Issued March 1971

SOIL SURVEY
Charleston County
South Carolina

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
and
Forest Service
In cooperation with
SOUTH CAROLINA AGRICULTURAL EXPERIMENT STATION

Major fieldwork for this soil survey was done in the period 1954–66. Soil names and descriptions were approved in 1967. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1966. This survey was made cooperatively by the Soil Conservation Service, U.S. Forest Service, and the South Carolina Agricultural Experiment Station. It is part of the technical assistance furnished to the Charleston Soil and Water Conservation District.

Either enlarged or reduced copies of the soil map in this publication can be made by commercial photographers, or they can be purchased on individual order from the Cartographic Division, Soil Conservation Service, USDA, Washington, D.C. 20250

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, or other structures; and in judging suitability of tracts of land for agriculture, industry, or recreation.

Locating Soils

All the soils of Charleston County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with numbers shown on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all of the soils of the county in alphabetic order by map symbol and gives the capability classification and woodland suitability classification of each. It also shows the page where each soil is described and the page for the capability unit and woodland suitability group in which the soil has been placed.

Interpretations not included in the text can be developed by using the soil map and information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have slight limitations for a given use can be colored green, those with moderate limitations can be colored yellow, and those with severe limitations can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of capability units and woodland suitability groups.

Foresters and others can refer to the section "Use of soils as Woodland," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others concerned with wildlife will find information about soils and wildlife in the section "Use of Soils for Wildlife Habitat."

Community planners and others concerned with community development can read about the soil properties that affect the choice of sites for homes, industrial buildings, schools, and parks in the section "Use of Soils in Community Development."

Engineers and builders can find under "Engineering Behavior of Soils," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Scientists and others can read about how the soils were formed and how they are classified in the section "Formation and Classification of Soils."

Students, teachers, and others will find information about soils and their management in various parts of the text, depending on their particular interest.

Newcomers in Charleston County may be especially interested in the section "General Soil Map," where broad patterns of soils are described.

Cover: Rows of privet hedge and rye on Seabrook and Kiawah loamy fine sands reduce wind erosion and protect vegetables against windblown sand.

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Soil Survey of Charleston County, South Carolina

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UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE AND FOREST SERVICE, IN COOPERATION WITH THE SOUTH CAROLINA AGRICULTURAL EXPERIMENT STATION

CHARLESTON COUNTY is in the southeastern part of South Carolina (fig. 1). It extends approximately 100 miles along the Atlantic Ocean from the mouth of the South Santee River to the mouth of the South Edisto River. A chain of islands forms a natural barrier along its irregularly shaped coast. This coast contains many small inlets.

Charleston, the county seat, is the next to largest city in South Carolina. One of the main seaports of the South Atlantic coast, it is nearly encompassed by the Ashley and Cooper Rivers that empty into Charleston Harbor.

The land area of Charleston County is approximately 604,800 acres, or about 945 square miles. Both fresh and tidal waters are prevalent in the county. The major soil series are Wadmalaw, Yonges, Capers, Chipley, Rutlege, and Wando. Exceeding any one of these in land area, however, is the Tidal marsh, soft, land type. The soils are level to gently sloping; sandy and loamy textures predominate. The average growing season in the county is about 246 days.

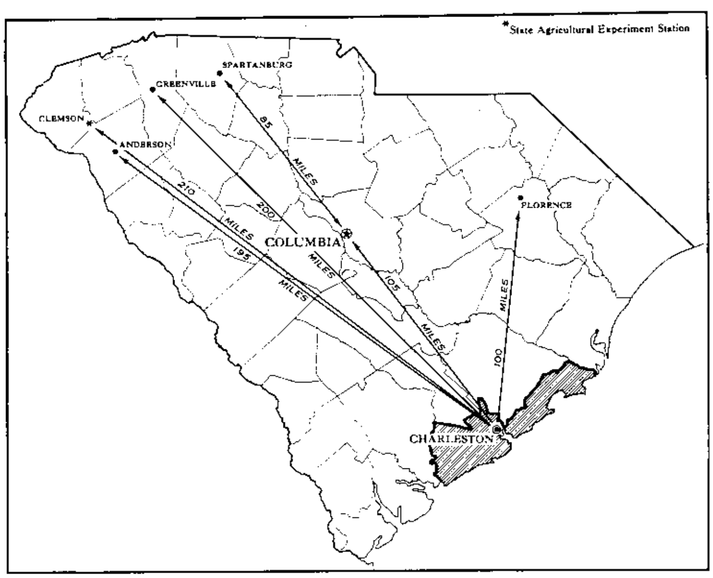

Figure 1.—Location of Charleston County in South Carolina.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Charleston County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area, or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field, or for selecting the exact location of a road, building, or similar structure, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect their management.

The soil associations in Charleston County are discussed in the following pages.

1. Seewee-Rutlege Association

Somewhat poorly drained to moderately well drained, nearly level, sandy soils on ridges and poorly drained to very poorly drained, sandy soils in depressions

This association occurs in long, narrow troughs, on broad ridges, and on long, narrow ridges in areas roughly parallel with the coastline. The troughs are 150 to 300 feet in width; the broad ridges, next higher in elevation than the troughs, are 150 to 1,000 feet in width; and the narrow ridges, at elevations 3 to 5 feet above the troughs, are 300 to 600 feet in width. Most of this association is less than 15 feet above sea level, but the range of elevation is from 5 to 25 feet.

This association occupies about 5 percent of the county. Seewee soils, on the broad ridges, make up about 68 percent of it; Rutlege soils, in the troughs, 17 percent; and Lakeland, Chipley, Leon, and St. Johns, the remaining 15 percent.

Seewee soils are somewhat poorly drained to moderately well drained. Their water table is at a depth of about 18 inches. These soils are sandy throughout but have a firm layer at a depth of about 21 inches. Typically, their surface layer is thick loamy fine sand that is black to dark grayish brown in the upper part and brown in the lower part.

Rutlege soils are poorly drained to very poorly drained. They are sandy throughout and are black in the upper part and gray below a depth of about 42 inches.

Pine and hardwood forest, mainly in Francis Marion National Forest, occupies about 80 percent of this association. The rest of the acreage is used for farms and residences. The farms are small ones that produce truck crops and some livestock.

If the dominant soils of this association are adequately drained, they are suitable for farming. They have moderate to severe limitations as sites for dwellings or as sites for recreation. A high water table and water standing in level or depressional areas are the main limitations. The soils are well suited to woodland and wildlife.

2. St. Johns-Leon Association

Somewhat poorly drained to poorly drained, level to nearly level, sandy soils that contain a weakly cemented layer stained by organic matter

This association occurs on narrow to broad, level areas and on long, broad ridges. The level areas are at elevations 1 to 3 feet lower than the ridges, and they range from 200 feet to 1,500 feet in width, although most of them are less than 600 feet in width. The ridges are 400 to 1,500 feet in width. Elevations in this association range from 20 to 40 feet above sea level.

This association occupies about 4 percent of the county. St. Johns soils, in the level areas, make up about 46 percent of it; Leon soils, on broad ridges, 40 percent; and Chipley, Lakeland, and Rutlege, the remaining 14 percent.

St. Johns soils are poorly drained. Their water table is 15 to 30 inches below the surface much of the time. These soils are sandy throughout but have a hardpan at a depth of about 11 inches that is weakly cemented by organic matter. Typically, their surface layer is black fine sand in the upper part and dark-gray fine sand in the lower part.

Leon soils are somewhat poorly drained. Their water table is at a depth of 12 to 24 inches. These soils are also sandy throughout, and they have, at a depth of about 20 inches, a weakly cemented layer stained by organic matter.

Pond pine and scattered hardwoods occupy about 85 percent of this association, and woodland products are the chief source of income. The rest of the acreage is used for pasture and general farming. The average size of a property holding is about 600 acres, but the holdings range from 30 to 1,000 acres. Some of the larger holdings are managed for wildlife production.

The dominant soils of this association are unsuitable or poorly suitable for farming. They have moderate to severe limitations as sites for dwellings and industrial buildings. Since most of the soils have a high water table or water standing on them, they are poorly to moderately suited to range pasture, woodland, and wildlife production.

3. Chipley-Lakeland Association

Mainly moderately well drained and excessively drained, nearly level to gently sloping, sandy soils

This association occurs in long, narrow depressions, on broad ridges, and on narrow ridges. The depressions are 100 to 300 feet in width; the broad ridges, next higher in elevation than the depressions, are 300 to 1,500 feet in width; and the narrow ridges, at elevations 2 to 4 feet above the broad ridges, are 200 to 500 feet in width.

This association occupies about 7 percent of the county. Chipley soils, on the broad ridges, make up 66 percent of it; Lakeland soils, on the narrow ridges, 23 percent; and Rutlege, Osier, and Wagram soils, the remaining 11 percent.

Chipley soils are moderately well drained to somewhat poorly drained. Typically, their surface layer is very dark gray loamy fine sand. It is underlain by a layer of yellowish-brown loamy fine sand. As depth below the surface layer increases, the sandy material becomes coarser and color changes to light yellowish brown. Then, at a depth of about 40 inches, it becomes light brownish-gray sand.

Lakeland soils are excessively drained. Typically, their surface layer is very dark grayish brown sand, and it is underlain by dark yellowish-brown to yellow sand that extends to a depth of 60 inches or more.

Tracts of pine and pine-hardwood forest, 500 to 1,000 acres in size, occupy about 60 percent of this association. Another 25 percent of it is part of the Francis Marion National Forest. The rest is small farms, 10 to 30 acres in size, that provide general farm products. The woodland areas are managed for pulp and timber products, wildlife support, and hunting.

Most of the soils in this association are fairly to poorly suited to farming and woodland development. The dominant soils have slight to moderate limitations as sites for dwellings and recreation and slight limitations as sites for industrial buildings.

4. Rutlege-Scranton-Pamlico Association

Somewhat poorly drained to very poorly drained, nearly level to depressional, sandy and mucky soils

This association occurs on a long, broad, wooded area of the Big Wambaw Swamp in Francis Marion National Forest. This area is made up of low, broad flats and long, nearly level, sandy ridges. The flats are flooded areas that are at elevations 2 to 4 feet lower than the ridges. The ridges are 300 to 1,000 feet in width. Most of the association is less than 20 feet above sea level, but the range of elevation is from 12 to 30 feet.

This association occupies about 6 percent of the county. Rutlege soils, on the flats, make up about 60 percent of it; Scranton soils, on the ridges, 15 percent; Pamlico mucks, on the lowest inaccessible areas that are covered by water, 14 percent; and Chipley, Seewee, and Lakeland soils, the remaining 11 percent.

Rutlege soils are poorly drained to very poorly drained. They are sandy throughout and are black in the upper part and gray below a depth of about 42 inches.

Scranton soils are somewhat poorly drained. They are sandy throughout, and their surface layer is typically loose in consistency and dark in color.

Pamlico mucks are very poorly drained. They are very dark organic soils that formed in woody materials in fresh water.

Pine and hardwood forest occupy this association, and it is managed for pulpwood and timber by the U.S. Forest Service. Part of the association is set aside as a game-management area for the protection and propagation of wildlife, and some of the higher areas are used as food patches for wild turkeys.

Except for the soils in the higher areas, the dominant soils in this association are poorly suited to woodland because of a high water table or standing water. Pine are well suited to those higher areas that are adequately drained. As sites for dwellings, Rutlege soils have a severe limitation, Scranton soils have a moderate limitation, and Pamlico soils have a very severe limitation.

5. Wando-Seabrook Association

Moderately well drained to excessively drained, nearly level to gently sloping, sandy soils

This association occurs on flat ridges and lower lying bands. The ridges are 400 to 1,500 feet in width and are at elevations 1 to 3 feet higher than the bands. The bands are 200 to 1,000 feet in width. Most of this association is less than 20 feet above sea level, but the range of elevation is 5 to 30 feet.

This association occupies about 9 percent of the county. Wando soils, on the broad ridges, make up 51 percent of it; Seabrook soils, on the bands, 31 percent; and Kiawah, Rutlege, Dawhoo, Charleston, Wagram, and Edisto soils, the remaining 18 percent.

Wando soils are excessively drained to well drained. These soils are deep and are sandy throughout. Typically, their surface layer is dark-brown loamy fine sand. The underlying material is brown to strong brown loamy fine sand that extends to a depth of about 51 inches. Below this is yellow fine sand.

Seabrook soils are moderately well drained. Their water table is at a depth of about 24 to 30 inches. These are deep soils that are sandy throughout. Typically, their surface layer is very dark grayish brown loamy fine sand. The underlying material is dark-brown to dark yellowish-brown loamy fine sand.

Pine and hardwood forests occupy about 50 percent, farms 30 percent, and residences 20 percent of this association. Most of the farms are 200 to 400 acres in size, but a few exceed 600 acres. Snap beans and tomatoes are the main crops; livestock and general farm produce are the minor ones. Residential areas are rapidly replacing farms and wooded areas on Mount Pleasant and James Islands.

This association is suited to those management practices used for upland wildlife species. However, because of the prevalence of truck farms and residential areas and the consequent danger to personnel, it is not very well suited to hunting.

6. Kiawah-Seabrook-Dawhoo Association

Moderately well drained to very poorly drained, nearly level to depressional, sandy soils

This association occurs on low, broad ridges and long, narrow-to-broad depressions in areas roughly parallel with the coastline. The ridges are 300 to 1,000 feet in width and are at elevations 2 to 4 feet above the depressions. The depressions are 150 to 600 feet in width. Most of this association is less than 15 feet above sea level, but the range of elevation is 5 to 25 feet.

This association occupies about 6 percent of the county. Kiawah soils, on the lower parts of the higher sandy ridges and on the ridges that are at intermediate elevations, make up 48 percent of it; Seabrook soils in the higher areas on the ridges, 19 percent; Dawhoo soils, in the depressions, 17 percent; and Rutlege, Wando, Edisto, and Yonges soils, the remaining 16 percent.

