7.5YR 5/8) mottles; massive; friable; few fine flakes of mica; very strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. Reaction ranges from strongly acid to extremely acid throughout the profile, except where the surface layer has been limed.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. The E horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. It is sandy loam, fine sandy loam, loam, or silt loam.

The upper part of the Bt horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. The lower part is neural in hue or has hue of 7.5YR to 2.5Y. It has value of 4 to 7 and chroma of 0 to 8. The Bt horizon is clay, sandy clay, sandy clay loam, loam, or clay loam.

The BC or CB horizon has hue of 7.5YR to 2.5Y or is neutral in hue. It has value of 4 to 7 and chroma of 0 to 8. It is sandy loam, sandy clay loam, clay loam, or sandy clay.

The C or Cg horizon has hue of 7.5YR to 2.5Y or is neutral in hue. It has value of 4 to 7 and chroma of 0 to 8. It ranges from sand to sandy clay loam.

Dorovan Series

The Dorovan series consists of very poorly drained, highly decomposed organic soils underlain by sandy and loamy marine and fluvial sediments. Slopes are 0 to 1 percent.

Typical pedon of Dorovan mucky peat, frequently flooded; 1.2 miles south of Washington on U.S. Highway 17, at Phosphate Junction, east on Norfolk and Southern Railroad 0.2 mile to junction of railroad spur south (Phosphate Junction), 20 feet south of railroad (State plane coordinates 650,000 feet N., 2,571,000 feet E.):

Oe—0 to 3 inches; very dark brown (10YR 2/2) mucky peat consisting of partially decomposed leaves, roots, and twigs mixed with small amounts of well decomposed organic matter; about 60 percent fiber; massive; friable, slightly sticky; extremely acid; gradual wavy boundary.
Oa1—3 to 12 inches; black (10YR 2/1) muck; about 30 percent fiber unrubbed, 4 percent rubbed; fibers remaining after rubbing occurring as partially decomposed limbs about 1 inch in size; massive; friable, slightly sticky; extremely acid; diffuse wavy boundary.
Oa2—12 to 63 inches; black (10YR 2/1) muck, black rubbed and pressed; about 30 percent fiber unrubbed, 4 percent rubbed; fibers remaining after rubbing occurring as partially decomposed fragments of wood 1 or 2 millimeters in size; massive; nonsticky; few roots; few logs and woody limbs; extremely acid; gradual wavy boundary.
2Cg—63 to 80 inches; gray (10YR 5/1) sand; single grain; loose; few small partially decayed fragments of wood; very strongly acid.

The thickness of the organic material ranges from 51 to more than 80 inches. Reaction is extremely acid in the organic layers and very strongly acid or strongly acid in the mineral layer.

The Oe horizon has hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 1 to 3, or it is neutral in hue and has value of 2 to 4.

The Oa horizon has hue of 7.5YR to 2.5Y or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 3. It is sapric material that has 30 to 40 percent fiber before rubbing. Typically, a few logs and large fragments of wood are in the lower part of the Oa horizon.

The 2Cg horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 2 to 5 and chroma of 0 to 3. It is sand, fine sand, loamy sand, sandy loam, fine sandy loam, or clay.

Dragston Series

The Dragston series consists of somewhat poorly drained soils that formed in loamy marine and fluvial sediments. Slopes are 0 to 1 percent.

Typical pedon of Dragston fine sandy loam; 0.8 mile west of Winsteadville on Secondary Road 1718, about 2 miles north on Secondary Road 1719, about 0.6 mile northeast on Secondary Road 1720, about 200 feet south of the road, in a cultivated field (State plane coordinates 648,000 feet N., 2,708,000 feet E.):

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; many fine roots; moderately acid; abrupt smooth boundary.
E—6 to 10 inches; light yellowish brown (2.5Y 6/4) fine sandy loam; few medium distinct light brownish gray (10YR 6/2) mottles; weak fine granular structure; very friable; very strongly acid; abrupt smooth boundary.
Bt—10 to 16 inches; light yellowish brown (2.5Y 6/4) sandy loam; few fine distinct light brownish gray

(10YR 6/2) mottles; weak medium subangular blocky structure; friable; dominantly light brownish gray (10YR 6/2) faces of peds; some clay bridges between sand grains; strongly acid; clear smooth boundary.

Btg—16 to 42 inches; light brownish gray (2.5Y 6/2) sandy loam; common medium distinct olive yellow (2.5Y 6/6) mottles; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; some clay bridges between sand grains; strongly acid; clear smooth boundary.

2Cg—42 to 60 inches; light gray (10YR 7/1) loamy sand; common medium distinct light yellowish brown (2.5Y 6/4) mottles; single grain; loose; few fine flakes of mica; few pockets of sandy loam; moderately acid.

The thickness of the solum ranges from 25 to 50 inches. Reaction is strongly acid or very strongly acid in the upper part of the profile, except where the surface layer has been limed, and ranges from very strongly acid to slightly acid in the lower part.

The Ap or A horizon has hue of 10YR to 5Y, value of 2 to 5, and chroma of 1 to 4. The E horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 to 4. It is loamy sand, loamy fine sand, sandy loam, fine sandy loam, or loam.

The Bt horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 3 to 8. It is sandy loam, fine sandy loam, or loam.

The Btg horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 2. It is sandy loam, fine sandy loam, or loam.

The C or Cg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 3 to 8. It is sand, fine sand, loamy sand, loamy fine sand, sandy loam, or fine sandy loam. In many pedons it is stratified with those textures.

Goldsboro Series

The Goldsboro series consists of moderately well drained soils that formed in loamy marine and fluvial sediments. Slopes range from 0 to 2 percent.

Typical pedon of Goldsboro fine sandy loam, 0 to 2 percent slopes; 1.5 miles west of the intersection of North Carolina Highway 102 and U.S. Highway 17, about 200 feet north of North Carolina Highway 102, in a cultivated field (State plane coordinates 620,000 feet N., 2,652,000 feet E.):

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

Bt1—9 to 24 inches; brownish yellow (10YR 6/8) sandy clay loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; few fine roots; strongly acid; gradual wavy boundary.

Bt2—24 to 30 inches; brownish yellow (10YR 6/8) sandy clay loam; common medium distinct light gray (10YR 7/2) and strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; few fine roots; many small pores; strongly acid; gradual wavy boundary.

Bt3—30 to 46 inches; brownish yellow (10YR 6/8) sandy clay loam; many medium distinct light gray (10YR 7/2) mottles; weak medium subangular blocky structure; firm, sticky and plastic; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt4—46 to 52 inches; light yellowish brown (10YR 6/4) sandy clay loam; pockets of sandy loam; common medium distinct gray (10YR 7/2) and few fine prominent reddish brown (2.5YR 5/4) mottles; weak fine subangular blocky structure; friable, sticky and plastic; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt5—52 to 69 inches; pale brown (10YR 6/3) sandy clay loam; many medium distinct light gray (10YR 7/2) mottles; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction ranges from strongly acid to extremely acid throughout the profile, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 2 to 6, and chroma of 1 to 4. Where value is 3 or less, the horizon is less than 6 inches thick.

The E horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 6. It is loamy sand, loamy fine sand, sandy loam, or fine sandy loam.

The Bt horizon has hue of 7.5YR to 2.5Y and value of 4 to 6. In the upper part it has chroma of 3 to 8. In the lower part it has chroma of 1 or 2 and has high-contrast mottles. Few or common low-chroma mottles that are indicative of wetness are at a depth of 18 to 30 inches. The Bt horizon is dominantly sandy clay loam, sandy loam, or clay loam. In some pedons the lower part of the horizon is clay or sandy clay.

Hyde Series

The Hyde series consists of very poorly drained soils that formed in loamy marine and fluvial sediments. Slopes are 0 to 1 percent.

Typical pedon of Hyde loam; 0.2 mile west of Pike Road Post Office on Secondary Road 1633, about 0.7 mile southwest on Secondary Road 1632, about 265 feet along a farm road, 120 feet northwest of the road, in a cultivated field (State plane coordinates 709,000 feet N., 2,699,000 feet E.):

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) loam; weak medium granular structure; friable; few fine roots; strongly acid; abrupt smooth boundary.
A—9 to 14 inches; very dark grayish brown (10YR 3/2) loam; moderate medium granular structure; friable; few fine roots; strongly acid; clear wavy boundary.
BA—14 to 24 inches; grayish brown (10YR 5/2) loam; weak fine and medium subangular blocky structure; friable; few fine roots; strongly acid; clear wavy boundary.
Btg1—24 to 34 inches; grayish brown (10YR 5/2) silty clay loam; few fine faint dark gray (10YR 4/1) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; very strongly acid; gradual wavy boundary.
Btg2—34 to 44 inches; dark grayish brown (10YR 4/2) silty clay loam; common medium faint brown (10YR 5/3) mottles; weak medium subangular blocky structure; friable and firm, slightly sticky and slightly plastic; very strongly acid; gradual wavy boundary.
Btg3—44 to 50 inches; grayish brown (10YR 5/2) silty clay loam; few fine distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable and firm, slightly sticky and slightly plastic; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.
Cg—50 to 60 inches; light brownish gray (10YR 6/2) sandy loam; massive; friable; very strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. Reaction ranges from extremely acid to strongly acid in the A and B horizons, except where the surface layer has been limed, and from extremely acid to neutral in the C horizon.

The Ap and A horizons have hue of 10YR to 5Y or are neutral in hue. They have value of 2 or 3 and chroma of 0 to 2.

The Btg horizon has hue of 10YR to 5Y or 5GY to 5BG, or it is neutral in hue. It has value of 4 to 7 and chroma of 0 to 2. It has few or common mottles in shades of brown to red. It is silty clay loam, clay loam, silt loam, or loam.

The Cg horizon has hue of 10YR to 5Y or 5GY to 5BG, or it is neutral in hue. It has value of 4 to 7 and chroma of 0 to 2. It is sand, loamy sand, sandy loam, fine sandy loam, sandy clay loam, loam, or clay loam.

Leaf Series

The Leaf series consists of poorly drained soils that formed in loamy and clayey marine and fluvial sediments. Slopes are 0 to 1 percent.

Typical pedon of Leaf silt loam; 0.25 mile southwest of Five Points on North Carolina Highway 32 (100 feet northeast of Secondary Road 1602), 0.4 mile west on a Weyerhaeuser Road, 50 feet south of the road, in a pine plantation (State plane coordinates 665,000 feet N., 2,624,000 feet E.):

A—0 to 4 inches; very dark gray (10YR 3/1) silt loam; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.
Eg—4 to 7 inches; gray (10YR 5/1) silt loam; weak fine granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.
Btg1—7 to 12 inches; light gray (10YR 6/1) silty clay; many medium distinct brownish yellow (10YR 6/8) and strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few faint clay films on faces of peds; many fine roots; strongly acid; gradual wavy boundary.
Btg2—12 to 34 inches; light gray (10YR 5/1) clay; few fine prominent yellowish red (5YR 5/8) and many medium prominent reddish yellow (7.5YR 6/8) mottles; moderate coarse columnar structure parting to moderate medium angular blocky; very firm, very sticky and very plastic; many distinct clay films on faces of peds; many fine roots and pores; strongly acid; gradual smooth boundary.
Btg3—34 to 60 inches; light gray (10YR 7/1) clay; few fine prominent yellowish red (5YR 5/8), many medium prominent reddish yellow (7.5YR 6/8), and many medium faint gray (10YR 5/1) mottles; moderate coarse columnar structure parting to moderate medium angular blocky; very firm, sticky and plastic; many distinct clay films on faces of peds; many fine roots and pores; very strongly acid; gradual wavy boundary.
Btg4—60 to 64 inches; dark gray (10YR 4/1) clay; few fine prominent yellow (10YR 7/8) mottles; moderate medium angular blocky structure; sticky and plastic; many distinct clay films on faces of peds; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction ranges from extremely acid to strongly acid throughout the profile, except where the surface layer has been limed.

The A or Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. The Eg horizon has hue of

10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. It is silt loam, very fine sandy loam, or loam.

The Btg horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 4 to 7 and chroma of 1 or 2. It is clay, silty clay, or silty clay loam.

Lenoir Series

The Lenoir series consists of somewhat poorly drained soils that formed in loamy and clayey marine and fluvial sediments. Slopes are 0 to 1 percent.

Typical pedon of Lenoir loam; 11 miles east of Washington, 0.25 mile south of Five Points, 75 feet east of North Carolina Highway 32 across from Five Points Free Will Baptist Church (State plane coordinates 665,000 feet N., 2,628,000 feet E.):

A—0 to 3 inches; very dark gray (10YR 3/1) loam; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear smooth boundary.

E—3 to 8 inches; dark gray (10YR 4/1) loam; weak fine granular structure; very friable; many fine and few medium roots; many medium pores; very strongly acid; clear wavy boundary.

Bt—8 to 13 inches; brownish yellow (10YR 6/6) clay loam; few medium distinct light brownish gray (10YR 6/2), pale brown (10YR 6/3), and light yellowish brown (10YR 6/4) mottles; dominantly light brownish gray (10YR 6/2) faces of peds; weak medium subangular blocky structure; friable, sticky and slightly plastic; few medium roots; few medium pores; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg1—13 to 36 inches; gray (10YR 5/1) clay; many medium distinct brownish yellow (10YR 6/8) mottles; moderate medium subangular and angular blocky structure; very firm, very sticky and very plastic; few fine roots; few faint clay films on faces of peds; few medium pores; very strongly acid; gradual wavy boundary.

Btg2—36 to 51 inches; gray (10YR 6/1) clay; many medium distinct brownish yellow (10YR 6/8) mottles; weak medium subangular and angular blocky structure; very firm, very sticky and very plastic; few fine roots and pores; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg3—51 to 63 inches; gray (10YR 6/1) sandy clay; few fine distinct brownish yellow (10YR 6/6) mottles; weak medium angular blocky structure; firm, sticky and plastic; few fine roots; very strongly acid; gradual wavy boundary.

BCg—63 to 75 inches; light gray (10YR 7/1) clay; few lenses of sandy clay; massive; very firm, very sticky and very plastic; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction ranges from extremely acid to moderately acid throughout the profile, except where the surface layer has been limed.

The A or Ap horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 3 to 6 and chroma of 0 to 2.

The E horizon has hue of 10YR or 2.5Y, value of 4 to 8, and chroma of 1 to 4. It is loam, fine sandy loam, or silt loam.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 8. It has few to many mottles with chroma of 2 or less. It is clay, clay loam, silty clay loam, or silty clay.

The Btg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It commonly has mottles in shades of yellow, brown, or red. It is clay, clay loam, silty clay loam, or silty clay.

The BCg horizon has colors similar to those of the Btg horizon. It is clay, clay loam, silty clay loam, sandy clay, sandy clay loam, or sandy loam.

Leon Series

The Leon series consists of poorly drained soils that formed in sandy marine sediments. Slopes are 0 to 1 percent.

Typical pedon of Leon sand; 3.8 miles north on U.S. Highway 17 from the Craven County line, 150 feet west (across railroad tracks), in a cultivated field (State plane coordinates 625,000 feet N., 2,552,000 feet E.):

Ap—0 to 9 inches; black (10YR 2/1) sand (salt and pepper colors on surface); weak fine granular structure; very friable and loose; many medium and fine roots; strongly acid; clear smooth boundary.

E—9 to 18 inches; dark grayish brown (10YR 5/2) sand coated with organic matter; single grain; loose; very pale brown streaks; very strongly acid; gradual wavy boundary.

Bh1—18 to 26 inches; dark brown (7.5YR 3/2) sand; few fine faint dark reddish brown (5YR 3/3) mottles; weak fine subangular blocky structure; slightly firm to very weakly cemented; some dark brown streaks; strongly acid; gradual wavy boundary.

Bh2—26 to 38 inches; dark brown (7.5YR 3/2) sand coated with organic matter; many medium faint very dark grayish brown (10YR 3/2) mottles; weak fine subangular blocky structure; weakly cemented; strongly acid; gradual irregular boundary.

BC—38 to 44 inches; brown (7.5YR 5/2) sand; few

uncoated sand grains; single grain; loose; strongly acid; clear wavy boundary.
C—44 to 72 inches; pale brown (10YR 6/3) sand; single grain; loose; strongly acid.

The combined thickness of the sandy horizons is more than 80 inches. Reaction ranges from extremely acid to strongly acid throughout the profile, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR or is neutral in hue. It has value of 2 to 4 and chroma of 0 or 1.

