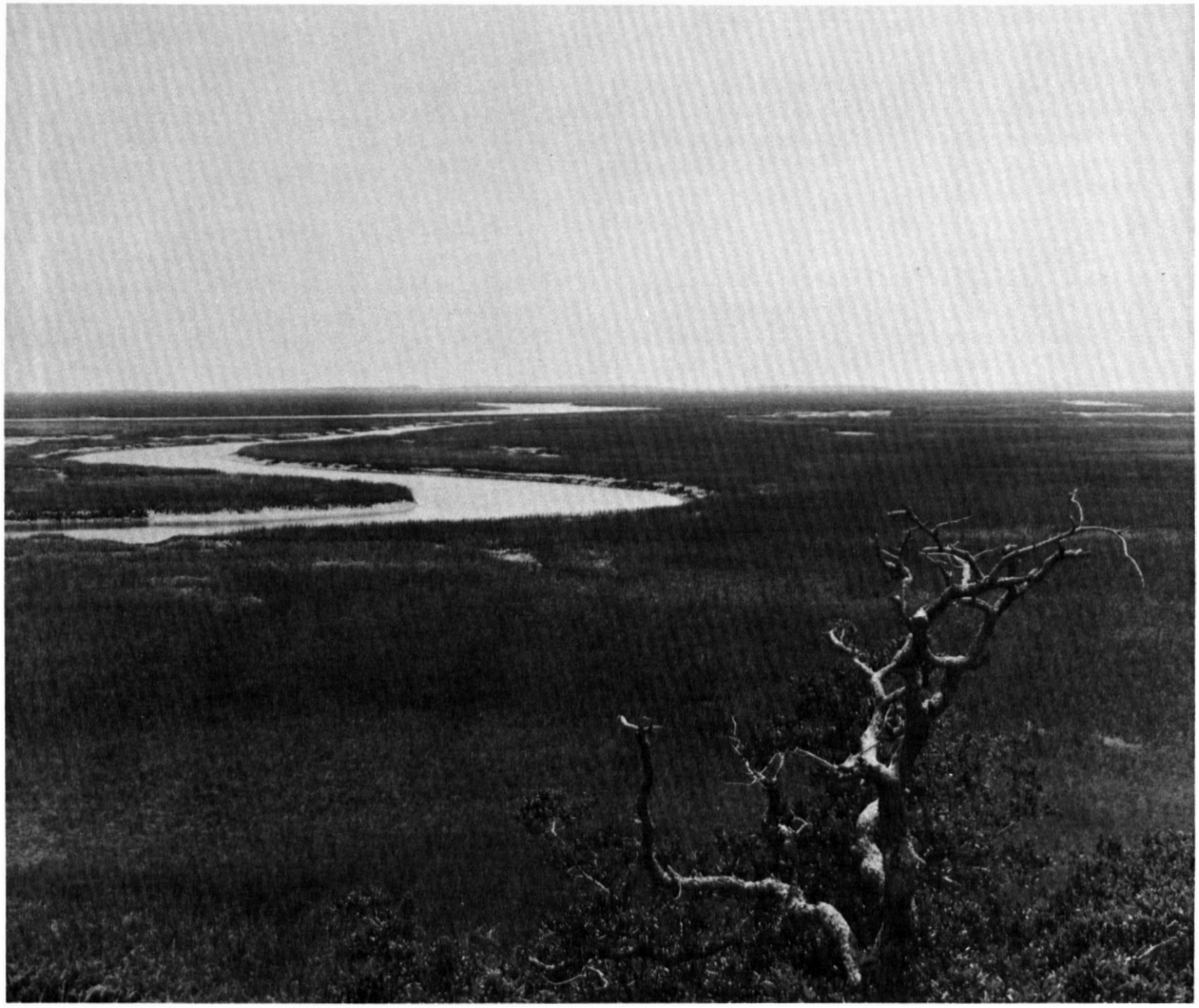
United States
Department of
Agriculture

Soil
Conservation
Service

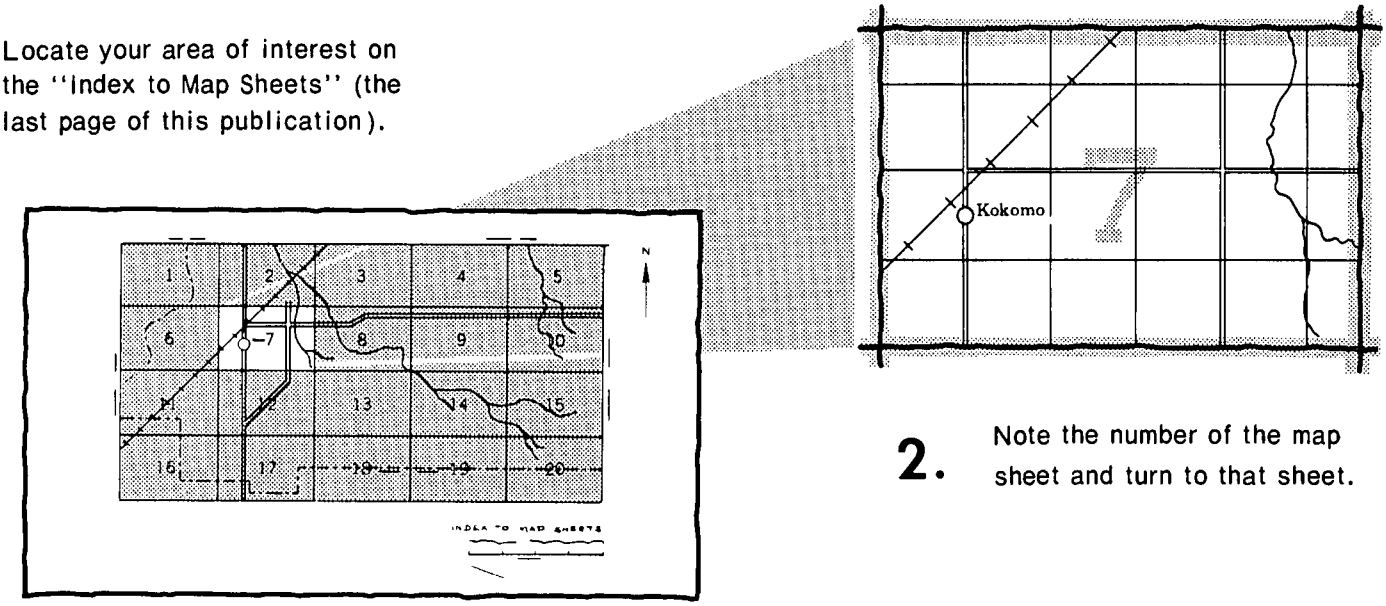
In Cooperation with
South Carolina
Agricultural
Experiment Station and
South Carolina
Land Resources
Conservation Commission

Soil Survey of Georgetown County South Carolina



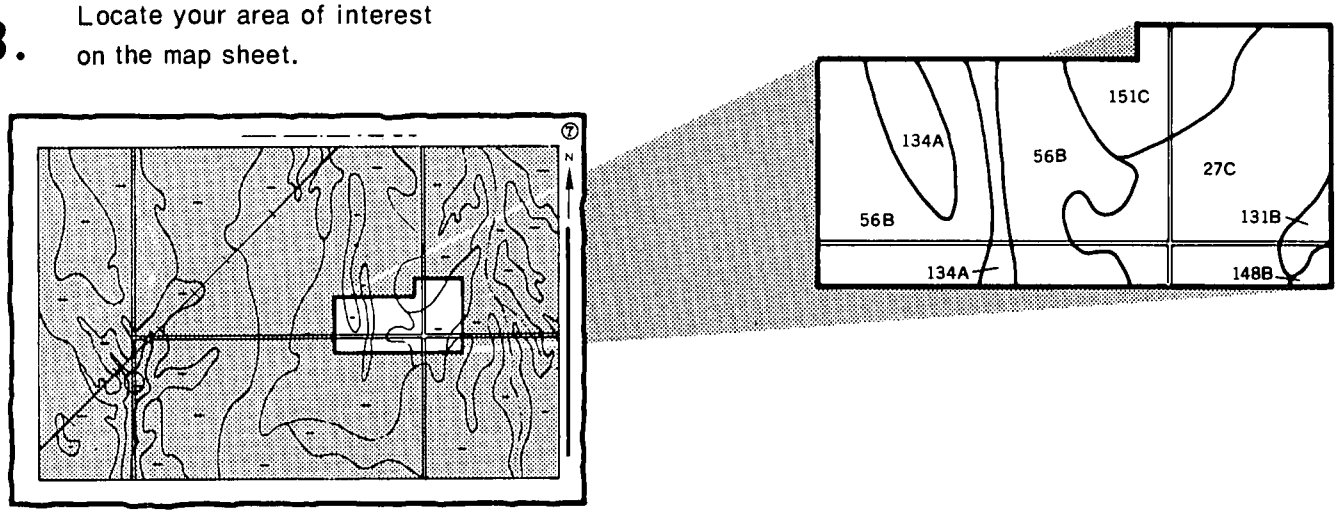
HOW TO USE

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

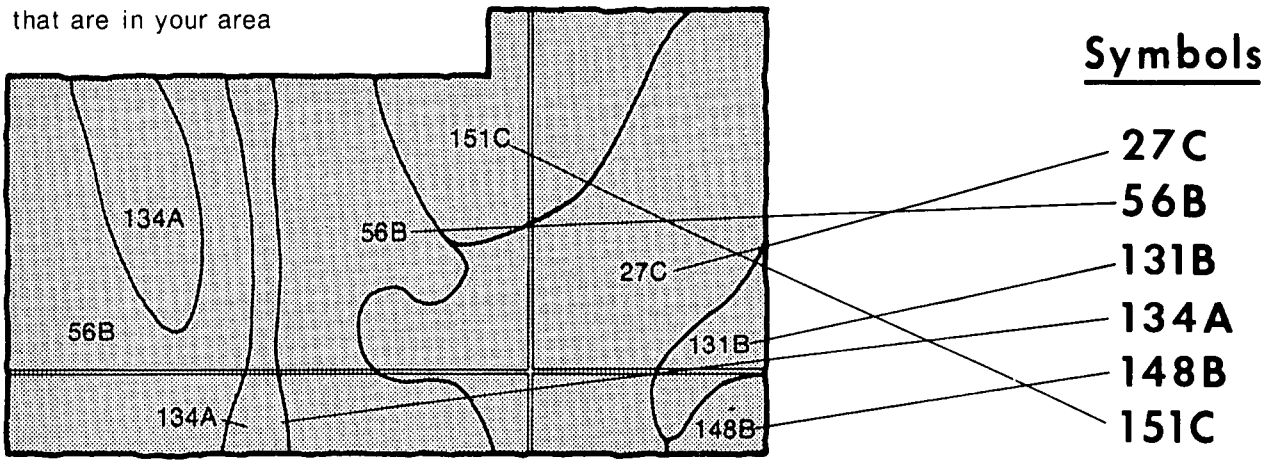


2. Note the number of the map sheet and turn to that sheet.

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

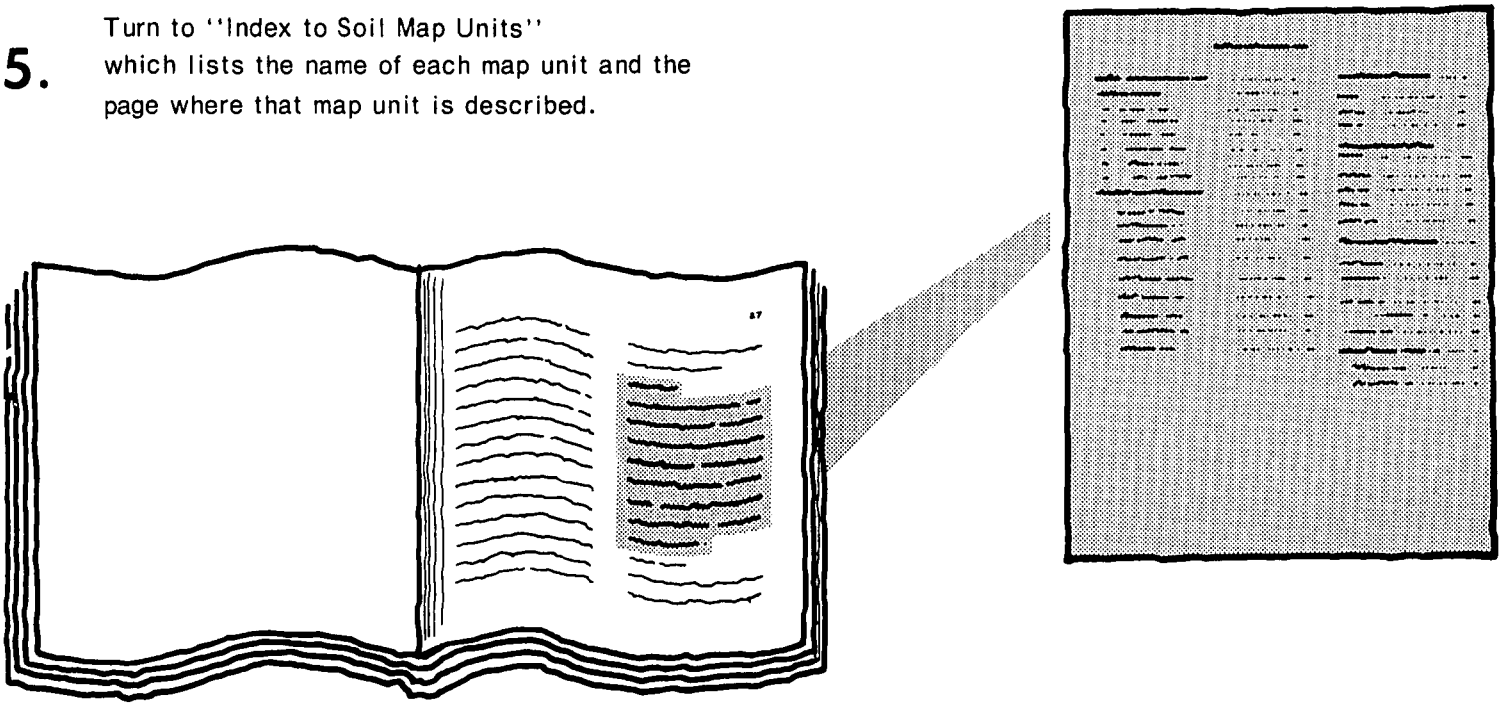


4. List the map unit symbols that are in your area

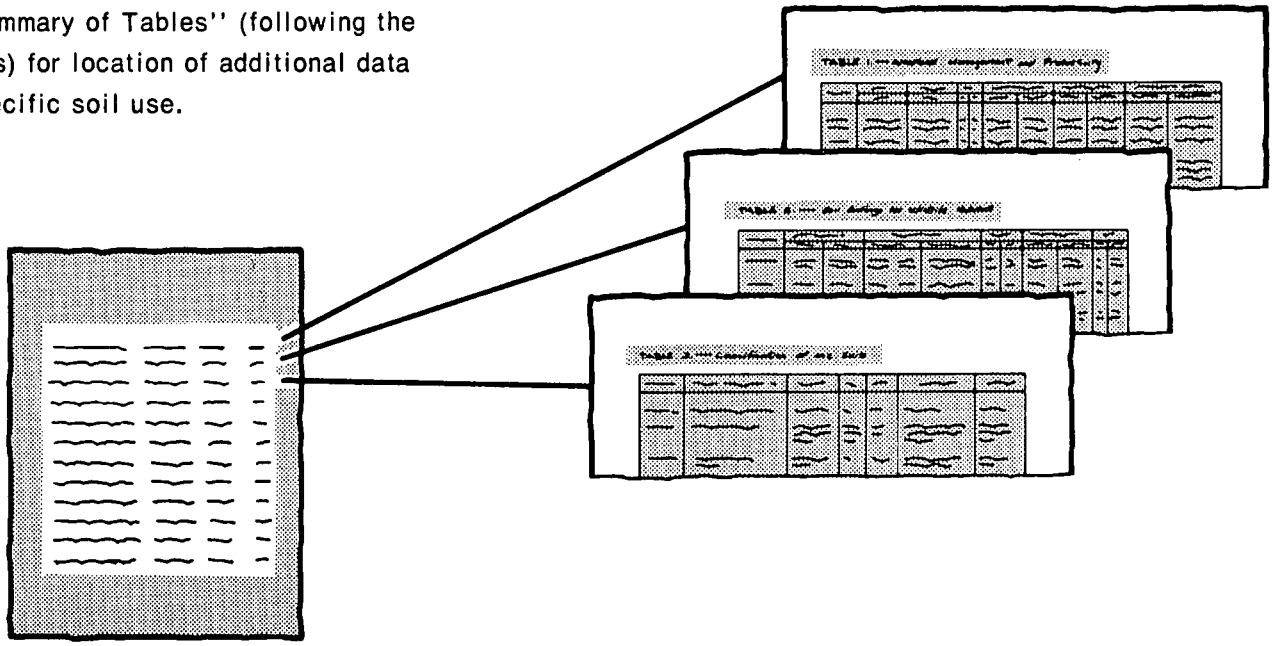


THIS SOIL SURVEY

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; for specialists in wildlife management, waste disposal, or pollution control.

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

Major fieldwork for this soil survey was performed in the period 1975-79. Soil names and descriptions were approved in 1980. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1980. This survey was made cooperatively by the Soil Conservation Service, the South Carolina Agricultural Experiment Station, and the South Carolina Land Resources Conservation Commission. It is part of the technical assistance furnished to the Georgetown Soil and Water Conservation District.

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

This soil survey supersedes a soil survey of Georgetown County published in 1912.

Cover: This tidal marsh is representative of much of the coastal area of Georgetown County. The soil is Bohicket silty clay loam.

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foreword

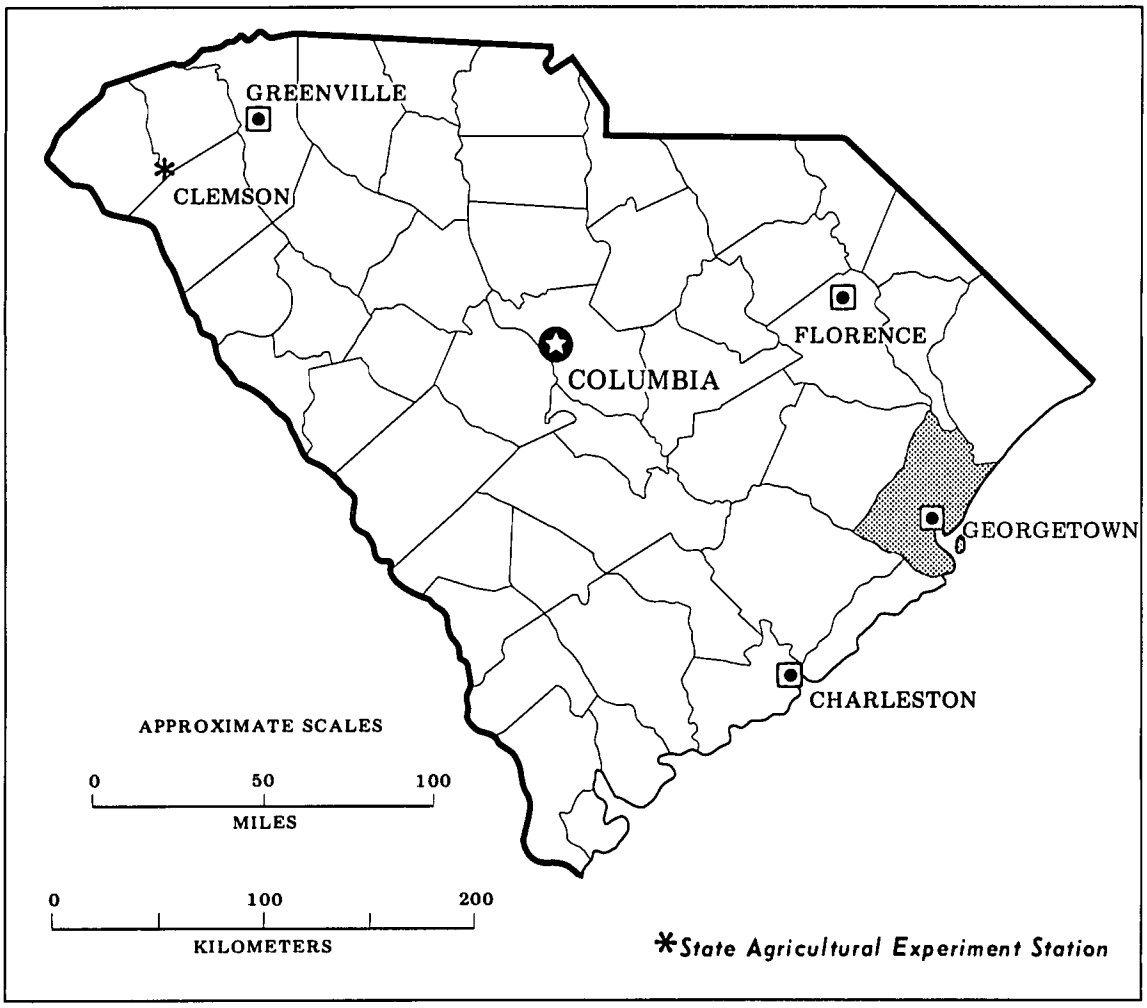
This soil survey contains information that can be used in land-planning programs in Georgetown County, South Carolina. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, 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 shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

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

George E. Huey
State Conservationist
Soil Conservation Service



Location of Georgetown County in South Carolina.

soil survey of
Georgetown County, South Carolina

By Benjamin N. Stuckey, Soil Conservation Service

Soils surveyed by Benjamin N. Stuckey, Ronald Morton, and Robert T. Eppinette,
Soil Conservation Service,
and Ezekiel Powell and Carl B. Lawrence,
South Carolina Land Resources Conservation Commission

United States Department of Agriculture, Soil Conservation Service
in cooperation with South Carolina Agricultural Experiment Station
and South Carolina Land Resources Conservation Commission

GEORGETOWN COUNTY is in the eastern part of South Carolina. Its land area is 812.5 square miles, or 520,000 acres. The county has a population of approximately 40,000. Georgetown, the county seat, has a population of approximately 10,000. The county is predominantly rural. Much of the land is used for the production of pulpwood. The major industries are related to the production of paper and steel.

The northwestern one-third of Georgetown County is in the Atlantic Coast Flatlands Land Resource Area, and the southeastern two-thirds is in the Tidewater Area. Relief generally is slight except in areas adjacent to the five major rivers in the county. Georgetown County is bordered by the Atlantic Ocean on the east; it is separated from Horry and Marion Counties on the north by the Pee Dee River; it is bordered by Williamsburg County on the west; and it is separated from Berkeley and Charleston Counties on the south by the Santee River.

The elevation in Georgetown County ranges from sea level along the coast to about 60 feet in the mainland part of the county and to a high point of 76 feet on Sandy Island. About 70 percent of the county is less than 40 feet above sea level.

general nature of the county

The first European settlers in what is now Georgetown County were Spaniards who came in the early 1500's, but their settlements lasted for less than a year. After that, no attempt at settlement was made until the early 1700's when English colonists began moving north from Charleston to trade with the Indians.

Much of the land in Georgetown County was granted to individuals by the King of England. In the early years, a form of limited government was provided by the Prince George Winyah Episcopal Church Parish, which was established in 1721. Georgetown, the third oldest city in South Carolina, was laid out in 1729.

The early economy was based on forest products, rice, indigo, and tobacco. Indigo, a source of dye, was the leader for a few years during the Revolutionary War. After the war, the resumption of imports and severe caterpillar infestations combined to make indigo unprofitable, and rice became the leading crop. The acreage planted to rice increased until in the late 1850's it comprised nearly 50,000 acres. After the Civil War, rice cultivation began to decline because of the loss of slave labor, several successive crop failures, and extremely

high interest rates. Forest and forest-related industries then became the major economic resource.

Today, about 75 percent of Georgetown County is woodland, and about half of the work force is employed by the forest industry.

climate

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

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

In winter the average temperature is 49 degrees F, and the average daily minimum temperature is 38 degrees. The lowest temperature on record, which occurred at Georgetown on December 14, 1962, is 11 degrees. In summer the average temperature is 79 degrees, and the average daily maximum temperature is 88 degrees. The highest recorded temperature, which occurred at Georgetown on June 28, 1952, is 104 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 52 inches. Of this, 31 inches, or 60 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 15.5 inches. The heaviest 1-day rainfall during the period of record was 8.8 inches at Georgetown on October 15, 1954. Thunderstorms occur on about 50 days each year, and most occur in summer.

Snowfall is rare. In 90 percent of the winters, there is no measurable snowfall. In 10 percent, the snowfall, usually of short duration, is little more than a trace. The heaviest 1-day snowfall on record was more than 11 inches.

The average relative humidity in midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 70 percent of the time possible in summer and 60 percent in winter. The prevailing wind is from the south-southwest. Average windspeed is highest, 10 miles per hour, in spring.

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

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

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

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

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

This soil survey supersedes the soil survey of Georgetown County published in 1912 (*4*). This survey provides additional information and contains larger maps that show the soils in greater detail.

general soil map units

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

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

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

Dominantly nearly level soils that are subject to flooding or ponding and that have a clayey subsoil or clayey underlying material

These soils are on the flood plains of the Santee and Sampit Rivers, on the lower flats of the Black and Waccamaw Rivers, and on tidal flats. Drainage patterns are very poorly defined, and the soils are subject to frequent flooding or to ponding.

1. Bohicket

Nearly level, very poorly drained soils that are flooded daily by ocean tides

This map unit is along the coast and extends inland along the lower part of the Santee River and along part of Winyah Bay. It makes up about 8.5 percent of the county. It is about 95 percent Bohicket soils and 5 percent minor soils.

Bohicket soils are very poorly drained and are flooded daily by high tides unless they are protected by dikes. They have a surface layer of dark greenish gray silty clay loam over dark greenish gray clayey and loamy underlying material.

The minor soils are Levy and Newhan soils and some sandy soils that are subject to shifting by water or wind. Levy soils are not saturated with salt water. Newhan soils are sandy throughout and are not subject to flooding.

Almost all the acreage of this map unit is in natural vegetation and is used for recreation and as habitat for wildlife. The soils are not suited to use as woodland but are well suited to use as wildlife areas.

These soils are not suited to urban uses or to cultivated crops. If the soils are drained and diked, the sulfides oxidize to form acids, and the fertility level drops. The soils shrink and crack when they dry.

2. Levy

Nearly level, very poorly drained soils that are along the major rivers and in backwater areas

This map unit makes up about 4.5 percent of the county. It is about 85 percent Levy soils and 15 percent minor soils.

Levy soils are very poorly drained. They are continuously saturated or flooded, unless they are diked and artificially drained. They have a surface layer of dark gray silty clay loam over dark greenish gray and dark gray silty clay underlying material.

The minor soils are Bohicket soils, which are saturated with salt water; Hobonny soils, which are organic; and Johnston soils, which are loamy and sandy.

Almost all of the acreage of these soils is in a natural state and is managed as habitat for wetland wildlife. The soils are well suited to this use if they are diked and if the water level is controlled.