Kiawah soils are somewhat poorly drained. Their water table is at a depth of about 18 inches. These soils are sandy throughout. Typically, their surface layer is very dark grayish brown. Their subsoil is grayish brown to a depth of about 32 inches, and mottled light gray, strong brown, and yellowish brown at depths of about 32 to 48 inches.

Seabrook soils are moderately well drained. They are sandy throughout. Typically, their surface layer is very dark grayish-brown loamy fine sand, and the underlying material is dark-brown to dark yellowish-brown loamy fine sand.

Dawhoo soils are very poorly drained. They, too, are sandy throughout, and typically, they have a black surface layer that is underlain by a very dark grayish-brown subsurface layer. Below this, at a depth of about 18 to 30 inches, there is a layer that is dark grayish brown.

Pine and hardwood forest occupies about 60 percent of this association. The rest of the acreage is used mainly for farming. The farms are mostly truck farms and are usually 15 to 200 acres in size, but some exceed 500 acres. Some livestock is produced, and some general farming occurs.

If the dominant soils of the association are adequately drained, they are suited to farming. However, as sites for houses, recreation, and industrial buildings, the Kiawah soils have moderate limitations, the Seabrook soils have slight limitations, and the Dawhoo soils have severe or very severe limitations. If they are adequately drained, the dominant soils are well suited to pine. These soils are suitable for deer and wild turkey. When they are used as a habitat for quail, the soils usually need draining.

7. Yonges-Hockley-Edisto Association

Moderately well drained to poorly drained, nearly level soils that have a sandy surface layer and a predominantly loamy subsoil

This association occurs on a low, broad plain. It contains randomly spaced drainageways that lead to tidal streams. Most of the association is 12 feet or less above sea level, but elevations range from 5 to 25 feet. Surface irregularities are slight.

This association occupies about 12 percent of the county. Yonges soils, on the lowest areas above the drainageways, make up about 31 percent of it; Hockley soils, on the highest areas, 21 percent; Edisto soils, on areas at slightly higher elevations than Yonges where the two occur together, 14 percent; and Charleston, Meggett, Santee, Wadmalaw, and Wicksburg soils, the remaining 34 percent.

Yonges soils are poorly drained. Their water table is at a depth of about 12 to 24 inches. Typically, their surface layer is dark grayish-brown loamy fine sand and their subsoil is gray fine sandy clay loam and fine sandy clay.

Hockley soils have a moderately high water table during rainy seasons because the subsoil is moderately permeable. Typically, their surface layer is dark grayish-brown loamy fine sand and their subsoil is yellowish-brown fine sandy clay loam.

In Edisto soils the water table is at a depth of 24 to 36 inches. Typically, their surface layer is very dark grayish-brown loamy fine sand and their subsoil light olive-brown to light brownish-gray fine sandy loam in the upper part.

Pine and hardwood forest occupies about 55 percent of this association. The rest of the acreage is mainly farmland that extends from Rantowles Creek to the Edisto River. The farms are mostly 200 to 500 acres in size, but a few exceed 700 acres. They produce truck crops for the most part, but some livestock is raised, and some general farming occurs.

If they are adequately drained, most areas of the dominant soils are suited to farming. As sites for dwellings, recreational areas, or industrial buildings, the Yonges soils have moderate limitations, the Hockley soils have slight limitations, and the Edisto soils have moderate to severe limitations. The soils are suited to deer and wild turkey, but drainage is required in most areas used as quail habitats.

8. Bayboro-Wagram-Orangeburg-Quitman Association

Well-drained to very poorly drained, depressional to nearly level and gently sloping soils that have a loamy to sandy surface layer and a clayey to loamy subsoil

This association occurs on a low, broad ridge. It is dissected by drainageways that lead to wide, swampy streams bordered by short slopes. Most of this association is 30 to 50 feet above sea level, but the range of elevation is from 10 to 70 feet.

This association occupies about 4 percent of the county. Bayboro soils make up about 19 percent of it, Wagram soils 17 percent, Orangeburg soils 14 percent, and Quitman soils 10 percent. The remaining 40 percent is made up of Ardilla, Chastain, Craven, Dothan, Dunbar, Myatt, Norfolk, Portsmouth, and Rains soils.

Bayboro soils are very poorly drained, level to depressional soils. Typically, their surface layer is black sandy clay loam. Their subsoil is very dark gray sandy clay in the upper part and mottled gray, dark-gray, and strong-brown sandy clay loam in the lower part.

Wagram soils are well drained, nearly level to gently sloping soils on ridges. Their surface layer is thick and typically is very dark grayish-brown and dark-brown loamy fine sand. Their subsoil is yellowish-brown sandy clay loam that extends to a depth of 60 inches or more.

Orangeburg soils are well drained. They are nearly level to gently sloping soils on ridges and side slopes. Typically, their surface layer is dark-brown loamy fine sand. Their subsoil is yellowish-red fine sandy loam in the upper part, red fine sandy clay loam in the middle, and red, strong-brown, and pale-brown sandy clay loam to sandy loam in the lower part, which reaches a depth of about 48 inches.

Quitman soils are somewhat poorly drained. Typically, their surface layer is black loamy sand. The subsoil is light yellowish-brown fine sandy loam in the upper part. Under this is a fragipan of sandy clay loam that extends to a depth of about 29 inches. Below the fragipan is light-gray sandy clay loam that extends to a depth of about 56 inches.

Woodland, mostly land managed by the U.S. Forest Service, occupies about 85 percent of this association. The rest of the acreage is used mainly for general farming. Farms are mostly 100 to 250 acres in size, but a few exceed 400 acres. Some residential developments occur along the highways in the Ladson and Lincolnville areas.

Most of this association is fair to poor for farming. The soils have slight to severe limitations for engineering uses and for dwellings that require septic tanks. The better drained areas are suitable sites for planting food for wildlife.

9. Wadmalaw-Yonges-Stono-Meggett Association

Poorly drained to very poorly drained, level to nearly level soils that have a loamy to sandy surface layer and a loamy to clayey subsoil

Soils of this association occur on a low, swamplike plain and on islands of higher areas that separate and parallel major streams within the plain. The plain is less than 10 feet above sea level and the islands 5 to 10 feet higher. One such area is Iron Swamp in Francis Marion National Park; another extends from Caw Caw Swamp to the Edisto River.

This association occupies about 14 percent of the county. Wadmalaw soils, on the lowest areas and frequently covered by standing water, make up about 45 percent of it; Yonges soils, 2 to 3 feet higher in elevation and occasionally flooded, about 15 percent; and Stono and Meggett soils, about 20 percent. Cape Fear, Charleston, Edisto, Hockley, and Wagram soils make up the remaining 20 percent.

Wadmalaw soils are poorly drained on the surface and very slowly drained internally. They are loamy throughout, and typically their surface layer is black to very dark gray and their subsoil is dark gray.

Yonges soils are poorly drained, as their water table is at a depth of about 12 to 36 inches. Typically, their surface layer is dark grayish-brown loamy fine sand, and their subsoil is gray fine sandy clay loam and fine sandy clay.

Stono soils are very poorly drained. Typically, their surface and subsurface layers are black fine sandy loam.

Their subsoil is very dark gray fine sandy loam in the upper part and dark-gray fine sandy clay loam in the lower part.

Meggett soils are nonacid soils that are poorly drained. Typically, their surface layer is very dark grayish-brown loam, and their subsoil is gray and dark-gray clay loam and clay.

Pine and hardwood forest occupy more than 90 percent of this association. Most of it is managed by the U.S. Forest service. The rest of the acreage is used for general farming.

Most of the soils in this association, even if properly drained, are only poor to fair in suitability for farming. They have moderate to severe limitations for engineering uses and severe limitations for dwellings that require septic tanks. The low areas are well suited to hardwoods; higher areas and well-drained areas are suited to pines and to wildlife management. Some sites would be excellent if managed as fields for ducks.

10. Tidal Marsh Association

Marshy areas flooded by tidewater

This association occurs on level plains along the Atlantic coastline and inland along the tidal streams and rivers.

The association occupies 31 percent of the county. Tidal marsh, soft, at elevations 3 feet above to 3 feet below mean sea level, makes up 70 percent of the association, and Capers soils make up about 18 percent. Coastal beaches and Dune land and Crevasse, Dawhoo, Pamlico, and Rutlege soils make up the remaining 12 percent.

Tidal marsh, soft, is dark-gray to black or brown loam, clay, muck, or peat. It is covered by 6 to 24 inches of salt water at high tides, and it is constantly saturated with water. The content of organic matter is medium to high. The sulfur content is high, and if the land is drained and allowed to dry it becomes cat clay, which does not support plant growth.

Capers soils are dark-gray clay loams to silty clays that are high in content of organic matter. They are covered by sea water once a month or oftener. If they are allowed to dry, they become cat clay, which does not support vegetation.

This association is not suited to crops, improved pasture, or trees. Tidal marsh, soft, has a thick cover of tall, salt-tolerant grasses, and the Capers soils, a thick cover of salt-tolerant plants. Capers soils have sufficient bearing strength to support low dams and the traffic of animals. Tidal marsh, soft, has very low bearing strength and consequently is not suited to range management, duck ponds, fish ponds, or installation of dikes and other structures for management of water.

11. Mine Pits and Dumps-Made Land Association

Mined areas and Made land

This association is in areas that have been changed by phosphate mining, by land smoothing, and by land filling. The high, narrow ridges, the low hummocks, and the deep, water-filled troughs result from phosphate mining. The nearly level areas were made by land smoothing and by land filling, mainly as a part of urban development.

This association occupies about 2 percent of the county. The pits and dumps left by phosphate mining make up about 70 percent of the association, and Made land, the remaining 30 percent.

About 66 percent of this association, mainly on the land mined for phosphate, is wooded. Where drainage is adequate, phosphate left after mining encourages a good growth of pines. Most of the mined areas, however, are poorly drained.

Urban development has taken place mainly on those areas of smoothed or filled land that are moderately well drained.

How This Survey Was Made

This survey was made to learn what kinds of soils are in Charleston County, where they are located, and how they can be used. Soil scientists went into the county knowing they likely would find many soils they had already seen and perhaps some they had not. As they traveled over the county, they observed the steepness, length, and shape of slopes, the size and speed of streams, the kinds of native plants or crops, the kinds of rock, and many facts about the soils. They dug many holes to expose 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 that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The categories of their classification most used in a local survey are the *soil series* and the *soil phase.*

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Edisto and Kiawah, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Hockley loamy fine sand, 2 to 6 percent slopes, is one of several phases within the Hockley series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map in the back of this publication was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series, or of different phases within one series. Two such kinds of mapping units are shown on the soil map of Charleston County; soil complexes, and undifferentiated soil groups.

A soil complex consists of areas of two or more soils, so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. The name of a soil complex consists of the names of the dominant soils joined by a hyphen. Crevasse-Dawhoo complex, rolling, is an example.

An undifferentiated group is made up of two or more soils that could be delineated individually but are shown as one unit because, for the purpose of the soil survey, there is little value in separating them. The pattern and proportion of soils are not uniform. An area shown on the map may be made up of only one of the dominant soils, or of two or more. The name of an undifferentiated group consists of the names of the dominant soils, joined by "and." Dawhoo and Rutlege loamy fine sands is an example.

In most areas surveyed there are places where the soil material is so rocky, so shallow, or so severely eroded that it cannot be classified by soil series. These places are shown on the soil map and are described in the survey, but they are called land types and are given descriptive names. Coastal beaches and Dune land is a land type in Charleston County.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soils in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soils. Yields under defined management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in such a way as to be readily useful to different groups of users, among them farmers, managers of woodland and rangeland, and engineers.

On the basis of yield and practice tables and other data, the soil scientists set up trial groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others, then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

Descriptions of the Soils

In this section the soils of Charleston County are described in detail. The procedure is to describe first a soil series, and then the mapping units in that series. To get full information on any one mapping unit, it is necessary to read both the description of that unit and the description of the soil series to which it belongs.

The description of each soil series contains a short description of a typical soil profile and a much more detailed description of the same profile that scientists, engineers, and others can use in making highly technical interpretations.[1]

The descriptions of mapping units contain a brief discussion of the use of the mapping unit for crops, pasture, and woodland. Following the name of each mapping unit is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. At the end of the description of each mapping unit are listed the capability unit and woodland suitability in which the mapping unit has been placed. The page where each capability unit and woodland group is described can be found readily by referring to the "Guide to Mapping Units." The approximate acreage and proportionate extent of each mapping unit are shown in table 1.

Ardilla Series

The Ardilla series consists of somewhat poorly drained, nearly level, acid soils that are clayey in the major part of the subsoil.

In a typical profile the surface layer is black fine sandy loam about 3 inches in thickness. The subsurface layer is pale-brown fine sandy loam and is about 6 inches in thickness. The subsoil, which is about 37 inches in thickness, is light olive-brown fine sandy loam and clay loam in the upper part and gray sandy clay to clay in the lower part. The lower part contains 10 to 20 percent plinthite. Weak fragipans occur in the lower horizons. The substratum is light-gray and brownish-yellow sandy loam that contains pockets of sandy clay loam.

Available water capacity and infiltration are moderate in these soils, and permeability is slow. Surface runoff is slow. Content of organic matter is low, and the inherent fertility is moderate.

Most areas are wooded, but these soils are suited to cultivation and respond to good management.

Typical profile in woodland about 4 miles north of McClellanville on Mill Branch Road, 0.2 mile northeast of State Highway 45:

A1—0 to 3 inches, black (N 2/0) fine sandy loam; weak, fine, granular structure; friable; abundant fine and medium roots; pH 4.6; clear, wavy boundary.

A2—3 to 9 inches, pale-brown (10YR 6/3) fine sandy loam; common, fine, distinct, olive-brown mottles; weak, fine, granular structure; friable; abundant fine roots; pH 5.3; clear, smooth boundary.

