United States Department of Agriculture

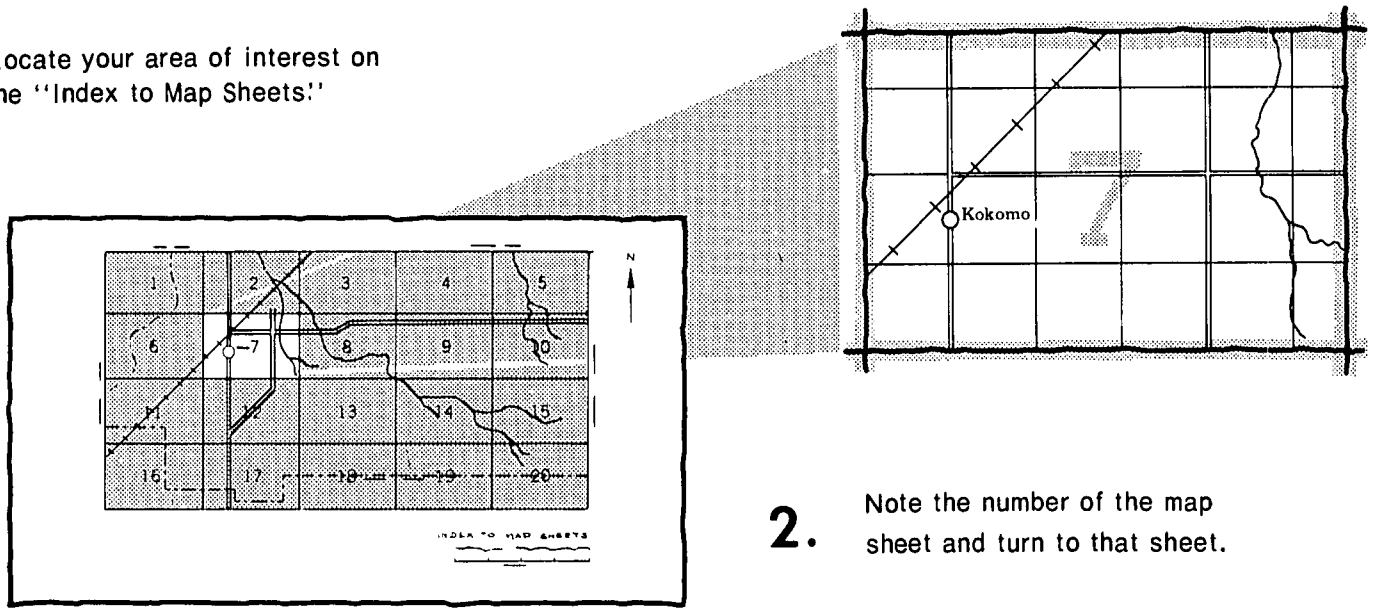
Soil Conservation Service

In cooperation with North Carolina Agricultural Research Service, North Carolina Agricultural Extension Service, North Carolina Department of Natural Resources and Community Development, and Pamlico County Board of Commissioners

Soil Survey of Pamlico County, North Carolina

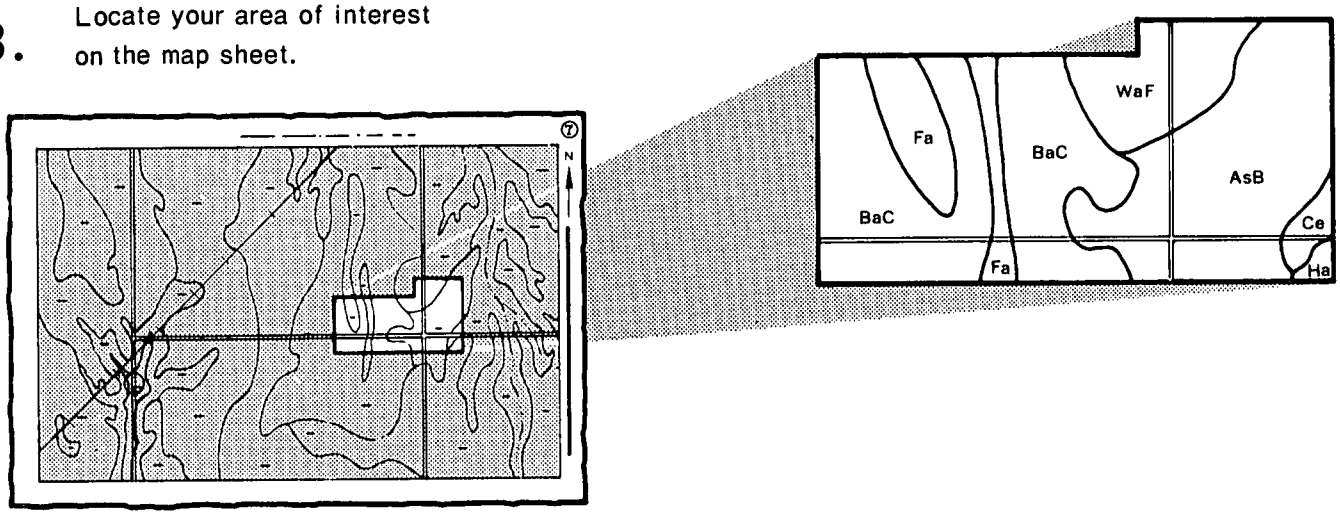
HOW TO USE

1. Locate your area of interest on the "Index to Map Sheets."

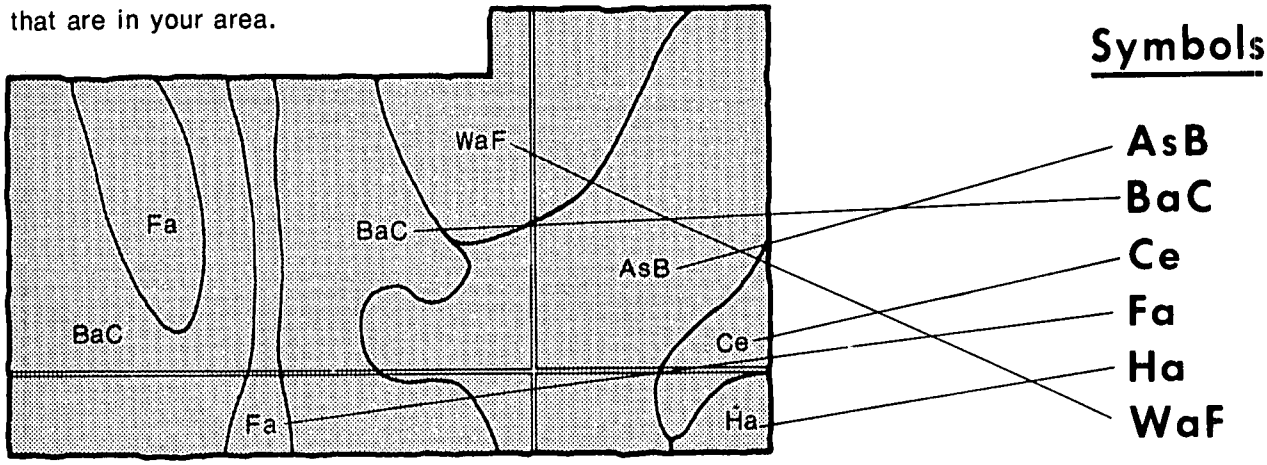


2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.

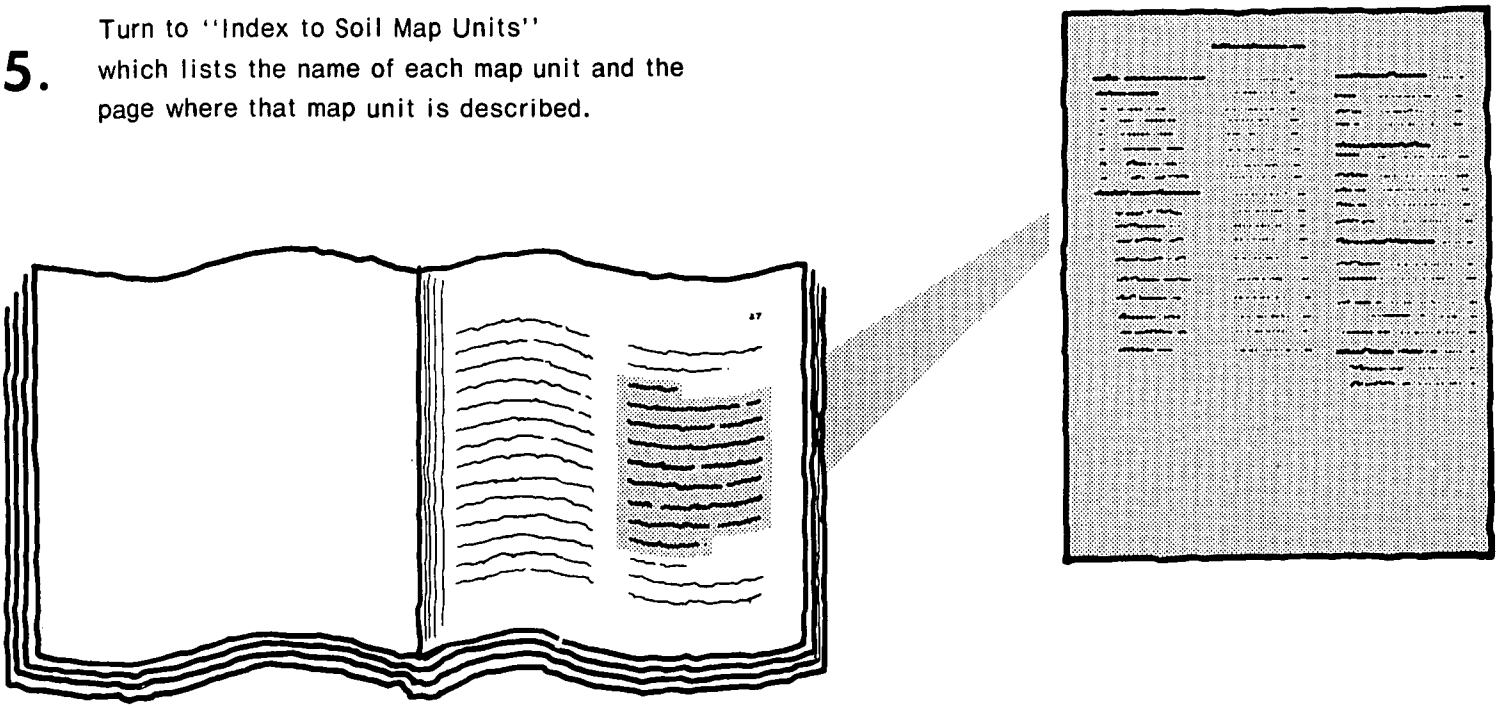


4. List the map unit symbols that are in your area.

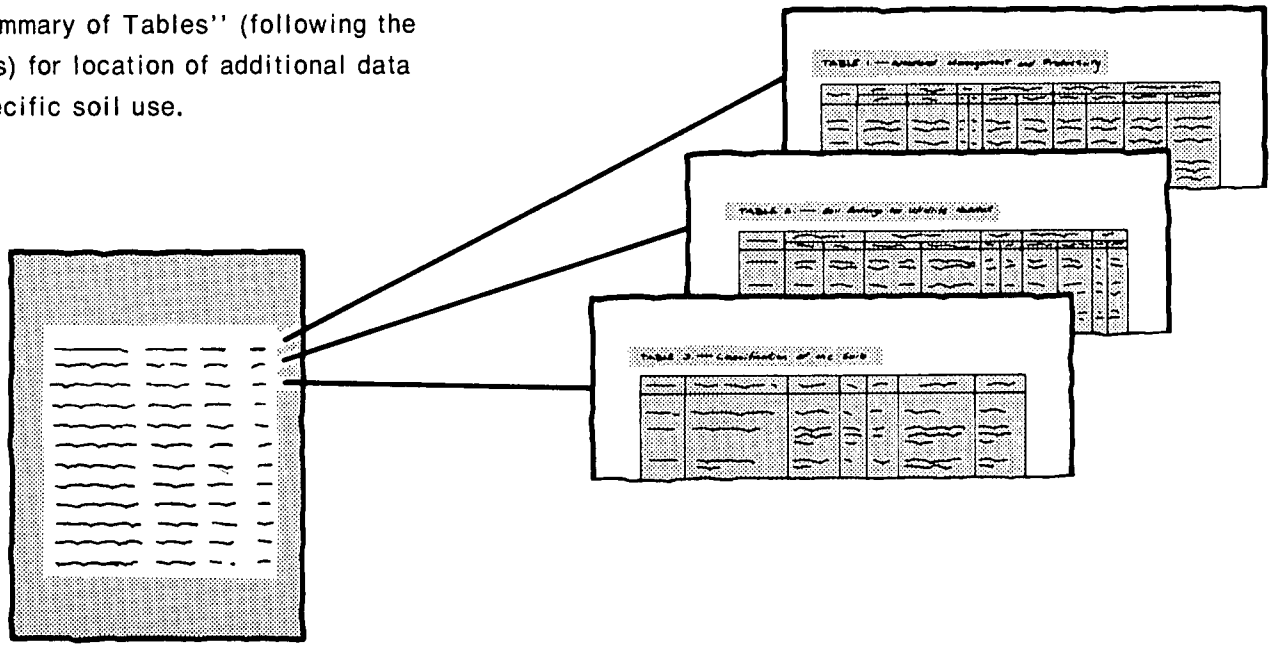


THIS SOIL SURVEY

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



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



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

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

Major fieldwork for this soil survey was completed in 1982. Soil names and descriptions were approved in 1984. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1984. This soil survey was made cooperatively by the Soil Conservation Service, the Pamlico County Board of Commissioners, North Carolina Department of Natural Resources and Community Development, North Carolina Agricultural Research Service, and North Carolina Agricultural Extension Service. It is part of the technical assistance furnished to the Bay River Soil and Water Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. Generally, there are small areas of contrasting soils or conditions within map unit delineations that cannot be shown at the publication scale. The level of information that can be obtained from an enlarged map will be no greater than that obtainable from the published map.

This survey supercedes the soil survey of Pamlico County published in 1937.

Cover: Wheat harvest in a drained area of Stockade loamy fine sand.

Contents

Soil Series

Issued August 1987

Index to Map Units

Summary of Tables

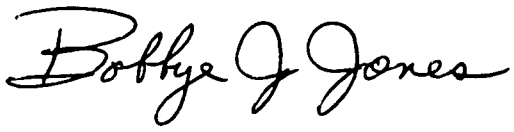
Foreword

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

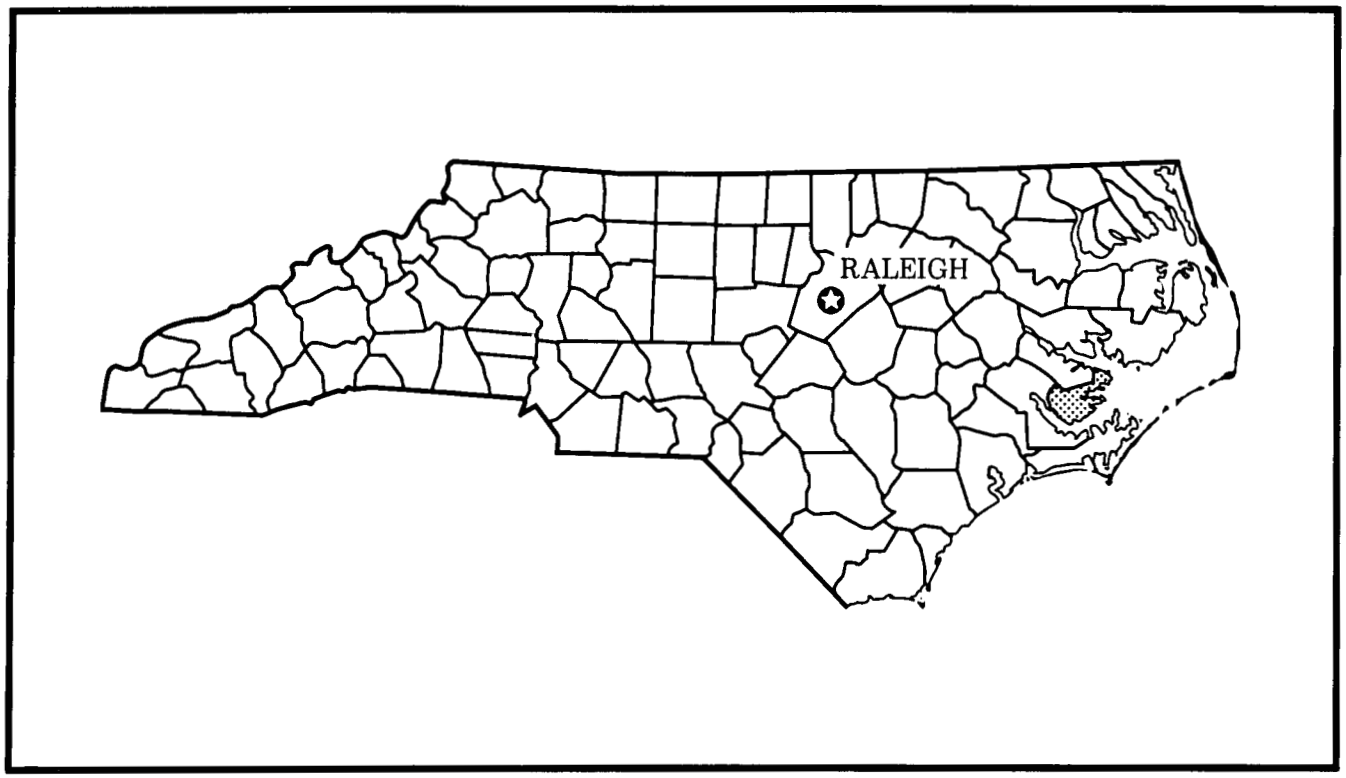
This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey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

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

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



Bobbye Jack Jones
State Conservationist
Soil Conservation Service



Location of Pamlico County in North Carolina.

Soil Survey of Pamlico County, North Carolina

By Roy A. Goodwin, Jr., Soil Conservation Service

Soils surveyed by Roy A. Goodwin, Jr., Soil Conservation Service;
H. Richard Greene and R. Bruce Rider, Pamlico County; and
Gina Boccetti, North Carolina Department of Natural Resources
and Community Development

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

PAMLICO COUNTY is in the Lower Coastal Plain region of eastern North Carolina. In 1980, the U.S. Census reported a county population of 10,398. Bayboro, the county seat and largest town, had a population of 759.

The county has a land area of 218,240 acres, or 341 square miles. According to data collected by the North Carolina Agricultural Extension Service in 1981, more than 38,000 acres was used as cropland. Most of the remaining acreage was in pasture and woodland, except about 16,660 acres that was in salt marshes.

General Nature of the Survey Area

This section gives general information concerning the county. It discusses physiography and drainage, history and development, water supply, and climate.

Physiography and Drainage

Pamlico County is drained by the Neuse, Bay, and Pamlico Rivers and by creeks that drain into Pamlico Sound. The flow is sluggish in the rivers and creeks.

The general slope of the county is to the east. About 96 percent of the land is nearly level, and 4 percent is gently sloping.

The four physiographic areas in the county are the uplands of the Talbot Surface, the low marine and stream terraces of the Pamlico Surface, the forested flood plains along streams, and the salt marshes.

The Minnesott Ridge, along North Carolina Highway 306, was formed at the shoreline of an ancient ocean, the Pamlico Sea. Along the east side of this sand ridge is the Suffolk Scarp. Elevation at the base of the scarp is about 20 feet (fig. 1). This scarp separates the older, upland soils of the Talbot Surface to the west from the lower, younger soils of the Pamlico Surface to the east. Stream terraces on the Pamlico Surface extend up the larger creeks west of North Carolina Highway 306. Narrow, forested flood plains are along freshwater streams. Narrow to broad salt marshes are in low areas beside estuaries and are frequently flooded with salt water.

According to the U.S. Geological Survey topographic maps, elevation of the uplands of the Talbot Surface ranges from about 20 to 46 feet. The low marine and stream terraces on the Pamlico Surface are less than 20 feet in elevation, and a large part is below 10 feet. The marshes are less than 2 feet in elevation, and the flood plains are slightly higher.

Large areas of soils that are nearly level and poorly drained and very poorly drained are on broad interstream

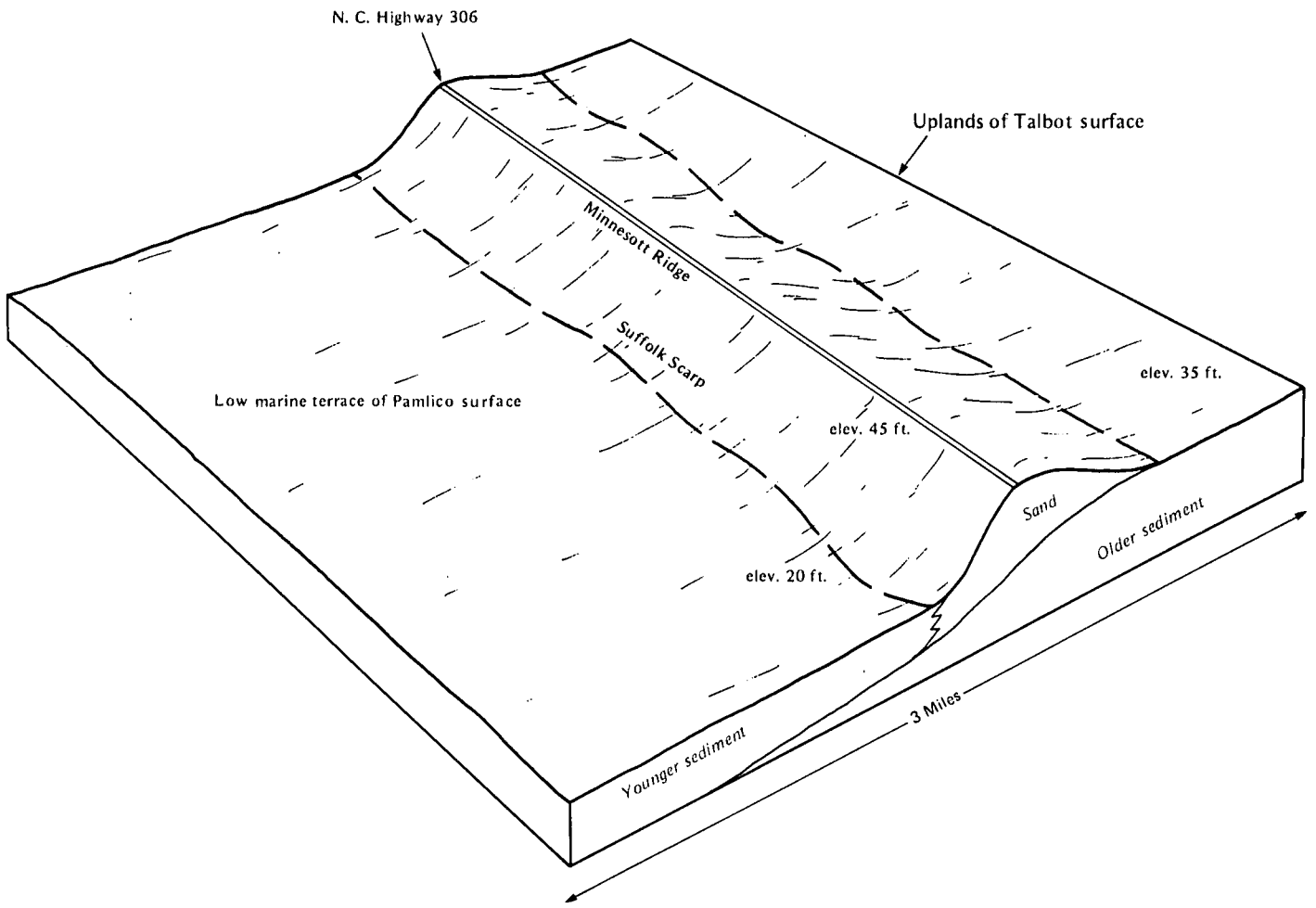


Figure 1.—The Minnesott Ridge and Suffolk Scarp are along the former shoreline of the ancient Pamlico Sea. This ridge separates the older soils of the Talbot surface from the younger soils of the Pamlico surface.

divides on uplands and low marine terraces. Near the drainageways, soils that are nearly level and somewhat poorly drained grade into soils that are gently sloping and moderately well drained and well drained (fig. 2).

In the central and northern parts of the county, organic soils are in large pocosins. The pocosins appear flat, but have very gentle slope from the center outward. In these places, surface runoff is very slow, the underlying material is slowly permeable, and rainfall exceeds evapotranspiration by about 18 inches a year *(7)*. These factors favor the accumulation of layers of organic material.

Soils that are gently sloping and excessively drained and well drained are on sand ridges on the uplands. These soils are intermingled with soils that are nearly level, somewhat poorly drained to very poorly drained. The largest sand ridge is the Minnesott Ridge along North Carolina Highway 306.

Soils that are nearly level and very poorly drained are in salt marshes beside rivers, creeks, bays, and the Pamlico Sound. These soils are most extensive in the eastern part of the county, but they are also on flood plains along streams throughout the county.

About 51 percent of Pamlico County is very poorly drained soils, 28 percent is poorly drained, 6 percent is somewhat poorly drained, 10 percent is moderately well drained, 2 percent is well drained, and less than 1 percent is excessively drained. The remaining 2 percent is small areas of water.

History and Development

Pamlico County was formed from part of Craven County in 1872, and from parts of Beaufort County in 1874 and 1875. The first permanent European settlers arrived in the early 1700's. The area was inhabited by the Pampticoe Indians for which the county is named. After the Tuscarora War in 1711, Scotch and English colonists came to the area. Settlement was slow, however, because the county is on an isolated peninsula. The earliest settlements were at the heads of the rivers, creeks, and bays. The interior of the county was settled as the road system was developed *(13)*.

The county's natural resources include the many miles of navigable water areas, extensive forests, and productive soils. Commercial fishing, forestry, and farming have been the major enterprises since the county was settled.

Large numbers of fish, crabs, oysters, and shrimp are caught, mainly in the Pamlico Sound, and processed by the local seafood industry. The main fishing ports are Bayboro, Hobucken, Lowland, Oriental, Pamlico, Vandemere, and Whortonsville.

Because of easy access and good drainage, early agriculture in the county was mainly along the Neuse River. Wheat, oats, rye, corn, cotton, peas, rice, and potatoes were produced, and cattle, hogs, and sheep were raised. In 1879, the leading crops were corn, cotton, and sweet potatoes. By 1919, cropland acreage had tripled to 32,383 acres as more poorly drained inland areas were cleared and drainage systems installed. At that time, soybeans were grown mainly for hay, and very little small grain was planted. Eventually cotton acreage decreased because of the boll weevil, and sweet potato production decreased because of the wireworm and low prices. Today, soybeans, wheat, potatoes, corn, and tobacco are the principal crops.

Forest products have been an important part of the county's economy since the colonial period. Tar, pitch turpentine, and lumber were important early products. In 1979, the North Carolina Forest Service reported that

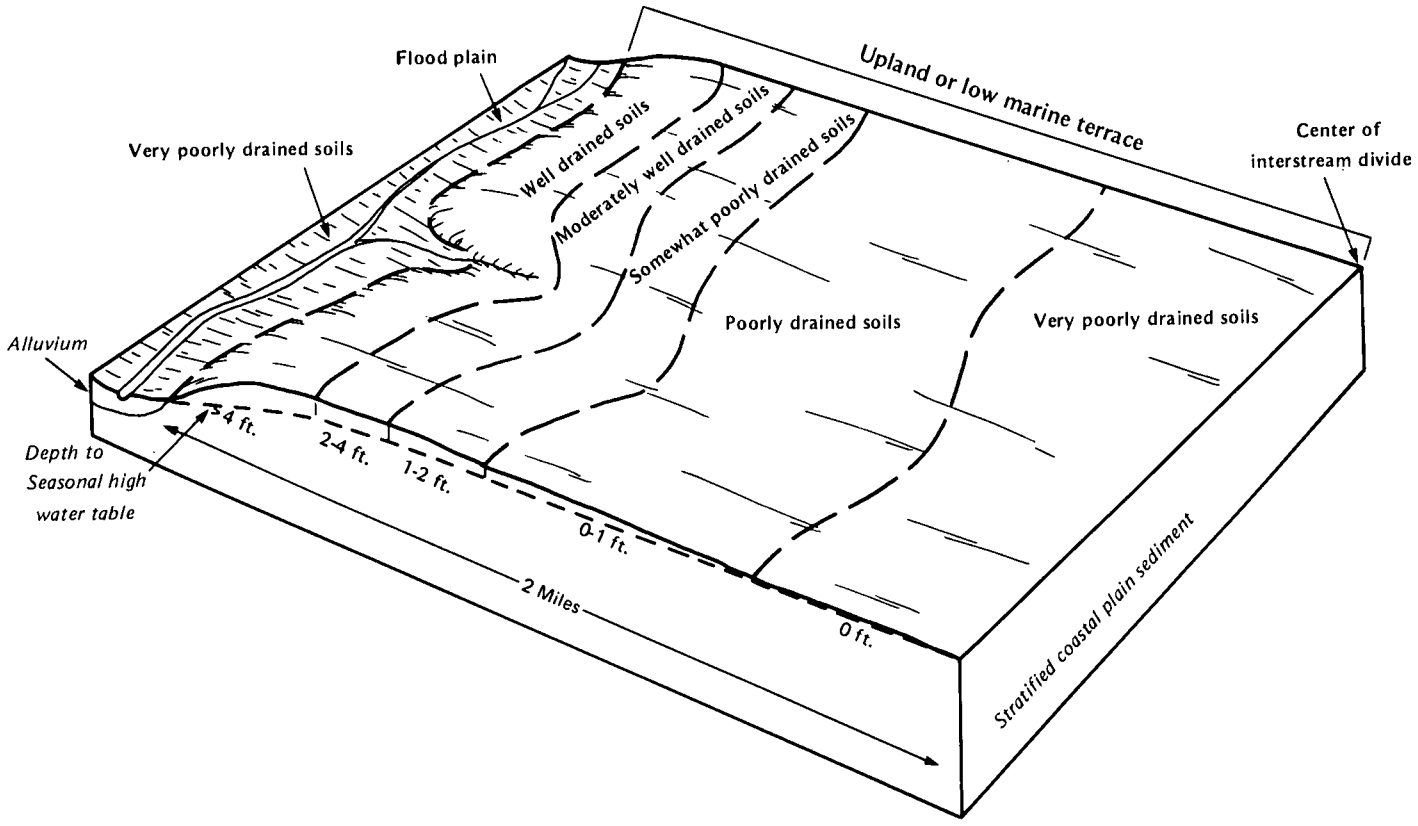


Figure 2.—Typical landscape position and drainage class relationships of soils are shown from a drainageway to the center of a broad interstream divide. The seasonal high water table approaches the surface as distance from the drainageway increases.

4,000,000 board feet was harvested for lumber, veneer, and plywood. Pulpwood production was 30,000 cords.

Water Supply

Ground water is plentiful throughout the county. It is near the surface in most places, particularly during winter and early in spring. Shallow water impoundments have been built in the eastern part of the county to attract waterfowl.

Thousands of feet of sedimentary deposits underlie the county. The upper part of these deposits contains aquifers that supply the county's well water. The surficial aquifer ranges from the water table to a maximum depth of about 75 feet. It is thickest along the Minnesott Sand Ridge. Earlier in the development of Pamlico County, this aquifer was the main source of small domestic water supplies. The use of shallow wells has decreased considerably because of small yield in some places, frequent high content of dissolved iron, and the risk of contamination. The Castle Hayne Formation is a very productive artesian aquifer and is the main source of water supply in the county. It ranges from 200 to more than 400 feet thick. The overlying Yorktown Formation produces moderate supplies of water, but most well drillers prefer to complete wells in the Castle Hayne Formation. The water from the Castle Hayne and Yorktown Formations is generally hard and has a variable content of dissolved iron. Salty water can occur in these aquifers near the estuaries *(10)*.

Climate

Prepared by the National Climatic Data Center, Asheville, North Carolina.

Pamlico County is hot and humid in summer, but the coast is frequently cooled by sea breezes. Winter is cool with occasional brief cold spells. Rains occur throughout the year and are fairly heavy at times. Average annual precipitation is adequate for all crops.

Table 1 gives data on temperature and precipitation for the survey area as recorded at New Bern in the period 1951 to 1979. 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 Bern on February 13, 1973, is 6 degrees. In summer the average temperature is 78 degrees, and the average daily maximum temperature is 87 degrees. The highest recorded temperature, which occurred at New Bern on July 22, 1952, is 106 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 53.2 inches. Of this, 32 inches, or 60 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 12.23 inches at New Bern on September 19, 1955. Thunderstorms occur on about 45 days each year, and most occur in summer.

The average seasonal snowfall is 3 inches. The greatest snow depth at any one time during the period of record was 13 inches. On an average, only 1 day each year has at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

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

Hurricanes occasionally cross the area and cause severe flooding and extensive damage in low areas near Pamlico Sound and along rivers, creeks, and bays. Since 1900, 56 hurricanes have passed across or close to the North Carolina coast. Of these, 21 were major hurricanes, and 12 were destructive in Pamlico County. The most recent hurricanes were Hazel in 1954, and Connie, Diane, and Ione in 1955. They caused flood elevations ranging from 6.1 to 8.7 feet at Oriental, 5.5 to 6.5 feet at Hobucken, and 5.6 to 8.9 feet at Bayboro *(17)*.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. 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; the kinds of crops and native plants growing on the soils; and the elevation and kinds of sediment. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile 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.

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each

kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable 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, kind and amount of rock fragments, distribution of plant roots, acidity, and other features that enable them to identify soils. After describing the soils in the survey area 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. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were 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 were assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can state with a fairly high degree of probability 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 always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

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 several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or 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 soils of minor extent.

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 mentioned 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, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

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

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or 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.

Well Drained to Poorly Drained Soils; Near Drainageways

The two map units in this group make up about 30 percent of the county. They consist of moderately permeable or moderately slowly permeable soils on uplands, low marine terraces, and stream terraces that are mostly moderately well drained or somewhat poorly drained. A small acreage is poorly drained. Principal uses are cropland and woodland. Seasonal wetness is the main limitation for uses other than forestry.

1. Yonges-Altavista-Fork

Nearly level, poorly drained, moderately well drained, and somewhat poorly drained soils that have a loamy subsoil; on low marine and stream terraces

These soils are on the Pamlico Surface near major drainageways (fig. 3) mainly in the southern, central, and southwestern parts of the county. The areas parallel the drainageways and are irregular in shape.

This map unit makes up about 26 percent of the county. About 40 percent is Yonges soil, 16 percent is Altavista soil, 9 percent is Fork soil, and 35 percent is soils of minor extent.

The Yonges soils are poorly drained and are on flats and in depressions generally farther from drainageways than the other major soils. The surface layer is loamy fine sand, and the subsoil is sandy clay loam.

The Altavista soils are moderately well drained and are nearest to the drainageways. The surface layer is loamy fine sand, and the subsoil is sandy clay loam.

The Fork soils are somewhat poorly drained and are commonly between the Yonges and Altavista soils. The surface layer is loamy fine sand, and the subsoil is sandy clay loam.

Soils of minor extent in this map unit are the Charleston, Conetoe, and Dogue soils near the drainageways, the Argent and Wahee soils on flats and in depressions, the Ballahack soils in depressions, the Masontown soils on flood plains, and the Hobucken and Lafitte soils in marshes.

About two-thirds of the major soils in this map unit is used as woodland. The rest is mainly in row crops. A seasonal high water table is the main limitation for uses other than forestry.

2. Goldsboro-Lynchburg-Norfolk

Nearly level to gently sloping, moderately well drained, somewhat poorly drained, and well drained soils that have a loamy subsoil; on uplands

These soils are on the Talbot Surface in smooth areas and on gentle slopes near drainageways in the western part of the county (fig. 4). The areas parallel the drainageways and are long and variable in width.

This map unit makes up about 4 percent of the county. About 38 percent is Goldsboro soils, 19 percent is Lynchburg soils, 18 percent is Norfolk soils, and 25 percent is soils of minor extent.

The Goldsboro soils are nearly level and moderately well drained. They are generally between the Norfolk and Lynchburg soils. The surface layer is loamy fine sand, and the subsoil is sandy clay loam.

The Lynchburg soils are nearly level and somewhat poorly drained. They are generally farther from drainageways than the other major soils. The surface layer is fine sandy loam and the subsoil is sandy clay loam.

The Norfolk soils are nearly level to gently sloping and well drained. They are nearer to the drainageways than the other major soils. The surface layer is loamy fine sand, and the subsoil is sandy clay loam.

The soils of minor extent in this map unit are the Craven and Tomahawk soils near drainageways, the

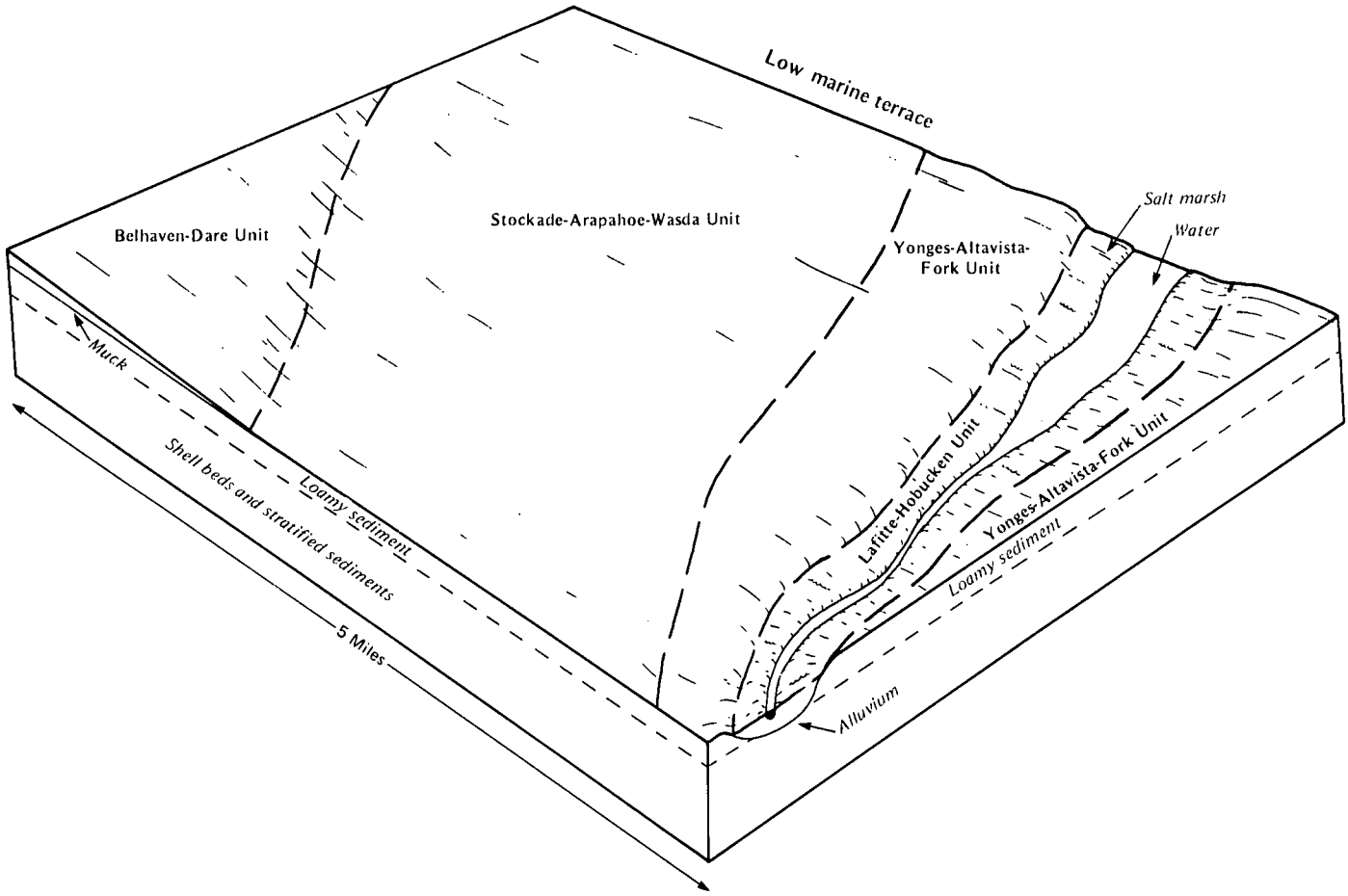


Figure 3.—The natural drainage and organic matter content of soils on the Pamlico Surface are influenced by position on the landscape.

nearly level Lenoir soils, the Rains soils in depressions, and the Masontown soils in drainageways.

About half the acreage of the major soils is used for row crops. The rest is mainly woodland. A seasonal high water table is the main limitation of Goldsboro and Lynchburg soils for uses other than forestry. The Norfolk soils do not have major limitations for most uses.

Very Poorly Drained and Poorly Drained Soils; on Broad Interstream Flats and In Depressions

The two map units in this group make up about 27 percent of the county. They consist of moderately permeable or moderately rapidly permeable, seasonally wet soils on low marine terraces, uplands, and stream terraces. The principal uses are woodland and cropland. A seasonal high water table, ponding, and flooding of low areas are the main limitations except in drained areas.