The E horizon has hue of 10YR or is neutral in hue. It has value of 5 to 8 and chroma of 0 to 2.

The Bh horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3.

The C horizon has hue of 10YR, value of 6 to 8, and chroma of 3 or 4.

Lynchburg Series

The Lynchburg series consists of somewhat poorly drained soils that formed in loamy marine and fluvial sediments. Slopes are 0 to 1 percent.

Typical pedon of Lynchburg fine sandy loam; 6.5 miles north of Washington on Secondary Road 1422, about 0.1 mile east on Secondary Road 1424, about 200 feet south of the road, in a cultivated field (State plane coordinates 695,000 feet N., 2,588,000 feet E.):

Ap—0 to 7 inches; dark gray (10YR 4/1) fine sandy loam; weak medium granular structure; very friable; many medium roots; strongly acid; clear smooth boundary.
E—7 to 10 inches; dark brown (10YR 4/2) fine sandy loam; few fine distinct brownish yellow (10YR 6/8) mottles; weak fine granular structure; very friable; few fine roots; strongly acid; clear smooth boundary.
Bt—10 to 16 inches; yellowish brown (10YR 5/4) sandy clay loam; few fine distinct light brownish gray (10YR 6/2) mottles; dominantly light brownish gray (10YR 6/2) faces of peds; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; many fine roots; very strongly acid; clear wavy boundary.
Btg1—16 to 24 inches; light brownish gray (10YR 6/2) sandy clay loam; common medium distinct brown (10YR 5/3) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; many fine roots; many fine pores; very strongly acid; gradual wavy boundary.
Btg2—24 to 51 inches; gray (10YR 6/1) sandy clay loam; many coarse distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; few fine pores; very strongly acid; gradual wavy boundary.
Btg3—51 to 63 inches; gray (10YR 5/1) clay loam; common distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable, sticky and plastic; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.
BCg—63 to 70 inches; gray (10YR 6/1) sandy clay; pockets of sandy clay loam; common medium prominent yellowish brown (10YR 5/6) and strong brown (7.5YR 5/8) mottles; weak coarse subangular blocky structure; firm; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction ranges from extremely acid to strongly acid throughout the profile, except where the surface layer has been limed.

The Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. The E horizon has hue of 10YR, value of 4 to 7, and chroma of 1 to 4.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 8. It has few to many mottles with chroma of 2 or less. It is sandy clay loam or clay loam.

The Btg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2. It is sandy clay loam or clay loam.

The BCg horizon has colors similar to those of the Btg horizon. It is sandy clay loam or sandy clay.

Muckalee Series

The Muckalee series consists of poorly drained soils that formed in loamy marine and fluvial sediments. Slopes are 0 to 1 percent.

Typical pedon of Muckalee loam, frequently flooded; 3.5 miles north of Washington on U.S. Highway 17 to Cherry Run, 150 feet west of the road and 20 feet north of a stream (State plane coordinates 672,000 feet N., 2,581,000 feet E.):

A—0 to 12 inches; dark grayish brown (10YR 4/2) loam; common fine distinct strong brown (7.5YR 4/6) mottles; weak medium granular structure; very friable; many fine roots; thin strata of sand on surface; strongly acid; clear wavy boundary.
Cg1—12 to 38 inches; gray (10YR 5/1) sandy loam; common medium distinct yellowish brown (10YR 5/6) mottles; massive; very friable; few fine and medium roots; thin lenses of loamy sand and sandy clay loam; slightly acid; gradual wavy boundary.

Cg2—38 to 60 inches; gray (5Y 5/1) sandy loam; common medium distinct very dark gray (5Y 3/1) mottles; massive; friable; few fine roots; few thin lenses of sandy clay loam and sand; neutral.

Reaction ranges from strongly acid to neutral in the A horizon and from moderately acid to moderately alkaline in the C horizon.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2.

The Cg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. It commonly has mottles in shades of yellow, brown, or gray. It is dominantly sandy loam. In some pedons, however, it has strata of sandy clay loam, sand, or loamy sand.

Pantego Series

The Pantego series consists of very poorly drained soils that formed in loamy marine and fluvial sediments. Slopes are 0 to 1 percent.

Typical pedon of Pantego loam; 0.5 mile south of Secondary Road 1507 from Five Points on North Carolina Highway 32, about 0.5 mile east on Secondary Road 1602, about 120 feet south of the road, in a cultivated field (State plane coordinates 662,000 feet N., 2,630,000 feet E.):

Ap—0 to 10 inches; very dark brown (10YR 2/2) loam; weak fine granular structure; very friable; common fine and very fine roots; strongly acid; gradual smooth boundary.

Btg1—10 to 14 inches; dark grayish brown (10YR 4/2) sandy clay loam; few medium prominent yellowish brown (10YR 5/8) and few fine faint light gray (10YR 7/2) mottles; weak fine subangular blocky structure; friable; few fine clay films on faces of peds; few fine and very fine roots; very strongly acid; gradual wavy boundary.

Btg2—14 to 32 inches; gray (10YR 5/1) sandy clay loam; few fine and medium distinct brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable, slightly sticky; few fine clay films on faces of peds; few fine roots; very strongly acid; gradual wavy boundary.

Btg3—32 to 36 inches; light gray (10YR 7/2) sandy clay loam; few medium distinct yellowish brown (10YR 5/6) and few fine faint gray (10YR 5/1) and red (2.5YR 4/6) mottles; weak fine subangular blocky structure; friable, slightly sticky; few fine clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg4—36 to 68 inches; light gray (10YR 7/1) sandy clay loam; common medium prominent yellowish brown (10YR 5/8) and red (2.5YR 4/8) mottles; weak coarse subangular blocky structure; friable; few fine clay films on faces of peds; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction ranges from extremely acid to strongly acid throughout the profile, except where the surface layer has been limed.

The Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. The E horizon, if it occurs, has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. It is loam or fine sandy loam.

The Btg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. It has few or common higher chroma mottles. It is sandy clay loam or clay loam. In some pedons it has thin transitional layers of sandy loam or sandy clay.

Perquimans Series

The Perquimans series consists of poorly drained soils that formed in loamy marine and fluvial sediments. Slopes are 0 to 1 percent.

Typical pedon of Perquimans silt loam; 1.8 miles west of Leechville on U.S. Highway 264, about 0.75 mile west on Secondary Road 1700 to Dail Road, 300 feet north of Secondary Road 1700 (and 300 feet east of Dail Road), in a cultivated field (State plane coordinates 670,000 feet N., 2,730,000 feet E.):

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; weak medium granular structure; very friable; few fine and medium roots; slightly acid; abrupt smooth boundary.

Eg—5 to 8 inches; grayish brown (10YR 5/2) silt loam; weak medium granular structure; very friable; few fine and medium roots; slightly acid; abrupt smooth boundary.

Btg1—8 to 16 inches; light brownish gray (10YR 6/2) silty clay loam; many medium faint dark grayish brown (10YR 4/2) and few fine distinct yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; very friable, slightly sticky and slightly plastic; few medium roots; few fine clay films on faces of peds; moderately acid; clear smooth boundary.

Btg2—16 to 28 inches; light brownish gray (10YR 6/2) silty clay loam; common fine distinct yellowish brown (10YR 5/6) and pale yellow (2.5Y 7/4) mottles; moderate fine subangular blocky structure; friable, slightly sticky and slightly plastic; few fine clay films on faces of peds; moderately acid; clear smooth boundary.

Btg3—28 to 44 inches; light gray (10YR 7/1) silty clay

loam; many medium distinct yellow (10YR 7/8) and common medium faint yellowish brown (10YR 5/4) mottles; moderate fine angular blocky structure; friable, slightly sticky and slightly plastic; few fine clay films on faces of peds; strongly acid; clear smooth boundary.

BCg—44 to 62 inches; light gray (10YR 7/1) silt loam; many medium distinct yellow (10YR 7/8) mottles; weak fine subangular blocky structure; very friable; moderately acid.

The thickness of the solum ranges from 40 to more than 60 inches. Reaction ranges from very strongly acid to moderately acid, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 2 to 6 and chroma of 0 to 2.

The Eg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2.

The Btg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It has few to many higher chroma mottles. It is silty clay loam or clay loam.

The BCg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It has few to many higher chroma mottles. It is silt loam or sandy loam.

The Cg horizon, if it occurs, has hue of 10YR to 5Y or is neutral in hue. It has value of 5 to 8 and chroma of 0 to 2. It is dominantly sandy or loamy material. In some pedons, however, it has thin strata of clay.

Ponzer Series

The Ponzer series consists of very poorly drained, highly decomposed organic soils underlain by loamy marine and fluvial sediments. Slopes are 0 to 1 percent.

Typical pedon of Ponzer muck; 2.6 miles east of Pantego on Secondary Road 1700, about 1 mile north of the road, in a cultivated field (State plane coordinates 677,500 feet N., 2,711,000 feet E.):

Oap—0 to 7 inches; muck, black (10YR 2/1) broken face and rubbed; less than 5 percent fiber, less than 1 percent rubbed; weak fine granular structure; very friable; few fine roots; strongly acid; clear smooth boundary.

Oa1—7 to 11 inches; muck, black (10YR 2/1) broken face and rubbed; about 15 percent fiber, less than 1 percent rubbed; weak medium subangular blocky structure; strongly acid; clear wavy boundary.

Oa2—11 to 25 inches; muck, black (10YR 2/1) broken face and rubbed; about 25 percent fiber, less than 1 percent rubbed; weak medium subangular blocky structure; friable; many pieces of wood; extremely acid; clear wavy boundary.

Oa3—25 to 37 inches; muck, black (N 2/0) broken face and rubbed; about 30 percent fiber, less than 5 percent rubbed; weak medium subangular blocky structure; very friable; few fine and medium roots; many pieces of wood; extremely acid; clear irregular boundary.

2A—37 to 41 inches; dark brown (10YR 3/2) fine sandy loam; some organic stains; massive; friable; very strongly acid; clear wavy boundary.

2Cg1—41 to 50 inches; grayish brown (10YR 5/2) fine sandy loam; massive; friable; some thin lenses of silt; very strongly acid; clear wavy boundary.

2Cg2—50 to 61 inches; dark grayish brown (10YR 4/2) loamy fine sand; massive; friable; very strongly acid.

The thickness of the organic material ranges from 16 to 51 inches. The organic material is underlain by loamy and sandy material. Reaction is extremely acid in the organic layers, except where the surface layer has been limed, and ranges from extremely acid to mildly alkaline in the mineral layers.

The Oap and Oa horizons have hue of 7.5YR to 2.5Y or are neutral in hue. They have value of 2 or 3 and chroma of 0 to 2.

The 2A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is fine sandy loam, sandy loam, silt loam, or sandy clay loam.

The 2Cg horizon has hue of 10YR, value of 3 to 6, and chroma of 2. In the upper part it has the same textures as those of the 2A horizon. In the lower part the texture varies, ranging from sand to clay.

Portsmouth Series

The Portsmouth series consists of very poorly drained soils that formed in loamy marine and fluvial sediments. Slopes are 0 to 1 percent.

Typical pedon of Portsmouth loam; 1.2 miles west of Wilkinson on Secondary Road 1621 (0.4 mile west of Norfolk Southern Railroad crossing and Secondary Road 1621), 0.2 mile northeast of Secondary Road 1621 on a private road, 100 feet east of the road, in a cultivated field (State plane coordinates 688,000 feet N., 2,678,000 feet E.):

Ap—0 to 12 inches; very dark brown (10YR 2/2) loam; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

A—12 to 18 inches; very dark grayish brown (10YR 3/2) loam; weak medium granular structure; very friable; few fine and medium roots; strongly acid; gradual wavy boundary.

Btg1—18 to 25 inches; dark grayish brown (10YR 4/2)

sandy clay loam; lenses of sandy clay; common medium distinct yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common faint clay films on faces of peds; few fine flakes of mica; strongly acid; gradual wavy boundary.

Btg2—25 to 34 inches; gray (10YR 5/1) sandy clay loam; lenses of clay; common medium distinct brown (7.5YR 5/4) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common faint clay films on faces of peds; few fine flakes of mica; strongly acid; gradual wavy boundary.

BCg—34 to 38 inches; dark grayish brown (2.5Y 4/2) sandy loam; lenses of sandy clay; few fine distinct brown (7.5YR 5/4) mottles; few black specks of organic matter; weak medium subangular blocky structure; friable, slightly sticky; few flakes of mica; strongly acid; gradual wavy boundary.

2Cg1—38 to 52 inches; gray (5Y 6/1) loamy sand; common medium prominent pale olive (5Y 6/4) mottles; few black specks of organic matter; massive; very friable; few small bodies of clay loam; strongly acid; diffuse irregular boundary.

2Cg2—52 to 60 inches; gray (5Y 6/1) loamy sand; lenses of fine sandy loam and clay loam; massive; very friable; strongly acid.

The thickness of the solum ranges from 30 to 40 inches. Reaction ranges from strongly acid to extremely acid throughout the profile, except where the surface layer has been limed.

The Ap and A horizons have hue of 10YR or are neutral in hue. They have value of 2 or 3 and chroma of 0 to 3.

The Btg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. It commonly has mottles in shades of yellow, brown, or red. It is sandy clay loam, loam, or clay loam.

The 2Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It is loamy sand or sand having pockets and lenses of sandy loam, clay loam, or sandy clay loam.

Rains Series

The Rains series consists of poorly drained soils that formed in loamy marine and fluvial sediments. Slopes are 0 to 1 percent.

Typical pedon of Rains fine sandy loam; 8.5 miles south of Washington on U.S. Highway 17, about 1.5 miles west on North Carolina Highway 102, about 500 feet south of the road, in a cultivated field (State plane coordinates 619,000 feet N., 2,551,000 feet E.):

Ap—0 to 10 inches; dark gray (10YR 4/1) fine sandy loam; weak fine granular structure; very friable; common fine and medium roots; strongly acid; clear smooth boundary.

Btg1—10 to 17 inches; gray (10YR 5/1) sandy clay loam; common medium distinct reddish yellow (7.5YR 6/8) and few fine prominent yellowish red (5YR 5/6) mottles; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; few fine pores; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg2—17 to 50 inches; gray (10YR 5/1) sandy clay loam; few medium prominent reddish brown (5YR 5/4) and few medium distinct reddish yellow (7.5YR 6/8) mottles; weak fine and medium subangular blocky structure; friable, slightly sticky and slightly plastic; many fine roots; few fine pores; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg3—50 to 54 inches; light gray (10YR 7/2) sandy clay loam; many coarse pockets of sandy clay; few fine prominent red (2.5YR 4/8) and few medium distinct brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg4—54 to 65 inches; light gray (10YR 7/2) sandy clay; common coarse friable pockets of sandy clay loam; common medium distinct yellowish brown (10YR 5/4) and yellow (10YR 7/6) mottles; firm, sticky and plastic; few faint clay films on faces of peds; very strongly acid.

The thickness of the solum ranges from 60 to 80 inches. Reaction ranges from strongly acid to extremely acid throughout the profile, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. The E horizon, if it occurs, has hue of 10YR, value of 4 to 6, and chroma of 1 or 2.

The Btg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. It has few or common high-chroma mottles. It is sandy clay loam, sandy clay, or clay loam. In some pedons it has thin transitional layers of sandy loam.

Roanoke Series

The Roanoke series consists of poorly drained soils that formed in loamy and clayey marine and fluvial sediments. Slopes are 0 to 1 percent.

Typical pedon of Roanoke fine sandy loam; 1.6 miles northeast of Bath on Secondary Road 1741, about 0.6

mile north on Secondary Road 1742, about 800 feet southeast on a farm lane, 300 feet south of the road, in a cultivated field (State plane coordinates 645,000 feet N., 2,657,000 feet E.):

Ap—0 to 6 inches; grayish brown (10YR 5/2) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.

Btg1—6 to 14 inches; gray (10YR 5/1) clay; few fine distinct brownish yellow (10YR 6/6) and few fine prominent reddish brown (5YR 5/4) mottles; moderate fine angular and subangular blocky structure; friable, slightly sticky and slightly plastic; common distinct clay films on faces of peds; many fine roots; very strongly acid; clear smooth boundary.

Btg2—14 to 29 inches; gray (10YR 5/1) clay; few fine distinct yellowish brown (10YR 5/8) mottles; moderate medium and coarse angular blocky structure; firm, sticky and plastic; common distinct clay films on faces of peds; many fine pores; few fine flakes of mica; very strongly acid; clear smooth boundary.