B1t—9 to 12 inches, light olive-brown (2.5Y 5/4) fine sandy loam; common, fine, distinct, yellowish-brown mottles; weak, fine, subangular blocky structure; firm, slightly plastic, slightly sticky; patchy clay films on ped faces; few small pores; abundant fine roots; pH 5.0; clear, wavy boundary.

[1] In the technical descriptions of soil profiles, colors given are for a moist soil.

TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soil	Area	Extent	Soil	Area	Extent
	Acres	*Percent*		*Acres*	*Percent*
Bayboro sandy clay loam	5, 002	0. 8	Osier fine sand	1, 476	. 2
Cape Fear loam	2, 044	. 3	Pamlico muck	5, 102	. 8
Capers silty clay loam	31, 946	5. 3	Portsmouth fine sandy loam	1, 352	. 2
Charleston loamy fine sand	9, 604	1. 6	Quitman loamy sand	2, 632	. 4
Chastain soils	1, 716	. 3	Rains sandy loam	1, 913	. 3
Chipley loamy fine sand	31, 264	5. 2	Rutlege loamy fine sand	27, 595	4. 6
Coastal beaches and Dune land	6, 209	1. 0	Rutlege-Pamlico complex	2, 541	. 4
Craven fine sandy loam	593	. 1	St. Johns fine sand	11, 226	1. 9
Crevasse-Dawhoo complex, rolling	9, 537	1. 6	Santee clay loam	4, 722	. 8
Dawhoo and Rutlege loamy fine sands	15, 956	2. 6	Santee loam	7, 040	1. 2
Dunbar and Ardilla fine sandy loams, 0 to 2 percent slopes	2, 460	. 4	Scranton loamy fine sand	5, 430	. 9
Edisto loamy fine sand	14, 048	2. 3	Seabrook loamy fine sand	22, 060	3. 6
Faceville fine sandy loam, 2 to 6 percent slopes	664	. 1	Seewee complex	16, 192	2. 7
Hockley loamy fine sand, 0 to 2 percent slopes	19, 062	3. 2	Stono fine sandy loam	15, 786	2. 6
Hockley loamy fine sand, 2 to 6 percent slopes	1, 115	. 2	Tidal marsh, firm	1, 542	. 3
Kiawah loamy fine sand	18, 812	3. 1	Tidal marsh, soft	119, 990	19. 8
Lakeland sand, 0 to 6 percent slopes	10, 672	1. 8	Wadmalaw fine sandy loam	38, 656	6. 4
Leon fine sand	9, 595	1. 6	Wagram loamy fine sand, 0 to 6 percent slopes	8, 018	1. 3
Made land	3, 862	. 6	Wando loamy fine sand, 0 to 6 percent slopes	24, 194	4. 0
Meggett clay loam	9, 638	1. 6	Wicksburg loamy fine sand, 0 to 6 percent slopes	651	. 1
Meggett loam	3, 468	. 6	Yonges loamy fine sand	37, 627	6. 2
Mine pits and dumps	7, 564	1. 3	City of Charleston and adjoining urban areas	27, 748	4. 6
Myatt loam	617	. 1	Irrigation and farm ponds	985	. 2
Norfolk and Dothan soils, 0 to 2 percent slopes	1, 237	. 2			
Orangeburg loamy fine sand, 0 to 2 percent slopes	1, 448	. 2			
Orangeburg loamy fine sand, 2 to 6 percent slopes	2, 189	. 4	Total	604, 800	100. 0

B21t—12 to 16 inches, light olive-brown (2.5Y 5/4) clay loam; many, medium, faint, grayish-brown mottles, common, fine, distinct, yellowish-brown mottles, and few, fine, distinct, strong-brown mottles; moderate, medium to coarse, subangular blocky structure; firm, sticky, plastic; broken, distinct clay films on ped faces; few small pores; few fine roots; pH 4.8; clear, wavy boundary.

B22tg—16 to 25 inches, gray (10YR 5/1) sandy clay to clay; many, fine, distinct, brownish-yellow mottles and many, fine, prominent, red and dark-red mottles; 10 to 15 percent plinthite; moderate, medium, subangular blocky structure; firm, sticky, plastic; ped faces completely covered with clay films; few small pores; pH 4.9; clear, wavy boundary.

B23tg—25 to 46 inches, gray (5Y 6/1) clay; common, medium, distinct, brownish-yellow and red mottles; 15 to 20 percent plinthite; moderate, medium and fine, angular to subangular blocky structure; firm and brittle; clay films on ped faces; few small pores; pH 4.5; clear, smooth boundary.

C—46 to 60 inches, light-gray (10YR 7/2) and brownish-yellow (10YR 6/6) sandy loam; pockets of sandy clay loam; few, fine, prominent, red mottles; friable; pH 4.8.

The solum in most places is 36 to 46 inches in thickness, but in some it ranges from 30 to 50 inches. The A1 horizon is black to dark gray; the A2 horizon is pale brown to yellowish brown in hue of 10YR. In disturbed areas the Ap horizon ranges from 4 to 7 inches in thickness.

The B1 horizon ranges from light olive brown and light yellowish brown to yellowish brown in color and from 0 to 6 inches in thickness. The B2 horizon ranges from grayish brown and yellowish brown to light olive brown in the upper part and gray to light gray in the lower part. Mottles are few to many and fine to coarse in this horizon and are red, yellowish red, dark red, strong brown, and brownish yellow. The B3 horizon, which is not present in all places, is mainly gray but ranges from gray to grayish brown and is mottled with brownish yellow, yellowish brown, and strong brown. From 10 to 20 percent of the B horizon is plinthite.

All the acreage of Ardilla soils is mapped in an undifferentiated unit with Dunbar soils. The Ardilla soils differ from the Dunbar mainly in having plinthite in the lower part of the subsoil. The acreages of Ardilla and Dunbar soils mapped together are in areas where there are Hockley and Dothan soils, mainly near Ladson and McClellanville. The Ardilla soils are somewhat poorly drained, but Hockley and Dothan soils are moderately well drained.

Bayboro Series

The Bayboro series is made up of deep, acid soils that are fine textured in the major part of the subsoil. These soils are nearly level to depressional and are very poorly drained.

A typical Bayboro soil has a surface layer of black sandy clay loam about 16 inches in thickness. The subsoil, which is about 34 inches in thickness, is very dark-gray sandy clay in the upper part and mottled gray, dark-gray, and strong-brown sandy clay loam in the lower part.

Surface runoff is slow, and permeability is very slow. Water stands on the surface of these soils 4 to 8 months of the year.

Most areas of Bayboro soils are wooded. When adequately drained, however, they respond to good management and are suitable for pasture.

Typical profile of Bayboro sandy clay loam, 3½ miles northwest of Ravenel, 1¼ miles north of U.S. Highway 17, and 100 feet north of the dirt road:

A11—0 to 2 inches, black (N 2/0) sandy clay loam; moderate, fine to medium, granular structure; friable; many medium roots and holes; pH 5.1; clear, smooth boundary.

A12—2 to 16 inches, black (N 2/0) sandy clay loam; moderate, medium, granular structure; friable to firm; many small roots and holes; pH 5.2; clear, smooth boundary.

B2tg—16 to 39 inches, very dark gray (10YR 3/1) sandy clay; few, fine, distinct, yellowish-brown and brown mottles; moderate, medium, subangular blocky structure; firm;

thin patchy clay films on peds; abundant small roots; pH 4.7; clear, wavy boundary.

B3tg—39 to 50 inches, mottled gray (10YR 6/1), dark-gray (10YR 4/1), and strong-brown (7.5YR 5/6) sandy clay loam; moderate, medium, subangular blocky structure; friable to firm; thin, patchy clay films on peds; few small roots; pH 4.8.

The A horizon is 12 to 19 inches in thickness. The combined thickness of the A and B horizons ranges from 50 to 60 inches. The B2tg horizon ranges from clay to sandy clay in texture, and from black to gray in hue of 10YR.

Bayboro soils occur with Rutlege and Stono soils. They are more acid in the lower part of the subsoil than Stono soils. The Bayboro soils have a B horizon in which clay has accumulated in the lower part, whereas the Rutlege soils do not have a B horizon.

Bayboro sandy clay loam (Bc).—This is a nearly level to depressional, deep, very poorly drained soil that is clayey in the major part of the subsoil.

Small areas of Rutlege, Portsmouth, Rains, Cape Fear, and Santee soils are mapped within the boundaries of this soil. The combined extent of the included areas is less than 5 percent of the total acreage.

Most of the soil is now wooded, but rice was once grown on some of it. It is suited to pasture, but crops do not grow well because of the clayey subsoil, slow permeability, and very poor drainage. (Capability unit VIw–1; woodland suitability group 1w3)

Cape Fear Series

The Cape Fear series is made up of very poorly drained, acid soils that have a clay layer in the subsoil.

The surface layer of a typical Cape Fear soil is black loam about 12 inches in thickness. The subsoil, which is about 28 inches in thickness, is very dark gray clay loam to clay in the upper part and mottled light olive-gray clay loam in the lower part. The substratum is light olive-gray, grayish-brown, and greenish-gray sandy clay loam.

Surface runoff is slow, infiltration is moderate, and permeability is very slow in these soils. Water stands on the surface for several months at a time. Available water capacity is high.

Cape Fear soils are in the western part of the county and are mostly woodland. They are suited to cultivation when adequately drained, and they respond to good management.

Typical profile of Cape Fear loam in a wooded area 4,500 feet west of intersection of State Highway 165 and secondary road S–18–317 on County Line Road at Docham Crossroads:

A1—0 to 12 inches, black (10YR 2/1) loam; moderate, fine, granular structure; friable; pH 4.8; clear, wavy boundary.

B21tg—12 to 18 inches, very dark gray (10YR 3/1) clay loam; moderate, medium, subangular blocky structure; friable, slightly sticky, slightly plastic; pH 4.7; gradual, wavy boundary.

B22tg—18 to 31 inches, very dark gray (10YR 3/1) clay; few, fine, olive-brown mottles; moderate, medium, subangular blocky structure; plastic; pH 4.8; gradual, wavy boundary.

B3g—31 to 40 inches, light olive-gray (5Y 6/2) clay loam; few, medium, prominent, yellowish-red mottles and common, fine, prominent, strong-brown mottles; weak, medium, subangular blocky structure; friable, slightly sticky and slightly plastic; pH 4.5; gradual, wavy to irregular boundary.

Cg—40 to 50 inches+, light olive-gray (5Y 6/2), grayish-brown (2.5Y 5/2), and in places greenish-gray (5BG 6/1) sandy clay loam; very dark-gray sandy clay loam material filling root channels; massive; pH 4.7.

The A horizon ranges from black to very dark gray in color and from loam to clay loam in texture. It is 10 to 15 inches in thickness. The B horizon ranges from clay loam to clay and is 20 to 38 inches in thickness. The solum is 40 inches or less in thickness in most places.

Cape Fear soils occur with Rutlege and Stono soils. The clay accumulation in the B horizon of Cape Fear soils is not present in the sandy Rutlege soils. Cape Fear soils are very strongly acid throughout the B horizon, but Stono soils are strongly acid in the upper part of the B horizon and medium acid in the lower part.

Cape Fear loam (Cf).—This nearly level soil has a clayey layer in the subsoil.

Small areas of Rutlege, Santee, Portsmouth, Bayboro, and Rains soils are mapped within the boundaries of this soil. They total less than 8 percent of the total acreage.

Most of Cape Fear loam is woodland. Truck crops, corn, and pasture do well when this soil is adequately drained, fertilized, and managed. (Capability unit IIIw–2; woodland suitability group 1w3)

Capers Series

Soils of the Capers series formed in silty clay to silty clay loam sediments on tidal flats that are inundated by 2 to 6 inches of sea water once or more each month. They are very poorly drained and are saturated with salt water.

In a typical profile the surface layer is dark-gray silty clay loam about 5 inches in thickness. Below this to a depth of 50 inches is dark grayish-brown to dark-gray mainly silty clay. Strong, fine, angular blocky microstructure and prismatic macrostructure are present in all horizons when the soils are dry. Pale-yellow sulfur compounds are common on faces of the dry soil material.

Infiltration is moderate and permeability slow, as they are impeded by a high saline water table. Surface runoff is very slow. Available water capacity is moderate to high, inherent fertility is moderate, and organic-matter content is high. Reaction is medium to slightly acid when the soils are wet and extremely acid when they are drained. (Reaction is less than pH 4.0 after air drying for 30 days.)

Because of their salt and sulfur content, Capers soils are not suited to cultivation. They can be used for range pasture and wildlife, however.

Typical profile of Capers silty clay loam in a tidal marsh, one-eighth mile west of the Santee River and 8 miles east of McClellanville:

A1—0 to 5 inches, dark-gray (5Y 4/1) silty clay loam; weak, fine, granular structure; slightly sticky to sticky; few to many fine and medium roots; medium acid; gradual, wavy boundary.

C1g—5 to 18 inches, dark grayish-brown (2.5Y 4/2) silty clay to silty clay loam; massive, sticky; few to many fine and medium roots; slightly acid; gradual, wavy boundary.

C2g—18 to 50 inches, dark-gray (5Y 4/1) silty clay; massive; soft, sticky; few fine roots; slightly acid.

The A1 horizon ranges from very dark grayish brown to dark gray in hue of 2.5Y and 5Y, value of 3 and 4, and chroma of 2 or less. Its texture ranges from silt loam to silty clay loam.

The C1g horizon ranges from grayish brown to dark gray in hue of 2.5Y and 5Y, value of 4 or 5, and chroma of 2 or less. Texture in this horizon ranges from silty clay to silty clay loam. The C2g horizon ranges from dark gray to gray or greenish gray in color and from silty clay to clay in texture.

Capers soils occur with bordering areas and islands of Rutlege and Yonges soils. Capers soils are loamy and clayey, as opposed to the Rutlege soils that are sandy throughout. They lack the B horizon present in the Yonges soils. Also, Capers soils are saline, sulfureous, and covered by sea water once a month or oftener, but Rutlege and Yonges soils are neither saline nor sulfureous and are not covered by sea water.