In some small areas, the soils are used as native pasture. These areas have been diked and drained and are burned yearly. Special equipment must be used to prevent bogging. The soils are well suited to use as native pasture if they are drained and protected from flooding. They were used extensively for rice in the days of hand labor in the 19th century.

The soils are poorly suited to most of the crops commonly grown in the area. They are also poorly suited to woodland and to urban uses. The high water table and poor engineering qualities are severe limitations.

3. Chastain

Nearly level, poorly drained soils that are along the upper reaches of the major rivers

This map unit makes up about 5.5 percent of the county. It is about 90 percent Chastain soils and 10 percent minor soils.

Chastain soils are on broad, flat flood plains and are poorly drained. They have a surface layer of brown silty clay loam over a gray clayey subsoil.

The minor soils are the very poorly drained Cape Fear and Levy soils, some well drained soils on ridges, and some moderately well drained soils in small areas.

Almost all the acreage of these soils is in the natural state and is used as woodland and wildlife habitat. Natural stands of hardwoods are predominant. The soils are well suited to use as woodland.

The soils are poorly suited to cultivated crops and to urban uses. Flooding and wetness are limitations.

4. Cape Fear

Nearly level, very poorly drained soils that are in depressions

This map unit makes up about 3.5 percent of the county. It is about 80 percent Cape Fear soils and 20 percent minor soils.

Cape Fear soils are in depressions, are subject to ponding, and are very poorly drained. They have a thick surface layer of black loam over a grayish clayey subsoil.

The minor soils are the poorly drained Bladen soils and the somewhat poorly drained Wahee soils.

The soils in this map unit are used mainly as woodland. Most of the acreage has been converted from stands of hardwoods to planted stands of loblolly pine. The soils are well suited to woodland production if they are drained.

The soils are well suited to the production of row crops, for example, corn and soybeans. These soils must be drained to insure good yields. They are poorly suited to urban uses because of the high water table and the clayey subsoil.

Dominantly nearly level to gently sloping soils that are sandy throughout

These soils commonly are near the major drainageways and rivers of the county. They are excessively drained to poorly drained.

5. Lakeland-Chipley-Centenary

Nearly level to gently sloping, excessively drained and moderately well drained soils

This map unit makes up about 11.5 percent of the county. It is about 30 percent Lakeland soils and similar soils, 16 percent Chipley soils, 8 percent Centenary soils, and 46 percent minor soils.

Lakeland soils are in higher positions on the landscape and are excessively drained. They have a surface layer of very dark grayish brown fine sand over yellowish brown and brownish yellow fine sand.

Chipley soils are on broad flats and are moderately well drained. They have a surface layer of very dark grayish brown fine sand over underlying material that is yellowish brown fine sand to a depth of 24 inches. Below that, there are layers of coarsely mottled light gray and brownish yellow fine sand and light gray fine sand.

Centenary soils are on broad flats and are moderately well drained. They have a surface layer of grayish brown fine sand, a subsurface layer of brown, yellow, and gray fine sand, and a subsoil of dark reddish brown fine sand.

The minor soils are the somewhat excessively drained Wakulla soils, the well drained Chisolm soils, the moderately well drained Echaw and Yauhannah soils, and the poorly drained Leon soils.

Almost all the acreage is woodland. Natural stands of longleaf pine and loblolly pine are predominant. The soils are moderately suited or well suited to use as woodland.

These soils are moderately suited to poorly suited to most of the crops commonly grown in the county.

In some areas, the soils have been cleared or partly cleared for housing developments and individual homes. The soils range from well suited to moderately suited to urban uses.

6. Leon-Lynn Haven-Chipley

Nearly level, poorly drained and moderately well drained soils

This map unit makes up about 7.5 percent of the county. It is about 43 percent Leon soils, 14 percent Lynn Haven soils, 7 percent Chipley soils, and 36 percent minor soils.

Leon soils are on broad flats and are poorly drained. They have a surface layer of very dark gray sand, a subsurface layer of gray sand, and a subsoil of black sand that has organic staining.

Lynn Haven soils are on flats and are poorly drained. They have a thick surface layer of black sand, a subsurface layer of gray sand, and a subsoil of black and dark reddish brown sand.

Chipley soils are on flats at a slightly higher elevation and are moderately well drained. They have a surface layer of very dark grayish brown fine sand. The underlying material is yellowish brown fine sand to a depth of 24 inches. Below that, it is coarsely mottled light gray and brownish yellow fine sand, and below that, it is light gray fine sand.

The minor soils are the moderately well drained Centenary and Echaw soils and the very poorly drained Hobcaw and Rutlege soils.

Almost all of the acreage of this map unit is woodland. Natural stands of longleaf pine and loblolly pine are predominant. The soils are well suited to moderately suited to use as woodland.

The soils are moderately suited to poorly suited to most urban uses because of the high water table. They are poorly suited to moderately suited to cultivated crops. Drainage is necessary to obtain good yields.

Dominantly nearly level upland soils that have a loamy subsoil

These soils are on broad flats throughout the county. They are moderately well drained and somewhat poorly drained.

7. Yauhannah-Yemassee

Nearly level, moderately well drained and somewhat poorly drained soils

This map unit makes up about 26 percent of the county. It is about 33 percent Yauhannah soils, 24 percent Yemassee soils, and 43 percent minor soils.

Yauhannah soils are in higher positions on the landscape and are moderately well drained. They have a surface layer of very dark grayish brown loamy fine sand, a subsurface layer of yellowish brown loamy fine sand, and a subsoil of brownish yellow or yellowish brown loam that has gray mottles.

Yemassee soils are in slightly lower positions and are somewhat poorly drained. They have a surface layer of black loamy fine sand, a subsurface layer of pale brown loamy fine sand, and a subsoil of pale brown or gray loam that has grayish and brownish mottles and is light gray in the lower part.

The minor soils are the poorly drained Bladen and Grifton soils, the somewhat poorly drained Wahee soils, the moderately well drained Eulonia soils, and the very poorly drained Johnston soils.

Almost all the acreage of this map unit is woodland. Planted stands of loblolly pine are predominant. The soils are well suited to use as woodland.

The soils are poorly suited to moderately suited to most urban uses because of the high water table. They are well suited to cultivated crops. However, drainage is necessary to obtain good yields.

Dominantly nearly level upland soils that have a clayey subsoil

These soils are on broad flats and are mainly in the western part of the county. They are poorly drained to moderately well drained.

8. Bladen-Wahee-Eulonia

Nearly level, poorly drained to moderately well drained soils

This map unit makes up about 29 percent of the county. It is about 34 percent Bladen soils, 28 percent Wahee soils, 15 percent Eulonia soils, and 23 percent minor soils.

Bladen soils are in lower positions on the landscape and are poorly drained. They have a surface layer of black loam and a grayish clayey subsoil.

Wahee soils are in slightly higher positions and are somewhat poorly drained. They have a surface layer of very dark gray fine sandy loam, a subsurface layer of yellowish brown fine sandy loam, and a gray clayey subsoil.

Eulonia soils are in higher positions and are moderately well drained. They have a surface layer of grayish brown loamy fine sand and a subsoil that is mainly yellowish brown and clayey in the upper part and gray and loamy in the lower part.

The minor soils are the very poorly drained Cape Fear soils and the moderately well drained Yauhannah soils.

Almost all the acreage is woodland. Planted stands of loblolly pine are predominant. The soils are well suited to use as woodland.

The soils are well suited to moderately suited to pasture and cultivated crops. Drainage is necessary to obtain good yields. The soils are poorly suited to most urban uses because of the high water table and the clayey subsoil.

Dominantly nearly level soils that are subject to flooding or ponding and that are organic throughout or have sandy underlying material or a loamy subsoil

These soils are on the upper reaches of the Black River, Mingo Creek, and the Waccamaw River and also in well defined "Carolina Bays." The soils generally are very poorly drained and are subject to frequent flooding or ponding.

9. Hobonny

Nearly level, very poorly drained organic soils on the flood plains of the Black River, Mingo Creek, and the upper reaches of the Waccamaw River

This map unit makes up 3 percent of the county. It is about 80 percent Hobonny soils and 20 percent minor soils.

Hobonny soils are very poorly drained and are continuously saturated or flooded unless they are diked and artificially drained. They have a surface layer of dark brown muck that is underlain by black muck.

The minor soils are the very poorly drained Johnston and Levy soils.

Almost all the acreage is in a natural state and is managed as habitat for wetland wildlife. The soils are well suited to this use if they are diked and the water level is controlled.

These soils are not suited to cultivated crops, to use as woodland, or to urban uses. The soils are very soft, and equipment bogs down easily. Many areas of these soils were once cleared and used for rice production.

10. Johnston-Hobcaw

Nearly level, very poorly drained soils in depressions

This map unit makes up 1 percent of the county. It is about 56 percent Johnston soils, 34 percent Hobcaw soils, and 10 percent minor soils.

Johnston soils are in broad depressions and are very poorly drained. They have a thick black loam surface layer over grayish loamy and sandy underlying material.

Hobcaw soils are in broad depressions and are very poorly drained. They have a thick black loam surface layer, a gray sandy loam subsurface layer, and a gray loamy subsoil.

The minor soils are the poorly drained Leon and Lynn Haven soils and the very poorly drained Cape Fear soils.

Almost all the acreage is woodland. Most of the woodland has been converted from stands of natural hardwoods to stands of planted loblolly pine. The soils are well suited to use as woodland if they are drained.

These soils are poorly suited to row crops and to urban uses because of ponding and wetness.

broad land use considerations

The soils in Georgetown County vary widely in their potential for major land uses. Approximately 65 percent of the land in the county is owned by paper companies, large plantations, government, and foundations and is used primarily as woodland and as habitat for wildlife. Less than 5 percent of the land in the county is used for crops. The cropland is scattered throughout the county, but most of it is in map units 7 and 8.

About 10,000 acres of the county is urban or developed land. The soils in the county range from well suited to poorly suited to urban development. Many of the soils have a seasonal high water table. The soils in map units 1, 2, 3, 4, 9, and 10 generally are not suited to development because of periodic flooding and ponding. Other map units generally have some areas that are suited to development.

Most areas throughout the county are suited to wildlife habitat. The soils in map units 5, 6, 7, and 8 generally are suited to use as habitat for woodland wildlife, and the soils in map units 1, 2, 3, 4, 9, and 10 generally are well suited to use as habitat for wetland wildlife. The soils in map units 1, 2, and 9 have been developed for waterfowl.

detailed soil map units

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

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

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

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

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, 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, Bladen loam is one of several phases in the Bladen 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.

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

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

soil descriptions

10—Leon sand. This is a poorly drained, nearly level soil on broad flats on the Coastal Plain. The areas commonly are 50 to 100 acres in size, but the range is 10 to several hundred acres.

Typically, the surface layer is 6 inches of very dark gray sand. The subsurface layer, between 6 and 16 inches, is gray sand. The subsoil, from 16 to 65 inches, is black and dark reddish brown sand.

Included with this soil in mapping are small areas of Rutlege, Echaw, Centenary, and Chipley soils. Also included are some areas of soils, just inland from the salt marshes, that have a loamy subsurface layer that is 3 to 8 inches thick; these soils are neutral in reaction. There are small ponds in some of the mapped areas. The included soils make up less than 20 percent of the map unit.

This soil is low in content of organic matter. It is extremely acid to strongly acid throughout. Permeability is rapid in the surface and subsurface layers and moderate to moderately rapid in the subsoil. The available water capacity is low to very low. The water table is within 1 foot of the surface in winter and spring.

Most of the acreage is woodland (fig. 1). This soil is moderately suited to loblolly pine, slash pine, and longleaf pine. Removing excess water, bedding, and using wider tires on the equipment reduce the limitations of wetness and sandy texture.

This soil is poorly suited to row crops, for example, corn and soybeans. Surface and subsurface drainage can improve crop yields by lowering the high water table. A protective filter may be needed around subsurface drains to prevent clogging of the lines. Also, if this soil is drained, frequent, small applications of fertilizer help reduce leaching problems.

This soil is poorly suited to community development. It is limited by the high water table and the sandy texture. Removing excess water by surface and subsurface drains, shaping and filling the area, and using a

Figure 1.—Managed woodland in an area of Leon sand.

community sewage disposal system help reduce these limitations.

This soil is in capability subclass IVw. The woodland ordination symbol is 4w.

11—Beaches. This map unit consists of the nearly level to gently sloping sandy shoreline bordering the Atlantic Ocean. The sands are washed twice daily as the ocean tides ebb and flow.

The soil material is low in content of organic matter. Permeability is very rapid. The available water capacity is very low.

Protective cover is lacking, and the areas are constantly changing in shape as sand is alternately and unpredictably taken away or added to by wind and water action. This erosion by wind and water is very difficult and very costly to overcome. Construction activities have often accelerated erosion of the beaches.

These beach sands are not suited to farming, woodland use, or community development. They are used extensively for recreation.

This map unit is in capability subclass VIIIs. It is not rated for woodland.

12A—Yauhannah loamy fine sand, 0 to 2 percent slopes. This is a moderately well drained, nearly level soil on broad flats on the lower Coastal Plain. The areas commonly are 20 to 40 acres in size, but the range is 5 to 200 acres.

Typically, the surface layer is 6 inches of very dark grayish brown loamy fine sand. The subsurface layer, from 6 to 9 inches, is yellowish brown loamy fine sand. The subsoil, from 9 to 62 inches, is brownish yellow or yellowish brown sandy clay loam that has red and gray mottles starting at a depth of 16 inches. The underlying material from 62 to 75 inches is brown and gray loamy sand.

Included with this soil in mapping are small areas of Chisolm and Eulonia soils, small areas of well drained soils, and small areas of soils that have sand at a depth of less than 40 inches. Also included are a few areas of Yauhannah soils that have a surface layer of loamy sand, sandy loam, or fine sandy loam. Some mapped areas include small dug ponds, small borrow pits, and small depressions in which the soils are more poorly drained. The included areas make up less than 15 percent of the map unit.

The content of organic matter is low. This soil is very strongly acid to slightly acid in the surface and subsurface layers and very strongly acid to medium acid in the subsoil and underlying material. Permeability is moderate. The available water capacity is medium. The water table is 1.5 to 2.5 feet below the surface in winter and spring.

Most of the acreage of this soil is woodland. This soil is well suited to loblolly pine, slash pine, and sweetgum. The high water table in winter and spring is a moderate limitation to the use of equipment in logging or planting trees. This problem can be reduced by removing excess water, logging during the drier months, and using wider tires on the equipment.

This soil is well suited to cultivated crops, for example, corn, soybeans, and tobacco (fig. 2). A high water table during the growing season is the major limitation. A drainage system that lowers the water table helps improve yields. A protective filter may be needed around subsurface drains to prevent clogging of the lines.

This soil is moderately suited to community development. It has severe limitations for septic tank absorption fields and moderate limitations for dwellings and local roads and streets because of the high water table. This problem can be reduced by surface and subsurface drainage and surface shaping and filling.

This soil is in capability subclass IIw. The woodland ordination symbol is 2w.

13—Bladen loam. This is a poorly drained, nearly level soil on broad flats on the Coastal Plain. The areas commonly are very large, but the range in size is 10 to several hundred acres.

Typically, the surface layer is 6 inches of black loam. The subsoil, from 6 to 70 inches, is dark gray and gray clay.

Included with this soil in mapping are small areas of Cape Fear and Eulonia soils; small areas of soils that are neutral in reaction; and small areas, in narrow intermittent drainageways, of soils that are similar to this Bladen soil, except that they are at a slightly lower elevation and are occasionally ponded. Some of the mapped areas include small ponds and small borrow pits. The included areas make up less than 10 percent of the map unit.

The content of organic matter is moderate. The soil is extremely acid to strongly acid throughout. Permeability is slow. The available water capacity is medium or high. The water table is at the surface or within 1 foot of the surface in winter and spring.

Almost all the acreage is woodland. This soil is well suited to such species as loblolly pine, slash pine, and sweetgum. The high water table in winter and spring is the major hazard in planting or harvesting trees. Bedding, removing excess water, planting and harvesting trees in the drier months, and using wider tires on the equipment can help reduce this limitation.

This soil is moderately suited to the cultivated crops commonly grown in the survey area. Yields are limited by the high water table and poor internal drainage. Open ditch drainage helps lower the water table, and deep subsoiling helps improve internal drainage.

This soil is poorly suited to community development. The seasonal high water table and the clayey subsoil are severe limitations for septic tank filter fields, dwellings, and roads and streets. These limitations can be reduced by increasing the size of the filter field, installing surface drainage, filling and shaping individual lots or large areas, and installing roadside ditches. This soil is difficult and costly to modify for urban uses.

This soil is in capability subclass IIIw. The woodland ordination symbol is 2w.

14B—Blanton sand, 0 to 6 percent slopes. This is a well drained, nearly level to gently sloping soil on broad ridges and in long, narrow areas along the Black and

Figure 2.—Yauhannah loamy fine sand, 0 to 2 percent slopes, is well suited to corn and other row crops.

Pee Dee Rivers. The areas range from 10 to 300 acres in size. However, most areas are 20 to 50 acres in size.

Typically, the surface layer is 5 inches of dark gray sand. The subsurface layer, from 5 to 65 inches, is brownish yellow, very pale brown, and white sand. The subsoil, from 65 to 85 inches, is pale brown and gray sandy clay loam.

Included with this soil in mapping are small areas of Chisolm and Lakeland soils, areas of small dug ponds, and small areas of soils that are poorly drained. The included areas make up less than 15 percent of the map unit.

The content of organic matter is low. This soil is very strongly acid to medium acid in the surface and subsurface layers and strongly acid or very strongly acid in the subsoil. Permeability is moderate. The available water capacity is low. The water table is at a depth of 5 to 6 feet late in winter and in spring.

Most of the acreage is woodland. This soil is moderately suited to slash pine and loblolly pine. The low available water capacity and the sandy surface and subsurface layers are moderate limitations to the use of equipment and to seedling survival. These limitations can be reduced by using wider tires on the equipment and by clearing the site to reduce seedling mortality and plant competition for moisture.

A small acreage of this soil has been cleared and is used as cropland. This soil is poorly suited to the row

crops commonly grown in the county because of the low available water capacity and the low nutrient holding capacity. Irrigation and split applications of fertilizer help reduce these limitations. Minimum tillage and the use of cover crops help to conserve moisture, build up the content of organic matter, and reduce soil blowing.

Several areas of this soil are being developed for urban uses. This soil is well suited to community development. The only hazard to development is the risk of pollution of the ground water, because the sandy subsurface layer is a poor filter for septic tank absorption fields. Backfilling the field trenches with loamy soil material or using some type of closed sewage system can overcome this limitation.

This soil is in capability subclass IIIs. The woodland ordination symbol is 3s.

15—Bohicket silty clay loam. This is a very poorly drained, nearly level soil on broad tidal flats on the Coastal Plain. The areas commonly are very large. They range from 10 to several hundred acres in size.

Typically, the surface layer is 12 inches of dark greenish gray silty clay loam. The substratum from 12 to 60 inches is dark greenish gray clay loam, clay, and silty clay loam.

Included with this soil in mapping are small areas of soils that are sandy throughout. The included soils make up less than 8 percent of the map unit.

Figure 3.—A tidal creek in an area of Bohicket silty clay loam.

The content of organic matter is moderate. In its natural condition, this soil is slightly acid to moderately alkaline throughout. Permeability is very slow. The available water capacity is very low. The water table fluctuates between 3 feet above the surface and the surface throughout the year. This soil is flooded twice daily by sea water. The content of sulfur is high. The fertility level is naturally high, but if this soil is drained, the sulfur oxidizes to form sulfuric acid, and the fertility level becomes very low. Also, this soil shrinks and cracks considerably if it is diked and drained.

This soil is not suited to cultivated crops, to use as pasture or woodland, and to community development. Limitations are the high water table, flooding, poor engineering qualities, a high content of salt and of sulfur, and low fertility if the soil is drained.

This soil is mainly in a natural state (fig. 3) or is managed as habitat for wetland wildlife, to which it is well suited. Water control structures and dikes are needed to manage the soil as habitat for wildlife. The areas of this soil are very important to the food chain for marine wildlife.

This soil is in capability subclass VIIIw. It is not rated for woodland.

18—Cape Fear loam. This is a very poorly drained, nearly level soil in flat drains and depressions on the lower Coastal Plain. The areas are 10 to several hundred acres in size.

Typically, the surface layer is 18 inches of black loam. The subsoil, from 18 to 65 inches, is dark gray or gray clay and clay loam.

Included with this soil in mapping are small areas of Bladen, Grifton, and Wahee soils and small areas of soils that are neutral in reaction. Also included are small areas of soils that have a silt loam surface layer. The included soils make up less than 15 percent of the map unit.

The content of organic matter is moderate. This soil is very strongly acid to medium acid throughout. Permeability is slow. The available water capacity is high or very high. The water table is above or near the soil surface in winter and spring.

Most of the acreage is woodland. This soil is well suited to such species as loblolly pine and sweetgum. Wetness is a severe limitation to the use of equipment and to seedling survival. This limitation can be reduced by removing excess water, bedding, planting and harvesting trees in the drier months, and using wider tires on the equipment.

If this soil is drained, it is well suited to row crops, for example, corn and soybeans. Wetness is a severe limitation but can be reduced by extensive surface drainage and land shaping.

This soil is poorly suited to community development. Wetness and the slow permeability are severe limitations that are difficult and expensive to overcome. Installing surface drainage, shaping and filling, enlarging the area of filter fields, and using a community sewage disposal system help to reduce or overcome these limitations.

This soil is in capability subclass IIIw. The woodland ordination symbol is 1w.

19—Levy silty clay loam. This is a very poorly drained, nearly level soil in low backwater areas and marshes adjacent to rivers. The areas commonly are very long and wide and are several hundred acres in size.

Typically, the surface layer is 8 inches of dark gray silty clay loam. The underlying material from 8 to 60 inches is dark greenish gray and dark gray silty clay.

Included with this soil in mapping are small areas of Bohicket and Chastain soils. Also included are small ponds, small areas of sandy soils, and small islands of soils that are not continuously saturated. Also included are some areas of Levy soil that has a silty clay surface layer. The included areas make up less than 10 percent of the map unit.

The content of organic matter is moderate. The soil is extremely acid or strongly acid to a depth of about 40 inches. Below that, it is very strongly acid to mildly alkaline. Permeability is slow. The available water capacity is high. The water table is above the surface throughout the year. This soil is frequently flooded.

In most areas, this soil is covered by native marsh plants. It is poorly suited to use as woodland, to crops, or to community development. It is limited by the high water table, flooding, and poor engineering qualities.

Most of the acreage is in a natural state and is managed as habitat for wetland wildlife, to which this soil is well suited. In some small areas, the soils are used as native pasture. These areas have been diked and drained and are burned yearly. In many areas there are old dikes and water control structures that were built for rice cultivation in the early to middle 1800's.

This soil is in capability subclass VIIw. The woodland ordination symbol is 3w.

20—Centenary fine sand. This is a moderately well drained, nearly level soil on broad ridges and flats on the Coastal Plain. The areas are 5 to 100 acres in size. However, most areas are about 25 acres in size.

Typically, the surface layer is 7 inches of grayish brown fine sand. The subsurface layer, from 7 to 63 inches, is light yellowish brown, brownish yellow, and light gray fine sand. The subsoil, from 63 to 80 inches, is dark reddish brown fine sand.

Included in mapping are small areas of Echaw, Witherbee, and Lakeland soils. Also included are small ponds and borrow areas. The included areas make up less than 20 percent of the map unit.

The content of organic matter is low. This soil is very strongly acid through slightly acid in the surface layer and very strongly acid through medium acid in the

underlying layers. Permeability is rapid in the surface and subsurface layers and moderately rapid in the subsoil. The available water capacity is low to very low. The water table is 3.5 to 5 feet below the surface in winter and spring.

Most of the acreage is woodland. This soil is well suited to this use. Slash pine and loblolly pine are the trees most commonly grown. The sandy nature of this soil is a moderate limitation to the use of equipment and to seedling survival. This limitation can be reduced by using wider tires on the equipment and by clearing the seedling bed of weeds to reduce competition for moisture.

This soil is moderately suited to corn, soybeans, tobacco, and pasture grasses, for example, Coastal bermudagrass and bahiagrass. The low or very low available water capacity is the major factor that limits crop yields. Leaching of nutrients is also a severe problem. Turning under crop residue, splitting applications of fertilizer, and similar management practices help to reduce these limitations.

This soil is moderately suited to community development. The seasonal water table is a moderate limitation to septic tank absorption fields. This limitation can be reduced by surface and subsurface drainage. Protective filters may be needed around subsurface drains to prevent clogging of the lines.

This soil is in capability subclass IIIs. The woodland ordination symbol is 2w.

24B—Chisolm sand, 0 to 4 percent slopes. This is a well drained, nearly level to gently sloping soil on uplands and stream terraces on the lower Coastal Plain. The areas commonly are about 30 acres in size, but the range is 5 to 300 acres.

Typically, the surface layer is 9 inches of dark grayish brown sand. The subsurface layer, from 9 to 25 inches, is very pale brown and light gray sand. The subsoil from 25 to 58 inches is yellowish brown and brownish yellow sandy clay loam that has red mottles, and from 58 to 80 inches it is mottled brownish yellow, red, and light gray sandy loam.

Included with this soil in mapping are small areas of Blanton, Chipley, Yauhannah, and Lakeland soils and small areas of soils that have slopes of more than 4 percent. Also included, in some of the mapped areas, are small borrow pits and small dug ponds. The included areas make up less than 20 percent of the map unit.

The content of organic matter is low. This soil is very strongly acid to medium acid in the surface and subsurface layers and the upper part of the subsoil and very strongly acid or strongly acid in the lower part of the subsoil. Permeability is moderate. The available water capacity is low to medium. The water table is 3.5 to 5 feet below the surface in winter and spring.

Most of the acreage is woodland. This soil is moderately suited to loblolly pine and longleaf pine. The sandy texture and the low available water capacity are moderate limitations to the use of equipment and the seedling survival. These limitations can be reduced by using wider tires on the equipment and by removing weeds in the seedling bed to reduce competition for moisture.

Some small areas of this soil are in crops. This soil is moderately suited to corn and soybeans. The low available water capacity limits crop yields. This limitation can be reduced by irrigation. Leaching of nutrients is also a problem. Splitting fertilizer applications helps overcome this problem.

This soil is moderately suited to urban development. Wetness is a moderate limitation for septic tank absorption fields but only a slight limitation for dwellings and local roads and streets. Wetness can be reduced by surface and subsurface drainage and by filling and shaping.

This soil is in capability subclass IIs. The woodland ordination symbol is 2s.

25A—Wakulla fine sand, 0 to 2 percent slopes. This is a somewhat excessively drained, nearly level soil on broad flats on the Coastal Plain. The areas commonly are 40 to 50 acres in size, but the range is 10 to more than 100 acres.

Typically, the surface layer is 6 inches of dark grayish brown fine sand, and the subsurface layer, from 6 to 26 inches, is brownish yellow fine sand. The subsoil, from 26 to 48 inches, is yellowish brown loamy sand. The underlying material from 48 to 80 inches is brownish yellow and pale brown fine sand.