Btg3—29 to 36 inches; mottled dark gray (10YR 4/1), light gray (10YR 6/1), brownish yellow (10YR 6/8), and strong brown (7.5YR 5/8) clay loam; many pockets of sandy clay loam; weak medium subangular blocky structure; firm, sticky and plastic; common distinct clay films on faces of peds; many fine roots; few fine pores; few fine flakes of mica; very strongly acid; gradual smooth boundary.

BCg—36 to 56 inches; light gray (10YR 6/1) sandy clay loam; pockets of clay; common medium distinct brownish yellow (10YR 6/8) and strong brown (7.5YR 5/8) mottles; weak fine and medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; few fine flakes of mica; very strongly acid; gradual smooth boundary.

Cg—56 to 65 inches; mottled light gray (10YR 7/1) and brownish yellow (10YR 6/8) sandy loam; lenses of sandy clay loam; massive; friable; few fine flakes of mica; very strongly acid.

The thickness of the solum ranges from 44 to 56 inches. Reaction ranges from extremely acid to slightly acid throughout the profile, except where the surface layer has been limed.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 1 or 2.

The Btg horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. It is clay, silty clay, or clay loam.

The BCg horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 4 to 7 and chroma of 0 to 2. It is clay loam, silty clay loam, sandy clay loam, or clay.

The Cg horizon varies in color and texture. In some pedons it is stratified.

Seabrook Series

The Seabrook series consists of moderately well drained soils that formed in sandy marine and fluvial sediments. Slopes range from 0 to 2 percent.

Typical pedon of Seabrook loamy sand; 3 miles west of Washington on U.S. Highway 264, about 75 feet east of the road, in a cultivated field (State plane coordinates 675,000 feet N., 2,565,000 feet E.):

Ap—0 to 8 inches; grayish brown (10YR 5/2) loamy sand; weak fine granular structure; very friable; many fine roots; slightly acid; clear wavy boundary.

C1—8 to 28 inches; light olive brown (2.5Y 5/4) loamy sand; few fine distinct olive yellow (2.5Y 6/6) and light gray (2.5Y 7/2) mottles; weak fine granular structure; very friable; strongly acid; gradual smooth boundary.

C2—28 to 37 inches; pale yellow (2.5Y 7/4) loamy sand; few fine distinct yellowish brown (10YR 5/6) and common fine distinct light gray (2.5Y 7/2) mottles; massive; very friable and loose; strongly acid; gradual wavy boundary.

Cg—37 to 80 inches; light gray (5Y 7/1) sand; single grain; loose; few strong brown concretions ¼ inch in diameter; strongly acid.

The combined thickness of the sandy horizons is more than 60 inches. Reaction ranges from very strongly acid to slightly acid throughout the profile, except where the surface layer has been limed.

The Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3.

The C horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 3 to 6. Its is loamy sand, loamy fine sand, or sand.

The Cg horizon has hue of 2.5Y or 5Y, value of 5 to 7, and chroma of 1 or 2. It has textures similar to those of the C horizon.

State Series

The State series consists of well drained soils that formed in loamy marine and fluvial sediments. Slopes range from 0 to 3 percent.

Typical pedon of State sandy loam, 0 to 3 percent slopes; 2.9 miles east of Godley's store on Secondary Road 1912, about 0.8 mile north on Secondary Road 1910, about 100 feet west of the road, in a cultivated field (State plane coordinates 583,000 feet N., 2,690,000 feet E.):

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) sandy loam; weak fine granular structure; very friable; many medium roots; moderately acid; abrupt smooth boundary.
E—6 to 18 inches; light yellowish brown (10YR 6/4) sandy loam; weak medium granular structure; friable; common fine roots; strongly acid; clear smooth boundary.
Bt1—18 to 31 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; friable, slightly sticky; few fine clay films on faces of peds; common fine roots; strongly acid; clear wavy boundary.
Bt2—31 to 44 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct pale brown (10YR 6/3) mottles; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; few fine clay films on faces of peds; few fine roots; few flakes of mica; strongly acid; gradual wavy boundary.
C—44 to 60 inches; light yellowish brown (10YR 6/4) sandy loam; some lenses of sandy clay; common medium distinct gray (10YR 6/1) mottles in the lower part; massive; very friable; common flakes of mica; strongly acid.

The thickness of the solum ranges from 30 to 50 inches. Reaction is very strongly acid or strongly acid throughout the profile, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 2 to 6. The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 or 4.

The Bt 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 sandy loam.

The C or 2C horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 2 to 8, or it is mottled. It is dominantly sandy loam, loamy sand, or sand. In some pedons it has thin lenses of sandy clay or sandy clay loam.

Tarboro Series

The Tarboro series consists of somewhat excessively drained soils that formed in sandy marine and fluvial sediments. Slopes range from 0 to 5 percent.

Typical pedon of Tarboro sand, 0 to 5 percent slopes; 1.3 miles south of Washington on U.S. Highway 17, about 0.7 mile west on Secondary Road 1170, about 0.7 mile west on Secondary Road 1164, about 70 feet north of the road, in a cultivated field (State plane coordinates 659,000 feet N., 2,569,000 feet E.):

Ap—0 to 8 inches; dark yellowish brown (10YR 4/4) sand; weak medium granular structure; very friable; few fine and medium roots; strongly acid; abrupt smooth boundary.
C1—8 to 33 inches; strong brown (7.5YR 5/8) sand; weak medium granular structure; very friable; few fine roots; strongly acid; gradual wavy boundary.
C2—33 to 40 inches; strong brown (7.5YR 5/8) sand; common medium distinct white (10YR 8/2) mottles; weak medium granular structure; very friable; few fine roots; few fine flakes of mica; strongly acid; gradual wavy boundary.
C3—40 to 46 inches; brownish yellow (10YR 6/6) sand; single grain; loose; few fine flakes of mica; strongly acid; gradual wavy boundary.
C4—46 to 72 inches; yellow (10YR 7/8) sand; single grain; loose; few fine flakes of mica; few small pebbles; strongly acid.

The combined thickness of the sandy materials is more than 80 inches. Reaction ranges from very strongly acid to slightly acid throughout the profile, except where the surface layer has been limed.

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

The C horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 3 to 8. It is sand or loamy sand.

Tomotley Series

The Tomotley series consists of poorly drained soils that formed in loamy marine and fluvial sediments. Slopes are 0 to 1 percent.

Typical pedon of Tomotley fine sandy loam; 1.2 miles north of the intersection of North Carolina Highways 306 and 33, about 630 feet west on a farm lane, 50 feet north of the lane, in a cultivated field (State plane coordinates 579,000 feet N., 2,655,000 feet E.):

Ap—0 to 7 inches; dark gray (5Y 4/1) fine sandy loam; weak fine granular structure; very friable; few fine roots; strongly acid; clear smooth boundary.
E—7 to 11 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; few fine roots; strongly acid; gradual wavy boundary.
Btg1—11 to 18 inches; gray (10YR 5/1) sandy clay loam; few fine distinct yellowish brown (10YR 5/8) mottles; weak fine subangular blocky structure; friable; few faint clay films on faces of peds; strongly acid; clear irregular boundary.
Btg2—18 to 39 inches; gray (10YR 5/1) sandy clay loam; common medium prominent strong brown (7.5YR 5/8) and few medium prominent red

(10YR 4/8) mottles; moderate medium subangular blocky structure; friable; few faint clay films on faces of peds; few fine flakes of mica; very strongly acid; clear wavy boundary.

Btg3—39 to 50 inches; light gray (10YR 6/1) sandy clay loam; many medium distinct brownish yellow (10YR 6/8) mottles; weak fine subangular blocky structure; friable; few faint clay films on faces of peds; few fine flakes of mica; very strongly acid; clear wavy boundary.

Cg—50 to 62 inches; light gray (10YR 6/1) sandy loam; few fine distinct brownish yellow (10YR 6/8) mottles; massive; friable; few fine flakes of mica; very strongly acid.

The thickness of the solum ranges from 34 to 50 inches. Reaction ranges from strongly acid to extremely acid throughout the profile, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 2 to 4 and chroma of 0 to 2.

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

The Btg horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 5 to 7 and chroma of 0 to 2. It is sandy clay loam or clay loam.

The Cg horizon has hue of 10YR to 5Y, value of 6 or 7, and chroma of 1 or 2. The texture varies, ranging from sand to clay.

Torhunta Series

The Torhunta series consists of very poorly drained soils that formed in loamy and sandy marine and fluvial sediments. Slopes are 0 to 1 percent.

Typical pedon of Torhunta sandy loam; 4 miles north of Acre on North Carolina Highway 32, about 0.4 mile west on Camp Road, 100 feet south on Camp Spur, 50 feet west in a pine plantation (State plane coordinates 709,000 feet N., 2,652,000 feet E.):

A1—0 to 8 inches; black (10YR 2/1) sandy loam; weak fine granular structure; very friable; many fine roots; strongly acid; clear wavy boundary.

A2—8 to 16 inches; very dark brown (10YR 2/2) sandy loam; weak medium granular structure; very friable; few fine roots; very strongly acid; gradual wavy boundary.

Bg1—16 to 29 inches; dark gray (10YR 4/1) sandy loam; weak medium subangular blocky structure; few pockets of loamy sand and sand; friable, slightly sticky; many fine roots; very strongly acid; gradual wavy boundary.

Bg2—29 to 40 inches; grayish brown (10YR 5/2) sandy loam; weak medium subangular blocky structure; very friable; few small pockets of loamy sand; very strongly acid; diffuse wavy boundary.

Cg—40 to 61 inches; light brownish gray (2.5Y 6/2) loamy sand; pockets of gray (5Y 6/1) sandy clay loam; common medium distinct brown (7.5YR 5/2) mottles; single grain; loose; some uncoated sand grains; very strongly acid.

The thickness of the solum ranges from 24 to 50 inches. Reaction ranges from strongly acid to extremely acid throughout the profile, except where the surface layer has been limed.

The A or Ap horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2.

The Bg horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 2. It is sandy loam or fine sandy loam.

The Cg horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 2. It is loamy sand, sand, or sandy loam.

Udorthents

Udorthents consist of areas where the natural soil has been altered by excavation or covered by earthy fill material. Most areas are well drained or moderately well drained. The excavated areas are mainly landfills where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil. After a final cover of soil material is added, the areas are nearly level to moderately steep and some are undulating.

A typical pedon is not given for these soils because of their variability. The fill areas are more than 20 inches deep and as thick as 30 feet in places. Landfills have layers of material other than soil covered by loamy soil material.

Udorthents are in shades of red, brown, yellow, and gray. The texture varies, but typically is loamy. Reaction ranges from extremely acid to slightly acid.

Wahee Series

The Wahee series consists of somewhat poorly drained soils that formed in loamy and clayey marine and fluvial sediments. Slopes are 0 to 1 percent.

Typical pedon of Wahee fine sandy loam; 1.7 miles east of Everetts Crossroad on U.S. Highway 264, about 0.8 mile south on Secondary Road 1339, about 500 feet west of the road, in an area supporting mixed hardwoods (State plane coordinates 650,000 feet N., 2,648,000 feet E.):

Oe—1 inch to 0; leaf litter.
A—0 to 3 inches; dark gray (10YR 4/1) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; abrupt wavy boundary.
E—3 to 9 inches; light yellowish brown (2.5Y 6/4) fine sandy loam; few fine distinct light brownish gray (10YR 6/2) mottles; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear wavy boundary.
Bt—9 to 15 inches; light olive brown (2.5Y 5/4) clay loam; dominantly light gray (10YR 6/1) faces of peds; few fine distinct light gray (10YR 6/1) mottles in the lower part; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; few medium roots; few faint clay films on faces of peds; strongly acid; clear wavy boundary.
Btg1—15 to 20 inches; grayish brown (2.5Y 5/2) clay; many medium distinct light yellowish brown (10YR 6/4) mottles; moderate medium subangular structure; firm, sticky and plastic; few fine roots; many distinct clay films on faces of peds; very strongly acid; clear wavy boundary.
Btg2—20 to 42 inches; dark gray (10YR 4/1) clay; common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; many prominent clay films on faces of peds; very strongly acid; gradual wavy boundary.
BC—42 to 51 inches; mottled dark gray (10YR 4/1) and yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; very strongly acid; gradual wavy boundary.
C—51 to 64 inches; mottled gray (10YR 5/1) and yellowish brown (10YR 5/4) sandy loam; massive; friable; few fine flakes of mica; very strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. Reaction ranges from moderately acid to very strongly acid in the surface layer and subsurface layer, except where the surface layer has been limed, and from extremely acid to strongly acid in the subsoil and underlying material.

The A or Ap horizon has hue of 10YR or is neutral in hue. It has value of 3 or 4 and chroma of 0 to 2.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 4. It is loam, silt loam, very fine sandy loam, fine sandy loam, or sandy loam.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 8. It is clay, clay loam, or sandy clay.

The Btg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is clay, clay loam, or sandy clay.

The BC horizon has colors similar to those of the Btg horizon or is mottled with those colors. It is sandy clay, silty clay loam, clay loam, sandy clay loam, or fine sandy loam.

The C horizon has hue of 10YR to 5Y or is neutral in hue, has value of 5 to 7 and chroma of 0 to 2, or is mottled with these colors and colors of higher chroma. The texture varies.

Wasda Series

The Wasda series consists of very poorly drained soils that formed in loamy marine and fluvial sediments. Slopes are 0 to 1 percent.

Typical pedon of Wasda muck; 1 mile southeast of Royal on Secondary Road 1002, about 1 mile south on Secondary Road 1922, about 1.75 miles south on the old railroad bed, 200 feet east on a farm road, 100 feet southeast of the road, in a cultivated field (State plane coordinates 568,000 feet N., 2,662,000 feet E.):

Oap—0 to 12 inches; black (N 2/0) muck; about 5 percent fiber, 3 percent rubbed; weak fine granular structure; common uncoated sand grains; very friable; few pieces of charcoal; few fine roots; very strongly acid; abrupt irregular boundary.
A—12 to 18 inches; grayish brown (10YR 5/2) clay loam; weak fine granular structure; few lenses less than 0.5 inch thick of sand; friable, slightly sticky and slightly plastic; strongly acid; abrupt wavy boundary.
Bg—18 to 43 inches; grayish brown (10YR 5/2) clay loam; weak fine subangular blocky structure; lenses of sandy loam; friable, slightly sticky and slightly plastic; strongly acid; few fine roots; abrupt wavy boundary.
Cg—43 to 60 inches; olive gray (5Y 5/2) loamy sand; many strata of sand less than 1 inch thick; single grain; loose; moderately acid.

The thickness of the organic material ranges from 10 to 16 inches. The thickness of the solum ranges from 40 to 60 inches. Reaction ranges from extremely acid to strongly acid in the solum, except where the surface layer has been limed, and from strongly acid to mildly alkaline in the C horizon.

The Oa or Oap horizon has a hue of 2.5YR or is neutral in hue. It has value of 2 and chroma of 0 or 1.

The A horizon has hue of 10YR to 5Y, value of 2 to 5, and chroma of 1 or 2. It is clay loam, sandy clay loam, or sandy loam.

The Bg horizon has hue of 10YR to 5Y, value of 2 to

5, and chroma of 1 or 2. It is clay loam, sandy clay loam, or sandy loam.

The C horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. The texture varies, ranging from sand to clay.

Winton Series

The Winton series consists of moderately well drained soils that formed in loamy and sandy marine and fluvial sediments. Slopes range from 12 to 25 percent.

Typical pedon of Winton fine sandy loam, 12 to 25 percent slopes; 1.6 miles west of Chocowinity on Secondary Road 1143, about 600 feet north across a cultivated field to a wooded area (State plane coordinates 652,000 feet N., 2,565,000 feet E.):

A—0 to 8 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; abrupt wavy boundary.

E—8 to 13 inches; yellowish brown (10YR 5/4) fine sandy loam; weak medium granular structure; friable; common fine roots; strongly acid; clear wavy boundary.

Bt1—13 to 20 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; common fine and medium roots; few faint clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt2—20 to 33 inches; yellowish brown (10YR 5/6) sandy clay loam; common fine distinct strong brown (7.5YR 5/8) and yellowish red (5YR 4/8) mottles; weak medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of peds; strongly acid; gradual wavy boundary.

C—33 to 61 inches; yellowish brown (10YR 5/6) loamy sand; common coarse distinct strong brown (7.5YR 5/8) and few fine distinct gray (10YR 6/1) mottles; single grain; loose; very strongly acid.