3. Stockade-Arapahoe-Wasda

Nearly level, very poorly drained soils that have a loamy subsoil; on low marine and stream terraces

These soils are on the Pamlico Surface on large interstream flats and in depressions mainly in the central and northeastern parts of the county (see fig. 3). The areas are generally broad and irregular in shape.

This map unit makes up about 21 percent of the county. About 40 percent is Stockade soils, 22 percent is Arapahoe soils, 15 percent is Wasda soils, and 23 percent is soils of minor extent.

The Stockade soils have a loamy fine sand surface layer and a sandy clay loam subsoil.

The Arapahoe soils have a loamy fine sand surface layer and a fine sandy loam subsoil.

The Wasda soils are farther from drainageways than the other major soils. The surface layer is well

decomposed organic matter, and the subsoil is sandy clay loam.

The soils of minor extent in this map unit are the Ballahack and Brookman soils on flats and in depressions, the Belhaven soils in depressions, and the Argent and Yonges soils near shallow drainageways.

About two-thirds of the acreage of this map unit is used as woodland. The rest is used mainly for row crops and pasture. A seasonal high water table at or near the surface, flooding of low areas, and frequent ponding are major limitations.

4. Paxville-Rains

Nearly level, very poorly drained and poorly drained soils that have a loamy subsoil; on uplands

These soils are on the Talbot Surface on interstream flats and in depressions in the western part of the county (see fig. 4). A large area of this map unit is north of Reelsboro, and small areas are between Reelsboro and Arapahoe. The areas are irregular in shape.

This map unit makes up about 6 percent of the county. About 54 percent is Paxville soils, 35 percent is Rains soils, and 11 percent is soils of minor extent.

The Paxville soils are very poorly drained. They are farther from drainageways than Rains soils. The surface layer is mucky fine sandy loam, and the subsoil is sandy clay loam.

The Rains soils are poorly drained. The surface layer is fine sandy loam, and the subsoil is sandy clay loam.

Soils of minor extent in this map unit are the Lenoir and Lynchburg soils near shallow drainageways and the Croatan and Rutlege soils in depressions.

The major soils are used mainly as woodland. In a few areas, these soils are used for row crops. Wetness is the main limitation.

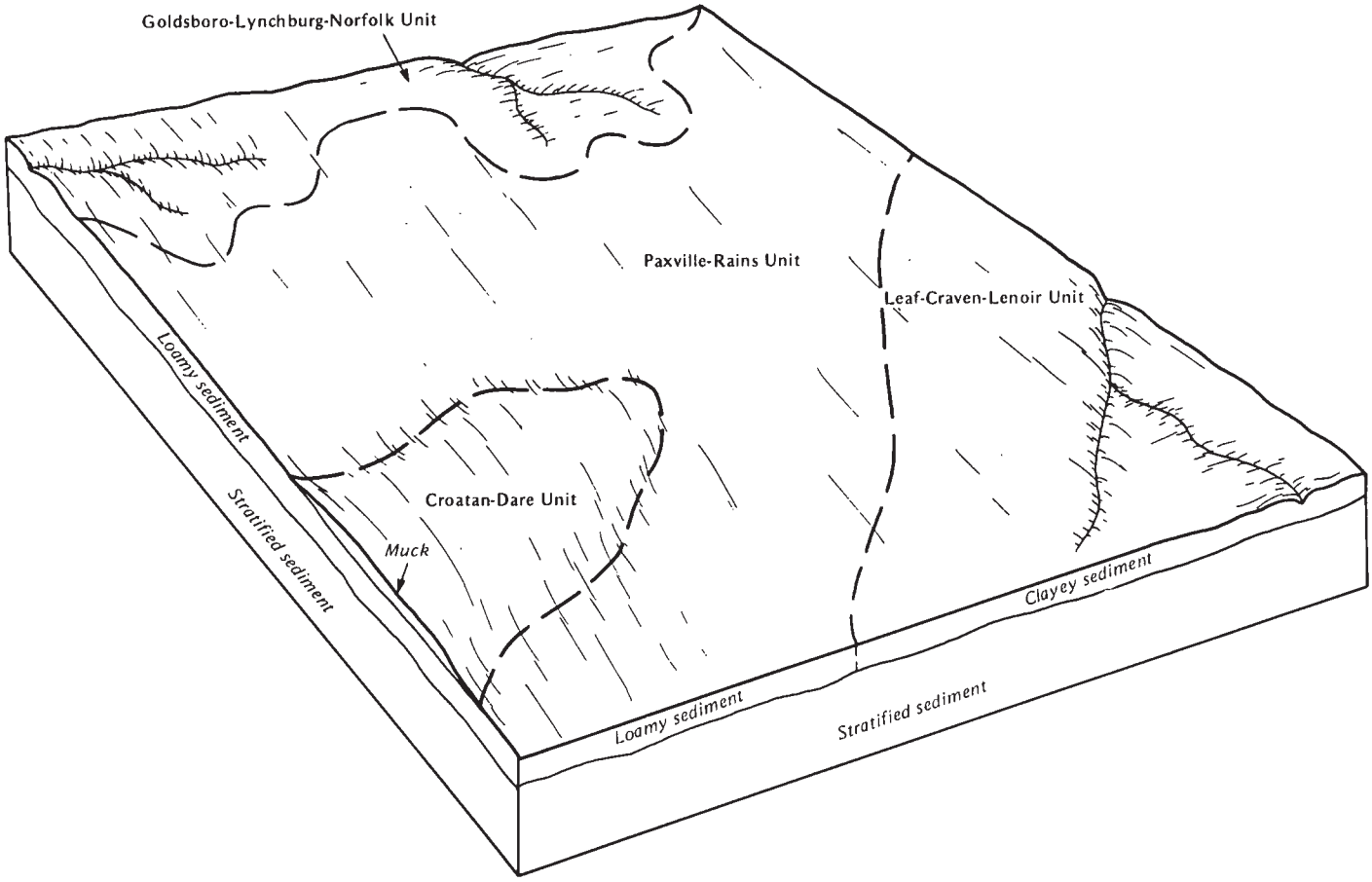


Figure 4.—The soils on the uplands of the Talbot Surface formed in loamy or clayey sediment or in muck.

Soils That Mainly Have a Clayey Subsoil

The two map units in this group make up about 17 percent of the county. They consist of slowly and very slowly permeable soils on low marine terraces, uplands, and stream terraces. Principal uses are woodland and cropland. Seasonal wetness, ponding, slow or very slow permeability, moderate to high shrink-swell potential, flooding of low areas, and low strength are the main limitations.

5. Argent-Brookman-Wahee

Nearly level, poorly drained, very poorly drained, and somewhat poorly drained soils that have a clayey or loamy subsoil; on low marine and stream terraces

These soils are on the Pamlico Surface mainly in the southern and central parts of the county. They are in a large, irregularly shaped area south of Bayboro to the Neuse River and in scattered, smaller areas to the east.

This map unit makes up about 11 percent of the county. About 55 percent is Argent soils, 26 percent is Brookman soils, 10 percent is Wahee soils, and 9 percent is soils of minor extent.

The Argent soils are poorly drained. They generally are between the Brookman and Wahee soils. The surface layer is loam, and the subsoil is clay.

The Brookman soils are very poorly drained. They are in the middle of broad interstream flats and depressions. The surface layer is mucky silt loam, and the subsoil is clay loam and clay.

The Wahee soils are somewhat poorly drained. They are nearer the drainageways than Argent or Brookman soils. The surface layer is fine sandy loam, and the subsoil is sandy clay and clay.

Soils of minor extent in this map unit are the Dogue and Fork soils near drainageways, the Yonges, Stockade, and Wasda soils on flats and in depressions, and the Hobucken and Lafitte soils in small areas of marsh.

The major soils are used as woodland in about three-fourths of this map unit. The rest is used for row crops and pasture. A seasonal high water table, ponding, flooding of low areas, slow permeability, moderate shrink-swell potential, and low strength are the major limitations.

6. Leaf-Craven-Lenoir

Nearly level to gently sloping, poorly drained, moderately well drained, and somewhat poorly drained soils that have a clayey subsoil; on uplands

These soils are on the Talbot Surface in the western part of the county on interstream flats and gentle slopes near drainageways (see fig. 4). The areas are broad and irregular in shape.

This map unit makes up about 6 percent of the county. About 58 percent is Leaf soils, 13 percent is Craven soils, 12 percent is Lenoir soils, and 17 percent is soils of minor extent.

The Leaf soils are nearly level and poorly drained. They are in the middle of interstream areas. The surface layer is silt loam, and the subsoil is clay.

The Craven soils are nearly level to gently sloping and moderately well drained. They are nearer the drainageways than Leaf or Lenoir soils. The surface layer is loam, and the subsoil is clay.

The Lenoir soils are nearly level and somewhat poorly drained. They are commonly between the Craven and Leaf soils. The surface layer is silt loam, and the subsoil is clay.

Soils of minor extent in this map unit are the Goldsboro and Lynchburg soils near drainageways, the Rains soils on interstream flats and in depressions, and the Masontown soils on flood plains.

Most of the acreage of the major soils in this map unit is used as woodland. The rest is mainly in row crops. A seasonal high water table, slow or very slow permeability, moderate to high shrink-swell potential, and low strength are the major limitations.

Very Poorly Drained, Mucky Soils

The two map units in this group make up about 12 percent of the county. They consist of organic soils on low marine terraces and uplands. The water table is at or near the surface most of the time. In undrained areas, the principal use is wildlife habitat. In a few areas, the soils have been drained and are used as cropland. The main problems for use of these soils are a high water table, ponding, low strength, subsidence, and the danger of fire during dry periods.

7. Belhaven-Dare

Nearly level, very poorly drained mucky soils that are subject to frequent ponding; on low marine terraces

These soils are on the Pamlico Surface on large interstream flats and in depressions in the Bay City Pocosin and the Light Ground Pocosin in the central part of the county (see fig. 3). The areas are broad and irregular in shape.

This map unit makes up about 8 percent of the county. About 68 percent is Belhaven soils, 27 percent is Dare soils, and 5 percent is soils of minor extent.

The Belhaven soils are near the outer edge of delineations. They typically consist of muck to a depth of 28 inches. Below the muck to a depth of 80 inches is mucky fine sandy loam, sandy clay loam, and fine sandy loam.

The Dare soils are in the middle of the delineations. They typically consist of muck to a depth of 61 inches. Below the muck to a depth of 80 inches is mucky sand and sand.

Soils of minor extent in this map unit are the mineral Arapahoe, Ballahack, Brookman, Stockade, and Wasda soils near the outer edge of delineations.

Most of this map unit is in native vegetation of plants adapted to long periods of wetness and ponding. A high water table, frequent ponding, and the danger of fire in the organic matter during dry periods are major limitations to uses other than wildlife management. These remote areas are important as habitat for deer, black bear, and wetland wildlife.

8. Croatan-Dare

Nearly level, very poorly drained mucky soils that are subject to frequent ponding; on uplands

These soils are on the Talbot Surface on a large interstream flat in the Carolina Pocosin in the northwestern part of the county (see fig. 4). The area is broad and irregular in shape.

This map unit makes up about 4 percent of the county. About 70 percent is Croatan soils, 27 percent is Dare soils, and 3 percent is soils of minor extent.

The Croatan soils are closer to drainageways than the Dare soils. They typically consist of muck to a depth of 25 inches. Below the muck to a depth of 80 inches is mucky fine sandy loam, sandy clay loam, sandy loam, and loamy sand.

The Dare soils are in the middle of the delineation. They typically consist of muck to a depth of 61 inches. Below the muck to a depth of 80 inches is mucky sand and sand.

Soils of minor extent in this map unit are the mineral Paxville and Rutlege soils near the outer edge of the delineation.

Nearly all of this map unit is in native vegetation of plants adapted to long periods of wetness and ponding. A high water table, frequent ponding, low strength, and the danger of fire in the organic matter during dry periods are the major limitations for uses other than wildlife management. This remote area is important as habitat for deer, black bear, and wetland wildlife.

Very Poorly Drained Soils; in Salt Marshes

The map unit in this group makes up about 9 percent of the county. It consists of persistently wet soils in marshes. These soils are used as habitat for wildlife because of frequent flooding, extreme wetness, and exposure to salt.

9. Lafitte-Hobucken

Nearly level, very poorly drained mucky and loamy soils that are flooded frequently with salt water; in marshes

These soils are in large areas of marsh in the eastern part of the county (see fig. 3). The areas are generally broad and irregular in shape.

This map unit is about 45 percent Lafitte soils, 18 percent Hobucken soils, and 13 percent soils of minor extent. The remaining 24 percent is shallow water impoundments constructed for waterfowl management.

The Lafitte soils are mainly in areas north of Bay River. They typically consist of muck 80 inches thick.

The Hobucken soils are mostly south of Bay River. They typically consist of a thin layer of muck overlying a mucky fine sandy loam surface layer to a depth of 16 inches. Below the surface layer to a depth of 80 inches is fine sandy loam and loamy fine sand.

Soils of minor extent in this map unit are the Arapahoe, Brookman, Stockade, and Wasda soils in small scattered areas of low marine terraces.

The major soils in this map unit are in native vegetation of plants adapted to long periods of wetness, frequent flooding, and exposure to salt. These marshland areas serve an important role in the coastal ecology. They provide primary habitat for many wetland animals and waterfowl, and they contribute nutrients to the estuary benefiting fish and shellfish. These soils are not in uses other than wildlife management because of the high water table, frequent flooding, the low elevation, and exposure to salt.

Sandy Soils

The map unit in this group makes up about 5 percent of the county. It consists mainly of sandy soils on upland ridges and in depressions. The soils are used mainly as woodland. The main problems are a seasonal high water table, ponding in depressions, leaching of plant nutrients, and a weakly cemented subsoil in many places.

10. Leon-Tomahawk-Rutlege

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

These soils are on the Talbot Surface on ridges and in depressions in the western part of the county. The areas are long and variable in width. The largest area of this map unit is on the Minnesott Ridge along North Carolina Highway 306.

This map unit is about 46 percent Leon soils, 24 percent Tomahawk soils, 19 percent Rutlege soils, and 11 percent soils of minor extent.

The Leon soils are nearly level to gently sloping and poorly drained. They are on ridges. The surface layer and subsurface layer are sand, and the subsoil is sand coated with organic matter.

The Tomahawk soils are nearly level to gently sloping and moderately well drained. They are in higher positions than the Leon soils. The surface layer is loamy sand, and the subsoil is sandy loam.

The Rutlege soils are nearly level and very poorly drained. They are in depressions. The surface layer is mucky loamy fine sand, and the underlying material is sand.

Soils of minor extent in this map unit are the Alpin and Baymeade soils on the highest parts of the ridges.

Most of the acreage of this map unit is in woodland. In a few areas, the Tomahawk soils are used for row crops, but the Leon and Rutlege soils are not cultivated. The major limitations are a seasonal high water table, ponding in depressions, leaching of plant nutrients, and the weakly cemented pan.

Detailed Soil Map Units

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

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

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses. Key physical and chemical properties are mentioned in the map units. Additional properties information is provided in tables 14, 15, 16, and 17.

Important or commonly occurring plants are listed by their recognized common plant names *(8, 12)* in each map unit. An alphabetical list of these plants and their scientific names is in table 4.

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 phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Norfolk loamy fine sand, 0 to 2 percent slopes, is one of several phases in the Norfolk series.

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 soil or 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 are identified by a special symbol on the soil maps. These include small wet spots, borrow pits, sandy spots, marshes, and short, steep slopes.

Table 5 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

AaA—Altavista loamy fine sand, 0 to 2 percent slopes. This soil is moderately well drained. It is in slightly convex areas near drainageways on low marine and stream terraces. This Altavista soil is along the Neuse and Bay Rivers and the larger creeks. The mapped areas are irregular in shape and range from 5 to 300 acres.

Typically, the surface layer is dark grayish brown loamy fine sand 5 inches thick. The subsurface layer is pale brown loamy fine sand to a depth of 8 inches. The subsoil is sandy clay loam. It extends to a depth of 57 inches and is brownish yellow in the upper part, brownish yellow with light brownish gray mottles in the middle part, and light yellowish brown with light brownish gray mottles in the lower part. The underlying material to a depth of 80 inches is light yellowish brown fine sandy loam and loamy fine sand and has light brownish gray and light gray mottles.

Permeability of the subsoil is moderate, and the available water capacity is moderate. The soil ranges from very strongly acid to medium acid except where lime has been added. The seasonal high water table is 1.5 to 2.5 feet below the surface. Low areas of this soil are subject to rare flooding.

Included with this soil in mapping are a few small areas of Fork, Dogue, and Charleston soils. The Fork soils are in depressions and are somewhat poorly drained. The Dogue and Charleston soils are moderately well drained and occur at random within the map unit with no apparent change in landscape. Some areas of wet soils in small depressions and areas of marsh smaller than 4 acres are shown on the map with special symbols. The included soils make up about 10 to 15 percent of this map unit.

This Altavista soil is used mainly as cropland. In a few areas, it is used as pasture or woodland.

In cultivated areas of this soil, the major crops are corn, tobacco, soybeans, and wheat. Wetness is the main limitation for cropland use. Drainage systems, such

as tile and open ditches, may be needed, especially in areas where tobacco is grown. Common pasture forages include tall fescue, Ladino clover, and coastal bermudagrass.

In woodland areas, loblolly pine, longleaf pine, southern red oak, water oak, yellow-poplar, sweetgum, red maple, white oak, and blackgum are dominant. Common understory plants are flowering dogwood, redbay, sweetleaf, sourwood, sweetbay, bitter gallberry, greenbrier, sweet pepperbush, Virginia creeper, waxmyrtle, American holly, honeysuckle, poison ivy, blueberry, grape, and Carolina jessamine. There are no major limitations for woodland use and management.

Seasonal wetness and rare flooding of low areas limit the use of this soil for building site development, sanitary facilities, and recreation. Wetness can be reduced by installing a drainage system that includes land grading and the use of tile and open ditches. The hazard of flooding at specific sites needs to be determined before use and management are planned.

This Altavista soil is in capability subclass IIw and in woodland group 9W.

AnB—Alpin fine sand, 0 to 5 percent slopes. This soil is excessively drained. It is on the Minnesott Ridge near Minnesott Beach. The mapped areas are irregular in shape and range from 20 to 200 acres.

Typically, the surface layer is grayish brown fine sand 5 inches thick. Below the surface layer to a depth of 80 inches is pale brown and pale yellow fine sand that has thin layers of yellowish brown loamy fine sand in the lower part.

Permeability is rapid, and the available water capacity is low. The soil ranges from very strongly acid to slightly acid except where lime has been added. The seasonal high water table is below a depth of 6 feet.

Included with this soil in mapping are a few small areas of Baymeade soils on ridges and Tomahawk soils in slightly convex areas. The Baymeade soils are gently sloping and well drained, and the Tomahawk soils are nearly level and moderately well drained. Also included are a few areas shown on the map with a special symbol. These areas are on short, steep slopes along the Neuse River. The included soils make up about 10 to 15 percent of this map unit.

This Alpin soil is used mainly as woodland. It generally is not used as cropland because of droughtiness and rapid leaching of plant nutrients.

In woodland areas, the dominant trees are longleaf pine, loblolly pine, southern red oak, post oak, hickory, and laurel oak. Common understory plants are turkey oak, flowering dogwood, sourwood, sassafras, redbay, American beautyberry, American holly, grape, waxmyrtle, threeawn grass, and blueberry. Droughtiness is the main limitation for woodland use and management.

This soil does not have any major limitations for use as sites for buildings or for sanitary facilities. The sandy surface layer is a limitation for recreation uses.

This Alpin soil is in capability subclass IVs and woodland group 7S.

Ap—Arapahoe loamy fine sand. This soil is nearly level and very poorly drained. It is on broad flats and in depressions on low marine and stream terraces. Some of the larger areas of this soil are north of North Carolina Highway 304 from Hollyville to Lowland and east of Merritt. The mapped areas are irregular in shape and range from 10 to 5,000 acres.

Typically, the surface layer is black and very dark brown loamy fine sand 17 inches thick. The subsoil is dark gray fine sandy loam to a depth of 42 inches. The underlying material to a depth of 80 inches is gray and dark greenish gray loamy fine sand.

Permeability is moderately rapid. The surface layer and subsoil range from extremely acid to strongly acid except where lime has been added. The underlying material ranges from medium acid to mildly alkaline. The seasonal high water table is at or near the surface. In depressions, the soil is subject to frequent ponding for brief to long periods unless a drainage system has been installed. This soil is also subject to rare flooding.

Included with this soil in mapping are small areas of the Ballahack, Stockade, Wasda, and Yonges soils. The Ballahack and Stockade soils are very poorly drained. They occur at random within the map unit with no apparent change in landscape. The Wasda soils have a muck surface layer and are in depressions. The poorly drained Yonges soils are in slightly higher positions than Arapahoe soil. The included soils make up about 10 to 20 percent of this map unit.

This Arapahoe soil is mostly native woodland. In a few areas, it is used as cropland.

In woodland areas, the dominant trees are sweetgum, blackgum, yellow-poplar, swamp chestnut oak, red maple, willow oak, water oak, loblolly pine, pond pine, and baldcypress. Hardwoods are dominant in areas subject to frequent ponding. Common understory plants are redbay, sweetbay, American holly, bitter gallberry, large gallberry, fetterbush, sweet pepperbush, switchcane, waxmyrtle, blueberry, huckleberry, titi, honeysuckle, Virginia chainfern, grape, Virginia creeper, cinnamon fern, poison ivy, and greenbrier. Trees grow well on this soil; however, wetness is a limitation to commercial woodland management. Areas of this soil managed for loblolly pine are ditched and bedded. Fertilizer is used in some plantations.

In cultivated areas, this soil has been intensively drained and is used for corn, soybeans, wheat, potatoes (fig. 5), and cabbage. Drainage systems include open ditches and tile. The sandy underlying material causes ditchbank caving and makes ditch maintenance difficult. Suitable outlets may not be available for drainage of

some low areas. Land grading improves surface drainage by eliminating depressions in which water ponds.

Seasonal wetness, rare flooding, and ponding in depressions limit the use of this soil for building site development and sanitary facilities. Some areas, however, have been developed using intensive drainage systems. Some wetness will remain if these systems are inadequate. This soil is generally not used for recreation.

This Arapahoe soil is in capability subclass IIIw (drained) or VIw (undrained). It is in woodland group 10W.

Ar—Argent loam. This soil is nearly level and poorly drained. It is on broad flats and in depressions on low marine and stream terraces. Some of the larger areas of this soil are between Stonewall and Janeiro, west of Hollyville, and south of Florence and Whortonsville. The mapped areas are irregular in shape and range from 10 to 5,000 acres.

Typically, the surface layer is very dark grayish brown loam 6 inches thick. The subsoil extends to a depth of 46 inches. It is dark gray clay loam in the upper part, gray and light brownish gray clay in the middle part, and gray sandy clay loam in the lower part. The underlying material to a depth of 80 inches is gray and dark greenish gray fine sandy loam and loamy fine sand.

Permeability is slow, and the shrink-swell potential is moderate. The soil ranges from very strongly acid to medium acid in the surface layer and subsoil except where lime has been added. The underlying material ranges from medium acid to moderately alkaline. The seasonal high water table is within 1 foot of the surface. Water ponds in depressions for brief periods except in drained areas. This soil is also subject to rare flooding.

Included with this soil in mapping are small areas of Yonges, Wahee, and Brookman soils. The Yonges soil are poorly drained. They occur at random within the map unit with no apparent change in the landscape. The Wahee soils are somewhat poorly drained and are in slightly higher areas. The Brookman soils are very poorly drained and are in depressions. The included soils make up 10 to 15 percent of this map unit.

This Argent soil is used mainly as woodland. In a few areas, it is used as pasture or cropland.

In woodland areas, the dominant trees are loblolly pine, pond pine, blackgum, sweetgum, water oak, swamp chestnut oak, red maple, yellow-poplar, and willow oak. Common understory plants are redbay, sweetbay, American holly, switchcane, sweet pepperbush,

Figure 5.—This area of Arapahoe loamy fine sand has been intensively drained and is used for Irish potatoes.

greenbrier, waxmyrtle, bitter gallberry, large gallberry, fetterbush, honeysuckle, blueberry, huckleberry, poison ivy, sweetleaf, grape, Virginia chainfern, cinnamon fern, Virginia creeper, and Carolina jessamine. Wetness is a limitation for woodland management. Logging when this soil is wet causes deep ruts, compaction, poor surface drainage, and lower productivity. Areas of this soil managed for loblolly pine are generally ditched and bedded. Fertilizer is used in many plantations.

In cultivated areas of this soil, corn, soybeans, and wheat are the main crops. Wetness is a major limitation. The slowly permeable subsoil limits internal drainage, so open ditches and land grading for surface drainage are used. Tile is generally not used. If this soil is tilled while wet, the soil structure is destroyed and large clods form, resulting in ponding and a poor seedbed. Common pasture forages include tall fescue and Ladino clover.

Seasonal wetness, slow permeability, rare flooding, ponding in depressions (fig. 6), moderate shrink-swell potential, and the clayey subsoil limit the use of this soil for building site development, sanitary facilities, and recreation. Wetness is reduced somewhat with an intensive drainage system. However, inadequate results from artificial drainage limit this soil for urban development. Foundations must be designed to resist cracking since the subsoil shrinks and swells during changes in moisture.

This Argent soil is in capability subclass IIIw (drained) or VIw (undrained). It is in woodland group 10W.

Ba—Ballahack fine sandy loam, occasionally flooded. This soil is nearly level and very poorly drained. It is on broad flats and in depressions on low marine and stream terraces. Some of the larger areas of this soil are

Figure 6.—Ponding of water on the surface limits Argent loam for residential uses.

north of Hollyville and Mesic and south of Alliance. The mapped areas are irregular in shape and range from 5 to 2,000 acres.

Typically, the surface layer is black and very dark brown fine sandy loam 37 inches thick. The underlying material to a depth of 80 inches is grayish brown sandy clay loam and gray fine sandy loam.

Permeability of the subsoil is moderate. The surface layer and the upper part of the underlying material range from extremely acid to strongly acid except where lime has been added. The lower part of the underlying material ranges from very strongly acid to mildly alkaline. The seasonal high water table is at or near the surface. The soil is subject to occasional flooding for brief periods. Water ponds in depressions for brief to long periods except in drained areas.

Included with this soil in mapping are small areas of the Arapahoe, Brookman, Stockade, and Wasda soils. These very poorly drained soils occur at random within this map unit with no apparent change in landscape. The included soils make up 15 to 25 percent of this map unit.

This Ballahack soil is used mostly as woodland. In a few areas, it is used as cropland.

In woodland areas of this soil, the dominant trees are loblolly pine, pond pine, sweetgum, blackgum, yellow-poplar, swamp chestnut oak, swamp tupelo, red maple, willow oak, water oak, and baldcypress. Hardwoods are dominant in some of the larger depressions. Common understory plants are redbay, sweetbay, American holly, bitter gallberry, large gallberry, fetterbush, sweet pepperbush, switchcane, waxmyrtle, blueberry, huckleberry, titi, honeysuckle, Virginia chainfern, grape, Virginia creeper, cinnamon fern, poison ivy, and greenbrier. Trees grow well on this soil; however, wetness and flooding are limitations to woodland use and management. Areas of this soil managed for loblolly pine are ditched and bedded. Fertilizer is used in some plantations.

In cultivated areas, the soil has been intensively drained and is used for corn, soybeans, wheat, potatoes, and cabbage. Drainage systems include open ditches and tile. The sandy underlying material causes ditchbank caving, and maintenance of ditches is difficult. Suitable outlets may not be available for drainage of some low areas. Land grading improves surface drainage by eliminating depressions in which water ponds.

This soil generally is not used for building site development, sanitary facilities, or recreation because of extreme wetness.

This Ballahack soil is in capability subclass IIIw (drained) or VIw (undrained). It is in woodland group 10W.

BH—Belhaven muck. This soil is nearly level and very poorly drained. It is in depressions and on broad flats on low marine terraces locally known as pocosins. This soil is in the Bay City and Light Ground Pocosins. The wooded areas are difficult to traverse because of water and dense vegetation. Therefore, observations of this soil in those places were not as detailed as those of other soils. However, the mapping was controlled well enough to make interpretations for the expected uses. The mapped areas are irregular in shape. Most of the acreage is in large areas that are generally more than 4,000 acres in size.

Typically, the surface layer is muck 28 inches thick. The upper 10 inches is granular black muck, and the lower 18 inches is massive, dark reddish brown muck. The underlying material to a depth of 80 inches is very dark brown mucky fine sandy loam, dark gray sandy clay loam, and dark greenish gray fine sandy loam.

Permeability is slow to moderately rapid. The organic horizons are extremely acid except where lime has been added. The underlying mineral horizons range from extremely acid to moderately alkaline. The water table is at or near the surface most of the time, and the soil is subject to frequent ponding for long periods except in drained areas. This soil is subject to rare flooding. Subsidence is a problem in drained areas.

Included with this soil in mapping are small areas of very poorly drained Dare and Wasda soils. The Dare soils are in the center of delineations, and the Wasda soils are near the edge. The included soils make up 15 to 25 percent of this map unit.

This Belhaven soil is used mainly as woodland. In a few areas, it is used as cropland.

In woodland areas, the vegetation on Belhaven soil occurs as "short pocosin" or "tall pocosin." The pattern of pocosin vegetation is determined by such factors as fire, depth of organic matter, length of periods of saturation, and nutrient availability. The "short pocosin" consists of a dense shrub thicket, 3 to 6 feet tall, that has very scattered, stunted pond pines. This vegetation is typically in the center of the pocosin over the deepest and most waterlogged organic matter. Common plants are titi, loblollybay, honey cup, fetterbush, bitter gallberry, large gallberry, huckleberry, redbay, sweetbay, blackgum, red chokeberry, greenbrier, sphagnum moss, Virginia chainfern, sundew, pitcher plant, bayberry, and sedges. The "tall pocosin" areas are mostly along the pocosin margin where organic accumulation is thinner. Nutrient availability is better because of greater circulation of ground water *(15)*, and plant growth is more vigorous than in the center of the pocosin, which has thicker organic deposits. The shrub layer reaches 10 to 12 feet, and pond pines, 25 to 55 feet tall, form a canopy of up to 75 percent. Loblolly bay, red maple, sweetbay, redbay, blackgum, sweetgum, and baldcypress are common trees. These wetland areas are important escape and cover habitat for a variety of wildlife *(9)*. Extreme wetness, low fertility, and possible ground fires after artificial drainage are major limitations for commercial woodland.

In cultivated areas, this soil has been intensively drained and is used mainly for corn (fig. 7), soybeans, and wheat. The drainage systems consist of open ditches and grading or "crowning" fields for surface drainage. Other problems are poor traffic supporting capacity, subsidence, buried wood, and possible ground fires after drainage. Subsidence exposes buried logs and woodland requires root raking every few years to permit the use of equipment. The organic material is highly reactive with many pesticides, which makes them ineffective or effective only at high rates.

This soil is not used for building site development, sanitary facilities, or recreation because of extreme wetness and the low strength of the organic material.

This Belhaven soil is in capability subclass IVw (drained) or VIIw (undrained). It is in woodland group 3W.

Bm—Brookman mucky loam, frequently flooded. This soil is nearly level and very poorly drained. It is on broad flats on low marine terraces beside marshes in the eastern part of the county in areas slightly higher than the adjacent marshes. The mapped areas are irregular in shape and range from 50 to 900 acres.

Typically, the surface layer is 14 inches thick. It is black mucky loam in the upper part and very dark gray clay loam in the lower part. The subsoil is gray clay to a depth of 52 inches. The underlying material to a depth of 64 inches is gray fine sandy loam and dark gray loamy fine sand.

Permeability of the subsoil is slow, and the shrink-swell potential is moderate. The soil ranges from very strongly acid to slightly acid in the surface layer and from very strongly acid to mildly alkaline in the subsoil and underlying material. The seasonal high water table is at or near the surface, and the soil is subject to frequent flooding with brackish water for long periods. The elevation is about 2 feet above sea level. Suitable outlets for artificial drainage are not available because of the low elevation.

Included with this soil in mapping are small areas of Hobucken soils in marshes and a few areas of Stockade

Figure 7.—This area of Belhaven muck has been drained and is used for corn. Buried wood, exposed in ditchbank, is a tillage problem on this soil.

soils that occur at random within the map unit with no apparent change in landscape. These soils are very poorly drained. The included soils make up about 20 to 30 percent of this map unit.

The native vegetation on this soil is adapted to wetness and some exposure to salt. The plant community reflects the transition from upland forests to salt marshes. Dominant plants are sawgrass, black needlerush, big cordgrass, eastern baccharis, waxmyrtle, redbay, and Atlantic white cedar. Scattered, stunted loblolly pine, pond pine, and red maple are also on this soil. Wetness, flooding, and exposure to salt prevent use of this soil for commercial woodland, cropland, building site development, sanitary facilities, and recreation.

This Brookman soil is in capability subclass VIw and in woodland group 3W.

Br—Brookman mucky silt loam. This soil is nearly level and very poorly drained. It is on flats and in depressions on low marine terraces. The largest areas of this soil are south of Stonewall and west of Hollyville. The mapped areas are irregular in shape and range from 10 to 3,000 acres.

Typically, the surface layer is black mucky silt loam 20 inches thick. The subsoil extends to a depth of 68 inches. It is dark grayish brown clay loam in the upper part, dark gray clay in the middle part, and light brownish gray clay loam in the lower part. The underlying material to a depth of 80 inches is dark greenish gray marly fine sandy loam.

Permeability of the subsoil is slow, and the shrink-swell potential is moderate. This soil ranges from very strongly acid to slightly acid in the surface layer except where lime has been added. The subsoil ranges from very strongly acid to mildly alkaline. The seasonal high water table is at or near the surface. Water ponds in depressions for brief to long periods except in areas that have been drained. This soil is subject to rare flooding.

Included with this soil in mapping are small areas of Argent, Stockade, and Wasda soils. The Argent soils are in slightly higher positions than Brookman soil. The Stockade and Wasda soils occur at random within the map unit with no apparent change in landscape. The Argent soils are poorly drained, and the Stockade and Wasda soils are very poorly drained. The included soils make up about 15 to 25 percent of this map unit.

This Brookman soil is used mainly as woodland. In a few areas, it is used as pasture or cropland.

In woodland areas, the dominant trees are blackgum, sweetgum, red maple, baldcypress, yellow-poplar, water oak, pond pine, willow oak, and swamp chestnut oak. Common understory plants are redbay, loblollybay, titi, sweet pepperbush, fetterbush, huckleberry, waxmyrtle, American holly, switchcane, blueberry, poison ivy, Virginia creeper, sweetbay, Virginia chainfern, sweetleaf, cinnamon fern, honeysuckle, and greenbrier. Some areas of this soil that have been ditched, bedded, and fertilized are planted to loblolly pine. Trees grow well on this soil, but wetness is a limitation to commercial woodland use and management. Logging when this soil is wet causes deep ruts, compaction, poor surface drainage, and lower productivity.

In cultivated areas, the soil has been intensively drained and is used for corn, soybeans, potatoes, and wheat. The drainage systems include open ditches and land grading for surface drainage. Tile is not used because of slow internal drainage. Common pasture forages include tall fescue and Ladino clover.

Brookman soil generally is not used for building site development, sanitary facilities, and recreation because of wetness and slow permeability. Other limitations are moderate shrink-swell potential, rare flooding, and the clayey subsoil.

This soil is in capability subclass IIIw (drained) or VIw (undrained). It is in woodland group 10W.

ByB—Baymeade sand, 1 to 6 percent slopes. This soil is well drained and is on gently undulating ridges on uplands. Most of the acreage is south and west of Arapahoe and west of Reelsboro. The mapped areas are irregular in shape and range from 5 to 100 acres.

Typically, the surface layer is dark gray sand 7 inches thick. The subsurface layer is sand. It extends to a depth of 30 inches and is light gray in the upper part, light gray and dark brown in the middle part, and pale yellow in the lower part. The subsoil extends to a depth of 50 inches. It is strong brown sandy loam in the upper part and reddish yellow loamy sand in the lower part. The underlying material to a depth of 80 inches is brownish yellow and very pale brown sand.

Permeability of the subsoil is moderately rapid, and the available water capacity is very low. The soil ranges from very strongly acid to slightly acid except where lime has been added. The seasonal high water table is 4 to 5 feet below the surface. Wind erosion is a hazard in areas unprotected by vegetation.

Included with this soil in mapping are small areas of Alpin, Tomahawk, and Leon soils. The Alpin and Tomahawk soils occur at random within the map unit with no apparent change in landscape. The Leon soils are in depressions. The Alpin soils are excessively drained, the Tomahawk soils are moderately well drained, and the Leon soils are poorly drained. Some areas of wet soils are shown on the map with a special symbol. These soils are in depressions smaller than 4 acres. The included soils make up about 10 to 15 percent of this map unit.

This Baymeade soil is used mainly as woodland. In a few areas, it is used as pasture or cropland.

In woodland areas, loblolly pine, longleaf pine, southern red oak, red maple, sweetgum, and post oak are dominant. Common understory plants are flowering dogwood, blackjack oak, sourwood, turkey oak, blueberry, Virginia creeper, bitter gallberry, waxmyrtle,

sassafras, grape, sweetbay, redbay, American beautyberry, and threeawn grass. The main limitation for woodland use and management is droughtiness.

In cultivated areas of this soil, the main crops grown are corn and soybeans. Droughtiness, leaching of plant nutrients, and wind erosion are major limitations. A common pasture forage is coastal bermudagrass.

Baymeade soil has no major limitations for building site development. Wetness and seepage are the main limitations for sanitary facilities. The sandy surface layer is a limitation for recreation use.

This Baymeade soil is in capability subclass IIIs and in woodland group 6S.

CnB—Conetoe loamy sand, 0 to 5 percent slopes. This soil is well drained and is on gently undulating ridges on low marine and stream terraces. The largest areas of this soil are in the western part of the county south of Lees Landing. The mapped areas are irregular in shape and range from 5 to 300 acres.

Typically, the surface layer is dark grayish brown loamy sand 4 inches thick. The subsurface layer is pale brown loamy sand to a depth of 36 inches. The subsoil is brownish yellow sandy loam to a depth of 51 inches. The underlying material to a depth of 80 inches is pale yellow loamy sand and light gray sand.

Permeability of the subsoil is moderately rapid, and the available water capacity is low. The soil ranges from very strongly acid to medium acid except where lime has been added. The seasonal high water table is below a depth of 6 feet. Low areas of this soil are subject to rare flooding. Wind erosion is a hazard in areas unprotected by vegetation.

Included with this soil in mapping are small areas of Charleston and Leon soils in slightly lower positions than Conetoe soil. The Charleston soils are moderately well drained, and the Leon soils are poorly drained. Some wet soils are shown on the map with a special symbol. The soils are in depressions smaller than 4 acres. Also included are a few small areas of a sandy soil that is somewhat excessively drained. This soil occurs at random within the map unit with no apparent change in landscape. The included soils make up about 10 to 15 percent of this map unit.

This Conetoe soil is used mainly as woodland. In a few areas, it is used as pasture or cropland.

In woodland areas, loblolly pine, longleaf pine, southern red oak, Shumard oak, hickory, southern sugar maple, red maple, sweetgum, white oak, and post oak are dominant. Common understory plants are flowering dogwood, sourwood, turkey oak, blueberry, bitter gallberry, Virginia creeper, waxmyrtle, sassafras, grape, sweetbay, redbay, American beautyberry, threeawn grass, and poison ivy. The main limitation for woodland use and management is droughtiness.

In cultivated areas of this soil, corn, tobacco, soybeans, and wheat are the major crops. Limitations are wind erosion, leaching of plant nutrients, and droughtiness. Blowing sand can damage young plants. A common pasture forage is coastal bermudagrass.

This soil generally does not have any major limitations for building site development. Low-lying areas of this soil, however, are subject to rare flooding. The flood hazard for specific sites needs to be determined before use and management are planned. Seepage is the main limitation for sanitary facilities. The sandy surface layer is a limitation for recreation use.

This Conetoe soil is in capability subclass IIs and in woodland group 8S.

CrB—Craven loam, 1 to 4 percent slopes. This soil is moderately well drained and is on low ridges and side slopes on uplands near drainageways. It is in the western part of the county north of Olympia, west of Reelsboro, and in the vicinity of Scott's Store. The mapped areas are irregular in shape and range from 5 to 300 acres.

Typically, the surface layer is brown loam 5 inches thick. The subsoil extends to a depth of 44 inches. It is brownish yellow clay in the upper part, brownish yellow clay that has light brownish gray mottles in the middle part, and light brownish gray sandy clay in the lower part. The underlying material to a depth of 80 inches is brownish yellow sandy clay loam and light brownish gray fine sandy loam.

Permeability of the subsoil is slow, and the shrink-swell potential is moderate. The available water capacity is moderate. This soil ranges from extremely acid to strongly acid except where lime has been added. The seasonal high water table is 2 to 3 feet below the surface. Erosion is a hazard in areas not protected by vegetation.