Included with this soil in mapping are small areas of Chipley and Lakeland soils. Also included are small areas of soils that have a surface layer and a subsurface layer that together are less than 20 inches thick or are more than 40 inches thick. In some mapped areas, there are small dug ponds and borrow pits. The included areas make up less than 20 percent of the map unit.

The content of organic matter is low. This soil is very strongly acid to medium acid throughout. Permeability is rapid. The available water capacity is low. The water table is more than 6 feet below the surface throughout the year.

Most of the acreage is woodland. This soil is moderately suited to such species as loblolly pine and slash pine. The sandy texture is a moderate limitation to the use of equipment and to seedling survival. This limitation can be reduced by using wider tires on the equipment and by clearing the seedling bed to reduce competition for moisture.

This soil is moderately suited to poorly suited to row crops, for example, corn and soybeans. Yields are limited by the rapid permeability and the low available water capacity. Irrigation, minimum tillage, use of cover crops, and split applications of fertilizer help to increase yields.

This soil is moderately suited to community development. It is severely limited for septic tank absorption fields because the sandy soil is a poor filter. Limitations are slight for dwellings and local roads and streets.

This soil is in capability subclass IIIs. The woodland ordination symbol is 3s.

26A—Eulonia loamy fine sand, 0 to 2 percent slopes. This is a moderately well drained, nearly level soil on broad flats on the Coastal Plain. The areas commonly are about 40 acres in size, but the range is 5 to 200 acres.

Typically, the surface layer is 6 inches of grayish brown loamy fine sand. The subsoil, in the upper 3 inches, is brownish yellow fine sandy loam; from 9 to 24 inches, it is yellowish brown clay; from 24 to 50 inches, it is mottled, gray and brownish yellow clay loam; and from 50 to 65 inches, it is light gray clay loam and sandy clay loam. The underlying material from 65 to 75 inches is brownish yellow loamy sand.

Included with this soil in mapping are small areas of Bladen and Yemassee soils, small areas of soils that are better drained than this Eulonia soil, small areas of soils that have slopes of 2 to 6 percent, and small dug ponds and borrow areas. The included areas make up less than 15 percent of the map unit.

The content of organic matter is moderate. This soil is very strongly acid to slightly acid in the surface layer and the upper part of the subsoil and very strongly acid to medium acid in the lower part of the subsoil and the underlying material. Permeability is moderately slow. The available water capacity is medium. The water table is 1.5 to 3.5 feet below the surface in winter and spring.

Most of the acreage is woodland. This soil is well suited to loblolly pine, slash pine, and hardwoods. Wetness caused by the seasonal water table is a moderate limitation to the use of equipment and to seedling survival. This limitation can be reduced by removing excess water, using wider tires on the equipment, bedding, and planting and harvesting trees in the drier months.

In some small areas, this soil is in crops. This soil is well suited to row crops, for example, corn and soybeans. Wetness caused by the seasonal water table is a moderate limitation. It can be reduced by surface drainage.

This soil is poorly suited to community development. The clayey subsoil and the seasonal water table are severe limitations to septic tank absorption fields and moderate limitations to dwellings and local roads and streets. These limitations can be reduced by surface drainage, filling and shaping, and enlarging the filter field.

This soil is in capability subclass IIw. The woodland ordination symbol is 2w.

26B—Eulonia loamy fine sand, 2 to 6 percent slopes. This is a moderately well drained, gently sloping soil along the breaks to natural drains and in broad rolling areas on the Coastal Plain. The areas commonly are about 20 acres in size, but the range is 5 to 150 acres.

Typically, the surface layer is 6 inches of grayish brown loamy fine sand. The subsoil, in the upper 3 inches, is brownish yellow fine sandy loam; from 9 to 24 inches, it is yellowish brown clay; from 24 to 50 inches, it is mottled, gray and brownish yellow clay loam; and from 50 to 65 inches, it is light gray clay loam and sandy clay loam. The underlying material from 65 to 75 inches is brownish yellow loamy sand.

Included with this soil in mapping are small areas of Yauhannah, Wahee, and Bladen soils. Also included are small areas of soils that have slopes of 0 to 2 percent. The included soils make up less than 15 percent of the map unit.

The content of organic matter is moderate. This soil is very strongly acid to slightly acid in the surface layer and the upper part of the subsoil and very strongly acid to medium acid in the lower part of the subsoil and the underlying material. Permeability is moderately slow. The available water capacity is medium. The water table is 1.5 to 3.5 feet below the surface in winter and spring.

Most of the acreage is woodland. This soil is well suited to loblolly pine, slash pine, and hardwoods. Wetness caused by the seasonal water table is a moderate limitation to the use of equipment and to seedling survival. This limitation can be reduced by removing excess water, using wider tires on the equipment, bedding, and planting and harvesting trees during the drier months.

In some small areas, this soil is in crops. This soil is well suited to row crops, for example, corn and soybeans. The seasonal water table and slope are moderate limitations to cultivated crops. These limitations can be reduced and yields can be improved by contour farming, minimum tillage, use of cover crops, and a water disposal system of terraces and grassed waterways. In most areas, the topography is rolling, and farming on the contour is difficult. In these areas, close-growing crops, for example, oats or wheat, are better than row crops because they help prevent erosion.

This soil is poorly suited to community development. The clayey subsoil and the seasonal water table are severe limitations to septic tank absorption fields and moderate limitations to dwellings and local roads and streets. These limitations can be reduced by surface drainage, filling and shaping, and enlarging the filter field.

This soil is in capability subclass IIe. The woodland ordination symbol is 2w.

27—Rutlege sand. This is a very poorly drained, nearly level soil along narrow drainageways on the Coastal Plain. The areas are long and narrow and

commonly are 20 to 40 acres in size, but the range is 5 to more than 150 acres.

Typically, the surface layer is 13 inches of black sand. The underlying material from 13 to 18 inches is dark gray sand; below that to a depth of 60 inches it is light gray sand.

Included with this soil in mapping are small areas of Johnston, Lynn Haven, and Hobcaw soils. Also included are small areas of soils that do not have a thick black surface layer, small areas of soils that are covered by as much as 1 foot of water for a month or more, and small dug ponds. Also included are some areas of Rutlege soil that has a loamy sand surface layer. The included soils make up less than 25 percent of the map unit.

The content of organic matter is moderate. This soil is extremely acid or very strongly acid throughout. Permeability is rapid. The available water capacity is low. The water table is at the surface or within 1 foot of the surface in winter and spring. This soil is frequently flooded.

Most of the acreage is woodland. The soil is well suited to loblolly pine, slash pine, sweetgum, water tupelo, and water oak. Wetness caused by the seasonal water table is a severe limitation to the use of equipment and to seedling survival. This limitation can be reduced by removing excess water, bedding, using wider tires on the equipment, and planting and harvesting trees during the drier months.

This soil is poorly suited to row crops. Yields are limited because of the seasonal high water table and frequent flooding. Intensive drainage, dikes, the use of fill material, and land grading help lower the water table and reduce flooding and ponding.

This soil is poorly suited to community development because of wetness and flooding. These limitations are very difficult and expensive to overcome. Intensive drainage and fill material help reduce these limitations. A protective filter may be needed around subsurface drains to prevent clogging of the lines.

This soil is in capability subclass VIw. The woodland ordination symbol is 2w.

28—Echaw sand. This is a moderately well drained, nearly level soil on broad flats on the Coastal Plain. The areas commonly are about 30 to 50 acres in size, but the range is 5 to 200 acres.

Typically, the surface layer is 5 inches of grayish brown sand. The subsurface layer, from 5 to 40 inches, is brown and pale brown sand. The subsoil, from 40 to 60 inches, is very dark brown sand.

Included with this soil in mapping are small areas of Leon and Lakeland soils. Also included are small borrow areas, small dug ponds, and small wet spots. The included areas make up less than 15 percent of the map unit.

The content of organic matter is low. This soil is very strongly acid to medium acid throughout. Permeability is moderately rapid to rapid. The available water capacity is low. The water table is 2.5 to 5 feet below the surface from late in the fall to spring.

Most of the acreage is woodland. The soil is moderately suited to loblolly pine and slash pine. The sandy texture of the soil is a moderate limitation to the use of equipment, but this limitation can be reduced by using wider tires on the equipment.

The soil is moderately suited to row crops, for example, corn and soybeans. The low available water capacity limits yields, but this limitation can be reduced by minimum tillage, the use of cover crops, and the return of all crop residue to the soil. Split applications of fertilizer can help counteract leaching.

This soil is moderately suited to community development. The rapid permeability and wetness are severe limitations for septic tank absorption fields. Limitations are slight for dwellings and local roads and streets. The limitations for septic tank absorption fields can be reduced by filling and shaping and surface and subsurface drainage. A protective filter may be needed around subsurface drains to prevent clogging of the lines.

This soil is in capability subclass IIIs. The woodland ordination symbol is 3s.

31—Hobcaw loam. This is a very poorly drained, nearly level soil in natural drainageways and depressions on the lower Coastal Plain. The areas commonly are about 50 acres in size, but the range is 5 to more than 200 acres.

Typically, the surface layer is 10 inches of black loam. The subsurface layer, from 10 to 18 inches, is gray sandy loam. The subsoil, from 18 to 48 inches, is gray sandy clay loam that has brownish yellow mottles. The underlying material to a depth of more than 60 inches is light gray sand.

Included with this soil in mapping are small areas of Bladen, Cape Fear, Grifton, and Rutlege soils. Also included are small areas of soils that are neutral in reaction. There are small dug ponds in some of the mapped areas. The included soils make up less than 25 percent of the map unit.

The content of organic matter is moderate. This soil is very strongly acid to slightly acid throughout. Permeability is moderate. The available water capacity is medium. The water table is 1 foot above to 1 foot below the surface in winter and spring.

Most of the acreage is woodland. This soil is well suited to loblolly pine, slash pine, and sweetgum. The seasonal high water table is a severe limitation to harvesting or planting trees. Removing excess water, using wider tires on equipment, bedding, and harvesting and planting trees in the drier months help reduce this limitation.

This soil is well suited to row crops, for example, corn and soybeans. Wetness caused by the seasonal high

Figure 4.—A typical area of Johnston loam.

water table is a severe limitation, but this limitation can be reduced by surface and subsurface drainage. A protective filter may be needed around subsurface drains to prevent clogging of the lines.

This soil is poorly suited to urban uses. Wetness and the low elevation of this soil are severe limitations for dwellings, septic tank absorption fields, and local roads and streets. These limitations are difficult and expensive to overcome. Surface and subsurface drainage and filling and shaping can help reduce these limitations.

This soil is in capability subclass IIIw. The woodland ordination symbol is 1w.

33—Hobonny muck. This is a very poorly drained, nearly level soil in backwater areas and marshes adjacent to rivers and streams. This soil formed in plant remains mixed with a small amount of mineral soil. The areas commonly are 100 acres or more in size.

Typically, the surface layer is 15 inches of dark brown muck. The underlying material from 15 to 62 inches is black muck.

Included with this soil in mapping are small areas of Johnston and Levy soils. Also included are some areas of soils that have layers of mineral soil in the organic material. The included soils make up less than 20 percent of the map unit.

This soil is high in natural fertility. It is extremely acid to strongly acid throughout. Permeability is moderate. The available water capacity is very high. The water table fluctuates between the surface and 1 foot above the surface. This soil is frequently flooded unless it is diked and protected.

This soil is mainly in its natural state, or it is managed as habitat for wetland wildlife, to which it is well suited. It is not suited to most other uses because of the high water table, frequent flooding, and poor engineering qualities. In the 19th century, this soil was used mainly for rice cultivation.

This soil is in capability subclass VIIw. It is not rated for woodland.

34—Johnston loam. This is a very poorly drained, nearly level soil on flood plains along rivers, streams, and drainageways on the Coastal Plain (fig. 4). The areas range from 10 to 100 acres in size, but they commonly are 20 to 40 acres in size.

Typically, the surface layer is 14 inches of black loam. The layer below that, from 14 to 32 inches, is very dark gray sandy loam. The underlying material from 32 to 65 inches is gray sand.

Included with this soil in mapping are small areas of Rutlege and Lynn Haven soils. Also included are small ponds, small areas of soils that have a loamy subsoil, and a few areas of soils that have a surface layer of mucky loam or sandy loam. The included soils make up less than 10 percent of the map unit.

The content of organic matter is high. This soil is very strongly acid or strongly acid throughout. Permeability is moderately rapid above the underlying material and rapid in the underlying material. The available water capacity is medium. This soil is frequently ponded or flooded. The water table, in winter and spring, ranges from 1 foot above the surface to 1.5 feet below the surface.

Most of the acreage is woodland. This soil is well suited to loblolly pine, sweetgum, and water oak. The main limitation for producing and harvesting timber is wetness, but this limitation can be reduced by using specialized logging equipment and harvesting and planting in the drier months.

This soil is poorly suited to crops and to community development. The main limitations are very poor drainage and frequent ponding or flooding. These limitations can be reduced only by major flood control and drainage measures.

This soil is in capability subclass VIIw. The woodland ordination symbol is 1w.

36B—Lakeland fine sand, 0 to 6 percent slopes. This is an excessively drained, nearly level to gently sloping soil in broad areas on the Coastal Plain, mainly near the major rivers (fig. 5). The areas commonly are 40 to 60 acres in size, but the range is 10 to several hundred acres.

Typically, the surface layer is 4 inches of very dark grayish brown fine sand. The underlying material from 4 to 80 inches consists of layers of yellowish brown and brownish yellow fine sand.

Included with this soil in mapping are small areas of Centenary, Chipley, and Echaw soils and some areas of soils that have slopes of more than 6 percent. There are small borrow areas and small ponds in some of the mapped areas. The included areas make up less than 15 percent of the map unit.

The content of organic matter is low. This soil is very strongly acid to medium acid throughout. Permeability is very rapid. The available water capacity is low. The water table is at a depth of more than 6 feet throughout the year.

Most of the acreage is woodland. This soil is moderately suited to such species as longleaf pine and loblolly pine. The sandy texture and droughtiness are moderate limitations to the use of equipment and to seedling survival. These limitations can be reduced by using wider tires on the equipment and by clearing the seedbed to reduce competition for moisture.

This soil is poorly suited to the row crops commonly grown in the county. The low available water capacity severely limits crop yields. Also, the soil material does not retain nutrients well. Irrigation, minimum tillage, use of cover crops, and split applications of fertilizer help to increase yields.

This soil is moderately suited to community development. The poor filtering capacity of the sandy material is a severe limitation for septic tank absorption fields. On this soil, a community sewage disposal system is preferable to a septic tank absorption system. Limitations for dwellings and local roads and streets are slight.

This soil is in capability subclass IVs. The woodland ordination symbol is 4s.

38B—Newhan sand, 0 to 6 percent slopes. This is an excessively drained, nearly level to gently sloping soil adjacent to beaches and waterways along the coast (fig. 6). The areas are long and narrow and commonly are 50 to 75 acres in size, but the range is 10 to 250 acres.

Typically, the surface layer is 1 inch of grayish brown sand. The underlying material to a depth of 80 inches is light gray sand that is 3 to 25 percent shell fragments.

Included with this soil in mapping are small areas of Chipley and Lakeland soils and small areas of beaches. The included areas make up less than 10 percent of the map unit.

The content of organic matter is low. This soil is neutral or mildly alkaline throughout. Permeability is very rapid. The available water capacity is very low. The water table is more than 6 feet below the soil surface.

This soil is poorly suited to use as woodland or cropland. It is severely limited by the salt spray and by droughtiness.

This soil has been extensively developed. The built-up areas are covered with beach cottages, motels, and amusement parks. This soil is moderately suited to community development. Because of the sandy texture, this soil is a poor filter for septic tank absorption fields. This limitation can be overcome by installing a community sewage disposal system.

If these areas are developed, care should be taken to protect and retain dunes and native vegetation. This helps to prevent beach erosion and to control possible

damage to structures during storms and unusually high tides.

This soil is in capability subclass VIIIs. It is not rated for woodland.

39A—Norfolk loamy fine sand, 0 to 2 percent slopes. This is a well drained, nearly level soil on uplands on the Coastal Plain. The areas commonly are 20 to 40 acres in size, but the range is 5 to 100 acres.

Typically, the surface layer is 7 inches of very dark grayish brown loamy fine sand. The subsurface layer, from 7 to 15 inches, is brownish yellow loamy fine sand. The subsoil from 15 to 80 inches is yellowish brown, strong brown, and brownish yellow sandy clay loam that has gray mottles below a depth of 48 inches.

Included with this soil in mapping are small areas of Yauhannah and Chisolm soils and small areas of soils in which the content of clay decreases by more than 20 percent within 60 inches of the surface. Also included are some small areas of soils that have slopes of 2 to 6

Figure 5.—Native trees and shrubs combine well with introduced ornamentals in this garden on Lakeland fine sand, 0 to 6 percent slopes.

Figure 6.—Typical area of Newhan sand, 0 to 6 percent slopes.

percent. There are small dug ponds in some of the mapped areas. The included soils make up less than 20 percent of the map unit.

The content of organic matter is moderate. The surface and subsurface layers are very strongly acid to medium acid, and the subsoil is very strongly acid or strongly acid. Permeability is moderate. The available water capacity is medium. The water table is 4 to 6 feet below the surface in winter and early in spring.

In some small areas, this soil is used as woodland. It is well suited to such species as loblolly pine and slash pine. This soil has slight limitations for use as woodland.

This soil is mainly used for crops. It is well suited to row crops, for example, corn, tobacco, and soybeans. It produces good yields under proper management (fig. 7).

This soil is well suited to community development. It has moderate limitations for septic tank absorption fields and slight limitations for dwellings and local roads and streets. Septic tank absorption fields need to be designed so that the base of the field is free of water.

This soil is in capability class I. The woodland ordination symbol is 2o.

50—Lynn Haven sand. This is a poorly drained, nearly level soil on low flats on the Coastal Plain. The areas commonly are 25 to 50 acres in size, but the range is 5 to several hundred acres.

Typically, the surface layer is 12 inches of black sand, and the subsurface layer, from 12 to 18 inches, is gray sand. The subsoil, from 18 to 60 inches, is black or reddish brown sand. The underlying material from 60 to 75 inches is gray sand.

Included with this soil in mapping are small areas of Johnston and Witherbee soils and a few small areas of soils along the coast that have a loamy sand surface layer and are neutral in reaction. Also included are a few small ponds. The included soils make up less than 15 percent of the map unit.

The content of organic matter is moderate. The soil is extremely acid to strongly acid throughout. Permeability is rapid in the surface and subsurface layers and moderately rapid or moderate in the subsoil. The available water capacity is low to very low. The water table is at the surface or within 1 foot of the surface from late in the fall to early in spring.

Most of the acreage is woodland. This soil is moderately suited to slash pine, loblolly pine, and longleaf pine. The high water table, from late in the fall to early in spring, is a major limitation to harvesting and planting trees. Removing excess water, bedding, using

wider tires on equipment, and harvesting and planting in the drier months can help reduce the limitations of wetness and sandy texture.

This soil is moderately suited to row crops, for example, corn and soybeans. Yields are limited by wetness. This limitation can be reduced by installing surface and subsurface drainage. A protective filter may be needed around subsurface drains to prevent clogging of the lines.

This soil is poorly suited to community development. Wetness late in the fall to early in spring, caused by the high water table, and the sandy texture are severe limitations for septic tank absorption fields, dwellings, and local roads and streets. These limitations can be reduced by surface and subsurface drainage and by shaping and filling. Nevertheless, on this soil a community sewage disposal system is preferable to a septic tank absorption system.

This soil is in capability subclass IVw. The woodland ordination symbol is 3w.

54A—Chipley fine sand, 0 to 2 percent slopes. This is a moderately well drained, nearly level soil on broad flats on the Coastal Plain. The areas range from 10 to 200 acres in size. However, most areas are about 40 acres in size.

Typically, the surface layer is 4 inches of dark grayish brown fine sand. The underlying material is fine sand. From 4 to 24 inches it is yellowish brown; below that, from 24 to 46 inches it is coarsely mottled light gray and brownish yellow; and below that, from 46 to 80 inches it is light gray.

Included with this soil in mapping are a few small areas of Wakulla, Leon, Lynn Haven, and Lakeland soils. Small ponds and borrow sites are also included in some mapped areas. The included areas make up less than 20 percent of the map unit.

The content of organic matter is low. The surface layer is extremely acid through medium acid, and the underlying material is strongly acid to slightly acid. Permeability is rapid. The available water capacity is low

Figure 7.—Norfolk loamy fine sand, 0 to 2 percent slopes, is one of the prime farmland soils in the county.

to very low. The water table is 2 to 3 feet below the surface from late in the fall to spring.

Most of the acreage is woodland. This soil is well suited to such species as loblolly pine and slash pine. The use of equipment is somewhat restricted unless wide tires are used on the equipment. Preparing and clearing the seedbed before planting help reduce competition for moisture.

This soil is moderately suited to row crops commonly grown in the county. Yields are limited by the sandy surface layer and underlying material. The low available water capacity and rapid leaching of nutrients are limitations. Plowing in organic residue, splitting fertilizer applications, and similar practices help to reduce these limitations.

This soil is moderately suited to community development. It is limited by seasonal wetness, seepage, and sandy texture. Subsurface and surface drainage and filling and shaping help to reduce these limitations.

This soil is in capability subclass IIIs. The woodland ordination symbol is 2s.

55—Witherbee fine sand. This is a somewhat poorly drained, nearly level soil on broad flats on the Coastal Plain. The areas commonly are 30 to 50 acres in size, but the range is 5 to 100 acres.

Typically, the surface layer is 8 inches of very dark gray fine sand. The subsurface layer, fron 8 to 20 inches, is brownish yellow fine sand. The subsoil, from 20 to 33 inches, is black fine sand. The underlying material from 33 to 75 inches is brown, pale brown, and light gray fine sand.

Included with this soil in mapping are small areas of Centenary, Echaw, and Leon soils. Also included are small areas of soils that are loamy throughout. There are small dug ponds in some of the mapped areas. The included soils make up less than 20 percent of the map unit.

The content of organic matter is low. This soil is extremely acid to medium acid in the surface and subsurface layers and very strongly acid to slightly acid in the subsoil and underlying material. Permeability is very rapid in the surface and subsurface layers and rapid in the subsoil. The available water capacity is low. The water table is within 2 feet of the surface from late in the fall to spring.

Most of the acreage is woodland. This soil is well suited to loblolly pine, slash pine, and sweetgum.

The seasonal high water table is a limitation to the use of equipment. This limitation can be overcome by removing excess water, harvesting and planting trees in the drier months, and using wider tires on the equipment.

This soil is moderately suited to row crops, for example, corn and soybeans. Wetness caused by the high water table limits yields, but yields can be improved by surface and subsurface drainage. A protective filter may be needed around subsurface drains to prevent clogging of the lines.

This soil is moderately suited to community development. The high water table and the sandy texture are severe limitations. These limitations can be overcome by surface and subsurface drainage and filling and shaping. A protective filter may be needed around subsurface drains to prevent clogging of the lines.

This soil is in capability subclass IIIw. The woodland ordination symbol is 2w.

56—Chastain silty clay loam. This is a poorly drained, nearly level soil on broad inland flood plains of the Santee and Pee Dee Rivers. The areas are several hundred acres in size.

Typically, the surface layer is 3 inches of brown silty clay loam. The subsoil from 3 to 40 inches is gray silty clay; from 40 to 56 inches it is gray clay; and from 56 to 75 inches it is gray clay loam.

Included with this soil in mapping are small areas of well drained soils, moderately well drained soils, and soils that are coarser textured throughout. The included soils make up less than 20 percent of the map unit.

The content of organic matter is low. This soil is very strongly acid to medium acid throughout. Permeability is slow. The available water capacity is medium or high. In most years, late in winter and in spring, this soil is frequently flooded to a depth of 1 foot to several feet and has a water table at the surface or within 1 foot of the surface.

All of the acreage is woodland. The trees are mainly water-tolerant hardwoods. Some pines grow in the higher areas. This soil is well suited to sweetgum, water oak, loblolly pine, and slash pine. Wetness and flooding are severe limitations to harvesting and management. These limitations can be reduced by using specialized logging equipment or by logging in the drier months.

This soil is poorly suited to row crops and to community development. Flooding, wetness, and the clayey subsoil are limiting factors that are difficult and expensive to overcome.

This soil is in capability subclass VIw. The woodland ordination symbol is 2w.

57—Grifton loamy fine sand. This is a poorly drained, nearly level soil on broad flats and in slight depressions on the Coastal Plain. The areas commonly are 30 to 60 acres in size, but the range is 5 to more than 200 acres.

Typically, the surface layer is 6 inches of very dark gray loamy fine sand. The subsurface layer, from 6 to 12 inches, is light brownish gray loamy fine sand. The subsoil from 12 to 46 inches is gray sandy clay loam, and from 46 to 55 inches it is gray sandy loam. The underlying material to a depth of 80 inches is light brownish gray sand.

Included with this soil in mapping are small areas of Yemassee and Wahee soils. Also included are small areas of soils that are underlain by sandy material at a depth of less than 40 inches. There are small ponds in some areas. Also included are some areas of Grifton soil that has a surface layer of sandy loam. The included soils make up less than 20 percent of the map unit.

The content of organic matter is moderate. This soil is very strongly acid to slightly acid throughout. Permeability is moderate. The available water capacity is medium. The water table is 0.5 to 1 foot below the surface in winter and spring.

Most of the acreage is woodland. The soil is well suited to woodland species such as loblolly pine, slash pine, and sweetgum. The high water table in winter and spring is a severe limitation to the use of equipment and to seedling survival. This limitation can be reduced by removing excess water, bedding, using wider tires on the equipment, and harvesting and planting trees in the drier months.

This soil is well suited to row crops, for example, corn and soybeans. The high water table in winter and spring is a limitation, but surface and subsurface drainage help lower the water table. A protective filter may be needed around subsurface drains to prevent clogging of the lines.

This soil is poorly suited to community development. The high water table is a severe limitation to septic tank absorption fields, dwellings, and local roads and streets. Extensive surface and subsurface drainage and shaping and filling can help reduce the limitation.

This soil is in capability subclass IIIw. The woodland ordination symbol is 2w.

58—Udorthents, loamy. The soil material in areas of this map unit commonly consists of several feet of loamy dredged material that has been pumped onto low-lying marshy areas. This pumped material has been dredged from rivers and bays to create channels and turning basins for ships. The areas are about 100 acres in size.

Also included in this map unit are industrial sites where the soil has been cut and filled, borrow areas, sanitary landfill areas, and industrial disposal areas.

The soils in all these areas have a low content of organic matter. Acidity, permeability, and the available water capacity are all variable.

These soils are poorly suited to most uses. All areas are diverse, complex, and highly variable. Onsite investigation is required to determine suitabilities and limitations.

These soils are not assigned to a capability subclass or to a woodland group.

59—Wahee fine sandy loam. This is a somewhat poorly drained, nearly level soil on broad flats on the Coastal Plain. The areas commonly are 40 to 60 acres in size, but the range is 5 to several hundred acres.

Typically, the surface layer is 5 inches of very dark gray fine sandy loam. The subsurface layer, from 5 to 9 inches, is yellowish brown fine sandy loam. The subsoil from 9 to 44 inches is gray clay, and from 44 to 53 inches it is gray clay loam. Below the subsoil to a depth of 80 inches there is gray loamy sand.