The thickness of the solum ranges from 30 to 50 inches. Reaction ranges from extremely acid to moderately acid throughout the profile, except where the surface layer has been limed.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2. The E horizon has hue of 10YR, value of 4 to 7, and chroma of 3 or 4. It is fine sandy loam, sandy loam, loam, loamy sand, or loamy fine sand.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 6 to 8. In some pedons it has mottles in shades of gray, brown, or yellow in the lower part. It is sandy clay loam, clay loam, or sandy loam.

The C horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 8, or it is mottled. The texture varies, ranging from sand to clay.

Yeopim Series

The Yeopim series consists of moderately well drained soils that formed in loamy marine and fluvial sediments. Slopes range from 0 to 2 percent.

Typical pedon of Yeopim silt loam, 0 to 2 percent slopes; 0.5 mile south of Pantego on U.S. Highway 264, about 0.4 mile south on Secondary Road 1704, about 3.5 miles east on a farm road, 210 feet south of the road, in a cultivated field (State plane coordinates 675,000 feet N., 2,696,000 feet E.):

Ap—0 to 5 inches; yellowish brown (10YR 5/4) silt loam; weak fine granular structure; very friable; few fine and medium roots; moderately acid; abrupt smooth boundary.

Bt1—5 to 16 inches; yellowish brown (10YR 5/4) silty clay loam; few medium distinct dark brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few medium roots; few faint clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—16 to 31 inches; light yellowish brown (10YR 6/4) silty clay loam; common medium distinct reddish yellow (7.5YR 6/6) and light gray (10YR 7/2) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; strongly acid; clear smooth boundary.

Btg—31 to 49 inches; light gray (10YR 7/1) silty clay loam; few medium distinct yellow (10YR 7/6) and few fine distinct very pale brown (10YR 7/3) mottles; weak fine subangular blocky structure; very friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; strongly acid; clear smooth boundary.

2C—49 to 62 inches; mottled light gray (10YR 7/2), very pale brown (10YR 7/4), yellow (10YR 7/8), and strong brown (7.5YR 5/8) sandy loam; lenses of sand and sandy clay loam; massive; friable; strongly acid.

The thickness of the solum ranges from 40 to 52 inches. Reaction ranges from strongly acid to extremely acid throughout the profile, except where the surface layer has been limed.

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

The Bt horizon dominantly has hue of 10YR, value of 5 to 7, and chroma of 4 to 8. In some pedons, however,

the lower part of the horizon is neutral in hue and has chroma of 0. The content of gray mottles having chroma of 2 or less is none to common in the upper 24 inches of the profile. The lower part of the Bt horizon has common or many gray mottles having chroma of 2 or less or is dominantly gray. The Bt horizon is silty clay loam, clay loam, or loam.

The C horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 to 6. It is loamy sand, sandy loam, or loam having lenses of sandy clay loam and sand.

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Glossary

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Available water capacity (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:

Very low	0 to 3
Low	3 to 6
Moderate	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.

Clayey. A general textural term that includes sandy clay, silty clay, and clay. According to family level criteria in the soil taxonomic system, a specific textural name referring to fine earth (particles less than 2 millimeters in size) containing 35 percent or more clay, by weight, within the control section. The content of rock fragments is less than 35 percent, by volume.

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, 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.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

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.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

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.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

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.

Eroded (soil phase). Because of erosion, these soils have lost an average of 25 to 75 percent of the original A horizon or the uppermost 2 to 6 inches if the original A horizon was less than 8 inches thick.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic)—Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated)—Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Fast intake (in tables). The movement of water into the soil is rapid.

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.

Flooding. The temporary covering of the soil surface by flowing water from any source, such as overflowing streams, runoff from adjacent or surrounding slopes, and inflow from high tides. The frequency of flooding generally is expressed as none, rare, occasional, or frequent. *None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year). *Occasional* means that flooding occurs infrequently

under normal weather conditions (the chance of flooding is 5 to 50 percent in any year). *Frequent* means that flooding occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year). The duration of flooding is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month).

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

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 the 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 uppercase letter represents the major horizons. Numbers or lowercase 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.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is, in part, a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as accumulation of clay, sesquioxides, humus, or a combination of these; prismatic or blocky structure; redder or browner colors than those in the A horizon; or 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 Arabic numeral 2 precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

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.

Interstream divide (or interstream area). The nearly level land between drainageways in relatively undissected parts of the Coastal Plain. It is in areas on uplands, low marine terraces, and stream terraces. Soils in these areas are generally poorly drained or very poorly drained.

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.

Loamy. A general textural term that includes coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, silt, clay loam, sandy clay loam, and silty clay loam. According to

family level criteria in the soil taxonomic system, a specific textural name referring to fine earth (particles less than 2 millimeters in size) of loamy very fine sand or finer textured material that contains less than 35 percent clay, by weight, within the control section. The content of rock fragments is less than 35 percent, by volume.

Low strength. The soil is not strong enough to support loads.

Marsh. Periodically wet or continually flooded areas where the surface is not deeply submerged. These areas generally are covered with sedges, cattails, rushes, or other hydrophytic plants. Subgroups are:

Freshwater.—Lowland areas bordering rivers, creeks, and lakes that are flooded by fresh water and dominated by halophobic (salt-intolerant) plants.

Salt.—Lowland areas bordering coastal islands, sounds, bays, and sloughs that are flooded by salt water and dominated by halophytic (salt-tolerant) plants.

Tidal.—Lowland areas bordering rivers, creeks, and sloughs and traversed by interlacing channels. During high tides these areas are inundated by either salt water or brackish water. They are dominated by halophytic (salt-tolerant) plants.

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.

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, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

No-till planting. A method of planting crops in which there is virtually no seedbed preparation. A thin slice of the soil is opened, and the seed is planted at the desired depth.

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.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

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.

Percs slowly (in tables). The slow movement of water through the soil, adversely affects the specified use.

Permeability. The quality of the soil that enables water to move through the profile. Permeability is measured as the number of inches per hour that water moves through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 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, such as slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Subsurface tunnels or pipelike cavities are formed by water moving through the soil.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Pocosin. Waterlogged land in large, flat interstream areas that are elevated above the distant flood plains. The soils are typically high in content of organic matter and support plants that are tolerant of wetness.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability,

the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of the 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 degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	below 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately 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

Relief. The elevations or inequalities of a land surface, considered collectively.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

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.

Sandy. A general textural term that includes coarse sand, sand, fine sand, very fine sand, loamy coarse sand, loamy sand, loamy fine sand, and loamy very fine sand. According to family level criteria in the soil taxonomic system, a specific textural name referring to fine earth (particles less than 2 millimeters in size) of sand or loamy sand that contains less than 50 percent very fine sand, by weight, within the control section. The content of rock fragments is less than 35 percent, by volume.

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.

Seasonal high water table. The highest level of a saturated zone (the apparent or perched water table) over a continuous period of more than 2 weeks in most years, but not a permanent water table.

Seepage (in tables). The movement of water through the soil 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.

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. In this survey area slope classes are as follows:

Nearly level	0 to 2 percent
Gently sloping	2 to 6 percent
Strongly sloping	6 to 12 percent
Moderately steep	12 to 25 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of 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.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to soil blowing 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 grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsidence. A pronounced reduction in volume in some drained soils because of the removal of water, shrinkage of organic material, and the oxidation of organic compounds. Generally associated with soils that have a high content of organic matter.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

Suitability ratings. Ratings for the degree of suitability of soils for pasture, crops, woodland, and engineering uses. The ratings and the general criteria used for their selection are as follows:

Well suited.—The intended use may be initiated and maintained by using only the standard materials and methods typically required for that use. Good results can be expected.

Suited or moderately suited.—The limitations affecting the intended use make special planning, design, or maintenance necessary.

Poorly suited.—The intended use is difficult or costly to initiate and maintain because of certain soil properties, such as steep slopes, a high hazard of erosion, a high water table, low fertility, and a hazard of flooding. Major soil reclamation, special design, or intensive management practices are needed.

Very poorly suited, not suited, or unsuited.—The intended use is very difficult or costly to initiate and maintain, and thus it generally should not be undertaken.

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. An embankment, or ridge, constructed on the contour or at a slight angle to the contour across sloping soils. The terrace intercepts surface runoff, so that water soaks into the soil or flows slowly to a prepared outlet.

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." The textural classes are defined as follows:

Sands (coarse sand, sand, fine sand, and very fine sand).—Soil material in which the content of sand is 85 percent or more and the percentage of silt plus 1½ times the percentage of clay does not exceed 15.

Loamy sands (loamy coarse sand, loamy sand, loamy fine sand, and loamy very fine sand).—Soil material in which, at the upper limit, the content of sand is 85 to 90 percent and the percentage of silt plus 1½ times the percentage of clay is not less than 15; at the lower limit, the content of sand is 70 to 85 percent and the percentage of silt plus twice the percentage of clay does not exceed 30.

Sandy loams (coarse sandy loam, sandy loam, fine sandy loam, and very fine sandy loam).—Soil material in which the content of clay is 20 percent or less, the percentage of silt plus twice the percentage of clay exceeds 30, and the content of sand is 52 percent or more or soil material in which the content of clay is less than 7 percent, the content of silt is less than 50 percent, and the content of sand is 43 to 52 percent.

Loam.—Soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand.

Silt loam.—Soil material that contains 50 or more percent silt and 12 to 27 percent clay or 50 to 80 percent silt and less than 12 percent clay.
Silt.—Soil material that contains 80 or more percent silt and less than 12 percent clay.
Sandy clay loam.—Soil material that contains 20 to 35 percent clay, less than 28 percent silt, and 45 or more percent sand.
Clay loam.—Soil material that contains 27 to 40 percent clay and 20 to 45 percent sand.
Silty clay loam.—Soil material that contains 27 to 40 percent clay and less than 20 percent sand.
Sandy clay.—Soil material that contains 35 or more percent clay and 45 or more percent sand.
Silty clay.—Soil material that contains 40 or more percent clay and 40 or more percent silt.
Clay.—Soil material that contains 40 or more percent clay, less than 45 percent sand, and less than 40 percent silt.

Thin layer (in tables). A layer of otherwise suitable soil material that is too thin for the specified use.

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.

Underlying material. Technically the C horizon; the part of the soil below the biologically altered A and B horizons.

Understory. The trees and other woody species growing under a more or less continuous cover of branches and foliage formed collectively by the upper portions of adjacent trees and other woody growth.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Water table (apparent). A thick zone of free water in the soil. The apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water table (perched). A saturated zone of water in the soil standing above an unsaturated zone.

Water table (seasonal high). The highest level of a saturated zone in the soil (the apparent or perched water table) over a continuous period of more than 2 weeks in most years, but not a permanent water table.

Wetness. A general term applied to soils that hold water at or near the surface long enough to be a common management problem.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1951-81 at New Holland, North Carolina)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	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	54.8	33.8	44.3	74	12	73	4.13	2.29	5.75	7	0.7
February	56.9	35.2	46.1	77	16	67	3.79	2.42	5.03	7	1.1
March	63.8	41.7	52.8	82	23	162	3.59	2.14	4.88	7	.2
April	72.5	49.7	61.1	88	31	333	3.23	1.87	4.43	5	.0
May	78.7	58.0	68.4	92	40	570	4.29	2.60	5.80	7	.0
June	84.2	65.5	74.9	96	50	747	4.49	2.25	6.43	6	.0
July	87.4	69.7	78.6	97	58	887	6.08	3.45	8.41	9	.0
August	86.7	69.2	78.0	96	56	868	6.57	3.61	9.17	8	.0
September	82.3	64.3	73.3	93	49	699	5.55	2.15	8.39	5	.0
October	74.1	54.1	64.1	88	32	437	3.80	1.33	5.84	5	.0
November	65.8	44.1	55.0	82	25	178	3.58	1.43	5.39	5	.0
December	57.6	36.2	46.9	76	17	93	3.49	1.39	5.25	6	.1
Yearly:											
Average	72.1	51.8	62.0	---	---	---	---	---	---	---	---
Extreme	---	---	---	97	12	---	---	---	---	---	---
Total	---	---	---	---	---	5,114	52.59	46.69	58.70	77	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 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1951-81 at New Holland, North Carolina)

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--	Mar. 14	Apr. 5	Apr. 14
2 years in 10 later than--	Mar. 6	Mar. 28	Apr. 9
5 years in 10 later than--	Feb. 19	Mar. 13	Mar. 30
First freezing temperature in fall:			
1 year in 10 earlier than--	Nov. 16	Nov. 8	Oct. 28
2 years in 10 earlier than--	Nov. 26	Nov. 14	Nov. 1
5 years in 10 earlier than--	Dec. 16	Nov. 25	Nov. 11

TABLE 3.--GROWING SEASON

(Recorded in the period 1951-81 at New Holland, North Carolina)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	263	230	204
8 years in 10	275	239	211
5 years in 10	298	256	225
2 years in 10	323	274	238
1 year in 10	338	283	245

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	7,977	1.5
AbA	Altavista-Urban land complex, 0 to 2 percent slopes	983	0.2
Ap	Arapahoe fine sandy loam	22,344	4.2
At	Augusta fine sandy loam	17,082	3.2
Ba	Bayboro loam	30,986	5.9
Bb	Belhaven muck	3,195	0.6
BoB	Bonneau loamy sand, 0 to 4 percent slopes	2,250	0.4
Cf	Cape Fear fine sandy loam	17,194	3.3
CnB	Conetoe loamy sand, 0 to 5 percent slopes	2,587	0.5
CrA	Craven fine sandy loam, 0 to 1 percent slopes	12,724	2.4
CrB	Craven fine sandy loam, 1 to 4 percent slopes	8,418	1.6
CsC2	Craven clay loam, 4 to 12 percent slopes, eroded	2,020	0.4
Ct	Croatan muck	11,344	2.1
Cu	Currituck muck, frequently flooded	7,459	1.4
Da	Dare muck	10,351	2.0
DgB	Dogue fine sandy loam, 1 to 4 percent slopes	1,972	0.4
Do	Dorovan mucky peat, frequently flooded	8,167	1.5
Ds	Dragston fine sandy loam	5,213	1.0
GoA	Goldsboro fine sandy loam, 0 to 2 percent slopes	11,970	2.3
Hy	Hyde loam	4,493	0.8
La	Leaf silt loam	43,526	8.2
Le	Lenoir loam	32,937	6.2
Lo	Leon sand	5,392	1.0
Ly	Lynchburg fine sandy loam	19,403	3.7
Me	Muckalee loam, frequently flooded	21,045	4.0
Pa	Pantego loam	14,054	2.7
Pe	Perquimans silt loam	3,698	0.7
Pm	Pits, mine	2,287	0.4
Po	Ponzer muck	14,561	2.8
Pt	Portsmouth loam	32,550	6.2
Ra	Rains fine sandy loam	18,573	3.5
Ro	Roanoke fine sandy loam	44,433	8.4
Sb	Seabrook loamy sand	5,969	1.1
Se	Seabrook-Urban land complex	568	0.1
StA	State sandy loam, 0 to 3 percent slopes	2,705	0.5
TaB	Tarboro sand, 0 to 5 percent slopes	6,880	1.3
To	Tomotley fine sandy loam	48,413	9.1
Tr	Torhunta sandy loam	8,598	1.6
Ud	Udorthents, loamy	73	*
Ur	Urban land	2,572	0.5
Wa	Wahee fine sandy loam	4,641	0.9
Wd	Wasda muck	2,802	0.5
WtD	Winton fine sandy loam, 12 to 25 percent slopes	4,018	0.8
YoA	Yeopim silt loam, 0 to 2 percent slopes	277	0.1
	Total	528,704	100.0

* Less than 0.1 percent.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

(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	Land capability	Corn	Cotton	Soybeans	Tobacco	Wheat	Improved Bermudagrass	Grass-clover
		Bu	Lbs	Bu	Lbs	Bu	AUM*	AUM*
AaA---------- Altavista	IIw	125	650	42	3,000	55	---	11.0
AbA:								
Altavista------	IIw	---	---	---	---	---	---	---
Urban land-----	VIIIs	---	---	---	---	---	---	---
Ap**---------- Arapahoe	IIIw	130	---	40	---	50	---	12.0
At---------- Augusta	IIIw	100	---	40	2,200	55	---	11.0
Ba---------- Bayboro	IIIw	130	---	45	---	55	---	---
Bb---------- Belhaven	VIIw	---	---	---	---	---	---	---
BoB---------- Bonneau	IIs	85	700	30	2,600	---	8.5	---
Cf**---------- Cape Fear	IIIw	140	---	45	---	---	---	---
CnB---------- Conetoe	IIs	75	---	25	2,200	---	9.0	8.0
CrA---------- Craven	IIw	115	600	45	2,700	55	---	10.0
CrB---------- Craven	IIIe	105	500	40	2,500	50	---	10.0
CsC2---------- Craven	VIe	---	---	---	---	---	---	7.0
Ct---------- Croatan	VIIw	---	---	---	---	---	---	---
Cu---------- Currituck	VIIIw	---	---	---	---	---	---	---
Da**---------- Dare	IVw	100	---	25	---	30	---	---
DgB---------- Dogue	IIe	115	---	40	---	55	8.5	---
Do---------- Dorovan	VIIw	---	---	---	---	---	---	---
Ds**---------- Dragston	IIw	130	---	40	---	50	10.0	---