Included with this soil in mapping are small areas of Lenoir and Goldsboro soils. The Lenoir soils are in depressions, and the Goldsboro soils occur at random within the map unit with no apparent change in landscape. The Lenoir soils are somewhat poorly drained, and the Goldsboro soils are moderately well drained. Also included are small areas of Craven soils that are moderately well drained and eroded. Short, steep slopes and wet soils are shown on the map with special symbols. The areas of wet soils are smaller than 4 acres. The included soils make up about 10 to 20 percent of this map unit.

This Craven soil is used mainly as woodland. In a few areas, it is used as pasture or cropland.

In woodland areas, loblolly pine, red maple, water oak, sweetgum, yellow-poplar, blackgum, southern red oak, white oak, and post oak are dominant. Common understory plants are bitter gallberry, sourwood, flowering dogwood, American holly, waxmyrtle, Virginia creeper, redbay, sweetbay, blueberry, honeysuckle, sweet pepperbush, Carolina jessamine, and poison ivy.

Logging when this soil is wet causes compaction, deep ruts, poor surface drainage, and lower productivity.

In cultivated areas, the principal crops are corn, soybeans, tobacco, and wheat. Erosion is the main limitation, and eroded spots are in many of the more sloping areas. The surface layer is easily eroded unless protected by vegetation. Conservation practices that reduce erosion and add organic matter are needed. If this soil is tilled while wet, large clods form, resulting in a poor seedbed, runoff, and erosion. Common pasture forages include tall fescue and Ladino clover.

Slow permeability, seasonal wetness, moderate shrink-swell potential, and the clayey subsoil are the main limitations to the use of this soil for building site development, sanitary facilities, and recreation. Foundations need to be designed to resist cracking since the subsoil shrinks and swells during changes in moisture. Removal of vegetation at construction sites causes a severe erosion hazard. Erosion control practices need to be used. Seasonal wetness can be reduced with open ditches or grassed waterways. Tile is not used because of slow internal drainage.

This Craven soil is in capability subclass IIIe and in woodland group 8W.

Cs—Charleston loamy fine sand. This soil is nearly level and moderately well drained. It is in slightly convex areas on stream and low marine terraces mainly along the Bay River and the larger creeks in the central part of the county. The mapped areas are irregular in shape and range from 5 to 200 acres.

Typically, the surface layer is very dark gray loamy fine sand 7 inches thick. The subsurface layer is light yellowish brown loamy fine sand to a depth of 14 inches. The subsoil is fine sandy loam to a depth of 55 inches. It is brownish yellow in the upper part, light yellowish brown with light gray mottles in the middle part, and light gray in the lower part. The underlying material to a depth of 80 inches is gray loamy fine sand and greenish gray fine sand.

Permeability of the subsoil is moderate, and the available water capacity is moderate. The soil ranges from very strongly acid to medium acid in the surface layer and subsoil except where lime has been added. The underlying material ranges from very strongly acid to mildly alkaline. The seasonal high water table is 2.0 to 3.5 feet below the surface. Low areas of this soil are subject to rare flooding.

Included with this soil in mapping are small areas of Altavista, Conetoe, and Fork soils. The Altavista soils are moderately well drained and occur at random within the map unit with no apparent change in landscape. The Conetoe soils are well drained and are in slightly higher positions than Charleston soil. The Fork soils are somewhat poorly drained and are in depressions. Some areas of wet soils are shown on the map with a special symbol. These soils are in depressions smaller than 4 acres. The included soils make up about 10 to 15 percent of this map unit.

This Charleston soil is used mainly as cropland. In a few areas, it is used as pasture or woodland.

In cultivated areas of this soil, the major crops are corn, tobacco, soybeans, and wheat. Wetness is the main limitation. Artificial drainage may be needed, especially in areas where tobacco is grown. Drainage systems include the use of tile and open ditches. Common pasture forages include tall fescue, Ladino clover, and coastal bermudagrass.

In woodland areas, loblolly pine, longleaf pine, southern red oak, water oak, yellow-poplar, sweetgum, red maple, white oak, and blackgum are dominant. Common understory plants are flowering dogwood, redbay, sweetleaf, sourwood, sweetbay, bitter gallberry, greenbrier, sweet pepperbush, Virginia creeper, waxmyrtle, American holly, honeysuckle, poison ivy, blueberry, grape, and Carolina jessamine. This soil does not have major limitations for woodland use and management.

Seasonal wetness and rare flooding of low areas are the main limitations for building site development, sanitary facilities, and recreation use. Wetness can be reduced by a drainage system that includes land grading for surface drainage and the use of tile and open ditches. The flood hazard at specific sites needs to be determined before use and management are planned.

This Charleston soil is in capability subclass IIw and in woodland group 8W.

CT—Croatan muck. This soil is nearly level and very poorly drained. It is on broad flats and in depressions on uplands, locally known as pocosins, mainly in the pocosin north of Reelsboro. The areas are difficult to traverse because of water and dense vegetation, so observations of this soil were not as detailed as those of other soils. However, the mapping has been controlled well enough to make interpretations for the expected use. The mapped areas are irregular in shape and range from 35 to more than 700 acres.

Typically, the surface layer is black muck 25 inches thick. The upper part is granular, and the lower part is massive. The underlying mineral soil to a depth of 80 inches is very dark brown mucky fine sandy loam and gray sandy clay loam, loamy sand, and sandy loam.

Permeability is slow to moderately rapid. The organic horizons are extremely acid except where lime has been added. The underlying mineral horizons range from extremely acid to slightly acid. The water table is at or near the surface most of the time, and water frequently ponds for long periods except where the soil is artificially drained. This soil is subject to rare flooding. Subsidence is a problem in drained areas.

Included with this soil in mapping are small areas of Dare, Paxville, and Rutlege soils that are very poorly drained. The Rutlege and Paxville soils are near the

outer edge of delineations, and the Dare soils are in the center. The included soils make up about 15 to 25 percent of this map unit.

This Croatan soil is used mainly as woodland. In a few areas, it is used as cropland.

The vegetation on Croatan soil occurs as "short pocosin" or "tall pocosin." The pattern of pocosin vegetation is determined by such factors as fire, depth of organic matter, length of periods of saturation, and nutrient availability. The "short pocosin" consists of a dense shrub thicket, 3 to 6 feet tall, that has very scattered, stunted pond pines (fig. 8). This vegetation is typically in the center of the pocosin over the deepest and most waterlogged organic matter. Common plants are titi, loblollybay, honey cup, fetterbush, bitter gallberry, large gallberry, huckleberry, redbay, sweetbay, blackgum, red chokeberry, greenbrier, sphagnum moss, Virginia chainfern, sundew, pitcher plant, bayberry, and sedges. The "tall pocosin" areas are mostly along the pocosin margin where organic accumulation is thinner. Nutrient availability is better because of greater circulation of ground water *(15)*, and plant growth is more vigorous than in the center of the pocosin, which has thicker organic deposits. The shrub layer reaches 10 to 12 feet, and pond pines, 25 to 55 feet tall, form a canopy of up to 75 percent. Loblollybay, red maple, sweetbay, redbay, blackgum, sweetgum, and baldcypress are also common trees. These wetland areas are important escape and cover habitat for a variety of wildlife *(9)*. Extreme wetness, low fertility, and possible ground fires after artificial drainage are major limitations for commercial woodland.

Figure 8.—Short pocosin vegetation in an area of Croatan muck.

This soil can be used as cropland if it is intensively drained. Potential crops are corn, soybeans, and wheat. The drainage systems include open ditches and grading or "crowning" fields for surface drainage. Tile is not used because of moderately slow internal drainage. If this soil is drained, subsidence exposes buried logs and wood and requires root raking every few years to permit the use of equipment. Ground fires are also possible after drainage. The organic material is highly reactive with many pesticides, making them ineffective or effective only at high rates.

This soil is not used for building site development, sanitary facilities, or recreation because of extreme wetness and low strength of the organic material.

This Croatan soil is in capability subclass IVw (drained) or VIIw (undrained). It is in woodland group 6W.

DA—Dare muck. This soil is nearly level and very poorly drained. It is on broad flats and in depressions, locally known as pocosins, on uplands and low marine terraces. The largest areas of this soil are in Big Pocosin north of Reelsboro and in Light Ground Pocosin northeast of Arapahoe. The areas are difficult to traverse because of water and dense vegetation, so observations of this soil were not as detailed as those of other soils. However, the mapping has been controlled well enough to make interpretations for the expected uses. The mapped areas are irregular in shape and range from 25 to more than 4,000 acres.

Typically, the surface layer is muck 61 inches thick. The upper 12 inches is granular black muck, and the lower 49 inches is massive black and dark reddish brown muck. Buried stumps, logs, and wood fragments are common. The underlying mineral soil to a depth of 80 inches is dark reddish brown mucky sand and very dark grayish brown sand.

Permeability is slow. The organic horizons are extremely acid except where lime has been added. The underlying mineral horizons range from extremely acid to medium acid. Subsidence is a problem in drained areas. The water table is at or near the surface continuously, and the soil is subject to frequent ponding for long periods. This soil is also subject to rare flooding.

Included with this soil in mapping are small areas of Belhaven and Croatan soils that are very poorly drained. These thin, organic soils are near the outer edge of delineations. The included soils make up about 15 to 25 percent of this map unit.

This Dare soil is in native vegetation that is adapted to extreme wetness. The short pocosin vegetation consists of a dense shrub thicket 3 to 6 feet tall and has very scattered, stunted pond pines. Large trees do not exist on this waterlogged soil because of the very low availability of plant nutrients *(15)*. Common plants in the shrub thicket are titi, loblollybay, honey cup, fetterbush, bitter gallberry, large gallberry, huckleberry, redbay, sweetbay, blackgum, red chokeberry, greenbrier, sphagnum moss, Virginia chainfern, bayberry, sundew, pitcher plant, and sedges. These wetland areas are important habitat for a variety of wildlife *(9)*.

This soil is not used as cropland or for building site development, sanitary facilities, or recreation uses because of extreme wetness, subsidence, and low strength of the organic soil. If this soil is drained and cultivated, subsidence exposes buried logs and wood and requires root raking every few years to permit the use of equipment.

This Dare soil is in capability subclass VIIw and in woodland group 3W.

DgB—Dogue fine sandy loam, 1 to 4 percent slopes. This soil is moderately well drained and is in slightly convex areas on low marine and stream terraces near drainageways. This soil is mainly in the vicinity of Janeiro. The mapped areas are irregular in shape and range from 5 to 200 acres.

Typically, the surface layer is brown fine sandy loam 6 inches thick. The subsoil extends to a depth of 58 inches. It is brownish yellow sandy clay in the upper part, and in the middle part, it is brownish yellow and pale brown sandy clay that has gray and light brownish gray mottles. It is light brownish gray sandy clay loam in the lower part. The underlying material extends to a depth of 80 inches. In the upper part, it is brownish yellow fine sandy loam that has light gray mottles, and in the lower part, it is yellow loamy fine sand.

Permeability of the subsoil is moderately slow, and the available water capacity is moderate. The shrink-swell potential is moderate. This soil ranges from extremely acid to strongly acid except where lime has been added. The seasonal high water table is 2 to 3 feet below the surface. Low areas of this soil are subject to rare flooding.

Included with this soil in mapping are small areas of Altavista and Wahee soils. Altavista soils occur at random within the map unit with no apparent change in landscape. They are moderately well drained. The Wahee soils are in small depressions and are somewhat poorly drained. Some areas of a wet soil are shown on the map with a special symbol. This soil is in depressions smaller than 4 acres. The included soils make up about 10 to 20 percent of this map unit.

This Dogue soil is used mainly as cropland. In a few areas, it is used as pasture or woodland.

In cultivated areas of this soil, the principal crops are corn, soybeans, tobacco, and wheat. Erosion is a hazard, and conservation practices to reduce runoff and control erosion are needed. If this soil is tilled while wet, large clods form, resulting in a poor seedbed, runoff, and erosion. Common pasture forages include tall fescue and Ladino clover.

In woodland areas, loblolly pine, red maple, water oak, sweetgum, yellow-poplar, blackgum, southern red oak, white oak, and post oak are dominant. Common

understory plants are bitter gallberry, sourwood, flowering dogwood, American holly, waxmyrtle, Virginia creeper, redbay, sweetbay, blueberry, honeysuckle, sweet pepperbush, Carolina jessamine, and poison ivy. Logging when the soil is wet causes compaction, deep ruts, poor surface drainage, and lower productivity.

Moderately slow permeability, seasonal wetness, moderate shrink-swell potential, and the clayey subsoil are the main limitations to use of this soil for building site development, sanitary facilities, and recreation. Foundations need to be designed to resist cracking caused by the shrinking and swelling of the subsoil during changes in moisture. Removal of vegetation at construction sites causes a severe hazard of erosion, and erosion control practices need to be used. Seasonal wetness can be reduced with open ditches or grassed waterways. Tile is not used because of slow internal drainage. The flood hazard should be determined before use and management of specific areas are planned.

This Dogue soil is in capability subclass IIe and in woodland group 9W.

Fo—Fork loamy fine sand. This soil is nearly level and somewhat poorly drained. It is on flats and in depressions on low marine and stream terraces along the Neuse and Bay Rivers and the larger creeks in the central part of the county. The mapped areas are irregular in shape and range from 5 to 300 acres.

Typically, the surface layer is brown loamy fine sand 8 inches thick. The subsoil extends to a depth of 49 inches. In the upper part, it is brownish yellow sandy clay loam that has light brownish gray mottles; in the middle part, it is gray and light gray sandy clay loam; and in the lower part, it is light gray fine sandy loam. The underlying material to a depth of 80 inches is light gray and gray fine sandy loam and dark greenish gray fine sand.

Permeability of the subsoil is moderate, and the available water capacity is moderate. The soil is very strongly acid or strongly acid in the surface layer and upper part of the subsoil except where lime has been added. The lower part of the subsoil and the underlying material range from strongly acid to neutral. The seasonal high water table is 1 foot to 2 feet below the surface. Low areas of this soil are subject to rare flooding.

Included with this soil in mapping are small areas of Altavista, Charleston, Wahee, and Yonges soils. The Altavista soils are moderately well drained, and the Charleston soils are somewhat poorly drained. These soils are in slightly higher positions than Fork soil. The Wahee soils are somewhat poorly drained and occur at random within the map unit with no apparent change in landscape. The Yonges soils are in depressions and are poorly drained. The included soils make up about 15 to 20 percent of this map unit.

This Fork soil is used mainly as cropland. In a few areas, it is used as pasture or woodland.

In cultivated areas of this soil, corn, soybeans, tobacco, and wheat are the major crops. A small acreage is in potatoes and cabbage (fig. 9). Wetness is the main limitation. Drainage systems include tile and open ditches. Common pasture forages include tall fescue and Ladino clover.

In woodland areas, loblolly pine, longleaf pine, southern red oak, water oak, laurel oak, yellow-poplar, sweetgum, red maple, white oak, and blackgum are dominant. Common understory plants are redbay, sweetleaf, sweet pepperbush, waxmyrtle, American holly, Virginia creeper, honeysuckle, sweetbay, bitter gallberry, blueberry, greenbrier, switchcane, poison ivy, and Carolina jessamine. There are no major limitations for woodland use and management.

Seasonal wetness and rare flooding of low areas are the main limitations to the use of this soil for building site development, sanitary facilities, and recreation. Wetness can be reduced by a drainage system that includes land grading for surface drainage and the use of tile and open ditches. The flood hazard should be determined before the use and management of specific sites is planned.

This Fork soil is in capability subclass IIIw and in woodland group 9W.

GoA—Goldsboro loamy fine sand, 0 to 2 percent slopes. This soil is moderately well drained and is in slightly convex areas on uplands near drainageways. It is in the western part of the county in the vicinity of Olympia and west and north of Arapahoe. The mapped areas are irregular in shape and range from 5 to 300 acres.

Typically, the surface layer is dark grayish brown loamy fine sand 8 inches thick. The subsurface layer is light yellowish brown loamy fine sand to a depth of 11 inches. The subsoil is sandy clay loam. It extends to a depth of 65 inches. In the upper part, it is brownish yellow sandy clay loam; in the middle part, it is brownish yellow sandy clay loam that has light gray mottles; and in the lower part, it is light gray sandy clay loam. The underlying material to a depth of 80 inches is light gray sandy clay loam.

Permeability of the subsoil is moderate, and the available water capacity is moderate. The soil is very strongly acid or strongly acid except where lime has been added. The seasonal high water table is 2 to 3 feet below the surface.

Included with this soil in mapping are small areas of Norfolk, Craven, and Lynchburg soils. The Norfolk soils are well drained and are in slightly higher positions than Goldsboro soil, or they are closer to drainageways. The Lynchburg soils are somewhat poorly drained and are in depressions. The moderately well drained Craven soils and a soil similar to Goldsboro soil except that it has sandy layers 4 to 5 feet below the surface occur at random within the map unit with no apparent change in landscape. Some areas of wet soils are shown on the

Figure 9.—This area of Fork loamy fine sand is drained and used to grow cabbage.

map with a special symbol. These soils are in depressions smaller than 4 acres. The included soils make up about 15 to 25 percent of this map unit.

This Goldsboro soil is used mainly as cropland. In a few areas, it is used as pasture or woodland.

In cultivated areas of this soil, the major crops are corn, tobacco, soybeans, and wheat. Wetness is the main limitation. Drainage systems, including tile and open ditches, may be needed, especially in areas where tobacco is grown. Common pasture forages include tall fescue, Ladino clover, and coastal bermudagrass.

In woodland areas, loblolly pine, longleaf pine, southern red oak, water oak, white oak, yellow-poplar, sweetgum, red maple, and blackgum are dominant. Common understory plants are flowering dogwood, redbay, Virginia creeper, sweetleaf, sweet pepperbush, waxmyrtle, American holly, sweetbay, bitter gallberry, greenbrier, honeysuckle, poison ivy, blueberry, grape, and Carolina jessamine. There are no major limitations for woodland use and management.

Seasonal wetness is the main limitation to the use of this soil for building site development, sanitary facilities, and recreation. Wetness can be reduced by a drainage system that includes land grading for surface drainage and the use of tile and open ditches.

This Goldsboro soil is in capability subclass IIw and in woodland group 9W.

HN—Hobucken muck, frequently flooded. This soil is nearly level and very poorly drained. It is in marshes adjacent to rivers, creeks, sounds, and bays. The largest areas of this soil are on the south side of Bay River to Pamlico Sound. Access is limited in many places because of water, so observations of this soil were not as detailed as those of other soils. However, the mapping was controlled well enough to make

interpretations for the expected uses. The mapped areas are irregular in shape and range from 4 to 2,000 acres.

Typically, the surface layer is 16 inches thick. The upper part is black muck, and the lower part is black mucky fine sandy loam. The underlying material to a depth of 80 inches is dark gray and gray fine sandy loam in the upper part and greenish gray loamy fine sand in the lower part.

This soil ranges from slightly acid to moderately alkaline. The water table is at or near the surface most of the time, and the soil is subject to frequent flooding for very brief periods. The salt concentration ranges from 5 to 25 parts per thousand. Elevation is less than 2 feet above sea level.

Included with this soil in mapping are some areas of the Lafitte soils in marshes and a few small areas of the Arapahoe, Brookman, Stockade, and Wasda soils on low marine and stream terraces. All of these soils are very poorly drained. The included soils make up about 15 to 25 percent of this map unit.

Hobucken soil is in native vegetation that is adapted to extreme wetness, flooding, and exposure to salt (fig. 10). This soil is not used as cropland, woodland, building site development, sanitary facilities, or recreation. Common plants are black needlerush, big cordgrass, sawgrass, saltgrass, eastern baccharis, seashore mallow, smooth cordgrass, marshhay cordgrass, saltmarsh bulrush, glasswort, marshelder, Atlantic white cedar, and saltwort. These marshland areas are an important part of the coastal ecology. The marsh plants contribute nutrients to the estuaries benefiting fish and shellfish and provide habitat for wetland wildlife.

This Hobucken soil is in capability subclass VIIw. It has not been assigned to a woodland group.

La—Leaf silt loam. This soil is nearly level and poorly drained. It is on broad flats and in depressions on uplands in the western part of the county north of Olympia, south and west of Grantsboro, and in the vicinity of Scott's Store. The mapped areas are irregular in shape and range from 5 to 3,000 acres.

Typically, the surface layer is very dark gray silt loam 6 inches thick. The subsoil extends to a depth of 72 inches. It is gray clay in the upper and middle parts and gray sandy clay in the lower part. The underlying material to a depth of 80 inches is greenish gray fine sandy loam.

Permeability of the subsoil is very slow, and the shrink-swell potential is high. The soil ranges from extremely acid to strongly acid except where lime has been added. The seasonal high water table is 0.5 foot to 1.5 feet below the surface. Water ponds in depressions for brief to long periods except where a drainage system is installed.

Included with this soil in mapping are small areas of Lenoir and Rains soils. The Lenoir soils are somewhat poorly drained and are in slightly higher positions than Leaf soil. The poorly drained Rains soil and a soil that is similar to Leaf soil except that it has a loamy or sandy layer 40 to 60 inches below the surface occur at random within the map unit with no apparent change in landscape. In a few areas, clayey soils that are very poorly drained are in depressions. The included soils make up about 15 to 25 percent of this map unit.

This Leaf soil is used mainly as woodland. In a few areas, it is used as pasture or cropland.

In woodland areas of this soil, loblolly pine, pond pine, blackgum, sweetgum, water oak, swamp chestnut oak, yellow-poplar, red maple, and willow oak are dominant. Hardwoods are dominant in depressions in which water ponds for long periods. Common understory plants are redbay, sweetbay, American holly, switchcane, sweet pepperbush, greenbrier, grape, huckleberry, waxmyrtle, bitter gallberry, large gallberry, fetterbush, honeysuckle, blueberry, poison ivy, sweetleaf, Virginia chainfern, Virginia creeper, cinnamon fern, and Carolina jessamine. Wetness is the main limitation for woodland use and management. Logging when the soil is wet causes compaction, deep ruts, poor surface drainage, and lower productivity (fig. 11). Areas managed for loblolly pine are ditched and bedded. Fertilizer is used in many plantations.

In cultivated areas, corn, soybeans, and wheat are the main crops. Wetness is a major limitation. Tile is not effective because the very slowly permeable subsoil limits internal drainage. Open ditches and land grading for surface drainage are used. If the soil is tilled when wet, soil structure is destroyed and large clods form, resulting in ponding and a poor seed bed. Common pasture forages include tall fescue and Ladino clover.

Seasonal wetness, ponding in depressions, very slow permeability, high shrink-swell potential, and the clayey subsoil are major limitations to the use of this soil for building site development, sanitary facilities, and recreation. Wetness can be reduced somewhat with an intensive drainage system. However, inadequate results from artificial drainage have limited development. Foundations must be designed to resist cracking caused by shrinking and swelling of the subsoil during changes in moisture.

This Leaf soil is in capability subclass IVw (drained) or VIw (undrained). It is in woodland group 9W.

Le—Lenoir silt loam. This soil is nearly level and somewhat poorly drained. It is on flats and in depressions on uplands in the western part of the county in areas north of Olympia, south and west of Grantsboro, and in the vicinity of Scott's Store. The mapped areas are irregular in shape and range from 5 to 200 acres.

Typically, the surface layer is very dark gray silt loam 4 inches thick. The subsurface layer is pale brown silt loam to a depth of 7 inches. The subsoil extends to a depth of 67 inches. In the upper part, it is yellowish brown clay that has light brownish gray mottles. It is light brownish gray clay and sandy clay in the middle and lower parts.

Figure 10.—Marsh vegetation in an area of Hobucken muck, frequently flooded.

The underlying material to a depth of 80 inches is light brownish gray sandy clay loam.

Permeability of the subsoil is slow, and the available water capacity is moderate. The shrink-swell potential is moderate. The soil ranges from extremely acid to strongly acid except where lime has been added. The seasonal high water table is 1 foot to 2 feet below the surface.

Included with this soil in mapping are small areas of Craven, Leaf, and Lynchburg soils. The Craven soils are moderately well drained and are in slightly higher positions than Lenoir soil. The Leaf soils are poorly drained and are in depressions. The somewhat poorly drained Lynchburg soils and some areas of a soil that is similar to Lenoir soil except that it has loamy and sandy layers 40 to 60 inches below the surface occur at random within the map unit with no apparent change in landscape. The included soils make up about 15 to 25 percent of this map unit.

This Lenoir soil is used mainly as woodland. In a few areas, it is used as pasture or cropland.

Figure 11.—Timber harvest when the soil was wet caused poor surface drainage and compaction and lowered productivity in this area of Leaf silt loam.

In woodland areas of this soil, the dominant trees are loblolly pine, red maple, sweetgum, water oak, yellow-poplar, southern red oak, blackgum, white oak, and swamp chestnut oak. Common understory plants are bitter gallberry, sourwood, flowering dogwood, American holly, waxmyrtle, blueberry, honeysuckle, sweet pepperbush, Carolina jessamine, poison ivy, switchcane, Virginia creeper, sweetleaf, redbay, sweetbay, and greenbrier. Wetness is the main limitation for commercial woodland. Logging when the soil is wet causes compaction, deep ruts, poor surface drainage, and lower productivity.

In cultivated areas, the major crops are corn, soybeans, tobacco, and wheat. Wetness is the main limitation. Tile generally is not used because the slowly permeable subsoil limits internal drainage. Open ditches and land grading for surface drainage are used. If the soil is tilled when wet, soil structure is destroyed and large clods form, resulting in ponding and a poor seed

bed. common pasture forages include tall fescue and Ladino clover.

Seasonal wetness, slow permeability, moderate shrink-swell potential, and the clayey subsoil are the major limitations to use of this soil for building site development, sanitary facilities, and recreation. Wetness can be reduced somewhat with a drainage system that includes open ditches and land grading for surface drainage. Foundations should be designed to resist cracking caused by shrinking and swelling of the subsoil during changes in moisture.

This Lenoir soil is in capability subclass IIIw and in woodland group 9W.

LF—Lafitte muck, frequently flooded. This soil is nearly level and very poorly drained. It is in marshes adjacent to sounds, bays, rivers, and creeks. The largest areas of this soil are in the northeastern part of the county. Access is limited in many places because of water, so observations of this soil were not as detailed as those of other soils. However, the mapping was controlled well enough to make interpretations for the expected uses. The mapped areas are long and have variable widths, or they are very broad and irregular in shape. They range from 4 to more than 2,000 acres.

Typically, the soil is black muck 80 inches thick.

This soil ranges from slightly acid to moderately alkaline. The water table is at or near the surface continuously, and the soil is subject to frequent flooding for brief to very long periods. The salt concentration generally ranges from 5 to 25 parts per thousand. Elevation is less than 2 feet above sea level. Subsidence would be a problem if this soil were drained.

Included with this soil in mapping are some areas of a soil that is similar to Lafitte soil except it has an organic layer that is less than 51 inches thick. Also included are small areas of Hobucken soils that are very poorly drained and are adjacent to uplands and low marine terraces and a few areas of the very poorly drained Stockade, Brookman, Wasda, and Arapahoe soils in small, slightly higher positions than Lafitte soil. The included soils make up about 20 to 30 percent of this map unit.

This Lafitte soil is in native vegetation adapted to long periods of wetness, flooding, and exposure to salt. It is not used as cropland, woodland, or for building site development, sanitary facilities, or recreation. Common plants are big cordgrass, sawgrass, seashore mallow, saltgrass, smooth cordgrass, black needlerush, and eastern baccharis. These marshland areas are an important part of the ecology of the estuarine system. The marsh plants contribute nutrients to the estuary benefiting fish and shellfish and provide habitat for wetland wildlife.

This Lafitte soil is in capability subclass VIIIw. It has not been assigned to a woodland group.

Ln—Leon sand. This soil is nearly level to gently sloping and is poorly drained. It is on ridges and flats and in depressions on uplands and stream terraces. The largest areas of this soil are on the Minnesott Ridge along North Carolina Highway 306. The mapped areas are irregular in shape and range from 5 to more than 2,000 acres.

Typically, the surface layer is black sand 7 inches thick. The subsurface layer is light gray sand to a depth of 15 inches. The subsoil, to a depth of 55 inches, is black and very dark brown weakly cemented and brittle sand. It is loose dark brown sand to a depth of 80 inches.

Permeability is rapid in the surface layer and subsurface layer and moderate to moderately rapid in the subsoil. The available water capacity is low. The soil ranges from extremely acid to strongly acid. The seasonal high water table is commonly within 1 foot of the surface from November to April.

Included with this soil in mapping are small areas of Baymeade, Rutlege, and Tomahawk soils. The Baymeade soils are well drained and are on ridges, and the Rutlege soils are very poorly drained and are in depressions. The moderately well drained Tomahawk soil, a soil that is similar to Leon soil except that it has a weekly cemented subsoil 30 to 50 inches below the surface, and a soil that is similar except that it has loamy material within a depth of 80 inches occur at random within the mapped areas with no apparent change in landscape. The included soils make up 10 to 15 percent of this map unit.

This Leon soil is used mainly as woodland. It generally is not used as cropland because of wetness during winter and spring, droughtiness in summer, the weakly cemented subsoil, and leaching of plant nutrients. In a few areas, this soil is used for pasture forages, such as coastal bermudagrass.

In woodland areas of this soil, the dominant trees are longleaf pine and pond pine. Scattered water oak, blackgum, and red maple are also on this soil. Common understory plants are threeawn grass, blueberry, huckleberry, brackenfern, bitter gallberry, large gallberry, fetterbush, waxmyrtle, sassafras, turkey oak, redbay, and sweetbay. Wetness during winter months limits woodland use and management. However, this soil is droughty during the growing season.

Seasonal wetness is the main limitation to use of this soil for building site development, sanitary facilities, and recreation. A drainage system reduces wetness, but the weakly cemented subsoil interferes with the performance of the system. Caving of ditchbanks is a maintenance problem. Droughtiness in the summer is a limitation for lawns and shrubs.

This Leon soil is in capability subclass IVw and in woodland group 4W.

Ly—Lynchburg fine sandy loam. This soil is nearly level and somewhat poorly drained. It is on flats and in depressions on uplands in the western part of the county in the vicinity of Olympia and west and north of Arapahoe. The mapped areas are irregular in shape and range from 5 to 150 acres.

Typically, the surface layer is dark grayish brown fine sandy loam 8 inches thick. The subsoil extends to a depth of 65 inches. In the upper part, it is light yellowish brown sandy clay loam that has light brownish gray mottles. It is gray sandy clay loam in the middle part and gray fine sandy loam in the lower part. The underlying material to a depth of 80 inches is gray sandy loam.

Permeability of the subsoil is moderate, and the available water capacity is moderate. The soil ranges from extremely acid to strongly acid except where lime has been added. The seasonal high water table is 1 foot to 1.5 feet below the surface.

Included with this soil in mapping are small areas of Goldsboro, Lenoir, and Rains soils. The Goldsboro soils are moderately well drained and are in slightly higher positions than Lynchburg soil. The somewhat poorly drained Lenoir soils and some areas of a soil that is similar to Lynchburg soil except that it has a sandy layer 4 to 5 feet below the surface occur at random within the map unit with no apparent change in landscape. The Rains soils are poorly drained and are in depressions. The included soils make up 15 to 25 percent of this map unit.

This Lynchburg soil is used mainly as cropland. In a few small areas, it is used as pasture or woodland.

In cultivated areas of this soil, the principal crops are corn, soybeans, tobacco, and wheat. Wetness is the main limitation. Drainage systems include tile and open ditches. Common pasture forages include tall fescue and Ladino clover.

In woodland areas, the dominant trees are loblolly pine, red maple, sweetgum, water oak, yellow-poplar, southern red oak, blackgum, white oak, and swamp chestnut oak. Common understory plants are bitter gallberry, sourwood, flowering dogwood, American holly, waxmyrtle, blueberry, honeysuckle, Virginia creeper, grape, sweet pepperbush, Carolina jessamine, poison ivy, switchcane, sweetleaf, redbay, sweetbay, and greenbrier. This soil has no major limitation for woodland use and management.

Seasonal wetness is a major limitation to the use of this soil for building site development, sanitary facilities, and recreation. Wetness can be reduced by a drainage system that includes land grading for surface drainage and the use of tile and open ditches.

This Lynchburg soil is in capability subclass IIw and in woodland group 9W.

MA—Masontown loam, frequently flooded. This soil is nearly level and very poorly drained. It is on flood plains along streams in the western part of the county. The mapped areas are difficult to traverse because of water and dense vegetation, so observations of this soil are not as detailed as those of other soils. However, the mapping was controlled well enough to make interpretations for the expected uses. The mapped areas are long and have variable widths, and they range from 10 to more than 1,000 acres.

Typically, the surface layer is 42 inches thick. It is black loam in the upper part, very dark gray fine sandy loam in the middle part, and very dark gray sandy loam in the lower part. The underlying material to a depth of 60 inches is grayish brown loamy sand.

This soil ranges from medium acid to mildly alkaline. The seasonal high water table is at or near the surface. This soil is subject to frequent, long flooding.

Included with this soil in mapping are some Hobucken, Ballahack, Arapahoe, Stockade, and Yonges soils. The Hobucken soils are in small areas of marsh. The Arapahoe, Ballahack, Stockade, and Yonges soils are on slightly higher stream terraces than the Masontown soil. These soils are poorly drained. The included soils make up about 20 to 30 percent of this map unit.

This Masontown soil is used mainly as native woodland (fig. 12). The dominant trees are baldcypress, blackgum, green ash, swamp tupelo, water tupelo, sweetgum, red maple, willow oak, water oak, American elm, and swamp chestnut oak. Common understory plants are Virginia willow, redbay, poison ivy, greenbrier, lizard's tail, black willow, arrowhead, American hornbeam, American holly, sedges, climbing hydrangea, Alabama supplejack, netted chainfern, Pennsylvania smartweed, cattail, royal fern, and cinnamon fern. These wetland areas produce large amounts of food for wildlife and support a wide variety of animals *(9)*. Tree growth is excellent. However, because of wetness and flooding, management of this soil for timber production is difficult.

This soil is generally not used as cropland or for building site development, sanitary facilities, or recreation. Wetness and flooding are the main limitations.

This Masontown soil is in capability subclass VIIw and in woodland group 12W.

NoA—Norfolk loamy fine sand, 0 to 2 percent slopes. This soil is well drained and is in slightly convex areas on uplands near drainageways. It is in the western part of the county in the vicinity of Olympia and north and west of Arapahoe. The mapped areas are irregular in shape and range from 5 to 100 acres.

Typically, the surface layer is grayish brown loamy fine sand 7 inches thick. The subsurface layer is light

Figure 12.—Native vegetation in an area of Masontown loam, frequently flooded.

yellowish brown loamy fine sand to a depth of 13 inches. The subsoil extends to a depth of 62 inches. It is strong brown sandy clay loam in the upper part and reddish yellow fine sandy loam in the lower part. The underlying material to a depth of 80 inches is brownish yellow loamy fine sand.

Permeability is moderate, and the available water capacity is moderate. The soil is very strongly acid or strongly acid except where lime has been added. The seasonal high water table is 4 to 6 feet below the surface.

Included with this soil in mapping are small areas of Goldsboro and Tomahawk soils. The Goldsboro soils are moderately well drained. They are in slightly lower positions than Norfolk soil. The Tomahawk soils are well drained. They are in slightly higher positions or near

drainageways. Also included at random with no apparent change in landscape is a soil similar to Norfolk soil except that it has a sandy layer 4 to 5 feet below the surface. Some areas of a wet soil are shown on the map with a special symbol. This soil is in depressions smaller than 4 acres. The included soils make up about 10 to 20 percent of this map unit.

This Norfolk soil is used mainly as cropland. In a few small areas, it is used as pasture or woodland.

In cultivated areas of this soil, the main crops are tobacco (fig. 13), corn, soybeans, and wheat. There are no major limitations for cropland use. Common pasture forages include tall fescue, Ladino clover, and coastal bermudagrass.

In woodland areas, loblolly pine, longleaf pine, southern red oak, Shumard oak, hickory, yellow-poplar, blackgum, red maple, sweetgum, white oak, water oak, and post oak are dominant. Common understory plants are flowering dogwood, sourwood, sweetbay, American holly, Carolina jessamine, waxmyrtle, Virginia creeper, redbay, poison ivy, blueberry, grape, partridgeberry, and bitter gallberry. This soil has no major limitations for woodland use and management.

This soil has no major limitations for building site development and recreation use. Wetness and seepage can restrict the use for sanitary facilities.

This Norfolk soil is in capability class I and in woodland group 9A.

Figure 13.—Tobacco in an area of Norfolk loamy fine sand, 0 to 2 percent slopes. This soil is well suited to use as cropland.

NoB—Norfolk loamy fine sand, 2 to 6 percent slopes. This soil is well drained and is on low ridges and side slopes on uplands near drainageways. It is in the western part of the county in the vicinity of Olympia and north and west of Arapahoe. The mapped areas are irregular in shape and range from 5 to 200 acres.

Typically, the surface layer is grayish brown loamy fine sand 7 inches thick. The subsurface layer is light yellowish brown loamy fine sand to a depth of 13 inches. The subsoil extends to a depth of 62 inches. It is strong brown sandy clay loam in the upper part and reddish yellow fine sandy loam in the lower part. The underlying material to a depth of 80 inches is brownish yellow loamy fine sand.

Permeability of the subsoil is moderate, and the available water capacity is moderate. The soil is very strongly acid or strongly acid except where lime has been added. Erosion is a moderate hazard in areas not protected by vegetation. The seasonal high water table is 4 to 6 feet below the surface.

Included with this soil in mapping are small areas of Baymeade, Craven, and Tomahawk soils. The droughty Baymeade soils are in slightly higher positions than Norfolk soil, or they are near drainageways. The moderately well drained Craven and Tomahawk soils, a few areas of nearly level Norfolk soils, and soils similar to Norfolk soil except they have a sandy layer 4 to 5 feet below the surface occur at random within the map unit with no apparent change in landscape. Some small areas of Norfolk soils that are moderately eroded are in the more sloping parts of this map unit. Areas of wet soils and areas on short, steep slopes beside drainageways are shown on the map with special symbols. The wet soils are in depressions smaller than 4 acres. The included soils make up about 15 to 30 percent of this map unit.

This Norfolk soil is used mainly as cropland. In a few areas, it is used as pasture or woodland.

In cultivated areas of this soil, tobacco, corn, soybeans, and wheat are the major crops. Slope, surface runoff, and susceptibility to erosion are the main limitations. Conservation practices to reduce erosion are needed. Common pasture forages include tall fescue, Ladino clover, and coastal bermudagrass.

In woodland areas, loblolly pine, longleaf pine, southern red oak, Shumard oak, hickory, American beech, yellow-poplar, red maple, blackgum, sweetgum, laurel oak, white oak, post oak, and water oak are dominant. Common understory plants are flowering dogwood, sourwood, sweetbay, Carolina jessamine, waxmyrtle, redbay, poison ivy, blueberry, grape, partridgeberry, American holly, Virginia creeper, and bitter gallberry. There are no major limitations for woodland use and management.

This soil has no major limitations for building site development and most recreation uses. Wetness and seepage are the main limitations for sanitary facilities.

This Norfolk soil is in capability subclass IIe and in woodland group 9A.

Pa—Paxville mucky fine sandy loam. This soil is nearly level and very poorly drained. It is on broad flats and in depressions on uplands. The larger areas of this soil are north of Reelsboro. The mapped areas are irregular in shape and range from 10 to more than 2,000 acres.

Typically, the surface layer is black mucky fine sandy loam and very dark gray fine sandy loam 15 inches thick. The subsoil extends to a depth of 52 inches. It is grayish brown sandy clay loam in the upper and middle parts and grayish brown fine sandy loam in the lower part. The underlying material to a depth of 80 inches is light brownish gray loamy fine sand and dark greenish gray sand.

Permeability of the subsoil is moderate. The soil ranges from extremely acid to strongly acid except where lime has been added. The seasonal high water table is at or near the surface. Water ponds in depressions for brief to long periods unless a drainage system has been installed.

Included with this soil in mapping are small areas of the Croatan, Rains, and Rutlege soils. The Croatan soils are in depressions and are very poorly drained. The Rains soils are in slightly higher areas and are poorly drained. The Rutlege soils occur at random within the map unit with no apparent change in landscape. They are very poorly drained. The included soils make up about 10 to 20 percent of this map unit.

This Paxville soil is used mainly as woodland. In a few areas, it is used as pasture or cropland.

In woodland areas of this soil, the dominant trees are loblolly pine, pond pine, water oak, willow oak, swamp chestnut oak, red maple, blackgum, yellow-poplar, and sweetgum. Hardwoods are dominant in depressions where water ponds for long periods. Common understory plants are redbay, loblollybay, fetterbush, titi, huckleberry, blueberry, sweet pepperbush, Virginia creeper, grape, switchcane, waxmyrtle, bitter gallberry, large gallberry, sweetleaf, sweetbay, bayberry, greenbrier, honeysuckle, poison ivy, American holly, Virginia chainfern, and cinnamon fern. Trees grow well on this soil; however, wetness causes seedling mortality and interferes with harvest operations. Soils managed for loblolly pine are generally ditched and bedded. Fertilizer is used in many plantations.

In cultivated areas, the main crops are corn, soybeans, and wheat. Wetness is the major limitation. Drainage systems include land grading for surface drainage and the use of tile and open ditches. Suitable drainage outlets can be difficult to develop in depressions. Common pasture forages include tall fescue and Ladino clover.