Included with this soil in mapping are small areas of Bladen, Eulonia, Yauhannah, and Yemassee soils. Also included are small areas of soils that are neutral in reaction. There are small dug ponds in some areas. The included soils make up less than 20 percent of the map unit.

The content of organic matter is low. This soil is very strongly acid to medium acid in the surface and subsurface layers and very strongly acid or strongly acid in the subsoil and underlying material. Permeability is slow. The available water capacity is high. The water table is 0.5 foot to 1.5 feet below the surface in winter and spring.

Most of the acreage is woodland. This soil is well suited to loblolly pine, slash pine, and sweetgum. The seasonal water table is a moderate limitation to the use of equipment and to seedling survival. This limitation can be reduced by removing excess water, bedding, using wider tires on the equipment, and harvesting and planting trees in the drier months.

In some small areas, this soil is in crops. It is moderately suited to row crops, for example, corn and soybeans. The seasonal water table is a limitation, but it can be reduced by surface drainage.

This soil is poorly suited to community development. The seasonal water table and the slow permeability are severe limitations to septic tank absorption fields, dwellings, and local roads and streets. These limitations are difficult to overcome, but they can be reduced by surface drainage, filling, and enlarging the filter field for added absorption.

This soil is in capability subclass IIIw. The woodland ordination symbol is 2w.

61—Yemassee loamy fine sand. This is a somewhat poorly drained, nearly level soil on broad flats on the lower Coastal Plain. The areas commonly are 25 to 50 acres in size, but the range is 5 to several hundred acres.

Typically, the surface layer is 7 inches of black loamy fine sand. The subsurface layer, from 7 to 12 inches, is pale brown sand. The subsoil from 12 to 50 inches is pale brown or gray sandy clay loam that has grayish and brownish mottles, and from 50 to 75 inches it is light gray sandy loam. The underlying material below a depth of 75 inches is gray sand.

Included with this soil in mapping are small areas of Yauhannah, Eulonia, Grifton, and Wahee soils. Also included are small areas of soils that are neutral in reaction. There are small dug ponds in some areas. The included soils make up less than 20 percent of the map unit.

The content of organic matter is low. This soil is extremely acid to medium acid in the surface and subsurface layers and extremely acid to strongly acid in the subsoil and underlying material. Permeability is moderate. The available water capacity is medium. The water table is 1.0 to 1.5 feet below the surface during winter and spring.

This soil is used mainly as woodland. It is well suited to such species as loblolly pine, slash pine, sweetgum, and water oak. The seasonal high water table is the only limitation to the use of equipment. This limitation can be reduced by removing excess water, harvesting or planting trees in the drier months, and using wider tires on the equipment.

This soil is well suited to row crops, for example, corn and soybeans. Wetness caused by the seasonal water table is a limitation, but the wetness can be reduced by surface and subsurface drainage. A protective filter may be needed around subsurface drains to prevent clogging of the lines.

This soil is poorly suited to urban development. Wetness caused by the seasonal water table is a severe limitation. Installing surface and subsurface drainage and shaping and filling help reduce this limitation.

This soil is in capability subclass IIw. The woodland ordination symbol is 2w.

prime farmland

In this section, prime farmland is defined and discussed, and the prime farmland soils in Georgetown 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 providing the nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that 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 and water areas cannot be considered prime farmland.

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 flooded during the growing season. The slope ranges mainly from 0 to 6 percent.

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

About 115,000 acres, or 22 percent of the county, is prime farmland. The areas are scattered throughout the county, and almost all of the areas are now used as woodland.

The following map units, or soils, make up prime farmland in Georgetown County. On some soils included in the list, appropriate measures have been applied to overcome a hazard or limitation, such as flooding, wetness, or droughtiness. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each unit is given in table 4. The soil qualities that affect use and management are described in the section "Detailed soil map units." This list does not constitute a recommendation for a particular land use.

12A	Yauhannah loamy fine sand, 0 to 2 percent slopes
26A	Eulonia loamy fine sand, 0 to 2 percent slopes
26B	Eulonia loamy fine sand, 2 to 6 percent slopes
39A	Norfolk loamy fine sand, 0 to 2 percent slopes
61	Yemassee loamy fine sand (where artificially drained)

use and management of the soils

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

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

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

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

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

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

crops and pasture

Gene E. Hardee, 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, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

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

Only about 18,000 acres in Georgetown County are used as cropland. The major crops are corn, soybeans, and tobacco. The potential for increased production is good. About 400,000 acres in Georgetown County are used as woodland, and almost half of that acreage could be used for crops.

Soil drainage is the main improvement needed on almost all of the cropland, pasture, and woodland in the county. Some soils are naturally so wet that crops common in the area cannot be economically grown. These are the very poorly drained Chastain, Johnston, Levy, and Rutlege soils. Also in this category are the salt-marsh Bohicket soils and the organic-marsh Hobonny soils. The very poorly drained Cape Fear and Hobcaw soils can be cropped if extensive drainage is used. The total acreage of these very poorly drained soils is about 160,000 acres. Cape Fear, Chastain, Johnston, and Rutlege soils are used mainly for water-tolerant hardwoods. The poorly drained soils that are difficult to drain, for example, Bladen, Leon, Lynn Haven, and Grifton soils, also are used for water-tolerant hardwoods. In places that have minimum drainage, the soils are planted to pines. These soils make up about 95,000 acres.

Unless they are artificially drained, the somewhat poorly drained Wahee, Witherbee, and Yemassee soils are so wet that crops are damaged in most years. These soils make up about 85,000 acres.

Centenary, Chipley, Echaw, Eulonia, and Yauhannah soils have good natural drainage most of the year, but they tend to dry out slowly after rains. These moderately well drained soils commonly include small areas of wetter soils along drainageways and in swales. In these areas, artificial drainage is needed. These soils make up about 115,000 acres.

The design of surface and subsurface drainage systems varies according to the soil. A combination of surface drainage and tile drainage is needed in most areas of poorly drained and somewhat poorly drained

soils that are used for intensive row cropping. Drains need to be more closely spaced in soils that have slow permeability than in the more permeable soils. Subsurface drainage is very slow in Bladen, Eulonia, and Wahee soils. Finding adequate outlets for tile and open drainage systems is difficult in many areas of Bladen, Grifton, Wahee, and Yemassee soils.

Soil fertility is naturally low in most of the upland soils in the county. All the soils in this survey area, except Bohicket soils, are naturally acid. The soils on flood plains, Bohicket, Chastain, Levy, and Hobonny soils, have a higher content of plant nutrients than most upland soils.

Many upland soils are naturally very strongly acid. Applications of ground limestone are required to raise the pH level sufficiently for crop growth. The levels of available phosphorus and potassium are naturally low in most of these soils. Additions of lime and fertilizer should be based on the results of soil tests, on the needs of the crop, and on the expected level of yields. The Cooperative Extension Service can help in determining the kind and amount of fertilizer and lime to apply.

Soil tilth is an important factor in the germination of seeds and in the infiltration of water into the soil. Soils that have good tilth are granular and porous.

Most of the soils used for crops in the county have a surface layer of loamy fine sand. This layer is light in color and low in content of organic matter. Generally, the structure of such soils is weak, and heavy rainfall causes a slight crust to form on the surface. This crust reduces infiltration and increases runoff. Regular additions of crop residue, manure, and other organic material help to improve soil structure and reduce crust formation. This material, if kept on the soil surface, is the best protection against the damaging effects of raindrops.

Fall plowing generally is not a good practice on the light-colored soils that have a surface layer of loamy fine sand, because a crust forms on the surface in winter and spring. However, the dark-colored Bladen and Grifton soils often stay wet until late in spring. If they are plowed when wet, they tend to be very cloddy when they dry, and it is difficult to prepare a good seedbed. On these soils, fall plowing generally results in good tilth in spring.

Field crops that are suited to the soils and climate of the county include many that are not commonly grown. Corn, tobacco, and soybeans are the common row crops. Grain sorghum, sunflowers, peanuts, potatoes, and other crops can be grown if economic conditions are favorable.

Wheat and oats are the common close-growing crops. Rye, barley, and flax can be grown, and seed can be produced from bahiagrass, annual lespedeza, lespedeza bicolor, and switchgrass.

yields per acre

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

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

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, 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 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils.

land capability classification

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

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. These levels are defined in the following 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 slight limitations that restrict their use.

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

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

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

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

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

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

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

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

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

The acreage of soils in each capability class and subclass is shown in table 6. The capability classification of each map unit is given in the section "Detailed soil map units."

woodland management and productivity

Norman W. Runge, forester, Soil Conservation Service, helped prepare this section.

In the forest that originally covered much of Georgetown County, pine, oak, and hickory were on the uplands, and baldcypress and water-tolerant hardwoods were in the low-lying wet areas. The virgin forest provided material for naval stores and logging industries.

Trees now cover about 75 percent of the survey area (fig. 8). The dominant forest type is pine, except in broad, low-lying areas and drainageways where hardwood forest is dominant. Loblolly pine is the most common species. Longleaf pine, slash pine, and pond pine are of minor extent. Hardwoods commonly are interspersed in the dominant pine forest unless the area has been replanted. Some common hardwoods are water oak, sweetgum, blackgum, American sycamore, water tupelo, yellow-poplar, and baldcypress.

Soils differ in their suitability for trees because of their different elevations, positions, and intrinsic characteristics. Those characteristics that determine moisture supply and the growing space for tree roots are the most important. Among such characteristics are the thickness and texture of the surface layer and subsoil, the depth to a root-restricting layer, the depth to the water table, and salinity.

The soils in about 12 percent of the county are affected by salt water, which precludes their use as woodland. The rest of the soils are mainly well suited to trees; however, about 4 percent of the soils are sandy and droughty. The climate is very favorable to tree growth; annual rainfall averages 52 inches, and there are about 225 frost-free days in the year.

The level of woodland management has improved significantly in recent years. Wildfires caused by uncontrolled burning, which were common in the area about two decades ago, have been significantly reduced by fire protection and prescribed burning. Drainage ditches that have access roads on the spoil banks are common in large wooded areas that are low-lying and wet. Droughty soils are furrowed and the seedlings are planted in the furrow, whereas low-lying, wet soils are bedded and the seedlings are planted on top of the beds. Additional measures being practiced or considered include planting genetically improved strains, water management to stabilize the water table, and fertilization.

The commercial value of wood products in the county is substantial, but it is below the potential capacity. Much of the woodland is owned by major paper companies and is managed for pulp production. In addition to its commercial use, woodland is valuable for grazing, wildlife habitat, recreation, natural beauty, and watershed protection.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination (woodland suitability) symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *w* indicates excessive water in or on the soil, and *s* indicates sandy texture. The letter *o* indicates that limitations or restrictions are insignificant. If a soil has

Figure 8.—Most of the acreage of Yauhannah loamy fine sand, 0 to 2 percent slopes, is woodland.

more than one limitation, the priority is as follows: w and s.

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

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

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

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant

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

Ratings of *windthrow hazard* are based on soil characteristics that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight* indicates that few trees may be blown down by strong winds; *moderate*, that some trees will be blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

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

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

recreation

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

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

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 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 mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders 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 or stones or boulders 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 free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

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

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

wildlife habitat

William J. Melven, biologist, Soil Conservation Service, helped prepare this section.

Georgetown County has a wide variety of wildlife habitat, which supports many different kinds of wildlife. Man's activities, as well as soil characteristics and natural moisture conditions, have influenced vegetative patterns. Habitat varies from dry upland ridges that have

sparse plant cover to upland deciduous forest that provides a variety of food and cover for wildlife and to pine plantations. Bottom lands afford another kind of habitat. Farm ponds, lakes, and streams provide favorable conditions for many species of fish. The southeastern part of the county includes large areas of marshland that extend inland for many miles along the major streams. These marsh areas are suited to ducks, geese, and other wetland wildlife.

The major game species in the county are eastern cottontail, gray squirrel, white-tailed deer, wild turkey, bobwhite quail, and mourning dove. The wild turkey population is increasing because of restocking carried out by the South Carolina Wildlife and Marine Resources Department.

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

In table 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. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

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, wheatgrass, and grama.

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 and cedar.

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

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are wetness, slope, and permeability. Examples of shallow water areas are marshes, 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, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, woodcock, thrushes, 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, shore birds, muskrat, mink, and beaver.

engineering

Lennie J. Farmer, area engineer, Soil Conservation Service, helped prepare this section.

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

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

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

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

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

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

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

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

building site development

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

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without

basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

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

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

sanitary facilities

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

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

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

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

Table 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, flooding, and content of organic matter.

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

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

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

The ratings in table 11 are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, slope, and flooding affect both types of landfill. Texture, highly organic layers, and soil reaction 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 that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

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

construction materials

Table 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 large stones, 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, few cobbles and stones, 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, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, 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), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

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

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

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less

than 8 percent. They are 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 gravel, stones, or 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 gravel, stones, or 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 nutrients for plant growth.

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 for each soil the restrictive features that affect drainage and irrigation.

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 and the depth to permeable material. 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 even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

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

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from 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 bedrock, to a 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; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by slope and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity. Availability of drainage outlets is not considered in the ratings.

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

soil properties

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

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

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

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

engineering index properties

Table 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 a soil contains particles coarser than sand, 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.

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

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

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

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

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

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

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

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

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

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion and the amount of soil lost. Soils are grouped according to the following distinctions:

1. Sands, coarse sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.
2. Loamy sands, loamy fine sands, and loamy very fine sands. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.
3. Sandy loams, coarse sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clays, silty clays, clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.

5. Loamy soils that are less than 18 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loams and sandy clays that are less than 5 percent finely divided calcium carbonate. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.

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

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands 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 a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

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

Table 16 gives the frequency and duration of flooding and the time of year when flooding is most likely.

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

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

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

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. 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 high. 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 beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

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

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

Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to 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 amount of sulfates in the saturation extract.

classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*6*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 17 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 Entisol.

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 Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

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 Fluvaquents (*Fluv*, meaning river, plus *aquent*, the suborder of the Entisols that have 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 Fluvaquents.

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, kaolinitic, acid, thermic Typic Fluvaquents.

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 underlying material can differ within a series.

soil series and their morphology

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

Characteristics of the soil and the material in which it formed are identified for each series. 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 (*5*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*6*). 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."

Bladen series

The Bladen series consists of poorly drained, slowly permeable soils that formed in clayey marine sediment. The soils are nearly level and are on broad flats on the Coastal Plain. Slopes are less than 2 percent. These soils are classified as clayey, mixed, thermic Typic Albaquults.

Bladen soils are geographically closely associated with Cape Fear, Eulonia, Grifton, and Wahee soils. Cape Fear soils are in a slightly lower position on the landscape than Bladen soils; they are very poorly drained and have a thick black or very dark gray A horizon. Eulonia and

Wahee soils are in a slightly higher position on the landscape than Bladen soils; and they are better drained. Grifton soils are on a similar landscape and have less clay in the control section.

Typical pedon of Bladen loam, 14 miles north of Georgetown on U.S. Highway 701; 5 miles west on county dirt road at Plantersville; 5,700 feet north along canal; 100 feet west of canal:

A1—0 to 6 inches; black (10YR 2/1) loam; weak fine granular structure; friable; common fine and medium roots; very strongly acid; clear smooth boundary.

B21tg—6 to 12 inches; dark gray (10YR 4/1) clay; few medium distinct yellowish brown (10YR 5/6) mottles; strong medium prismatic structure parting to moderate medium angular blocky; firm; few fine and medium roots; thin patchy clay films on faces of peds; very strongly acid; gradual smooth boundary.

B22tg—12 to 45 inches; gray (10YR 5/1) clay; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few fine roots; thin patchy clay films on faces of peds; very strongly acid; gradual smooth boundary.

B23tg—45 to 70 inches; gray (10YR 6/1) clay; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm; patchy clay films on faces of peds; very strongly acid.

The solum is more than 60 inches thick. The soils are extremely acid to strongly acid throughout.

The A1 or Ap horizon is 5 to 7 inches thick. It has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The B2tg horizon is 34 to 65 inches thick. It has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. In most places it has mottles in shades of red, brown, yellow, or gray. It is dominantly clay, but the range includes clay loam.

In some places there is a B3g horizon that is as much as 20 inches thick. It has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. In most places it has mottles in shades of red, brown, yellow, or gray. It commonly is clay but ranges to clay loam in some pedons. In some places, thin lenses or pockets of sandy loam are in the lower part of the B horizon.

Blanton series

The Blanton series consists of well drained, moderately permeable soils that formed in sandy and loamy marine sediment. The soils are nearly level to gently sloping and are in long narrow areas and broad rolling areas along the Black and Pee Dee Rivers. Slopes range from 0 to 6 percent. These soils are classified as loamy, siliceous, thermic Grossarenic Paleudults.

Blanton soils are geographically closely associated with Chisolm, Chipley, Lakeland, and Norfolk soils. Chisolm soils have an A horizon that is 20 to 38 inches thick. Chipley and Lakeland soils have fine sand to a depth of 80 inches. Norfolk soils have an A horizon that is less than 20 inches thick.

Typical pedon of Blanton sand, 0 to 6 percent slopes, 19.5 miles north of Georgetown on U.S. Highway 701; 9 miles west on S.C. Highway 261; about 4.5 miles north on S.C. Highway 14 (to 3,000 feet past intersection of S.C. Highways 14 and 55); about 4,500 feet northeast on farm road to cleared area in woods; about 0.25 mile west of edge of clearing:

A1—0 to 5 inches; dark gray (10YR 4/1) sand; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; abrupt smooth boundary.

A21—5 to 14 inches; brownish yellow (10YR 6/6) sand; single grained; loose; common fine and medium roots; very strongly acid; gradual smooth boundary.

A22—14 to 20 inches; very pale brown (10YR 7/4) sand; few fine faint pockets of clean sand grains; single grained; loose; few fine roots; medium acid; gradual smooth boundary.

A23—20 to 42 inches; very pale brown (10YR 8/4) sand; few fine faint pockets of clean sand grains; single grained; loose; few fine roots; medium acid; gradual smooth boundary.

A24—42 to 65 inches; white (10YR 8/1) sand; single grained; loose; sand grains are uncoated; medium acid; clear smooth boundary.

B21t—65 to 75 inches; pale brown (10YR 6/3) sandy clay loam; common medium distinct gray (10YR 6/1) and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; very strongly acid; clear smooth boundary.

B22t—75 to 85 inches; gray (10YR 6/1) sandy clay loam; few medium faint pale brown (10YR 6/3) and few fine distinct yellowish brown mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; very strongly acid.

The solum is more than 70 inches thick. The soils range from medium acid to very strongly acid in the A horizon and strongly acid or very strongly acid in the Bt horizon.

The A1 or Ap horizon is 4 to 8 inches thick. It has hue of 10YR and either value of 3 and chroma of 1 or value of 4 and chroma of 1 to 3.

The A2 horizon is 34 to 64 inches thick. It has hue of 10YR; in the upper part it has value of 5 to 7 and chroma of 3 to 6, and in the lower part it has value of 6 to 8 and chroma of 1 to 4.

The B2t horizon is 14 to more than 40 inches thick. The B21t horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 8. It has mottles in shades of red, brown, or gray. The B22t horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 8. It has mottles in shades of red, brown, or gray. The B2t horizon is dominantly sandy clay loam, but the range includes sandy loam.

Bohicket series

The Bohicket series consists of very poorly drained, very slowly permeable soils that formed in silty and clayey marine sediment. The soils are on broad, level tidal flats that border the Atlantic Ocean and extend inland for about 5 miles along Winyah Bay and the Santee River. Slopes are less than 1 percent. These soils are classified as fine, mixed, nonacid, thermic Typic Sulfaquents.

Bohicket soils are geographically closely associated with Chipley, Levy, and Newhan soils. Chipley and Newhan soils are sandy throughout, are at a higher elevation than Bohicket soils, and are not flooded by seawater. Levy soils have a lower content of sulfur and are associated with freshwater.

Typical pedon of Bohicket silty clay loam, 20 miles northeast of Georgetown on U.S. Highway 17, in Huntington Beach State Park, 300 feet out boardwalk into marsh:

A1—0 to 12 inches; dark greenish gray (5GY 4/1) silty clay loam; massive; sticky; many fine and medium live and dead roots; when squeezed, soil flows easily between fingers, and very little residue is left in hand; soil has sulfur odor; moderately alkaline; gradual smooth boundary.

C1g—12 to 29 inches; dark greenish gray (5GY 4/1) clay loam; massive; sticky; common fine dead roots; soil flows easily between fingers when squeezed, and small amount of residue is left in hand; soil has sulfur odor; moderately alkaline; gradual smooth boundary.

C2g—29 to 45 inches; dark greenish gray (5GY 4/1) clay; massive; sticky; few fine dead roots; soil flows easily between fingers when squeezed, and small amount of residue is left in hand; soil has sulfur odor; moderately alkaline; gradual smooth boundary.

C3g—45 to 60 inches; dark greenish gray (5GY 4/1) silty clay loam; pockets of sandier material; common oyster shell fragments; massive; slightly sticky; few fine dead roots; soil flows easily between fingers when squeezed, and small amount of residue is left in hand; soil has sulfur odor; moderately alkaline.

Bohicket soils have *n* value of 1 or more in all horizons within the 10- to 40-inch control section. Depth to sand ranges from 52 to more than 70 inches. These soils are slightly acid to moderately alkaline throughout.

The A1 horizon is 12 to 23 inches thick. It has hue of 10YR, 5Y, or 5GY or is neutral; it has value of 3 or 4 and chroma of 0 to 2.

The C1g horizon is 15 to 42 inches thick. It has hue of 10YR to 5GY or is neutral; it has value of 2 to 5 and chroma of 0 to 2. It commonly is clay loam, but the range includes clay, silty clay loam, and silty clay. In some places it has thin strata of silt loam.

The C2g horizon is 15 to 20 inches thick. It has hue of 10YR to 5GY or is neutral; it has value of 2 to 5 and chroma of 0 or 1. It is clay, clay loam, or silty clay. Some pedons have pockets of sandy material.

In some places there is a C3g horizon that has hue of 5Y or 5GY or is neutral; it has value of 3 to 6 and chroma of 0 or 1. It ranges from silty clay to sand.

Cape Fear series

The Cape Fear series consists of very poorly drained, slowly permeable soils that formed in clayey marine sediment. The soils are nearly level and are in broad flat depressions and narrow flat drains on the Coastal Plain. Slopes are less than 2 percent. These soils are classified as clayey, mixed, thermic Typic Umbraquults.

Cape Fear soils are geographically closely associated with Bladen, Eulonia, and Wahee soils. Bladen, Eulonia, and Wahee soils are slightly higher on the landscape than Cape Fear soils and are better drained.

Typical pedon of Cape Fear loam, 4 miles west of Georgetown on U.S. Highway 17A; north on S.C. Highway 119; 3,700 feet on Brick Chimney Road beyond end of pavement; 0.1 mile east on paper company road; 25 feet south of road:

A1—0 to 18 inches; black (10YR 2/1) loam; weak fine granular structure; friable; many fine and medium roots; very strongly acid; gradual smooth boundary.

B21tg—18 to 36 inches; dark gray (10YR 4/1) clay; few fine distinct yellowish brown mottles; moderate medium subangular blocky structure; firm; common fine and medium roots; very strongly acid; gradual smooth boundary.

B22tg—36 to 58 inches; gray (10YR 5/1) clay; common fine distinct yellowish brown mottles; weak medium subangular blocky structure; very firm; few fine roots; very strongly acid; gradual smooth boundary.

B3g—58 to 65 inches; dark gray (10YR 4/1) clay loam; common medium distinct brownish yellow (10YR 6/6) and light gray (10YR 7/1) mottles; weak coarse subangular blocky structure; firm; very strongly acid.

The solum is 46 to more than 60 inches thick. The soils are very strongly acid to medium acid throughout.

The A1 horizon is 10 to 18 inches thick. It has hue of 10YR, value of 2 or 3, and chroma of 1.

In some places there is a B1 horizon that is 5 to 12 inches thick. It has hue of 10YR, value of 2 to 6, and

chroma of 1. In some places it has mottles in shades of brown and yellow. It is sandy clay loam or clay loam.

The B2tg horizon is 22 to more than 40 inches thick. It has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 1. In most places it has mottles in shades of brown and yellow. It is clay, sandy clay, clay loam, or silty clay.

In some places there is a B3g horizon that has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1. It commonly has mottles in shades of brown and yellow. It is clay loam, sandy clay loam, or sandy loam.

Centenary series

The Centenary series consists of moderately well drained, rapidly permeable soils that formed in sandy marine sediment. These are nearly level soils on broad ridges and flats on the Coastal Plain. Slopes are less than 2 percent. These soils are classified as sandy, siliceous, thermic Grossarenic Entic Haplohumods.

Centenary soils are geographically closely associated with Chipley, Echaw, Leon, and Lakeland soils. Chipley and Echaw soils are on a similar landscape. Echaw soils have a Bh horizon at a depth of 30 to 50 inches, and Chipley soils do not have a Bh horizon within 80 inches of the soil surface. Leon soils are slightly lower on the landscape and are more poorly drained than Centenary soils. Lakeland soils do not have a Bh horizon, are slightly higher on the landscape, and are excessively drained.

Typical pedon of Centenary fine sand, 3 miles north of Georgetown on U.S. Highway 701; 1.6 miles northwest on S.C. Highway 51; 1.25 miles west on Brick Chimney Road; 100 feet south of road:

A1—0 to 7 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; many fine and medium roots; common fine pores; strongly acid; clear wavy boundary.

A21—7 to 19 inches; light yellowish brown (10YR 6/4) fine sand; few medium faint pale brown (10YR 6/3) mottles; single grained; loose; common fine and medium roots; strongly acid; gradual smooth boundary.

A22—19 to 32 inches; brownish yellow (10YR 6/6) fine sand; few medium prominent strong brown (7.5YR 5/8) and few medium distinct light gray (10YR 7/2) mottles; single grained; loose; common fine and medium roots; few fine holes; strongly acid; clear smooth boundary.

A23—32 to 49 inches; brownish yellow (10YR 6/6) fine sand; common medium prominent yellowish red (5YR 5/8) and common medium distinct light gray (10YR 7/2) mottles; single grained; loose; few fine and medium roots; strongly acid; gradual smooth boundary.

A24—49 to 63 inches; light gray (10YR 7/2) fine sand; few fine distinct brownish yellow (10YR 6/6) mottles; single grained; loose; strongly acid; clear smooth boundary.

Bh—63 to 80 inches; dark reddish brown (5YR 2/2) fine sand; weak fine granular structure; friable; slightly brittle in places; most sand grains are coated with organic matter; very strongly acid.

The texture is sand or fine sand to a depth of more than 60 inches. These soils are very strongly acid to slightly acid in the Ap or A1 horizon and very strongly acid to medium acid in the lower horizons.

The A1 or Ap horizon is 4 to 10 inches thick. It has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. Where the value is 3, the horizon is less than 6 inches thick.

The A2 horizon is 50 to 65 inches thick. It has hue of 10YR, value of 5 to 7, and chroma of 4 to 8 in the upper part, and hue of 10YR, value of 5 to 7, and chroma of 1 to 4 in the lower part. In most places it has mottles in shades of brown and gray.