Capers silty clay loam (Cg).—This soil formed in silty clay to silty clay loam sediments and occurs on tidal flats.

Areas of Yonges, Meggett, Rutlege, Scranton, and Edisto soils 2 to 8 acres in size are mapped within the boundaries of this soil. The combined extent of these inclusions is less than 2 percent of the total acreage. Also mapped within the boundaries are areas of Capers soil that have a loamy sand or muck surface layer and areas of Capers soil that have loamy sand, sand, or muck subsoil. The total of all these included areas is approximately 10 percent of the acreage of this Capers soil.

All Capers silty clay loam is in marsh grass. It is used for range pasture. It is not suited to crops and woodland, because of its salt and sulfur content. If this soil is drained it becomes so extremely acid that plants die. (Capability unit Vw-4; not classified in a woodland suitability group)

Charleston Series

Soils of the Charleston series have a sandy surface layer and a fine sandy loam subsoil. They are nearly level to gently sloping, acid, and moderately well drained to somewhat poorly drained.

The surface and subsurface layers of a typical soil in this series are loamy fine sand. The surface layer is dark brown, and the subsurface layer is yellowish brown. Each is about 8 inches in thickness. The subsoil is fine sandy loam and is about 28 inches in thickness. It is dark brown in the upper part. The lower part is yellowish brown and contains light brownish-gray, strong-brown, and yellowish-red mottles. The substratum is pale-brown and pale-olive fine sandy loam.

Charleston soils have moderately rapid infiltration, moderately rapid permeability, and moderate to low available moisture capacity. They are moderate to low in inherent fertility, low in organic matter, and strongly acid.

Charleston soils are suitable for cultivation and respond to good management. About equal parts of their acreage is used for forest and tilled crops.

Typical profile of Charleston loamy fine sand in a nearly level idle area 0.9 mile east of James Island Creek on the north side of Harbor View Road, James Island:

Ap—0 to 8 inches, dark-brown (10YR 3/3) loamy fine sand; weak, fine, granular structure; very friable; few, fine and medium, firm and hard, strong-brown to dark-brown concretions; pH 5.5; clear, smooth boundary.

A2—8 to 16 inches, yellowish-brown (10YR 5/4) loamy fine sand; weak, fine, granular structure; very friable; few fine roots; many fine pores; pH 5.3; clear, smooth boundary.

B21t—16 to 24 inches, dark-brown (7.5YR 4/4) fine sandy loam; weak, medium to coarse, subangular blocky structure; friable; patchy clay films on vertical ped faces; many fine and medium pores; few, fine, soft, dark-brown concretions; pH 5.2; clear, smooth boundary.

B22t—24 to 36 inches, yellowish-brown (10YR 5/4) fine sandy loam; common, medium, distinct, light brownish-gray mottles and few, fine, prominent, yellowish-red mottles; weak, medium, subangular blocky structure; friable; few patchy clay films on ped faces; many fine pores; few, fine, soft, dark-brown concretions in lower part; pH 4.8; gradual, wavy boundary.

B3—36 to 44 inches, yellowish-brown (10YR 5/6) fine sandy loam; common, medium, distinct strong-brown and light brownish-gray mottles; weak, medium, subangular blocky structure; friable; few fine pores; some fine, soft, dark-brown concretions; pH 4.5; gradual, wavy boundary.

C—44 to 52 inches+, pale-brown (10YR 6/3) and pale-olive (5Y 6/3) fine sandy loam; very friable; few fine pores; common, medium (15-25 mm.), very soft, strong-brown concretions; pH 4.5.

The Ap horizon ranges from 5 to 10 inches in thickness and from dark brown to very dark gray in hue 10YR. In areas not cultivated the A1 horizon is 3 to 5 inches thick. The A2 horizon ranges from 4 to 12 inches in thickness, from dark brown to yellowish brown or pale brown in color, and from loamy fine sand to fine sandy loam in texture. In plowed areas, the upper part of this horizon is mixed with the A1 horizon.

The B21t horizon is 8 to 16 inches thick and dark brown to yellowish brown. In places there are a few to common, fine to medium, faint to prominent, red and pale-brown mottles. The B22t horizon is 8 to 14 inches thick and yellowish brown to strong brown. In this horizon, mottles are few to common, fine to medium, faint to prominent, and strong brown, yellowish red, and pale brown.

The B3 horizon ranges from 0 to 8 inches in thickness, from yellowish brown to strong brown in color, and from sandy loam to loamy fine sand in texture. The fine sandy loam texture is most common. In this horizon, mottles are common to few, fine to medium, and prominent to faint. Their colors are yellowish red, strong brown, yellowish brown, and light brownish gray. The pH in this horizon ranges from 4.5 to 5.0.

The C horizon begins at a depth of 38 to 58 inches. Its texture ranges from sand to fine sandy loam. Mottles in this horizon are pale brown, strong brown, and yellowish brown.

Soils of the Charleston series occur with soils of the Hockley and Seabrook series. The subsoil of Charleston is coarser textured than that of the Hockley soils. Charleston soils have a fine sandy loam B horizon, but Seabrook soils do not contain a B horizon and are sandy throughout.

Charleston loamy fine sand (0 to 6 percent slopes) (Ch).—This is a nearly level to gently sloping, deep, sandy soil that has a moderately coarse textured subsoil.

Mapped within the boundaries of this soil are areas of Edisto, Yonges, and Hockley soils 1 to 4 acres in size and minor inclusions of Seabrook, Stono, and Kiawah soils. The combined extent of all inclusions is less than 8 percent of the total acreage.

Approximately 50 percent of Charleston loamy fine sand is in mixed pine and hardwood forest, 40 percent is in cropland and pasture, and 10 percent is residential. The principal crops are tomatoes, soybeans, snap beans, and cucumbers. The soil is easy to work but needs to be drained. (Capability unit IIw-2; woodland suitability group 1o1)

Chastain Series

The Chastain series consists of very poorly drained, level, acid soils that formed mainly in moderately fine textured stream deposits.

The surface layer of a typical soil in the Chastain series is silt loam about 7 inches in thickness. It is very dark grayish brown in the upper part and dark grayish brown in the lower part. Gray to very dark grayish-brown silty clay loam and clay loam underlie the surface layer.

Permeability is slow and surface runoff is very slow in Chastain soils, and stream overflow and ponding occur frequently. Low areas are under water most of the year. These soils are moderate in inherent fertility, low in organic-matter content, and moderate in available water capacity and infiltration.

Chastain soils occur along the Santee River, and hardwood forests grow on them. Because of frequent flooding, they are poorly suited to cultivation, although extensive areas of these soils were once used for rice production.

Typical profile of Chastain soils in level woodland about 8 miles north of McClellanville, 200 feet south of the county line, 100 feet east of Echaw Road, and 60 feet from Wambaw Creek:

A11—0 to 2 inches, very dark grayish-brown (10YR 3/2) silt loam; fine, granular structure; friable; numerous fine and medium roots; strongly acid; clear, smooth boundary.

A12—2 to 7 inches, dark grayish-brown (2.5Y 4/2) silt loam; weak, fine, granular structure; friable; common fine roots; strongly acid; clear, smooth boundary.

C1g—7 to 14 inches, gray (10YR 5/1) silty clay loam; common, fine, distinct, strong-brown mottles and few, fine, distinct, brown mottles; friable, slightly plastic, hard when dry; few fine pores and roots; strongly acid; gradual, smooth boundary.

C2g—14 to 42 inches, very dark grayish-brown (10YR 3/2) clay loam; massive; slightly plastic; numerous dead roots and other wood; strongly acid.

The A11 and A12 horizons of Chastain soils range from silt loam to loam in texture and from dark grayish brown to black in color in hue of 10YR and 2.5Y. In some locations the A1 horizon is the only A horizon. In others a buried A horizon may be present at depths of 40 inches or less.

The C1g horizon ranges from silty clay loam to clay loam in texture and from gray to very dark gray in color. The C2g horizon ranges from clay to clay loam in colors of very dark grayish brown to gray.

Chastain soils occur with Capers and Rutlege soils. They are upstream from the tidal marshes of Capers soils, and although they are frequently flooded, they are not covered by sea water once a month or more as the Capers soils are. Chastain soils typically have a much thinner surface layer than Rutlege soils. The Chastain soils typically are loamy throughout; the Rutlege soils are sandy throughout.

Chastain soils (Ck).—These are very poorly drained, level, acid soils that formed mainly in moderately fine textured stream deposits along the Santee River. The surface layer ranges from silt loam to loam.

Areas of Capers, Rains, and Meggett soils 3 to 7 acres in size are mapped within the boundaries of these soils. The combined extent of all inclusions is less than 10 percent of the total acreage.

The Chastain soils are wooded. They are poorly suited to cultivation because of the flooding hazard. Chastain soils close to the Santee River have a shallow profile underlain by very dark clay. Buried logs and charred wood are found in these soils in some places, and backwater areas may have a mucky surface. (Capability unit IVw-1; woodland suitability group 1w3)

Chipley Series

The Chipley series consists of nearly level, moderately well drained to somewhat poorly drained, deep, acid soils that are sandy throughout.

A typical soil in the Chipley series has a very dark gray loamy fine sand surface layer about 6 inches in thickness. Below this is yellowish-brown loamy fine sand. As depth below the surface layer increases, the sandy material becomes coarser, and color changes to light yellowish brown. Then, below a depth of about 40 inches, it becomes light brownish-gray sand.

Available water capacity, inherent fertility, and organic-matter content are low in Chipley soils. Infiltration and permeability are rapid, but are impeded by a fluctuating water table. Surface runoff is slow.

Although Chipley soils can be used for cultivation, they require superior management for crop production.

Typical profile in nearly level woodland on dirt road, one-fourth mile southeast of County Line Road No. 317, 8 miles north-northwest of Ravenel, and 1¼ miles east of Dorham Crossroads:

A1—0 to 6 inches, very dark gray (10YR 3/1) loamy fine sand; weak, fine, granular structure; very friable; many fine roots and few medium roots; few small pores; pH 5.1; clear, wavy boundary.

C1—6 to 10 inches, yellowish-brown (10YR 5/4) loamy fine sand; weak, fine, granular structure; very friable; abundant small and medium roots; pH 5.2; gradual, wavy boundary.

C2—10 to 24 inches, light yellowish-brown (2.5Y 6/4) loamy sand; common, medium, faint, yellowish-brown and a few, fine, distinct, brownish-yellow mottles; weak, fine, granular structure; loose; few small and medium roots; pH 5.0; gradual, wavy boundary.

C3—24 to 40 inches, light yellowish-brown (2.5Y 6/4) loamy sand; few, medium, faint, light brownish-gray mottles and few, medium, distinct, strong-brown mottles; single grain; loose; few small roots and pores; pH 5.1.

C4—40 to 50 inches, light brownish-gray (3.5Y 6/2) sand; few, medium, yellow and few strong-brown mottles; single grain; loose; few small roots and pores; pH 5.6.

The A1 horizon ranges from loamy fine sand to loamy sand in texture and from very dark gray to dark gray, or occasionally to black, in color. It is 4 to 8 inches in thickness.

The C1 horizon ranges from light yellowish brown to dark yellowish brown in hue of 10YR, value of 4 to 6, and chroma of 2 to 4. The texture of this horizon ranges from light yellowish brown to yellowish brown in color and from loamy fine sand to fine sand in texture. The C3 horizon ranges from yellowish brown to very pale brown and has few to common strong-brown, yellowish-brown, light brownish-gray, or light-gray mottles. The texture of this horizon ranges from loamy fine sand to sand. The C4 horizon is sand; it ranges from light gray to light brownish gray and has few to common yellow and strong-brown mottles.

Chipley soils occur with Rutlege and Seewee soils. They are better drained and have a much thinner surface layer than Rutlege soils. They are yellowish brown in the upper part of the C horizon instead of grayish brown as in Seewee soils.

Chipley loamy fine sand (Cm).—This is a deep, nearly level, moderately well drained to somewhat poorly drained soil that is sandy throughout.

Mapped within the boundaries of this soil are areas of Lakeland, Scranton, Rutlege, and Seewee soils 1 to 4 acres in size. The combined extent of these included areas is less than 7 percent of the total acreage.

This soil is very friable and easy to work. Most areas are wooded. The cleared areas are used for tomatoes, cucumbers, corn, and soybeans. (Capability unit IIIw–1; woodland suitability group 3o1)

Coastal Beaches and Dune Land

Coastal beaches and Dune land (Co) consist of sandy shoreline and sand dunes that border the Atlantic Ocean. The shoreline areas are nearly level fine sand beaches that are flooded twice daily by ocean tides. The dunes, which are formed by wind, are mounded areas of dry, loose, very pale brown to yellow sand.

The available water capacity is very low in this land type. Content of organic matter and inherent fertility are also very low.

Protective plant cover is sparse or lacking, and sand is removed by wind the year around. Storms and hurricane tides often erode the shoreline and dunes. Water erosion of the beaches and wind erosion of the dunes are constant problems that are expensive to control. Jetties are built in some places to stabilize the beaches. Windbreaks of American beachgrass, Seaoats, and Tamarix can be used to hold the dry sand in place.

This land type is used heavily in the summer by bathers. It is not suited to cultivation, and it is poorly suited to the development of such recreational facilities as parks, golf courses, roads, buildings, and camps. (Capability unit VIIIs–1; not classified in a woodland suitability group)

Craven Series

The Craven series consists of deep, moderately well drained to somewhat poorly drained, acid soils that are clayey in the major part of the subsoil.

A typical Craven soil has a dark-gray fine sandy loam surface layer about 3 inches in thickness and a pale-brown fine sandy loam subsurface layer about 6 inches in thickness. The subsoil to a depth of about 56 inches is mainly yellowish-brown clay in the upper part, light olive-brown and gray clay in the middle part, and brownish-yellow fine sandy clay loam in the lower part.

Infiltration is moderate, permeability is slow, and available water capacity is moderate. Surface runoff is slow. Organic-matter content is low, and inherent fertility is moderate.