Seasonal wetness and ponding are major limitations to the use of this soil for building site development, sanitary

facilities, and recreation. An intensive drainage system is needed.

This Paxville soil is in capability subclass IIIw (drained) or VIw (undrained). It is in woodland group 10W.

Ra—Rains fine sandy loam. This soil is nearly level and poorly drained. It is on broad flats and in depressions on uplands in the western part of the county in the vicinity of Olympia, and west and north of Arapahoe. The mapped areas are irregular in shape and range from 5 to more than 150 acres.

Typically, the surface layer is black fine sandy loam 7 inches thick. The subsurface layer is light brownish gray fine sandy loam to a depth of 12 inches. The subsoil extends to a depth of 64 inches. It is gray fine sandy loam in the upper part, gray sandy clay loam in the middle part, and light brownish gray fine sandy loam in the lower part. The underlying material to a depth of 80 inches is gray loamy fine sand.

Permeability of the subsoil is moderate. This soil ranges from extremely acid to strongly acid except where lime has been added. The seasonal high water table is within 1 foot of the surface. Water ponds in depressions for brief periods except where a drainage system has been installed.

Included with this soil in mapping are small areas of Lynchburg, Paxville, and Leaf soils. The Lynchburg soils are in slightly higher areas than Rains soil and are somewhat poorly drained. The Paxville soils are in depressions and are very poorly drained. The Leaf soils occur at random within the map unit with no apparent change in landscape. They are poorly drained. Also included are some areas of a soil that is similar to Rains soil except it has a sandy layer 4 to 5 feet below the surface. The included soils make up about 15 to 25 percent of this map unit.

This Rains soil is used mainly as woodland. In a few areas, it is used as pasture or cropland.

In woodland areas of this soil, the dominant trees are loblolly pine, pond pine, red maple, sweetgum, yellow-poplar, blackgum, water oak, swamp chestnut oak, and willow oak. Important understory plants are bitter gallberry, large gallberry, fetterbush, switchcane, sweet pepperbush, greenbrier, sweetleaf, American holly, blueberry, huckleberry, sweetbay, redbay, waxmyrtle, honeysuckle, poison ivy, Virginia creeper, Virginia chainfern, cinnamon fern, and Carolina jessamine. Wetness is the main limitation for woodland use and management. Soils managed for loblolly pine benefit from ditching and bedding. Fertilizer is used in many plantations.

In cultivated areas, the principal crops are corn, soybeans, and wheat. Wetness is the main limitation. Drainage systems include land grading for surface drainage, open ditches, and tile. Common pasture forages include tall fescue and Ladino clover.

Seasonal wetness is a major limitation to the use of this soil for building site development, sanitary facilities, and recreation. However, some areas of this soil have been drained and then developed.

This Rains soil is in capability subclass IIIw and in woodland group 10W.

Ru—Rutlege mucky loamy fine sand. This soil is nearly level and very poorly drained. It is in depressions on uplands mainly on the west side of the Minnesott Ridge along North Carolina Highway 306. The mapped areas are irregular in shape and range from 10 to 500 acres.

Typically, the surface layer is black mucky loamy fine sand 20 inches thick. The underlying material to a depth of 80 inches is dark grayish brown loamy fine sand and light brownish gray sand.

Permeability is rapid. The soil is extremely acid or very strongly acid. The water table is at or near the surface most of the time, and the soil ponds frequently for brief to long periods.

Included with this soil in mapping are small areas of Leon and Paxville soils. The Leon soils are in higher areas than Rutlege soil and are poorly drained. The Paxville soils are in the lowest parts of depressions and are very poorly drained. Some areas of a soil that is similar to Rutlege soil except it has a weakly cemented subsoil occur at random within the map unit with no apparent change in landscape. The included soils make up about 15 to 20 percent of this map unit.

This Rutlege soil is used mainly for native trees that are adapted to extreme wetness, such as pond pine, loblolly pine, red maple, blackgum, and sweetgum. Common understory plants are loblollybay, honey cup, fetterbush, waxmyrtle, blueberry, bitter gallberry, large gallberry, huckleberry, redbay, sweetbay, titi, red chokeberry, greenbrier, sphagnum moss, Virginia chainfern, and sedges. Wetness is a major limitation for woodland use and management.

Rutlege soil generally is not used as cropland or for building site development, sanitary facilities, and recreation because of extreme wetness.

This Rutlege soil is in capability subclass VIw and in woodland group 9W.

Sk—Stockade loamy fine sand. This soil is nearly level and very poorly drained. It is on broad flats and in depressions on low marine and stream terraces. Some of the larger areas of this soil are north of North Carolina Highway 304 and south of Alliance, south and east of Merritt, and on Goose Creek Island. The mapped areas are irregular in shape and range from 5 to 2,000 acres.

Typically, the surface layer is black and very dark grayish brown loamy fine sand about 19 inches thick. The subsoil extends to a depth of 54 inches. It is light brownish gray sandy clay loam in the upper part, gray sandy clay loam in the middle part, and grayish brown

fine sandy loam in the lower part. The underlying material to a depth of 80 inches is gray loamy fine sand and dark greenish gray marly fine sand.

Permeability of the subsoil is moderate. The soil ranges from very strongly acid to slightly acid in the surface layer unless lime is added. The subsoil and underlying material range from very strongly acid to moderately alkaline. The seasonal high water table is at or near the surface. Low areas of this soil are subject to rare flooding. Water ponds in depressions for brief to long periods except where a drainage system is installed.

Included with this soil in mapping are small areas of Arapahoe, Brookman, Wasda, and Yonges soils. The Arapahoe soils are very poorly drained, and the Brookman soils occur at random within the map unit with no apparent change in landscape. The Wasda soils are in depressions and are very poorly drained. They have an organic surface layer. The Yonges soils are in slightly higher positions than Stockade soil and are poorly drained. Also included at random with no apparent change in landscape is a soil that is similar to Stockade soil except that it is more acid or contains more silt. The included soils make up about 10 to 20 percent of this map unit.

This Stockade soil is used mainly as woodland. In a few areas, it is used as pasture or cropland.

In woodland areas, the dominant trees are loblolly pine, pond pine, water oak, willow oak, swamp chestnut oak, red maple, blackgum, yellow-poplar, sweetgum, and baldcypress. Hardwoods are dominant in depressions where water ponds for long periods. Common understory plants are redbay, sweet pepperbush, loblollybay, American holly, sweetbay, bitter gallberry, large gallberry, fetterbush, switchcane, huckleberry, waxmyrtle, blueberry, Virginia chainfern, cinnamon fern, poison ivy, sweetleaf, Virginia creeper, honeysuckle, titi, and greenbrier. Wetness increases seedling mortality and restricts harvest operations. Areas of this soil managed for loblolly pine are commonly ditched and bedded. Fertilizer is used in many plantations.

In cultivated areas of this soil, the principal crops are corn, soybeans (fig. 14), potatoes, and wheat. A small acreage is in cabbage. Wetness is the main limitation. Drainage systems include tile, open ditches, and land grading for surface drainage. Crops can be damaged by rare flooding. Common pasture forages include tall fescue and Ladino clover.

Seasonal wetness, ponding in depressions, rare flooding, and seepage limit the use of Stockade soil for building site development and sanitary facilities. This soil is generally not used for recreation. Wetness can be reduced somewhat with an intensive drainage system that includes land grading and the use of tile and open ditches. However, drained areas of this soil can still be subject to rare flooding.

This Stockade soil is in capability subclass IIIw (drained) or VIw (undrained). It is in woodland group 10W.

Sm—Stockade mucky loam, frequently flooded. This soil is nearly level and very poorly drained. It is on broad flats on low marine terraces slightly higher than adjacent marshes in the eastern part of the county near sounds, bays, and creeks. The mapped areas are generally oblong and irregular in width and range from 5 to 300 acres.

Typically, the surface layer is black mucky loam 13 inches thick. The subsoil extends to a depth of 54 inches. It is grayish brown sandy clay loam in the upper part and gray fine sandy loam in the lower part. The underlying material to a depth of 60 inches is dark greenish gray sandy clay loam.

Permeability of the subsoil is moderate. The soil ranges from very strongly acid to slightly acid in the surface layer and from very strongly acid to moderately alkaline in the subsoil and underlying material. The water table is at or near the surface most of the time. The soil is only about 1 foot higher than the adjacent marshes and is subject to frequent flooding with brackish water for long periods. Generally, outlets for drainage systems are not available because of the low elevation.

Included with this soil in mapping are some small areas of Hobucken and Brookman soils. The Hobucken soils are in marshes, and the Brookman soils occur at random within the map unit with no apparent change in landscape. The Brookman soils are very poorly drained. The included soils make up about 20 to 30 percent of this map unit.

This Stockade soil is used mainly as habitat for wildlife. The dominant native vegetation consists of sawgrass, black needlerush, big cordgrass, eastern baccharis, and waxmyrtle and some scattered, stunted pond pine, loblolly pine, Atlantic white cedar, and red maple. This plant community reflects the transition from upland forests to salt marshes. Wetness and flooding with brackish water are major limitations for woodland use.

This soil is not used as cropland, building site development, sanitary facilities, or recreation because of wetness and flooding.

This Stockade soil is in capability subclass VIw and in woodland group 3W.

Th—Tomahawk loamy sand, 0 to 3 percent slopes. This soil is moderately well drained and is in slightly convex areas on upland ridges. The largest areas of this soil are on the Minnesott Ridge along North Carolina Highway 306. The mapped areas are irregular in shape and range from 5 to 100 acres.

Typically, the surface layer is dark grayish brown loamy sand 7 inches thick. The subsurface layer is light yellowish brown loamy sand to a depth of 25 inches. The

Figure. 14.—Soybeans grow well in this drained area of Stockade loamy fine sand.

subsoil to a depth of 80 inches is yellowish brown sandy loam and loamy sand in the upper part, dark reddish brown and dark brown loamy sand in the middle part, and very dark grayish brown sand in the lower part. Light gray mottles are in the upper part of the subsoil.

Permeability of the subsoil is moderately rapid, and the available water capacity is low. This soil ranges from very strongly acid to slightly acid except where lime has been added. The seasonal high water table is 2 to 3 feet below the surface. Wind erosion is a hazard in areas unprotected by vegetation.

Included with this soil in mapping are small areas of Baymeade and Leon soils. The Baymeade soils are in slightly higher areas than Tomahawk soil and are well drained. The Leon soils are in depressions and are poorly drained. The included soils make up about 15 to 25 percent of this map unit.

This Tomahawk soil is used mainly as woodland. In a few areas, it is used as pasture or cropland.

In woodland areas of this soil, loblolly pine, longleaf pine, red maple, sweetgum, blackgum, southern red oak, white oak, and post oak are dominant. Common understory plants are waxmyrtle, flowering dogwood, blueberry, bitter gallberry, sourwood, sassafras, grape, sweetbay, redbay, American beautyberry, threeawn grass, poison ivy, and Virginia creeper. The main

limitation for woodland use and management is droughtiness between rainy periods.

In cultivated areas, the main crops are corn, soybeans, and wheat. A small acreage of tobacco is also grown. Leaching of plant nutrients and wetness during rainy periods are the main limitations. Droughtiness and the hazard of wind erosion are limitations in dry weather. Blowing sand can damage young plants. Common pasture forages include coastal bermudagrass.

Seasonal wetness is the main limitation to the use of this soil for building site development, sanitary facilities, and recreation. Wetness can be reduced by land grading for surface drainage and by the use of open ditches and tile. Droughtiness is a limitation in summer for establishing and maintaining lawns and shrubs.

This Tomahawk soil is in capability subclass IIw and in woodland group 8W.

Ud—Udorthents, loamy. This map unit consists of areas of soils that are nearly level to gently sloping and somewhat poorly drained. They consist of dredge spoil. The dredge material was piled up during construction and maintenance of waterways and channels. Most of the acreage is along the Intracoastal Waterway in the northeastern part of the county. The spoil was placed on low marine terraces in most places, but some areas overlie marshes. Several areas of landfill in this map unit are labeled on the map. The mapped areas are long and have variable widths. The areas range from 5 to 200 acres.

The surface layer is gray to dark grayish brown sand to sandy clay loam 6 to 12 inches thick. The underlying material to a depth of 72 inches is yellow and light gray to black sand to sandy clay loam.

Soil properties are variable, but the following generally apply. Permeability is moderately slow, and the available water capacity is moderate. The soil ranges from medium acid to moderately alkaline. The seasonal high water table is 1 foot to 2 feet below the surface. Low areas are subject to rare flooding.

Included with this soil in mapping are small areas where the depth of fill is less than 20 inches. Also included are small areas of Lafitte and Hobucken soils in marshes. These soils are very poorly drained. The included soils make up about 15 to 25 percent of this map unit.

The soil in this map unit is used mostly as woodland. Loblolly pine, longleaf pine, red maple, blackgum, water oak, sweetgum, and yellow-poplar are dominant. Waxmyrtle, bitter gallberry, eastern baccharis, blueberry, persimmon, and greenbrier are common understory plants. Wetness is the main limitation to woodland use and management, but soil compaction is also a limitation.

Seasonal wetness is the main limitation to use of these soils for building site development, sanitary facilities, and recreation. Onsite investigation is needed before use and management of specific sites is planned.

The soils in this map unit are not assigned to a capability subclass or to a woodland group.

Wa—Wahee fine sandy loam. This soil is nearly level and somewhat poorly drained. It is on flats and in depressions on stream terraces and low marine terraces. Some of the larger areas are in the vicinity of Janeiro and south and east of Whortonsville. The mapped areas are irregular in shape and range from 5 to 200 acres.

Typically, the surface layer is grayish brown fine sandy loam 6 inches thick. The subsoil extends to a depth of 57 inches. It is brownish yellow sandy clay in the upper part, gray clay and sandy clay in the middle part, and gray sandy clay loam in the lower part. Light brownish gray mottles are in the upper part of the subsoil. The underlying material to a depth of 80 inches is gray sandy clay loam.

Permeability of the subsoil is slow, and the available water capacity is high. The shrink-swell potential is moderate. The soil ranges from extremely acid to strongly acid except where lime has been added. The seasonal high water table is 1 foot to 1.5 feet below the surface. Low areas of this soil are subject to rare flooding.

Included with this soil in mapping are small areas of Argent, Dogue, and Fork soils. The Argent soils are in depressions and are poorly drained. The Dogue soils are in slightly higher areas than the Wahee soil, and they are moderately well drained. Fork soils occur at random within the map unit with no apparent change in landscape. They are somewhat poorly drained. The included soils make up about 10 to 20 percent of this map unit.

This Wahee soil is used mainly as woodland. In a few areas, it is used as pasture or cropland.

In woodland areas of this soil, the dominant trees are loblolly pine, pond pine, red maple, sweetgum, yellow-poplar, blackgum, water oak, swamp chestnut oak, and willow oak. Common understory plants are bitter gallberry, fetterbush, switchcane, sweet pepperbush, greenbrier, sweetleaf, American holly, blueberry, huckleberry, sweetbay, redbay, waxmyrtle, Virginia creeper, honeysuckle, poison ivy, Carolina jessamine, Virginia chainfern, and cinnamon fern. Wetness is the main limitation for woodland use and management. Soils managed for loblolly pine benefit from ditching and bedding.

In cultivated areas, the principal crops are corn, soybeans, potatoes, and wheat. A small acreage is used for cabbage. Wetness is the main limitation. Drainage systems include open ditches and land grading for surface drainage. Common pasture forages include tall fescue and Ladino clover.

Figure 15.—Open ditch drainage is used in this area of Wasda muck that is being converted to cropland.

Seasonal wetness, slow permeability, moderate shrink-swell potential, the clayey subsoil, and the hazard of rare flooding of low areas are the main limitations to use of this soil for building site development, sanitary facilities, and recreation. However, some areas of this soil have been drained and then developed. The flood hazard needs to be determined before use and management of specific sites is planned. Foundations need to be designed to resist cracking caused by the shrinking and swelling of the subsoil as a result of changes in moisture.

This Wahee soil is in capability subclass IIw and in woodland group 9W.

Wd—Wasda muck. This soil is nearly level and very poorly drained. It is on broad flats and in depressions on low marine terraces. The largest areas of this soil are around the edges of Light Ground and Bay City Pocosins. The mapped areas are irregular in shape and range from 20 to more than 4,000 acres.

Typically, the surface layer is black muck 12 inches thick. The subsurface layer is black mucky fine sandy loam to a depth of 19 inches. The subsoil is dark grayish brown and grayish brown sandy clay loam to a depth of 46 inches. The underlying material to a depth of 72 inches is greenish gray fine sandy loam.

Permeability of the subsoil is moderate. The soil ranges from extremely acid to strongly acid in the surface layer and upper part of the subsoil except where lime has been added. The lower part of the subsoil and the underlying material range from medium acid to moderately alkaline. The seasonal high water table is at or near the surface. Water frequently ponds for long periods except in drained areas. This soil is subject to rare flooding. Subsidence can be a problem in some areas if this soil is drained.

Included with this soil in mapping are small areas of the Arapahoe, Ballahack, Belhaven, Brookman, and Stockade soils. The Arapahoe, Ballahack, Brookman, and Stockade soils are in slightly higher areas than Wasda soil or they are on the edge of the areas nearer to drainageways. The Belhaven soils are on the edge of the areas farthest from the drainageways. The included

soils are very poorly drained. They make up about 15 to 25 percent of this map unit.

This Wasda soil is used mainly as woodland. In some areas, it is used as pasture or cropland.

In woodland areas of this soil, the dominant trees are pond pine, blackgum, red maple, sweetgum, and baldcypress. Hardwoods are dominant in depressions where water ponds for long periods. Common understory plants are redbay, sweetbay, titi, loblollybay, fetterbush, greenbrier, huckleberry, blueberry, red chokeberry, sphagnum moss, honey cup, waxmyrtle, bayberry, sundew, pitcher plant, Virginia chainfern, and sedges. Trees grow well on this soil; however, wetness causes seedling mortality and restricts equipment use. Soils managed for loblolly pine are generally ditched, bedded, and fertilized.

In cultivated areas, the soil has been intensively drained and is used mainly for corn, soybeans, and wheat. A small acreage is used for cabbage. The drainage systems include open ditches (fig. 15) and land grading for surface drainage. Tile is used in some places. Common pasture forages include tall fescue and Ladino clover.

Wasda soil is not used for building site development, sanitary facilities, or recreation because of extreme wetness.

Figure 16.—This drained area of Yonges loamy fine sand is used for corn.

This Wasda soil is in capability subclass IIIw (drained) or VIw (undrained). It is in woodland group 10W.

Yo—Yonges loamy fine sand. This soil is nearly level and poorly drained. It is on broad flats and in depressions on low marine terraces and stream terraces and occurs extensively in the eastern three-fourths of the county. The mapped areas are irregular in shape and range from 5 to 3,000 acres.

Typically, the surface layer is grayish brown loamy fine sand 7 inches thick. The subsurface layer is light brownish gray loamy fine sand to a depth of 11 inches. The subsoil extends to a depth of 49 inches. It is light brownish gray fine sandy loam in the upper part, gray sandy clay loam in the middle part, and gray fine sandy loam in the lower part. The underlying material to a depth of 80 inches is light brownish gray fine sandy loam and marly fine sandy loam and greenish gray marly fine sand.

Permeability of the subsoil is moderately slow. The soil ranges from very strongly acid to mildly alkaline in the surface layer and the upper part of the subsoil. It ranges from slightly acid to moderately alkaline in the lower part of the subsoil and underlying material. The seasonal high water table is within 1 foot of the surface. This soil is subject to rare flooding in low areas. Water ponds in depressions for brief periods unless the soil has been drained.

Included with this soil in mapping are small areas of Arapahoe, Argent, Fork, and Stockade soils. The Arapahoe and Stockade soils are in depressions and are very poorly drained. The Argent soils occur at random within the map unit with no apparent change in landscape. They are poorly drained. The Fork soils are in slightly higher positions than Yonges soil and are somewhat poorly drained. The included soils make up about 10 to 20 percent of this map unit.

This Yonges soil is used mainly as woodland. In a few areas, it is used as pasture or cropland.

In woodland areas of this soil, the dominant trees are loblolly pine, pond pine, red maple, sweetgum, yellow-poplar, blackgum, water oak, swamp chestnut oak, and willow oak. Common understory plants are bitter gallberry, large gallberry, fetterbush, switchcane, sweet pepperbush, greenbrier, sweetleaf, American holly, blueberry, huckleberry, sweetbay, redbay, waxmyrtle, Virginia creeper, honeysuckle, poison ivy, Carolina jessamine, Virginia chainfern, and cinnamon fern. Trees grow well on this soil; however, wetness causes seedling mortality and restricts equipment use. Soils that are managed for loblolly pine benefit from ditching and bedding.

In cultivated areas, the principal crops are corn (fig. 16), soybeans, potatoes, and wheat. A small acreage is used for cabbage. Wetness is the main limitation. Drainage systems include open ditches, tile, and land grading for surface drainage. Common pasture forages include tall fescue and Ladino clover.

Seasonal wetness and rare flooding of low areas are major limitations to the use of this soil for building site development, sanitary facilities, and recreation. However, some areas of this soil have been drained and then developed. The flood hazard needs to be determined before use and management of specific sites is planned.

This Yonges soil is in capability subclass IIIw (drained) or IVw (undrained). It is in woodland group 12W.

Prime Farmland

In this section, prime farmland is defined and discussed, and the prime farmland soils in Pamlico County 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 producing food, feed, forage, fiber, and oilseed crops. Such soils have properties that are favorable for the economic production of sustained high yields of crops. The soils need only to be treated and managed using acceptable farming methods. The moisture supply, of course, must be adequate, and the growing season has to be sufficiently long. Prime farmland soils produce the highest yields with minimal inputs of energy and economic resources, and farming these soils results in the least damage to the environment.

Prime farmland soils may presently be in use as cropland, pasture, or woodland, or they may be in other uses. They either are used for producing 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 get 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 subject to frequent flooding during the growing season. The slope ranges mainly from 0 to 6 percent.

Prime farmland is throughout the survey area on uplands, stream terraces, and low marine terraces, mainly in areas near major drainageways. Soybeans, wheat, corn, Irish potatoes, and tobacco are the main crops.

In some parts of the survey area a recent trend in land use has been the conversion of prime farmland to urban and industrial uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are wet.

The following map units, or soils, make up prime farmland in Pamlico 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 5. 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.

Soils that have limitations, such as a high water table, flooding, or droughtiness, may qualify as prime farmland if these limitations are overcome by such measures as drainage, flood control, or irrigation. Onsite evaluation is necessary to determine the effectiveness of the corrective measures. More information on the criteria for prime farmland can be obtained at the local Soil Conservation Service office.

AaA	Altavista loamy fine sand, 0 to 2 percent slopes
Cs	Charleston loamy fine sand
CrB	Craven loam, 1 to 4 percent slopes
DgB	Dogue fine sandy loam, 1 to 4 percent slopes
GoA	Goldsboro loamy fine sand, 0 to 2 percent slopes
NoA	Norfolk loamy fine sand, 0 to 2 percent slopes
NoB	Norfolk loamy fine sand, 2 to 6 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 avoid soil-related failures in land uses.

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

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

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern 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 or very firm soil layers can cause difficulty in excavation.

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

Crops and Pasture

Warren Mincey, district conservationist, and Foy Hendrix, conservation agronomist, Soil Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils are identified, the system of land capability classification used by the Soil Conservation Service is explained, and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

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

Over 38,000 acres in Pamlico County was used for crops in 1981, according to data collected by the North Carolina Agricultural Extension Service. Of this total, there were about 23,500 acres of soybeans, 12,000 acres of wheat double-cropped mainly with soybeans, 10,000 acres of corn, 4,200 acres of Irish potatoes double-cropped mainly with soybeans, and 680 acres of tobacco. According to the 1978 North Carolina Land Utilization Survey, 911 acres was used as pasture and hay in 1977. A small acreage is used for vegetable, fruit, and berry crops.

Tobacco is commonly grown on soils that have good natural drainage, such as Altavista, Charleston, Craven, Goldsboro, and Norfolk soils. Corn, soybeans, and wheat are grown on soils that are well drained and moderately well drained, and in artificially drained areas of soils that are somewhat poorly drained, poorly drained, and very poorly drained. Many of the soils are well suited to vegetable, fruit, and berry crops. The main pasture forages are coastal bermudagrass on the droughty, sandy soils, such as Alpin, Baymeade, Conetoe, and Tomahawk soils. A tall fescue/Ladino clover mixture is on the soils that have adequate available water capacity.

In Pamlico County, wetness is a problem on about 95 percent of the acreage suitable for farming. The design of the drainage systems used depends on the soil and the crops to be grown. Only limited artificial drainage is needed on the moderately well drained Altavista, Charleston, Dogue, and Goldsboro soils. Soils that are somewhat poorly drained, poorly drained, and very poorly drained require more intensive drainage systems. These systems have primary canals, a secondary system of parallel field ditches or tile drains or both, and land grading for surface drainage (fig. 17). On wetter soils, the area between the ditches is crowned in the middle to allow excess water to run off. In some fields, water furrows, or hoe drains, are used to carry the surface water to the field ditches. Land grading is often used to fill in low areas or depressions, smooth fields, and make

a uniform grade for removing excess rain water. Ditchbank caving can be a problem in some coarser-textured soils. Drainage ditches, drain pipes, and flashboard risers can control the removal of excess water and subsurface irrigation. By impounding runoff water, they also aid in denitrification of nitrates, which improves water quality.

Tillage needs to be avoided when clayey soils are wet because soil structure is destroyed and large clods form. This results in ponding and a poor seedbed. Timeliness of farming operations on the wet organic soils is critical because the soils can become waterlogged and unable to support traffic. Other problems of organic soils are subsidence, exposure of buried logs and wood, and possible ground fires after drainage.

Control of water and wind erosion is needed on some of the soils in Pamlico County. Water erosion is a hazard on the gently sloping Craven, Dogue, and Norfolk soils. Some short, steep slopes along major drainageways and some small and narrow, gently sloping areas near small drainageways are also susceptible to erosion. Grassed waterways, field borders, conservation tillage, crop residue management, diversions, close-growing crops in rotations, and a permanent vegetative cover on some soils help control water erosion. A combination of these practices is generally needed where row crops are grown.

Hoe drains can cause an erosion hazard on wet, nearly level soils. Drop structures are needed where the hoe drains outlet into open ditches. These structures help to prevent ditchbanks from washing away. Erosion can be controlled by land grading the fields to reduce the number of hoe drains needed. Controlling erosion improves crop production and water quality and lowers the loss of nutrients.

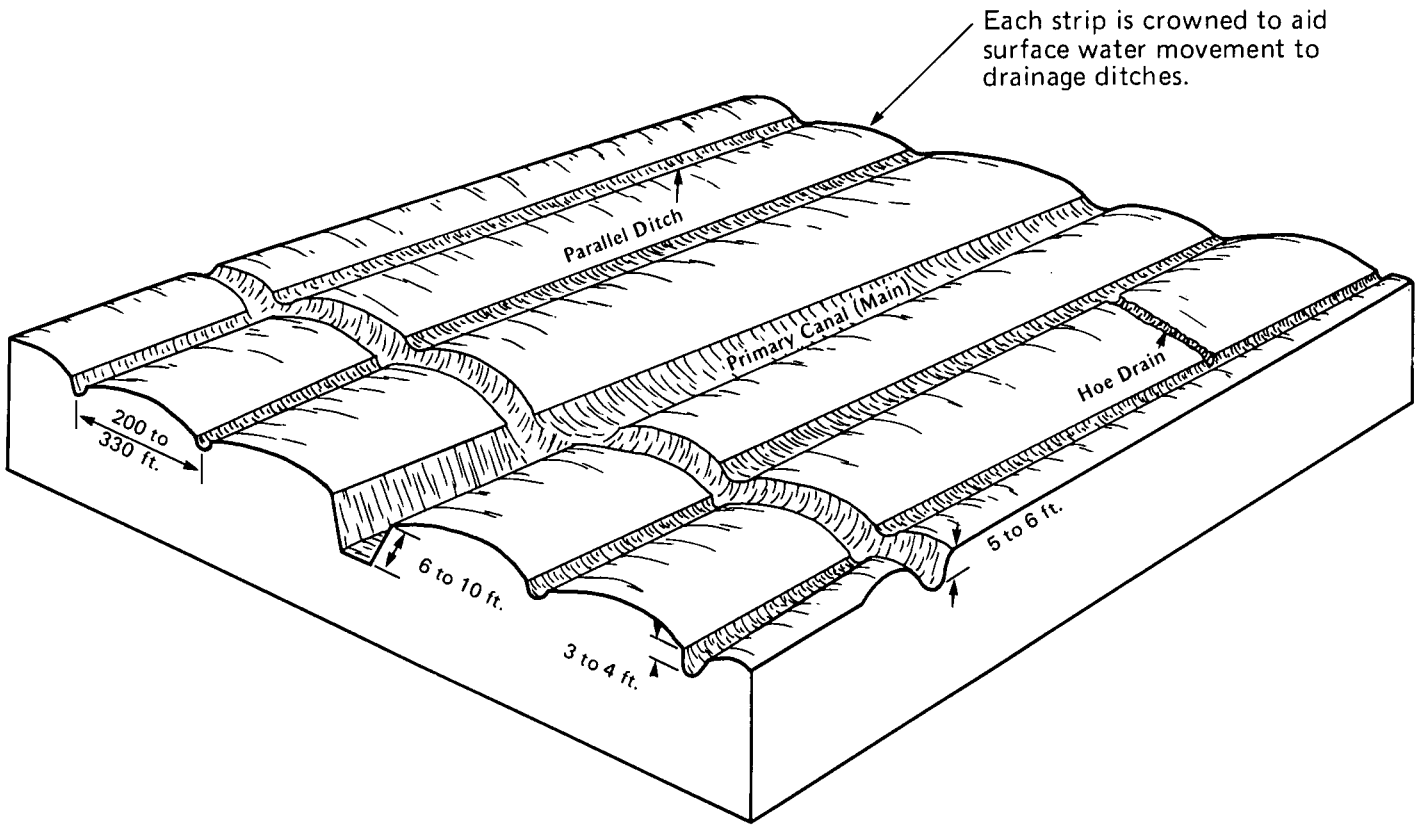


Figure 17.—Artificial drainage systems are commonly used in Pamlico County. The distance between ditches varies with the soil and the crops to be grown.

Alpin, Baymeade, Conetoe, and Tomahawk soils are highly susceptible to wind erosion. These soils also are droughty and subject to leaching of plant nutrients. Many of the other soils in the county have a sandy surface layer. Wind erosion can be a problem on these soils in large fields. Crop residue left on the surface or cover crops helps to conserve moisture. Splitting fertilizer applications reduces leaching of plant nutrients. Strips of small grain left between rows of tobacco reduce sand blowing on newly planted fields, and permanent windbreaks between fields help control wind erosion.

Soil Fertility

None of the soils in Pamlico County have enough natural fertility to produce economic returns on crops. They are naturally acid and require lime and fertilizer to make them suitable for use as cropland.

Liming requirements are a major concern to the farmer because the acidity level in the soil affects the availability of many nutrient elements to plants and the activity of beneficial bacteria. Lime also neutralizes exchangeable aluminum. This counteracts the adverse effects excess aluminum has on crops. Calcitic lime provides calcium, and dolomitic lime provides calcium and magnesium to the soil.

A soil test is used as a guide to indicate how much and what kind of lime should be used. In soils that have a sandy surface texture, magnesium and available calcium levels may be low. The desired pH levels will vary depending upon the soil properties and the crop to be grown.

Nitrogen fertilization is required for most crops. Soil testing is not dependable for predicting nitrogen requirements. Appropriate rates are discussed in the "Yields per acre" section under a description of good management practices. Because nitrogen can be readily leached from sandy soils, applications of nitrogen on these soils may be needed more than once during the growing season.

The need for phosphorus (P) and potassium (K) fertilizers can be predicted from soil tests. Because past applications of phosphorus and potassium tend to build up in the soil, requirements for these nutrients need to be determined.

In areas of native vegetation, the organic Belhaven and Croatan soils are extremely acid and much lower in natural fertility than most of the mineral soils in the county. Lime is required to reach the pH levels needed for crops after these soils are cleared and drained. However, crops grow well at somewhat lower pH levels in organic soils than in mineral soils. Nitrogen is a constituent of the organic matter, but often the carbon/nitrogen ratio is so high that the nitrogen is not available to plants. Therefore, nitrogen fertilizers are needed for organic soils just as in the mineral soils. Potassium and phosphorus are low in these organic soils initially. Applications of these nutrients need to be based on soil tests. The organic soils may be deficient in the micronutrient copper. In Pamlico County, copper deficiency has occurred in wheat. Each field needs to be tested to determine if copper should be added.

Chemical Weed Control

The use of herbicides for weed control in crops is a common practice in Pamlico County. Successful use leads to less tillage and is an integral part of modern farming. Soil properties, such as organic matter content and texture of the surface layer, affect the rate of herbicide application. Estimates for these properties were determined for the soils in this survey area. Table 15 shows a general range of organic matter content. The surface texture is shown in table 14 in the USDA texture column.

Higher organic matter content can occur in soils that have received high amounts of animal or manmade waste. Soils currently being brought into cultivation can have higher organic matter content in their surface layer than like soils that have been in cultivation for a long period of time. Conservation tillage increases organic matter content in the surface layer. Lower levels of organic matter are common in soils where the surface layer has been partly or completely removed by erosion, land smoothing, or other activities. Current soil tests need to be used to measure organic matter content before determining required herbicide rates. The labels of herbicides show specific application rates based on organic matter content and soil surface texture.

Pasture and hayland acreages in Pamlico County are mostly planted in coastal bermudagrass, tall fescue, and Ladino clover. Most coastal bermudagrass areas are used as hayland and are predominantly on soils that have a sandy surface layer, such as Alpin, Baymeade, Conetoe, Leon, and Tomahawk soils.

Soil tests to determine appropriate levels of nitrogen, phosphorus, and potassium required to sustain production of coastal bermudagrass are needed. Nitrogen application requires special attention since each cutting of hay removes significant amounts of nitrogen from the field.

A tall fescue/Ladino clover mixture is commonly used in pastures on soils that have adequate available water capacity, such as Altavista, Arapahoe, Argent, Ballahack, Belhaven, Craven, Croatan, Dogue, Fork, Goldsboro, Leaf, Lenoir, Lynchburg, Norfolk, Paxville, Rains, Rutlege, Stockade, Wahee, Wasda, and Yonges soils. Applications of lime and fertilizer, as determined by soil tests, are needed for establishment of tall fescue or fescue/clover pastures. After a good stand is established, only 1 to 2 tons of lime need to be applied every 3 to 5 years. Since tall fescue makes most of its growth in the spring and fall, fertilizer recommendations generally call for applications of nitrogen in February and again in September for best results. Tall fescue grows

very little in hot, dry periods during summer months, so it should not be grazed shorter than 3 inches. Livestock rotation between pastures in the summer may be necessary to prevent overgrazing.

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 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

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

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

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 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the North Carolina Agricultural 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. 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 rangeland, for woodland, and for engineering purposes.

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

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,* or *s* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is 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); and *s* shows that the soil is limited mainly because it is droughty.

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,* or *s*.

The capability classification of each map unit is given in the section "Detailed Soil Map Units."

Woodland Management and Productivity

Edwin J. Young, forester, Soil Conservation Service, and Obie Willingham, forester, North Carolina Forest Service, helped prepare this section.

Originally, the area that is now Pamlico County was forested except for the marshes. In 1984, commercial forest covered about 55 percent of the county, or 120,348 acres. Of this amount, corporate and private individual landowners owned 47,840 acres; forest products industry, 52,748 acres; farmers, 18,719 acres; and public agencies, 1,041 acres *(22)*.

Forests provide wood products, scenic beauty, wildlife habitat, outdoor recreation, and protection of water quality. Clearing additional land for farming, urban encroachment, and other forest withdrawals continue to reduce the commercial forest acreage. Commercial forest land is land that is capable of economically producing crops of industrial wood.

Loblolly pine, longleaf pine, upland oaks, and hickories are common on the better drained soils. Loblolly pine, pond pine, bottom land oaks, sweetgum, blackgum, yellow-poplar, and red maple are common on the more poorly drained soils. In pocosins, the soils are forested with pond pine, redbay, sweetbay, loblollybay, and blackgum. Flood plains and depressions that pond water for long periods are growing baldcypress, swamp tupelo, blackgum, green ash, American elm, water tupelo, and American hornbeam.

Loblolly pine is important in the county because it grows fast, is adapted to the soil and climate, has a high market value, and is easy to establish and manage (fig. 18). Foresters encourage landowners to manage for pine instead of hardwoods because quality pines can be produced more rapidly and in greater volume than quality hardwoods. Prescribed burning reduces hardwood competition, improves wildlife habitat, protects from wildfire, and helps reestablish pine more economically.

Loblolly pine grows on a wide variety of soils. It grows best on moist soils that have a deep surface layer and a loamy or clayey subsoil. The highest yields are produced in areas of the poorly drained Argent, Rains, and Yonges

Figure. 18—Loblolly pine grows well in this area of Yonges loamy fine sand.

soils, and the very poorly drained Arapahoe, Ballahack, Brookman, Paxville, and Stockade soils that have been ditched (fig. 19) and bedded. Water management practices are needed to protect seedlings from ponded water, reduce competition from other plants, and permit conversion of native stands of pond pine to loblolly pine. Many of the other soils in the county produce good crops of pine, although the yield is lower.

The very poorly drained, organic Belhaven, Croatan, and Dare soils in large pocosins are mostly growing pond pine of non-commercial value. These soils have poor potential for conversion to loblolly pine because of the difficulty of developing adequate drainage, poor soil fertility, high development cost, possibility of ground fires after drainage, and high possibility of stand failure.

Soils that are droughty and sandy, such as Alpin and Baymeade soils, have very low site quality. A weakly cemented subsoil, such as in Leon soils, also causes poor site quality.

For the purpose of a forest inventory, four commercial forest types are identified in the county *(22)*.

Loblolly pine (63,251 acres). This type is more than 50 percent loblolly pine and has pond pine, longleaf pine, southern red oak, water oak, swamp chestnut oak, willow oak, white oak, red maple, blackgum, sweetgum, hickory, and yellow-poplar. The soils range from well drained to very poorly drained. A significant acreage of pond pine forest type growing on very poorly drained soils is included in this forest type.

Oak-Pine (4,160 acres). In this type, hardwoods make up more than 50 percent of the stand, and pines make up 25 to 50 percent. The hardwood species are the same as those listed for the loblolly pine forest type. The dominant trees vary depending on soil drainage. This timber type represents a trend toward hardwood dominance where pine management practices have not been applied. The understory generally consists of shrubs and hardwood seedlings and saplings that are more tolerant of shade than pine. The soils are moderately well drained to very poorly drained.

Oak-Gum-Maple (50,857 acres). This type consists of hardwood forests on broad interstream flats, in

Figure 19.—This very poorly drained area can produce high yields of loblolly pine after it is drained, cleared, bedded, and replanted. The soils are Ballahack fine sandy loam, occasionally flooded, and Stockade loamy fine sand.

depressions, and along narrow flood plains. Water oak, swamp chestnut oak, willow oak, blackgum, sweetgum, red maple, and yellow-poplar are on the flats and in depressions. The flood plains are forested with swamp tupelo, baldcypress, water tupelo, American elm, red maple, green ash, and American hornbeam. The soils are poorly drained or very poorly drained.

Longleaf pine (2,080 acres). This type is more than 50 percent longleaf pines and lesser amounts of loblolly pine and scattered southern red oak, post oak, turkey oak, blackjack oak, sweetgum, and blackgum. This forest type is on sandy soils that are excessively drained to poorly drained.

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to fertilization than others, some are more susceptible to landslides and erosion after building roads and harvesting timber, and some require special efforts to reforest. In the section "Detailed soil map units," each map unit in the survey area suitable for producing timber presents information about productivity, limitations for harvesting timber, and management concerns for producing timber. The common forest understory plants are also listed. Table 7 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.

The first tree listed for each soil under the column "Important trees" 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.

Table 7 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. 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 for use and management. The letter *W* indicates a soil in which excessive water, either seasonal or year-round, causes a significant limitation. The letter *S* indicates a dry, sandy soil. The letter *A* indicates a soil that has no significant restrictions or limitations for forest use and management. If a soil has more than one limitation, the priority is W and then S.

Ratings of the *erosion hazard* indicate the probability that damage may occur if site preparation activities or harvesting operations 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 of harvesting and reforestation operations, or use of specialized 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, stoniness, or susceptibility of the surface layer to compaction. As slope gradient and length increase, it becomes more difficult to use wheeled equipment. On the steeper slopes, tracked equipment must be used. On the steepest slopes, even tracked equipment cannot operate; more sophisticated systems are needed. The rating is *slight* if equipment use is restricted by soil wetness for less than 2 months and if special equipment is not needed. The rating is *moderate* if slopes are steep enough that wheeled equipment cannot be operated safely across the slope, if soil wetness restricts equipment use from 2 to 6 months per year, if stoniness restricts ground-based equipment, or if special equipment is needed to avoid or reduce soil compaction. The rating is *severe* if slopes are steep enough that tracked equipment cannot be operated safely across the slope, if soil wetness restricts equipment use for more than 6 months per year, if stoniness restricts ground-based equipment, or if special equipment is needed to avoid or reduce soil compaction. Ratings of *moderate* or *severe* indicate a need to choose the most suitable equipment and to carefully plan the timing of harvesting and other management operations.