See footnotes at end of table.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Cotton	Soybeans	Tobacco	Wheat	Improved Bermudagrass	Grass-clover
		Bu	Lbs	Bu	Lbs	Bu	AUM*	AUM*
GoA---------- Goldsboro	IIw	125	700	42	3,000	60	---	11.0
Hy**---------- Hyde	IIIw	150	---	50	---	55	---	---
La**---------- Leaf	IVw	100	---	35	---	45	---	9.0
Le---------- Lenoir	IIIw	100	525	40	2,200	45	---	10.0
Lo---------- Leon	IVw	50	---	---	---	---	9.0	---
Ly---------- Lynchburg	IIw	115	675	45	2,800	---	---	11.0
Me---------- Muckalee	Vw	---	---	---	---	---	---	---
Pa**---------- Pantego	IIIw	135	---	50	---	50	---	12.0
Pe**---------- Perquimans	IIIw	135	---	45	---	55	---	---
Pm***---------- Pits	VIIIs	---	---	---	---	---	---	---
Po---------- Ponzer	VIIw	---	---	---	---	---	---	---
Pt**---------- Portsmouth	IIIw	130	---	45	---	60	---	---
Ra---------- Rains	IIIw	120	450	40	2,300	---	---	11.0
Ro**---------- Roanoke	IIIw	120	---	40	---	45	---	9.0
Sb---------- Seabrook	IIIs	75	---	30	2,000	---	9.0	---
Se***:								
Seabrook-------	IIIs	---	---	---	---	---	---	---
Urban land-----	VIIIs	---	---	---	---	---	---	---
StA---------- State	I	130	---	45	3,000	60	---	11.0
TaB---------- Tarboro	IIIs	50	---	20	---	---	6.0	---
To**---------- Tomotley	IIIw	130	---	40	---	55	---	11.0
Tr**---------- Torhunta	IIIw	120	---	40	---	45	---	12.0

See footnotes at end of table.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Cotton	Soybeans	Tobacco	Wheat	Improved Bermudagrass	Grass-clover
		Bu	Lbs	Bu	Lbs	Bu	AUM*	AUM*
Ud***----- Udorthents	VIIe	---	---	---	---	---	---	---
Ur***----- Urban land	VIIIs	---	---	---	---	---	---	---
Wa----- Wahee	IIw	110	---	45	---	---	---	---
Wd**----- Wasda	IIIw	130	---	45	---	---	---	---
WtD----- Winton	VIe	---	---	---	---	---	---	7.0
YoA----- Yeopim	IIw	130	---	45	3,000	55	---	11.0

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** Capability subclass and yields are for drained areas. See description of map unit for the capability subclass in undrained areas.

*** 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	Volume*	
AaA---------- Altavista	9A	Slight	Slight	Slight	Loblolly pine	91	133	Loblolly pine.
					Shortleaf pine	77	124	
					Sweetgum	84	90	
					White oak	---	---	
					Red maple	---	---	
					Yellow-poplar	---	---	
					Southern red oak	---	---	
Ap---------- Arapahoe	10W	Slight	Severe	Severe	Loblolly pine	95	142	Loblolly pine.
					Pond pine	65	46	
					Sweetgum	---	---	
					Red maple	---	---	
					Water tupelo	---	---	
					Baldcypress	---	---	
					Yellow-poplar	---	---	
					Blackgum	---	---	
					Willow oak	---	---	
					Swamp chestnut oak	---	---	
					Water oak	---	---	
At---------- Augusta	9W	Slight	Moderate	Slight	Loblolly pine	90	131	Loblolly pine.
					Sweetgum	90	106	
					White oak	80	62	
					Water oak	---	---	
					Yellow-poplar	---	---	
					American beech	---	---	
Ba---------- Bayboro	10W	Slight	Severe	Severe	Loblolly pine	98	149	Loblolly pine.
					Sweetgum	94	119	
					Water oak	89	85	
					Yellow-poplar	---	---	
					Swamp tupelo	---	---	
					Red maple	---	---	
					Swamp chestnut oak	---	---	
					Willow oak	---	---	
					Pond pine	---	---	
Bb---------- Belhaven	6W	Slight	Severe	Severe	Loblolly pine	65	85	Loblolly pine.
					Pond pine	60	39	
					Red maple	---	---	
					Sweetgum	---	---	
					Blackgum	---	---	
BoB---------- Bonneau	8S	Slight	Moderate	Moderate	Loblolly pine	84	118	Loblolly pine,
					Longleaf pine	75	101	longleaf pine.
Cf---------- Cape Fear	11W	Slight	Severe	Severe	Loblolly pine	100	154	Loblolly pine,
					Willow oak	86	81	sweetgum.
					Sweetgum	---	---	
					Water oak	---	---	
					Water tupelo	---	---	
					Baldcypress	---	---	

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Potential productivity: Common trees	Site index	Volume*	Trees to plant
CnB---- Conetoe	8S	Slight	Moderate	Moderate	Loblolly pine	80	110	Loblolly pine.
					Southern red oak	---	---	
					White oak	---	---	
					Hickory	---	---	
					Sweetgum	---	---	
					Red maple	---	---	
					Shumard oak	---	---	
CrA, CrB---- Craven	9C	Slight	Moderate	Slight	Loblolly pine	88	127	Loblolly pine.
					White oak	85	67	
					Sweetgum	---	---	
					White oak	---	---	
					Southern red oak	---	---	
					Red maple	---	---	
					Blackgum	---	---	
					Yellow-poplar	---	---	
CsC2---- Croatan	8C	Slight	Moderate	Moderate	Loblolly pine	81	112	Loblolly pine.
					White oak	---	---	
					Southern red oak	---	---	
					Red maple	---	---	
Ct---- Croatan	6W	Slight	Severe	Severe	Loblolly pine	70	93	Loblolly pine.
					Pond pine	55	33	
Da---- Dare	5W	Slight	Severe	Severe	Loblolly pine	60	76	Loblolly pine.
					Pond pine	55	33	
					Baldcypress	---	---	
					Water tupelo	---	---	
DgB---- Dogue	9C	Slight	Moderate	Slight	Loblolly pine	90	131	Loblolly pine.
					Southern red oak	80	62	
					Sweetgum	90	106	
					Yellow-poplar	93	95	
					White oak	80	62	
Do---- Dorovan	5W	Slight	Severe	Severe	Sweetgum	75	68	Baldcypress, sweetgum.
					Blackgum	---	---	
					Baldcypress	---	---	
					Swamp tupelo	---	---	
					Red maple	---	---	
Ds---- Dragston	8W	Slight	Moderate	Slight	Loblolly pine	85	120	Loblolly pine.
					Southern red oak	80	62	
					Sweetgum	90	106	
					Yellow-poplar	90	90	
					White oak	---	---	
GoA---- Goldsboro	9A	Slight	Slight	Slight	Loblolly pine	90	131	Loblolly pine.
					Sweetgum	90	106	
					Southern red oak	---	---	
					White oak	---	---	
					Red maple	---	---	
Hy---- Hyde	10W	Slight	Severe	Severe	Loblolly pine	96	145	Loblolly pine.
					Sweetgum	---	---	
					Water oak	---	---	
					Baldcypress	---	---	
					Pond pine	---	---	
					Blackgum	---	---	

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Potential productivity: Common trees	Site index	Volume*	Trees to plant
La Leaf	9W	Slight	Moderate	Moderate	Loblolly pine Sweetgum Water oak	90 90 ---	131 106 ---	Loblolly pine, sweetgum.
Le Lenoir	9W	Slight	Moderate	Slight	Loblolly pine Sweetgum White oak Southern red oak	90 90 --- ---	131 106 --- ---	Loblolly pine, sweetgum.
Lo Leon	7W	Slight	Moderate	Moderate	Loblolly pine Longleaf pine Water oak	75 65 ---	101 67 ---	Longleaf pine, loblolly pine.
Ly Lynchburg	9W	Slight	Moderate	Slight	Loblolly pine Yellow-poplar Sweetgum Southern red oak White oak	86 92 90 --- ---	123 93 106 --- ---	Loblolly pine.
Me Muckalee	7W	Slight	Severe	Severe	Sweetgum Loblolly pine Water oak Green ash Baldcypress	90 90 90 85 ---	106 131 86 59 ---	Sweetgum, loblolly pine.
Pa Pantego	10W	Slight	Severe	Severe	Loblolly pine Pond pine Baldcypress Water tupelo Water oak Willow oak	95 73 --- --- --- ---	142 57 --- --- --- ---	Loblolly pine.
Pe Perquimans	10W	Slight	Severe	Moderate	Loblolly pine Green ash Sweetgum Water oak	94 --- --- ---	140 --- --- ---	Loblolly pine.
Po Ponzer	6W	Slight	Severe	Severe	Loblolly pine Pond pine Sweetgum Sweetbay Redbay Red maple	70 60 --- --- --- ---	93 39 --- --- --- ---	Loblolly pine.
Pt Portsmouth	10W	Slight	Severe	Severe	Loblolly pine Sweetgum Red maple Water oak Willow oak	96 --- --- --- ---	145 --- --- --- ---	Loblolly pine.
Ra Rains	9W	Slight	Severe	Moderate	Loblolly pine Sweetgum	90 90	131 106	Loblolly pine.
Ro Roanoke	10W	Slight	Severe	Severe	Loblolly pine Willow oak Sweetgum Red maple Water oak	96 76 90 --- ---	145 68 106 --- ---	Loblolly pine, sweetgum.

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Trees to plant
Sb Seabrook	8S	Slight	Moderate	Moderate	Loblolly pine	81	112	Loblolly pine, longleaf pine.
					Longleaf pine	70	79	
StA State	9A	Slight	Slight	Slight	Loblolly pine	86	123	Loblolly pine.
					Southern red oak	85	67	
					Yellow-poplar	100	107	
TaB Tarboro	7S	Slight	Moderate	Moderate	Loblolly pine	72	96	Loblolly pine, longleaf pine.
					Longleaf pine	---	---	
					Southern red oak	---	---	
					Blackjack oak	---	---	
					White oak	---	---	
To Tomotley	10W	Slight	Severe	Moderate	Loblolly pine	96	145	Loblolly pine.
					Sweetgum	90	106	
					Willow oak	---	---	
Tr Torhunta	9W	Slight	Severe	Severe	Loblolly pine	88	127	Loblolly pine, sweetgum.
					Sweetgum	90	106	
					Water tupelo	---	---	
Wa Wahee	9W	Slight	Moderate	Slight	Loblolly pine	86	123	Loblolly pine, sweetgum.
					Sweetgum	90	106	
					Water oak	---	---	
					Willow oak	---	---	
Wd Wasda	8W	Slight	Severe	Severe	Loblolly pine	80	110	Loblolly pine, sweetgum.
					Water oak	80	74	
					Baldcypress	---	---	
					Sweetgum	---	---	
					Pond pine	70	53	
					Red maple	---	---	
WtD Winton	10R	Moderate	Moderate	Slight	Loblolly pine	93	138	Loblolly pine.
					Southern red oak	---	---	
					Sweetgum	---	---	
					American beech	---	---	
YoA Yeopim	9A	Slight	Slight	Slight	Loblolly pine	91	133	Loblolly pine.
					Sweetgum	---	---	
					Yellow-poplar	---	---	
					Southern red oak	---	---	
					White oak	---	---	

* Volume is the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

TABLE 7.--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.
AbA*: Altavista	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Urban land.					
Ap Arapahoe	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
At Augusta	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Ba Bayboro	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Bb Belhaven	Severe: flooding, wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness.	Severe: wetness, excess humus.	Severe: wetness, excess humus.
BoB Bonneau	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Cf Cape Fear	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
CnB Conetoe	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
CrA Craven	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Slight.
CrB Craven	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
CsC2 Craven	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Ct Croatan	Severe: wetness, excess humus.	Severe: wetness, excess humus, too acid.	Severe: excess humus, wetness.	Severe: wetness, excess humus.	Severe: too acid, wetness.
Cu Currituck	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Da Dare	Severe: flooding, wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness.	Severe: wetness, excess humus.	Severe: excess humus, wetness.
DgB Dogue	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, small stones, wetness.	Moderate: wetness.	Moderate: wetness.
Do Dorovan	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.
Ds Dragston	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
GoA Goldsboro	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight	Slight.
Hy Hyde	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
La Leaf	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Le Lenoir	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Lo Leon	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
Ly Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Me Muckalee	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Pa Pantego	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Pe Perquimans	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
Pm*. Pits					
Po Ponzer	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness.	Severe: wetness, excess humus.	Severe: wetness, excess humus.
Pt Portsmouth	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Ra Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ro Roanoke	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Sb Seabrook	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight	Severe: droughty.
Se*: Seabrook	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight	Severe: droughty.
Urban land.					
StA State	Slight	Slight	Slight	Slight	Slight.
TaB Tarboro	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
To Tomotley	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Tr Torhunta	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ud*. Udorthents					
Ur*. Urban land					
Wa Wahee	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Wd Wasda	Severe: flooding, wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness.	Severe: wetness, excess humus.	Severe: wetness, excess humus.
WtD Winton	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
YoA Yeopim	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: erodes easily.	Moderate: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--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.
AbA*:										
Altavista----	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Urban land.										
Ap---- Arapahoe	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Fair.
At---- Augusta	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Ba---- Bayboro	Fair	Good	Good	Good	Good	Poor	Good	Good	Good	Fair.
Bb---- Belhaven	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
BoB---- Bonneau	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Cf---- Cape Fear	Fair	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
CnB---- Conetoe	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Fair	Very poor.
CrA---- Craven	Good	Good	Good	Good	Good	Poor	Good	Good	Good	Poor.
CrB---- Craven	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CsC2---- Craven	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Ct---- Croatan	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Cu---- Currituck	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Good	Very poor.	Very poor.	Good.
Da---- Dare	Fair	Fair	Good	Good	Good	Poor	Good	Fair	Good	Fair.
DgB---- Dogue	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Do---- Dorovan	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
Ds---- Dragston	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Fair.

See footnote at end of table.

TABLE 8.--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
GoA---- Goldsboro	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Hy---- Hyde	Fair	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
La---- Leaf	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Le---- Lenoir	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Lo---- Leon	Poor	Fair	Good	Poor	Fair	Fair	Poor	Fair	Fair	Poor.
Ly---- Lynchburg	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Me---- Muckalee	Poor	Poor	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
Pa---- Pantego	Fair	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
Pe---- Perquimans	Good	Good	Good	Good	Good	Poor	Fair	Good	Good	Fair.
Pm*. Pits										
Po---- Ponzer	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Pt---- Portsmouth	Fair	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
Ra---- Rains	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Good	Good.
Ro---- Roanoke	Good	Good	Good	Good	Good	Fair	Poor	Good	Good	Fair.
Sb---- Seabrook	Fair	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Se*: Seabrook----	Fair	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Urban land.										
StA---- State	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
TaB---- Tarboro	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
To---- Tomotley	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Good	Good.

See footnote at end of table.

TABLE 8.--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
Tr--Torhunta	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Fair.
Ud*. Udorthents										
Ur*. Urban land										
Wa--Wahee	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Wd--Wasda	Very poor.	Fair	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
WtD--Winton	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
YoA--Yeopim	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--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. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation)

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.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, low strength.	Moderate: wetness.
AbA*: Altavista	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, low strength.	Moderate: wetness.
Urban land.						
Ap Arapahoe	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
At Augusta	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: low strength, wetness.	Moderate: wetness.
Ba Bayboro	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
Bb Belhaven	Severe: excess humus, wetness.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness.	Severe: flooding, wetness, low strength.	Severe: low strength, wetness.	Severe: wetness, excess humus.
BoB Bonneau	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
Cf Cape Fear	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
CnB Conetoe	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
CrA, CrB Craven	Severe: wetness, cutbanks cave.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength.	Slight.
CsC2 Craven	Severe: wetness, cutbanks cave.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: slope.
Ct Croatan	Severe: excess humus, wetness.	Severe: wetness, low strength.	Severe: wetness.	Severe: flooding, wetness, low strength.	Severe: wetness.	Severe: too acid, wetness.
Cu Currituck	Severe: cutbanks cave, excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: ponding, flooding.	Severe: ponding, flooding, excess humus.