Most areas of Craven soils are wooded, but they are suited to cultivation and respond to good management.

Typical profile in wooded area on South Carolina Highway 45, 150 yards south of Mechaw Creek and 4 miles north of McClellanville:

A1—0 to 3 inches, dark-gray (10YR 4/1) fine sandy loam; weak, fine, granular structure; friable; abundant fine roots; pH 5.1; clear, smooth boundary.

A2—3 to 9 inches, pale-brown (10YR 6/3) fine sandy loam; few, fine, faint, light yellowish-brown mottles; weak, fine, granular structure; friable; abundant fine roots; pH 5.4; clear, smooth boundary.

B1—9 to 12 inches, light yellowish-brown (10YR 6/4) loam; weak, fine, subangular blocky structure; friable; abundant fine roots; pH 5.1; clear, wavy boundary.

B21t—12 to 18 inches, yellowish-brown (10YR 5/6) clay; common, fine, prominent, red mottles and few, fine, distinct, strong-brown mottles; moderate, medium, subangular blocky structure; firm, sticky, slightly plastic; shiny ped faces; few fine roots; pH 5.0; clear, wavy boundary.

B22t—18 to 24 inches, yellowish-brown (10YR 5/6) clay; common, fine, prominent, red mottles and few, fine, distinct, light brownish-gray and strong-brown mottles; moderate, fine and medium, subangular blocky structure; firm, sticky, plastic; shiny ped faces; few fine roots; pH 5.0; gradual, wavy boundary.

B23t—24 to 30 inches, light olive-brown (2.5Y 5/4) clay; many, fine, prominent, red mottles, common, fine, distinct, light brownish-gray mottles, and few, fine, distinct, strong-brown mottles; moderate, fine and medium, subangular blocky structure; firm, sticky, plastic; discontinuous clay films on ped faces; common small pores and root holes; pH 4.8; gradual, wavy boundary.

B24tg—30 to 44 inches, gray (10YR 6/1) clay; many, fine and medium, prominent, red mottles, few, fine, distinct, light brownish-gray mottles, and common, fine, distinct, strong-brown mottles; weak to moderate, medium to coarse, subangular blocky structure; very firm, sticky, plastic; broken, continuous clay films on ped faces; pH 4.5; clear, wavy boundary.

B3t—44 to 56 inches, brownish-yellow (10YR 6/6) fine sandy clay loam; common, medium to coarse, distinct, light-gray mottles and few, fine, distinct, strong-brown mottles; massive; firm, slightly sticky, slightly plastic; pH 4.8.

The A horizon ranges from sandy loam to fine sandy loam in texture. The A1 horizon is dark gray to very dark gray, and the A2 is light yellowish brown to pale brown. The A1 horizon is 2 to 5 inches in thickness.

The B2t horizon ranges from clay to clay loam but is predominantly clay. Colors in this horizon range from light yellowish brown to light olive brown and gray, with mottles of red, yellowish red, strong brown, and olive brown. The B3t horizon ranges from clay to fine sandy clay loam in texture; its color is gray to brownish yellow, with strong-brown, yellowish-brown, and light-gray mottles.

Craven soils occur with Faceville, Myatt, and Dunbar soils. They are not so well drained as Faceville soils, but are better drained than the Myatt soils or the Dunbar soils.

Craven fine sandy loam (0 to 6 percent slopes) (Cr).—This is a deep, nearly level to gently sloping, moderately well drained to somewhat poorly drained soil that is clayey in the subsoil.

Included with this soil in mapping were areas of Faceville, Dunbar, Myatt, and Wagram soils that together make up less than 5 percent of the acreage. The areas of Faceville, Dunbar, and Myatt soils are 2 to 4 acres in size, and those of Wagram soils are 1 to 3 acres.

About 75 percent of this soil is wooded. The rest is in crops or pasture or is idle. The principal crops are corn, small grains, soybeans, and tame grasses for pasture. (Capability unit IIw–5; woodland suitability group 3o1)

Crevasse Series

The Crevasse series consists of excessively drained, gently sloping to moderately steep, sandy soils that occur on long, narrow ridges.

A typical Crevasse soil has a grayish-brown fine sand surface layer about 6 inches in thickness. Below this and extending to a depth of about 60 inches is brownish-yellow to very pale brown fine sand that is slightly acid to neutral.

Infiltration and permeability are rapid in Crevasse soils, and the available water capacity is low. Content of organic matter and inherent fertility are low.

About 90 percent of the acreage is wooded. The rest is used for residential purposes.

Typical profile of Crevasse soil on Oak Island, 0.8 mile north of Folly Beach and 0.5 mile east of South Carolina Highway 171:

A1—0 to 6 inches, grayish-brown (10YR 5/2) fine sand; structureless; loose; many, fine, medium and coarse roots; pH 5.3; clear, smooth boundary.
C1—6 to 36 inches, brownish-yellow (10YR 6/6) fine sand; loose; few fine roots in upper 10 inches of horizon; pH 6.4; gradual, wavy boundary.
C2—36 to 60 inches, very pale brown (10YR 7/4) fine sand; loose; neutral.

The upper part of the C horizon is fine sand that ranges from very pale brown to dark yellowish brown in hue of 10YR, value of 4 to 7, and chroma of 3 to 6. The lower part ranges from very pale brown to white and has a few pale-olive to dark-brown mottles in places.

Since Crevasse soils are intricately mixed with Dawhoo soils, the two are mapped together as the Crevasse-Dawhoo complex. The complex occurs with Chipley and St. Johns soils. The Crevasse soils are excessively drained, as compared to the very poorly drained Dawhoo, the moderately well drained to somewhat poorly drained Chipley, and the poorly drained St. Johns soils. The complex does not contain the organic hardpan that is present in the St. Johns soils.

Crevasse-Dawhoo complex, rolling (0 to 15 percent slopes) (CvC).—Crevasse soils make up about 55 percent of the acreage of this complex, and Dawhoo about 35 percent. The soils occupy a ridge-and-trough landscape bordering the Atlantic Ocean. The Crevasse soils are excessively drained, sandy soils on the long, narrow ridges. Ridges are 25 to 60 feet in width, 5 to 15 feet in height, and 200 to over 1,000 feet in length. Side slopes of the ridges range from 5 to 15 percent.

The Dawhoo soils are level to depressional, very poorly drained, sandy soils in narrow troughs between the ridges. These troughs are 10 to 40 feet in width and from 300 to 1,000 feet in length.

In a typical Crevasse profile, the surface layer is grayish-brown fine sand, which is underlain by brownish-yellow to very pale brown fine sand. In a typical Dawhoo profile, the surface layer is black loamy fine sand in the upper part and very dark grayish-brown loamy fine sand in the lower part. The underlying material is dark grayish-brown loamy fine sand to greenish-gray and gray sand.

Crevasse and Dawhoo soils have similar characteristics. Each has rapid infiltration and rapid permeability, low available water capacity, low content of organic matter, and low inherent fertility. The Crevasse soils, however, do not have a water table at the surface several months of the year. Dawhoo soils have such a water table. It impedes infiltration and permeability, and the surface is frequently ponded.

Areas of St. Johns, Kiawah, and Seabrook soils are mapped within the boundaries of the complex. The combined extent of these included soils is about 10 percent of the total acreage.

Soils of the complex are not suited to cultivation. They can be used for range pasture and recreation, and they are satisfactory for residences if they are leveled and smoothed. About 90 percent of this complex is wooded. The rest is used for residential purposes. (Capability unit VIIs-1; woodland suitability group 4s2)

Dawhoo Series

The Dawhoo series consists of very poorly drained, slightly acid, sandy soils. These nearly level to depressional soils occur in narrow troughs between ridges.

The surface layer of a typical Dawhoo soil is loamy fine sand and is about 18 inches in thickness. It is black in the upper part and very dark grayish brown in the lower part. Below this layer, to a depth of about 52 inches, is dark grayish-brown to light brownish-gray loamy fine sand to sand.

In the Dawhoo soils infiltration and permeability are rapid, but both are impeded several months of the year when the water is at the surface. These soils are low in available water capacity.

About 90 percent of the acreage of these soils is wooded. The rest is used for residences. Although Dawhoo soils are not suited to cultivation, they can be used for range pasture and recreation.

Typical profile of Dawhoo soil on Johns Island, three-fourths mile south of County Road 20 and Andell Creek bridge intersection and 1 mile west of Kiawah River:

Ap—0 to 11 inches, black (10YR 2/1) loamy fine sand; weak, fine, granular structure; very friable; numerous grains of shiny quartz; high organic-matter content; slightly acid; abrupt, smooth boundary.
A12—11 to 18 inches, very dark grayish-brown (10YR 3/2) loamy fine sand; structureless to weak, fine, angular blocky structure; high organic-matter content; slightly acid; gradual, smooth boundary.
C1—18 to 30 inches, dark grayish-brown (10YR 4/2) loamy fine sand; single grain; slightly acid; gradual, smooth boundary.
C2—30 to 52 inches, light brownish-gray (10YR 6/2) fine sand; single grain; numerous grains of shiny quartz; slightly acid; free water in places; clear, smooth boundary.
C3—52 to 60 inches, greenish-gray (5GY 6/1) to gray sand with common, medium, prominent, yellowish-brown mottles; shiny quartz crystals in places and many dark-colored minerals; slightly acid.

The A horizon is mainly loamy fine sand but in a few places is fine sand. The Ap horizon is black or very dark gray. The A12 horizon is mainly very dark grayish brown but ranges from very dark gray to very dark brown in hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The C1 horizon is mainly loamy fine sand but ranges from loamy fine sand to sand. Its color ranges from dark grayish brown to very dark grayish brown in hue of 10YR, value of 3 or 4, and chroma of 2. The C2 horizon is fine sand to loamy fine sand and is very dark grayish brown to light brownish gray in hue of 10YR, value of 3 to 6, and chroma of 1 or 2. The C3 horizon is sand to fine sand and is greenish gray (5GY) and gray (10YR), value of 5 or 6, and chroma of 1. Firm to hard dark-brown concretions are few to common in some places.

The troughs that the Dawhoo soils occupy range from 10 to 40 feet in width and from 300 to 1,000 feet in length.

Since the Dawhoo soils are intricately mixed with the Crevasse soils, the two are mapped together as the Crevasse-Dawhoo complex. (See Crevasse series.) The Dawhoo soils are very poorly drained, as compared to the excessively drained Crevasse soils. They have a water table at the surface several months of the year that the Crevasse soils do not have. The Dawhoo soils also occur with the Rutlege soils, and in these instances the two kinds of soils are mapped as Dawhoo and Rutlege loamy fine sands.

Dawhoo and Rutlege loamy fine sands (Da).—These are nearly level, poorly to very poorly drained, sandy soils. Any delineated area may be Dawhoo, Rutlege, or some combination of the two.

The Dawhoo soil has a black to very dark grayish-brown loamy fine sand surface layer underlain by very dark grayish-brown to gray sandy material. The Rutlege soil has a black to very dark brown loamy fine sand surface layer underlain by very dark brown to gray sandy material.

Areas of Seewee, Chipley, St. Johns, Leon, and Scranton soils 1 to 8 acres in size are mapped within the boundaries of these soils. The combined extent of the included areas is less than 7 percent of the total acreage.

About 80 percent of the acreage of these soils is wooded. The principal crops are pasture grasses. Intensive drainage and management are needed. (Capability unit Vw–2; woodland suitability group 2w3)

Dothan Series

The Dothan series consists of moderately well drained, level and nearly level, acid soils that have a clayey layer in the subsoil. The lower part of the subsoil contains 10 to 30 percent plinthite.

The surface layer of a typical Dothan soil is very dark gray and grayish brown in color and about 5 inches in thickness. The subsurface layer is pale brown in color and about 10 inches in thickness. Both of these layers are fine sandy loam. The subsoil, which is about 40 inches in thickness, is light yellowish-brown and pale-brown sandy clay loam and clay loam in the upper part, light brownish-gray, brittle fine sandy clay in the middle part, and gray sandy clay loam in the lower part. Both the upper and the lower part of the subsoil are mottled. The middle and lower parts contain about 15 percent plinthite.

Available water capacity is moderate in Dothan soils. Infiltration is moderate, and permeability is moderately slow. Surface runoff is slow in these soils. They are low in content of organic matter and moderate in inherent fertility.

Dothan soils are suited to cultivation and respond to good management.

Typical profile in nearly level woodland about 3 miles north of McClellanville, 0.3 mile south of Elmwood Road, and 200 yards northwest of the spur road:

A11—0 to 2 inches, very dark gray (10YR 3/1) fine sandy loam; weak, fine, granular structure; very friable; abundant fine and medium roots; pH 5.0; clear, wavy boundary.

A12—2 to 5 inches, grayish-brown (2.5Y 5/2) fine sandy loam; many, fine and medium, distinct to faint, very dark gray and very dark grayish-brown mottles; weak, fine, granular structure; very friable; abundant fine and medium roots; pH 5.3; clear, smooth boundary.

A2—5 to 15 inches, pale-brown (10YR 6/3) fine sandy loam; few, fine, faint, yellowish-brown mottles in lower 4 inches; weak, fine, granular structure; friable; few fine roots; pH 5.3; clear, wavy boundary.

B21t—15 to 20 inches, light yellowish-brown (10YR 6/4) sandy clay loam; common, fine and medium, faint, yellowish-brown mottles and few, fine, distinct, strong-brown and red mottles; moderate, fine, subangular blocky structure; friable; faint, distinct, patchy clay films on ped faces; few fine roots; pH 5.2; clear, wavy boundary.

B22t—20 to 29 inches, pale-brown (10YR 6/3) clay loam; many, fine and medium, prominent, red mottles and few, fine, faint, brownish-yellow mottles; moderate, medium, subangular blocky structure; firm, sticky and plastic when wet; distinct patchy clay films on ped faces; few fine roots; about 5 percent plinthite; pH 5.1; clear, wavy boundary.