Ratings of *seedling mortality* refer to the probability of death of 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 and duration of the water table, rock fragments in the surface layer, rooting depth, and the aspect of the slope. Mortality generally is greatest 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 surface drainage, or providing artificial shade for seedings. 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*. Common trees are listed in the order of their observed general occurrence. Generally, only two or three tree species dominate. 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. This index applies to fully stocked, even-aged, unmanaged stands.

Site index values shown in table 7 are based on measurements at selected sites in Pamlico County and other counties and the use of published site index curves used in the Pamlico County Soil Survey *(3, 4, 5, 6, 11, 18, 20)*. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Each map unit in this soil survey that is commonly used to produce timber has the yield predicted in the Productivity column of table 7 and given as cubic feet per acre per year. Cubic feet per acre can be converted to board feet per acre by multiplying by a factor of about 5. The yield is predicted at the point where mean annual increment culminates.

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

Recreation

In table 8, 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 sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

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

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

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, horseback riding, and bicycling should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, are not subject to flooding more than once a year during the period of use, and 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, are not subject to prolonged flooding during the period of use, and have moderate slopes. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

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

Wildlife is related to soils through a direct relationship with plants. Wildlife species are associated with given plant communities, which in turn are directly related to particular soils. Proper management of soil, water, and plants to produce suitable habitat effectively maintains and improves wildlife populations.

The soils of Pamlico County produce a wide variety of plants that provide food, cover, and protection for wildlife. Upland species, such as squirrel, rabbit, fox, quail, mourning dove, and songbirds, are abundant throughout the county. Deer are plentiful, and a small number of black bear are in the more remote areas. Furbearers, such as raccoon, mink, muskrat, otter, and

oppossum, are also abundant. Because of the large acreage of marshes and water, many species of waterfowl are in the county.

Pamlico County has some interesting contrasts in wildlife habitat caused by the varied plant communities, landforms, and patterns of land use.

The better drained, productive soils in the county, such as the Altavista, Charleston, Conetoe, Craven, Dogue, Fork, Goldsboro, Lenoir, Lynchburg, Norfolk, Tomahawk, and Wahee soils, are largely in farmland. Many fields are small and provide good edge habitat for quail, rabbit, and dove. Deer, hawks, and many species of songbirds are also attracted to these areas. Food, nesting cover, brood areas, and resting cover are primary habitat elements provided by land use patterns associated with these soils. In areas that have not been cleared, there is generally good woodland habitat of mixed oaks and pine.

Wet soils, such as the Arapahoe, Argent, Ballahack, Brookman, Leaf, Paxville, Rains, Stockade, Wasda, and Yonges soils, make up a large acreage in the county. Habitat values of these wet soils vary greatly, depending on the depth and duration of flooding and ponding or the degree of wetness or both. This determines the vegetative community on a given site, and the vegetative community will directly influence the wildlife species present. Most of the acreage of the wet soils in the county occur in large blocks. Some of these large blocks are being cleared, drained, and converted to cropland. Many others are being clearcut, drained, and planted to loblolly pine.

The drainage and resultant change in land use or vegetative community or both often determine the type and quality of wildlife habitat on a given site. Edge habitat is at a minimum where large fields occur, so small game habitat is generally poor. Also, populations of deer and bear have been affected by direct loss of escape cover as the woodland was cleared. Wildlife habitat in these areas can be improved by using field borders, field windbreaks, minimum tillage, and shelterbelts.

Other wet soils on which little or no clearing or draining has been done are on flood plains and in wet depressions, pocosins, or marshes. The flood plains and wet depressions are mostly in forests of green ash, blackgum, baldcypress, swamp tupelo, swamp chestnut oak, red maple, and other water-tolerant hardwoods. These areas provide excellent wildlife habitat. Associated soils are the Arapahoe, Ballahack, Brookman, Masontown, Stockade, and Wasda soils.

Some large blocks of very poorly drained soils are in pocosins, such as the Light Ground, Bay City, and Carolina Pocosins. Although the carrying capacity for black bear, deer, and other wildlife is not high, these areas serve as good escape and cover habitat *(9)*. Associated soils are Belhaven, Croatan, Dare, and Wasda soils.

A large acreage of salt marsh occurs in the county, especially in the eastern part. The Hobucken and Lafitte soils in these marshes serve an important role in the ecology of estuaries, such as Bay River, Neuse River, and Pamlico Sound. The marsh plants contribute nutrients to the estuaries, benefiting fish and shellfish, and provide excellent habitat for waterfowl and other wetland wildlife. A number of large impoundments have been constructed in these areas for waterfowl management (fig. 20).

Pamlico County has an extensive acreage of estuarine water that is excellent fish and shellfish habitat. This makes commercial fishing a major local industry and sport fishing an important recreational activity in the county.

In table 9, 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 potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

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

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

Figure 20.—A waterfowl impoundment in an area of Lafitte muck, frequently flooded.

Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and lespedeza.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, and wheatgrass.

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

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, saltgrass, cordgrass, rushes, sedges, and cane.

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, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, mourning dove, cottontail rabbit, red fox, and many songbirds.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include woodpeckers, squirrels, gray fox, raccoon, deer, and 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, muskrat, otter, 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. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet, and 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 must be considered in planning, in site selection, and in design.

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

This information can be used to: evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate routes for roads, streets, highways, pipelines, and underground cables; evaluate 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 10 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 the depth to a weakly cemented pan or a very firm, dense layer; soil texture; and slope. The time of the year that excavations

can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

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

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

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

Sanitary Facilities

Table 11 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 11 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and 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, a high water table, depth to a weakly cemented pan, and flooding affect absorption of the effluent. A cemented pan can also interfere with installation.

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 and gravel are 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.

The health department in Pamlico County administers a program of site evaluation and issuance of permits for installation of septic tanks and absorption fields. Sanitarians evaluate each site and determine its suitability for waste disposal using criteria adopted by the State of North Carolina. These criteria differ somewhat from those used to rate the soils in table 11. Individuals who are considering an on-lot waste disposal system should contact the Pamlico County Health Department in Bayboro.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 11 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth

to a weakly cemented pan, flooding, and content of organic matter.

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

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

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

The ratings in table 11 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to a weakly cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

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

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

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over a weakly cemented pan or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer of natural soil 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 12 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 determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

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

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

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 12, 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), and the thickness of suitable material. 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 up to 12 percent silty fines. This material must be at least 3 feet thick. All other soils are rated as an improbable source.

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, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They have little or no gravel and have slopes of less than 8 percent. They are low in content of soluble salts, 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, soils that have an appreciable amount of soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

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

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and releases a balanced combination of plant available nutrients as it decomposes.

Water Management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

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

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil. Excessive slope can affect the storage capacity of the reservoir area.

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 or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

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

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

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Wetness and slope affect the construction of grassed waterways. A hazard of wind erosion, low available water

capacity, droughtiness, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

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

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 17.

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

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

Engineering Index Properties

Table 14 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

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

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, 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.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20, or higher, for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 17.

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

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an 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.

The estimates of grain-size distribution, liquid limit, and plasticity index are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 15 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 clay content of 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 influence the soil's adsorbtion of cations, moisture retention, 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 downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage 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, but rather the ability of the soil to store water. Higher volumes indicate longer rain free periods that can occur before plants wilt.

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

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

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

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

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion. 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.

In table 15, 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 of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops. Some organic soils have a high carbon to nitrogen ratio and are not effective sources of nitrogen.

Soil and Water Features

Table 16 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 intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

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

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

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

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have 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 some organic soils. These soils have a very slow rate of water transmission.

Group B/D. A dual hydrologic group is given for certain wet soils that can be adequately drained. The first letter applies to the drained condition and the second letter refers to the undrained condition.

Flooding, the temporary covering of the soil 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 16 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, frequent,* or *common. None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (there is a near 0 to 5 percent chance of flooding in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (there is a 5 to 50 percent chance of flooding in any year). *Frequent* means that flooding occurs often under normal weather conditions (there is more than a 50 percent chance of flooding in any year). *Common* is used when classification as occasional or frequent does not affect interpretations. 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. November-May, for example, means that flooding can occur during the period November through May. 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 absence of distinctive horizons, which are characteristic of soils that are not subject to flooding.

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

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 16 are the depth to the seasonal high water table; the kind of water table, that is, *perched, artesian*, or *apparent;* and the months of the year that the water table commonly is highest. A water table that is seasonally high for less than 1 month is not indicated in table 16.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An *artesian* water table is under hydrostatic head, generally

below an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

The two numbers in the "High water table-Depth" column 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. If a plus sign precedes the range in depth, the first number indicates how high the water table rises above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that the water table exists for less than a month.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence 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 16 shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Not shown in the table is subsidence caused by an imposed surface load or by the withdrawal of ground water throughout an extensive area as a result of lowering the water table.

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 creates a severely corrosive environment. 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.

Engineering Index Test Data

Table 17 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." The soil samples were tested by the North Carolina Department of Transportation and Highway Safety, Materials and Test Unit.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are: AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 423 (ASTM); Plasticity index—T 90 (AASHTO), D 424 (ASTM); Moisture density, Method A—T 99 (AASHTO), D 698 (ASTM).

Formation of the Soils

This section discusses the factors of soil formation and relates them to the soils in the survey area.

Factors of Soil Formation

Soil is the product of the combined effects of parent material, climate, plant and animal life, time, and relief. These five factors determine the characteristics of the soil in any of the natural soil bodies. The processes of soil formation include additions of organic and mineral material to the soil as solids, liquids, and gases; losses of this material from the soil; translocation of material from one part of the soil to another; and transformation of mineral and organic substances within the soil *(14)*.

Parent Material

Parent material has been an important factor in the formation of the soils of Pamlico County. It has caused differences in such characteristics as thickness and texture of horizons, mineral make-up, amount and thickness of organic matter, and the chemistry of the soil.

The soil in Pamlico County formed in surficial sediment of the Pamlico marine terrace (Pamlico Surface) that has extensive strata that contain many shell fragments 5 or 6 feet below the surface, surficial sediment of the Talbot marine terrace (Talbot Surface), alluvium recently deposted in drainageways, and accumulation of organic material on the broad, undissected interstream divides and in marshes.

The kinds of parent material, although related, differ in mineral and chemical composition. The soils in Pamlico County are grouped according to the parent material in which they formed. The Argent, Brookman, Craven, Dogue, Leaf, Lenoir, and Wahee soils formed in fine-textured sediment. The Altavista, Ballahack, Fork, Goldsboro, Lynchburg, Norfolk, Paxville, Rains, Stockade, Wasda, and Yonges soils formed in moderately fine-textured sediment. The Arapahoe, Hobucken, Baymeade, Charleston, Conetoe, Masontown, and Tomahawk soils formed in moderately coarse-textured sediment. The Alpin, Leon, and Rutlege soils formed in sediment consisting almost entirely of sand. The Belhaven, Croatan, Dare, and Lafitte soils formed in an accumulation of organic matter in wet areas.

Climate

Climate is a major determinant of the kinds of plants and animals living in and on the soil. Pamlico County has a warm and humid climate. Summers are long and hot, and winters are short and mild. Except in continuously saturated soil, mild temperatures and abundant rainfall promote rapid decomposition of organic matter in soils not saturated with water, hasten chemical reactions, speed leaching of soluble bases, and increase translocation of the less soluble fine particles in the soil profile *(16)*. Consequently the soils are acid, strongly leached, and low in natural fertility, except for those that formed in sediment containing shell fragments at a shallow depth or that are flooded with salt water. The soils have a higher content of clay in the B horizon than in the A or C horizon, except for those that formed in sand and recent alluvium.

Plant and Animal Life

Plants and animals determine the kind of organic matter and the way it is incorporated into the soil. Pine forests cover most of the dissected uplands in Pamlico County. Pond pine and shrubs cover the undissected interstream divides. Baldcypress, green ash, blackgum, sweetgum, and other hardwoods predominate on the flood plains. Plants, such as black needlerush and big cordgrass, are in the salt marshes.

Roots take up nutrients from the lower horizons, and animals transfer soil particles from one horizon to another. Plants and animals add organic matter, and plant roots aid development of soil structure and porosity. The organic matter is thought to be the energy source for the biological activity in which micro-organisms consume oxygen in a saturated A horizon. The micro-organisms can reduce the oxygen level of the ground water, and the resultant anaerobic conditions can exist for several days or even weeks. Saturation and anaerobic conditions reduce and make soluble the red and yellow iron compounds in soil. Leaching of the iron results in the gray subsoil in the poorly drained soils. Saturation retards oxidation of organic matter and contributes to development of organic soil.

Time

The horizons in a soil profile take a long time to develop. Relief changes with time. Some of the

differences in the soils in Pamlico County reflect a difference in age and changes in relief because of natural or geologic erosion. The older soils, such as the Goldsboro, Lynchburg, and Rains soils on the nearly level upland divides, have well developed horizons and a thick profile. By contrast, the younger Hobucken soils in marshes have almost no horizon development, and the Altavista, Conetoe, and Yonges soils have well developed horizons but only a thin profile. The younger soils also contain a higher percentage of weatherable minerals than soils on the older uplands.

Relief

The relief in Pamlico County is largely the result of dissection of parts of the original, nearly level plains by rivers and creeks or of wind and wave action along previous shorelines on the mainland. The degree of dissection of the plains and the relief along old shorelines affects the formation of the soils by influencing the depth to the water table and the geologic removal of soil material by slope retreat.

The soils near drainageways and on ridges are moderately well drained to excessively drained. The seasonal high water table is 2 feet to more than 6 feet below the surface. Where the soils are loamy or clayey, they have a light colored A horizon and a bright colored Bt horizon, and many of these soils have a thick E horizon. The soils in Pamlico County that have these characteristics are the Altavista, Baymeade, Charleston, Conetoe, Craven, Dogue, Goldsboro, Norfolk, and Tomahawk soils.

The soils in broad, nearly level interstream areas and depressions are somewhat poorly drained to very poorly drained. The seasonal high water table is at or near the surface. The soils are loamy and clayey and have a dark color A horizon, a gray Bg or Btg horizon, and a gray Cg horizon. The soils that have these characteristics are the Arapahoe, Argent, Ballahack, Brookman, Leaf, Lynchburg, Paxville, Rains, Stockade, Wahee, Wasda, and Yonges soils. The sandy soils in these areas are the Leon and Rutlege soils. They have a dark color A horizon and a grayish Cg horizon. The Leon soils have a weakly cemented Bh horizon.

The largest interstream areas have an accumulation of organic matter in the most undissected part. Here, the rainfall exceeds both evapotranspiration and the slow flow of water overland to the distant drainageways. The organic litter from each year's growth decomposes more slowly than it is produced. The organic Belhaven, Choatan, and Dare soils are in these areas.

The soils on flood plains and marshes are at the lowest elevations in the county and are very poorly drained. They are flooded frequently with fresh or salt water and have a dark color O or A horizon and a grayish Cg horizon. Hobucken, Lafitte, and Masontown soils are in these areas.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(21).* 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 18 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

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

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

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

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

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

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series. The Rains series is an example and is classified as fine-loamy, siliceous, thermic Typic Paleaquults.

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. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual (19).* Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (21).* 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."

Alpin Series

The Alpin series consists of excessively drained soils that formed in coarse-textured sediment on uplands. Slope ranges from 0 to 5 percent.

Typical pedon of Alpin fine sand, 0 to 5 percent slopes; 1.6 miles north of Minnesott Beach on North Carolina Highway 306, 1.2 miles west on State Road 1121, 0.3 mile east on a dirt road to end, 75 feet north of road:

A—0 to 5 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; common fine and medium roots; strongly acid; clear wavy boundary.
E—5 to 44 inches; pale brown (10YR 6/3) fine sand; single grained; loose; few fine roots; medium acid; diffuse wavy boundary.
E/B—44 to 80 inches; pale yellow (2.5Y 7/4) fine sand; single grained; loose; common yellowish brown (10YR 5/6) loamy fine sand lamellae 1/8 to 1/2 inch thick; slightly acid.

Alpin soils have sandy horizons 80 inches thick or more. Thin sandy or loamy lamellae occur below a depth of 40 inches. The soils range from very strongly acid to slightly acid.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 1 to 3.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 3 to 8. It is sand or fine sand.

The E part of the E/B horizon has hue of 10YR or 2.5Y, value of 7 or 8, and chroma of 1 to 6, and it is sand or fine sand. The B part of this horizon has hue of 10YR or 7.5YR, value of 5 to 7, and chroma of 4 to 8. It is loamy fine sand, loamy sand, sandy loam, or fine sandy loam lamellae.

Altavista Series

The Altavista series consists of moderately well drained soils that formed in moderately fine-textured sediment. The soils are on low marine and stream terraces. Slope ranges from 0 to 2 percent.

Typical pedon of Altavista loamy fine sand, 0 to 2 percent slopes; 3.4 miles east of Arapahoe on State Road 1300, 0.8 mile south on State Road 1307, 1.2 miles southeast on State Road 1350 and 80 feet east of road:

A—0 to 5 inches; dark grayish brown (10YR 4/2) loamy fine sand; weak medium granular structure; very friable; common fine and medium roots; very strongly acid; clear wavy boundary.
E—5 to 8 inches; pale brown (10YR 6/3) loamy fine sand; weak medium granular structure; very friable; few fine and medium roots; very strongly acid; abrupt wavy boundary.
Bt1—8 to 23 inches; brownish yellow (10YR 6/8) sandy clay loam; few fine faint strong brown mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and medium roots; common fine pores; very strongly acid; clear wavy boundary.
Bt2—23 to 40 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium distinct light brownish gray (10YR 6/2) mottles and common fine distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and medium roots; common fine pores; very strongly acid; diffuse wavy boundary.
BC—40 to 57 inches; light yellowish brown (10YR 6/4) sandy clay loam; common medium distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; very friable; few medium white (10YR 8/1) sand pockets; few fine and medium roots; few fine pores; very strongly acid; gradual wavy boundary.
C1—57 to 72 inches; light yellowish brown (10YR 6/4) fine sandy loam, common medium white (10YR 8/1) sand pockets; common medium distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/8) mottles; massive; very friable; few fine and medium roots; very strongly acid; clear wavy boundary.
C2—72 to 80 inches; light yellowish brown (10YR 6/4) loamy fine sand, common medium white (10YR 8/1) sand pockets; common medium distinct light gray (10YR 7/2) mottles and many medium and coarse distinct strong brown (7.5YR 5/8) mottles; single grained; loose; strongly acid.

Altavista soils have sandy A and E horizons and a loamy B horizon, 38 to 65 inches thick underlain by loamy or sandy sediment. The soil ranges from very strongly acid to medium acid except where lime has been added.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 1 to 3.

The E horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 3 or 4.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 8; or it has hue of 7.5YR, value of 5 or 6, and chroma of 6 or 8. Mottles that have chroma of 2 or less are within the upper 24 inches of the Bt horizon. In some pedons, the lower part of the Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. The Bt horizon is commonly sandy clay loam or clay loam but ranges to sandy loam and fine sandy loam.

The C horizon has hue of 10YR or 2.5Y, value of 6 to 8, and chroma of 1 to 4. It is sandy or loamy sediment.

Arapahoe Series

The Arapahoe series consists of very poorly drained soils that formed in moderately coarse-textured sediment. The soils are on low marine and stream terraces. Slope ranges from 0 to 2 percent.

Typical pedon of Arapahoe loamy fine sand; 2.3 miles north of Alliance on State Road 1200, 0.8 mile north on State Road 1202, 0.5 mile north on a farm path and 50 feet east of path:

Ap—0 to 11 inches; black (10YR 2/1) loamy fine sand; weak medium granular structure; very friable; many fine roots; medium acid; clear smooth boundary.
A—11 to 17 inches; very dark brown (10YR 2/2) loamy fine sand; weak medium granular structure; very friable; common fine roots; strongly acid; gradual wavy boundary.
Bg1—17 to 21 inches; dark gray (10YR 4/1) fine sandy loam; common medium faint grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; very friable; few fine roots; common fine pores; strongly acid; gradual wavy boundary.
Bg2—21 to 30 inches; dark gray (10YR 4/1) fine sandy loam; common medium faint gray (10YR 6/1) mottles and few medium distinct dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; very friable; common fine pores; few thin lenses of sandy clay loam; strongly acid; gradual wavy boundary.
BCg—30 to 42 inches; dark gray (10YR 4/1) fine sandy loam; common medium distinct gray (10YR 6/1) and dark yellowish brown (10YR 4/4) mottles; massive; very friable; common pockets of loamy sand and sandy clay loam; slightly acid; gradual wavy boundary.
Cg1—42 to 60 inches; gray (10YR 5/1) loamy fine sand; massive; very friable; common pockets of sand; neutral; abrupt smooth boundary.
Cg2—60 to 80 inches; dark greenish gray (5GY 4/1) loamy fine sand; massive; common thin lenses of loam and clay loam; neutral.

Arapahoe soils have a sandy A horizon and loamy B horizon 24 to 60 inches thick underlain by loamy or sandy sediment. The surface layer and the subsoil range from extremely acid to strongly acid except where lime has been added. The underlying material ranges from medium acid to mildly alkaline.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2 or 3. The A horizon is 10 to 24 inches thick.

The Bg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. It is fine sandy loam, sandy loam, or loam.

The Cg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2; or it has hue of 5GY, 5G, or 5BG, value of 4 or 5, and chroma of 1. This horizon is sandy or loamy sediment. A 2Cg horizon that contains shell fragments occurs in many pedons. This horizon can be at any depth between 60 and 84 inches.

Argent Series

The Argent series consists of poorly drained soils that formed in fine-textured sediment. The soils are on low marine and stream terraces. Slope ranges from 0 to 2 percent.

Typical pedon of Argent loam; 1 mile south of Stonewall on State Road 1337 and 100 feet east of road:

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) loam; weak medium granular structure; very friable; many fine roots; neutral; clear smooth boundary.
BEg—6 to 11 inches; dark gray (10YR 4/1) clay loam; weak fine subangular blocky structure; firm, slightly sticky and slightly plastic; few fine roots; common fine pores; slightly acid; clear wavy boundary.
Btg1—11 to 20 inches; gray (10YR 5/1) clay; many medium faint dark gray (10YR 4/1) mottles and common medium distinct yellowish red (5YR 5/8) and strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; very firm, sticky and plastic; few fine roots; few fine pores; strongly acid; clear wavy boundary.
Btg2—20 to 36 inches; light brownish gray (10YR 6/2) clay; common medium distinct yellowish brown (10YR 5/8) mottles and common medium faint yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; firm, sticky and plastic; very strongly acid; gradual wavy boundary.
BCg—36 to 46 inches; gray (10YR 6/1) sandy clay loam; common medium distinct yellowish brown (10YR 5/8) mottles and common medium faint yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; medium acid; gradual wavy boundary.
Cg1—46 to 51 inches; gray (10YR 6/1) fine sandy loam; common medium distinct yellowish brown (10YR 5/8) mottles; massive; very friable; slightly acid; clear wavy boundary.
Cg2—51 to 61 inches; gray (10YR 6/1) stratified loamy fine sand and fine sandy loam; common medium distinct yellowish brown (10YR 5/6) mottles; massive; very friable; neutral; clear wavy boundary.
Cg3—61 to 75 inches; gray (5Y 5/1) fine sandy loam, lenses and pockets of loamy fine sand and loam; common medium distinct yellowish brown (10YR 5/8) mottles and common medium faint yellowish brown (10YR 5/4) mottles; massive; very friable; neutral; abrupt smooth boundary.
Cg4—75 to 80 inches; dark greenish gray (5G 4/1) loamy fine sand; massive; very friable; moderately alkaline.

Argent soils have loamy and clayey horizons 40 to 70 inches thick underlain by loamy or sandy sediment. Except where lime has been added, the soil ranges from medium acid to very strongly acid in the surface layer and subsoil. The underlying material ranges from medium acid to moderately alkaline.

The A or Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It is less than 10 inches thick.

The Btg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 4 to 7. The Btg horizon is clay, clay loam, or sandy clay.

The Cg horizon has hue of 10YR to 5Y, 5G, or 5GY, value of 4 to 7, and chroma of 1; or it is neutral and has value of 4 to 7. This horizon is loamy or sandy sediment. A 2Cg horizon that contains shell fragments occurs in many pedons. This horizon can be at any depth between 72 and 84 inches.

Ballahack Series

The Ballahack series consists of very poorly drained soils that formed in moderately fine-textured sediment. They are on low marine and stream terraces. Slope is less than 2 percent.

Typical pedon of Ballahack fine sandy loam, occasionally flooded; 0.5 mile east of Arapahoe on State Road 1300, 0.3 mile north on a farm path and 20 feet east of path:

A1—0 to 11 inches; black (10YR 2/1) fine sandy loam; weak medium granular structure; very friable; common fine and medium roots; very strongly acid; gradual irregular boundary.

A2—11 to 37 inches; very dark brown (10YR 2/2) fine sandy loam; weak medium granular structure; very friable; common fine roots; very strongly acid; clear irregular boundary.

Cg1—37 to 49 inches; grayish brown (10YR 5/2) sandy clay loam; few fine distinct strong brown (7.5YR 5/8) and brownish yellow (10YR 6/6) mottles; massive; friable, slightly sticky and slightly plastic; very strongly acid; gradual wavy boundary.

Cg2—49 to 80 inches; gray (10YR 5/1) fine sandy loam; few fine distinct strong brown (7.5YR 5/8) and brownish yellow (10YR 6/6) mottles; massive; very friable; strongly acid.

Ballahack soils have loamy horizons 40 to 80 inches thick underlain by sandy or loamy sediment. Except where lime has been added, the soils range from extremely acid to strongly acid in the surface layer and the upper part of the underlying material. The lower part of the underlying material ranges from very strongly acid to mildly alkaline.

The A or Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It ranges from 24 to 48 inches thick.

The Cg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2; hue of 5GY or 5G, value of 4 to 6, and chroma of 1; or it is neutral and has value of 4 to 7. This horizon is sandy or loamy sediment. A 2Cg horizon that has many shell fragments occurs in some pedons. This horizon can be at any depth between 60 and 84 inches.

Baymeade Series

The Baymeade series consists of well drained soils that formed in moderately coarse-textured sediment. The soils are on uplands. Slope ranges from 1 to 6 percent.

Typical pedon of Baymeade sand, 1 to 6 percent slopes; 1.6 miles north of Minnesott Beach on North Carolina Highway 306 and 100 feet east, in woods:

A—0 to 7 inches; dark gray (10YR 4/1) sand; weak fine granular structure; loose; common fine and medium roots; many light gray (10YR 7/1) uncoated sand grains; very strongly acid; clear wavy boundary.

E—7 to 12 inches; light gray (10YR 7/2) sand; single grained; loose; common fine and medium roots; very strongly acid; abrupt wavy boundary.

E/Bh—12 to 17 inches; (E part) light gray (10YR 7/1) and (Bh part) dark brown (7.5YR 4/4) sand; common medium distinct light gray (10YR 7/1) mottles; single grained; loose; common weakly cemented and brittle dark brown (7.5YR 3/4) nodules stained with organic matter; massive; very friable; few fine and medium roots; strongly acid; clear wavy boundary.

E —17 to 30 inches; pale yellow (2.5Y 7/4) sand; single grained; loose; medium acid; abrupt wavy boundary.

Bt—30 to 41 inches; strong brown (7.5YR 5/8) sandy loam; weak medium subangular blocky structure; very friable; strongly acid; gradual wavy boundary.

BC—41 to 50 inches; reddish yellow (7.5YR 6/8) loamy sand; massive; very friable; strongly acid; clear wavy boundary.

C1—50 to 69 inches; brownish yellow (10YR 6/8) sand; single grained; loose; medium acid; gradual wavy boundary.

C2—69 to 80 inches; very pale brown (10YR 7/3) sand; common medium distinct brownish yellow (10YR 6/8) mottles; single grained; loose; medium acid.

Baymeade soils have sandy A and E horizons, 20 to 40 inches thick, and a loamy Bt horizon. The soil ranges from very strongly acid to slightly acid except where lime has been added.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 1.

The E horizon has hue of 10YR or 2.5Y, value of 6 to 8, and chroma of 1 or 2. In addition to these colors, the E' horizon and E part of the E/Bh horizon can have hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 3 or 4. The E horizon is sand, and the Bh part of the E/Bh horizon is weakly to strongly cemented, brittle nodules and pockets of organic strained sand that make up 5 to 20 percent of the entire horizon. The Bh material has hue of 7.5YR or 10YR, value of 3 to 6, and chroma of 2 to 6.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 4 to 8. It is fine sandy loam, sandy loam, or sandy clay loam.

The C horizon has hue of 10YR or 2.5Y, value of 6 to 8, and chroma of 1 to 8. It is sandy or loamy sediment.

Belhaven Series

The Belhaven series consists of very poorly drained soils that formed in moderately thick beds of organic material underlain by moderately fine- to coarse-textured sediment. The soils are on low marine terraces. Slope is less than 2 percent.

Typical pedon of Belhaven muck; 1.1 miles south of Bayboro on State Road 1343, 0.9 mile south on a farm path, 1.2 miles southeast on a farm path and 100 feet north of path:

Op—0 to 10 inches; black (10YR 2/1) broken face and rubbed muck; about 20 percent fiber, less than 1 percent rubbed; moderate medium granular structure; very friable; many fine and medium roots; extremely acid; clear smooth boundary.

Oa—10 to 28 inches; dark reddish brown (5YR 2/2) broken face and rubbed muck; about 10 percent fiber, less than 1 percent rubbed; massive; very friable; slightly sticky, greasy and paste-like when wet; common fine and medium roots; extremely acid; clear wavy boundary.

2A—28 to 36 inches; very dark brown (10YR 2/2) mucky fine sandy loam; massive; very friable; very strongly acid; gradual wavy boundary.

2Cg1—36 to 59 inches; dark gray (10YR 4/1) sandy clay loam, common lenses and pockets of fine sandy loam; massive; friable, slightly sticky and slightly plastic; very strongly acid; gradual wavy boundary.

2Cg2—59 to 80 inches; dark greenish gray (5G 4/1) fine sandy loam; massive; very friable; small pieces of decaying wood; neutral.

Belhaven soils have a highly decomposed organic horizon 16 to 51 inches thick. The organic horizon is extremely acid except where lime has been added. The underlying mineral horizon ranges from extremely acid to moderately alkaline. Buried logs, stumps, and wood fragments are up to 20 percent of the soil volume.

The organic horizon has hue of 10YR, 5YR, or 2.5YR, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2 or 3. The surface layer consists of muck and has granular structure. The lower part of this horizon is massive, has fewer roots than the surface layer, and is very greasy and paste-like when wet. Ten inches or more of the lower part of the organic horizon has hue of 5YR or 2.5YR. If drained and aerated, the otherwise massive organic material forms blocky structure. If this material dries completely, it hardens and will not rewet.

The underlying mineral horizon has hue of 10YR to 5Y, value of 2 to 6, and chroma of 1 or 2. The lower part of this horizon may have hue of 5GY or 5G, value of 4 to 6, and chroma of 1. The underlying horizon is loamy in the upper 12 inches or more and sandy, loamy, or clayey sediment in the lower part.

Brookman Series

The Brookman series consists of very poorly drained soils that formed in fine-textured sediment. The soils are on low marine and stream terraces. Slope is less than 1 percent.

Typical pedon of Brookman mucky silt loam; 2.1 miles south of Stonewall on State Road 1337, 0.3 mile south on a farm path, 100 feet south of path:

A—0 to 20 inches; black (10YR 2/1) mucky silt loam; weak medium granular structure; very friable; common fine and medium roots; very strongly acid; clear smooth boundary.

Btg1—20 to 24 inches; dark grayish brown (10YR 4/2) clay loam; weak medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine roots; common fine pores; strongly acid; clear wavy boundary.

Btg2—24 to 60 inches; dark gray (10YR 4/1) clay; few fine and medium distinct red (2.5YR 4/8) mottles; moderate fine and medium angular blocky structure; very firm, sticky and plastic; few fine roots; few fine pores; common distinct clay films on faces of peds; strongly acid; clear wavy boundary.

BCg—60 to 68 inches; light brownish gray (10YR 6/2) clay loam; common medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; firm, slightly sticky and slightly plastic; strongly acid; abrupt smooth boundary.

2Cg—68 to 80 inches; dark greenish gray (5GY 4/1) marly fine sandy loam; massive; friable; many fine and medium shell fragments; mildly alkaline.

Brookman soils have a loamy A horizon and clayey B horizon 40 to 70 inches thick underlain by loamy or sandy sediment. The soils range from very strongly acid to slightly acid in the A horizon and very strongly acid to mildly alkaline in the B and C horizons.

The A or Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2 or 3. This horizon is 10 to 20 inches thick and is mucky silt loam or mucky loam.

The Btg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 4 to 7. The Btg horizon is clay, clay loam, or sandy clay.

The Cg horizon has hue of 10YR to 5G, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 4 to 7. This horizon is loamy or sandy sediment. The 2Cg horizon can occur at any depth between 60 and 84 inches. Some pedons do not have a 2Cg horizon.

Charleston Series

The Charleston series consists of moderately well drained soils that formed in moderately coarse-textured sediment. The soils are on low marine and stream terraces. Slope ranges from 0 to 2 percent.

Typical pedon of Charleston loamy fine sand; 1.9 miles northeast of Bayboro on North Carolina Highway 304; 0.3 mile south of State Road 1209; 0.4 mile east on a farm path and 100 feet north of path:

Ap—0 to 7 inches; very dark gray (10YR 3/1) loamy fine sand; weak medium granular structure; very friable; common fine and medium roots; neutral; abrupt smooth boundary.

E—7 to 14 inches; light yellowish brown (10YR 6/4) loamy fine sand; weak medium granular structure; very friable; few fine roots; strongly acid; clear wavy boundary.

Bt1—14 to 22 inches; brownish yellow (10YR 6/6) fine sandy loam; common fine and medium distinct strong brown (7.5YR 5/8) and pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; very friable; few fine roots; very strongly acid; clear wavy boundary.

Bt2—22 to 38 inches; light yellowish brown (2.5Y 6/4) fine sandy loam; common medium distinct light gray (2.5Y 7/2) and strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; very friable; very strongly acid; gradual wavy boundary.

BCg—38 to 55 inches; light gray (10YR 7/1) fine sandy loam; common medium distinct yellowish brown (10YR 5/6) and light yellowish brown (2.5Y 6/4) mottles; weak medium and coarse subangular blocky structure; very friable; medium acid; clear wavy boundary.

Cg1—55 to 69 inches; gray (5Y 6/1) loamy fine sand; common medium faint pale olive (5Y 6/3) and few fine distinct brownish yellow (10YR 6/8) mottles; massive; very friable; mildly alkaline; clear smooth boundary.

2Cg2—69 to 80 inches; greenish gray (5GY 5/1) fine sand; common fine and medium shell fragments; massive; very friable; mildly alkaline.

Charleston soils have sandy A and E horizons and a loamy B horizon 35 to 60 inches thick underlain by sandy or loamy sediment. The soils range from very strongly acid to medium acid in the A, E, and B horizons except where lime has been added. The C horizon ranges from very strongly acid to mildly alkaline.

The A or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2.

The E horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 4.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. Mottles that have chroma of 2 or less are within the upper 10 inches of the Bt horizon. The Bt horizon is fine sandy loam or sandy loam.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2; hue of 5GY or 5G, value of 5 or 6, and chroma of 1; or it is neutral and has value of 5 to 7. This horizon is sandy sediment. The 2Cg horizon has colors similar to those of the Cg horizon. This horizon contains shell fragments in many pedons. It can occur at any depth between 60 and 84 inches.

The Charleston soils in Pamlico County are taxadjuncts to the Charleston series because the C horizon has a more alkaline reaction than is allowed for the series. The use and management of the Charleston soils are similar to those of the Charleston series.

Conetoe Series

The Conetoe series consists of well drained soils that formed in moderately coarse-textured sediment. The soils are on low marine and stream terraces. Slope ranges from 0 to 5 percent.

Typical pedon of Conetoe loamy sand, 0 to 5 percent slopes; 1.9 miles southwest of Reelsboro on State Road 1103; 4.7 miles south on a logging road and 20 feet east of road:

A—0 to 4 inches; dark grayish brown (10YR 4/2) loamy sand; single grained; loose; common fine and medium roots; very strongly acid; abrupt wavy boundary.

E—4 to 36 inches; pale brown (10YR 6/3) loamy sand; weak medium granular structure; very friable; few fine roots; very strongly acid; clear wavy boundary.

Bt—36 to 51 inches; brownish yellow (10YR 6/6) sandy loam; few fine faint pale brown and reddish yellow mottles; weak medium subangular blocky structure; very friable; very strongly acid; gradual wavy boundary.

C1—51 to 67 inches; pale yellow (2.5Y 7/4) loamy sand; common medium faint brownish yellow (10YR 6/6) and light gray (10YR 7/2) mottles; single grained; loose; very strongly acid; clear wavy boundary.

C2—67 to 80 inches; light gray (2.5Y 7/2) sand; single grained; loose; very strongly acid.

Conetoe soils have sandy A and E horizons 20 to 40 inches thick underlain by a loamy Bt horizon. The soils range from very strongly acid to medium acid except where lime has been added.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 1 to 3; or it has hue of 2.5Y, value of 4 or 5, and chroma of 2.

The E horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 3 to 8. It is loamy sand, loamy fine sand, or sand.

The Bt horizon has hue of 7.5YR, value of 5 or 6, and chroma of 6 or 8; or it has hue of 10YR, value of 5 to 7,

and chroma of 4 to 8. The Bt horizon is sandy loam or fine sandy loam.

The C horizon has hue of 7.5YR, value of 5 or 6, and chroma of 6 or 8; or it has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 1 to 8. The C horizon is sandy sediment.

Craven Series

The Craven series consists of moderately well drained soils that formed in fine-textured sediment. The soils are on uplands. Slope ranges from 1 to 4 percent.

Typical pedon of Craven loam, 1 to 4 percent slopes; 1 mile east of Olympia on North Carolina Highway 55 and 50 feet south of road:

Ap—0 to 5 inches; brown (10YR 5/3) loam; weak medium granular structure; very friable; many fine roots; medium acid; abrupt smooth boundary.

Bt1—5 to 19 inches; brownish yellow (10YR 6/6) clay; few fine distinct strong brown (7.5YR 5/8) mottles; moderate fine and medium angular blocky structure; very firm, sticky and plastic; many distinct clay films on faces of peds; few fine roots; common fine pores; very strongly acid; clear wavy boundary.

Bt2—19 to 35 inches; brownish yellow (10YR 6/6) clay; common fine and medium faint light brownish gray (10YR 6/2) mottles and few fine prominent red (10R 4/6) mottles; moderate fine and medium angular blocky structure; very firm, sticky and plastic; many distinct clay films on faces of peds; few fine pores; very strongly acid; gradual wavy boundary.

BCg—35 to 44 inches; light brownish gray (10YR 6/2) sandy clay; common medium faint brownish yellow (10YR 6/6) mottles and few fine distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; firm, sticky and plastic; very strongly acid; gradual wavy boundary.

C—44 to 65 inches; brownish yellow (10YR 6/6) sandy clay loam; many medium distinct yellowish brown (10YR 5/8) mottles, common medium faint light brownish gray (10YR 6/2) mottles, and common medium distinct strong brown (7.5YR 5/8) mottles; massive; friable, slightly sticky and slightly plastic; very strongly acid; gradual wavy boundary.

Cg—65 to 80 inches; light brownish gray (10YR 6/2) fine sandy loam; common medium distinct yellow (10YR 6/6) mottles and few fine distinct strong brown (7.5YR 5/8) mottles; massive; very friable; very strongly acid.

Craven soils have loamy and clayey horizons 40 to 60 inches thick underlain by sandy, loamy, or clayey sediment. The soils range from extremely acid to strongly acid except where lime has been added.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 3.

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 of the Bt horizon has similar colors and few to many mottles in 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 has mottles in shades of red, yellow, or brown. The Bt horizon is clay loam, silty clay, or clay.

The C horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. The Cg horizon has similar hue and value, but has chroma of 1 or 2. The C and Cg horizons are sandy, loamy, or clayey sediment.

Croatan Series

The Croatan series consists of very poorly drained soils that formed in moderately thick beds of organic material underlain by moderately coarse to moderately fine textured sediment. The soils are on uplands. Slope is less than 2 percent.

Typical pedon of Croatan muck; 6.2 miles north of Grantsboro on North Carolina Highway 306; 3 miles west on a logging road and 25 feet southwest of road:

Oa1—0 to 8 inches; black (10YR 2/1) broken face and rubbed muck; about 25 percent fiber, less than 5 percent rubbed; moderate medium granular structure; very friable; many fine and medium roots; extremely acid; gradual wavy boundary.

Oa2—8 to 25 inches; black (10YR 2/1) broken face and rubbed muck; about 10 percent fiber, less than 1 percent rubbed; massive; very friable; common fine and medium roots; extremely acid; clear wavy boundary.

2A—25 to 32 inches; very dark brown (10YR 2/2) mucky fine sandy loam; massive; very friable; very strongly acid; clear wavy boundary.