See footnote at end of table.

TABLE 9.--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
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.
DgB Dogue	Severe: cutbanks cave, wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength.	Moderate: wetness.
Do Dorovan	Severe: excess humus, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, ponding, flooding.	Severe: ponding, flooding, excess humus.
Ds Dragston	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
GoA Goldsboro	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Slight.
Hy Hyde	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
La Leaf	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
Le Lenoir	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
Lo Leon	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
Ly Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Me Muckalee	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
Pa Pantego	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Pe Perquimans	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, low strength.	Severe: wetness.
Pm* Pits						
Po Ponzer	Severe: excess humus, wetness.	Severe: subsides, wetness, low strength.	Severe: subsides, wetness.	Severe: subsides, wetness, low strength.	Severe: wetness, low strength, subsides.	Severe: wetness, excess humus.

See footnote at end of table.

TABLE 9.--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
Pt---------- Portsmouth	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ra---------- Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ro---------- Roanoke	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
Sb---------- Seabrook	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
Se*: Seabrook---------	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
Urban land.						
StA---------- State	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Moderate: low strength.	Slight.
TaB---------- Tarboro	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty, too sandy.
To---------- Tomotley	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Tr---------- Torhunta	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ud*. Udorthents						
Ur*. Urban land						
Wa---------- Wahee	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
Wd---------- Wasda	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, excess humus.
WtD---------- Winton	Severe: wetness, slope.	Severe: wetness, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
YoA---------- Yeopim	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Moderate: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation)

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, too clayey.
AbA**: Altavista----------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness, too clayey.
Urban land.					
Ap---------- Arapahoe	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
At---------- Augusta	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
Ba---------- Bayboro	Severe: wetness, percs slowly.	Slight----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Bb---------- Belhaven	Severe: wetness, percs slowly.	Severe: seepage, excess humus.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
BoB---------- Bonneau	Severe: wetness.	Severe: seepage.	Severe: wetness.	Severe: seepage.	Good.
Cf---------- Cape Fear	Severe: wetness, percs slowly.	Severe: seepage.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
CnB---------- Conetoe	Slight----------	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
CrA---------- Craven	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
CrB---------- Craven	Severe: wetness, percs slowly.	Moderate: slope, seepage.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
CsC2---------- Craven	Severe: wetness, percs slowly.	Severe: slope.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.

See footnotes at end of table.

TABLE 10.--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
Ct Croatan	Severe: wetness, percs slowly.	Severe: seepage, excess humus.	Severe: wetness, too acid.	Severe: seepage, wetness.	Poor: wetness, thin layer.
Cu Currituck	Severe: flooding, ponding, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: seepage, too sandy, ponding.
Da Dare	Severe: wetness, percs slowly.	Severe: flooding, excess humus, wetness.	Severe: seepage, wetness, excess humus.	Severe: wetness.	Poor: excess humus, wetness.
DgB Dogue	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
Do Dorovan	Severe: subsides, flooding, ponding.	Severe: flooding, excess humus, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: ponding, excess humus.
Ds Dragston	Severe: wetness, poor filter.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Poor: wetness, thin layer.
GoA Goldsboro	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
Hy Hyde	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
La Leaf	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Le Lenoir	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Lo Leon	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Ly Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Me Muckalee	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Pa Pantego	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.

See footnotes at end of table.

TABLE 10.--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
Pe Perquimans	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Pm**. Pits					
Po Ponzer	Severe: wetness, percs slowly.	Severe: excess humus.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Pt Portsmouth	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Ra Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Ro Roanoke	Severe: wetness, percs slowly.	Severe: seepage.	Severe: seepage, wetness.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Sb Seabrook	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
Se**: Seabrook	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
Urban land.					
StA State	Moderate: wetness, percs slowly.	Severe: seepage.	Severe: seepage, wetness.	Moderate: wetness.	Fair: too clayey, thin layer.
TaB Tarboro	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
To Tomotley	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Tr Torhunta	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
Ud**. Udorthents					
Ur**. Urban land					

See footnotes at end of table.

TABLE 10.--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
Wa Wahee	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Wd Wasda	Severe: wetness.	Severe: flooding, excess humus, wetness.	Severe: wetness, seepage.	Severe: wetness.	Poor: wetness, excess humus.
WtD Winton	Severe: wetness, percs slowly, slope.	Severe: seepage, slope.	Severe: slope.	Severe: slope.	Poor: slope.
YoA Yeopim	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness.	Fair: wetness, thin layer.

* Ratings are for aerobic lagoons. Anaerobic lagoons for disposal of animal waste are not considered in these ratings.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AaA Altavista	Fair: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
AbA*: Altavista	Fair: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Urban land.				
Ap Arapahoe	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: wetness.
At Augusta	Fair: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
Ba Bayboro	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Bb Belhaven	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
BoB Bonneau	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Cf Cape Fear	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
CnB Conetoe	Good	Probable	Improbable: too sandy.	Fair: too sandy.
CrA, CrB, CsC2 Craven	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Ct Croatan	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness, too acid.
Cu Currituck	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
Da Dare	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
DgB Dogue	Fair: wetness.	Probable	Improbable: too sandy.	Poor: thin layer.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Do---------- Dorovan	Poor: wetness.	Probable----------	Improbable: too sandy.	Poor: excess humus, wetness.
Ds---------- Dragston	Fair: wetness.	Probable----------	Improbable: too sandy.	Fair: thin layer.
GoA---------- Goldsboro	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Hy---------- Hyde	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
La---------- Leaf	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Le---------- Lenoir	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Lo---------- Leon	Poor: wetness.	Probable----------	Improbable: too sandy.	Poor: too sandy, wetness.
Ly---------- Lynchburg	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Me---------- Muckalee	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Pa---------- Pantego	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Pe---------- Perquimans	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Pm*. Pits				
Po---------- Ponzer	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
Pt---------- Portsmouth	Poor: wetness.	Probable----------	Improbable: too sandy.	Poor: wetness.
Ra---------- Rains	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Ro---------- Roanoke	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Sb---------- Seabrook	Fair: wetness.	Probable----------	Improbable: too sandy.	Fair: too sandy, small stones.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Se*:				
Seabrook	Fair: wetness.	Probable	Improbable: too sandy.	Fair: too sandy, small stones.
Urban land.				
StA--State	Good	Probable	Improbable: too sandy.	Fair: too clayey.
TaB--Tarboro	Good	Probable	Improbable: too sandy.	Poor: too sandy.
To--Tomotley	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Tr--Torhunta	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
Ud*. Udorthents				
Ur*. Urban land				
Wa--Wahee	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Wd--Wasda	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: excess humus, wetness.
WtD--Winton	Fair: wetness, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
YoA--Yeopim	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--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. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation)

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	Severe: piping, wetness.	Moderate: deep to water, slow refill.	Favorable------	Wetness--------	Wetness--------	Favorable.
AbA*: Altavista--------	Severe: piping, wetness.	Moderate: deep to water, slow refill.	Favorable------	Wetness--------	Wetness--------	Favorable.
Urban land.						
Ap---------- Arapahoe	Severe: piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness--------	Wetness--------	Wetness.
At---------- Augusta	Severe: piping, wetness.	Moderate: slow refill.	Favorable------	Wetness--------	Wetness--------	Wetness.
Ba---------- Bayboro	Severe: wetness.	Severe: slow refill.	Percs slowly---	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Bb---------- Belhaven	Severe: piping, wetness.	Slight---------	Wetness, subsides, percs slowly.	Wetness, percs slowly.	Wetness--------	Wetness.
BoB---------- Bonneau	Severe: thin layer.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Soil blowing---	Droughty.
Cf---------- Cape Fear	Severe: hard to pack, wetness.	Severe: slow refill.	Percs slowly---	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
CnB---------- Conetoe	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake.	Too sandy------	Droughty.
CrA, CrB---------- Craven	Severe: hard to pack.	Severe: slow refill, cutbanks cave.	Percs slowly---	Wetness, percs slowly.	Wetness, percs slowly.	Percs slowly.
CsC2---------- Craven	Severe: hard to pack.	Severe: slow refill, cutbanks cave.	Percs slowly, slope.	Wetness, percs slowly, slope.	Slope, wetness, percs slowly.	Slope, percs slowly.
Ct---------- Croatan	Severe: piping, wetness.	Severe: slow refill.	Percs slowly, subsides.	Wetness, percs slowly.	Wetness--------	Wetness, percs slowly.
Cu---------- Currituck	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, flooding, subsides.	Ponding, rooting depth, flooding.	Ponding, too sandy.	Wetness, rooting depth.

See footnote at end of table.

TABLE 12.--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
Da---- Dare	Severe: excess humus, wetness.	Slight----	Percs slowly, subsides.	Percs slowly, wetness.	Percs slowly, wetness.	Wetness, percs slowly.
DgB---- Dogue	Severe: wetness.	Severe: slow refill, cutbanks cave.	Favorable----	Wetness, soil blowing.	Wetness, soil blowing.	Favorable.
Do---- Dorovan	Severe: excess humus, ponding.	Severe: cutbanks cave.	Ponding, flooding, subsides.	Ponding, flooding.	Ponding----	Wetness.
Ds---- Dragston	Severe: piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.	Wetness, soil blowing.	Wetness, droughty.
GoA---- Goldsboro	Moderate: piping, wetness.	Moderate: slow refill, deep to water.	Favorable----	Wetness----	Wetness----	Favorable.
Hy---- Hyde	Severe: wetness.	Severe: slow refill.	Favorable----	Wetness----	Wetness, erodes easily.	Wetness, erodes easily.
La---- Leaf	Severe: wetness.	Severe: slow refill.	Percs slowly---	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Le---- Lenoir	Severe: wetness.	Severe: slow refill.	Percs slowly---	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Lo---- Leon	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
Ly---- Lynchburg	Severe: piping, wetness.	Moderate: slow refill.	Favorable----	Wetness----	Wetness----	Wetness.
Me---- Muckalee	Severe: piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, flooding.	Wetness, too sandy.	Wetness, droughty.
Pa---- Pantego	Severe: wetness, piping.	Moderate: slow refill.	Favorable----	Wetness----	Wetness----	Wetness.
Pe---- Perquimans	Severe: piping, wetness.	Severe: slow refill.	Favorable----	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
Pm*. Pits						
Po---- Ponzer	Severe: wetness, piping.	Severe: slow refill.	Percs slowly, subsides.	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.

See footnote at end of table.

TABLE 12.--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
Pt---- Portsmouth	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness----	Wetness, too sandy.	Wetness.
Ra---- Rains	Severe: piping, wetness.	Moderate: slow refill.	Favorable----	Wetness----	Wetness, soil blowing.	Wetness.
Ro---- Roanoke	Severe: wetness.	Severe: slow refill, cutbanks cave.	Percs slowly---	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Sb---- Seabrook	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
Se*: Seabrook----	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
Urban land.						
StA---- State	Moderate: thin layer, piping.	Severe: cutbanks cave.	Deep to water	Soil blowing---	Soil blowing---	Favorable.
TaB---- Tarboro	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake.	Too sandy----	Droughty.
To---- Tomotley	Severe: piping, wetness.	Severe: slow refill.	Favorable----	Wetness, soil blowing.	Wetness, soil blowing.	Wetness.
Tr---- Torhunta	Severe: piping, wetness.	Severe: cutbanks cave.	Favorable----	Wetness----	Wetness----	Wetness.
Ud*. Udorthents						
Ur*. Urban land						
Wa---- Wahee	Severe: wetness, hard to pack.	Severe: slow refill.	Percs slowly---	Wetness, soil blowing.	Wetness, soil blowing, percs slowly.	Wetness, percs slowly.
Wd---- Wasda	Severe: wetness.	Slight----	Subsides----	Wetness----	Wetness----	Wetness.
WtD---- Winton	Moderate: piping, wetness.	Severe: no water.	Slope----	Slope, wetness.	Slope, wetness.	Slope.
YoA---- Yeopim	Severe: piping, wetness.	Severe: cutbanks cave.	Favorable----	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated. Some soils have Unified classifications and USDA textures in addition to those shown. Generally, the dominant classifications and textures are shown)

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	> 3 inches	4	10	40	200		
	In				Pct					Pct	
AaA---------- Altavista	0-10	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	95-100	90-100	65-99	35-60	<23	NP-7
	10-42	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
	42-62	Variable---------	---	---	---	---	---	---	---	---	---
AbA*:											
Altavista-------	0-10	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	95-100	90-100	65-99	35-60	<23	NP-7
	10-42	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
	42-62	Variable---------	---	---	---	---	---	---	---	---	---
Urban land.											
Ap---------- Arapahoe	0-22	Fine sandy loam	SM	A-2, A-4	0	100	100	80-100	20-49	<30	NP-4
	22-42	Fine sandy loam, loam, sandy loam.	SM	A-2, A-4	0	100	100	70-100	20-49	---	NP
	42-60	Loamy sand-------	SM, SP-SM	A-2, A-3, A-4	0	100	100	65-100	5-45	<30	NP-4
At---------- Augusta	0-12	Fine sandy loam	SM, SM-SC, ML	A-2, A-4	0	90-100	75-100	50-98	30-60	<25	NP-7
	12-45	Sandy clay loam, clay loam, loam.	CL, CL-ML	A-4, A-6, A-7	0	90-100	75-100	75-100	51-80	20-45	5-25
	45-65	Variable---------	---	---	---	---	---	---	---	---	---
Ba---------- Bayboro	0-14	Loam----------	CL, ML, CL-ML	A-6, A-7, A-4	0	100	100	85-100	60-80	25-42	3-20
	14-64	Clay loam, sandy clay, clay.	CL, CH	A-7, A-6	0	100	100	85-100	55-95	35-70	20-40
Bb---------- Belhaven	0-46	Muck----------	PT	---	---	---	---	---	---	---	---
	46-65	Loam, clay loam, sandy clay loam.	CL, CL-ML, SC, SM-SC	A-4, A-6	0	100	100	80-100	36-95	15-36	4-15
BoB---------- Bonneau	0-22	Loamy sand-------	SM	A-2	0	100	100	50-95	15-35	---	NP
	22-60	Sandy loam, sandy clay loam, sandy clay.	CL, SC, SM-SC, CL-ML	A-4, A-6, A-2	0	100	100	60-95	25-60	20-40	4-18
Cf---------- Cape Fear	0-14	Fine sandy loam	SM, SC, SM-SC	A-4	0	100	95-100	70-85	36-50	<25	NP-10
	14-48	Clay loam, clay, sandy clay loam.	ML, CL, MH, CH	A-7	0	100	95-100	90-100	60-85	41-65	15-35
	48-65	Loamy sand, sand	SM, SP, SP-SM	A-2, A-3, A-1	0	100	100	50-99	5-30	<20	NP
CnB---------- Conetoe	0-22	Loamy sand-------	SM, SP-SM	A-2, A-3	0	100	100	50-99	5-30	<20	NP
	22-40	Sandy loam, sandy clay loam, fine sandy loam.	SM, SC, SM-SC	A-2, A-4	0	100	100	50-99	20-40	<30	NP-10
	40-62	Loamy sand, sand	SM, SP, SP-SM	A-2, A-3, A-1	0	100	100	40-99	4-30	<20	NP