The Bh horizon is at a depth of 50 to 72 inches and is 7 to 25 inches thick. It has hue of 5YR to 10YR, value of 2 to 4, and chroma of 1 to 3.

Chastain series

The Chastain series consists of poorly drained, slowly permeable soils that formed in clayey alluvial sediment. The soils are nearly level and are on the inland flood plains of the Santee and Pee Dee Rivers. Slopes are less than 2 percent. These soils are classified as fine, kaolinitic, acid, thermic Typic Fluvaquents.

Chastain soils are geographically closely associated with Bladen, Cape Fear, Levy, and Johnston soils. Bladen and Cape Fear soils are slightly higher on the landscape and, unlike Chastain soils, are not subject to frequent flooding. Levy and Johnston soils are in a position on the landscape similar to that of Chastain soils; Levy soils are continuously saturated, and Johnston soils have a thick loamy A horizon that is underlain by sandy or loamy material.

Typical pedon of Chastain silty clay loam, southeast of the Santee River Bridge (on U.S. Highway 17A); west on side road at north end of bridge, back under bridge and across railroad tracks; southeast along riverbank to powerline right-of-way; 0.1 mile north along right-of-way; 10 feet west of right-of-way:

A1—0 to 3 inches; brown (10YR 4/3) silty clay loam; common fine distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; firm; many fine and medium roots; common fine and medium holes; strongly acid; clear smooth boundary.

B21g—3 to 12 inches; gray (10YR 6/1) silty clay; common fine prominent strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; very firm; common fine roots and pores; strongly acid; gradual smooth boundary.

B22g—12 to 40 inches; gray (10YR 6/1) silty clay; common medium distinct yellowish brown (10YR 5/6) mottles and few medium distinct dark brown (10YR 3/3) mottles; moderate medium subangular blocky structure; very firm; few fine and medium roots; few fine black concretions; medium acid; gradual smooth boundary.

B31g—40 to 56 inches; gray (5Y 6/1) clay; common medium distinct yellowish brown (10YR 5/6) mottles; massive; very firm; common fine black concretions; few fine flakes of mica; medium acid; gradual smooth boundary.

B32g—56 to 75 inches; gray (N 5/0) clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; massive; very firm; few medium decaying roots; common fine flakes of mica; medium acid.

The solum is 55 to more than 80 inches thick. These soils range from very strongly acid to medium acid throughout.

The A1 horizon is 3 to 6 inches thick. It has hue of 10YR, value of 4 to 6, and chroma of 2 or 3.

The B2g horizon is 31 to more than 50 inches thick. It has hue of 10YR, 5Y, or 5GY, value of 5 or 6, and chroma of 1 or 2. It has mottles in shades of brown and yellow. The B2g horizon is dominantly silty clay, but the range includes clay and silty clay loam.

The B3g horizon is 8 to more than 40 inches thick. It has hue of 10YR, 5Y, or 5GY or is neutral; value is 5 or 6, and chroma is 0 to 2. It has mottles in shades of brown. It is clay loam, silty clay, or clay.

Chipley series

The Chipley series consists of moderately well drained, rapidly permeable soils that formed in sandy marine sediment. The soils are nearly level and are in broad areas on the Coastal Plain. Slopes range from 0 to 2 percent. These soils are classified as thermic, coated Aquic Quartzipsamments.

Chipley soils are closely associated with Rutlege, Leon, Centenary, Echaw, Newhan, and Lakeland soils. Rutlege soils are lower on the landscape and are very poorly drained. Leon, Centenary, and Echaw soils are on a similar landscape and have a Bh horizon. Lakeland and Newhan soils are higher on the landscape and do not have mottles of low chroma caused by wetness within the upper 40 inches.

Typical pedon of Chipley fine sand, 0 to 2 percent slopes, about 6 miles east of Georgetown on Arcadia Plantation; 2.2 miles north of main entrance to plantation on U.S. Highway 17; 30 paces west of highway right-of-way and 35 paces north of Public Service Authority light pole number 74:

A1—0 to 4 inches; dark grayish brown (10YR 4/2) fine sand; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; abrupt smooth boundary.

C1—4 to 8 inches; yellowish brown (10YR 5/4) fine sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear wavy boundary.

C2—8 to 14 inches; yellowish brown (10YR 5/6) fine sand; common medium distinct pale brown (10YR 6/3) mottles; single grained; loose; common fine and medium roots; strongly acid; clear smooth boundary.

C3—14 to 24 inches; yellowish brown (10YR 5/6) fine sand; common medium distinct light gray (10YR 7/2) mottles; single grained; loose; few fine and medium roots; strongly acid; gradual smooth boundary.

C4g—24 to 46 inches; coarsely mottled light gray (10YR 7/2) and brownish yellow (10YR 6/8) fine sand; single grained; loose; medium acid; gradual smooth boundary.

C5g—46 to 80 inches; light gray (10YR 7/2) fine sand; few medium distinct yellowish brown (10YR 5/6) mottles; single grained; loose; many dark colored sand grains; medium acid.

The soils are sand or fine sand to a depth of 80 inches or more. They range from extremely acid through medium acid in the A horizon and from very strongly acid to slightly acid in the C horizon.

The A1 or Ap horizon is 3 to 8 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 1 or 2.

The upper part of the C horizon has hue of 10YR, value of 4 to 7, and chroma of 3 to 8. In most places it has mottles in shades of brown, yellow, red, or gray. There are gray mottles within a depth of 4 inches. The Cg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. In some places it has mottles in shades of brown and yellow.

Chisolm series

The Chisolm series consists of well drained, moderately permeable soils that formed in sandy and loamy marine deposits on the lower Coastal Plain. Slopes range from 0 to 4 percent. These soils are classified as loamy, siliceous, thermic Arenic Hapludults.

Chisolm soils are geographically closely associated with Lakeland, Wakulla, and Chipley soils. All of these soils are on a similar landscape. Chipley and Lakeland soils are sandy throughout. Wakulla soils have a Bt horizon of loamy sand.

Typical pedon of Chisolm sand, 0 to 4 percent slopes, about 3 miles north of Georgetown on U.S. Highway 701;

about 12.5 miles northwest on S.C. Highway 51 (about 2.5 miles past Browns Ferry Bridge); 0.25 mile north on dirt road; about 0.1 mile south on farm road; 15 feet east of road:

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

A21—9 to 13 inches; very pale brown (10YR 7/3) sand; single grained; loose; common fine roots; medium acid; clear smooth boundary.

A22—13 to 25 inches; light gray (10YR 7/2) sand; few medium faint brownish yellow (10YR 6/6) mottles; single grained; loose; few fine roots; medium acid; clear wavy boundary.

B21t—25 to 33 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; sand grains coated and bridged with clay; friable; common very fine pores; strongly acid; gradual wavy boundary.

B22t—33 to 48 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium prominent red (2.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; sand grains coated and bridged with clay; few very fine pores; strongly acid; gradual wavy boundary.

B23t—48 to 58 inches; brownish yellow (10YR 6/6) sandy clay loam; common coarse prominent red (2.5YR 5/8) and common medium distinct light gray (10YR 7/1) mottles; moderate medium subangular blocky structure; friable; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

B3—58 to 80 inches; mottled brownish yellow (10YR 6/6), red (2.5YR 4/8), and light gray (10YR 7/1) sandy loam; massive; very friable; sand grains coated and bridged with clay; few medium pockets of sandy clay loam; strongly acid.

The solum is 55 to more than 70 inches thick. The soils are very strongly acid to medium acid in the A horizon and upper part of the B horizon and very strongly acid or strongly acid in the lower part of the B horizon.

The A1 or Ap horizon is 6 to 9 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The A2 horizon is 14 to 29 inches thick. It has hue of 10YR, value of 5 to 7, and chroma of 2 to 6. It commonly is sand, but the range includes loamy sand.

The B2t horizon is 20 to 35 inches thick. It has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 or 8. It has mottles in shades of red and brown. The lower part of the Bt horizon has mottles in shades of gray.

In some places there is a B3 horizon that is as much as 22 inches thick. It has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 or 8. In some places it has mottles in shades of brown, red, or gray. It is sandy loam or loamy sand.

Echaw series

The Echaw series consists of moderately well drained, rapidly permeable soils that formed in sandy marine sediment. The soils are nearly level and are on broad flats on the Coastal Plain. Slopes are less than 2 percent. These soils are classified as sandy, siliceous, thermic Entic Haplohumods.

Echaw soils are geographically closely associated with Leon, Centenary, Chipley, Witherbee, and Lakeland soils. Leon and Witherbee soils are in a slightly lower position on the landscape and are more poorly drained than Echaw soils. Centenary and Chipley soils are in a similar position on the landscape. Centenary soils have a Bh horizon at a depth of 50 to 72 inches, and Chipley soils do not have a Bh horizon. Lakeland soils are in a slightly higher position on the landscape; they do not have a Bh horizon, and are better drained than Echaw soils.

Typical pedon of Echaw sand, on True Blue Plantation, about 11 miles northeast of Georgetown on U.S. Highway 17; 0.65 mile west on dirt road to True Blue Plantation; 65 feet south of road:

A1—0 to 5 inches; grayish brown (10YR 5/2) sand; weak fine granular structure; very friable; many fine and medium roots; many clean sand grains; very strongly acid; clear wavy boundary.

A21—5 to 18 inches; brown (10YR 5/3) sand; few fine faint brownish yellow (10YR 6/8) and few fine faint pale brown (10YR 6/3) mottles; single grained; loose; many fine and medium roots; strongly acid; gradual smooth boundary.

A22—18 to 40 inches; pale brown (10YR 6/3) sand; common fine and medium distinct brownish yellow (10YR 6/6) and common medium distinct gray (10YR 6/1) mottles; single grained; loose; few fine and medium roots; very strongly acid; clear smooth boundary.

Bh—40 to 60 inches; very dark brown (10YR 2/2) sand; single grained; loose; sand grains coated with organic matter; very strongly acid.

The solum is 55 to more than 80 inches thick. It is sand or fine sand. The soils are very strongly acid to medium acid throughout.

The A1 or Ap horizon is 2 to 6 inches thick. It has hue of 10YR, value of 2 to 5, and chroma of 1 to 3.

The A2 horizon is 31 to 40 inches thick. The upper part of the horizon has hue of 10YR, value of 4 to 7, and chroma of 3 to 8. The lower part has the same colors as the upper part and has few to many gray mottles, or it has hue of 10YR, value of 5 to 7, and chroma of 1 or 2 and has mottles of higher chroma.

Depth to the Bh horizon is 30 to 50 inches. This horizon is 10 to 44 inches thick. It has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 or 2. In some places it has subhorizons that have value of 4 or 5 and chroma of 3.

Eulonia series

The Eulonia series consists of moderately well drained, moderately slowly permeable soils that formed in clayey marine sediment. The soils are nearly level to gently sloping and are on broad flats and along breaks to natural drainageways on the lower Coastal Plain. Slopes range from 0 to 6 percent. These soils are classified as clayey, mixed, thermic Aquic Hapludults.

Eulonia soils are geographically closely associated with Wahee and Bladen soils. Wahee and Bladen soils are lower on the landscape than Eulonia soils and are more poorly drained.

Typical pedon of Eulonia loamy fine sand, 0 to 2 percent slopes, about 2 miles south of Georgetown on U.S. Highway 17; 0.8 mile west on S.C. Highway 42; 1.1 miles south on International Paper Company (IPCO) Road; 0.5 mile south on Collins Road (IPCO); 1 mile east on Singleton Road (IPCO); 150 feet southeast of intersection of dirt roads:

A1—0 to 6 inches; grayish brown (10YR 5/2) loamy fine sand; weak fine granular structure; very friable; common fine and medium roots; very strongly acid; clear wavy boundary.

B1—6 to 9 inches; brownish yellow (10YR 6/6) fine sandy loam; few fine faint pale brown mottles; weak fine granular structure; very friable; common fine and medium roots; very strongly acid; clear wavy boundary.

B21t—9 to 16 inches; yellowish brown (10YR 5/6) clay; common medium prominent yellowish red (5YR 4/8) and few medium distinct pale brown (10YR 6/3) mottles; moderate medium prismatic structure parting to strong angular blocky; firm; common fine roots; thin patchy clay films on faces of peds; very strongly acid; clear smooth boundary.

B22t—16 to 24 inches; yellowish brown (10YR 5/6) clay; common medium prominent yellowish red (5YR 5/8) and few medium distinct light brownish gray (10YR 6/2) mottles; moderate medium prismatic structure parting to strong medium angular blocky; firm; few fine roots; few fine pores; thin patchy clay films on faces of peds; very strongly acid; clear smooth boundary.

B23t—24 to 50 inches; mottled gray (10YR 6/1) and brownish yellow (10YR 6/8) clay loam; common medium prominent yellowish red (5YR 5/8) mottles; moderate medium prismatic structure parting to strong angular blocky; firm; few fine roots; few fine pores; thin patchy clay films on faces of peds; very strongly acid; gradual smooth boundary.

B24tg—50 to 55 inches; light gray (10YR 7/1) clay loam; few medium distinct brownish yellow (10YR 6/8) and few medium prominent yellowish red (5YR 5/8) mottles; weak medium prismatic structure parting to weak medium subangular blocky; firm; thin patchy clay films on faces of peds; very strongly acid; clear smooth boundary.

B3g—55 to 65 inches; light gray (10YR 7/1) sandy clay loam; common medium distinct brownish yellow (10YR 6/8) and common medium prominent yellowish red (5YR 5/8) mottles; massive; friable; very strongly acid; clear smooth boundary.

IIC—65 to 75 inches; brownish yellow (10YR 6/6) loamy sand; common medium distinct gray (10YR 6/1) mottles; single grained; loose; very strongly acid.

The solum is 50 to 80 inches thick. The soils are very strongly acid to slightly acid in the A horizon and upper part of the B horizon and very strongly acid to medium acid in the B3 and C horizons.

The A1 or Ap horizon is 4 to 8 inches thick. It has hue of 10YR, value of 2 to 5, and chroma of 1 or 2. In some places there is an A2 horizon that is as much as 9 inches thick. It has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 4. In some places it has mottles in shades of brown. The A2 horizon commonly is loamy fine sand, loamy sand, sandy loam, or fine sandy loam.

The B1 horizon is as much as 8 inches thick. It has hue of 10YR, value of 4 to 6, and chroma of 4 to 6. In some places it has mottles in shades of red, brown, or gray.

The B2t horizon is 24 to 46 inches thick. The upper part of the B2t horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. The lower part of the B2t horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 1 to 8. All parts of the B2t horizon have mottles in shades of red, brown, yellow, or gray. The horizon is clay or clay loam. There are gray mottles within the upper 24 inches of the B2t horizon.

The B3 horizon is 4 to 28 inches thick. It has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 1 to 8. It has mottles in shades of red, brown, yellow, or gray. It is sandy clay loam or sandy loam. In some places it has pockets of coarser material. Also, in some places it has flakes of mica.

The IIC or C horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 1 to 8. It has mottles in shades of red, brown, yellow, or gray. It is loamy sand, sand, sandy loam, or sandy clay loam.

Grifton series

The Grifton series consists of poorly drained, moderately permeable soils that formed in loamy marine sediment. The soils are nearly level and are on broad flats on the Coastal Plain. Slopes are less than 2 percent. These soils are classified as fine-loamy, siliceous, thermic Typic Ochraqualfs.

Grifton soils are geographically closely associated with Yauhannah, Eulonia, Bladen, Wahee, Yemassee, and Hobcaw soils. Yauhannah, Eulonia, Wahee, and Yemassee soils are better drained than Grifton soils. Eulonia, Bladen, and Wahee soils have a clayey control section. Hobcaw soils are more poorly drained.

Typical pedon of Grifton loamy fine sand, about 3 miles north of Georgetown on U.S. Highway 701; 0.3 mile northwest on S.C. Highway 51; 75 feet west of highway:

A1—0 to 6 inches; very dark gray (10YR 3/1) loamy fine sand; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; abrupt smooth boundary.

A2—6 to 12 inches; light brownish gray (10YR 6/2) loamy fine sand; few medium distinct brown (10YR 4/3) root stains; single grained; loose; many fine and medium roots; very strongly acid; clear smooth boundary.

B21tg—12 to 36 inches; gray (10YR 5/1) sandy clay loam; common medium distinct yellowish brown (10YR 5/8 and 10YR 5/4) mottles; moderate medium subangular blocky structure; friable; thin patchy clay films on old root channels and on faces of some peds; few fine roots; few fine holes; medium acid; clear smooth boundary.

B22tg—36 to 46 inches; gray (10YR 6/1) sandy clay loam; many medium distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable; thin patchy clay films on faces of peds; few fine roots; few fine holes; medium acid; clear smooth boundary.

B3g—46 to 55 inches; gray (10YR 6/1) sandy loam; common medium distinct brownish yellow (10YR 6/6) mottles; massive; very friable; few fine flakes of mica; medium acid; gradual smooth boundary.

IICg—55 to 80 inches; light brownish gray (10YR 6/2) sand; single grained; loose; few fine flakes of mica; medium acid.

The solum is 50 to more than 80 inches thick. The soils are very strongly acid to slightly acid throughout.

The A1 or Ap horizon is 4 to 9 inches thick. It has hue of 10YR, or it is neutral; value is 2 to 4, and chroma is 0 to 2.

The A2 horizon is 3 to 8 inches thick. It has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. In most places it has mottles in shades of brown or yellow. It is loamy fine sand or sandy loam.

In some places there is a B1 horizon that is as much as 9 inches thick. It has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It has mottles in shades of brown and yellow. It is sandy loam.

The B2t horizon is 34 to more than 45 inches thick. It has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. In most places it has mottles in shades of red, brown, or yellow. It commonly is sandy clay loam but ranges to clay loam.

In some places there is a B3 horizon that is 5 to 20 inches thick. It has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. In most places it has mottles in shades of red, brown, or yellow. The B3 horizon commonly is sandy loam, but in some places it is sandy clay loam.

The IICg horizon is at a depth of 50 to more than 80 inches. It has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. In some places it has mottles in shades of red, brown, or yellow. The IICg horizon is sand or loamy sand.

Hobcaw series

The Hobcaw series consists of very poorly drained, moderately permeable soils that formed in loamy marine sediment. The soils are nearly level and are in natural drains and depressions on the lower Coastal Plain. Slopes are less than 2 percent. These soils are classified as fine-loamy, siliceous, thermic Typic Umbraquults.

Hobcaw soils are geographically closely associated with Grifton, Yemassee, and Wahee soils. Grifton, Yemassee, and Wahee soils are slightly higher on the landscape than Hobcaw soils and are better drained.

Typical pedon of Hobcaw loam, about 4 miles east of Georgetown on U.S. Highway 17; south into entrance to Hobcaw Plantation; 0.5 mile on Hobcaw Road beyond intersection with dirt road to Strawberry Village; 25 feet west of Hobcaw Road:

A1—0 to 10 inches; black (10YR 2/1) loam; moderate fine granular structure; friable; many fine and medium roots; few fine holes; very strongly acid; clear smooth boundary.

A2—10 to 18 inches; gray (10YR 6/1) sandy loam; weak fine granular structure; very friable; many fine and medium roots; few fine holes; very strongly acid; clear smooth boundary.

B21tg—18 to 36 inches; gray (10YR 6/1) sandy clay loam; common medium distinct brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; friable; few faint patchy clay films on faces of peds and in old root channels; few fine and medium roots; few fine holes; strongly acid; clear smooth boundary.

B22tg—36 to 46 inches; gray (10YR 6/1) sandy clay loam; common fine and medium distinct brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; friable; few faint patchy clay films on faces of peds; few fine roots; few fine holes; pockets of sandy clay and loamy sand; strongly acid; clear smooth boundary.

IICg—46 to 65 inches; light gray (10YR 7/1) sand; single grained; loose; strongly acid.

The solum is 40 to more than 60 inches thick. The soils are very strongly acid to slightly acid throughout.

The A1 horizon is 10 to 18 inches thick. It has hue of 10YR, value of 2 or 3, and chroma of 1.

In some places there is an A2 horizon that is as much as 8 inches thick. It has hue of 10YR, value of 5 or 6, and chroma of 1 or 2.

The B2tg horizon is 22 to more than 42 inches thick. It has hue of 10YR, value of 3 to 6, and chroma of 1 or 2. In most places it has mottles in shades of brown and yellow. It is sandy clay loam, clay loam, or fine sandy loam.

In some places there is a B3g horizon that is 5 to 10 inches thick. It has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It is fine sandy loam, sandy loam, or loamy sand.

The IICg or Cg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It is sand or loamy sand.

Hobonny series

The Hobonny series consists of very poorly drained, moderately permeable soils that formed in organic deposits of remains of herbaceous and woody plants. These are nearly level organic soils on the flood plains of the major rivers. The soils are covered by water a large part of the time. Slopes are less than 1 percent. These soils are classified as euic, thermic Typic Medisaprists.

Hobonny soils are geographically closely associated with Levy, Johnston, and Rutlege soils. All of these soils are on a similar landscape. Johnston, Levy, and Rutlege soils are mineral soils. Levy soils are more affected by tidal waters than Hobonny soils.

Typical pedon of Hobonny muck, about 8 miles north of Georgetown on U.S. Highway 701; about 4 miles northwest on S.C. Highway 4; 2.9 miles south on dirt road along canal; 100 feet east of road, in marsh:

Oa1—0 to 15 inches; dark brown (7.5YR 3/2) muck; very dark gray (10YR 3/1) pressed and rubbed; about 5 percent fiber, 1 percent rubbed; massive; soil flows easily between fingers when squeezed, and small amount of residue is left in hand; common fine and medium roots; strongly acid; clear smooth boundary.

Oa2—15 to 40 inches; black (N 2/0) muck; black (10YR 2/1) pressed and rubbed; about 10 percent fiber, 2 percent rubbed; massive; soil flows easily between fingers when squeezed, and small amount of residue is left in hand; few fine roots; very strongly acid; clear smooth boundary.

Oa3—40 to 62 inches; black (N 2/0) muck; very dark gray (10YR 3/1) pressed and rubbed; about 15 percent fiber, 2 percent rubbed; massive; soil flows easily between fingers when squeezed, and small amount of residue is left in hand; strongly acid.

The organic layers are more than 51 inches thick. In some places a thin layer of mineral soil overlies the organic layers. The soils are very strongly acid or strongly acid and some horizons range to extremely acid.

The organic material of the surface tier has hue of 7.5YR or 10YR, or it is neutral; value is 2 to 4, and chroma is 0 to 3. The organic material of this tier is less than 20 percent fiber after being rubbed.

The second and third tiers have organic material that has hue of 7.5YR or 10YR or is neutral; value is 2 or 3, and chroma is 0 to 2. The organic material of these tiers is less than 10 percent fiber after being rubbed.

Where there is a Cg horizon, it is mineral soil that ranges from sand to clay.

Johnston series

The Johnston series consists of very poorly drained soils that are moderately rapidly permeable in the A horizon and rapidly permeable in the C horizon. These soils formed in loamy, stratified fluvial sediment. The soils are nearly level and are on the flood plains of rivers and streams on the Coastal Plain. Slopes are less than 1 percent. These soils are classified as coarse-loamy, siliceous, acid, thermic Cumulic Humaquepts.

Johnston soils are geographically closely associated with Rutlege, Leon, Lynn Haven, Yauhannah, and Yemassee soils. Rutlege soils are on a landscape similar to that of Johnston soils; they are sandy throughout. Leon and Lynn Haven soils are slightly higher on the landscape and have a spodic horizon. Yauhannah and Yemassee soils also are higher on the landscape than Johnston soils, and they are better drained; they have an argillic horizon.

Typical pedon of Johnston loam, about 5 miles south of Georgetown on U.S. Highway 17; 4,475 feet south of entrance to county airport and 125 feet west of the highway:

A11—0 to 14 inches; black (10YR 2/1) loam; massive; friable; many fine and medium roots; very strongly acid; gradual smooth boundary.

A12—14 to 32 inches; very dark gray (10YR 3/1) sandy loam; few medium distinct pockets of grayish brown (10YR 5/2) sand; massive; friable; common fine and medium roots; very strongly acid; gradual smooth boundary.

Cg—32 to 65 inches; gray (10YR 6/1) sand; few medium faint light yellowish brown (10YR 6/4) mottles; single grained; loose; few fine roots; strongly acid.

These soils are very strongly acid or strongly acid throughout.

The A1 horizon is 28 to 51 inches thick. It has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The Cg horizon has hue of 10YR or is neutral; value is 4 to 7, and chroma is 0 to 2. The horizon is sand, loamy sand, sandy loam, or, in a few places, sandy clay loam.

Lakeland series

The Lakeland series consists of excessively drained, very rapidly permeable soils that formed in sandy marine sediment. The soils are nearly level to gently sloping and are on broad flats and also in long narrow areas along drainageways throughout the Coastal Plain. Slopes range from 0 to 6 percent. These soils are classified as thermic, coated Typic Quartzipsamments.

Lakeland soils are geographically closely associated with Centenary, Chipley, Echaw, and Leon soils, which are lower on the landscape than Lakeland soils. Centenary, Echaw, and Leon soils have a Bh horizon and have a seasonal water table at a depth of less than 60 inches.

Typical pedon of Lakeland fine sand, 0 to 6 percent slopes, 2.9 miles north of Georgetown on U.S. Highway 701; 10.8 miles northwest on S.C. Highway 51; 0.15 mile south on Indian Hut Road; 0.8 mile southwest on dirt road to Francis Marion Estates; 0.15 mile northwest of intersection; 100 feet south of road:

A1—0 to 4 inches; very dark grayish brown (10YR 3/2) fine sand; single grained; loose; common fine and medium roots; strongly acid; clear wavy boundary.

C1—4 to 21 inches; yellowish brown (10YR 5/4) fine sand; single grained; loose; common fine and medium roots; strongly acid; gradual smooth boundary.

C2—21 to 48 inches; yellowish brown (10YR 5/8) fine sand; single grained; loose; few fine roots; strongly acid; gradual smooth boundary.

C3—48 to 66 inches; brownish yellow (10YR 6/6) fine sand; single grained; loose; strongly acid; gradual smooth boundary.

C4—66 to 80 inches; brownish yellow (10YR 6/6) fine sand; single grained; loose; many clean sand grains; strongly acid.

The soils are fine sand or sand to a depth of 80 inches. They are very strongly acid to medium acid throughout.

The A1 horizon is 3 to 6 inches thick. It has hue of 10YR, value of 3 to 5, and chroma of 1 or 2.

The C horizon extends to a depth of 80 inches or more. It has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 3 to 8. In some places, there are pockets of clean sand in the lower part of the C horizon.

Leon series

The Leon series consists of poorly drained, moderately permeable to moderately rapidly permeable soils that formed in sandy marine sediment. The soils are nearly level and are on broad flats on the lower Coastal Plain. Slopes are less than 2 percent. These soils are classified as sandy, siliceous, thermic Aeric Haplaquods.