2Cg1—32 to 50 inches; gray (10YR 5/1) sandy clay loam; few fine faint pale brown mottles; massive; friable; very strongly acid; gradual wavy boundary.

2Cg2—50 to 80 inches; gray (10YR 6/1) stratified sandy loam and loamy sand; massive; very friable; very strongly acid.

Croatan soils have a highly decomposed organic horizon 16 to 51 inches thick underlain by sandy, loamy, or clayey sediment. The organic horizon is extremely acid except where lime has been added. The underlying mineral horizon ranges from extremely acid to slightly acid. Buried logs, stumps, and wood fragments make up as much as 10 percent of the volume of the organic horizon.

The organic horizon has hue of 7.5YR to 5Y, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2 or 3. The surface layer consists of muck and has granular structure. The lower part of the organic horizon is massive.

The underlying mineral horizon has hue of 5YR to 5Y, value of 2 to 6, and chroma of 1 to 3 in the upper part. The lower part of the mineral horizon has hue of 5GY or 5G, value of 4 to 6, and chroma of 1. The mineral horizon is loamy in the upper 12 inches or more and sandy, loamy, or clayey sediment in the lower part.

Dare Series

The Dare series consists of vary poorly drained soils that formed in thick beds of organic material. The soils are on uplands and low marine terraces. Slope is less than 1 percent.

Typical pedon of Dare muck; 1.7 miles east of Arapahoe on State Road 1300; 4.2 miles north on a logging road; 50 feet west of road along ditch:

Oa1—0 to 12 inches; black (N 2/0) broken face and rubbed muck; about 20 percent fiber, less than 1 percent rubbed; moderate medium granular structure; very friable, slightly sticky; many fine roots; common medium pieces of charcoal; extremely acid; clear wavy boundary.

Oa2—12 to 29 inches; black (10YR 2/1) broken face and rubbed muck; about 15 percent fiber, less than 1 percent rubbed; massive; very friable, slightly sticky, greasy and paste-like when wet; few fine roots; common buried stumps, logs, and wood fragments; few medium pieces of charcoal; extremely acid; gradual smooth boundary.

Oa3—29 to 61 inches; dark reddish brown (5YR 3/2) broken face and rubbed muck; about 20 percent fiber, less than 1 percent rubbed; massive; very friable, slightly sticky, greasy and paste-like when wet; few fine pieces of charcoal; few buried stumps, logs, and wood fragments; extremely acid; clear wavy boundary.

2Cg1—61 to 66 inches; dark reddish brown (5YR 3/2) mucky sand; massive; very friable; extremely acid; gradual wavy boundary.

2Cg2—66 to 80 inches; very dark grayish brown (10YR 3/2) sand; massive; very friable; very strongly acid.

Dare soils have a highly decomposed organic horizon 51 to 84 inches thick in most places but ranging to 108 inches thick in a few small areas. The organic horizon is extremely acid except where lime has been added, and the underlying mineral horizon ranges from extremely acid to medium acid. Buried logs, stumps, and wood fragments occupy up to 25 percent of the volume of the organic horizon.

The surface layer has hue of 10YR, value of 2, and chroma of 1 or 2; hue of 5YR, value of 2, and chroma of 1; or it is neutral and has value of 2.

The subsurface tier has hue of 2.5YR or 5YR, value of 2 or 3, and chroma of 1 or 2; hue of 10YR, value of 2, and chroma of 1 or 2; or it is neutral and has value of 2. Ten inches or more of the subsurface tier has hue of 2.5YR or 5YR. The organic material is massive when wet. If drained and aerated, it forms blocky structure. If this material dries over a short period, it hardens and will not rewet.

The underlying mineral horizon has hue of 5YR or 7.5YR, value of 3 or 4, and chroma of 2 to 4; or hue of 10YR to 5Y, value of 3 to 6, and chroma of 1 to 4; or hue of 5GY or 5G, value of 4 to 6, and chroma of 1, in addition to the colors of the organic horizon. The mineral horizon is sandy sediment. Thin layers of loamy material occur in some pedons.

Dogue Series

The Dogue series consists of moderately well drained soils that formed in fine-textured sediment. The soils are on low marine and stream terraces. Slope ranges from 1 to 4 percent.

Typical pedon of Dogue fine sandy loam, 1 to 4 percent slopes, 0.3 mile east of Arapahoe on State Road 1300; 4.2 miles south on State Road 1301 and 75 feet west of road:

Ap—0 to 6 inches; brown (10YR 5/3) fine sandy loam; weak medium granular structure; very friable; common fine roots; medium acid; abrupt smooth boundary.

Bt1—6 to 16 inches; brownish yellow (10YR 6/8) sandy clay; few fine distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; common faint clay films on faces of peds; few fine roots; common fine pores; strongly acid; clear wavy boundary.

Bt2—16 to 37 inches; brownish yellow (10YR 6/8) sandy clay; few fine distinct strong brown (7.5YR 5/8) mottles, few fine faint yellowish brown and light brownish gray mottles, and few fine prominent red (2.5YR 5/8) mottles; moderate medium subangular blocky structure; very firm, sticky and plastic; common distinct clay films on faces of peds; few fine roots; few fine pores; very strongly acid; gradual wavy boundary.

Bt3—37 to 44 inches; pale brown (10YR 6/3) sandy clay; few fine distinct strong brown (7.5YR 5/8) and gray (N 6/0) mottles, common medium faint light brownish gray (10YR 6/2) and brownish yellow (10YR 6/6) mottles, and few fine prominent red (2.5YR 5/8) mottles; weak medium subangular blocky structure; very firm, sticky and plastic; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

BCg—44 to 58 inches; light brownish gray (10YR 6/2) sandy clay loam; common medium distinct brownish yellow (10YR 6/6) and yellowish brown (10YR 5/8) mottles and few fine prominent red (2.5YR 5/8) mottles; weak medium subangular blocky structure;

firm, slightly sticky and slightly plastic; very strongly acid; clear wavy boundary.
C1—58 to 66 inches; brownish yellow (10YR 6/6) fine sandy loam; few fine distinct light gray (10YR 7/1) and strong brown (7.5YR 5/8) mottles; massive; very friable; very strongly acid; clear wavy boundary.
C2—66 to 80 inches; yellow (10YR 7/6) loamy fine sand; single grained; loose; very strongly acid.

Dogue soils have a loamy A horizon and clayey B horizon 40 to 60 inches thick. The soil ranges from extremely acid to strongly acid except where lime has been added.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 or 3.

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 of the Bt horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 0 to 8. The Bt horizon is clay, clay loam, or sandy clay.

The C horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Some pedons have a C horizon that has dominant chroma of 3 or more and mottles in shades of gray, red, yellow, or brown. The C horizon is sandy or loamy sediment.

Fork Series

The Fork series consists of somewhat poorly drained soils that formed in moderately fine-textured sediment. The soils are on low marine and stream terraces. Slope ranges from 0 to 2 percent.

Typical pedon of Fork loamy fine sand; 3.3 miles northeast of Bayboro on North Carolina Highway 304; 0.2 mile north on State road 1215; 0.1 mile east on a farm path and 50 feet east of path:

Ap—0 to 8 inches; brown (10YR 5/3) loamy fine sand; weak medium granular structure; very friable; few fine roots; strongly acid; clear wavy boundary.
Bt—8 to 14 inches; brownish yellow (10YR 6/6) sandy clay loam; few fine faint light brownish gray mottles and common medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; very strongly acid; clear wavy boundary.
Btg1—14 to 25 inches; gray (10YR 6/1) sandy clay loam; common fine faint brownish yellow mottles and many medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; very strongly acid; gradual wavy boundary.
Btg2—25 to 38 inches; light gray (10YR 7/1) sandy clay loam; few fine faint white mottles and common medium distinct strong brown (7.5YR 5/8) and brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine pores; very strongly acid; gradual wavy boundary.
BCg—38 to 49 inches; light gray (10YR 7/1) fine sandy loam; many medium distinct brownish yellow (10YR 6/6) mottles and few fine distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; very friable; strongly acid; gradual wavy boundary.
Cg1—49 to 57 inches; light gray (10YR 7/1) fine sandy loam; many medium distinct pale brown (10YR 6/3) mottles and few fine distinct strong brown (7.5YR 5/8) mottles; massive; very friable; slightly acid; gradual wavy boundary.
Cg2—57 to 69 inches; gray (N 6/0) fine sandy loam; common medium distinct brownish yellow (10YR 6/6) and strong brown (7.5YR 5/8) mottles; massive; very friable; neutral; clear wavy boundary.
Cg3—69 to 80 inches; dark greenish gray (5GY 4/1) fine sand; single grained; loose; neutral.

Fork soils have a sandy A horizon and a loamy B horizon 40 to 60 inches thick underlain by sandy or loamy sediment. The soils are very strongly acid or strongly acid in the A horizon and upper part of the B horizon except where lime has been added. The lower part of the B horizon and the C horizon range from strongly acid to neutral.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 to 3.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. Some pedons do not have a Bt horizon. The Btg horizon begins within a depth of 20 inches. It has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Mottles in shades of red, yellow, brown, and gray are common to many. The Bt and Btg horizons are sandy clay loam or clay loam.

The Cg horizon has hue of 10YR to 5GY, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 4 to 7. This horizon is sandy or loamy sediment. A 2Cg horizon that contains shell fragments is in many pedons. This horizon can occur at any depth between 60 and 84 inches.

Goldsboro Series

The Goldsboro series consists of moderately well drained soils that formed in moderately fine-textured sediment. The soils are on uplands. Slope is 0 to 2 percent.

Typical pedon of Goldsboro loamy fine sand, 0 to 2 percent slopes; 1.7 miles north of Olympia on State Road 1126 and 200 feet west of road:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loamy fine sand; weak medium granular structure; very

friable; common fine roots; slightly acid; abrupt smooth boundary.

E—8 to 11 inches; light yellowish brown (10YR 6/4) loamy fine sand; weak medium granular structure; very friable; few fine roots; slightly acid; abrupt wavy boundary.

Bt1—11 to 24 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium distinct reddish yellow (7.5YR 6/8) mottles and common medium faint pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; very strongly acid; clear wavy boundary.

Bt2—24 to 36 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium distinct reddish yellow (7.5YR 6/8) and light gray (10YR 7/2) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine pores; very strongly acid; clear wavy boundary.

BCg—36 to 65 inches; light gray (10YR 7/2) sandy clay loam; common medium distinct strong brown (7.5YR 5/8) mottles, few fine prominent yellowish red (5YR 5/8) mottles, and many medium distinct brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common pockets and lenses of fine sandy loam; very strongly acid; gradual wavy boundary.

Cg—65 to 80 inches; light gray (10YR 7/2) sandy clay loam; common medium distinct brownish yellow (10YR 6/6) and strong brown (7.5YR 5/8) mottles; weak medium platy structure; friable, slightly sticky and slightly plastic; common pockets and lenses of sandy loam; very strongly acid.

Goldsboro soils have sandy A and E horizons and a loamy B horizon 60 to 80 inches thick underlain by sandy or loamy sediment. The soils are very strongly acid or strongly acid except where lime has been added.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 or 2.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 8. Mottles are in shades of yellow, brown, red, or gray. Mottles that have chroma of 2 or less are within 30 inches of the surface. The Bt horizon is sandy clay loam.

The C or Cg horizon is similar in color to the Bt horizon and is sandy, loamy, or clayey sediment.

Hobucken Series

The Hobucken series consists of very poorly drained soils that formed in moderately coarse-textured sediment. The soils are in marshes. Slope is less than 1 percent.

Typical pedon of Hobucken muck, frequently flooded; 0.7 mile east of Hobucken on State Road 1228 and 100 feet south of road:

Oe—0 to 6 inches; black (10YR 2/1) broken face and rubbed muck; 60 percent fiber, about 30 percent rubbed, about 50 percent mineral; massive; very friable; many fine and medium roots; neutral; medium acid after drying; gradual wavy boundary.

A—6 to 16 inches; black (10YR 2/1) mucky fine sandy loam; massive; very friable; many fine roots; mildly alkaline, neutral after drying; gradual wavy boundary.

Cg1—16 to 36 inches; dark gray (10YR 4/1) fine sandy loam; massive; very friable; slightly fluid; common pockets and lenses of loamy fine sand; few fine roots; moderately alkaline, neutral after drying; clear wavy boundary.

Cg2—36 to 64 inches; gray (N 6/0) fine sandy loam; many medium distinct light olive brown (2.5Y 5/4) mottles; massive; very friable; few fine roots; moderately alkaline, no change after drying; diffuse wavy boundary.

Cg3—64 to 80 inches; greenish gray (5GY 5/1) loamy fine sand; massive; very friable; few fine shell fragments; moderately alkaline, no change after drying.

Hobucken soils have a loamy A horizon high in organic matter content underlain by a loamy and sandy C horizon. Many pedons have an organic surface layer less than 7 inches thick. The soils range from slightly acid to moderately alkaline in their natural setting. In some pedons, air-dried soils become extremely acid. Salt concentration generally ranges from 5 to 25 parts per thousand. Subhorizons between depths of 8 and 20 inches are typically slightly fluid.

The O horizon is neutral and has value of 2; or it has hue of 10YR, value of 2, and chroma of 1 or 2. Some pedons do not have an O horizon.

The A horizon has hue of 10YR to 5Y, value of 2 or 3, and chroma of 1 or 2.

The Cg horizon is neutral and has value of 4 to 7; or it has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2; or hue of 5GY or 5G, value of 5 to 6, and chroma of 1. This horizon is loamy or sandy sediment. Some pedons have thin strata of clayey material in the Cg horizon. A 2Cg horizon that contains shell fragments is in many pedons.

Lafitte Series

The Lafitte series consists of very poorly drained soils that formed in thick beds of organic material. The soils are in marshes. Slope is less than 1 percent.

Typical pedon of Lafitte muck, frequently flooded; 3.3 miles northeast of Bayboro on North Carolina Highway 304; 0.2 mile east on State Road 1211; south on a farm path to end and 100 feet south of path:

Oe—0 to 7 inches; black (10YR 2/1) broken face and rubbed muck; 70 percent fiber, 30 percent rubbed;

massive; very friable; many fine roots; slightly acid; clear smooth boundary.

Oa1—7 to 28 inches; black (10YR 2/1) broken face and rubbed muck; 70 percent fiber, 16 percent rubbed; massive; very fluid (squeezes easily between fingers); few fine roots; slight sulfur odor; slightly acid; clear wavy boundary.

Oa2—28 to 80 inches; black (10YR 2/1) broken face and rubbed muck; 46 percent fiber, 10 percent rubbed; massive; very fluid (squeezes easily between fingers); neutral.

Lafitte soils have an organic horizon 51 to 80 inches thick underlain by sandy, loamy, or clayey sediment. The soils range from slightly acid to moderately alkaline. Salt concentration generally ranges from 5 to 25 parts per thousand.

The organic horizon has hue of 10YR, value of 2, and chroma of 1 or 2; or it has hue of 7.5YR, value of 3, and chroma of 2.

Some pedons have a 2Cg horizon below a depth of 51 inches. It has hue of 5Y to 5GY, value of 4 or 5, and chroma of 1. The 2Cg horizon is sandy, loamy, or clayey sediment.

Leaf Series

The Leaf series consists of poorly drained soils that formed in fine-textured sediment on uplands. Slope ranges from 0 to 2 percent.

Typical pedon of Leaf silt loam; 0.4 mile west of Scott's Store on State Road 1100 and 25 feet south of road:

A—0 to 6 inches; very dark gray (10YR 3/1) silt loam; moderate medium granular structure; very friable; many fine and medium roots; very strongly acid; abrupt smooth boundary.

Btg1—6 to 30 inches; gray (10YR 5/1) clay; common medium distinct reddish yellow (7.5YR 6/8) and red (2.5YR 4/8) mottles; moderate coarse prismatic structure parting to moderate medium angular blocky; very firm, sticky and plastic; few fine roots; few fine pores; many distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg2—30 to 53 inches; gray (10YR 6/1) clay; common medium distinct reddish yellow (7.5YR 6/8) and yellow (10YR 7/8) mottles; moderate fine and medium angular blocky structure; very firm, sticky and plastic; few fine pores; many distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

BCg—53 to 72 inches; gray (10YR 6/1) sandy clay; many medium distinct reddish yellow (7.5YR 6/8) mottles and few fine prominent yellowish red (5YR 4/8) mottles; massive; very firm, sticky and plastic; very strongly acid; clear wavy boundary.

Cg—72 to 80 inches; greenish gray (5G 5/1) fine sandy loam; massive; very friable; few thin lenses of clay; very strongly acid.

Leaf soils have a loamy A horizon and clayey B horizon 60 to 80 inches thick. The soil ranges from extremely acid to strongly acid except where lime has been added.

The A or Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It is less than 10 inches thick.

The Btg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 4 to 7. The Btg horizon is clay, silty clay, or silty clay loam.

The Cg horizon has hue of 5Y, 5GY, or 5G, value of 4 to 6, and chroma of 1; or it has colors similar to those of the Btg horizon. The Cg horizon is sandy, loamy, or clayey sediment.

Lenoir Series

The Lenoir series consists of somewhat poorly drained soils that formed in fine-textured sediment. The soils are on uplands. Slope ranges from 0 to 2 percent.

Typical pedon of Lenoir silt loam; 0.5 mile west of Scott's Store on State Road 1100 and 50 feet north of road:

A—0 to 4 inches; very dark gray (10YR 3/1) silt loam; moderate medium granular structure; very friable; common fine and medium roots; very strongly acid; clear wavy boundary.

E—4 to 7 inches; pale brown (10YR 6/3) silt loam; moderate medium granular structure; very friable; common fine and medium roots; very strongly acid; gradual wavy boundary.

Bt—7 to 17 inches; yellowish brown (10YR 5/4) clay; common medium distinct light brownish gray (10YR 6/2) mottles and few fine and medium distinct yellowish red (5YR 5/8) and reddish yellow (7.5YR 6/8) mottles; moderate coarse prismatic primary structure parting to moderate medium angular blocky; very firm, sticky and plastic; few fine roots; few fine pores; many distinct clay films on faces of peds; very strongly acid; clear wavy boundary.

Btg—17 to 47 inches; light brownish gray (10YR 6/2) clay; common medium distinct reddish yellow (7.5YR 6/8) mottles and few fine prominent red (2.5YR 5/8) mottles; moderate coarse prismatic primary structure parting to moderate medium angular blocky; very firm, sticky and plastic; few fine roots and pores; many distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

BCg—47 to 67 inches; light brownish gray (10YR 6/2) sandy clay; common medium distinct reddish yellow (7.5YR 6/8) mottles; weak medium subangular blocky structure grading to weak medium platy in the

lower part; very firm, sticky and plastic; very strongly acid; clear wavy boundary.
Cg—67 to 80 inches; light brownish gray (10YR 6/2) sandy clay loam; few medium distinct strong brown (7.5YR 5/8) mottles; massive; very friable; common lenses of loamy fine sand and clay; very strongly acid.

Lenoir soils have loamy A and E horizons and a clayey B horizon 60 to 80 inches thick underlain by sandy, loamy, or clayey sediment. The soils range from extremely acid to strongly acid except where lime has been added.

The A or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2; or it has hue of 2.5Y, value of 4, and chroma of 2.

The E horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 4.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. Some pedons do not have a Bt horizon. The Btg horizon begins within a depth of 20 inches. It has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Mottles in shades of red, yellow, brown, or gray are common to many. The Bt and Btg horizons are clay, clay loam, silty clay loam, or silty clay.

The Cg horizon has colors similar to those of the Btg horizon, or has hue of 5Y, value of 5 to 7, and chroma of 1 or 2; or it is neutral and has value of 5 to 7. The Cg horizon is sandy, loamy, or clayey sediment.

Leon Series

The Leon series consists of poorly drained soils that formed in coarse-textured sediment. The soils are on uplands and stream terraces. Slope ranges from 0 to 5 percent.

Typical pedon of Leon sand; 1.7 miles west of Reelsboro on North Carolina Highway 55; 0.4 mile south on State Road 1131; 0.4 mile west on a private road and 20 feet north of road:

A—0 to 7 inches; black (N 2/0) sand; weak fine granular structure; very friable; many uncoated light gray (10YR 7/1) sand grains; salt and pepper appearance; many fine and medium roots; very strongly acid; abrupt wavy boundary.
Eg—7 to 15 inches; light gray (10YR 7/1) sand; single grained; loose; few fine roots; very strongly acid; abrupt wavy boundary.
Bh1—15 to 23 inches; black (10YR 2/1) sand; massive; weakly cemented and brittle; sand grains thickly coated with organic matter, few uncoated sand grains; few fine roots and pores; very strongly acid; clear wavy boundary.
Bh2—23 to 34 inches; very dark brown (10YR 2/2) sand; massive; very weakly cemented and slightly brittle; sand grains thickly coated with organic matter; few fine roots; very strongly acid; clear wavy boundary.
Bh3—34 to 55 inches; black (10YR 2/1) sand; massive; weakly cemented, slightly brittle; sand grains thickly coated with organic matter, few uncoated sand grains; very strongly acid; diffuse wavy boundary.
BC—55 to 80 inches; dark brown (10YR 4/3) sand; single grained; loose; common uncoated sand grains; very strongly acid.

Leon soils have sandy horizons 80 inches or more thick. The soils range from extremely acid to strongly acid except where lime has been added.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1; or it is neutral and has value of 2 to 4. Many uncoated sand grains mixed with sand grains coated with organic matter cause a salt and pepper appearance.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 1 or 2; or it is neutral and has value of 5 to 8.

The Bh horizon has hue of 10YR, 7.5YR, or 5YR, value of 2 or 3, and chroma of 1 to 3. This horizon is sand or fine sand, but it can have a loamy feel and appearance because of the organic matter content. It is weakly cemented and brittle. Some pedons have several sequences of E and Bh horizons.

Some pedons have a C horizon that has hue of 10YR or 2.5Y, value of 4 to 8, and chroma of 1 to 3. This horizon is sand or fine sand.

Lynchburg Series

The Lynchburg series consists of somewhat poorly drained soils that formed in moderately fine-textured sediment. The soils are on uplands. Slope ranges from 0 to 2 percent.

Typical pedon of Lynchburg fine sandy loam; 3.6 miles west of Arapahoe on State Road 1102 and 100 feet north of road:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; common fine roots; slightly acid; abrupt wavy boundary.
BE—8 to 13 inches; light yellowish brown (10YR 6/4) sandy clay loam; few fine faint brownish yellow mottles, common medium faint light brownish gray (10YR 6/2) mottles, few fine prominent yellowish red (5YR 5/8) mottles, and few fine distinct strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; strongly acid; clear wavy boundary.
Btg1—13 to 29 inches; gray (10YR 5/1) sandy clay loam; common medium distinct strong brown (7.5YR 5/8) mottles, few fine faint brownish yellow mottles, and few fine prominent yellowish red (5YR 5/8) mottles; weak medium subangular blocky structure;

friable, slightly sticky and slightly plastic; few fine roots; common fine pores; very strongly acid; gradual wavy boundary.

Btg2—29 to 54 inches; gray (10YR 6/1) sandy clay loam; common medium distinct brownish yellow (10YR 6/6) mottles and few fine faint pale brown mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; very strongly acid; gradual wavy boundary.

BCg—54 to 65 inches; gray (10YR 6/1) fine sandy loam; common medium distinct brownish yellow (10YR 6/8) mottles and few fine faint pale brown mottles; weak medium and coarse subangular blocky structure; very friable; common lenses of sandy clay loam; very strongly acid; diffuse wavy boundary.

Cg—65 to 80 inches; gray (10YR 6/1) sandy loam; few fine faint pale brown mottles; few fine distinct strong brown (7.5YR 5/8) mottles, and common medium distinct brownish yellow (10YR 6/8) mottles; massive; very friable; common lenses of loamy sand and sandy clay loam; very strongly acid.

Lynchburg soils have loamy A and B horizons 60 to 80 inches thick underlain by sandy, loamy, or clayey sediment. The soil ranges from extremely acid to strongly acid except where lime has been added.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 or 2.

The Btg horizon begins within a depth of 20 inches. It has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. There are common to many mottles in shades of yellow, brown, red, or gray. Some pedons have a Bt horizon that has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. The Bt and Btg horizons are sandy clay loam or clay loam.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2; or it is neutral and has value of 5 to 7. This horizon is sandy, loamy, or clayey sediment.

The Lynchburg soils in Pamlico County are taxadjuncts to the Lynchburg series because most pedons have more than a 20 percent decrease from the maximum in clay content from 40 to 60 inches below the surface, and these pedons do not contain skeletans. The use and management of the soils are similar to those of the Lynchburg series.

Masontown Series

The Masontown series consists of very poorly drained soils that formed in moderately coarse-textured recent alluvium. The soils are on flood plains. Slope is 0 to 2 percent.

Typical pedon of Masontown loam, frequently flooded; 0.8 mile west of Olympia on North Carolina Highway 55 and 100 feet south of road:

A1—0 to 12 inches; black (10YR 2/1) loam; moderate medium granular structure; very friable; common fine and medium roots; medium acid; gradual wavy boundary.

A2—12 to 27 inches; very dark gray (10YR 3/1) fine sandy loam; weak medium granular structure; very friable; common fine roots; slightly acid; clear wavy boundary.

A3—27 to 42 inches; very dark gray (10YR 3/1) sandy loam, many pockets of loamy sand; many medium faint dark gray (10YR 4/1) mottles; massive; neutral; gradual wavy boundary.

Cg—42 to 60 inches; grayish brown (2.5Y 5/2) loamy sand, many lenses of sandy loam and sandy clay loam; common medium distinct dark gray (10YR 4/1) and very dark gray (10YR 3/1) mottles; massive; very friable; neutral.

Masontown soils have a loamy A horizon more than 24 inches thick underlain by sandy or loamy alluvium. The soils range from medium acid to mildly alkaline.

The A horizon has hue of 10YR to 5Y, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2 or 3.

The Cg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 4 to 7. This horizon is sandy loam, fine sandy loam, silt loam, loam, loamy sand, or sand. Thin strata of finer texture can occur in some pedons, but the soil between depths of 10 to 40 inches averages 10 to 18 percent clay.

Norfolk Series

The Norfolk series consists of well drained soils that formed in moderately fine-textured sediment. The soils are on uplands. Slope ranges from 0 to 6 percent.

Typical pedon of Norfolk loamy fine sand, 0 to 2 percent slopes; 1.2 miles east of Olympia on North Carolina Highway 55, 0.7 mile north on a farm path and 50 feet west of path:

Ap—0 to 7 inches; grayish brown (10YR 5/2) loamy fine sand; weak medium granular structure; very friable; common fine roots; neutral; abrupt smooth boundary.

E—7 to 13 inches; light yellowish brown (10YR 6/4) loamy fine sand; weak medium granular structure; very friable; common fine roots; slightly acid; clear wavy boundary.

Bt—13 to 43 inches; strong brown (7.5YR 5/8) sandy clay loam; weak medium subangular blocky structure; very friable, slightly sticky and slightly plastic; few fine roots; common fine pores; strongly acid; gradual wavy boundary.

BC—43 to 62 inches; reddish yellow (7.5YR 6/8) fine sandy loam; weak medium subangular blocky structure; very friable; strongly acid; clear wavy boundary.

C—62 to 80 inches; brownish yellow (10YR 6/6) loamy fine sand; common fine distinct very pale brown (10YR 8/3) mottles; single grained; loose; strongly acid.

Norfolk soils have sandy A and E horizons and a loamy B horizon 60 to more than 80 inches thick. The soils are underlain by sandy, loamy, or clayey sediment. They are very strongly acid or strongly acid unless limed.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3; or it has hue of 2.5Y, value of 4, and chroma of 2.

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 5 or 6, and chroma of 6 or 8. It is sandy clay loam or clay loam.

The C horizon is similar in color to the Bt horizon. It is sandy, loamy, or clayey sediment.

The Norfolk soils in Pamlico County are taxadjuncts to the Norfolk series. Most pedons have more than a 20 percent decrease from the maximum in clay content from 40 to 60 inches below the surface, and these pedons do not contain skeletans. The use and management of the soils are similar to those of the Norfolk series.

Paxville Series

The Paxville series consists of very poorly drained soils that formed in moderately fine-textured sediment. The soils are on uplands. Slope is 0 to 1 percent.

Typical pedon of Paxville mucky fine sandy loam; 6.2 miles north of Grantsboro on North Carolina Highway 306, 2 miles west on a logging road and 50 feet southwest of road:

A1—0 to 9 inches; black (10YR 2/1) mucky fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; very strongly acid; clear wavy boundary.

A2—9 to 15 inches; very dark gray (10YR 3/1) fine sandy loam; weak medium granular structure; very friable; common fine and medium roots; very strongly acid; clear wavy boundary.

Btg—15 to 47 inches; grayish brown (2.5Y 5/2) sandy clay loam; few medium faint dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; very strongly acid; gradual wavy boundary.

BCg—47 to 52 inches; grayish brown (2.5Y 5/2) fine sandy loam; few fine faint pale brown mottles; massive; very friable; common lenses of light gray (10YR 7/2) sand; very strongly acid; clear wavy boundary.

Cg1—52 to 76 inches; light brownish gray (2.5Y 6/2) loamy fine sand; single grained; loose; very strongly acid; clear wavy boundary.

Cg2—76 to 80 inches; dark greenish gray (5GY 4/1) sand; single grained; loose; strongly acid.

Paxville soils have loamy A and B horizons 40 to 60 inches thick underlain by sandy sediment. The soils range from extremely acid to strongly acid except where lime has been added.

The A or Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1; or it is neutral and has value of 2 or 3. This horizon is 10 to 24 inches thick.

The Btg horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 1 or 2; or it is neutral and has value of 3 to 6. The Btg horizon is sandy clay loam, fine sandy loam, or sandy loam.

The Cg horizon has hue of 10YR to 5GY, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 4 to 7. This horizon is sandy sediment.

Rains Series

The Rains series consists of poorly drained soils that formed in moderately fine-textured sediment. The soils are on uplands. Slope is 0 to 2 percent.

Typical pedon of Rains fine sandy loam; 1.3 miles west of Arapahoe on State Road 1117 and 75 feet south of road:

A—0 to 7 inches; black (10YR 2/1) fine sandy loam; weak fine granular structure; very friable; common fine and medium roots; very strongly acid; clear wavy boundary.

Eg—7 to 12 inches; light brownish gray (10YR 6/2) fine sandy loam; weak medium granular structure; common fine and medium roots; very strongly acid; clear wavy boundary.

BEg—12 to 18 inches; gray (10YR 5/1) fine sandy loam; few fine distinct yellowish brown (10YR 5/8) mottles; weak fine subangular blocky structure; very friable; few fine roots; very strongly acid; clear wavy boundary.

Btg1—18 to 30 inches; gray (10YR 6/1) sandy clay loam; few fine faint brownish yellow mottles; weak medium subangular blocky structure; friable, slightly stickly and slightly plastic; few fine roots; common fine pores; very strongly acid; clear wavy boundary.

Btg2—30 to 47 inches; gray (10YR 6/1) sandy clay loam; few fine faint brownish yellow mottles and few fine distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; firm, slightly plastic; few fine pores; very strongly acid; abrupt wavy boundary.

BCg—47 to 64 inches; light brownish gray (10YR 6/2) fine sandy loam; massive; very friable; very strongly acid; gradual wavy boundary.

Cg—64 to 80 inches; gray (5Y 6/1) loamy fine sand; single grained; loose; very strongly acid.

Rains soils have loamy A, E, and B horizons 60 to 80 inches thick underlain by sandy, loamy, or clayey sediment. The soils range from extremely acid to strongly acid except where lime has been added.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 or 2; or it is neutral and has value of 2 to 4. This horizon is less than 10 inches thick.

The Eg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2.

The Btg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 4 to 7. The Btg horizon is sandy clay loam or clay loam.

The Cg horizon has hue of 10YR to 5GY, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 4 to 7. This horizon is sandy, loamy, or clayey sediment.

The Rains soils in Pamlico County are taxadjuncts to the Rains series because most pedons have more than a 20 percent decrease from the maximum in clay content from 40 to 60 inches below the surface, and they do not contain skeletans. The use and management of the soils are similar to those of the Rains series.

Rutlege Series

The Rutlege series consists of very poorly drained soils that formed in coarse-textured sediment. The soils are on uplands. Slope is 0 to 2 percent.

Typical pedon of Rutlege mucky loamy fine sand; 0.4 mile south of the intersection of State Road 1121 and North Carolina Highway 306 on State Road 1121; 0.5 mile west on a path and 30 feet north of path:

A—0 to 20 inches; black (10YR 2/1) mucky loamy fine sand; weak medium granular structure; very friable; common fine and medium roots; very strongly acid; clear wavy boundary.

Cg1—20 to 37 inches; dark grayish brown (10YR 4/2) loamy fine sand; massive; very friable; common fine roots; very strongly acid; gradual wavy boundary.

Cg2—37 to 80 inches; light brownish gray (2.5Y 6/2) sand; single grained; loose; few fine roots; very strongly acid; diffuse wavy boundary.

Rutlege soils have sandy horizons 80 inches or more thick. The soils are extremely acid or very strongly acid.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2 or 3. This horizon is 10 to 24 inches thick.

The Cg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 4 to 7. This horizon is sand, loamy sand, or loamy fine sand.

Stockade Series

The Stockade series consists of very poorly drained soils that formed in moderately fine-textured sediment. The soils are on low marine and stream terraces. Slope is 0 to 2 percent.

Typical pedon of Stockade loamy fine sand; 2.1 miles northeast of Bayboro on North Carolina Highway 304; 1 mile north on State Road 1208 to end; 100 feet north on a farm path; 0.6 mile east on farm path and 50 feet north of path:

Ap—0 to 10 inches; black (10YR 2/1) loamy fine sand; weak medium granular structure; very friable; medium acid; clear wavy boundary.

A—10 to 19 inches; very dark grayish brown (10YR 3/2) loamy fine sand; weak medium granular structure; very friable; common fine roots; medium acid; clear wavy boundary.

Btg1—19 to 26 inches; light brownish gray (10YR 6/2) sandy clay loam; few fine prominent red (2.5YR 4/8) mottles and few medium distinct brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; strongly acid; clear wavy boundary.

Btg2—26 to 41 inches; gray (10YR 5/1) sandy clay loam; common medium distinct brownish yellow (10YR 6/6) mottles and few fine and medium prominent red (2.5YR 4/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine pores; strongly acid; clear wavy boundary.

BCg—41 to 54 inches; grayish brown (2.5Y 5/2) fine sandy loam; common medium distinct brownish yellow (10YR 6/6) mottles and common medium prominent strong brown (7.5YR 4/6) mottles; weak medium subangular blocky structure; very friable; strongly acid; clear wavy boundary.

Cg1—54 to 60 inches; gray (N 6/0) loamy fine sand; common medium distinct brownish yellow (10YR 6/6) mottles; massive; common lenses of fine sandy loam; neutral; abrupt wavy boundary.

2Cg2—60 to 80 inches; dark greenish gray (5G 4/1) marly fine sand; single grained; loose; many fine and medium shell fragments; mildly alkaline.

Stockade soils have a sandy A horizon and a loamy B horizon 40 to 60 inches thick. The soils are underlain by sandy or loamy sediment. The A horizon ranges from very strongly acid to slightly acid except where lime has been added. The B and C horizons range from very strongly acid to moderately alkaline.

The A and Ap horizons have hue of 10YR, value of 2 or 3, and chroma of 1 or 2; or they are neutral and have value of 2 or 3. These horizons are mucky loam or loamy

fine sand. The A and Ap horizons combined are 10 to 24 inches thick.

The Btg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 4 to 7. This horizon is sandy clay loam or clay loam.

The Cg horizon has hue of 10YR to 5G, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 4 to 7. This horizon is sandy or loamy sediment. The 2Cg horizon contains shell fragments in many pedons. This horizon can occur at any depth between 60 and 84 inches. Some pedons do not have a 2Cg horizon.

Tomahawk Series

The Tomahawk series consists of moderately well drained soils that formed in moderately coarse-textured sediment. The soils are on uplands. Slope ranges from 0 to 3 percent.

Typical pedon of Tomahawk loamy sand, 0 to 3 percent slopes; 2.7 miles south of Grantsboro on North Carolina Highway 306 and 450 feet west of the highway:

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

E—7 to 25 inches; light yellowish brown (10YR 6/4) loamy sand; weak medium granular structure; very friable; few fine roots; medium acid; clear wavy boundary.

Bt—25 to 38 inches; yellowish brown (10YR 5/6) sandy loam; few fine distinct light gray (10YR 7/2) mottles; weak medium subangular blocky structure; very friable; few fine roots; strongly acid; gradual wavy boundary.

BC—38 to 44 inches; yellowish brown (10YR 5/4) loamy sand; few fine distinct light gray (10YR 7/2) mottles and few medium distinct dark brown (10YR 3/3) mottles; massive; very friable; strongly acid; clear wavy boundary.

Bhb1—44 to 60 inches; dark reddish brown (5YR 3/2) loamy sand; massive; very friable; sand grains thinly coated with organic matter; medium acid; gradual wavy boundary.

2Bhb2—60 to 70 inches; dark brown (7.5YR 3/2) loamy sand; massive; very friable; sand grains thinly coated with organic matter; medium acid; gradual wavy boundary.

2Bhb3—70 to 80 inches; very dark grayish brown (10YR 3/2) sand; common medium faint dark grayish brown (10YR 4/2) and grayish brown (10YR 5/2) mottles; massive; very friable; sand grains very thinly coated with organic matter; medium acid.

Tomahawk soils have sandy A and E horizons 20 to 40 inches thick underlain by a loamy Bt horizon and sandy 2Bhb horizon. The soil ranges from very strongly acid to slightly acid except where lime has been added.

The A or Ap horizon has hue of 10YR or 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 6 or 7, and chroma of 2 to 4.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 6, and has mottles that have chroma of 1 or 2. The Bt horizon is sandy loam.

The 2Bhb horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 or 2. It is sand or loamy sand.

Wahee Series

The Wahee series consists of somewhat poorly drained soils that formed in fine-textured sediment. The soils are on low marine and stream terraces. Slope ranges from 0 to 2 percent.

Typical pedon of Wahee fine sandy loam; 0.3 mile east of Arapahoe on State Road 1005; 3.1 miles south on State Road 1301 and 50 feet east of road:

Ap—0 to 6 inches; grayish brown (10YR 5/2) fine sandy loam; weak medium granular structure; very friable; common fine roots; medium acid; abrupt wavy boundary.

Bt—6 to 15 inches; brownish yellow (10YR 6/6) sandy clay; few fine faint pale brown and light brownish gray mottles and few fine distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; many distinct clay films on faces of peds; few fine roots; common fine pores; strongly acid; clear wavy boundary.

Btg1—15 to 27 inches; gray (10YR 5/1) clay; many medium distinct brownish yellow (10YR 6/6) mottles; few fine distinct strong brown (7.5YR 5/8) mottles, and few fine prominent red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; very firm, sticky and plastic; many distinct clay films on faces of peds; few fine roots; few fine pores; very strongly acid; gradual wavy boundary.

Btg2—27 to 44 inches; gray (10YR 6/1) sandy clay; common medium distinct brownish yellow (10YR 6/6) mottles, common medium prominent red (2.5YR 4/8) mottles, and few fine distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; firm, sticky and plastic; many distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

BCg—44 to 57 inches; gray (10YR 6/1) sandy clay loam; common medium distinct brownish yellow (10YR 6/6) mottles and few fine distinct strong brown (7.5YR 5/8) mottles; massive; firm, slightly sticky and slightly plastic; very strongly acid; gradual wavy boundary.

Cg—57 to 80 inches; gray (10YR 6/1) sandy clay loam; few fine distinct brownish yellow (10YR 6/6) and

strong brown (7.5YR 5/8) mottles; massive; friable, slightly sticky and slightly plastic; very strongly acid.

Wahee soils have a loamy A horizon and clayey B horizon 40 to 60 inches thick underlain by sandy or loamy sediment. The soils range from extremely acid to strongly acid except where lime has been added.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 3 to 4, and chroma of 1 or 2.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. Some pedons do not have a Bt horizon. The Btg horizon begin within a depth of 20 inches. It has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Mottles in shades of red, yellow, and brown are common to many. The Bt and Btg horizons are clay, sandy clay, or clay loam.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2; or it is neutral and has value of 5 to 7. This horizon is sandy or loamy sediment.

Wasda Series

The Wasda series consists of very poorly drained soils that formed in moderately fine-textured sediment that is overlain by a thin organic layer. The soils are on low marine terraces. Slope is less than 2 percent.

Typical pedon of Wasda muck; 1.2 miles south of Bayboro on State Road 1343 at end of road, 0.7 mile south on farm path and 50 feet west of path:

Oa—0 to 12 inches; black (N 2/0) broken face and rubbed muck; about 20 percent fiber, less than 1 percent rubbed; moderate medium granular structure; very friable; many fine and medium roots; very strongly acid; abrupt wavy boundary.

A—12 to 19 inches; black (10YR 2/1) mucky fine sandy loam; weak medium granular structure; very friable; many fine roots; very strongly acid; clear wavy boundary.

Bg1—19 to 26 inches; dark grayish brown (10YR 4/2) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; many partly decayed roots; very strongly acid; gradual wavy boundary.