B23t—29 to 40 inches, light brownish-gray (2.5Y 6/2) fine sandy clay; many, medium, prominent, red mottles and common, fine, distinct, yellowish-brown and brownish-yellow mottles; moderate, medium, subangular blocky structure; firm, brittle; distinct patchy clay films on ped faces; about 15 percent plinthite; pH 5.0; gradual, wavy boundary.

B3tg—40 to 56 inches, gray (10YR 6/1) sandy clay loam; common, medium, prominent, red mottles and distinct brownish-yellow and yellowish-brown mottles; weak to moderate, medium, subangular blocky structure; firm, brittle; distinct patchy clay films on ped faces; about 15 percent plinthite; pH 5.1; gradual, wavy boundary.

Cg—56 to 68 inches+, gray (10YR 6/1) sandy clay loam; many, medium, distinct, yellowish-brown mottles and common, fine, prominent, red and strong-brown mottles; massive; friable; pH 5.2.

The solum ranges from 45 to 66 inches in thickness. Depth to the first layer containing plinthite ranges from 20 to 35 inches. The A horizon is predominantly fine sandy loam but in a few areas this horizon is loamy fine sand. In cultivated areas the Ap horizon is 6 to 8 inches in thickness and is a mixture of the A1 horizon and the upper A2 horizon. The A1 horizon is very dark gray to grayish brown in hue of 10YR and 2.5Y.

A B1 horizon occurs in some areas. It is fine sandy loam to sandy clay loam that is light yellowish brown to yellowish brown in hue of 10YR. The B21t horizon is sandy clay loam to fine sandy clay loam that is light yellowish brown to yellowish brown in hue of 10YR. The B22t horizon is clay loam to sandy clay in texture and yellowish brown to pale brown in color. Red, strong-brown, and brownish-yellow mottles occur in this horizon. The B3tg horizon is sandy clay loam to sandy clay. Color is gray in hue of 10YR. Red, brownish-yellow, and yellowish-brown mottles occur.

Dothan soils are mapped only in undifferentiated units with Norfolk soils. They are in areas where there are Dunbar and Portsmouth soils. Dothan soils are not so well drained as Norfolk soils but are better drained than Dunbar and Portsmouth soils. The subsoil in a Dothan soil is not so gray as the subsoil in a Portsmouth soil. Plinthite occurs in Dothan soils but not in the Norfolk, Dunbar, or Portsmouth soils.

Dunbar Series

The Dunbar series consists of somewhat poorly drained, nearly level, acid soils that have a clayey layer in the subsoil.

In a typical profile the surface layer is black fine sandy loam about 3 inches in thickness. The subsurface layer is light brownish-gray fine sandy loam about 6 inches in thickness. The subsoil, which extends to a depth of about 60 inches, is sandy clay loam to sandy clay. It is light yellowish brown to grayish brown in the upper part, light brownish gray and gray in the middle part, and mottled strong brown, gray, and red in the lower part.

Available water capacity and infiltration are moderate in Dunbar soils, and permeability is moderately slow. Surface runoff is slow. The content of organic matter is low in these soils, and inherent fertility is moderate.

Most of the acreage is wooded, but these soils are suited to cultivation and respond to good management.

Typical profile on a logging road about 3 miles north of McClellanville, 0.2 mile south of Mill Branch Road, and 0.2 mile southwest of Mill Branch Creek:

A1—0 to 3 inches, black (10YR 2/1) fine sandy loam; weak, fine, granular structure; friable; many fine roots; pH 4.9; clear, smooth boundary.

A2—3 to 9 inches, light brownish-gray (2.5Y 6/2) fine sandy loam; few, fine, faint, light olive-brown (2.5Y 5/4) mottles; weak, fine, granular structure; friable; many fine roots; pH 5.4; clear, smooth boundary.

B1t—9 to 12 inches, light yellowish-brown (2.5Y 6/4) sandy clay loam; common, fine, faint, light olive-brown (2.5Y 5/4) and yellowish-brown (10YR 5/6) mottles; weak, fine, subangular blocky structure; friable; faint patchy clay films on ped faces; pH 5.1; clear, smooth boundary.

B21tg—12 to 18 inches, grayish-brown (2.5Y 5/2) sandy clay; common, fine, distinct, yellowish-brown (10YR 5/6) and red (2.5YR 4/8) mottles; moderate, fine, subangular blocky structure; friable; sticky, plastic; few small pores; distinct clay films cover ped faces; pH 5.0; clear, smooth boundary.

B22tg—18 to 28 inches, light brownish-gray (2.5Y 6/2) sandy clay; common, fine and medium, distinct to prominent, yellowish-brown and red mottles; moderate, fine and medium, subangular blocky structure; friable, sticky, plastic; distinct clay films cover ped faces; few small pores and root holes; pH 4.9; clear, wavy boundary.

B23tg—28 to 42 inches, gray (5Y 6/1) sandy clay loam; common, medium, prominent, strong-brown (7.5YR 5/8) mottles and few, fine, prominent, red mottles; weak to moderate, subangular blocky structure; friable, slightly sticky, slightly plastic; faint patchy clay films on vertical ped faces; pH 5.0; gradual, wavy boundary.

B24tg—42 to 50 inches, mottled strong-brown, gray, and red sandy clay loam; massive; friable, slightly sticky, slightly plastic; pH 5.0; clear, wavy boundary.

B3g—50 to 60 inches+, strong-brown (7.5Y 5/8) sandy clay loam; common, fine, prominent, gray (5Y 6/1 and 10YR 6/1) and brownish-yellow (10YR 6/6) mottles; massive; friable, slightly sticky, slightly plastic; pH 4.9; few small pockets of sandy loam.

The solum is more than 50 inches in thickness. The A1 horizon ranges from black to very dark gray, and the A2 horizon is grayish brown and light brownish gray to yellowish brown.

The B1 horizon ranges from fine sandy loam to sandy clay loam. It is grayish brown to light yellowish brown, mainly in the 2.5Y and 10YR hue, and is mottled with yellowish brown, red, or light olive brown. The B21tg horizon ranges from clay loam to clay, and from grayish brown to light yellowish brown in the 2.5Y and 10YR hue. The B22tg horizon is brownish-yellow to gray sandy clay loam to clay. Mottles in this horizon are red, gray, and yellowish brown. The B3g horizon is strong-brown or gray sandy clay loam mottled with red, brownish yellow, or yellowish brown.

Dunbar soils are mapped only with Ardilla soils. The Dunbar soils do not have plinthite in the lower subsoil, but the Ardilla soils do. These soils occur with Hockley and Dothan soils. They are somewhat poorly drained, and Hockley and Dothan soils are moderately well drained.

Dunbar and Ardilla fine sandy loams, 0 to 2 percent slopes (DdA).—These are nearly level, somewhat poorly drained soils that have a clayey layer in the subsoil. Any delineated area may be Dunbar, Ardilla, or a combination of the two.

The Dunbar soil has the profile described as typical for the series. In a typical Ardilla profile the surface layer is black fine sandy loam and the subsurface layer is pale-brown fine sandy loam. The subsoil is light olive-brown fine sandy loam in the upper part and light olive-brown and gray clay loam to clay in the lower part. The lower part is 10 to 20 percent plinthite. The substratum is light-gray and brownish-yellow sandy loam that contains pockets of sandy clay loam.

Areas of Craven, Myatt, and Dothan soils 1 to 7 acres in size are mapped within the boundaries of these soils. The combined extent of the included areas is less than 7 percent of the total acreage.

Most areas are woodland. Corn, soybeans, small grains, and snap beans are the principal crops grown in cultivated areas. (Capability unit for Dunbar soil is IIw-2 and woodland suitability group is 2w2; capability unit for Ardilla soil is IIIw-6 and woodland suitability group is 2w2)

Edisto Series

The Edisto series consists of nearly level, somewhat poorly drained, sandy, acid soils that have a loamy subsoil.

The surface layer of a typical Edisto soil is very dark grayish-brown loamy fine sand about 10 inches in thickness. The subsurface layer is pale-brown loamy fine sand about 4 inches in thickness. The upper part of the subsoil is light olive-brown to light brownish-gray fine sandy loam. The lower part begins as gray to light brownish-gray loamy fine sand, which overlies a weakly expressed fragipan of slightly brittle, mottled fine sandy loam to sandy clay loam. At its lowest depth the subsoil is light-gray fine sand. The fragipan begins at a depth of about 36 inches and extends to a depth of about 70 inches.

Edisto soils have a moderately low available water capacity. They have rapid infiltration and moderately rapid permeability, which are impeded by a high water table. Surface runoff is slow. These soils are moderate to high in inherent fertility and low in content of organic matter.

Most areas of Edisto soils are cultivated. These soils respond well to good management, are friable, and are well suited to cultivation.

Typical profile in a cropped area on the north side of the field road, 1½ miles southeast of Hollywood, 650 feet south of the Seaboard Coast Line Railroad, and 950 feet west of County Road 79:

Ap—0 to 10 inches, very dark grayish-brown (10YR 3/2) loamy fine sand; weak, fine, granular structure; very friable; few, fine, firm, dark reddish-brown concretions; pH 5.5; clear, smooth boundary.

A2—10 to 14 inches, pale-brown (10YR 6/3) loamy fine sand; weak, fine, granular structure; very friable; few, fine, firm concretions; pH 5.0; clear, wavy boundary.

B—14 to 19 inches, light olive-brown (2.5Y 5/4) fine sandy loam; common, fine, distinct, yellowish-brown mottles; weak, medium, subangular blocky structure; friable; many fine and medium root channels with strong-brown stains around larger pores; common, medium, firm concretions; pH 5.0; gradual, wavy boundary.

B & A'2—19 to 27 inches, light brownish-gray (10YR 6/2) fine sandy loam; common, medium, faint, yellowish-brown mottles and many, medium, faint, brown mottles; weak, medium, subangular blocky structure; friable; many fine root channels stained strong brown; few, fine, firm concretions; pH 5.5; gradual, wavy boundary.

A'2—27 to 36 inches, light brownish-gray (10 YR 6/2) to gray (10YR 6/1) loamy fine sand; common, fine, brown mottles; structureless; many brown-stained root channels; brittle, very friable; few, small, irregularly shaped, soft, reddish-brown concretions; few very fine vesicular pores; pH 5.5.

B'x1—36 to 50 inches, mottled pale-brown (10YR 6/3), yellowish-brown (10YR 5/6) and gray (10YR 6/1) fine sandy loam; moderate, medium, subangular blocky structure; brittle, friable; few brown-stained root channels; few clay films; tongues of A'2 horizon penetrate this horizon; pH 5.1; gradual, wavy boundary.

B'x2—50 to 62 inches, mottled light-gray (10YR 7/1) and strong-brown (7.5YR 5/8) fine sandy loam; moderate, medium, subangular blocky structure; brittle, very friable; tongues of A'2 horizon penetrate this horizon; clay films on ped faces; pH 4.6; gradual, wavy boundary.

B'x3—62 to 70 inches, mottled brownish-yellow (10 YR 6/8), light brownish-gray (2.5Y 6/2), strong-brown (7.5YR 5/8), and light-gray (2.5Y 7/2) fine sandy clay loam; moderate, medium, subangular blocky structure; brittle, friable; tonges of A'2 horizon in this horizon; clay film on ped faces; pH 4.5; gradual, wavy boundary.

B3—70 to 84 inches, light-gray (2.5Y 7/2) fine sand; common, fine, distinct, strong-brown (7.5YR 5/8) mottles; very friable, brittle; pH 4.6.

The Ap horizon ranges from 7 to 11 inches in thickness. Texture ranges from loamy fine sand to fine sandy loam but is mostly loamy fine sand. Colors are dark gray, very dark gray, dark grayish brown, or very dark grayish brown in hue of 10YR, value of 3 or 4, and chroma of 1 or 2. The A1 horizon is 4 to 8 inches in thickness. Color is the same in it as it is in the Ap horizon. Color in the A2 horizon is mostly pale brown but ranges to dark brown and light brownish gray in hue of 10YR and 2.5Y, value of 3 to 6, and chroma of 2 or 3. Texture in this horizon ranges to fine sandy loam but is dominantly loamy sand.

The upper part of the B horizon is fine sandy loam or light sandy clay loam. Color is light olive brown, yellowish brown, or grayish brown to dark grayish brown in hue of 10YR and 2.5Y, value of 4 or 5, and chroma of 2 to 6. Mottles in this layer are few to common, fine to medium, and faint to distinct in brownish colors. In places there are a few, fine, gray mottles. Although clay content is greater in the upper part of the B horizon than in the A horizon, the upper B horizon is not clay enriched. Depth to the fragipan ranges from 20 to 40 inches. In the B & A'2 horizon the B material is brown or yellowish-brown fine sandy loam to light sandy clay loam, and the A'2 material is brownish gray or light brownish-gray fine sandy loam to loamy fine sand. Mottles in the A'2 material are dark gray to yellowish brown and brown. The B'x horizons are fine sandy loam to fine sandy clay loam. The increase in clay content is more clearly discernible in these horizons than it is nearer the surface. Base saturation in the B' horizons is more than 35 percent. Color in the Bx horizons ranges from pale brown, yellowish brown, and gray in the upper part to brownish yellow, light brownish gray, strong brown, and light gray in the lower part.

Edisto soils are better drained than Yonges soils and have a fragipan that does not occur in the Chipley soils.

Edisto loamy fine sand (Ed).—This is a deep, acid, somewhat poorly drained, sandy soil that has a loamy subsoil.

Areas of Charleston, Yonges, Stono, Hockley, Chipley, Scranton, and Rutlege soils are mapped within the boundaries of this soil. The combined extent of the included areas is less than 10 percent of the total acreage.

Most of this soil is cultivated, but a small percentage of it is wooded or used for residential purposes. The soil responds to good management and is easy to work, but it must be drained. The principal crops are Irish potatoes, cabbage, snap beans, and soybeans. Minor ones are cucumbers, tomatoes, corn, small grains, and pasture. (Capability unit IIw-3; woodland suitability group 1w2)

Faceville Series

The Faceville series consists of deep, well-drained, acid soils that are mainly clayey in the subsoil.