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	> 3 inches	4	10	40	200		
	In				Pct					Pct	
CrA, CrB--------- Craven	0-7	Fine sandy loam	ML, CL, SM, SC	A-4, A-6	0	100	100	75-100	45-90	<35	NP-15
	7-51	Clay, silty clay, clay loam.	CH	A-7	0	100	100	90-100	65-98	51-70	24-43
	51-61	Sandy clay loam, sandy loam, loamy sand.	SM, SM-SC, SC	A-2, A-4, A-6	0	100	95-100	50-100	15-49	<35	NP-15
CsC2------------- Craven	0-7	Clay loam---------	CL, CH	A-6, A-7	0	100	95-100	80-100	55-98	35-60	15-35
	7-51	Clay, silty clay, clay loam.	CH	A-7	0	100	100	90-100	65-98	51-70	24-43
	51-61	Sandy clay loam, sandy loam, loamy sand.	SM, SM-SC, SC	A-2, A-4, A-6	0	100	95-100	50-100	15-49	<35	NP-15
Ct--------------- Croatan	0-24	Muck-------------	PT	---	---	---	---	---	---	---	---
	24-89	Loam, clay loam, sandy clay loam.	CL, SM, ML, SC	A-4, A-6	0	100	100	75-100	36-95	<36	NP-15
Cu--------------- Currituck	0-12	Muck-------------	PT	A-8	---	---	---	---	---	---	---
	12-30	Muck-------------	PT	A-8	---	---	---	---	---	---	---
	30-62	Loamy sand, sand	SM, SP-SM	A-2, A-3	0	95-100	90-100	50-75	5-35	---	NP
Da--------------- Dare	0-61	Muck-------------	PT	---	0	---	---	---	---	---	NP
	61-73	Stratified loamy sand to sandy loam.	SM, SP-SM	A-2, A-3	0	100	90-100	60-80	5-30	---	NP
DgB-------------- Dogue	0-7	Fine sandy loam	SM, SC, SM-SC	A-2, A-4	0	95-100	75-100	50-100	20-50	<25	NP-10
	7-50	Sandy clay, clay, sandy clay loam.	CL, CH, SC	A-6, A-7	0	95-100	75-100	65-100	40-90	35-60	16-40
	50-64	Sandy clay loam	SM, SC, SP-SM, SM-SC	A-2, A-4, A-1	0	80-100	60-100	35-100	10-40	<30	NP-10
Do--------------- Dorovan	0-3	Mucky peat-------	PT	---	0	---	---	---	---	---	---
	3-63	Muck-------------	PT	---	0	---	---	---	---	---	---
	63-80	Sand, loamy sand, loam.	SP-SM, SM-SC, SM	A-1, A-3, A-4, A-2-4	0	100	100	5-70	5-49	<20	NP-7
Ds--------------- Dragston	0-10	Fine sandy loam	SM, SC, SM-SC, CL-ML	A-2, A-4	0	100	95-100	60-85	30-60	<20	NP-8
	10-42	Fine sandy loam, sandy loam, loam.	SM, SC, SM-SC, CL-ML	A-2, A-4	0	100	95-100	60-85	30-60	<25	NP-10
	42-60	Sand, loamy sand, fine sandy loam.	SM, SP-SM, SM-SC	A-1, A-2, A-3	0	95-100	85-100	35-70	5-30	<18	NP-7
GoA-------------- Goldsboro	0-9	Fine sandy loam	SM, SM-SC, SC	A-2, A-4, A-6	0	95-100	95-100	50-100	15-45	<25	NP-14
	9-46	Sandy clay loam, sandy loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6	0	98-100	95-100	60-100	25-55	16-37	4-18
	46-69	Sandy clay loam, clay loam, sandy clay.	SC, CL, CL-ML, CH	A-4, A-6, A-7-6	0	95-100	90-100	65-95	36-70	25-55	6-32

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	> 3 inches	4	10	40	200		
	In				Pct					Pct	
Hy Hyde	0-24	Loam	ML	A-4	0	100	98-100	85-100	60-90	<35	NP-7
	24-50	Clay loam, loam, silty clay loam.	CL	A-6, A-4, A-7	0	100	98-100	90-100	75-95	22-42	7-20
	50-60	Variable	---	---	---	---	---	---	---	---	---
La Leaf	0-7	Silt loam	ML, CL	A-4, A-6	0	100	95-100	85-100	50-90	30-40	5-15
	7-64	Silty clay loam, silty clay, clay.	CL, CH	A-7	0	100	95-100	90-100	75-95	42-65	20-38
Le Lenoir	0-8	Loam	ML, CL, CL-ML	A-4	0	100	100	85-95	60-85	20-35	4-10
	8-75	Clay, sandy clay, clay loam.	CL, CH	A-6, A-7	0	100	100	85-95	55-95	30-55	11-35
Lo Leon	0-18	Sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	18-38	Sand, fine sand, loamy sand.	SM, SP-SM, SP	A-3, A-2-4	0	100	100	80-100	3-20	---	NP
	38-72	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
Ly Lynchburg	0-10	Fine sandy loam	SM, ML, SM-SC, CL-ML	A-2, A-4	0	92-100	90-100	75-100	25-55	<30	NP-7
	10-70	Sandy clay loam, sandy clay, clay loam.	SM-SC, SC, CL, CL-ML	A-2, A-4, A-6	0	92-100	90-100	70-100	25-67	15-40	4-18
Me Muckalee	0-12	Loam	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	60-95	50-95	17-35	4-15
	12-60	Sandy loam, loamy sand.	SM	A-2, A-4	0	95-100	80-100	60-90	20-40	<20	NP-4
Pa Pantego	0-10	Loam	SM, ML	A-2, A-4	0	100	95-100	60-95	25-75	<35	NP-10
	10-36	Sandy clay loam, sandy loam, clay loam.	SC, CL, SM-SC, CL-ML	A-4, A-6, A-2	0	100	95-100	65-100	30-80	20-40	4-16
	36-68	Clay loam, sandy clay, sandy clay loam.	CL, SC	A-6, A-7	0	100	95-100	80-100	36-80	25-49	11-24
Pe Perquimans	0-8	Silt loam	ML, CL-ML, CL	A-4	0	100	100	85-100	55-95	<30	NP-10
	8-44	Loam, silty clay loam, clay loam.	CL	A-4, A-6, A-7	0	100	100	90-100	75-98	22-49	8-30
	44-62	Silt loam, loam, sandy loam.	ML, CL-ML, CL	A-4	0	100	100	85-100	55-95	<30	NP-10
Pm*. Pits											
Po Ponzer	0-37	Muck	PT	---	---	---	---	---	---	---	---
	37-50	Fine sandy 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
	50-61	Variable	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	> 3 inches	4	10	40	200		
	In				Pct					Pct	
Pt---------- Portsmouth	0-18	Loam----------	SM, SM-SC, ML	A-2, A-4	0	98-100	98-100	65-95	30-65	<30	NP-7
	18-34	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
	34-38	Loamy sand, sandy loam.	SM	A-2	0	98-100	98-100	50-70	13-35	<18	NP-4
	38-60	Sand, loamy sand	SP-SM, SP, SM	A-1, A-2, A-3	0	98-100	98-100	45-65	3-25	---	NP
Ra---------- Rains	0-10	Fine sandy loam	SM, ML	A-2, A-4	0	100	95-100	50-85	25-56	<35	NP-10
	10-50	Sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	100	95-100	55-98	30-70	18-40	4-20
	50-54	Sandy clay loam, clay loam, sandy clay.	SC, SM-SC, CL, CL-ML	A-4, A-6, A-7	0	100	98-100	60-98	36-72	18-45	4-28
	54-65	Sandy loam, sandy clay loam, sandy clay.	SM, SC, ML, CL	A-2, A-4, A-6	0	100	95-100	60-95	30-60	15-40	3-18
Ro---------- Roanoke	0-6	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-2, A-4	0	85-100	80-100	45-85	25-55	<25	NP-7
	6-56	Clay, sandy clay loam, clay loam.	CH, CL	A-7	0	90-100	85-100	85-100	65-95	45-70	22-40
	36-56	Stratified sand to clay.	CL-ML, GM-GC, CH, SM	A-1, A-2, A-4	0-5	40-100	35-100	25-95	15-90	10-60	NP-40
	56-65	Variable---------	---	---	---	---	---	---	---	---	---
Sb---------- Seabrook	0-8	Loamy sand-------	SM, SP-SM	A-2, A-3	0	95-100	90-100	85-99	5-25	---	NP
	8-80	Loamy fine sand, loamy sand, sand.	SM, SP-SM	A-2, A-3	0	95-100	90-100	85-100	5-25	---	NP
Se*: Seabrook--------	0-8	Loamy sand-------	SM, SP-SM	A-2, A-3	0	95-100	90-100	85-99	5-25	---	NP
	8-80	Loamy fine sand, loamy sand, sand.	SM, SP-SM	A-2, A-3	0	95-100	90-100	85-100	5-25	---	NP
Urban land.											
StA---------- State	0-18	Sandy loam-------	SM, ML, CL-ML, SM-SC	A-2, A-4	0	95-100	95-100	45-85	25-55	<28	NP-7
	18-44	Loam, clay loam, sandy clay loam.	CL, SC	A-4, A-6	0	95-100	95-100	75-100	35-80	24-40	8-22
	44-60	Stratified sand to fine sandy loam.	SM, SM-SC, SP-SM	A-1, A-2, A-3, A-4	0	85-100	75-100	40-90	5-50	<25	NP-7
TaB---------- Tarboro	0-8	Sand----------	SM, SP-SM, SW-SM	A-2, A-3, A-1	0	95-100	95-100	40-99	8-35	---	NP
	8-72	Sand, loamy sand	SP, SP-SM, SW-SM, SM	A-2, A-3, A-1	0	95-100	90-100	45-100	3-15	---	NP

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	> 3 inches	4	10	40	200		
	In				Pct					Pct	
To----------	0-11	Fine sandy loam	SM	A-2, A-4	0	98-100	95-100	75-98	25-50	<30	NP-7
Tomotley	11-50	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
	50-62	Variable----------	---	---	---	---	---	---	---	---	---
Tr----------	0-16	Sandy loam-------	SM	A-2, A-4	0	100	95-100	70-96	20-49	<25	NP-4
Torhunta	16-40	Sandy loam, fine sandy loam.	SM, SM-SC	A-2, A-4	0	100	95-100	70-92	20-40	<25	NP-7
	40-61	Loamy sand, sand, sandy loam.	SM, SP-SM, SM-SC	A-2, A-3	0	100	95-100	65-92	5-35	<25	NP-4
Ud*. Udorthents											
Ur*. Urban land											
Wa----------	0-9	Fine sandy loam	SM, SM-SC	A-2, A-4	0	100	95-100	50-98	30-50	<28	NP-7
Wahee	9-51	Clay, clay loam, sandy clay loam.	CL, CH	A-6, A-7	0	100	100	85-100	51-92	38-81	16-54
	51-64	Variable----------	---	---	---	---	---	---	---	---	---
Wd----------	0-12	Muck----------	PT	---	0	---	---	---	---	---	NP
Wasda	12-43	Clay loam, sandy clay loam, sandy loam.	ML, CL, CL-ML	A-2, A-4, A-6	0	98-100	95-100	75-99	50-80	20-40	6-18
	43-60	Variable----------	---	---	---	---	---	---	---	---	---
WtD----------	0-13	Fine sandy loam	ML, SM, CL, SC	A-2, A-4, A-6	0-3	90-100	90-100	50-99	25-65	<30	NP-15
Winton	13-33	Sandy clay loam, sandy loam, clay loam.	SC, CL	A-2, A-4, A-6, A-7	0-2	90-100	90-100	45-95	25-70	20-45	8-30
	33-61	Variable----------	---	---	---	---	---	---	---	---	---
YoA----------	0-5	Silt loam--------	ML, CL-ML	A-4	0	100	100	85-100	55-80	<30	NP-7
Yeopim	5-49	Silty clay loam, clay loam, loam.	CL	A-4, A-6, A-7	0	100	100	90-100	70-90	22-49	8-30
	49-62	Stratified sand to loam.	SM, ML, SM-SC, SP-SM	A-2, A-3, A-4	0	98-100	98-100	50-95	5-80	<20	NP-7

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--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	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
AaA	0-10	10-20	1.30-1.50	2.0-6.0	0.12-0.20	3.6-6.0	Low	0.24	5	.5-3
Altavista	10-42	18-35	1.30-1.50	0.6-2.0	0.12-0.20	3.6-6.0	Low	0.24		
	42-62	---	---	---	---	---				
AbA*:										
Altavista	0-10	10-20	1.30-1.50	2.0-6.0	0.12-0.20	3.6-6.0	Low	0.24	5	.5-3
	10-42	18-35	1.30-1.50	0.6-2.0	0.12-0.20	3.6-6.0	Low	0.24		
	42-62	---	---	---	---	---				
Urban land.										
Ap	0-22	8-18	1.45-1.60	2.0-6.0	0.11-0.15	3.6-5.5	Low	0.15	5	5-20
Arapahoe	22-42	8-18	1.45-1.60	2.0-6.0	0.10-0.14	3.6-7.8	Low	0.15		
	42-60	3-15	1.40-1.65	2.0-20	0.05-0.14	5.6-7.8	Low	0.10		
At	0-12	5-20	1.40-1.70	2.0-6.0	0.10-0.15	4.5-6.0	Low	0.20	4	.5-2
Augusta	12-45	20-35	1.35-1.60	0.6-2.0	0.12-0.18	4.5-6.0	Low	0.24		
	45-65	---	---	---	---	---				
Ba	0-14	10-27	1.30-1.50	0.6-2.0	0.15-0.20	3.6-5.5	Low	0.17	5	4-10
Bayboro	14-64	35-60	1.20-1.40	0.06-0.2	0.14-0.18	4.5-5.5	Moderate	0.32		
Bb	0-46	---	0.40-0.65	0.2-6.0	0.20-0.26	<4.5	Low	---	---	20-95
Belhaven	46-65	10-35	1.30-1.45	0.2-0.6	0.12-0.20	3.6-6.5	Low	0.24		
BoB	0-22	5-15	1.30-1.70	6.0-20	0.05-0.11	4.5-6.0	Low	0.15	5	.5-2
Bonneau	22-60	15-40	1.40-1.60	0.6-2.0	0.10-0.16	4.5-5.5	Low	0.20		
Cf	0-14	5-15	1.40-1.60	2.0-6.0	0.11-0.15	4.5-6.5	Low	0.17	5	5-15
Cape Fear	14-48	25-60	1.25-1.40	0.06-0.2	0.12-0.22	3.6-6.0	Moderate	0.32		
	48-65	2-10	1.40-1.70	6.0-20	0.05-0.10	3.6-6.0	Low	0.10		
CnB	0-22	2-10	1.60-1.75	6.0-20	0.05-0.10	4.5-6.0	Low	0.15	5	.5-2
Conetoe	22-40	10-22	1.40-1.60	2.0-6.0	0.10-0.15	4.5-6.0	Low	0.15		
	40-62	2-10	1.60-1.70	6.0-20	0.05-0.10	4.5-6.0	Low	0.10		
CrA, CrB	0-7	7-20	1.30-1.45	0.2-2.0	0.12-0.15	3.6-6.5	Low	0.32	5	.5-2
Craven	7-51	35-60	1.30-1.45	0.06-0.2	0.12-0.15	3.6-5.5	Moderate	0.32		
	51-61	5-35	1.35-1.60	0.2-6.0	0.08-0.14	3.6-5.5	Low	0.32		
CsC2	0-7	27-40	1.30-1.45	0.06-0.2	0.12-0.15	3.6-5.5	Moderate	0.37	5	.5-2
Craven	7-51	35-60	1.30-1.45	0.06-0.2	0.12-0.15	3.6-5.5	Moderate	0.32		
	51-61	5-35	1.35-1.60	0.2-6.0	0.08-0.14	3.6-5.5	Low	0.32		
Ct	0-24	---	0.40-0.65	0.06-6.0	0.35-0.45	<4.5	Low	---	---	25-60
Croatan	24-89	10-35	1.40-1.60	0.2-2.0	0.12-0.20	3.6-6.5	Low	---		
Cu	0-12	---	0.25-0.40	0.6-6.0	0.25-0.35	4.5-5.5	Low	---	---	---
Currituck	12-30	---	0.35-0.55	0.6-6.0	0.25-0.35	3.6-5.5	Low	---		
	30-62	3-10	1.60-1.75	6.0-20	0.04-0.09	3.6-5.5	Low	---		
Da	0-61	---	0.40-0.65	0.06-0.2	0.20-0.26	3.6-4.4	Low	---	---	20-95
Dare	61-73	2-12	1.60-1.70	6.0-20	0.04-0.09	3.6-6.0	Low	0.15		