Bg2—26 to 46 inches; grayish brown (10YR 5/2) sandy clay loam; weak medium subangular blocky structure; firm, slightly sticky and slightly plastic; many partly decayed roots; medium acid; gradual wavy boundary.

Cg—46 to 72 inches; greenish gray (5G 5/1) fine sandy loam; massive; very friable; common partly decayed roots; neutral.

Wasda soils have an organic surface layer (Oa or Op horizon) 8 to 16 inches thick and loamy A and B horizons. The soils range from extremely acid to strongly acid in the O, A, and the upper part of the B horizons except where lime has been added. The lower part of the B horizon and the C horizon range from medium acid to moderately alkaline.

The Oa or Op horizon has hue of 10YR to 5YR, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2 or 3.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2 or 3. This horizon is fine sandy loam, sandy loam, loam, or their mucky counterparts.

The Bg horizon has hue of 10YR to 5Y, value of 2 to 5, and chroma of 1 or 2; or it is neutral and has value of 2 to 5. This horizon is clay loam, loam, sandy clay loam, or sandy loam.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2; hue of 5GY or 5G, value of 4 to 6, and chroma of 1; or it is neutral and has value of 4 to 6. The Cg horizon is sandy, loamy, or clayey sediment. A 2Cg horizon that contains shell fragments occurs in some pedons. It can occur at any depth between 60 and 84 inches.

Yonges Series

The Yonges series consists of poorly drained soils that formed in moderately fine-textured sediment. The soils are on low marine and stream terraces. Slope is 0 to 2 percent.

Typical pedon of Yonges loamy fine sand; 2 miles east of Bayboro on North Carolina Highway 304; 0.1 mile east of State Road 1208 on North Carolina Highway 304; 0.5 mile north of highway on a farm path and 20 feet east of path:

Ap—0 to 7 inches; grayish brown (10YR 5/2) loamy fine sand; weak medium granular structure; very friable; many fine and medium roots; very strongly acid; clear smooth boundary.

Eg—7 to 11 inches; light brownish gray (10YR 6/2) loamy fine sand; few fine distinct strong brown (7.5YR 5/8) mottles; weak medium granular structure; very friable; few fine roots; strongly acid; clear wavy boundary.

BEg—11 to 14 inches; light brownish gray (10YR 6/2) fine sandy loam; common medium distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; few fine roots; strongly acid; clear wavy boundary.

Btg—14 to 36 inches; gray (10YR 6/1) sandy clay loam; common medium distinct yellowish brown (10YR 5/8) mottles and common medium faint pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; neutral; gradual wavy boundary.

BCg—36 to 49 inches; gray (10YR 6/1) fine sandy loam; common medium distinct yellowish brown (10YR 5/8) mottles and common medium faint pale brown (10YR 6/3) mottles; weak medium and coarse

subangular blocky structure; very friable; moderately alkaline; gradual wavy boundary.

Cg1—49 to 59 inches; light brownish gray (10YR 6/2) fine sandy loam; common medium distinct light yellowish brown (10YR 6/4) mottles and common fine and medium distinct yellowish brown (10YR 5/8) mottles; massive; very friable; moderately alkaline; clear wavy boundary.

2Cg2—59 to 72 inches; light brownish gray (10YR 6/2) marly fine sandy loam; many coarse distinct yellowish brown (10YR 5/8) mottles; many fine to coarse shell fragments; massive; very friable; moderately alkaline; abrupt smooth boundary.

2Cg3—72 to 80 inches; greenish gray (5GY 5/1) marly fine sand; many fine to coarse shell fragments; single grained; loose; moderately alkaline.

Yonges soils have sandy A and E horizons and a loamy B horizon 40 to 60 inches thick underlain by sandy or loamy sediment. The soils range from very strongly acid to mildly alkaline in the A, E, and the upper part of the B horizons. It is slightly acid to moderately alkaline in the lower part of the B horizon and in the C horizon.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 2 to 5, and chroma of 1 or 2; or it is neutral and has value of 2 to 5. This horizon is 6 to 10 inches thick.

The Eg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2.

The Btg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 4 to 7. The Btg horizon is sandy clay loam or clay loam.

The Cg horizon has hue of 10YR to 5GY, value of 5 to 7, and chroma of 1 or 2; or it is neutral and has value of 5 to 7. This horizon is loamy or sandy sediment. The 2Cg horizon contains shell fragments. It can occur at any depth between 55 to 84 inches. Some pedons do not have a 2Cg horizon.

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Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well-aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

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—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

	Inches/inch (in tables)
Very low	0.00 to 0.05
Low	0.05 to 0.10
Moderate	0.10 to 0.15
High	0.15 to 0.20
Very high	more than 0.20

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

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. (general soil textural class). A general textural term that includes sandy clay, silty clay, and clay (Soil Taxonomy, p. 470).

Clayey. (taxonomic: family level criteria). A specific textural name referring to fine earth (particles less than 2mm in size) within the control section, containing 35 percent or more clay by weight; rock fragments are less than 35 percent by volume (Soil Taxonomy, p 385).

Coarse textured soil. Sand or loamy sand.

Compressible (in tables). The volume of soft soil decreases excessively under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

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.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Denitrification. The biochemical reduction of nitrate or nitrite to gaseous nitrogen either as molecular nitrogen or as an oxide of nitrogen.

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. 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. 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, 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, 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, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

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 the activities of man or other animals or of a catastrophe in nature, such as fire, that exposes the surface.

Evapotranspiration. The combined loss of water from a given area, and during a specified period of time, by evaporation from the soil surface and from transpiration by plants.

Excess fines (in tables). Excess silt and clay are in the soil. The soil is not a source of gravel or sand for construction purposes.

Excess salts (in tables). Excess water-soluble salts in the soil restrict the growth of most plants.

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.

Fine textured soil. Sandy clay, silty clay, and clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

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.

R layer.—Consolidated rock (unweathered bedrock) beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material. This contrasts with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Interstream Area. The nearly level land between drainageways in relatively undissected parts of Coastal Plain uplands, low marine terraces, and stream terraces, where the soils are dominantly 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 (general: soil textural class). 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 (Soil Taxonomy, p. 470).

Loamy (taxonomic: family level criteria). A specific textural name referring to fine earth (particles less than 2mm in size) within the control section, of

loamy very fine sand or finer that contains less than 35 percent clay by weight; rock fragments are less than 35 percent by volume (Soil Taxonomy, p. 385).

Low strength. The soil is not strong enough to support loads.

Marsh. Periodically wet or continually flooded areas with the surface not deeply submerged. These areas are dominantly covered with sedges, cattails, rushes or other hydrophytic (water loving) plants. Subgroups are:

Freshwater.—Lowland areas bordering rivers, creeks, and lakes that are flooded with fresh water and dominated by halophobic (salt intolerant) plants.

Salt.—Lowland areas bordering coastal islands, sounds, bays, and sloughs that are flooded with salt water and dominated by halophytic (salt tolerant) plants.

Tidal.—Lowland areas bordering rivers, creeks, and sloughs, and traversed by interlacing channels that are periodically inundated by high tides with either saltwater or brackish water and dominated by halophytic (salt tolerant) plants.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

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.

Moderately coarse textured soil. Sandy loam and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

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 with no seed bed preparation. A specialized planter opens a slit in the soil surface and places the seed at the desired depth. Weeds are controlled with herbicides.

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.

Organic soil. Soil that is at least 20 percent organic matter, by weight, if the mineral matter does not contain clay, or soil that is at least 30 percent organic matter if the mineral material contains more than 60 percent clay.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

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.

Percolation. The downward movement of water through 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 downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 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. For example, 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.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Pocosin. A large, waterlogged, flat interstream area that is elevated slightly above the distant flood plains. Soils are typically high in organic matter and vegetated by high wetness tolerant plants.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

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.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poor outlets (in tables). In these areas, surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of 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 degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

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.

Salty water (in tables.) Water is too salty for consumption by livestock.

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 (general: soil textural class). 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 (Soil Taxonomy, p. 470).

Sandy (taxonomic: family level criteria). A specific textural name referring to fine earth (particles less than 2mm in size) within the control section, of sand or loamy sand that contains less than 50 percent very fine sand by weight; rock fragments are less than 35 percent by volume (Soil Taxonomy, p. 385).

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.

Skeletans. Coatings of light colored, low luster silica flour or silica dust adhering to the natural surfaces in soil materials.

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.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsidence. A term applied to soils that experience a pronounced reduction in volume when drained because of the removal of water, shrinkage of organic materials, and the oxidation of organic compounds. Usually associated with soils that have a high organic matter content.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

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.

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."

Sand.—Soil material that contains 85 percent or more sand; the percentage of silt plus 1 1/2 times the percentage of clay does not exceed 15.

Loamy sand.—Soil material that contains at the upper limit 85 to 90 percent sand, and the percentage of silt plus 1 1/2 times the percentage of clay is not less than 15; at the lower limit it contains not less than 70 to 85 percent sand, and the percentage of silt plus twice the percentage of clay does not exceed 30.

Sandy loam.—Soil material that contains either 20 percent clay or less and the percentage of silt plus twice the percentage of clay exceeds 30, and 52 percent or more sand; or less than 7 percent clay, less than 50 percent silt, and between 43 and 52 percent sand.

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 percent or more 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 percent or more 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 percent or more 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 percent or more clay and 45 percent or more sand.

Silty clay.—Soil material that contains 40 percent or more clay and 40 percent or more silt.

Clay.—Soil material that contains 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Thin layer (in tables). Otherwise suitable soil material 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.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

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.

Trace elements. Chemical elements, such as zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Unstable fill (in tables). There is a risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Well graded. Refers to soil material consisting of course grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. This contrasts with poorly graded soil.

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

[Data recorded in the period 1951-79 at New Bern, 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----	54.4	33.5	44.0	77	14	71	4.01	2.20	5.61	8	1.2
February---	57.0	35.0	46.0	80	16	73	4.03	2.49	5.42	7	.9
March------	64.0	41.6	52.8	86	25	165	3.50	2.24	4.62	7	.4
April------	73.8	49.9	61.9	91	33	357	3.02	1.77	4.13	6	.0
May--------	80.0	58.7	69.4	96	42	601	4.42	2.82	5.87	7	.0
June-------	85.5	65.9	75.7	98	51	771	5.13	2.72	7.24	7	.0
July-------	88.2	70.1	79.2	98	58	905	6.86	3.61	9.71	9	.0
August-----	87.6	69.8	78.7	97	58	890	6.38	3.25	9.11	9	.0
September--	83.2	64.4	73.8	94	49	714	5.80	2.70	8.47	6	.0
October----	74.5	52.9	63.7	90	31	425	3.39	1.12	5.24	5	.0
November---	65.9	42.7	54.3	84	25	165	3.07	1.45	4.45	5	.0
December---	57.4	35.5	46.5	79	16	93	3.60	1.71	5.22	6	.3
Yearly:											
Average--	72.6	51.7	62.2	---	---	-----	-----	-----	-----	---	-----
Extreme--	-----	-----	-----	100	12	-----	-----	-----	-----	---	-----
Total----	-----	-----	-----	---	---	5230	53.21	45.44	60.69	82	2.8

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 °F).

TABLE 2. FREEZE DATES IN SPRING AND FALL

[Data recorded in the period 1951-79 at New Bern, 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--	March 11	March 26	April 7
2 years in 10 later than--	March 3	March 20	April 2
5 years in 10 later than--	February 15	March 7	March 23
First freezing temperature in fall:			
1 year in 10 earlier than--	November 18	November 3	October 24
2 years in 10 earlier than--	November 25	November 10	October 29
5 years in 10 earlier than--	December 10	November 22	November 9

TABLE 3. GROWING SEASON

[Data recorded in the period 1951-79 at New Bern, North Carolina]

Probability	Length of growing season if daily minimum temperature is --		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	261	229	207
8 years in 10	274	239	215
5 years in 10	299	259	230
2 years in 10	330	279	245
1 year in 10	>365	290	253

Plant List
Table 4

[Only the commonly occurring plants in the survey are listed]

Common Plant Name	Scientific Plant Name
Alabama supplejack	Berchemia scandens
American beautyberry	Callicarpa americana
American beech	Fagus grandifolia
American elm	Ulmus americana
American holly	Ilex opaca
American hornbeam	Carpinus caroliniana
arrowhead	Sagittaris sp.
Atlantic white-cedar	Chamaecyparis thyoides
baldcypress	Taxodium distichum
bayberry	Myrica heterophylla
big cordgrass	Spartina cynosuroides
bitter gallberry	Ilex glabra
black needlerush	Juncus roemerianus
black willow	Salix nigra
blackgum	Nyssa sylvatica
blackjack oak	Quercus marilandica
blueberry	Vaccinium sp.
brackenfern	Pteridium aquilinum
Carolina jessamine	Gelsemium sempervirens
cattail	Typha sp.
cinnamon fern	Osmunda cinnamomea
climbing hydrangea	Decumaria barbara
eastern baccharis	Baccharis halimifolia
eastern white cedar	Thuja occidentalis
fetterbush	Lyonia lucida
flowering dogwood	Cornus florida
glasswort	Salicornia sp.
grape	Vitus sp.
green ash	Fraxinus pennsylvanica
greenbrier	Smilax sp.
hickory	Carya sp.
honey cup	Zenobia pulverulenta
honeysuckle	Lonicera sp.
huckleberry	Gaylussacia sp.
large gallberry	Ilex coriacea
laurel oak	Quercus laurilfolia
lizard's tail	Saururus cernuus
loblollybay	Gordonia lasianthus
loblolly pine	Pinus taeda
longleaf pine	Pinus palustris
marshelder	Iva frutescens
marshhay cordgrass	Spartina patens
netted chainfern	Woodwardia areolata
partridgeberry	Mitchella repens
Pennsylvania smartweed	Polygonum pennsylvanicum
persimmon	Diospyros virginiana
pitcherplant	Sarracenia sp.
poison-ivy	Rhus radicans
pond pine	Pinus serotina
post oak	Quercus stellata
red chokeberry	Aronia arbutifolia
red maple	Acer rubrum
redbay	Persea borbonia
royal fern	Osmunda regalis
saltgrass	Distichlis spicata
saltmarsh bulrush	Scirpus robustus

Plant List--Continued
Table 4

Common Plant Name	Scientific Plant Name
saltwort	Batis maritima
sassafras	Sassafras albidum
sawgrass	Cladium jamaicense
seashore mallow	Kosteletskya virginica
sedges	Cyperaceae
Shumard oak	Quercus shumardii
smooth cordgrass	Spartina alterniflora
sourwood	Oxydendrum arboreum
southern red oak	Quercus falcata
southern sugar maple	Acer saccharum floridanum
sphagnum moss	Sphagnum
sundew	Drosera sp.
swamp chestnut oak	Quercus michauxii
sweetbay	Magnolia virginiana
sweetgum	Liquidambar styraciflua
sweet pepperbush	Clethra alnifolia
swamp tupelo	Nyssa sylvatica biflora
sweetleaf	Symplocos tinctoria
switchcane	Arundinaria gigantea
threeawn grass	Aristida sp.
titi	Cyrilla racemiflora
turkey oak	Quercus laevis
Virginia chainfern	Woodwardia virginica
Virginia creeper	Parthenocissus quinquefolia
Virginia willow	Itea virginica
water oak	Quercus nigra
water tupelo	Nyssa aquatica
waxmyrtle	Myrica cerifera
white oak	Quercus alba
willow oak	Quercus phellos
yellow-poplar	Liriodendron tulipfera

TABLE 5.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
AaA	Altavista loamy fine sand, 0 to 2 percent slopes	9,429	4.3
AnB	Alpin fine sand, 0 to 5 percent slopes	488	0.2
Ap	Arapahoe loamy fine sand	12,308	5.6
Ar	Argent loam	15,225	7.0
Ba	Ballahack fine sandy loam, occasionally flooded	5,583	2.6
BH	Belhaven muck	12,591	5.8
Bm	Brookman mucky loam, frequently flooded	1,556	0.7
Br	Brookman mucky silt loam	5,826	2.7
ByB	Baymeade sand, 1 to 6 percent slopes	1,798	0.8
CnB	Conetoe loamy sand, 0 to 5 percent slopes	1,619	0.7
CrB	Craven loam, 1 to 4 percent slopes	1,857	0.9
Cs	Charleston loamy fine sand	2,691	1.2
CT	Croatan muck	6,609	3.0
DA	Dare muck	7,092	3.2
DgB	Dogue fine sandy loam, 1 to 4 percent slopes	1,087	0.5
Fo	Fork loamy fine sand	5,563	2.6
GoA	Goldsboro loamy fine sand, 0 to 2 percent slopes	3,739	1.7
HN	Hobucken muck, frequently flooded	5,374	2.5
La	Leaf silt loam	8,044	3.7
Le	Lenoir silt loam	1,786	0.8
LF	Lafitte muck, frequently flooded	11,286	5.2
Ln	Leon sand	5,609	2.6
Ly	Lynchburg fine sandy loam	1,788	0.8
MA	Masontown loam, frequently flooded	2,768	1.3
NoA	Norfolk loamy fine sand, 0 to 2 percent slopes	242	0.1
NoB	Norfolk loamy fine sand, 2 to 6 percent slopes	1,357	0.6
Pa	Paxville mucky fine sandy loam	7,525	3.4
Ra	Rains fine sandy loam	6,195	2.8
Ru	Rutlege mucky loamy fine sand	2,265	1.0
Sk	Stockade loamy fine sand	21,187	9.7
Sm	Stockade mucky loam, frequently flooded	777	0.4
Th	Tomahawk loamy sand, 0 to 3 percent slopes	2,759	1.3
Ud	Udorthents, loamy	818	0.4
Wa	Wahee fine sandy loam	3,030	1.4
Wd	Wasda muck	8,199	3.8
Yo	Yonges loamy fine sand	27,286	12.5
	Water areas less than 40 acres	4,884	2.2
	Total	218,240	100.0

TABLE 6--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management that includes artificial drainage where needed. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Land capability	Corn	Soybeans	Tobacco	Wheat	Irish potatoes	Improved bermuda-grass	Grass-clover
		Bu	Bu	Lbs	Bu	Cwt	AUM*	AUM*
AaA---- Altavista	IIw	125	40	3,000	55	160	---	11.0
AnB---- Alpin	IVs	---	---	---	---	---	8.0	---
Ap---- Arapahoe	IIIw	135	45	---	55	250	---	12.0
Ar---- Argent	IIIw	110	35	---	50	180	---	9.0
Ba---- Ballahack	IIIw	135	45	---	55	250	---	12.0
BH**---- Belhaven	IVw	135	45	---	55	---	---	12.0
Bm---- Brookman	VIw	---	---	---	---	---	---	---
Br---- Brookman	IIIw	130	45	---	55	210	---	12.0
ByB---- Baymeade	IIIs	60	---	---	---	---	8.0	---
CnB---- Conetoe	IIs	75	25	2,200	---	---	9.0	---
CrB---- Craven	IIIe	105	35	2,500	45	---	---	10.0
Cs---- Charleston	IIw	90	35	2,400	45	150	11.0	---
CT**---- Croatan	IVw	125	40	---	50	---	---	12.0
DA---- Dare	VIIw	---	---	---	---	---	---	---
DgB---- Dogue	IIe	110	40	2,500	50	---	---	10.0
Fo---- Fork	IIIw	125	40	2,800	55	170	---	11.0
GoA---- Goldsboro	IIw	125	40	3,000	55	---	---	11.0
HN**---- Hobucken	VIIw	---	---	---	---	---	---	---
La---- Leaf	IVw	110	35	---	45	---	---	9.0

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Tobacco	Wheat	Irish potatoes	Improved bermuda-grass	Grass-clover
		Bu	Bu	Lbs	Bu	Cwt	AUM*	AUM*
Le---------- Lenoir	IIIw	110	35	2,200	45	---	---	10.0
LF**---------- Lafitte	VIIIw	---	---	---	---	---	---	---
Ln---------- Leon	IVw	50	---	---	---	---	9.0	---
Ly---------- Lynchburg	IIw	125	40	2,800	55	---	---	11.0
MA**---------- Masontown	VIIw	---	---	---	---	---	---	---
NoA---------- Norfolk	I	115	40	3,000	55	---	---	10.5
NoB---------- Norfolk	IIe	110	35	2,900	50	---	---	10.0
Pa---------- Paxville	IIIw	135	45	---	55	---	---	12.0
Ra---------- Rains	IIIw	130	40	---	55	---	---	11.0
Ru---------- Rutlege	VIw	---	---	---	---	---	---	---
Sk---------- Stockade	IIIw	135	45	---	55	225	---	12.0
Sm---------- Stockade	VIw	---	---	---	---	---	---	---
Th---------- Tomahawk	IIw	75	25	2,200	40	---	8.0	---
Ud**. Udorthents								
Wa---------- Wahee	IIw	110	40	2,500	50	---	---	10.0
Wd---------- Wasda	IIIw	135	45	---	55	---	---	12.0
Yo---------- Yonges	IIIw	130	40	---	50	200	---	12.0

* 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.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--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. The indicator tree used to determine the ordination class is listed first]

Map symbol and soil name	Ordination symbol	Management concerns			Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	Productivity	
							$Ft^3/AC/YR$	
AaA--- Altavista	9W	Slight	Moderate	Slight	Loblolly pine---	91	133	Loblolly pine.
					Longleaf pine---	84	110	
					Sweetgum---	84	90	
					White oak---	---	---	
					Red maple---	---	---	
					Yellow-poplar---	---	---	
					Southern red oak---	---	---	
					Blackgum---	---	---	
					Water oak---	---	---	
AnB--- Alpin	7S	Slight	Moderate	Moderate	Loblolly pine---	76	103	Loblolly pine, longleaf pine.
					Longleaf pine---	70	79	
					Southern red oak---	---	---	
					Laurel oak---	---	---	
					Post oak---	---	---	
					Hickory---	---	---	
Ap--- Arapahoe	10W	Slight	Severe 1/	Severe 1/	Loblolly pine 2/---	95	142	Loblolly pine. 3/
					Sweetgum---	---	---	
					Red maple---	---	---	
					Baldcypress---	---	---	
					Pond pine---	85	75	
					Yellow-poplar---	---	---	
					Blackgum---	---	---	
					Willow oak---	---	---	
					Swamp chestnut oak---	---	---	
					Water oak---	---	---	
Ar--- Argent	10W	Slight	Severe 1/	Severe 1/	Loblolly pine 2/---	96	145	Loblolly pine. 3/
					Sweetgum---	96	125	
					Water oak---	96	93	
					Pond pine---	---	---	
					Blackgum---	---	---	
					Swamp chestnut oak---	---	---	
					Red maple---	---	---	
					Yellow-poplar---	---	---	
					Willow oak---	---	---	
Ba--- Ballahack	10W	Slight	Severe 1/	Severe 1/	Loblolly pine 2/---	96	145	Loblolly pine. 3/
					Sweetgum---	111	176	
					Pond pine---	80	68	
					Water oak---	100	98	
					Yellow-poplar---	---	---	
					Baldcypress---	---	---	
					Swamp tupelo---	---	---	
					Blackgum---	---	---	
					Willow oak---	---	---	
					Swamp chestnut oak---	---	---	
					Red maple---	---	---	
BH--- Belhaven	3W	Slight	Severe	Severe	Pond pine---	60	39	
					Loblolly bay---	---	---	
					Red maple---	---	---	
					Blackgum---	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns			Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	Productivity	
							$Ft^3/AC/YR$	
Bm---------- Brookman	3W	Slight	Severe	Severe	Pond pine---------- Loblolly pine-------- Red maple----------	60 --- ---	39 --- ---	
Br---------- Brookman	10W	Slight	Severe [1]	Severe [1]	Loblolly pine [2]----- Baldcypress---------- Blackgum---------- Red maple---------- Water oak---------- Willow oak---------- Swamp chestnut oak--- Sweetgum---------- Yellow-poplar-------- Pond pine----------	95 --- --- --- --- --- --- --- --- ---	142 --- --- --- --- --- --- --- --- ---	Loblolly pine. [3]
ByB---------- Baymeade	6S	Slight	Moderate	Moderate	Loblolly pine-------- Longleaf pine-------- Southern red oak----- Red maple---------- Sweetgum---------- Post oak----------	66 63 --- --- --- ---	86 63 --- --- --- ---	Loblolly pine, longleaf pine.
CnB---------- Conetoe	8S	Slight	Moderate	Moderate	Loblolly pine-------- Longleaf pine-------- Southern red oak----- Post oak---------- White oak---------- Hickory---------- Sweetgum---------- Red maple---------- Shumard oak----------	80 65 --- --- --- --- --- --- ---	110 67 --- --- --- --- --- --- ---	Loblolly pine.
CrB---------- Craven	8W	Slight	Moderate	Slight	Loblolly pine-------- Water oak---------- Sweetgum---------- White oak---------- Southern red oak----- Red maple---------- Blackgum---------- Yellow-poplar-------- Post oak----------	85 --- --- --- --- --- --- --- ---	120 --- --- --- --- --- --- --- ---	Loblolly pine.
Cs---------- Charleston	8W	Slight	Moderate	Slight	Loblolly pine-------- Sweetgum---------- Water oak---------- Longleaf pine-------- Southern red oak----- Yellow-poplar-------- Red maple---------- White oak---------- Blackgum----------	85 80 80 --- --- --- --- --- ---	120 79 74 --- --- --- --- --- ---	Loblolly pine.

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns			Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	Productivity	
							$Ft^3/AC/YR$	
CT---------- Croatan	6W	Slight	Severe	Severe	Loblolly pine [2]-----	70	93	Loblolly pine. [3]
					Pond pine----------	56	34	
					Loblollybay----------	---	---	
					Baldcypress----------	---	---	
					Sweetbay----------	---	---	
					Sweetgum----------	---	---	
					Redbay----------	---	---	
					Blackgum----------	---	---	
					Red maple----------	---	---	
DA---------- Dare	3W	Slight	Severe	Severe	Pond pine----------	60	39	
					Loblollybay----------	---	---	
					Sweetbay----------	---	---	
DgB---------- Dogue	9W	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	
					Red maple----------	---	---	
					Water oak----------	---	---	
					Blackgum----------	---	---	
					Post oak----------	---	---	
Fo---------- Fork	9W	Slight	Moderate	Slight	Loblolly pine--------	90	131	Loblolly pine.
					Southern red oak-----	---	---	
					Longleaf pine--------	80	100	
					Water oak----------	---	---	
					Sweetgum----------	90	106	
					Yellow-poplar--------	90	90	
					Red maple----------	---	---	
					Blackgum----------	---	---	
					Laurel oak----------	---	---	
					White oak----------	---	---	
GoA---------- Goldsboro	9W	Slight	Moderate	Slight	Loblolly pine--------	90	131	Loblolly pine.
					Longleaf pine--------	77	94	
					Sweetgum----------	90	106	
					Southern red oak-----	---	---	
					White oak----------	---	---	
					Water oak----------	---	---	
					Red maple----------	---	---	
					Yellow-poplar--------	---	---	
					Blackgum----------	---	---	
La---------- Leaf	9W	Slight	Severe [1]	Severe [1]	Loblolly pine [2]-----	90	131	Loblolly pine. [3]
					Pond pine----------	---	--	
					Sweetgum----------	90	106	
					Blackgum----------	---	--	
					Water oak----------	---	--	
					Swamp chestnut oak---	---	--	
					Yellow-poplar--------	---	--	
					Red maple----------	---	--	
					Willow oak----------	---	--	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns			Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	Productivity	
							$Ft^3/AC/YR$	
Le---------- Lenoir	9W	Slight	Moderate	Slight	Loblolly pine--------	90	131	Loblolly pine.
					Sweetgum----------	90	106	
					Pond pine----------	---	---	
					Red maple----------	---	---	
					Yellow-poplar-------	---	---	
					Blackgum----------	---	---	
					Water oak----------	---	---	
					Swamp chestnut oak---	---	---	
					Willow oak----------	---	---	
Ln---------- Leon	4W	Slight	Moderate	Moderate	Longleaf pine--------	58	52	Longleaf pine.
					Pond pine----------	---	---	
Ly---------- Lynchburg	9W	Slight	Moderate	Slight	Loblolly pine--------	86	123	Loblolly pine.
					Yellow-poplar-------	92	93	
					Sweetgum----------	90	106	
					Southern red oak-----	---	---	
					White oak----------	---	---	
					Blackgum----------	---	---	
					Red maple----------	---	---	
					Water oak----------	---	---	
					Swamp chestnut oak---	---	---	
MA---------- Masontown	12W	Slight	Severe	Severe	Sweetgum----------	111	176	4/
					Green ash----------	---	---	
					Swamp tupelo-------	---	---	
					Baldcypress--------	---	---	
					Blackgum----------	---	---	
					Water oak----------	103	101	
					Red maple----------	---	---	
					American elm-------	---	---	
					Willow oak----------	---	---	
					Swamp chestnut oak---	---	---	
NoA, NoB---------- Norfolk	9A	Slight	Slight	Slight	Loblolly pine--------	86	123	Loblolly pine.
					Longleaf pine--------	68	74	
					Southern red oak-----	---	---	
					White oak----------	---	---	
					Shumard oak--------	---	---	
					Hickory----------	---	---	
					American beech------	---	---	
					Post oak----------	---	---	
					Water oak----------	---	---	
					Yellow-poplar-------	---	---	
					Red maple----------	---	---	
					Sweetgum----------	---	---	
Pa---------- Paxville	10W	Slight	Severe 1/	Severe 1/	Loblolly pine 2/-----	96	145	Loblolly pine. 3/
					Pond pine----------	77	63	
					Water oak----------	90	86	
					Willow oak----------	---	---	
					Swamp chestnut oak---	---	---	
					Red maple----------	---	---	
					Blackgum----------	---	---	
					Yellow-poplar-------	---	---	
					Sweetgum----------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns			Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	Productivity	
							$Ft^3/AC/YR$	
Ra---------- Rains	10W	Slight	Severe 1/	Severe 1/	Loblolly pine 2/-----	94	140	Loblolly pine. 3/
					Sweetgum----------	90	106	
					Pond pine----------	---	---	
					Red maple----------	---	---	
					Yellow-poplar--------	---	---	
					Blackgum----------	---	---	
					Water oak----------	---	---	
					Swamp chestnut oak---	---	---	
					Willow oak----------	---	---	
Ru---------- Rutlege	9W	Slight	Severe 1/	Severe 1/	Loblolly pine 2/-----	90	131	Loblolly pine. 3/
					Sweetgum----------	90	106	
					Pond pine----------	---	---	
					Blackgum----------	---	---	
					Red maple----------	---	---	
Sk---------- Stockade	10W	Slight	Severe 1/	Severe 1/	Loblolly pine--------	96	145	Loblolly pine. 3/
					Water oak----------	100	98	
					Blackgum----------	100	178	
					Swamp chestnut oak---	100	98	
					Sweetgum----------	100	138	
					Pond pine----------	---	---	
					Willow oak----------	---	---	
					Red maple----------	---	---	
					Yellow-poplar--------	---	---	
					Baldcypress----------	---	---	
Sm---------- Stockade	3W	Slight	Severe	Severe	Pond pine----------	60	39	
					Loblolly pine--------	---	---	
					Red maple----------	---	---	
Th---------- Tomahawk	8W	Slight	Moderate	Moderate	Loblolly pine--------	80	110	Loblolly pine.
					Longleaf pine--------	70	79	
					Red maple----------	---	---	
					Sweetgum----------	---	---	
					Southern red oak-----	---	---	
					White oak----------	---	---	
					Post oak----------	---	---	
					Blackgum----------	---	---	
Wa---------- Wahee	9W	Slight	Moderate	Moderate	Loblolly pine--------	86	123	Loblolly pine.
					Red maple----------	---	---	
					Sweetgum----------	90	106	
					Blackgum----------	---	---	
					Water oak----------	---	---	
					Swamp chestnut oak---	---	---	
					White oak----------	---	---	
					Southern red oak-----	---	---	
					Yellow-poplar--------	---	---	
Wd---------- Wasda	10W	Slight	Severe 1/	Severe 1/	Loblolly pine 2/-----	96	145	Loblolly pine. 3/
					Sweetgum----------	---	---	
					Baldcypress----------	---	---	
					Pond pine----------	80	68	
					Red maple----------	---	---	
					Blackgum----------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns			Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	Productivity	
							$Ft^3/AC/YR$	
Yo---------- Yonges	12W	Slight	Severe 1/	Severe 1/	Loblolly pine 2/----- Sweetgum---------- Water oak---------- Pond pine---------- Red maple---------- Yellow-poplar--------- Blackgum---------- Swamp chestnut oak--- Willow oak----------	105 100 100 --- --- --- --- --- ---	166 138 98 --- --- --- --- --- ---	Loblolly pine. 3/

1/ Equipment use is moderately restricted and seedling mortality is moderate in areas that have been adequately drained.
2/ Potential productivity is attainable only in areas that have been adequately drained.
3/ Trees named are suitable for planting only in areas that have been adequately drained.
4/ Select species from natural regeneration.

TABLE 8.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AaA---------- Altavista	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
AnB---------- Alpin	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
Ap---------- Arapahoe	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ar---------- Argent	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ba---------- Ballahack	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
BH* ---------- Belhaven	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
Bm---------- Brookman	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Br---------- Brookman	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
ByB---------- Baymeade	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
CnB---------- Conetoe	Slight----------	Slight----------	Moderate: slope.	Slight----------	Moderate: droughty.
CrB---------- Craven	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight----------	Slight.
Cs---------- Charleston	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight----------	Moderate: droughty.
CT* ---------- Croatan	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus, too acid.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: too acid, ponding.
DA* ---------- Dare	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: excess humus, ponding.

See footnote at end of table

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
DgB---- Dogue	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness.	Moderate: wetness.	Moderate: wetness.
Fo---- Fork	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
GoA---- Goldsboro	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight----	Slight.
HN*---- Hobucken	Severe: flooding, ponding.	Severe: ponding.	Severe: flooding, ponding.	Severe: ponding.	Severe: flooding, ponding.
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.
LF*---- Lafitte	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.
Ln---- Leon	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
Ly---- Lynchburg	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: wetness.
MA*---- Masontown	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
NoA---- Norfolk	Slight----	Slight----	Slight----	Slight----	Slight.
NoB---- Norfolk	Slight----	Slight----	Moderate: slope.	Slight----	Slight.
Pa---- Paxville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ra---- Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ru---- Rutlege	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Sk---- Stockade	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Sm---- Stockade	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.

See footnote at end of table

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Th---------- Tomahawk	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, droughty.
Ud*. Udorthents					
Wa---------- Wahee	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: wetness.
Wd---------- Wasda	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
Yo---------- Yonges	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated. The ratings are based on the undrained condition for poorly drained and very poorly drained soils]

Map symbol and soil name	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.
AnB---- Alpin	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Ap* ---- Arapahoe	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Ar* ---- Argent	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Ba* ---- Ballahack	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
BH* ---- Belhaven	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Bm---- Brookman	Very poor.	Very poor.	Very poor.	Poor	Poor	Good	Good	Very poor.	Poor	Good.
Br* ---- Brookman	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
ByB---- Baymeade	Poor	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
CnB---- Conetoe	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CrB---- Craven	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Cs---- Charleston	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CT* ---- Croatan	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
DA---- Dare	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
DgB---- Dogue	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Fo---- Fork	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
GoA---- Goldsboro	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
HN---- Hobucken	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.

See footnotes at end of table

TABLE 9.--WILDLIFE HABITAT--Continued

Map symbol and soil name	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
La* ---------- Leaf	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Le---------- Lenoir	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
LF* ---------- Lafitte	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
Ln---------- Leon	Poor	Fair	Good	Poor	Fair	Fair	Poor	Fair	Fair	Poor.
Ly---------- Lynchburg	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
MA---------- Masontown	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
NoA, NoB---------- Norfolk	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Pa* ---------- Paxville	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Ra* ---------- Rains	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Ru---------- Rutlege	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Sk* ---------- Stockade	Very poor.	Poor	Very poor.	Poor	Poor	Good	Good	Poor	Poor	Good.
Sm---------- Stockade	Very poor.	Very poor.	Very poor.	Poor	Poor	Good	Good	Very poor.	Poor	Good.
Th---------- Tomahawk	Fair	Good	Good	Fair	Fair	Poor	Poor	Good	Good	Poor.
Ud** Udorthents										
Wa---------- Wahee	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Wd* ---------- Wasda	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Yo* ---------- Yonges	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

* Artificially drained areas of these soils have a higher potential for openland and woodland wildlife habitat than shown in this table. The potential for wetland habitat is lower.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--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 but does not eliminate the need for onsite investigation]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AaA---- Altavista	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
AnB---- Alpin	Severe: cutbanks cave.	Slight---	Slight---	Slight---	Slight---	Severe: droughty.
Ap---- Arapahoe	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.
Ar---- Argent	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness.	Severe: wetness.
Ba---- Ballahack	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness.
BH* ---- Belhaven	Severe: excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, excess humus.
Bm---- Brookman	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness, low strength.	Severe: wetness, flooding.
Br---- Brookman	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness.	Severe: wetness.
ByB---- Baymeade	Severe: cutbanks cave.	Slight---	Moderate: wetness.	Slight---	Slight---	Severe: droughty.
CnB---- Conetoe	Severe: cutbanks cave.	Slight---	Slight---	Slight---	Slight---	Moderate: droughty.
CrB---- Craven	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength.	Slight.
Cs---- Charleston	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty.
CT* ---- Croatan	Severe: excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: ponding.	Severe: ponding, excess humus.

See footnote at end of table

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
DA* ---------- Dare	Severe: excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: ponding, low strength.	Severe: excess humus, ponding.
DgB---------- Dogue	Severe: cutbanks cave, wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength.	Moderate: wetness.
Fo---------- Fork	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
GoA---------- Goldsboro	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Slight.
HN* ---------- Hobucken	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.
La---------- Leaf	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.	Severe: wetness.
Le---------- Lenoir	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
LF* ---------- Lafitte	Severe: excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: ponding, flooding.	Severe: excess humus, ponding, flooding.
Ln---------- 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.
MA* ---------- Masontown	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding.	Severe: ponding, flooding.
NoA---------- Norfolk	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Slight.
NoB---------- Norfolk	Moderate: wetness.	Slight---------	Moderate: wetness.	Moderate: slope.	Slight---------	Slight.
Pa---------- Paxville	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.
Ru---------- Rutlege	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

See footnote at end of table

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Sk---------- Stockade	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Sm---------- Stockade	Severe: wetness, flooding.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
Th---------- Tomahawk	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
Ud*. Udorthents						
Wa---------- Wahee	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
Wd---------- Wasda	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, excess humus.
Yo---------- Yonges	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--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 but does not eliminate the need for onsite investigation]

Map symbol and soil name	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: seepage, wetness.	Fair: wetness.
AnB--- Alpin	Slight---	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy; seepage.
Ap--- Arapahoe	Severe: wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
Ar--- Argent	Severe: percs slowly, wetness.	Severe: flooding, wetness.	Severe: too clayey, wetness.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Ba* --- Ballahack	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness.
BH* --- Belhaven	Severe: ponding, percs slowly.	Severe: seepage, flooding, ponding, excess humus.	Severe: seepage, ponding.	Severe: seepage, ponding.	Poor: ponding, excess humus.
Bm--- Brookman	Severe: flooding, wetness, percs slowly.	Slight---	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
Br--- Brookman	Severe: wetness, percs slowly.	Slight---	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
ByB--- Baymeade	Severe: poor filter.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: too sandy.
CnB--- Conetoe	Slight---	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage.
CrB--- Craven	Severe: wetness, percs slowly.	Moderate: slope.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.

See footnote at end of table

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Cs Charleston	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness.	Moderate: wetness.	Poor: thin layer.
CT* Croatan	Severe: ponding, percs slowly.	Severe: seepage, ponding, excess humus.	Severe: ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
DA* Dare	Severe: ponding, percs slowly.	Severe: flooding, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: ponding.	Poor: excess humus, ponding.
DgB Dogue	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
Fo Fork	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
GoA Goldsboro	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
HN* Hobucken	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding.	Poor: ponding.
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.
LF* Lafitte	Severe: flooding, ponding.	Severe: seepage, flooding, excess humus.	Severe: flooding, ponding, seepage, excess humus.	Severe: flooding, seepage, ponding.	Poor: ponding, excess humus.
Ln 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.
MA* Masontown	Severe: flooding, ponding, poor filter.	Severe: seepage, flooding, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: seepage, too sandy, ponding.
NoA, NoB Norfolk	Moderate: wetness.	Moderate: seepage.	Severe: wetness.	Slight	Good.

See footnote at end of table

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Pa---------- Paxville	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
Ra---------- Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, seepage.	Poor: wetness.
Ru---------- Rutlege	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: too sandy, ponding.
Sk---------- Stockade	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness, thin layer.
Sm---------- Stockade	Severe: flooding, wetness.	Severe: seepage, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness, thin layer.
Th---------- Tomahawk	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness, seepage.	Severe: seepage, wetness.	Poor: thin layer.
Ud*. Udorthents					
Wa---------- Wahee	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Wd---------- Wasda	Severe: ponding.	Severe: excess humus, ponding.	Severe: ponding, seepage.	Severe: ponding.	Poor: ponding, excess humus.
Yo---------- Yonges	Severe: wetness, percs slowly.	Severe: wetness, seepage.	Severe: wetness.	Severe: wetness.	Poor: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--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 but does not eliminate the need for onsite investigation]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
AaA Altavista	Fair: wetness, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
AnB Alpin	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Ap Arapahoe	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: wetness.
Ar Argent	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, thin layer.
Ba Ballahack	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
BH* Belhaven	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
Bm, Br Brookman	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
ByB Baymeade	Good	Probable	Improbable: too sandy.	Poor: too sandy.
CnB Conetoe	Good	Probable	Improbable: too sandy.	Fair: too sandy.
CrB Craven	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Cs Charleston	Fair: wetness.	Probable	Improbable: too sandy.	Fair: too sandy.
CT* Croatan	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	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.
Fo Fork	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
GoA Goldsboro	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.