A typical soil of the Faceville series has a dark grayish-brown fine sandy loam surface layer about 7 inches in thickness. The subsurface layer is light-brown fine sandy loam about 4 inches in thickness. The subsoil is clay loam to clay and mainly yellowish red. It extends to a depth of about 57 inches.

Runoff is moderate to rapid and infiltration and permeability are moderate. Available water capacity is moderate. Inherent fertility and content of organic matter are both low.

Faceville soils are suited to cultivation and respond to good management. Erosion is a hazard when these soils are cultivated.

Typical profile from a cultivated field 600 feet east of Sawmill Branch on U. S. Highway 78:

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, medium, granular structure; very friable; abundant small and medium roots; few fine pores; pH 5.6; clear, smooth boundary.

A2—7 to 11 inches, light-brown (7.5YR 6/4) fine sandy loam; weak, medium, granular structure; very friable; few fine roots; few small pores; pH 5.3; clear, smooth boundary.

B21t—11 to 24 inches, yellowish-red (5YR 4/8) clay loam; moderate, fine, subangular blocky structure; firm patchy clay films on peds, but films cover more of ped with increase in depth; pH 5.0; clear, smooth boundary.

B22t—24 to 36 inches, yellowish-red (5YR 5/8) clay loam to clay; few, fine, prominent, brownish-yellow (10YR 6/6) mottles and few, fine, prominent, light olive-brown (2.5Y 5/6) mottles; moderate subangular blocky structure; sticky and slightly plastic, firm; continuous clay films; few small roots; pH 4.9; gradual, wavy boundary.

B23t—36 to 50 inches, yellowish-red (5YR 5/6) clay; many, fine, prominent, brownish-yellow (10YR 6/6) mottles and common, medium, distinct, red (10R 4/8) mottles; moderate, fine and medium, subangular blocky structure; sticky, slightly plastic, firm when moist; continuous clay films; pH 5.1; gradual, smooth boundary.

B24t—50 to 57 inches +, mottled red, brownish-yellow, and light-gray clay; spheroidal pockets of clean sand grains; pH 5.0.

In areas of virgin forest, a horizon of loose, partly decomposed forest litter 1 to 2 inches thick abruptly overlies the A1 horizon. The A1 horizon is very dark grayish-brown (10YR) loamy fine sand to fine sandy loam. The A2 horizon ranges from pale brown to light brown, mainly in hue of 7.5YR or 10YR. Its texture ranges from loamy fine sand to fine sandy loam. In plowed areas the Ap horizon is a mixture of the A1 and the upper part of the A2 horizon and is very dark grayish brown to dark grayish brown.

In the B horizon textures range from clay loam to clay; colors range from strong brown to red, but yellowish red is dominant.

Faceville soils occur with Craven, Dunbar, Ardilla, Hockley, and Norfolk soils. They are redder and better drained than all except the Norfolk soils. Faceville soils are finer textured throughout than the Norfolk soils, which are also well drained.

Faceville fine sandy loam, 2 to 6 percent slopes (FvB).—This is a deep, well-drained soil that is mainly clayey in the subsoil.

Included with this soil in mapping were small areas of Craven, Dunbar, and Ardilla soils. Together these soils make up less than 5 percent of the total acreage.

Most of this Faceville soil is in pines and hardwoods. Corn, small grains, soybeans, and pasture are the main crops. Erosion is a hazard where this soil is cultivated. (Capability unit IIe-2; woodland suitability group 3o1)

Hockley Series

The Hockley series consists of nearly level, moderately well-drained, acid soils that have a loamy subsoil.

A typical Hockley soil has a dark grayish-brown loamy fine sand surface layer about 9 inches in thickness. The subsurface layer is light yellowish-brown loamy fine sand about 4 inches in thickness. The subsoil, which extends to a depth of 60 inches, is yellowish-brown fine sandy clay loam that has strong-brown, red, and light brownish-gray mottles. The lower part contains 5 to 10 percent plinthite.

Hockley soils have slow runoff, moderately low available water capacity, rapid infiltration, and moderate permeability. Inherent fertility is moderate, and organic-matter content is low in these soils. At a depth of 50 inches below the top of the clay-enriched horizon, base saturation is more than 35 percent.

Hockley soils respond to good management, and about 40 percent of the acreage in Charleston County is cultivated. The rest, except for a small percentage that is used for residential purposes, is woodland.

Typical profile of Hockley loamy fine sand in a cultivated area, 4 miles southwest of Charleston, 900 feet west of Stono River Road, and 1¼ miles south of James Island Creek Bridge:

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) loamy fine sand; weak, fine, granular structure; very friable; pH 5.5; clear, smooth boundary.

A2—9 to 13 inches, light yellowish-brown (10YR 6/4) loamy fine sand; weak, fine, granular structure; very friable; pH 5.6; clear, smooth boundary.

B21t—13 to 20 inches, yellowish-brown (10YR 5/6) fine sandy clay loam; few, fine, distinct, strong-brown mottles that become more numerous with depth; weak, medium, subangular blocky structure; friable; few clay films; many fine and few large pores; pH 5.0; gradual, wavy boundary.

B22t—20 to 29 inches, yellowish-brown (10YR 5/6) fine sandy clay loam; common, medium, prominent, red mottles; weak, medium, subangular blocky structure; clay films on ped faces; firm; few small and large pores; pH 4.9; gradual, wavy boundary.

B23—29 to 60 inches, yellowish-brown (10YR 5/6) fine sandy clay loam; common, medium, prominent, red and light brownish-gray mottles; 5 to 10 percent plinthite; weak, medium, subangular blocky structure; sticky, friable; lenses of sand and sandy clay at lower depths; pH 4.6.

The thickness of the solum ranges from 33 to 60 inches in Hockley soils. The A1 horizon and the upper part of the A2 horizon are mixed to form the Ap horizon. The dominant texture of the Ap horizon is loamy fine sand, but fine sandy loam occurs in a few places. The Ap horizon ranges from very dark grayish brown to grayish brown in hue of 10YR or 2.5Y. The A2 horizon ranges from light yellowish brown to pale brown in a hue of 10YR.

The B1 horizon (where present) is 3 to 5 inches of yellowish-brown fine sandy loam that in places has a few strong-brown, pale-brown, or red mottles. The B21t horizon is yellowish brown to grayish brown in a hue of 10YR. In this horizon red mottles are few to common. Color of the B22t horizon ranges from yellowish brown to grayish brown. Gray, red, and yellowish-brown mottles are common to few in this horizon. The B23 horizon is yellowish brown to light yellowish brown. It has a few to many mottles of red, yellowish red, strong brown, light brownish gray, and gray. The dark-red mottles in this horizon are plinthite.

Hockley soils occur with Yonges and Seabrook soils. They are better drained than Yonges soils, but lower in base saturation. The Hockley soils have a fine sandy clay loam B horizon in contrast to the Seabrook soils, which are sandy throughout.

Hockley loamy fine sand, 0 to 2 percent slopes (HoA).—This is a moderately well drained, friable, acid soil that contains a moderately fine textured subsoil. It has a high water table.

This soil has the profile described as typical for the series.

Mapped within the boundaries of this soil are areas of Yonges, Meggett, Stono, Charleston, and Orangeburg soils 2 to 5 acres in size. The combined extent of these included areas is less than 6 percent of the total acreage.

About 40 percent of this soil is cultivated. The remaining 60 percent is woodland, except for a small amount used for residential purposes. Irish potatoes, cabbage, snap beans, cucumbers, soybeans, and tomatoes are the principal crops. Corn and small grains are the minor ones. Where this soil is drained and intensively managed, crops grow moderately well or well. (Capability unit IIw-2; woodland suitability group 3o1)

Hockley loamy fine sand, 2 to 6 percent slopes (HoB).—This is a moderately well drained, friable, acid soil.

The surface layer is dark grayish-brown loamy fine sand. The subsoil is yellowish-brown fine sandy clay loam with red and yellowish-red mottles.

Areas of 2 to 4 acres of Orangeburg, Charleston, Chipley, and Wando soils are mapped within the boundaries of this soil. The combined extent of these included areas is less than 5 percent of the total acreage.

Most of this soil is woodland. Principal crops in cultivated areas are Irish potatoes, cabbage, and soybeans. The soil is easy to work, and crops grow moderately well. Erosion is not a serious problem if good management practices are exercised. Intensive drainage is not required. (Capability unit IIe-3; woodland suitability group 3o1)

Kiawah Series

The Kiawah series consists of deep, somewhat poorly drained, acid soils that are sandy throughout.

The surface layer and subsoil of a typical Kiawah soil are loamy fine sand. The surface layer is very dark grayish brown to grayish brown and is about 18 inches in thickness. The subsoil, which is about 30 inches in thickness, is grayish brown and dark grayish brown in the upper part and mottled light gray, strong brown, and yellowish brown in the lower part. The substratum is light-gray, pale-brown, brown, and yellowish-brown fine sand. Soft to hard, small to medium-sized concretions are few to common in the profile.

Surface runoff is slow, and the soils are ponded for short periods after heavy rainfall. Infiltration and permeability are rapid but are impeded by a high water table. Available water capacity is low. Content of organic matter is low, and inherent fertility is moderately low.

Kiawah soils are suitable for cultivation when adequately drained and managed.

Typical profile in nearly level cropland opposite Westchester subdivision on the west side of State Highway 171, 3 miles southwest of Charleston:

Ap—0 to 8 inches, very dark grayish-brown (10YR 3/2) loamy fine sand; weak, fine, granular structure; very friable; many small crop roots; few, medium and coarse, hard, strong-brown concretions; pH 5.6; clear, smooth boundary.

A2—8 to 15 inches, dark grayish-brown (10YR 4/2) loamy fine sand; weak, fine, granular structure; very friable; many small crop roots; few, coarse, soft, yellowish-brown concretions; less than 10 percent clean sand grains; pH 5.0; gradual, smooth boundary.

A3—15 to 18 inches, grayish-brown (10YR 5/2) loamy fine sand; many, fine, distinct mottles of yellowish brown; weak, fine, granular structure; very friable; few small plant roots and few small pores; few, fine, firm, strong-brown concretions; pH 5.5; sand grains are coated; gradual, smooth boundary.

B21t—18 to 32 inches, grayish-brown (10YR 5/2) and dark grayish-brown (10YR 4/2) loamy fine sand; common, medium, faint mottles of yellowish brown; weak, fine, granular structure; very friable; sand grains are coated and bridged; common, medium and coarse, dark reddish-brown, hard concretions; few small roots; pH 5.8; gradual, wavy boundary.

B22t—32 to 48 inches, mottled light-gray (10YR 7/1), strong-brown (7.5YR 5/8), and yellowish-brown (10YR 5/6) loamy fine sand; weak, fine, granular structure; very friable; sand grains are coated and some are bridged; few, medium, dark reddish-brown concretions; pH 6.0.

C—48 to 72 inches +, light-gray (10YR 7/1), pale-brown (10YR 6/3), brown (7.5YR 5/4), and yellowish-brown (10YR 5/6) fine sand; structureless; loose to very friable; few, fine to medium, soft, dark reddish-brown concretions; pH 6.0.

Thickness of the solum ranges from 35 to 54 inches in Kiawah soils. The A1 or Ap horizon is loamy fine sand or loamy sand that is very dark gray, very dark grayish brown, very dark brown, or black in hue of 7.5YR and 10YR, value of 2 or 3, and chroma of 2 or less. These dark colors reach to a depth of 10 inches or less.

In undisturbed areas the A1 horizon is very dark brown or black and is 5 to 7 inches in thickness. Organic-matter content of the Ap horizon is between 1 and 2 percent, but ammonium acetate tests show that base saturation is less than 50 percent.

The B horizon is light brownish gray to dark grayish brown in hue of 10YR, value of 4 to 7, and chroma of 2. Mottles of higher value and higher or lower chroma occur. The upper part of the B horizon in places is a series of clayey lamellae less than an inch thick. Clay content is 8 to 12 percent in the most heavily clay enriched part of the B horizon. This is at least 3 percent more than the clay content of the A2 horizon. Soil reaction at depths of 20 to 48 inches ranges from medium to slightly acid.

The C horizon is sand or fine sand and is mottled with gray, light gray, brown, pale brown, strong brown, or yellowish brown in hue of 10YR or 7.5YR, value of 5 to 7, and chroma of 1 to 8.

The mean annual temperature of Kiawah soils is between 59 and 71.6 degrees Fahrenheit. The water table ranges from a depth of approximately 1 foot below the surface in the wettest season to 5 feet below in the driest season. Few to common iron-enriched concretions occur throughout the profile. Base saturation varies throughout the profile and ranges from 30 to 100 percent 40 inches below the surface.

The Kiawah soils occur in the Sea Island areas of the county with Rutlege and Yonges soils. Kiawah soils have a loamy fine sand B horizon as opposed to the sandy clay loam and fine sandy clay B horizon of the Yonges soils.

Kiawah loamy fine sand (Ka).—This is a level, somewhat poorly drained sandy soil.

Areas of Seabrook, Rutlege, Edisto, and Yonges soils 2 to 6 acres in size are mapped within the boundaries of this soil. The combined extent of the included areas is less than 8 percent of the total acreage.

Most Kiawah loamy fine sand is woodland. The principal woodland vegetation is loblolly pine, sweetgum, and water oak. Crops do well on this soil if it is adequately drained and managed. Cabbage, tomatoes, soybeans, and Irish potatoes are the principal crops; corn and small grains are the minor ones. (Capability unit IIIw-1; woodland suitability group 3w2)

Lakeland Series

The Lakeland series consists of deep, nearly level to gently sloping, acid soils that are sandy throughout.

The surface layer of a typical Lakeland soil is very dark grayish brown sand about 7 inches in thickness. It is underlain by dark yellowish brown to yellow sand that extends to a depth of about 60 inches.