Leon soils are geographically closely associated with Lynn Haven, Echaw, Rutlege, Centenary, Chipley, Witherbee, and Lakeland soils. Centenary and Echaw soils are better drained than Leon soils and have an A horizon that is more than 30 inches thick. Rutlege, Chipley, and Lakeland soils do not have a Bh horizon. Lynn Haven soils have a black or very dark gray A horizon that is 10 inches or more thick. Witherbee soils are better drained and have a brighter colored A2 horizon.

Typical pedon of Leon sand, about 5 miles northeast of Georgetown in the Arcadia Plantation; 5,400 feet north of Debordieu Colony waste treatment pond on road in woods to first crossroads; 500 feet northwest on dirt road; 30 feet west of road:

A1—0 to 6 inches; very dark gray (10YR 3/1) sand; weak fine granular structure; very friable; many fine and medium roots; many clean sand grains give a salt-and-pepper appearance; very strongly acid; clear smooth boundary.

A2—6 to 16 inches; gray (10YR 5/1) sand; few fine distinct very dark gray (10YR 3/1) mottles; single grained; loose; many fine and medium roots; very strongly acid; clear smooth boundary.

Bh—16 to 37 inches; black (N 2/0) sand; weak medium subangular blocky structure; friable; slightly brittle; few fine and medium roots; most sand grains have organic coatings; very strongly acid; clear wavy boundary.

A'2—37 to 46 inches; light brownish gray (10YR 6/2) sand; single grained; loose; strongly acid; gradual smooth boundary.

B'21h—46 to 54 inches; dark reddish brown (5YR 2/2) sand; weak medium subangular blocky structure; very friable; slightly brittle; very strongly acid; gradual wavy boundary.

B'22h—54 to 65 inches; dark reddish brown (5YR 3/3) sand; weak medium subangular blocky structure; very friable; slightly brittle; very strongly acid.

The solum is sand or fine sand to a depth of 80 inches or more. The soils are extremely acid to strongly acid throughout.

The A1 horizon is 5 to 8 inches thick. It has hue of 10YR or is neutral; value is 2 or 3, and chroma is 0 or 1.

The A2 horizon is 4 to 22 inches thick. It has hue of 10YR, value of 5 to 7, and chroma of 1 or 2.

The Bh horizon is 8 to 35 inches thick. It has hue of 5YR to 10YR or is neutral; value is 2 to 4, and chroma is 0 to 3.

Where there is an A'2 horizon, it is similar to the A2 horizon.

Where there is a B'h horizon, it is similar to the Bh horizon.

Levy series

The Levy series consists of very poorly drained, slowly permeable soils that formed in clayey marine sediment. The soils are nearly level, are in broad marsh areas, and are continuously saturated. Slopes are less than 1 percent. These soils are classified as fine, mixed, acid, thermic Typic Hydraquents.

Levy soils are geographically closely associated with Bohicket, Chipley, Hobonny, and Chastain soils. Bohicket soils have a higher content of salt and sulfur than Levy soils. Hobonny soils are organic. Chastain soils are not permanently saturated and have a lower *n* value. Chipley soils are better drained than Levy soils and are sandy throughout.

Typical pedon of Levy silty clay loam, 1 mile east of intersection of U.S. Highway 701 and North Street, in the city of Georgetown:

A1—0 to 8 inches; dark gray (10YR 4/1) silty clay loam; massive; very sticky; soil flows easily between fingers when squeezed, and a residue of live roots and fibric organic material is left; about 20 percent, by volume, live roots; about 20 percent, by volume, organic matter that is dominantly fibric material; extremely acid; gradual wavy boundary.

C1g—8 to 44 inches; dark greenish gray (5GY 4/1) silty clay; few fine distinct pale brown (10YR 6/3) mottles; massive; very sticky; soil flows easily between fingers when squeezed, and a residue of live roots and fibric organic material is left; about 5 percent, by volume, live roots; about 15 percent, by volume, organic matter that is dominantly fibric material; very strongly acid; gradual wavy boundary.

C2g—44 to 60 inches; dark gray (10YR 4/1) silty clay; massive; sticky; soil flows with difficulty between fingers when squeezed, and a residue is left that is about 10 percent, by volume, organic matter that is dominantly fibric material; medium acid.

These soils have an *n* value higher than 0.7 in all mineral layers between the surface and a depth of 40 inches. The soils are extremely acid to strongly acid to a depth of about 40 inches. Below that, they are very strongly acid to mildly alkaline.

In some places an organic layer that is 2 to 15 inches thick overlies the mineral soil. This organic layer consists of many living and dead roots, grasses, twigs, and leaves. The mineral fraction of this layer is 10 to 20 percent of the volume. It has hue of 10YR, value of 4, and chroma of 1 to 3. It is silty clay loam or mucky loam.

The A horizon is 2 to 10 inches thick. It has hue of 10YR or is neutral; it has value of 3 to 5 and chroma of 0 to 3.

The Cg horizon has hue of 10YR, 2.5Y, or 5GY or is neutral. It has value of 2 to 5 and chroma of 0 to 4. It commonly is silty clay, but in some pedons it is clay or silty clay loam.

Lynn Haven series

The Lynn Haven series consists of poorly drained, moderately permeable or moderately rapidly permeable soils that formed in sandy marine sediment. The soils are nearly level and are on broad flats on the Coastal Plain. Slopes are less than 2 percent. These soils are classified as sandy, siliceous, thermic Typic Haplaquods.

Lynn Haven soils are geographically closely associated with Leon, Rutlege, Echaw, and Witherbee soils. Leon soils are in a position on the landscape similar to that of Lynn Haven soils; they have an ochric epipedon, which Lynn Haven soils do not have. Rutlege soils are in a slightly lower position on the landscape; they do not have a spodic horizon. Echaw and Witherbee soils are in a slightly higher position, and they are better drained.

Typical pedon of Lynn Haven sand, about 4 miles east of Georgetown on U.S. Highway 17; 0.3 mile south into Hobcaw Plantation to first intersection; 3.65 miles east on road to Marine Field Station and Clambank; 0.4 mile west at intersection; 0.4 mile north; 30 feet east of road:

A1—0 to 12 inches; black (10YR 2/1) sand; weak fine granular structure; very friable; many medium and fine roots; few clean sand grains; very strongly acid; clear smooth boundary.

A2—12 to 18 inches; gray (10YR 5/1) sand; single grained; loose; common fine and medium roots; few clean sand grains; very strongly acid; clear smooth boundary.

B21h—18 to 36 inches; black (5YR 2/1) sand; weak medium subangular blocky structure; friable; sand grains are coated with organic matter; few fine roots; very strongly acid; gradual smooth boundary.

B22h—36 to 60 inches; dark reddish brown (5YR 2/2) sand; single grained; loose; sand grains are coated with organic matter; very strongly acid; gradual wavy boundary.

C—60 to 75 inches; gray (10YR 6/1) sand; single grained; loose; very strongly acid.

Sand or fine sand extends to a depth of 60 inches or more. The soils are extremely acid to strongly acid throughout.

The A1 or Ap horizon is 10 to 14 inches thick. It has hue of 10YR or is neutral; value is 2 or 3, and chroma is 0 or 1.

The A2 horizon is 2 to 18 inches thick. It has hue of 10YR, value of 5 or 6, and chroma of 1 or 2.

The Bh horizon is 12 to more than 40 inches thick. It has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3.

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

Newhan series

The Newhan series consists of excessively drained, very rapidly permeable soils that formed in sandy marine sediment. The soils are nearly level to gently sloping and are adjacent to beaches and waterways along the coastline. Slopes range from 0 to 6 percent. These soils are classified as thermic, uncoated Typic Quartzipsamments.

Newhan soils are geographically closely associated with Chipley soils and with Beaches. Chipley soils are moderately well drained. Beaches are washed and rewashed by waves and are partly covered by water at high tide.

Typical pedon of Newhan sand, 0 to 6 percent slopes, 17 miles northeast of Georgetown on U.S. Highway 17; 3,000 feet east on S.C. Secondary Route 302; 900 feet south of Inlet Point Clubhouse and 150 feet west of primary dune:

A1—0 to 1 inch; grayish brown (10YR 5/2) sand; single grained; loose; few fine roots; few small fragments of colored marine shells; neutral; abrupt wavy boundary.

C1—1 to 10 inches; light gray (10YR 7/1) sand (about 5 percent black or dark brown); single grained; loose; few fine roots; about 5 percent, by volume, small fragments of colored marine shells; neutral; gradual wavy boundary.

C2—10 to 25 inches; light gray (10YR 7/2) sand (about 5 percent black or dark brown); single grained; loose; few fine roots; about 7 percent, by volume, small fragments of colored marine shells; neutral; gradual wavy boundary.

C3—25 to 48 inches; light gray (10YR 7/2) sand (about 5 percent black or dark brown); single grained; loose; about 20 percent, by volume, small and medium fragments of colored marine shells; neutral; gradual wavy boundary.

C4—48 to 72 inches; light gray (10YR 7/1) sand (about 5 percent black or dark brown); single grained; loose; about 7 percent, by volume, small fragments of colored marine shells; few large fragments of colored marine shells; mildly alkaline; gradual wavy boundary.

C5—72 to 80 inches; light gray (10YR 7/2) sand (about 10 percent black or dark brown); single grained; loose; about 5 percent, by volume, small fragments of colored marine shells; mildly alkaline.

The thickness of the A and C horizons is 72 inches or more. The soils are neutral or mildly alkaline throughout.

In some places there is an A1 horizon that is as much as 3 inches thick. It has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Shell fragments make up 3 to 20 percent of the volume.

The C horizon is 65 inches or more thick. It has hue of 10YR, value of 7 or 8, and chroma of 1 or 2. Shell fragments make up 3 to 25 percent of the volume.

Norfolk series

The Norfolk series consists of well drained, moderately permeable soils that formed in loamy marine sediment. The soils are nearly level and are on broad flats on the Coastal Plain. Slopes range from 0 to 2 percent. These soils are classified as fine-loamy, siliceous, thermic Typic Paleudults.

Norfolk soils are geographically closely associated with Chisolm, Yauhannah, and Yemassee soils. Chisolm soils are in a similar position on the landscape and have a surface layer that is more than 20 inches thick. Yauhannah and Yemassee soils are slightly lower on the landscape and are more poorly drained than Norfolk soils.

Typical pedon of Norfolk loamy fine sand, 0 to 2 percent slopes, about 19.5 miles north of Georgetown on U.S. Highway 701; about 7.3 miles west on S.C. Highway 261; about 2.2 miles north on secondary Highway 14; 1.4 miles northwest on secondary Highway 45; 0.15 mile east on farm road through field to back corner of back field; 50 feet east of field corner:

A1—0 to 7 inches; very dark grayish brown (10YR 3/2) loamy fine sand; weak medium granular structure; very friable; many fine and medium roots; few medium distinct light brownish gray (10YR 6/2) mottles; medium acid; clear smooth boundary.

A2—7 to 15 inches; brownish yellow (10YR 6/6) loamy fine sand; common medium faint yellowish brown (10YR 5/8) mottles; weak fine granular structure; very friable; many fine roots; medium acid; clear wavy boundary.

B21t—15 to 36 inches; yellowish brown (10YR 5/8) sandy clay loam; few fine faint yellowish red (5YR 5/8) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; few fine roots; common fine holes and pores; medium acid; clear smooth boundary.

B22t—36 to 48 inches; strong brown (7.5YR 5/8) sandy clay loam; common medium prominent red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; friable; thin patchy faint clay films on faces of peds; few fine roots; common fine holes; common very fine pores; few fine flakes of mica; medium acid; gradual smooth boundary.

B23t—48 to 56 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium prominent red (2.5YR 4/8) and yellowish red (5YR 5/8) mottles, and common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; few fine roots; few fine pores; few fine flakes of mica; strongly acid; gradual smooth boundary.

B31—56 to 68 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium prominent red (2.5YR 4/8) and common medium distinct light gray (10YR 7/1) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; few fine roots; few very fine pores; few coarse pockets of sandy loam; few fine flakes of mica; strongly acid; gradual smooth boundary.

B32—68 to 80 inches; brownish yellow (10YR 6/8) sandy clay loam; few medium distinct light gray (10YR 7/1) and yellowish red (5YR 5/8) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; few fine flakes of mica; strongly acid.

The solum is 65 to more than 80 inches thick. The A horizon is very strongly acid to medium acid, and the B horizon is very strongly acid or strongly acid.

The A1 or Ap horizon is 5 to 9 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. The A2 horizon is 4 to 12 inches thick. It has hue of 10YR, value of 5 or 6, and chroma of 4 to 6. The A2 horizon commonly is loamy fine sand, but the range includes loamy sand.

The B2t horizon is more than 40 inches thick. The upper part of the B2t horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. The lower part of the B2t horizon has colors similar to those in the upper part and has mottles in shades of gray. In some places the matrix is gray at a depth of 50 inches or more. The B2t horizon is dominantly sandy clay loam, but the range includes sandy loam.

Where there is a B3 horizon, it has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. It commonly has mottles in shades of yellow, brown, red, or gray. The B3 horizon ranges from sandy loam to clay.

In many places there is evidence of stratification in the lower part of the Bt and B3 horizons. Thin strata of sandy loam or loamy sand are common.

Rutlege series

The Rutlege series consists of very poorly drained, rapidly permeable soils that formed in sandy marine sediment. The soils are nearly level and are in narrow drainageways on the Coastal Plain. Slopes are less than 2 percent. These soils are classified as sandy, siliceous, thermic Typic Humaquepts.

Rutlege soils are geographically closely associated with Chipley, Lakeland, Leon, and Lynn Haven soils. Chipley and Lakeland soils are higher on the landscape and are better drained than Rutlege soils. Lynn Haven and Leon soils are slightly higher on the landscape, are poorly drained, and have a Bh horizon, which Rutlege soils do not have. Also, unlike Rutlege soils, Chipley, Lakeland, and Leon soils do not have an umbric epipedon.

Typical pedon of Rutlege sand, about 16 miles northeast of Georgetown on U.S. Highway 17; 0.1 mile west from entrance to Litchfield County Club; 0.7 mile south on Cypress Drive; east on dirt road, 0.2 mile past Litchfield stables; in cutover area 300 feet west of road:

A1—0 to 13 inches; black (10YR 2/1) sand; weak fine granular structure; loose; many fine and medium roots; common clean sand grains; very strongly acid; gradual smooth boundary.

C1g—13 to 18 inches; dark gray (10YR 4/1) sand; common medium faint very dark gray (10YR 3/1) mottles; single grained; loose; common fine roots; very strongly acid; gradual smooth boundary.

C2g—18 to 60 inches; light gray (10YR 6/1) sand; single grained; loose; few coarse sand grains; very strongly acid.

The sand is 60 inches thick or more. Rutlege soils are extremely acid or very strongly acid throughout.

The A1 horizon is 13 to 20 inches thick. It has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The Cg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. In some places it has mottles in shades of gray.

Wahee series

The Wahee series consists of somewhat poorly drained, slowly permeable soils that formed in clayey marine sediment. The soils are nearly level and are on

broad flats on the Coastal Plain. Slopes are less than 2 percent. These soils are classified as clayey, mixed, thermic Aeric Ochraquults.

Wahee soils are geographically closely associated with Bladen, Eulonia, Grifton, and Yemassee soils. Bladen soils are more poorly drained than Wahee soils and are predominantly gray throughout the profile. Eulonia soils are better drained. Unlike Wahee soils, Grifton and Yemassee soils have a loamy argillic horizon.

Typical pedon of Wahee fine sandy loam, about 3 miles north of Georgetown on U.S. Highway 701; about 4 miles northwest on S.C. Highway 51; 0.8 mile west from entrance to Georgetown County Landfill; across canal, 0.4 mile north on dirt road; 90 feet west of road:

A1—0 to 5 inches; very dark gray (10YR 3/1) fine sandy loam; few fine pockets of clean sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear wavy boundary.

A2—5 to 9 inches; yellowish brown (10YR 5/4) fine sandy loam; common medium faint light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; common fine and medium roots; common fine pores; strongly acid; clear smooth boundary.

B21tg—9 to 24 inches; gray (10YR 5/1) clay; common medium prominent red (10R 4/6) and common medium distinct brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; firm; common medium roots; few fine pores; thin patchy faint clay films on faces of peds; very strongly acid; gradual smooth boundary.

B22tg—24 to 44 inches; gray (10YR 5/1) clay; common medium prominent red (2.5YR 4/6) and common fine distinct brownish yellow (10YR 6/8) mottles; strong medium subangular blocky structure; firm; few medium roots; few fine pores; thin patchy faint clay films on faces of peds; very strongly acid; clear smooth boundary.

B3g—44 to 53 inches; gray (10YR 5/1) sandy clay loam; few fine faint light gray (10YR 7/1) and many medium distinct brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; few coarse pockets of sandy loam material; very strongly acid; gradual smooth boundary.

IICg—53 to 80 inches; gray (10YR 6/1) loamy sand; common medium faint grayish brown (10YR 5/2), few medium distinct strong brown (7.5YR 5/8), and many medium distinct brownish yellow (10YR 6/8) mottles; massive; friable; very strongly acid.

The solum is 48 to 68 or more inches thick. The soils are very strongly acid to medium acid in the A horizon and very strongly acid or strongly acid in the B and C horizons.

The Ap or A1 horizon is 5 to 8 inches thick. It has hue of 10YR, value of 3 to 4, and chroma of 1. In places there is an A2 horizon that is as much as 8 inches thick. It has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. It has mottles in shades of brown, gray, and yellow. The A2 horizon generally is fine sandy loam, but the range includes sandy loam and loam.

Where there is a B1 horizon, the horizon is as much as 6 inches thick. It has hue of 10YR, value of 5 or 6, and chroma of 4. It has mottles in shades of brown and gray, and it is sandy clay loam.

The B2t horizon is 20 to 43 inches thick. Where there is no A2 or B1 horizon, the upper part of the B2t horizon has hue of 10YR, value of 5 or 6, and chroma of 6 to 8, and in most places it has gray, brown, yellow, and red mottles. The lower part of the B2t horizon, or all of the B2t horizon where there is an A2 or B1 horizon, has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. There are brown, yellow, and red mottles throughout the lower part of the B2t horizon in most places. The B2t horizon is clay loam or clay.

Where there is a B3g horizon, the horizon is as much as 27 inches thick. It has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. In some places it has mottles in shades of brown, yellow, and red. It is sandy loam, sandy clay loam, or sandy clay.

The C horizon has hue of 10YR, value of 5 to 7, and chroma of 2 or less. It has mottles in shades of brown and red. It is sandy loam or loamy sand.

Wakulla series

The Wakulla series consists of somewhat excessively drained, rapidly permeable soils that formed in loamy and sandy marine sediment. These soils are nearly level and are on broad flats of the Coastal Plain. Slopes range from 0 to 2 percent. These soils are classified as sandy, siliceous, thermic Psammentic Hapludults.

Wakulla soils are geographically closely associated with Chisolm, Lakeland, and Chipley soils. Chisolm soils have a Bt horizon of sandy clay loam. Unlike Wakulla soils, Lakeland and Chipley soils do not have a Bt horizon and are sandy throughout.

Typical pedon of Wakulla fine sand, 0 to 2 percent slopes, in the True Blue Plantation; about 10 miles northeast of Georgetown on U.S. Highway 17; west into Sea Gull Golf Course; 1.3 miles north across Sea Gull Golf Course past intersection with Hagley Landing Road to entrance to True Blue Plantation; 0.5 mile west; 15 paces north of road:

A1—0 to 6 inches; dark grayish brown (10YR 4/2) fine sand; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear smooth boundary.

A2—6 to 26 inches; brownish yellow (10YR 6/8) fine sand; common medium distinct pockets of pale brown (10YR 6/3) clean sand; weak fine granular structure; very friable; many fine and medium roots; medium acid; clear smooth boundary.

B21t—26 to 42 inches; yellowish brown (10YR 5/8) loamy sand; few medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; very friable; sand grains coated and bridged with clay; few fine roots; strongly acid; clear smooth boundary.

B22t—42 to 48 inches; yellowish brown (10YR 5/8) loamy sand; common medium distinct reddish yellow (7.5YR 6/8) mottles; weak medium granular structure; sand grains coated with clay; few fine roots; strongly acid; clear smooth boundary.

C1—48 to 56 inches; brownish yellow (10YR 6/8) fine sand; common medium distinct pale brown (10YR 6/3) and strong brown (7.5YR 5/8) mottles; single grained; loose; few dark-colored sand grains; strongly acid; gradual smooth boundary.

C2—56 to 80 inches; mottled pale brown (10YR 6/3) and brownish yellow (10YR 6/8) fine sand; common medium faint light brownish gray (10YR 6/2) and few fine prominent yellowish red (5YR 5/8) mottles; single grained; loose; few dark-colored sand grains; strongly acid.

The solum is 36 to 58 inches thick. The soils are very strongly acid to medium acid throughout.

The A1 or Ap horizon is 4 to 9 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. The A2 horizon is 15 to 25 inches thick. It has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 8. In some places it has mottles in shades of brown. It is fine sand or loamy fine sand.

The Bt horizon is 12 to 24 inches thick. It has hue of 5YR, 7.5YR, or 10YR, value of 4 or 5, and chroma of 6 or 8. In some places it has strong brown, reddish yellow, or yellowish red mottles. It is typically loamy sand, but in some places it has thin layers of sandy loam.

The C horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 2 to 8. It has mottles in shades of yellow, brown, red, and gray. It is fine sand or sand.

Witherbee series

The Witherbee series consists of somewhat poorly drained, rapidly permeable soils that formed in sandy marine sediment. The soils are nearly level and are on broad flats on the lower Coastal Plain. Slopes range from 0 to 2 percent. These soils are classified as sandy, siliceous, thermic Entic Haplaquods.

Witherbee soils are geographically closely associated with Leon, Centenary, Echaw, Chipley, and Lakeland soils. Leon soils are slightly lower on the landscape and are more poorly drained than Witherbee soils. Centenary, Echaw, Chipley, and Lakeland soils are higher on the landscape and are better drained. Also, unlike Witherbee soils, Chipley and Lakeland soils do not have a spodic horizon.

Typical pedon of Witherbee fine sand, 2.9 miles south of Georgetown on U.S. Highway 17; 1.3 miles west on Penny Royal Road (Secondary S.C. 42); 0.1 mile northwest on dirt subdivision road; 0.3 mile southwest on dirt road; 240 feet southeast of road:

A1—0 to 8 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; many fine and medium roots; few fine holes; very strongly acid; abrupt smooth boundary.

A2—8 to 20 inches; brownish yellow (10YR 6/6) fine sand; few medium faint pale brown (10YR 6/3) and yellowish brown (10YR 5/8) mottles; gray (10YR 6/1) mottles in lower 2 inches of horizon; single grained; loose; common fine and medium roots; very strongly acid; abrupt smooth boundary.

Bh—20 to 33 inches; black (5YR 2/1) fine sand; moderate medium subangular blocky structure; very friable; sand grains coated with organic matter; brittle in places; few fine roots; medium acid; gradual wavy boundary.

B3—33 to 42 inches; brown (10YR 4/3) fine sand; few medium distinct pale brown (10YR 6/3) mottles; single grained; loose; medium acid; gradual wavy boundary.

C1—42 to 60 inches; pale brown (10YR 6/3) fine sand; few medium distinct brown (10YR 4/3) mottles; single grained; loose; medium acid; gradual wavy boundary.

C2—60 to 75 inches; light gray (10YR 7/1) fine sand; single grained; loose; medium acid.

Depth to the Bh horizon is 18 to 30 inches. The soils are extremely acid to medium acid in the A horizon and very strongly acid to slightly acid in the B and C horizons.

The A1 or Ap horizon is 3 to 8 inches thick. It has hue of 10YR, value of 2 to 4, and chroma of 1 or 2.

The A2 horizon is 12 to 26 inches thick. It has hue of 10YR, value of 4 to 6, and chroma of 2 to 6. In all pedons some part of the A2 horizon has chroma of 3 or more.

The Bh horizon is 8 to 48 inches thick. It has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 or 2.

In places there is a B3 horizon that is as much as 15 inches thick. It has hue of 10YR, value of 2 to 5, and chroma of 1 to 4, or it has mottles in these colors.

The C horizon is at a depth of 36 to more than 70 inches. It has hue of 10YR, value of 5 to 7, and chroma of 1 to 3.

Yauhannah series

The Yauhannah series consists of moderately well drained, moderately permeable soils that formed in loamy marine sediment. The soils are nearly level and are on broad flats on the lower Coastal Plain. Slopes range from 0 to 2 percent. These soils are classified as fine-loamy, siliceous, thermic Aquic Hapludults.

Yauhannah soils are geographically closely associated with Chisolm, Eulonia, Grifton, and Yemassee soils. Chisolm soils are slightly higher on the landscape than Yauhannah soils and are better drained. Eulonia soils are in a similar position on the landscape and have a clayey Bt horizon. Grifton and Yemassee soils are lower on the landscape and are more poorly drained.

Typical pedon of Yauhannah loamy fine sand, 0 to 2 percent slopes, 2.9 miles south of Georgetown on U.S. Highway 17; 3.7 miles west on S.C. Highway 42; 0.1 mile south on field road under high voltage power lines; 30 feet west of road:

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) loamy fine sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

A2—6 to 9 inches; yellowish brown (10YR 5/4) loamy fine sand; few medium distinct pale brown (10YR 6/3) mottles; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.

B21t—9 to 16 inches; brownish yellow (10YR 6/6) sandy clay loam; few medium distinct pale brown (10YR 6/3) and yellowish red (5YR 4/6) mottles; weak medium subangular blocky structure; thin patchy clay films on faces of peds; friable; common fine and medium roots; few fine pores; very strongly acid; clear smooth boundary.

B22t—16 to 24 inches; yellowish brown (10YR 5/6) sandy clay loam; few medium distinct yellowish red (5YR 5/8) and light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; thin patchy clay films on faces of peds; friable; few fine and medium roots; few fine pores; very strongly acid; clear smooth boundary.

B23t—24 to 33 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct light brownish gray (10YR 6/2) and yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; thin patchy clay films on faces of peds; friable; few fine roots; few fine pores; very strongly acid; clear smooth boundary.

B24t—33 to 52 inches; yellowish brown (10YR 5/6) sandy clay loam; many medium distinct light brownish gray (10YR 6/2) and common medium distinct yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; thin patchy clay films on faces of peds; friable; few fine pores; very strongly acid; clear smooth boundary.

B3—52 to 62 inches; yellowish brown (10YR 5/6) sandy loam; common medium distinct gray (10YR 6/1) and yellowish red (5YR 5/8) mottles; weak fine subangular blocky structure; sand grains coated and bridged with clay; very strongly acid; clear smooth boundary.

Cg—62 to 75 inches; gray (10YR 6/1) loamy sand; common medium distinct yellowish brown (10YR 5/6) mottles; single grained; loose; very strongly acid.

The solum is 40 to more than 60 inches thick. The A horizon is very strongly acid to slightly acid, and the B and C horizons are very strongly acid to medium acid.

The A1 or Ap horizon is 5 to 8 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. In places there is an A2 horizon that is 3 to 12 inches thick. It has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. The A2 horizon commonly is loamy fine sand or loamy sand, but the range includes fine sandy loam and sandy loam.

In some places there is a B1 horizon that is as much as 9 inches thick. This horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. In most places it has mottles that have hue of 7.5YR, value of 5 or 6, and chroma of 6 to 8. It is sandy loam or fine sandy loam.