See footnote at end of table

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
HN* ---------- Hobucken	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
La---------- Leaf	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
Le---------- Lenoir	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
LF* ---------- Lafitte	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
Ln---------- Leon	Poor: wetness.	Probable----------	Improbable: too sandy.	Poor: too sandy, wetness.
Ly---------- Lynchburg	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
MA* ---------- Masontown	Poor: wetness.	Probable----------	Improbable: too sandy.	Poor: wetness.
NoA, NoB---------- Norfolk	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Pa---------- Paxville	Poor: wetness.	Probable----------	Improbable: too sandy.	Poor: wetness.
Ra---------- Rains	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Ru---------- Rutlege	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: wetness.
Sk, Sm---------- Stockade	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Th---------- Tomahawk	Fair: wetness.	Probable----------	Improbable: too sandy.	Fair: too sandy.
Ud*. Udorthents				
Wa---------- Wahee	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Wd---------- Wasda	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: excess humus, wetness.
Yo---------- Yonges	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--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 but does not eliminate the need for onsite investigation]

Map symbol and soil name	Limitations for--			Features affecting--	
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Grassed Waterways
AaA---- Altavista	Moderate: seepage.	Moderate: wetness.	Moderate: deep to water.	Favorable----	Favorable.
AnB---- Alpin	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water----	Droughty.
Ap---- Arapahoe	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Cutbanks cave----	Wetness.
Ar---- Argent	Slight----	Severe: wetness, hard to pack.	Severe: slow refill.	Percs slowly----	Wetness, percs slowly.
Ba---- Ballahack	Severe: seepage.	Severe: wetness.	Slight----	Flooding----	Wetness.
BH* ---- Belhaven	Moderate: seepage.	Severe: piping, ponding.	Slight----	Ponding, subsides, percs slowly.	Ponding.
Bm---- Brookman	Slight----	Severe: hard to pack, wetness.	Severe: slow refill.	Flooding, percs slowly.	Wetness.
Br---- Brookman	Slight----	Severe: hard to pack, wetness.	Severe: slow refill.	Percs slowly----	Wetness.
ByB---- Baymeade	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water----	Droughty, rooting depth.
CnB---- Conetoe	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water----	Droughty.
CrB---- Craven	Moderate: seepage.	Moderate: hard to pack, wetness.	Severe: slow refill.	Percs slowly----	Erodes easily, percs slowly.
Cs---- Charleston	Moderate: seepage.	Severe: piping.	Severe: cutbanks cave.	Favorable----	Droughty.
CT* ---- Croatan	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill.	Percs slowly, subsides, ponding.	Wetness, percs slowly.
DA* ---- Dare	Slight----	Severe: excess humus, wetness.	Slight----	Percs slowly, subsides, ponding.	Wetness, percs slowly.

See footnote at end of table

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--			Features affecting--	
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Grassed Waterways
DgB---------- Dogue	Moderate: seepage.	Severe: wetness.	Severe: slow refill, cutbanks cave.	Favorable--------	Favorable.
Fo---------- Fork	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Favorable--------	Wetness.
GoA---------- Goldsboro	Moderate: seepage.	Moderate: piping, wetness.	Moderate: slow refill, deep to water.	Favorable--------	Favorable.
HN* ---------- Hobucken	Moderate: seepage.	Severe: piping, ponding.	Moderate: salty water.	Ponding, flooding.	Wetness, excess salt.
La---------- Leaf	Slight----------	Severe: wetness.	Severe: slow refill.	Percs slowly-----	Wetness, percs slowly.
Le---------- Lenoir	Slight----------	Severe: wetness.	Severe: slow refill.	Percs slowly-----	Wetness, erodes easily, percs slowly.
LF* ---------- Lafitte	Severe: seepage.	Severe: excess humus, ponding.	Moderate: salty water.	Ponding, flooding, subsides.	Wetness, excess salt.
Ln---------- Leon	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave----	Wetness, droughty.
Ly---------- Lynchburg	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Favorable--------	Wetness.
MA* ---------- Masontown	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, flooding, cutbanks cave.	Wetness.
NoA---------- Norfolk	Moderate: seepage.	Moderate: piping.	Moderate: deep to water, slow refill.	Deep to water----	Favorable.
NoB---------- Norfolk	Moderate: seepage, slope.	Moderate: piping.	Moderate: deep to water, slow refill.	Deep to water----	Favorable.
Pa---------- Paxville	Moderate: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Cutbanks cave----	Wetness.
Ra---------- Rains	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Favorable--------	Wetness.
Ru---------- Rutlege	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Wetness.

See footnote at end of table

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--			Features affecting--	
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Grassed Waterways
Sk---------- Stockade	Severe: seepage.	Severe: wetness.	Slight----------	Favorable--------	Wetness.
Sm---------- Stockade	Severe: seepage.	Severe: wetness.	Slight----------	Flooding---------	Wetness.
Th---------- Tomahawk	Severe: seepage.	Severe: piping, wetness, seepage.	Severe: cutbanks cave.	Cutbanks cave----	Droughty.
Ud*. Udorthents					
Wa---------- Wahee	Slight----------	Severe: wetness.	Severe: slow refill.	Percs slowly-----	Wetness, percs slowly.
Wd---------- Wasda	Moderate: seepage.	Severe: wetness.	Slight----------	Subsides---------	Wetness.
Yo---------- Yonges	Moderate: seepage.	Severe: piping, wetness.	Severe: slow refill.	Favorable--------	Wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated. Some soils may have Unified classifications and USDA textures in addition to those shown. In general, the dominant classifications and textures are shown]

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
AaA---------- Altavista	0-8	Loamy fine sand	SM	A-2	0	95-100	90-100	50-99	15-35	---	NP
	8-57	Clay loam, sandy clay loam, sandy 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
	57-80	Variable---------	---	---	---	---	---	---	---	---	---
AnB---------- Alpin	0-5	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	95-100	90-100	60-100	5-20	---	NP
	5-44	Fine sand, sand	SP-SM	A-3, A-2-4	0	95-100	90-100	60-100	5-20	---	NP
	44-80	Fine sand, sand	SP-SM, SM	A-2-4	0	95-100	90-100	60-100	11-20	---	NP
Ap---------- Arapahoe	0-17	Loamy fine sand	SM	A-2, A-4	0	100	100	60-100	15-45	---	NP
	17-42	Fine sandy loam, loam, sandy loam.	SM	A-2, A-4	0	100	100	70-100	20-49	---	NP
	42-80	Stratified sand to loamy fine sand.	SM, SP-SM	A-2, A-3, A-4	0	100	100	65-100	5-45	<30	NP-4
Ar---------- Argent	0-6	Loam----------	CL, CL-ML	A-4, A-6, A-7	0	100	98-100	90-100	51-80	20-43	5-20
	6-36	Clay, sandy clay, clay loam.	CL, CH	A-6, A-7	0	100	98-100	90-100	55-98	30-60	11-40
	36-46	Sandy clay loam.	CL, CL-ML, SC, SM-SC	A-4, A-6, A-7	0	100	98-100	90-100	40-80	22-49	6-28
	46-80	Variable---------	---	---	---	---	---	---	---	---	---
Ba---------- Ballahack	0-37	Fine sandy loam	SM, SC, CL, ML	A-4	0	100	100	60-95	36-70	<30	NP-10
	37-49	Sandy clay loam, loam.	SC, CL	A-4, A-6	0	100	100	70-98	36-65	20-40	8-20
	49-80	Variable---------	---	---	---	---	---	---	---	---	---
BH* ---------- Belhaven	0-28	Muck----------	PT	---	---	---	---	---	---	---	---
	28-36	Sandy loam, mucky fine sandy loam.	SM, SC, SM-SC	A-2, A-4	0	100	100	60-85	30-49	<30	NP-10
	36-59	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
	59-80	Variable---------	---	---	---	---	---	---	---	---	---
Bm---------- Brookman	0-14	Mucky loam-------	CL, ML, CL-ML	A-6, A-4	0	100	95-100	75-100	51-81	25-40	6-20
	14-52	Sandy clay, clay, clay loam.	CH, CL	A-7, A-6	0	100	98-100	85-100	55-91	37-65	18-41
	52-64	Variable---------	---	---	---	---	---	---	---	---	---
Br---------- Brookman	0-20	Mucky silt loam	CL, ML, CL-ML	A-6, A-4	0	100	95-100	75-100	51-81	25-40	6-20
	20-60	Sandy clay, clay, clay loam.	CH, CL	A-7, A-6	0	100	98-100	85-100	55-91	37-65	18-41
	60-68	Clay loam, clay, sandy clay loam.	CL, CH, SC	A-6, A-7	0	100	90-100	70-100	43-90	25-55	11-35
	68-80	Variable---------	---	---	---	---	---	---	---	---	---

See footnote at end of table

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
ByB----------	0-30	Sand----------	SM, SP-SM	A-2, A-3	0	100	100	51-100	5-20	---	NP
Baymeade	30-41	Fine sandy loam, sandy clay loam, sandy loam.	SC, SM, SM-SC	A-2, A-4	0	100	100	60-100	30-49	<25	NP-10
	41-80	Loamy fine sand, sand, loamy sand.	SM, SP-SM	A-2, A-3	0	100	100	51-75	5-30	---	NP
CnB----------	0-36	Loamy sand-------	SM, SP-SM	A-2, A-3	0	100	100	50-95	5-30	---	NP
Conetoe	36-51	Sandy loam, sandy clay loam, fine sandy loam.	SM, SC, SM-SC	A-2, A-4	0	100	100	50-95	20-40	<30	NP-10
	51-80	Loamy sand, sand	SM, SP, SP-SM	A-2, A-3, A-1	0	100	100	40-95	4-30	---	NP
CrB----------	0-5	Loam----------	ML, CL-ML, SM, SM-SC	A-4	0	100	100	75-100	45-90	<35	NP-7
Craven	5-44	Clay, silty clay, clay loam.	CH	A-7	0	100	100	90-100	65-98	51-70	24-43
	44-80	Variable---------	---	---	---	---	---	---	---	---	---
Cs----------	0-14	Loamy fine sand	SM, SP-SM	A-2, A-3	0	95-100	90-100	85-100	5-25	---	NP
Charleston	14-55	Fine sandy loam, sandy loam.	SM, SM-SC	A-2, A-4	0	95-100	90-100	88-100	25-50	<30	NP-7
	55-80	Loamy fine sand, loamy sand, fine sand.	SM, SP-SM	A-2, A-3	0	95-100	90-100	85-100	5-25	---	NP
CT* ----------	0-25	Muck----------	PT	---	---	---	---	---	---	---	---
Croatan	25-32	Sandy loam, fine sandy loam, mucky fine sandy loam.	SM, SC, SM-SC	A-2, A-4	0	100	100	60-85	25-49	<30	NP-10
	32-50	Loam, clay loam, sandy clay loam.	CL, SM, ML, SC	A-4, A-6	0	100	100	75-100	36-95	<36	NP-15
	50-80	Variable---------	---	---	---	---	---	---	---	---	---
DA* ----------	0-61	Muck----------	PT	---	0	---	---	---	---	---	NP
Dare	61-80	Stratified mucky sand to loamy sand.	SM, SP-SM	A-2, A-3	0	100	90-100	60-80	5-30	---	NP
DgB----------	0-6	Fine sandy loam	SM, SC, SM-SC	A-2, A-4	0	95-100	90-100	85-100	20-50	<25	NP-10
Dogue	6-44	Clay loam, clay, sandy clay.	CL, CH	A-6, A-7	0	95-100	90-100	90-100	50-90	35-60	16-40
	44-58	Sandy clay loam.	SC, SM-SC	A-2, A-4, A-6	0	95-100	90-100	80-100	30-49	16-37	4-18
	58-80	Variable---------	---	---	---	---	---	---	---	---	---
Fo----------	0-8	Loamy fine sand	SM	A-2	0	95-100	90-100	70-100	20-35	---	NP
Fork	8-49	Clay loam, sandy clay loam, fine sandy loam.	SC, CL, ML, SM	A-4, A-6, A-7	0	95-100	90-100	80-100	35-80	29-46	8-20
	49-80	Variable---------	---	---	---	---	---	---	---	---	---
GoA----------	0-11	Loamy fine sand	SM	A-2	0	95-100	95-100	50-95	13-30	---	NP
Goldsboro	11-65	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
	65-80	Variable---------	---	---	---	---	---	---	---	---	---

See footnote at end of table

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
HN* ---------- Hobucken	0-6	Muck	PT	---	0	---	---	---	---	---	---
	6-16	Mucky fine sandy loam.	SM, ML, SM-SC, CL-ML	A-2, A-4	0	100	95-100	70-95	30-65	<30	NP-7
	16-64	Fine sandy loam, loam, silt loam.	SM, SM-SC, ML	A-2, A-4	0	100	95-100	60-95	39-90	<30	NP-10
	64-80	Variable---------	---	---	---	---	---	---	---	---	---
La---------- Leaf	0-6	Silt loam--------	ML, CL	A-4, A-6	0	100	95-100	85-100	50-90	30-40	5-15
	6-72	Silty clay loam, silty clay, clay, sandy clay	CL, CH	A-7	0	100	95-100	90-100	75-95	42-65	20-38
	72-80	Variable---------	---	---	---	---	---	---	---	---	---
Le---------- Lenoir	0-7	Silt loam--------	ML, CL, CL-ML	A-4	0	100	100	85-95	60-85	20-35	4-10
	7-67	Clay, silty clay, clay loam, sandy clay.	CL, CH	A-6, A-7	0	100	100	85-95	55-95	30-55	11-35
	67-80	Variable---------	---	---	---	---	---	---	---	---	---
LF* ---------- Lafitte	0-80	Muck----------	PT	---	0	---	---	---	---	---	---
Ln---------- Leon	0-15	Sand----------	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	15-55	Sand, fine sand.	SM, SP-SM, SP	A-3, A-2-4	0	100	100	80-100	3-20	---	NP
	55-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
Ly---------- Lynchburg	0-8	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
	8-65	Sandy clay loam, fine sandy loam, 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
	65-80	Variable---------	---	---	---	---	---	---	---	---	---
MA* ---------- Masontown	0-27	Loam----------	SM, ML, SC, CL	A-2, A-4	0	100	95-100	60-95	25-75	<30	NP-10
	27-42	Sandy loam, loam, silt loam.	SM, SM-SC, ML	A-4	0	100	95-100	70-100	40-90	<30	NP-7
	42-60	Loamy sand, sand, sandy loam.	SM, SP-SM	A-2, A-3, A-5	0	100	95-100	50-75	5-40	---	NP
NoA, NoB--------- Norfolk	0-13	Loamy fine sand	SM	A-2	0	95-100	92-100	50-95	13-30	<20	NP
	13-62	Fine sandy loam, sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	95-100	91-100	70-96	30-63	20-38	4-15
	62-80	Variable---------	---	---	---	---	---	---	---	---	---
Pa---------- Paxville	0-15	Mucky fine sandy loam.	SM, ML	A-2, A-4	0	100	100	80-98	30-60	<35	NP-7
	15-52	Sandy clay loam, sandy loam.	CL-ML, CL, SM-SC	A-2, A-4, A-6	0	100	98-100	60-98	30-60	21-40	5-15
	52-80	Loamy fine sand, sand, loamy sand	SM, SP-SM	A-2, A-3, A-1	0	95-100	90-100	45-65	5-25	---	NP

See footnote at end of table

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Ra----------	0-12	Fine sandy loam	SM, ML	A-2, A-4	0	100	95-100	50-85	25-56	<35	NP-10
Rains	12-47	Sandy clay loam, clay loam, fine sandy 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
	47-64	Fine sandy loam, sandy clay loam.	SM, SC, ML, CL	A-2, A-4, A-6	0	100	95-100	60-95	30-60	15-40	3-18
	64-80	Variable----------	---	---	---	---	---	---	---	---	---
Ru----------	0-20	Mucky loamy fine sand.	SM, SP-SM	A-2, A-3	0	95-100	95-100	50-80	5-35	<25	NP
Rutlege	20-80	Sand, loamy sand, loamy fine sand.	SP-SM, SP, SM	A-2, A-3	0	95-100	95-100	50-80	2-25	<20	NP
Sk----------	0-19	Loamy fine sand	SM	A-2-4	0	100	100	90-100	13-29	---	NP
Stockade	19-54	Sandy clay loam, clay loam, fine sandy loam.	SC, CL	A-4, A-6, A-2	0	100	100	90-100	40-70	28-40	9-18
	54-80	Variable----------	---	---	---	---	---	---	---	---	---
Sm----------	0-13	Mucky loam-------	SM, ML	A-2-4, A-4	0	100	100	85-100	40-60	<30	NP-7
Stockade	13-54	Sandy clay loam, clay loam, fine sandy loam.	SC, CL	A-4, A-6, A-2	0	100	100	90-100	40-70	28-40	9-18
	54-60	Variable----------	---	---	---	---	---	---	---	---	---
Th----------	0-25	Loamy sand-------	SM, SP-SM	A-2-4, A-1-B	0	100	95-100	40-70	10-30	---	NP
Tomahawk	25-38	Sandy loam.	SM, SC, SM-SC	A-2-4, A-4	0	100	95-100	50-80	20-49	<25	NP-10
	38-80	Sand, loamy sand.	SM, SP-SM	A-2-4, A-1-B, A-3	0	100	95-100	35-65	5-20	---	NP
Ud*. Udorthents											
Wa----------	0-6	Fine sandy loam	SM, SM-SC	A-2, A-4	0	100	95-100	50-98	30-50	<28	NP-7
Wahee	6-44	Clay, clay loam, sandy clay.	CL, CH	A-6, A-7	0	100	100	85-100	51-90	38-70	18-42
	44-57	Sandy clay loam.	SC, SM-SC	A-2, A-4, A-6	0	95-100	90-100	80-100	30-49	16-37	4-18
	57-80	Variable----------	---	---	---	---	---	---	---	---	---
Wd----------	0-12	Muck----------	PT	---	0	---	---	---	---	---	NP
Wasda	12-46	Clay loam, sandy clay loam, mucky fine sandy loam.	ML, CL, CL-ML	A-2, A-4, A-6	0	98-100	95-100	75-95	50-80	<25	NP-10
	46-72	Variable----------	---	---	---	---	---	---	---	---	---
Yo----------	0-11	Loamy fine sand	SM, ML	A-2, A-4	0	100	100	90-100	25-55	<30	NP-7
Yonges	11-36	Sandy clay loam, clay loam.	CL-ML, CL, SC, SM-SC	A-4, A-6, A-7	0	100	100	95-100	40-70	20-45	6-28
	36-59	Fine sandy loam, sandy clay loam.	CL, ML, SC, SM	A-4, A-6	0	100	100	80-100	40-65	20-40	3-22
	59-80	Variable----------	---	---	---	---	---	---	---	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--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]

Map symbol and soil name	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----------	0-8	5-10	1.40-1.60	6.0-20	0.07-0.12	4.5-6.0	Low----------	0.17	5	.5-3
Altavista	8-57	18-35	1.30-1.50	0.6-2.0	0.12-0.20	4.5-6.0	Low----------	0.24		
	57-80	---	---	---	---	---	----------	----		
AnB----------	0-5	1-7	1.35-1.55	2.0-6.0	0.05-0.10	4.5-6.5	Low----------	0.10	5	0-2
Alpin	5-44	1-7	1.40-1.55	6.0-20.0	0.03-0.09	4.5-6.5	Low----------	0.10		
	44-80	5-8	1.45-1.65	2.0-6.0	0.06-0.09	4.5-6.5	Low----------	0.10		
Ap----------	0-17	3-10	1.45-1.60	6.0-20	0.08-0.12	3.6-5.5	Low----------	0.15	5	5-10
Arapahoe	17-42	8-18	1.45-1.60	2.0-6.0	0.10-0.14	3.6-7.8	Low----------	0.15		
	42-80	3-18	1.40-1.65	2.0-20	0.05-0.14	5.6-7.8	Low----------	0.10		
Ar----------	0-6	10-27	1.30-1.50	0.6-2.0	0.15-0.20	4.5-6.0	Low----------	0.24	5	1-3
Argent	6-36	35-60	1.30-1.50	0.06-0.2	0.14-0.18	4.5-6.0	Moderate-----	0.32		
	36-46	20-35	1.20-1.50	0.06-0.6	0.12-0.16	5.6-8.4	Moderate-----	0.32		
	46-80	---	---	---	---	---	----------	----		
Ba----------	0-37	5-20	1.40-1.60	2.0-6.0	0.10-0.20	3.6-5.5	Low----------	0.10	5	5-10
Ballahack	37-49	18-35	1.30-1.50	0.6-2.0	0.12-0.17	3.6-5.5	Low----------	0.10		
	49-80	---	---	---	---	---	----------	----		
BH* ----------	0-28	---	0.40-0.65	0.06-6.0	0.20-0.26	<4.5	Low----------	----	---	20-80
Belhaven	28-36	5-15	1.45-1.65	2.0-6.0	0.10-0.15	3.6-5.5	Low----------	0.24		
	36-59	10-35	1.30-1.45	0.2-0.6	0.12-0.20	3.6-6.5	Low----------	0.24		
	59-80	---	---	---	---	---	----------	----		
Bm----------	0-14	10-27	1.00-1.30	0.6-2.0	0.18-0.22	4.5-6.5	Low----------	0.15	4	10-20
Brookman	14-52	35-55	1.30-1.50	0.06-0.2	0.18-0.22	4.5-7.8	Moderate-----	0.28		
	52-64	---	---	---	---	---	----------	----		
Br----------	0-20	10-27	1.00-1.30	0.6-2.0	0.18-0.22	4.5-6.5	Low----------	0.15	4	10-20
Brookman	20-60	35-55	1.30-1.50	0.06-0.2	0.18-0.22	4.5-6.5	Moderate-----	0.28		
	60-68	20-55	1.45-1.65	0.06-0.2	0.12-0.16	5.1-7.8	Moderate-----	0.24		
	68-80	---	---	---	---	---	----------	----		
ByB----------	0-30	0-8	1.60-1.75	6.0-20	0.02-0.06	4.5-6.5	Low----------	0.10	5	.5-1
Baymeade	30-41	8-26	1.45-1.60	2.0-6.0	0.10-0.14	4.5-6.5	Low----------	0.10		
	41-80	0-12	1.60-1.75	6.0-20	0.02-0.10	4.5-6.5	Low----------	0.10		
CnB----------	0-36	2-10	1.60-1.75	6.0-20	0.05-0.10	4.5-6.0	Low----------	0.15	5	.5-2
Conetoe	36-51	10-22	1.40-1.60	2.0-6.0	0.10-0.15	4.5-6.0	Low----------	0.15		
	51-80	2-10	1.60-1.75	6.0-20	0.05-0.10	4.5-6.0	Low----------	0.10		
CrB----------	0-5	6-20	1.30-1.55	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.37	5	.5-2
Craven	5-44	35-60	1.30-1.45	0.06-0.2	0.12-0.15	3.6-5.5	Moderate-----	0.32		
	44-80	---	---	---	---	---	----------	----		
Cs----------	0-14	2-10	1.40-1.60	6.0-20	0.05-0.08	4.5-6.0	Low----------	0.15	5	.5-3
Charleston	14-55	10-18	1.30-1.50	0.6-2.0	0.10-0.13	4.5-6.0	Low----------	0.20		
	55-80	5-12	1.30-1.60	6.0-20	0.04-0.08	4.5-7.8	Low----------	0.15		
CT* ----------	0-25	---	0.40-0.65	0.06-6.0	0.35-0.45	<4.5	Low----------	----	---	25-60
Croatan	25-32	8-20	1.40-1.60	0.2-6.0	0.10-0.15	3.6-6.5	Low----------	----		
	32-50	10-35	1.40-1.60	0.2-2.0	0.12-0.20	3.6-6.5	Low----------	----		
	50-80	---	---	---	---	---	----------	----		

See footnote at end of table

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	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
DA*	0-61	---	0.40-0.65	0.06-0.2	0.20-0.26	3.6-4.4	Low	---	---	20-95
Dare	61-80	2-12	1.60-1.70	6.0-20	0.04-0.09	3.6-6.0	Low	0.15		
DgB	0-6	5-20	1.35-1.50	2.0-6.0	0.08-0.15	3.6-5.5	Low	0.28	4	.5-1
Dogue	6-44	35-50	1.45-1.60	0.2-0.6	0.12-0.19	3.6-5.5	Moderate	0.28		
	44-58	18-35	1.30-1.50	0.6-2.0	0.12-0.17	3.6-5.5	Low	0.17		
	58-80	---	---	---	---	---		---		
Fo	0-8	2-8	1.40-1.60	6.0-20	0.08-0.12	4.5-5.5	Low	0.17	5	1-3
Fork	8-49	18-35	1.30-1.60	0.6-2.0	0.16-0.21	4.5-7.3	Low	0.32		
	49-80	---	---	---	---	---		---		
GoA	0-11	2-8	1.55-1.75	6.0-20.0	0.06-0.11	4.5-5.5	Low	0.17	5	.5-2
Goldsboro	11-65	18-35	1.30-1.50	0.6-2.0	0.11-0.15	4.5-5.5	Low	0.24		
	65-80	---	---	---	---	---		---		
HN*	0-6	---	---	0.6-6.0	0.25-0.45	6.1-8.4		---	---	30-50
Hobucken	6-16	10-18	---	0.6-6.0	0.20-0.26	6.1-8.4	Low	0.10		
	16-64	10-18	---	0.6-6.0	0.12-0.20	6.1-8.4	Low	0.10		
	64-80	---	---	---	---	---		---		
La	0-6	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	6-72	35-60	1.30-1.50	<0.06	0.18-0.21	3.6-5.5	High	0.32		
	72-80	---	---	---	---	---		---		
Le	0-7	12-20	1.30-1.50	0.6-2.0	0.14-0.18	3.6-5.5	Low	0.37	5	2-4
Lenoir	7-67	35-60	1.30-1.50	0.06-0.2	0.13-0.15	3.6-5.5	Moderate	0.32		
	67-80	---	---	---	---	---		---		
LF*	0-80	---	0.05-0.25	2.0-6.0	0.18-0.45	6.1-8.4	Low	---	---	30-70
Lafitte										
Ln	0-15	1-6	1.40-1.65	6.0-20	0.02-0.05	3.6-5.5	Low	0.10	5	.5-4
Leon	15-55	2-8	1.50-1.70	0.6-6.0	0.05-0.10	3.6-5.5	Low	0.15		
	55-80	1-6	1.40-1.65	0.6-6.0	0.02-0.05	3.6-5.5	Low	0.10		
Ly	0-8	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	8-65	18-35	1.30-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low	0.20		
	65-80	---	---	---	---	---		---		
MA*	0-27	10-18	1.20-1.50	2.0-6.0	0.12-0.20	5.6-7.8	Low	0.15	5	4-10
Masontown	27-42	10-18	1.20-1.50	2.0-6.0	0.12-0.20	5.6-7.8	Low	0.20		
	42-60	2-18	1.40-1.60	2.0-20	0.02-0.12	5.6-7.8	Low	0.10		
NoA, NoB	0-13	2-8	1.55-1.75	6.0-20	0.06-0.11	4.5-5.5	Low	0.20	5	.5-2
Norfolk	13-62	18-35	1.30-1.45	0.6-2.0	0.10-0.20	4.5-5.5	Low	0.24		
	62-80	---	---	---	---	---		---		
Pa	0-15	8-20	1.20-1.40	2.0-6.0	0.12-0.16	3.6-5.5	Low	0.20	5	10-20
Paxville	15-52	8-35	1.30-1.60	0.6-2.0	0.12-0.18	3.6-5.5	Low	0.15		
	52-80	2-12	1.30-1.60	6.0-20	0.05-0.08	3.6-5.5	Low	0.10		
Ra	0-12	5-20	1.30-1.60	2.0-6.0	0.10-0.14	3.6-5.5	Low	0.20	5	1-6
Rains	12-47	18-35	1.30-1.50	0.6-2.0	0.11-0.15	3.6-5.5	Low	0.24		
	47-64	15-35	1.30-1.60	0.6-2.0	0.10-0.15	3.6-5.5	Low	0.28		
	64-80	---	---	---	---	---		---		

See footnote at end of table

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	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
Ru	0-20	<10	1.20-1.40	6.0-20	0.12-0.18	3.6-5.0	Low	0.17	5	10-20
Rutlege	20-80	<10	1.40-1.60	6.0-20	0.04-0.08	3.6-5.0	Low	0.17		
Sk	0-19	6-10	1.40-1.60	2.0-6.0	0.10-0.15	4.5-6.5	Low	0.17	5	3-6
Stockade	19-54	18-35	1.40-1.70	0.6-2.0	0.12-0.17	4.5-8.4	Low	0.28		
	54-80	---	---	---	---	---	---	---		
Sm	0-13	10-15	1.30-1.50	0.6-2.0	0.15-0.24	4.5-6.5	Low	0.20	5	10-20
Stockade	13-54	18-35	1.40-1.70	0.6-2.0	0.12-0.17	4.5-8.4	Low	0.28		
	54-60	---	---	---	---	---	---	---		
Th	0-25	2-8	1.60-1.75	6.0-20	0.04-0.10	4.5-5.5	Low	0.10	5	.5-2
Tomahawk	25-38	5-15	1.45-1.65	2.0-6.0	0.10-0.14	4.5-5.5	Low	0.15		
	38-80	2-8	1.60-1.75	6.0-20	0.04-0.08	4.5-6.5	Low	0.10		
Ud*.										
Udorthents										
Wa	0-6	5-20	1.30-1.60	0.6-2.0	0.10-0.15	3.6-5.5	Low	0.24	5	.5-5
Wahee	6-44	35-55	1.40-1.60	0.06-0.2	0.12-0.20	3.6-5.5	Moderate	0.28		
	44-57	18-35	1.40-1.60	0.2-0.6	0.12-0.17	3.6-5.5	Low	0.24		
	57-80	---	---	---	---	---	---	---		
Wd	0-12	---	0.40-0.65	0.2-0.6	0.20-0.25	3.6-5.5	---	---	---	20-50
Wasda	12-46	18-35	1.35-1.60	0.6-2.0	0.12-0.18	4.5-5.5	Low	0.20		
	46-72	---	---	---	---	---	---	---		
Yo	0-11	5-10	1.40-1.60	0.6-6.0	0.09-0.14	4.5-7.8	Low	0.15	5	1-5
Yonges	11-36	18-35	1.30-1.60	0.2-0.6	0.13-0.18	5.1-8.4	Low	0.17		
	36-59	10-35	1.30-1.50	0.6-2.0	0.12-0.16	6.1-8.4	Low	0.20		
	59-80	---	---	---	---	---	---	---		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--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]

Map symbol and soil name	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.
AnB---------- Alpin	A	None-------	---	---	>6.0	---	---	---	---	Low------	High.
Ap---------- Arapahoe	B/D	Rare-------	---	---	0-1.0	Apparent	Dec-Apr	---	---	High-----	High.
Ar---------- Argent	D	Rare-------	---	---	0-1.0	Apparent	Dec-Apr	---	---	High-----	High.
Ba---------- Ballahack	D	Occasional	Brief	Nov-Mar	0-1.0	Apparent	Nov-Apr	---	---	High-----	High.
BH* ---------- Belhaven	D	Rare-------	---	---	+.5-1.0	Apparent	Jan-Dec	10-20	20-48	High-----	High.
Bm---------- Brookman	D	Frequent---	Long---	Jan-Dec	0-1.0	Apparent	Nov-May	---	---	Moderate	Moderate.
Br---------- Brookman	D	Rare-------	---	---	0-1.0	Apparent	Dec-Apr	---	---	Moderate	Moderate.
ByB---------- Baymeade	A	None-------	---	---	4.0-5.0	Apparent	Dec-Mar	---	---	Low------	Moderate.
CnB---------- Conetoe	A	None-------	---	---	>6.0	---	---	---	---	Low------	High.
CrB---------- Craven	C	None-------	---	---	2.0-3.0	Apparent	Dec-Apr	---	---	High-----	High.
Cs---------- Charleston	C	None-------	---	---	2.0-3.5	Apparent	Dec-Mar	---	---	Moderate	High.
CT* ---------- Croatan	D	Rare-------	---	---	+.5-1.0	Apparent	Jan-Dec	4-10	18-24	High-----	High.
DA* ---------- Dare	D	Rare-------	---	---	+.5-1.0	Apparent	Jan-Dec	6-20	36-60	High-----	High.
DgB---------- Dogue	C	None-------	---	---	1.5-3.0	Apparent	Dec-Mar	---	---	High-----	High.
Fo---------- Fork	C	None-------	---	---	1.0-2.0	Apparent	Dec-Mar	---	---	High-----	High.
GoA---------- Goldsboro	B	None-------	---	---	2.0-3.0	Apparent	Dec-Mar	---	---	Moderate	High.
HN* ---------- Hobucken	D	Frequent---	Very brief.	Jan-Dec	+1-1.0	Apparent	Jan-Dec	---	---	High-----	High.
La---------- Leaf	D	None-------	---	---	0.5-1.5	Apparent	Dec-Apr	---	---	High-----	Moderate.

See footnote at end of table

TABLE 16.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Initial	Total	Uncoated steel	Concrete
					Ft			In	In		
Le---------- Lenoir	D	None-------	---	---	1.0-2.0	Apparent	Dec-Apr	---	---	High-----	High.
LF* ---------- Lafitte	D	Frequent---	Brief to very long.	Jan-Dec	+1-0.5	Apparent	Jan-Dec	---	---	High-----	Moderate.
Ln---------- Leon	B/D	None-------	---	---	0-1.0	Apparent	Nov-Apr	---	---	High-----	High.
Ly---------- Lynchburg	C	None-------	---	---	1.0-1.5	Apparent	Dec-Mar	---	---	High-----	High.
MA* ---------- Masontown	D	Frequent---	Long---	Nov-Apr	+1-0.5	Apparent	Nov-Apr	---	---	Moderate	Moderate.
NoA, NoB------- Norfolk	B	None-------	---	---	4.0-6.0	Apparent	Jan-Mar	---	---	Moderate	High.
Pa---------- Paxville	B/D	None-------	---	---	0-1.0	Apparent	Dec-Apr	---	---	High-----	High.
Ra---------- Rains	B/D	None-------	---	---	0-1.0	Apparent	Dec-Mar	---	---	High-----	High.
Ru---------- Rutlege	B/D	None-------	---	---	+.5-1.0	Apparent	Nov-May	---	---	High-----	High.
Sk---------- Stockade	B/D	None-------	---	---	0-1.0	Apparent	Dec-Apr	---	---	High-----	Moderate.
Sm---------- Stockade	D	Frequent---	Long---	Jan-Dec	0-1.0	Apparent	Nov-May	---	---	High-----	Moderate.
Th---------- Tomahawk	A	None-------	---	---	1.5-3.0	Apparent	Dec-Apr	---	---	Moderate	High.
Ud*. Udorthents											
Wa---------- Wahee	D	None-------	---	---	1.0-1.5	Apparent	Dec-Apr	---	---	High-----	High.
Wd---------- Wasda	B/D	Rare-------	---	---	+.5-1.0	Apparent	Nov-Jan	3-7	7-14	High-----	High.
Yo---------- Yonges	D	None-------	---	---	0-1.0	Apparent	Dec-Mar	---	---	High-----	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--ENGINEERING TEST DATA

[Dashes indicate data were not available. NP means nonplastic]

Soil name, report number, horizon, and depth in inches*	Classification		Grain-size distribution							Liquid limit	Plasticity index	Moisture density	
			Percentage smaller than--				Percentage smaller than--					Max-dry density	Optimum Moisture
	AASHTO	Unified	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm				
										Pct		Lb/ft^3	Pct
Arapahoe loamy fine sand: (S80NC-137-7)													
Ap - - - - - - - - - 0 to 11	A-2-4(0)	SM	100	100	100	27	17	6	3	---	NP	102	17
Bg2 - - - - - - - - 21 to 30	A-2-4(0)	SM	100	100	100	25	21	15	12	---	NP	118	13
Cg1 - - - - - - - - 42 to 60	A-3(0)	SP-SM	100	100	100	10	6	5	3	---	NP	101	16
Brookman mucky silt loam: (S80NC-137-2)													
A - - - - - - - - - 0 to 20	A-5	MH	100	100	97	66	43	19	9	66**	10	53	6
Btg2 - - - - - - - - 24 to 60	A-7-5(13)	CH	100	100	98	90	62	43**	32**	50	19	90	26
2Cg - - - - - - - - 68 to 80	A-4(1)	SM	100	100	100	38	25	15	11	---	NP	116	14
Charleston loamy fine sand: (S80NC-137-3)													
Ap - - - - - - - - - 0 to 7	A-2-4(0)	SM	100	100	100	20	10	5	3	---	NP	103	15
Bt2 - - - - - - - - 22 to 38	A-2-4(0)	SM	100	100	100	26	21	16	13	---	NP	116	13
2Cg2 - - - - - - - - 69 to 80	A-2-4(0)	SM	100	100	99	14	7	5	4	---	NP	104	15
Fork loamy fine sand: (S80NC-137-6)													
Ap - - - - - - - - - 0 to 8	A-2-4(0)	SM	100	100	100	23	15	9	6	---	NP	106	15
Bt - - - - - - - - - 8 to 14	A-4(0)	SC	100	100	100	36	30	26	22	29	10	113	15
Cg3 - - - - - - - - 69 to 80	A-3(0)	SP-SM	100	100	97	9	6	4	3	---	NP	103	15
Stockade loamy fine sand: (S80NC-137-5)													
Ap - - - - - - - - - 0 to 10	A-2-4(0)	SM	100	100	99	29	16	8	3	---	NP	100	18
Btg2 - - - - - - - - 26 to 41	A-6(2)	SC	100	100	100	41	34	27	24	30	12	112	13
2Cg2 - - - - - - - - 60 to 80	A-3(0)	SP-SM	100	98	91	10	7	5	3	---	NP	106	14
Yonges loamy fine sand: (S80NC-137-4)													
Ap - - - - - - - - - 0 to 7	A-2-4(0)	SM	100	100	100	28	15	6	4	---	NP	107	14
Btg - - - - - - - - 14 to 36	A-4(1)	SC	100	100	100	40	32	25	22	27	9	115	14
2Cg3 - - - - - - - - 72 to 80	A-3(0)	SP-SM	100	98	91	10	7	5	3	---	NP	106	15

* Location of pedon sampled is the same as given for the typical pedon in "Soil Series and Their Morphology."
** This value is higher than normal for this soil.

TABLE 18.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Alpin	Thermic, coated Typic Quartzipsamments
Altavista	Fine-loamy, mixed, thermic Aquic Hapludults
Arapahoe	Coarse-loamy, mixed, nonacid, thermic Typic Humaquepts
Argent	Fine, mixed, thermic Typic Ochraqualfs
Ballahack	Fine-loamy, mixed, acid, thermic Cumulic Humaquepts
Baymeade	Loamy, siliceous, thermic Arenic Hapludults
Belhaven	Loamy, mixed, dysic, thermic Terric Medisaprists
Brookman	Fine, mixed, thermic Typic Umbraqualfs
*Charleston	Coarse-loamy, mixed, thermic Aquultic Hapludalfs
Conetoe	Loamy, mixed, thermic Arenic Hapludults
Craven	Clayey, mixed, thermic Aquic Hapludults
Croatan	Loamy, siliceous, dysic, thermic Terric Medisaprists
Dare	Dysic, thermic Typic Medisaprists
Dogue	Clayey, mixed, thermic Aquic Hapludults
Fork	Fine-loamy, mixed, thermic Aeric Ochraqualfs
Goldsboro	Fine-loamy, siliceous, thermic Aquic Paleudults
Hobucken	Coarse-loamy, mixed, nonacid, thermic Typic Hydraquents
Lafitte	Euic, thermic Typic Medisaprists
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
Masontown	Coarse-loamy, siliceous, nonacid, thermic Cumulic Humaquepts
*Norfolk	Fine-loamy, siliceous, thermic Typic Paleudults
Paxville	Fine-loamy, siliceous, thermic Typic Umbraquults
*Rains	Fine-loamy, siliceous, thermic Typic Paleaquults
Rutlege	Sandy, siliceous, thermic Typic Humaquepts
Stockade	Fine-loamy, mixed, thermic Typic Umbraqualfs
Tomahawk	Loamy, siliceous, thermic Arenic Hapludults
*Wahee	Clayey, mixed, thermic Aeric Ochraquults
Wasda	Fine-loamy, mixed, nonacid, thermic Histic Humaquepts
Yonges	Fine-loamy, mixed, thermic Typic Ochraqualfs

* The soil is a taxadjunct to the series. See range in characteristics for a description of those characteristics of the soil that are outside the range of the series.

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