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
DgB	0-7	5-10	1.35-1.50	2.0-6.0	0.08-0.15	3.6-5.5	Low	0.28	4	.5-1
Dogue	7-50	20-50	1.45-1.60	0.2-0.6	0.12-0.19	3.6-5.5	Moderate	0.28		
	50-64	15-35	1.30-1.50	0.6-6.0	0.05-0.14	3.6-5.5	Low	0.17		
Do	0-3	---	0.25-0.40	0.6-2.0	0.25-0.50	3.6-4.4			---	>60
Dorovan	3-63	---	0.35-0.55	0.6-2.0	0.25-0.50	3.6-4.4				
	63-80	5-20	1.40-1.65	6.0-20	0.05-0.08	4.5-5.5	Low			
Ds	0-10	4-12	1.20-1.50	2.0-6.0	0.08-0.15	4.5-5.5	Low	0.20	4	1-2
Dragston	10-42	10-18	1.25-1.45	2.0-6.0	0.08-0.16	4.5-5.5	Low	0.17		
	42-60	2-12	1.35-1.55	6.0-20.0	0.04-0.10	4.5-6.5	Low	0.17		
GoA	0-9	5-15	1.40-1.60	2.0-6.0	0.08-0.12	3.6-6.0	Low	0.20	5	.5-2
Goldsboro	9-46	18-30	1.30-1.50	0.6-2.0	0.11-0.15	3.6-5.5	Low	0.24		
	46-69	20-40	1.30-1.40	0.6-2.0	0.11-0.15	3.6-5.5	Low	0.24		
Hy	0-24	7-18	1.30-1.50	0.6-2.0	0.13-0.20	3.6-5.5	Low	0.17	5	3-10
Hyde	24-50	18-35	1.30-1.40	0.2-0.6	0.15-0.20	3.6-5.5	Low	0.43		
	50-60	---	---	---	---	---				
La	0-7	12-25	1.30-1.50	0.06-0.2	0.20-0.22	3.6-5.5	Low	0.32	4	1-3
Leaf	7-64	35-60	1.50-1.60	<0.06	0.18-0.21	3.6-5.5	High	0.32		
Le	0-8	7-20	1.30-1.50	0.6-2.0	0.14-0.18	3.6-5.5	Low	0.37	5	2-4
Lenoir	8-75	35-60	1.20-1.35	0.06-0.2	0.13-0.15	3.6-5.5	Moderate	0.32		
Lo	0-18	1-6	1.40-1.65	6.0-20	0.02-0.05	3.6-6.5	Low	0.10	5	.5-4
Leon	18-38	2-8	1.50-1.70	0.6-6.0	0.05-0.10	3.6-6.5	Low	0.15		
	38-72	1-6	1.40-1.65	0.6-6.0	0.02-0.05	3.6-6.5	Low	0.10		
Ly	0-10	5-20	1.30-1.60	2.0-6.0	0.09-0.13	3.6-5.5	Low	0.20	5	.5-5
Lynchburg	10-70	20-40	1.30-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low	0.20		
Me	0-12	10-25	1.30-1.45	0.6-2.0	0.09-0.15	5.1-7.3	Low	0.20	5	---
Muckalee	12-60	5-20	1.35-1.50	0.6-2.0	0.08-0.12	5.6-8.4	Low	0.20		
Pa	0-10	5-15	1.40-1.60	2.0-6.0	0.12-0.20	3.6-5.5	Low	0.15	5	4-10
Pantego	10-36	18-35	1.30-1.50	0.6-2.0	0.12-0.20	3.6-5.5	Low	0.28		
	36-68	20-40	1.30-1.60	0.6-2.0	0.15-0.20	3.6-5.5	Low	0.28		
Pe	0-8	8-25	1.20-1.40	2.0-6.0	0.13-0.20	4.5-6.5	Low	0.37	5	2-4
Perquimans	8-44	18-35	1.40-1.60	0.2-0.6	0.15-0.20	4.5-6.0	Low	0.43		
	44-62	8-25	1.20-1.40	0.2-0.6	0.13-0.20	4.5-6.0	Low	0.37		
Pm*.										
Pits										
Po	0-37	---	0.40-0.65	0.06-2.0	0.35-0.45	3.6-4.4	Low		---	20-80
Ponzer	37-50	5-25	1.30-1.60	0.06-2.0	0.10-0.24	3.6-7.8	Low	0.24		
	50-61	---	---	---	---	---	Low			
Pt	0-18	7-25	1.30-1.40	0.6-6.0	0.12-0.18	3.6-5.5	Low	0.24	5	3-15
Portsmouth	18-34	20-35	1.45-1.55	0.6-2.0	0.14-0.20	3.6-5.5	Low	0.28		
	34-38	8-18	1.40-1.60	2.0-6.0	0.06-0.10	3.6-5.5	Low	0.17		
	38-60	2-10	1.40-1.65	6.0-20	0.02-0.05	3.6-6.0	Low	0.17		
Ra	0-10	5-20	1.30-1.60	2.0-6.0	0.10-0.14	3.6-6.5	Low	0.20	5	1-6
Rains	10-50	20-35	1.30-1.50	0.6-2.0	0.11-0.15	3.6-5.5	Low	0.24		
	50-54	20-40	1.30-1.50	0.6-2.0	0.10-0.15	3.6-5.5	Low	0.28		
	54-65	15-45	1.30-1.60	0.6-2.0	0.10-0.15	3.6-5.5	Low	0.28		

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
Ro	0-6	10-18	1.20-1.50	2.0-6.0	0.12-0.18	3.6-5.5	Low	0.28	4	1-3
Roanoke	6-36	32-60	1.35-1.65	0.06-0.2	0.10-0.19	3.6-5.5	Moderate	0.24		
	36-56	5-50	1.20-1.50	0.06-20	0.04-0.14	3.6-6.5	Moderate	0.24		
	56-65	---	---	---	---	---	Low	----		
Sb	0-8	2-12	1.30-1.60	6.0-20	0.05-0.11	4.5-6.5	Low	0.10	5	.5-2
Seabrook	8-80	2-12	1.30-1.60	6.0-20	0.02-0.09	4.5-6.5	Low	0.10		
Se*:										
Seabrook	0-8	2-12	1.30-1.60	6.0-20	0.05-0.11	4.5-6.5	Low	0.10	5	.5-2
	8-80	2-12	1.30-1.60	6.0-20	0.02-0.09	4.5-6.5	Low	0.10		
Urban land.										
StA	0-18	5-15	1.25-1.40	0.6-6.0	0.08-0.15	3.6-5.5	Low	0.28	5	<2
State	18-44	18-34	1.35-1.50	0.6-2.0	0.14-0.19	3.6-5.5	Low	0.28		
	44-60	2-15	1.35-1.50	>2.0	0.02-0.10	3.6-5.5	Low	0.17		
TaB	0-8	3-10	1.60-1.75	6.0-20	0.05-0.09	4.5-6.5	Low	0.10	5	.5-1
Tarboro	8-72	2-7	1.60-1.75	>20	0.02-0.06	4.5-6.5	Low	0.10		
To	0-11	5-20	1.30-1.60	2.0-6.0	0.10-0.15	3.6-5.5	Low	0.20	5	1-6
Tomotley	11-50	20-35	1.30-1.50	0.6-2.0	0.12-0.18	3.6-5.5	Low	0.20		
	50-62	---	---	---	---	---		----		
Tr	0-16	5-18	1.35-1.65	2.0-6.0	0.10-0.15	3.6-5.5	Low	0.15	5	3-10
Torhunta	16-40	5-18	1.35-1.60	2.0-6.0	0.10-0.15	3.6-5.5	Low	0.15		
	40-61	2-18	1.45-1.65	6.0-20	<0.05	3.6-6.5	Low	0.10		
Ud*.										
Udorthents										
Ur*.										
Urban land										
Wa	0-9	5-20	1.30-1.60	0.6-2.0	0.10-0.15	4.5-6.0	Low	0.24	5	.5-5
Wahee	9-51	27-60	1.40-1.60	0.06-0.2	0.12-0.20	3.6-5.5	Moderate	0.28		
	51-64	---	---	---	---	---		----		
Wd	0-12	---	0.40-0.65	0.2-0.6	0.20-0.25	3.6-5.5		----	---	20-50
Wasda	12-43	18-35	1.35-1.60	0.6-2.0	0.12-0.18	3.6-5.5	Low	0.20		
	43-60	2-40	1.60-1.70	6.0-20	0.02-0.06	5.1-7.8	Low	0.15		
WtD	0-13	7-20	1.30-1.40	2.0-6.0	0.12-0.20	3.6-6.0	Low	0.20	5	.5-3
Winton	13-33	18-35	1.30-1.50	0.2-2.0	0.12-0.20	3.6-6.0	Low	0.24		
	33-61	---	---	---	---	---		----		
YoA	0-5	4-15	1.20-1.40	2.0-6.0	0.15-0.20	3.6-5.5	Low	0.37	5	.5-2
Yeopim	5-49	20-35	1.40-1.60	0.6-2.0	0.15-0.20	3.6-5.5	Low	0.37		
	49-62	5-25	1.40-1.60	0.6-6.0	0.15-0.20	3.6-5.5	Low	0.17		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. 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			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Initial	Total	Uncoated steel	Concrete
					Ft			In	In		
AaA---Altavista	C	None	---	---	1.5-2.5	Apparent	Dec-Mar	---	---	Moderate	Moderate.
AbA*:											
Altavista	C	None	---	---	1.5-2.5	Apparent	Dec-Mar	---	---	Moderate	Moderate.
Urban land.											
Ap---Arapahoe	B/D	None	---	---	0-1.0	Apparent	Dec-May	---	---	High	High.
At---Augusta	C	None	---	---	1.0-2.0	Apparent	Jan-May	---	---	High	Moderate.
Ba---Bayboro	D	None	---	---	0-1.0	Apparent	Dec-May	---	---	High	High.
Bb---Belhaven	D	Rare	---	---	0-1.0	Apparent	Dec-May	10-20	20-48	High	High.
BoB---Bonneau	A	None	---	---	3.5-5.0	Apparent	Dec-Mar	---	---	Low	High.
Cf---Cape Fear	D	None	---	---	0-1.5	Apparent	Dec-Apr	---	---	High	High.
CnB---Conetoe	A	None	---	---	>6.0	---	---	---	---	Low	High.
CrA, CrB, CsC2-Craven	C	None	---	---	2.0-3.0	Apparent	Dec-Apr	---	---	High	High.
Ct---Croatan	D	None	---	---	0-1.0	Apparent	Dec-May	4-10	18-24	High	High.
Cu---Currituck	D	Frequent	Very long.	Jan-Dec	+1-1.0	Apparent	Jan-Dec	16-20	16-38	High	High.
Da---Dare	D	None	---	---	0-1.0	Apparent	Nov-May	6-20	36-60	High	High.
DgB---Dogue	C	None	---	---	1.5-3.0	Apparent	Jan-Mar	---	---	High	High.
Do---Dorovan	D	Frequent	Very long.	Jan-Dec	+1-0.5	Apparent	Jan-Dec	4-12	51-80	High	High.
Ds---Dragston	C	None	---	---	1.0-2.5	Apparent	Nov-Apr	---	---	Low	High.
GoA---Goldsboro	B	None	---	---	2.0-3.0	Apparent	Dec-Apr	---	---	Moderate	High.
Hy---Hyde	B/D	None	---	---	0-1.5	Apparent	Dec-Apr	---	---	High	High.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Initial	Total	Uncoated steel	Concrete
					Ft			In	In		
La---------- Leaf	D	None-------	---	---	0.5-1.5	Apparent	Jan-Apr	---	---	High-----	Moderate.
Le---------- Lenoir	D	None-------	---	---	1.0-2.5	Apparent	Dec-May	---	---	High-----	High.
Lo---------- Leon	B/D	None-------	---	---	0-1.0	Apparent	Dec-May	---	---	High-----	High.
Ly---------- Lynchburg	C	None-------	---	---	0.5-1.5	Apparent	Nov-Apr	---	---	High-----	High.
Me---------- Muckalee	D	Frequent---	Brief	Nov-Apr	0.5-1.5	Apparent	Dec-Mar	---	---	High-----	Moderate.
Pa---------- Pantego	B/D	None-------	---	---	0-1.5	Apparent	Dec-May	---	---	High-----	High.
Pe---------- Perquimans	D	None-------	---	---	0-1.0	Apparent	Nov-Apr	---	---	High-----	High.
Pm*. Pits											
Po---------- Ponzer	D	None-------	---	---	0-1.0	Apparent	Dec-May	9-12	18-24	High-----	High.
Pt---------- Portsmouth	B/D	None-------	---	---	0-1.0	Apparent	Dec-Apr	---	---	High-----	High.
Ra---------- Rains	B/D	None-------	---	---	0-1.0	Apparent	Nov-Apr	---	---	High-----	High.
Ro---------- Roanoke	D	None-------	---	---	0-1.0	Apparent	Nov-May	---	---	High-----	High.
Sb---------- Seabrook	C	None-------	---	---	2.0-4.0	Apparent	Dec-Mar	---	---	Low------	Moderate.
Se*: Seabrook------	C	None-------	---	---	2.0-4.0	Apparent	Dec-Mar	---	---	Low------	Moderate.
Urban land.											
StA---------- State	B	None-------	---	---	4.0-6.0	Apparent	Dec-Jun	---	---	Moderate	High.
TaB---------- Tarboro	A	None-------	---	---	>6.0	---	---	---	---	Low------	Moderate.
To---------- Tomotley	B/D	None-------	---	---	0-1.0	Apparent	Dec-Mar	---	---	High-----	High.
Tr---------- Torhunta	C	None-------	---	---	0.5-1.5	Apparent	Dec-May	---	---	High-----	High.
Ud*. Udorthents											
Ur*. Urban land											

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Initial	Total	Uncoated steel	Concrete
					Ft			In	In		
Wa Wahee	D	None	---	---	0.5-1.5	Apparent	Dec-Mar	---	---	High	High.
Wd Wasda	B/D	Rare	---	---	0-1.0	Apparent	Dec-May	3-7	7-14	High	High.
WtD Winton	C	None	---	---	2.0-4.0	Perched	Dec-May	---	---	Moderate	Moderate.
YoA Yeopim	B	None	---	---	1.5-3.0	Apparent	Nov-Mar	---	---	Moderate	High.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Altavista	Fine-loamy, mixed, thermic Aquic Hapludults
Arapahoe	Coarse-loamy, mixed, nonacid, thermic Typic Humaquepts
Augusta	Fine-loamy, mixed, thermic Aeric Ochraquults
Bayboro	Clayey, mixed, thermic Umbric Paleaquults
Belhaven	Loamy, mixed, dysic, thermic Terric Medisaprists
Bonneau	Loamy, siliceous, thermic Arenic Paleudults
Cape Fear	Clayey, mixed, thermic Typic Umbraquults
Conetoe	Loamy, mixed, thermic Arenic Hapludults
Craven	Clayey, mixed, thermic Aquic Hapludults
Croatan	Loamy, siliceous, dysic, thermic Terric Medisaprists
Currituck	Sandy or sandy-skeletal, mixed, euic, thermic Terric Medisaprists
Dare	Dysic, thermic Typic Medisaprists
Dogue	Clayey, mixed, thermic Aquic Hapludults
Dorovan	Dysic, thermic Typic Medisaprists
Dragston	Coarse-loamy, mixed, thermic Aeric Ochraquults
Goldsboro	Fine-loamy, siliceous, thermic Aquic Paleudults
Hyde	Fine-silty, mixed, thermic Typic Umbraquults
Leaf	Clayey, mixed, thermic Typic Albaquults
Lenoir	Clayey, mixed, thermic Aeric Paleaquults
Leon	Sandy, siliceous, thermic Aeric Haplaquods
Lynchburg	Fine-loamy, siliceous, thermic Aeric Paleaquults
Muckalee	Coarse-loamy, siliceous, nonacid, thermic Typic Fluvaquents
Pantego	Fine-loamy, siliceous, thermic Umbric Paleaquults
Perquimans	Fine-silty, mixed, thermic Typic Ochraquults
Ponzer	Loamy, mixed, dysic, thermic Terric Medisaprists
Portsmouth	Fine-loamy over sandy or sandy-skeletal, mixed, thermic Typic Umbraquults
Rains	Fine-loamy, siliceous, thermic Typic Paleaquults
Roanoke	Clayey, mixed, thermic Typic Ochraquults
Seabrook	Mixed, thermic Aquic Udipsamments
State	Fine-loamy, mixed, thermic Typic Hapludults
Tarboro	Mixed, thermic Typic Udipsamments
Tomotley	Fine-loamy, mixed, thermic Typic Ochraquults
Torhunta	Coarse-loamy, siliceous, acid, thermic Typic Humaquepts
Udorthents	Udorthents
Wahee	Clayey, mixed, thermic Aeric Ochraquults
Wasda	Fine-loamy, mixed, acid, thermic Histic Humaquepts
Winton	Fine-loamy, mixed, thermic Aquic Hapludults
Yeopim	Fine-silty, mixed, thermic Aquic Hapludults

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