The B2t horizon is 17 to 44 inches thick. It has hue of 7.5YR or 10YR and value of 5 or 6. It has chroma of 4 to 8 in the upper part and chroma of 1 to 8 in the lower part. Mottles that have chroma of 2 or less are near the top of the B2t horizon and increase with depth. In some places this horizon has mottles that have hue of 5YR. The B2t horizon is sandy clay loam, clay loam, or sandy loam.

The B3 horizon is 4 to 20 inches thick. It has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 1 to 8. It commonly has mottles in shades of red, brown, yellow, or gray. It is sandy loam, fine sandy loam, or sandy clay loam.

The C horizon has colors similar to those of the B3 horizon. It is loamy sand, sand, or sandy loam.

Yemassee series

The Yemassee series consists of somewhat poorly drained, moderately permeable soils that formed in loamy sediment. The soils are nearly level and are on broad flats on the lower Coastal Plain. Slopes are less than 2 percent. These soils are classified as fine-loamy, siliceous, thermic Aeric Ochraquults.

Yemassee soils are geographically closely associated with Chisolm, Eulonia, Grifton, and Yauhannah soils. Chisolm soils are higher on the landscape than Yemassee soils and are better drained. Eulonia soils are on a similar landscape and have a clayey Bt horizon. Grifton soils are lower on the landscape and are more poorly drained. Yauhannah soils are slightly higher on the landscape and are better drained than the Yemassee soils.

Typical pedon of Yemassee loamy fine sand, 2.9 miles south of Georgetown on U.S. Highway 17; 4.3 miles west on S.C. Highway 42; 1.0 mile north on Mouresina Road; 0.4 mile west on unmarked road; 150 feet south of road:

A1—0 to 7 inches; black (10YR 2/1) loamy fine sand; weak fine subangular blocky structure; very friable; many medium roots; many medium holes; few uncoated sand grains; very strongly acid; abrupt smooth boundary.

A2—7 to 12 inches; pale brown (10YR 6/3) loamy fine sand; common medium faint light brownish gray (10YR 6/2) mottles; weak fine granular structure; friable; many fine and medium roots; few fine holes; some root channels filled with material from the A1 horizon; very strongly acid; clear smooth boundary.

B21t—12 to 20 inches; pale brown (10YR 6/3) sandy clay loam; many medium distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; common fine roots; few fine holes; thin patchy faint clay films in old root channels and on faces of some peds; very strongly acid; clear smooth boundary.

B22tg—20 to 34 inches; gray (10YR 6/1) sandy clay loam; common medium faint grayish brown (10YR 5/2) and common medium distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; few fine roots; thin patchy clay films on faces of some peds; very strongly acid; clear smooth boundary.

B23tg—34 to 50 inches; gray (10YR 6/1) sandy clay loam; many coarse distinct yellowish brown (10YR 5/8) and few medium distinct grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; few fine roots; thin patchy clay films on faces of some peds; few uncoated sand grains; very strongly acid; gradual smooth boundary.

B3g—50 to 75 inches; light gray (10YR 7/2) sandy loam; common medium distinct yellowish red (5YR 5/8) mottles; weak fine granular structure; very friable; strongly acid; gradual smooth boundary.

Cg—75 to 90 inches; gray (10YR 6/1) sand; single grained; loose; strongly acid.

The solum is 50 to more than 70 inches thick. The A horizon is extremely acid to medium acid, and the B and C horizons are extremely acid to strongly acid.

The A1 or Ap horizon is 5 to 8 inches thick. It has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. In places there is an A2 horizon that is 3 to 8 inches thick. It has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. It is loamy fine sand, loamy sand, or fine sandy loam.

Where there is a B1 horizon, the horizon is 3 to 7 inches thick. It has hue of 10YR, value of 5 or 6, and chroma of 3 or 4; it has mottles in shades of brown and gray. It is sandy loam or fine sandy loam.

The B2t horizon is 33 to 47 inches thick. Where there is no A2 or B1 horizon, the upper part of the B2t horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 3 to 6. The lower part of the B2t horizon, or all of the B2t horizon where there is an A2 or B1 horizon, has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 1 to 3. In most places it has red, brown, yellow, and gray mottles. The B2t horizon commonly is sandy clay loam, but the range includes clay loam and fine sandy loam.

Where there is a B3 horizon, it is as much as 30 inches thick. It has hue of 10YR, value of 5 to 7, and chroma of 1 or 2; it has mottles in shades of red, yellow, or brown. It is dominantly sandy loam, but the range includes sandy clay loam and sandy clay.

The C horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2 and has mottles in shades of yellow or brown. It varies in texture but commonly is sand, sandy loam, or loamy sand.

formation of the soils

In the paragraphs that follow, the factors of soil formation are described and related to the soils in the county. The processes of soil horizon differentiation are also described.

factors of soil formation

Soil is the natural medium for the growth of plants. It is the product of soil-forming processes acting on accumulated geologic material. The five important factors in soil formation are parent material, climate, living organisms (plants and animals), relief, and time.

Climate and living organisms are the active forces of soil formation. Their effect on the parent material is modified by relief and by the length of time the parent material has been in place. The relative importance of each factor differs from place to place. In some places a single dominant factor fixes most of the properties of the soil that is formed, but in general the interaction of all five factors determines the kind of soil that forms at any given place.

Although soil formation is complex, a clearer understanding of the soil-forming processes may be gained by considering each of the five factors separately. It must be remembered, however, that each of the five factors is affected by and also affects each of the others.

parent material

Parent material is the unconsolidated material in which a soil forms. It has much to do with the mineral and chemical composition of the soil. In Georgetown County the parent materials of the soils are marine or fluvial deposits. These deposits have varying amounts of sand, silt, and clay.

The Penholoway, Talbot, and Pamlico Formations, which were deposited during the Pleistocene Epoch, make up much of the parent material in Georgetown County (*3*).

The Penholoway Terrace is about 42 to 70 feet above sea level. It is in a small area in the northernmost section of Georgetown County. Norfolk, Yauhannah, Yemassee, and Chisolm soils are the dominant soils in the upland part of the area, and Cape Fear, Chastain, Johnston, and Rutlege soils are dominant on the flood plains.

The Talbot Terrace is about 25 to 42 feet above sea level. It is in a broad strip down the western one-third of Georgetown County. Eulonia, Bladen, Wahee, Yauhannah, Yemassee, and Grifton soils are the dominant soils in most of this area, and Hobonny, Chastain, Johnston, and Rutlege soils are dominant on the flood plains.

The Pamlico Terrace has a shoreline less than 25 feet above sea level. It covers almost all of the eastern two-thirds of Georgetown County. Yauhannah, Yemassee, Bladen, Wahee, Leon, Chipley, and Lakeland soils are the dominant soils that formed in this material.

climate

The climate in Georgetown County is temperate. Rainfall is well distributed throughout the year. The climate is fairly uniform throughout the county. Therefore, climate does not account for significant differences among the soils.

Precipitation and temperature affect the physical, chemical, and biological relationships in the soil. Water dissolves minerals, aids chemical and biological activity, and transports the dissolved mineral and organic material through the soil profile. Abundant rainfall promotes leaching of soluble bases and translocation of less soluble, fine-textured soil material downward through the soil profile. The amount of water that percolates through the soil depends on the amount of rainfall, the length of the frost-free season, relief, and the permeability of the soil material.

Weathering of the parent material is speeded by moist conditions and warm temperatures.

The growth and activity of living organisms increase in a warm, humid climate.

Thus, in Georgetown County, high rainfall, warm temperatures, and the long frost-free season have had a marked effect directly on the soils and on other factors that affect the soils.

living organisms

The kind and number of plants and animals that live in and on the soil are determined mainly by the climate and, to a lesser extent, by parent material, relief, and age of the soil.

Bacteria, fungi, and other micro-organisms are indispensable in soil formation. They hasten the weathering of minerals and the decomposing of organic

matter. Larger plants alter the soil microclimate, furnish organic matter, and transfer chemical elements from the subsoil to the surface soil.

Most of the fungi, bacteria, and other micro-organisms are in the upper few inches of soil. The activity of earthworms and other small invertebrates is chiefly in the A horizon and the upper part of the B horizon, where these organisms slowly and continuously mix the soil material. Bacteria and fungi decompose organic matter and release nutrients for plant use.

Animals play a secondary role in soil formation, but their influence is great. Plant-eating animals help to return plant material to the soil. Burrowing animals help to mix and aerate the soil material.

In Georgetown County the native vegetation on the better drained soils was mainly loblolly pine, longleaf pine, oak, and hickory. In the wetter areas it was mainly sweetgum, blackgum, yellow poplar, maple, ash, tupelo, and cypress. Large trees influence soil formation by bringing nutrients up from deep in the soil, by bringing soil material up from varying depths where trees are blown over, and by providing large openings that are filled by material from above as large roots decay.

relief

Relief influences soil formation because of its effect on moisture, temperature, and erosion. Because of its influence, different kinds of soil can form from similar parent material.

There are three general landscapes in Georgetown County that affect the formation of soils. These landscapes are described as follows:

1. Nearly level to gently sloping areas that are moderately dissected by streams. The soils in these areas generally are well drained and deep.
2. Broad, nearly level, slightly dissected areas between streams. Most of the soils are yellow to gray in color, and many are distinctly mottled. They are deep and moderately well drained to poorly drained.
3. Nearly level areas on stream bottoms and low terraces. The soils in these areas are young, are predominantly gray, and have poorly defined genetic layers.

time

The length of time required for a soil to develop depends largely on the intensity of other soil-forming factors. The soils in Georgetown County range from immature to mature. On the higher elevations on the uplands, the soils generally have well-developed horizons that are easily recognized. However, where the parent material is very sandy, little horizonation has taken place; and where the relief is very low and the soils are permanently saturated, horizons are only moderately distinct. On the first bottoms of streams, the soil material has not been in place long enough for soil horizons to form.

processes of soil horizon differentiation

The differentiation of horizons is the result of many soil-forming processes. These include the accumulation of organic matter; the leaching of soluble salts; the reduction and translocation of iron; the formation of soil structure; physical weathering, for example, freezing and thawing; and the chemical weathering of primary minerals or rocks.

Some of these processes are continually taking place in all soils, but the number of active processes and the degree of their activity vary from one soil to another.

Most soils have three major horizons, which are called the A, B, and C horizons (*5*). These horizons can be subdivided by the use of subscripts and letters that indicate changes within a horizon. An example is the B2t horizon, which represents a layer within the B horizon that has translocated clay illuviated from the A horizon.

The A horizon is the surface layer. The layer that has the largest accumulation of organic matter is called the A1 horizon. If the soils have been cleared and plowed, the plow layer is called the Ap horizon. Yemassee and Bladen soils, for example, have a distinctive, dark-colored A1 or Ap horizon. The A horizon is also the layer of maximum leaching, or eluviation, of clay and iron. If considerable leaching has taken place, an A2 horizon forms just below the surface layer. Generally the A2 horizon is the lightest colored horizon in the soil. It is well expressed in Chisolm and Blanton soils.

The B horizon lies below the A horizon. It is commonly called the subsoil. It is the horizon of maximum accumulation, or illuviation; of clay and of iron, aluminum, and other compounds leached from the A horizon. Norfolk, Yauhannah, and Eulonia soils have a well expressed B horizon.

The C horizon is below the B horizon. Some soils, however, have no B horizon, and the C horizon lies directly below the A horizon. This is the case in Lakeland and Rutlege soils. The C horizon consists of material that is little altered by the soil-forming processes but may be modified by weathering.

Well drained and moderately well drained soils in Georgetown County have a yellowish brown or reddish subsoil. These colors are mainly due to thin coatings of iron oxide on the sand, silt, and clay particles. A well drained soil does not have gray mottles that have chroma of 2 or less within a depth of at least 30 inches. Among the well drained soils in this county are Norfolk, Wakulla, and Chisolm soils. Moderately well drained soils are wet for short periods and generally do not have gray mottles within a depth of about 15 to 20 inches. Yauhannah and Eulonia soils are moderately well drained soils.

The reduction and transfer of iron is associated with the wetter, more poorly drained soils. This process is called gleying. In poorly drained and very poorly drained soils, for example, Bladen and Hobcaw soils, the subsoil

and underlying material are gray or grayish. These colors are due to the reduction and transfer of iron. Moderately well drained and somewhat poorly drained soils have yellowish brown and gray mottles, which indicate the segregation of iron. Yemassee and Wahee soils are among the somewhat poorly drained soils in Georgetown County.

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glossary

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

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

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.

Coarse textured soil. Sand or loamy sand.

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.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods.

Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

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, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

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.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

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.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

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.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

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.

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 affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.20 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Ponding. Standing water on soils in closed depressions. The water can be removed only by percolation or evapotranspiration.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slow 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 mm in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

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.

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.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-73 at Georgetown, South Carolina]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	57.4	36.6	47.0	77	19	86	3.54	1.46	5.29	7	.0
February---	59.4	38.1	48.8	79	20	94	3.68	1.90	5.23	6	.0
March------	65.9	45.0	55.5	84	27	219	4.27	2.23	6.05	7	.0
April------	74.0	53.8	63.9	90	36	417	2.34	.84	3.58	4	.0
May--------	81.5	62.3	71.9	95	46	679	3.60	1.66	5.25	6	.0
June-------	86.5	68.6	77.6	98	55	828	5.40	2.91	7.58	8	.0
July-------	88.9	72.0	80.5	97	62	946	7.20	4.15	9.91	9	.0
August-----	88.8	71.5	80.2	97	62	936	6.73	3.11	9.83	8	.0
September--	84.4	66.3	75.5	94	53	765	6.04	2.85	8.78	7	.0
October----	76.3	55.9	66.1	90	36	499	4.09	.69	6.68	5	.0
November---	67.7	45.2	56.5	83	27	200	2.28	.82	3.49	4	.0
December---	60.2	38.2	49.6	77	20	142	3.02	1.51	4.33	6	.0
Yearly:											
Average--	74.3	54.5	64.4	---	---	---	---	---	---	---	---
Extreme--	---	---	---	100	16	---	---	---	---	---	---
Total----	---	---	---	---	---	5,811	52.19	42.72	62.05	77	.0

*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-73 at Georgetown, South 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 5	March 21	April 4
2 years in 10 later than--	February 22	March 12	March 27
5 years in 10 later than--	February 1	February 22	March 12
First freezing temperature in fall:			
1 year in 10 earlier than--	November 21	November 17	November 3
2 years in 10 earlier than--	December 1	November 23	November 9
5 years in 10 earlier than--	December 23	December 4	November 20

TABLE 3.--GROWING SEASON

[Recorded in the period 1951-73 at Georgetown, South 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	287	251	226
8 years in 10	298	263	235
5 years in 10	323	284	252
2 years in 10	>365	306	269
1 year in 10	>365	318	278

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
10	Leon sand	18,460	3.6
11	Beaches	660	0.1
12A	Yauhannah loamy fine sand, 0 to 2 percent slopes	50,500	9.7
13	Bladen loam	51,770	9.9
14B	Blanton sand, 0 to 6 percent slopes	1,210	0.2
15	Bohicket silty clay loam	43,590	8.4
18	Cape Fear loam	19,720	3.8
19	Levy silty clay loam	24,110	4.6
20	Centenary fine sand	5,510	1.1
24B	Chisolm sand, 0 to 4 percent slopes	14,390	2.8
25A	Wakulla fine sand, 0 to 2 percent slopes	11,090	2.1
26A	Eulonia loamy fine sand, 0 to 2 percent slopes	25,490	4.9
26B	Eulonia loamy fine sand, 2 to 6 percent slopes	5,230	1.0
27	Rutlege sand	8,210	1.6
28	Echaw sand	11,800	2.3
31	Hobcaw loam	9,590	1.8
33	Hobonny muck	16,280	3.1
34	Johnston loam	13,350	2.6
36B	Lakeland fine sand, 0 to 6 percent slopes	19,110	3.7
38B	Newhan sand, 0 to 6 percent slopes	1,210	0.2
39A	Norfolk loamy fine sand, 0 to 2 percent slopes	1,540	0.3
50	Lynn Haven sand	7,480	1.4
54A	Chipley fine sand, 0 to 2 percent slopes	15,170	2.9
55	Witherbee fine sand	4,420	0.9
56	Chastain silty clay loam	28,740	5.5
57	Grifton loamy fine sand	17,500	3.4
58	Udorthents, loamy	3,380	0.7
59	Wahee fine sandy loam	47,790	9.2
61	Yemassee loamy fine sand	33,780	6.5
	Water	8,920	1.7
	Total	520,000	100.0

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Corn	Soybeans	Tobacco	Oats	Bahiagrass	Improved bermudagrass
	Bu	Bu	Lb	Bu	AUM*	AUM*
10 Leon	50	20	---	---	7.5	8.5
11. Beaches						
12A Yauhannah	125	45	3,000	85	9	11
13 Bladen	105	35	---	55	6.0	---
14B Blanton	60	25	2,000	55	6.5	8
15 Bohicket	---	---	---	---	---	---
18 Cape Fear	120	45	---	65	10.5	---
19 Levy	---	---	---	---	---	---
20 Centenary	65	20	2,000	55	7.5	7.5
24B Chisolm	100	30	2,400	50	8	10
25A Wakulla	45	20	1,700	50	6.5	9
26A Eulonia	100	40	2,500	75	9.5	9.5
26B Eulonia	90	35	2,500	70	9.0	10.0
27 Rutlege	---	---	---	---	---	---
28 Echaw	70	30	---	50	7.5	7.5
31 Hobcaw	110	40	---	70	10	---
33 Hobonny	---	---	---	---	---	---
34 Johnston	---	---	---	---	---	---
36B Lakeland	---	20	1,700	20	7.0	7.0
38B Newhan	---	---	---	---	---	---
39A Norfolk	110	40	3,000	80	8.0	10.5

See footnote at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Corn	Soybeans	Tobacco	Oats	Bahiagrass	Improved bermudagrass
	Bu	Bu	Lb	Bu	AUM*	AUM*
50---------- Lynn Haven	70	---	---	---	7.5	---
54A---------- Chipley	50	20	2,000	35	7.5	8.0
55---------- Witherbee	70	25	---	30	10	10
56---------- Chastain	---	---	---	---	---	---
57---------- Grifton	110	40	2,400	70	10	---
58. Udorthents						
59---------- Wahee	90	40	2,300	70	8.0	---
61---------- Yemassee	120	45	2,800	75	11	12

* 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.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)			
		Erosion (e)	Wetness (w)	Soil problem (s)	Climate (c)
		Acres	Acres	Acres	Acres
I	1,540	---	---	---	---
II	129,390	5,230	109,770	14,390	---
III	195,570	---	150,790	44,780	---
IV	45,050	---	25,940	19,110	---
V	---	---	---	---	---
VI	36,950	---	36,950	---	---
VII	53,740	---	53,740	---	---
VIII	44,800	---	43,590	1,210	---

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]

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Trees to plant
10 Leon	4w	Slight	Moderate	Moderate	Moderate	Slash pine	70	Slash pine.
						Longleaf pine	65	
12A Yauhannah	2w	Slight	Moderate	Slight	Slight	Loblolly pine	90	Loblolly pine, slash pine, yellow-poplar, sweetgum, American sycamore.
						Slash pine	90	
						Sweetgum	90	
						Southern red oak	80	
						White oak	80	
						Yellow-poplar	100	
13 Bladen	2w	Slight	Severe	Severe	--------	Loblolly pine	94	Loblolly pine, slash pine, American sycamore, water oak.
						Slash pine	91	
						Sweetgum	90	
14B Blanton	3s	Slight	Moderate	Moderate	Slight	Slash pine	80	Slash pine.
						Loblolly pine	80	
						Longleaf pine	70	
18 Cape Fear	1w	Slight	Severe	Severe	--------	Sweetgum	---	Loblolly pine, water tupelo, American sycamore, sweetgum, slash pine.
						Loblolly pine	100	
						Water oak	---	
						Water tupelo	---	
						Baldcypress	---	
19 Levy	3w	Slight	Severe	Severe	Slight	Water tupelo	---	Baldcypress, water tupelo.
						Sweetgum	---	
						Red maple	---	
						Baldcypress	---	
20 Centenary	2w	Slight	Moderate	Moderate	Slight	Slash pine	85	Slash pine, loblolly pine.
						Loblolly pine	85	
						Longleaf pine	72	
24B Chisolm	2s	Slight	Moderate	Moderate	Slight	Loblolly pine	90	Slash pine, longleaf pine.
						Slash pine	90	
						Longleaf pine	78	
25A Wakulla	3s	Slight	Moderate	Moderate	--------	Loblolly pine	73	Loblolly pine, slash pine, longleaf pine.
						Slash pine	---	
						Longleaf pine	78	
26A, 26B Eulonia	2w	Slight	Moderate	Moderate	Slight	Loblolly pine	90	Loblolly pine, slash pine, American sycamore, sweetgum, yellow-poplar.
						Slash pine	88	
						Water oak	90	
						Sweetgum	90	
						Blackgum	---	
						Southern red oak	---	
27 Rutlege	2w	Slight	Severe	Severe	Slight	Loblolly pine	90	Loblolly pine, baldcypress.
						Sweetgum	90	
28 Echaw	3s	Slight	Moderate	Slight	Slight	Longleaf pine	68	Longleaf pine, loblolly pine, slash pine, shortleaf pine.
						Loblolly pine	85	
						Slash pine	80	
31 Hobcaw	1w	Slight	Severe	Severe	Slight	Loblolly pine	96	Slash pine, loblolly pine, American sycamore, water tupelo, sweetgum.
						Slash pine	93	
						Pond pine	77	
						Water tupelo	---	

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Trees to plant
34 Johnston	1w	Slight	Severe	Severe	--------	Loblolly pine Sweetgum Water oak	97 111 103	Loblolly pine, slash pine, baldcypress, yellow-poplar, sweetgum, green ash, water tupelo.
36B Lakeland	4s	Slight	Moderate	Moderate	Slight	Slash pine Loblolly pine Longleaf pine	75 75 60	Loblolly pine, slash pine.
39A Norfolk	2o	Slight	Slight	Slight	--------	Loblolly pine Longleaf pine Slash pine	86 68 86	Slash pine, loblolly pine.
50 Lynn Haven	3w	Slight	Moderate	Moderate	Slight	Slash pine Loblolly pine Longleaf pine Pond pine	90 80 70 70	Slash pine, loblolly pine.
54A Chipley	2s	Slight	Moderate	Slight	Slight	Slash pine Loblolly pine Longleaf pine	90 90 80	Slash pine, loblolly pine.
55 Witherbee	2w	Slight	Moderate	Slight	Slight	Longleaf pine Loblolly pine Slash pine	72 90 90	Loblolly pine, longleaf pine, slash pine, shortleaf pine.
56 Chastain	2w	Slight	Severe	Severe	Slight	Sweetgum Water oak Eastern cottonwood Green ash Loblolly pine Water tupelo White oak Southern red oak Baldcypress	94 89 90 88 90 --- --- --- ---	Loblolly pine, American sycamore, sweetgum, cherrybark oak.
57 Grifton	2w	Slight	Severe	Severe	--------	Loblolly pine Sweetgum Water tupelo Southern red oak	89	Loblolly pine, slash pine, sweetgum, water tupelo, American sycamore, water oak.
59 Wahee	2w	Slight	Moderate	Moderate	Slight	Loblolly pine Slash pine Sweetgum	86 86 90	Loblolly pine, slash pine, sweetgum, American sycamore, water oak.
61 Yemassee	2w	Slight	Moderate	Slight	Slight	Loblolly pine Slash pine Sweetgum Southern red oak White oak Yellow-poplar	90 88 95 --- --- 100	Slash pine, loblolly pine, American sycamore, yellow-poplar.

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
10 Leon	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
11. Beaches					
12A Yauhannah	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
13 Bladen	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
14B Blanton	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
15 Bohicket	Severe: flooding, ponding, percs slowly.	Severe: ponding, excess salts.	Severe: ponding, flooding.	Severe: ponding.	Severe: excess salts, excess sulfur, ponding.
18 Cape Fear	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
19 Levy	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
20 Centenary	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
24B Chisolm	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
25A Wakulla	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
26A Eulonia	Moderate: percs slowly, wetness.	Moderate: wetness, percs slowly.	Moderate: percs slowly, wetness.	Moderate: wetness.	Moderate: wetness.
26B Eulonia	Moderate: percs slowly, wetness.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
27 Rutlege	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, droughty, flooding.
28 Echaw	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
31 Hobcaw	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
33 Hobonny	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding, excess humus.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
34 Johnston	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
36B Lakeland	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
38B Newhan	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
39A Norfolk	Slight	Slight	Slight	Slight	Slight.
50 Lynn Haven	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
54A Chipley	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
55 Witherbee	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
56 Chastain	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
57 Grifton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
58. Udorthents					
59 Wahee	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
61 Yemassee	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

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]

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
10 Leon	Poor	Fair	Good	Poor	Fair	Fair	Poor	Fair	Fair	Poor.
11. Beaches										
12A Yauhannah	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
13 Bladen	Fair	Good	Good	Good	Good	Fair	Good	Good	Good	Fair.
14B Blanton	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
15 Bohicket	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
18 Cape Fear	Fair	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
19 Levy	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Good	Good	Very poor.	Very poor.	Good.
20 Centenary	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
24B Chisolm	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
25A Wakulla	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
26A, 26B Eulonia	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
27 Rutlege	Very poor.	Poor	Poor	Poor	Poor	Fair	Good	Poor	Poor	Fair.
28 Echaw	Poor	Fair	Good	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
31 Hobcaw	Poor	Poor	Poor	Good	Good	Good	Fair	Poor	Fair	Fair.
33 Hobonny	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
34 Johnston	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
36B Lakeland	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
38B Newhan	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
39A Norfolk	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
50 Lynn Haven	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Poor	Fair	Fair.

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
54A---------- Chipley	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
55---------- Witherbee	Poor	Fair	Fair	Fair	Fair	Fair	Very poor.	Fair	Fair	Poor.
56---------- Chastain	Very poor.	Poor	Poor	Fair	Poor	Good	Good	Poor	Fair	Good.
57---------- Grifton	Good	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
58. Udorthents										
59---------- Wahee	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
61---------- Yemassee	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.

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]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
10 Leon	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
11. Beaches						
12A Yauhannah	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
13 Bladen	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
14B Blanton	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Severe: droughty.
15 Bohicket	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: low strength, ponding, flooding.	Severe: excess salt, excess sulfur, ponding.
18 Cape Fear	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding.	Severe: ponding.
19 Levy	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
20 Centenary	Severe: cutbanks cave, wetness.	Slight	Moderate: wetness.	Slight	Slight	Severe: droughty.
24B Chisolm	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty, too sandy.
25A Wakulla	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
26A Eulonia	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Moderate: wetness.
26B Eulonia	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: low strength, wetness.	Moderate: wetness.
27 Rutlege	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, droughty, flooding.
28 Echaw	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
31 Hobcaw	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
33 Hobonny	Severe: excess humus, ponding.	Severe: flooding, low strength, ponding.	Severe: flooding, low strength, ponding.	Severe: flooding, low strength, ponding.	Severe: ponding, flooding.	Severe: ponding, flooding, excess humus.

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
34 Johnston	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding.	Severe: ponding, flooding.
36B Lakeland	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
38B Newhan	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
39A Norfolk	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight	Slight.
50 Lynn Haven	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
54A Chipley	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
55 Witherbee	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
56 Chastain	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
57 Grifton	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
58. Udorthents						
59 Wahee	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
61 Yemassee	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

TABLE 11.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
10 Leon	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
11. Beaches					
12A Yauhannah	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: wetness.
13 Bladen	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
14B Blanton	Severe: poor filter.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: too sandy, seepage.
15 Bohicket	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding, too clayey.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.
18 Cape Fear	Severe: ponding, percs slowly.	Severe: seepage, ponding.	Severe: ponding, too clayey.	Severe: seepage, ponding.	Poor: too clayey, hard to pack, ponding.
19 Levy	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding, too clayey.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.
20 Centenary	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
24B Chisolm	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness.	Severe: seepage.	Good.
25A Wakulla	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage.
26A, 26B Eulonia	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey.
27 Rutlege	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
28 Echaw	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy.

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
31 Hobcaw	Severe: ponding.	Severe: seepage, ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
33 Hobonny	Severe: flooding, ponding.	Severe: flooding, excess humus, ponding.	Severe: flooding, excess humus, ponding.	Severe: flooding, ponding.	Poor: ponding, excess humus.
34 Johnston	Severe: flooding, ponding, poor filter.	Severe: seepage, flooding, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: seepage, ponding.
36B Lakeland	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
38B Newhan	Severe: poor filter.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
39A Norfolk	Moderate: wetness.	Moderate: seepage.	Slight	Slight	Slight.
50 Lynn Haven	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
54A Chipley	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy, seepage.
55 Witherbee	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
56 Chastain	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
57 Grifton	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Poor: wetness.
58. Udorthents					
59 Wahee	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
61 Yemassee	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Poor: wetness.

TABLE 12.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
10 Leon	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
11. Beaches				
12A Yauhannah	Fair: wetness.	Probable	Improbable: excess fines.	Good.
13 Bladen	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
14B Blanton	Good	Probable	Improbable: too sandy.	Poor: too sandy.
15 Bohicket	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salts, wetness.
18 Cape Fear	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
19 Levy	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
20 Centenary	Good	Probable	Improbable: too sandy.	Poor: too sandy.
24B Chisolm	Good	Probable	Improbable: too sandy.	Poor: too sandy.
25A Wakulla	Good	Probable	Improbable: too sandy.	Poor: too sandy.
26A, 26B Eulonia	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
27 Rutlege	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
28 Echaw	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
31 Hobcaw	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
33 Hobonny	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess humus.
34 Johnston	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: wetness.
36B Lakeland	Good	Probable	Improbable: too sandy.	Poor: too sandy.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
38B---------- Newhan	Good----------	Probable----------	Improbable: too sandy.	Poor: too sandy.
39A---------- Norfolk	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
50---------- Lynn Haven	Poor: wetness.	Probable----------	Improbable: too sandy.	Poor: too sandy, wetness.
54A---------- Chipley	Fair: wetness.	Probable----------	Improbable: too sandy.	Poor: too sandy.
55---------- Witherbee	Poor: wetness.	Probable----------	Improbable: too sandy.	Poor: too sandy, wetness.
56---------- Chastain	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
57---------- Grifton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
58. Udorthents				
59---------- Wahee	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
61---------- Yemassee	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.

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]

Map symbol and soil name	Limitations for--			Features affecting--	
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation
10 Leon	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Slope, cutbanks cave.	Wetness, droughty, fast intake.
11. Beaches					
12A Yauhannah	Moderate: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Favorable	Wetness, soil blowing, fast intake.
13 Bladen	Slight	Severe: wetness.	Severe: slow refill.	Percs slowly	Wetness, percs slowly.
14B Blanton	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.
15 Bohicket	Slight	Severe: hard to pack, ponding, excess salts.	Severe: slow refill, salty water.	Ponding, percs slowly, flooding.	Ponding, percs slowly.
18 Cape Fear	Slight	Severe: hard to pack, ponding.	Severe: slow refill.	Percs slowly, ponding.	Ponding, percs slowly.
19 Levy	Slight	Severe: hard to pack, ponding.	Severe: slow refill.	Ponding, percs slowly, flooding.	Ponding, percs slowly.
20 Centenary	Severe: seepage.	Severe: seepage.	Severe: cutbanks cave.	Cutbanks cave	Droughty, fast intake, soil blowing.
24B Chisolm	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.
25A Wakulla	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake.
26A Eulonia	Moderate: seepage.	Moderate: wetness.	Moderate: deep to water.	Favorable	Wetness, fast intake, soil blowing.
26B Eulonia	Moderate: seepage.	Moderate: wetness.	Moderate: deep to water.	Slope	Wetness, soil blowing, slope.
27 Rutlege	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.
28 Echaw	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation
31 Hobcaw	Moderate: seepage.	Severe: piping, ponding.	Moderate: slow refill.	Ponding	Ponding, soil blowing.
33 Hobonny	Moderate: seepage.	Severe: excess humus, ponding.	Moderate: slow refill.	Flooding, ponding, subsides.	Ponding, soil blowing.
34 Johnston	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, flooding, cutbanks cave.	Ponding, flooding.
36B Lakeland	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.
38B Newhan	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.
39A Norfolk	Moderate: seepage.	Slight	Severe: deep to water.	Deep to water	Fast intake.
50 Lynn Haven	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.
54A Chipley	Severe: seepage.	Severe: seepage.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.
55 Witherbee	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.
56 Chastain	Slight	Severe: hard to pack, wetness.	Severe: slow refill.	Percs slowly, flooding.	Wetness, percs slowly.
57 Grifton	Moderate: seepage.	Severe: wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness.
58. Udorthents					
59 Wahee	Slight	Severe: wetness.	Severe: slow refill.	Percs slowly, slope.	Wetness, soil blowing, percs slowly.
61 Yemassee	Moderate: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, fast intake, soil blowing.

TABLE 14.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
10---------- Leon	0-16	Sand----------	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	16-37	Sand, fine sand	SM, SP-SM, SP	A-3, A-2-4	0	100	100	80-100	3-20	---	NP
	37-65	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
11. Beaches											
12A---------- Yauhannah	0-9	Loamy fine sand	SM	A-2	0	100	100	75-100	15-35	<25	NP-4
	9-52	Sandy clay loam, clay loam, sandy loam.	SC, CL, SM-SC, CL-ML	A-2, A-4, A-6	0	100	100	75-100	25-55	16-35	4-16
	52-62	Fine sandy loam, sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2, A-4	0	100	100	75-100	25-50	<30	NP-8
	62-75	Sandy loam, loamy fine sand, fine sand.	SM, SM-SC, SP-SM	A-2, A-4	0	100	100	75-100	10-45	<28	NP-6
13---------- Bladen	0-6	Loam----------	CL, ML, CL-ML	A-4	0	100	98-100	80-100	51-90	<30	NP-10
	6-45	Clay, sandy clay	CL, CH	A-7	0	100	99-100	75-100	55-85	45-67	23-45
	45-70	Clay, sandy clay, clay loam.	CL, CH, SC	A-4, A-6, A-7	0	100	89-99	75-95	45-75	25-60	8-35
14B---------- Blanton	0-65	Sand----------	SP-SM	A-3, A-2-4	0	100	100	65-100	5-12	---	NP
	65-85	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM-SC, SM	A-4, A-2-4, A-2-6, A-6	0	100	100	69-95	25-50	15-37	3-20
15---------- Bohicket	0-12	Silty clay loam	CH	A-7	0	100	99-100	98-100	90-100	60-100	30-60
	12-60	Silty clay, clay, sandy clay.	CH, MH	A-7	0	100	99-100	90-100	70-95	50-100	19-60
18---------- Cape Fear	0-18	Loam----------	ML, CL-ML, CL	A-4, A-6	0	100	95-100	85-100	60-90	20-40	3-15
	18-58	Clay loam, clay, silty clay.	ML, CL, MH, CH	A-7	0	100	95-100	90-100	60-85	41-65	15-35
	58-65	Variable---------	---	---	---	---	---	---	---	---	---
19---------- Levy	0-8	Silty clay loam	CL, CH, ML, MH	A-6, A-7	0	100	100	98-100	85-100	30-65	12-35
	8-44	Silty clay, clay, silty clay loam.	CL, CH, ML, MH	A-6, A-7	0	100	100	98-100	85-100	35-65	15-35
	44-60	Variable---------	---	---	---	---	---	---	---	---	---
20---------- Centenary	0-7	Fine sand--------	SP, SP-SM	A-3	0	100	100	60-90	4-10	---	NP
	7-63	Sand, fine sand, loamy sand.	SP-SM, SP, SM	A-3, A-2-4	0	100	100	65-90	4-20	---	NP
	63-80	Sand, fine sand, loamy sand.	SP, SP-SM, SM	A-3, A-2-4	0	100	100	60-90	3-20	---	NP
24B---------- Chisolm	0-25	Sand----------	SP-SM, SM	A-2, A-3	0	100	98-100	75-98	5-20	---	NP
	25-58	Sandy clay loam.	SM-SC, SC, CL, CL-ML	A-4, A-6	0	100	98-100	75-98	36-55	20-35	4-15
	58-80	Fine sandy loam, loamy sand, sand.	SM, SP-SM	A-2	0	100	98-100	60-98	10-20	<30	NP-7

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
25A---------- Wakulla	0-26	Fine sand--------	SP, SP-SM	A-3	0	100	100	60-90	4-10	---	NP
	26-48	Loamy sand, loamy fine sand.	SM, SP-SM	A-2	0	100	95-100	80-95	10-25	---	NP
	48-80	Sand, fine sand	SM, SP-SM	A-2, A-3	0	100	100	75-80	5-15	---	NP
26A, 26B--------- Eulonia	0-9	Loamy fine sand	SM, SM-SC	A-2	0	100	95-100	50-96	18-35	<20	NP-4
	9-55	Sandy clay, clay, clay loam.	SC, CL	A-6, A-7, A-4	0	100	95-100	70-99	45-80	25-45	8-20
	55-65	Sandy clay loam, sandy loam.	SC, SM, SM-SC	A-2, A-4, A-6	0	100	90-100	60-100	18-50	15-35	3-15
	65-75	Variable---------	---	---	---	---	---	---	---	---	---
27---------- Rutlege	0-13	Sand----------	SM, SP-SM	A-2, A-3	0	95-100	95-100	50-80	5-35	<25	NP
	13-60	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
28---------- Echaw	0-5	Sand----------	SP, SP-SM	A-3	0	100	100	50-80	4-10	---	NP
	5-40	Loamy sand, fine sand, sand.	SM, SP-SM	A-2, A-3	0	100	100	50-75	6-30	---	NP
	40-60	Fine sand, loamy sand, sand.	SM, SP-SM	A-2, A-3	0	100	100	50-70	5-20	---	NP
31---------- Hobcaw	0-18	Loam----------	SM, SM-SC, ML, CL-ML	A-2, A-4	0	100	100	70-95	30-65	<35	NP-7
	18-46	Sandy clay loam, clay loam, fine sandy loam.	SM-SC, SC, CL-ML, CL	A-4, A-6, A-7	0	100	100	75-98	36-70	18-45	4-22
	46-65	Variable---------	---	---	---	---	---	---	---	---	---
33---------- Hobonny	0-62	Muck----------	PT	A-8	---	---	---	---	---	---	---
34---------- Johnston	0-32	Loam----------	ML, SM	A-2, A-4	0	100	100	60-100	18-65	<35	NP-10
	32-65	Stratified fine sandy loam to sand.	SM	A-2, A-4	0	100	100	50-100	25-49	<35	NP-10
36B---------- Lakeland	0-80	Fine sand--------	SP-SM	A-3, A-2-4	0	90-100	90-100	60-100	5-12	---	NP
38B---------- Newhan	0-80	Sand----------	SP	A-3	0	95-100	95-100	60-75	0-5	---	NP
39A---------- Norfolk	0-15	Loamy fine sand	SM	A-2	0	95-100	92-100	50-91	13-30	<20	NP
	15-68	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	30-55	20-38	4-15
	68-80	Variable---------	---	---	---	---	---	---	---	---	---
50---------- Lynn Haven	0-18	Sand----------	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	18-60	Sand, fine sand	SM, SP-SM	A-3, A-2-4	0	100	100	80-100	5-20	---	NP
	60-75	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
54A---------- Chipley	0-4	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	80-100	6-12	---	NP
	4-80	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	100	80-100	o-12	---	NP
55---------- Witherbee	0-20	Fine sand--------	SP-SM, SM, SP	A-3, A-2	0	100	100	80-100	5-15	---	NP
	20-75	Fine sand, sand, loamy fine sand.	SP-SM, SP, SM	A-3, A-2	0	100	100	80-100	3-15	---	NP

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
56---------- Chastain	0-3	Silty clay loam	ML, CL, CL-ML	A-4, A-6, A-7	0	100	100	90-100	70-95	23-45	3-18
	3-75	Silty clay loam, silty clay, clay.	CL, CH, ML, MH	A-6, A-7	0	100	100	95-100	85-98	35-75	12-40
57---------- Grifton	0-12	Loamy fine sand	SM, SP-SM	A-2	0	100	95-100	60-100	12-35	<25	NP-4
	12-55	Sandy loam, sandy clay loam, clay loam.	SC, CL, SM-SC, CL-ML	A-4, A-6, A-2	0	98-100	95-100	60-100	31-60	20-35	8-15
	55-80	Variable---------	---	---	---	---	---	---	---	---	---
58. Udorthents											
59---------- Wahee	0-9	Fine sandy loam	SM, SM-SC	A-2, A-4	0	100	95-100	50-98	30-50	<28	NP-7
	9-44	Clay, clay loam, silty clay.	CL, CH	A-7, A-6	0	100	100	85-100	51-90	38-70	18-42
	44-80	Variable---------	---	---	---	---	---	---	---	---	---
61---------- Yemassee	0-12	Loamy fine sand	SM	A-2	0	100	100	75-100	15-35	<25	NP-4
	12-50	Sandy clay loam, clay loam, fine sandy loam.	CL, SC, CL-ML, SM-SC	A-2, A-4, A-6	0	100	100	75-100	30-70	16-38	4-18
	50-75	Sandy clay loam, fine sandy loam, sandy clay.	SC, SM, CL-ML, SM-SC	A-2, A-4, A-6	0	100	100	75-100	25-55	<35	NP-15
	75-90	Variable---------	---	---	---	---	---	---	---	---	---

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 "Wind erodibility group" 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	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group
	In	Pct	In/hr	In/in	pH				
10---------- Leon	0-16	1-6	6.0-20	0.02-0.05	3.6-5.5	Low----------	0.20	5	1
	16-37	2-8	0.6-6.0	0.05-0.10	3.6-5.5	Low----------	0.20		
	37-65	1-6	>20	0.02-0.05	3.6-5.5	Low----------	0.17		
11. Beaches									
12A---------- Yauhannah	0-9	5-15	6.0-20	0.06-0.11	4.5-6.5	Low----------	0.17	5	2
	9-52	18-35	0.6-2.0	0.11-0.16	4.5-6.0	Low----------	0.24		
	52-62	10-30	2.0-6.0	0.10-0.15	4.5-6.0	Low----------	0.24		
	62-75	5-15	2.0-20	0.06-0.12	4.5-6.0	Low----------	0.17		
13---------- Bladen	0-6	15-27	0.6-2.0	0.14-0.18	3.6-5.5	Low----------	0.10	5	1
	6-45	35-55	0.06-0.2	0.12-0.16	3.6-5.5	Moderate--------	----		
	45-70	35-70	0.06-0.2	0.12-0.16	3.6-5.5	Moderate--------	----		
14B---------- Blanton	0-65	2-7	6.0-20	0.03-0.07	4.5-6.0	Very low--------	0.17	5	2
	65-85	12-30	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.32		
15---------- Bohicket	0-12	30-60	0.06-0.2	0.02-0.06	6.1-8.4	High----------	0.32	5	4
	12-60	35-60	<0.06	0.02-0.06	6.1-8.4	High----------	0.24		
18---------- Cape Fear	0-18	5-15	0.6-6.0	0.15-0.22	4.5-6.0	Low----------	0.15	5	---
	18-58	35-60	0.06-0.2	0.12-0.22	4.5-6.0	Moderate--------	0.32		
	58-65	5-30	---	---	---	----------	----		
19---------- Levy	0-8	27-50	0.06-0.2	0.16-0.22	3.6-5.5	High----------	0.32	5	4
	8-44	35-60	0.06-0.2	0.16-0.22	3.6-5.5	High----------	0.32		
	44-60	---	---	---	---	----------	----		
20---------- Centenary	0-7	1-8	6.0-20	0.03-0.08	4.5-6.5	Low----------	0.10	5	1
	7-63	2-8	6.0-20	0.03-0.05	4.5-6.0	Low----------	0.10		
	63-80	2-10	2.0-6.0	0.03-0.08	4.5-6.0	Low----------	0.10		
24B---------- Chisolm	0-25	2-10	6.0-20	0.03-0.05	4.5-6.0	Low----------	0.10	5	1
	25-58	18-35	0.6-2.0	0.10-0.15	4.5-6.0	Low----------	0.15		
	58-80	2-20	6.0-20	0.03-0.08	4.5-5.5	Low----------	0.15		
25A---------- Wakulla	0-26	2-8	6.0-20	<0.05	4.5-6.0	Low----------	0.10	5	1
	26-48	5-12	6.0-20	0.05-0.10	4.5-6.0	Low----------	0.10		
	48-80	2-8	6.0-20	<0.05	4.5-6.0	Low----------	0.10		
26A, 26B--------- Eulonia	0-9	5-15	6.0-20	0.06-0.09	4.5-6.5	Low----------	0.20	5	2
	9-55	35-45	0.2-0.6	0.12-0.16	4.5-6.5	Low----------	0.24		
	55-65	15-35	0.6-2.0	0.10-0.14	4.5-6.0	Low----------	0.20		
	65-75	---	---	---	---	----------	----		
27---------- Rutlege	0-13	<10	6.0-20	0.04-0.10	3.6-5.0	Low----------	0.17	5	1
	13-60	<10	6.0-20	0.04-0.08	3.6-5.0	Low----------	0.17		
28---------- Echaw	0-5	1-8	2.0-20	0.03-0.08	4.5-6.0	Low----------	0.10	5	1
	5-40	2-10	6.0-20	0.05-0.10	4.5-6.0	Low----------	0.10		
	40-60	2-10	2.0-20	0.03-0.08	4.5-6.0	Low----------	0.10		
31---------- Hobcaw	0-18	5-20	2.0-6.0	0.10-0.16	4.5-6.5	Low----------	0.17	5	3
	18-46	18-35	0.6-2.0	0.12-0.18	4.5-6.5	Low----------	0.24		
	46-65	---	---	---	---	----------	----		
33---------- Hobonny	0-62	---	0.6-2.0	0.20-0.25	3.6-5.5	Low----------	0.15	---	---

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group
	In	Pct	In/hr	In/in	pH				
34---------- Johnston	0-32	5-18	2.0-6.0	0.10-0.20	4.5-5.5	Low----------	0.20	5	---
	32-65	5-20	6.0-20	0.06-0.12	4.5-5.5	Low----------	0.17		
36B---------- Lakeland	0-80	2-8	>20	0.05-0.08	4.5-6.0	Low----------	0.17	5	2
38B---------- Newhan	0-80	---	>20	<0.05	6.6-7.8	Low----------	0.10	5	1
39A---------- Norfolk	0-15	2-8	6.0-20	0.06-0.11	4.5-6.0	Low----------	0.17	5	2
	15-68	18-35	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.24		
	68-80	---	---	---	---	----------	----		
50---------- Lynn Haven	0-18	1-4	6.0-20	0.02-0.05	3.6-5.5	Low----------	0.20	5	1
	18-60	2-8	0.6-6.0	0.05-0.10	3.6-5.5	Low----------	0.20		
	60-75	2-5	>20	0.01-0.05	3.6-5.5	Low----------	0.15		
54A---------- Chipley	0-4	1-5	6.0-20	0.05-0.10	3.6-6.0	Very low--------	0.17	5	2
	4-80	1-7	6.0-20	0.03-0.08	4.5-6.5	Very low--------	0.17		
55---------- Witherbee	0-20	1-5	>20	0.05-0.08	3.6-6.0	Low----------	0.10	5	1
	20-75	1-8	6.0-20	0.03-0.08	4.5-6.5	Low----------	0.10		
56---------- Chastain	0-3	15-35	0.2-0.6	0.12-0.18	4.5-6.0	Moderate--------	0.32	5	5
	3-75	35-60	0.06-0.2	0.12-0.16	4.5-6.0	Moderate--------	0.37		
57---------- Grifton	0-12	2-10	6.0-20.0	0.07-0.10	4.5-6.5	Low----------	0.17	5	2
	12-55	18-35	0.6-2.0	0.12-0.17	4.5-6.5	Low----------	0.24		
	55-80	---	---	---	---	----------	----		
58. Udorthents									
59---------- Wahee	0-9	5-20	0.6-2.0	0.10-0.15	4.5-6.0	Low----------	0.28	5	3
	9-44	35-55	0.06-0.2	0.12-0.20	4.5-5.5	Moderate--------	0.28		
	44-80	---	0.2-0.6	0.12-0.20	4.5-5.5	Moderate--------	0.28		
61---------- Yemassee	0-12	5-15	6.0-20	0.06-0.11	3.6-6.0	Low----------	0.10	5	2
	12-50	18-35	0.6-2.0	0.11-0.18	3.6-5.5	Low----------	0.20		
	50-75	12-40	0.6-2.0	0.11-0.17	3.6-5.5	Low----------	0.20		
	75-90	---	---	---	---	----------	----		

TABLE 16.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "brief," "apparent," and "perched" are explained in the text. The symbol > means more than. Absence of an entry indicates that the feature is not a concern]

Map symbol and soil name	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
10---------- Leon	A/D	None--------	---	---	0-1.0	Apparent	Nov-Apr	High-----	High.
11. Beaches									
12A---------- Yauhannah	B	None--------	---	---	1.5-2.5	Apparent	Dec-Mar	Moderate	High.
13---------- Bladen	D	None--------	---	---	0-1.0	Apparent	Dec-May	High-----	High.
14B---------- Blanton	A	None--------	---	---	5.0-6.0	Perched	Jan-Apr	High-----	High.
15*---------- Bohicket	D	Frequent----	Very brief	Jan-Dec	+3-0	Apparent	Jan-Dec	High-----	High.
18*---------- Cape Fear	D	None--------	---	---	+1-1.5	Apparent	Dec-Apr	High-----	High.
19*---------- Levy	D	Frequent----	Very long	Jan-Dec	+2-+1	Apparent	Jan-Dec	High-----	High.
20---------- Centenary	B	None--------	---	---	3.5-5.0	Apparent	Dec-Mar	Moderate	High.
24B---------- Chisolm	A	None--------	---	---	3.5-5.0	Apparent	Jan-Mar	Low------	High.
25A---------- Wakulla	A	None--------	---	---	>6.0	---	---	Low------	High.
26A, 26B---------- Eulonia	C	None--------	---	---	1.5-3.5	Apparent	Dec-May	Moderate	High.
27---------- Rutlege	D	Frequent----	Brief-----	Dec-May	0-1.0	Apparent	Dec-May	High-----	High.
28---------- Echaw	B	None--------	---	---	2.5-5.0	Apparent	Nov-Apr	Low------	High.
31*---------- Hobcaw	D	None--------	---	---	+1-1.0	Apparent	Nov-Apr	High-----	High.
33*---------- Hobonny	D	Frequent----	Very long	Jan-Dec	+1-0	Apparent	Jan-Dec	High-----	High.
34*---------- Johnston	D	Common------	Brief to long.	Nov-Jul	+1-1.5	Apparent	Nov-Jun	High-----	High.
36B---------- Lakeland	A	None--------	---	---	>6.0	---	---	Low------	Moderate.
38B---------- Newhan	A	None--------	---	---	>6.0	---	---	High-----	Low.
39A---------- Norfolk	B	None--------	---	---	4.0-6.0	Apparent	Jan-Mar	Moderate	High.
50---------- Lynn Haven	B/D	None--------	---	---	0-1.0	Apparent	Nov-Apr	High-----	High.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
54A---------- Chipley	B	None--------	---	---	2.0-3.0	Apparent	Nov-Apr	Low------	High.
55---------- Witherbee	B	None--------	---	---	0-2.0	Apparent	Nov-Apr	Low------	High.
56---------- Chastain	D	Frequent----	Very long	Dec-Apr	0-1.0	Apparent	Nov-May	High-----	High.
57---------- Grifton	D	None--------	---	---	0.5-1.0	Apparent	Dec-May	High-----	Moderate.
58. Udorthents									
59---------- Wahee	D	None--------	---	---	0.5-1.5	Apparent	Dec-Mar	High-----	High.
61---------- Yemassee	C	None--------	---	---	1.0-1.5	Apparent	Dec-Mar	High-----	High.

* In the "High water table--Depth" column, a plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

TABLE 17.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Bladen----------	Clayey, mixed, thermic Typic Albaquults
Blanton----------	Loamy, siliceous, thermic Grossarenic Paleudults
Bohicket----------	Fine, mixed, nonacid, thermic Typic Sulfaquents
Cape Fear----------	Clayey, mixed, thermic Typic Umbraquults
Centenary----------	Sandy, siliceous, thermic Grossarenic Entic Haplohumods
Chastain----------	Fine, kaolinitic, acid, thermic Typic Fluvaquents
Chipley----------	Thermic, coated Aquic Quartzipsamments
Chisolm----------	Loamy, siliceous, thermic Arenic Hapludults
Echaw----------	Sandy, siliceous, thermic Entic Haplohumods
Eulonia----------	Clayey, mixed, thermic Aquic Hapludults
Grifton----------	Fine-loamy, siliceous, thermic Typic Ochraqualfs
Hobcaw----------	Fine-loamy, siliceous, thermic Typic Umbraquults
Hobonny----------	Euic, thermic Typic Medisaprists
Johnston----------	Coarse-loamy, siliceous, acid, thermic Cumulic Humaquepts
Lakeland----------	Thermic, coated Typic Quartzipsamments
Leon----------	Sandy, siliceous, thermic Aeric Haplaquods
Levy----------	Fine, mixed, acid, thermic Typic Hydraquents
Lynn Haven----------	Sandy, siliceous, thermic Typic Haplaquods
Newhan----------	Thermic, uncoated Typic Quartzipsamments
Norfolk----------	Fine-loamy, siliceous, thermic Typic Paleudults
Rutlege----------	Sandy, siliceous, thermic Typic Humaquepts
Wahee----------	Clayey, mixed, thermic Aeric Ochraquults
Wakulla----------	Sandy, siliceous, thermic Psammentic Hapludults
Witherbee----------	Sandy, siliceous, thermic Entic Haplaquods
Yauhannah----------	Fine-loamy, siliceous, thermic Aquic Hapludults
Yemassee----------	Fine-loamy, siliceous, thermic Aeric Ochraquults

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