Infiltration and permeability are rapid in these soils, and the soils are excessively drained. Surface runoff is slow, and available water capacity is low. Content of organic matter and inherent fertility are low.

About 90 percent of the acreage of Lakeland soils is wooded. The rest is in pasture, is cultivated, or is used for residences. These soils are poorly suited to cultivation.

Typical profile in a wooded area, 7 miles northeast of Osborn, 700 feet west of State Highway 83, and 50 feet north of a rural road:

A1—0 to 7 inches, very dark grayish-brown (10YR 3/2) sand; single grain; loose; abundant small and medium roots; pH 5.0; clear, wavy boundary.

C1—7 to 13 inches, dark yellowish-brown (10YR 4/4) sand; single grain; loose; few small and medium roots; pH 5.3; gradual, wavy boundary.

C2—13 to 48 inches, brownish-yellow (10YR 6/6) sand; single grain; loose; few small and medium roots; pH 4.9; gradual, wavy boundary.

C3—48 to 60 inches, yellow (10YR 7/6) sand; few, fine, faint, brownish-yellow mottles; single grain; loose; few small roots; few small white lenses of fine sand; pH 5.5.

The A1 horizon ranges from sand to loamy fine sand in texture and from dark gray to very dark brown in 10YR hue.

The C1 horizon is also loamy fine sand to sand; its color ranges from dark yellowish brown to pale brown in the 10YR hue. The C2 and C3 horizons are sand. Color ranges from brownish yellow to dark brown in the C2 horizon and from yellow to strong brown, with a few mottles of brownish yellow, yellowish red, or brown, in the C3 horizon. The C2 and C3 horizons contain a few, soft to firm, dark reddish-brown concretions in some places. The available phosphorus content is medium in these horizons.

The Lakeland soils occur with the Chipley and Rutlege soils. The Lakeland soils are excessively drained, as opposed to moderately well drained to somewhat poorly drained for Chipley soils and poorly to very poorly drained for Rutlege soils.

Lakeland sand, 0 to 6 percent slopes (LaB).—This is a deep, acid, nearly level to gently sloping, sandy soil.

Areas of Chipley, Scranton, Rutlege, Wando, and St. Johns soils that are 2 to 7 acres in size are mapped within the boundaries of this soil. The combined extent of the included soils is less than 5 percent of the total acreage.

About 90 percent of this soil is woodland. The rest is used for tilled crops and pasture or for houses. The principal crops are small grains and corn. The main pasture grasses are bahiagrass and Coastal bermudagrass. This soil is not well suited to crops. (Capability unit IVs-1; woodland suitability group 4s2)

Leon Series

The Leon series consists of somewhat poorly drained, acid, sandy soils that have a subsoil weakly cemented with organic matter.

The surface and subsurface layers of a typical Leon soil are sand. Each is about 10 inches in thickness. The surface layer is very dark gray, and the subsurface layer is gray. The subsoil, which is about 11 inches in thickness, is a pan layer of dark reddish-brown weakly cemented sand. The substratum is dark grayish-brown to light brownish-gray sand.

The available water capacity is low in Leon soils, infiltration is rapid, and permeability is rapid. The content of organic matter and the inherent fertility are low. Permeability is impeded by a high water table and the pan layer. Surface runoff is slow.

Most of the Leon acreage is woodland. A small part of it, approximately 10 percent, is cropland and pasture.

Typical profile in Cardin Bridge Swamp area on private road near Santee Hunting Club, 5 miles north of Osborn:

A1—0 to 10 inches, very dark gray (10YR 3/1) fine sand; many, coarse, distinct, gray (10YR 6/1) sand grains; clear, coarse sand grains mixed with the gray sand grains give a salt and pepper appearance at the surface; single grain; loose; many medium tree roots and many fine grass and shrub roots; many fine pores; pH 4.2; clear, smooth boundary.

A2—10 to 20 inches, gray (10YR 6/1) coarse sand; single grain; loose; few fine roots; many fine pores; pH 6.4; clear, smooth boundary.

Bh—20 to 31 inches, dark reddish-brown (5YR 2/2) weakly cemented sand with lumps of strongly cemented dark-red sand; single grain; firm when undisturbed and loose when disturbed; abundant small pores; pH 5.1; clear, smooth boundary.

C1—31 to 37 inches, dark grayish-brown (10YR 4/2) sand; common, medium, faint, very dark grayish-brown mottles; many clear grains of quartz; single grain; loose; many small pores; pH 5.8; gradual, smooth boundary.

C2—37 to 48 inches, light brownish-gray (10YR 6/2) sand, single grain; loose; pH 6.2.

The A1 horizon is sand or fine sand and is very dark gray to black in hue of 10YR. When dry, it looks like a mixture of salt and pepper. The A2 horizon is sand or coarse sand and is gray to white in hue of 10YR, value of 6 to 8, and chroma of 1.

The Bh horizon ranges from dark reddish brown to black. This horizon is weakly cemented with organic matter and is brittle when moist and hard when dry.

The dark-brown to dark grayish-brown color of the C1 horizon results from organic staining by the overlying layer. There is no cementation in the C1 horizon. The C2 horizon is light brownish gray to gray.

Leon soils occur with the sandy Rutlege and St. Johns soils. Leon soils have a pan layer that the Rutlege soils do not have. Although the Leon soils are somewhat poorly drained, they are better drained than the Rutlege and St. Johns soils.

Leon fine sand (Le).—This is a deep, somewhat poorly drained, level, sandy soil. The subsoil is weakly cemented with organic matter.

Areas of Rutlege, St. Johns, and Scranton soils 2 to 6 acres in size are included within the boundaries of this soil. The combined extent of the included areas is less than 5 percent of the total acreage.

Most of this soil is wooded. It is not suited to cultivation. The soil must be drained before it can be used for pasture. Bahiagrass and Coastal bermudagrass are the grasses that are best suited. (Capability unit Vw–3; woodland suitability group 4w2)

Made Land

Made land (Ma) is made up of areas mostly in and around the city of Charleston that have been excavated, filled, or otherwise disturbed by man.

This land consists of variable amounts of sand, silt, and clay, or mixtures of these materials. In some places it contains seashells and fragments of seashells. The color and texture of the surface and subsurface layers vary considerably.

Onsite investigations are necessary to determine whether Made land is suited to the use for which it is planned. Sandfill on top of sand is satisfactory for residences, recreation, industry, or roads, if the water table is kept below a depth of 36 inches. Sand that has been hauled in and compacted may have a moderately slow percolation rate. Pilings must be driven for house foundations in areas of shallow sand underlain by soft marsh.

Clayey material, or cat clay, dug from the soft marshes shrinks and swells and has a very slow percolation rate. Thus, it is seldom suitable for buildings or for septic tanks. This material becomes so extremely acid when it dries that plants die in it. A layer of topsoil 6 to 8 inches thick may be spread over the cat clay to provide soil that is suitable for growing grass. Those areas of Made land where acid clays do not occur are suitable for growing loblolly pine. (Capability unit VIIs–2; not classified for woodland suitablity)

Meggett Series

The Meggett series consists of poorly drained soils that have a predominantly clayey subsoil. The surface layer of these soils is acid, but the lower part of the subsoil is neutral to moderately alkaline.

The surface layer of a typical soil in the Meggett series is very dark grayish-brown loam about 4 inches in thickness. The subsoil is gray and dark-gray clay loam and clay. It extends to a depth of about 55 inches. The substratum is mottled gray, light-gray, strong-brown and yellowish-brown clay that contains many calcareous concretions.

In Meggett soils infiltration is moderate to slow, permeability is slow, and available water capacity is moderate to high. A high water table is present in these soils. Surface runoff is slow, and the surface is ponded during rainy periods. The content of organic matter is low, and the soils are moderate in inherent fertility.

About 85 percent of the acreage of these soils is woodland. The rest is cropland and pasture. The soils are suitable for crops if they are adequately drained and properly managed otherwise.

Typical profile in woodland three-fourths mile north of County Road 98, 1½ miles east of Guerin Creek on Charleywood Road, and 300 feet north of the Fairlawn Spur Road intersection:

A1—0 to 4 inches, very dark grayish-brown (10YR 3/2) loam; moderate, fine, granular structure; friable; many fine and many medium roots; pH 4.7; clear, smooth boundary.

B21tg—4 to 14 inches, gray (10YR 5/1) clay loam; common, medium, distinct, dark-brown mottles; weak, fine, subangular blocky structure; sticky, very plastic; many fine roots; pH 4.8; clear, smooth boundary.

B22tg—14 to 20 inches, dark-gray (10YR 4/1) clay; common, fine, distinct, yellowish-brown mottles; weak, fine, subangular blocky structure; sticky, very plastic; clay films on vertical ped faces; few fine roots; pH 5.4; gradual, smooth boundary.

B23tg—20 to 32 inches, dark-gray (10YR 4/1) clay; many, medium, distinct, yellowish-brown mottles; weak, medium, subangular blocky structure; sticky, very plastic; clay films on ped faces; pH 6.0; gradual, smooth boundary.

B24tg—32 to 38 inches, dark-gray (5Y 4/1) clay; many medium, distinct, yellowish-brown mottles; moderate, medium, subangular blocky structure; sticky, very plastic; pH 7.0; gradual, smooth boundary.

B3g—38 to 55 inches, gray (10YR 6/1) clay with many, coarse, distinct, yellowish-brown (10YR 5/8) mottles; moderate, medium, subangular blocky structure; plastic, sticky; pH 7.3.

C—55 to 72 inches, mottled gray, light-gray, strong-brown, and yellowish-brown clay; many dark-brown and white calcic concretions; pH 7.1.

The solum ranges from 37 to 71 inches in thickness. The A1 horizon is loam to clay loam and is black to very dark grayish brown in the 10YR hue. Reaction ranges from pH 4 to 5.2. The A2 horizon, if present, is gray to dark-gray fine sandy loam to loamy fine sand. Reaction ranges from pH 4.5 to 5.5.

The B21t horizon is very dark gray to light brownish-gray clay to sandy clay loam. Reaction ranges from pH 4.5 to 6.5. Mottles of light brownish gray, dark brown, and olive brown are few to common and fine to medium. The B22tg horizon is dark-gray to light brownish-gray clay to sandy clay. Brownish-yellow, yellowish-brown, and gray mottles are few to common and fine to coarse. Reaction is pH 5.4 to 7.8. Small dark-brown or white calcic concretions occur in some places. The B24tg and B3g horizons are dark gray to gray and are mainly clay, but fine sandy clay loam occurs in some places. Mottles are brownish yellow, yellowish brown, and gray. Reaction is pH 7.0 and higher. Dark-brown or white calcic concretions occur in some places.

The C horizon is clay to sandy clay. Reaction is pH 7.1 to 8.0. This horizon contains few to many dark-brown or white calcic concretions.

Meggett soils occur with soils of the Hockley and Yonges series. They are not so well drained as Hockley, and the subsoil of Meggett is finer textured than the subsoil of Hockley or Yonges. Meggett soils are acid in the surface layer and upper subsoil and neutral to moderately alkaline in the lower part of the subsoil; Hockley soils are acid throughout.

Meggett clay loam (Me).—This is a level, poorly drained soil that is clayey in the subsoil.

The surface layer of this soil is black to dark-gray clay loam. The subsoil is gray clay to sandy clay.

Areas of Yonges, Santee, and Bayboro soils 1 to 5 acres in size are mapped within the boundaries of this soil. The combined extent of all these included soils is less than 5 percent of the total acreage.

This soil is wooded now, but large areas were once used for rice. It is difficult to use this soil for crops because water stands on it several months at a time. (Capability unit VIw–1; woodland suitability group 1w3)

Meggett loam (Mg).—This poorly drained soil has a predominantly clayey subsoil. It has the profile described as typical of the Meggett series.

Areas of Yonges, Santee, and Bayboro soils 2 to 5 acres in size are mapped within the boundaries of this soil. The combined extent of all these included soils is less than 6 percent of the total acreage.

Most of this soil is woodland. Some areas were formerly used to grow rice. Intensive surface drainage is necessary for crop production. Where this soil is cultivated, the principal crops are Irish potatoes, cabbage, corn, and pasture grasses. (Capability unit IIIw–2; woodland suitability group 1w3)

Mine Pits and Dumps

Mine pits and dumps (Mp) consists of (1) open pits that remain after phosphate rock, soil material, and sand have been removed from the soil and (2) areas where soil material removed during mining operations has been dumped.

Extensive areas in the central part of the county that were mined for phosphate rock have a ridge-and-trough landscape. The ridges are 8 to 12 feet in height and are 15 to 25 feet in width at the bases. The sides of the ridges slope steeply. The ridges are covered by trees. The troughs are 7 to 15 feet in depth and 15 to 25 feet in width. When they are not drained the troughs contain 4 to 10 feet of water. Borrow pits are areas where soil, usually sand, has been removed. These pits are 2 to 10 feet in depth and cover 4 to 20 acres. Borrow pits less than 4 acres in area are indicated on the soil map by a pick-and-shovel symbol. Borrow pits that are more than 2 feet in depth contain water. Shallow borrow pits contain water during rainy periods.

Mine pits and dumps are not suitable for cultivation, even if they are drained. If drained, they can be used to grow pine trees. Pits that contain water more than 4 feet in depth can be stocked with fish, can be used for recreational purposes, or can serve as irrigation ponds. (Capability unit VIIs–2; not classified in a woodland suitability group)

Myatt Series

This series consists of deep, acid, poorly drained soils that have a loamy subsoil.

The surface layer of a typical Myatt soil is very dark gray loam about 6 inches in thickness. The subsurface layer is gray loam about 3 inches in thickness. The subsoil, which extends to a depth of about 53 inches, is gray loam and clay loam. It is mottled with brownish yellow and red.

Available water capacity and infiltration are moderate in these soils, and permeability is slow. Surface runoff is slow, and internal drainage is moderately slow. A high water table occurs during rainy seasons, and the surface is frequently ponded. Content of organic matter is low, and inherent fertility is moderate.

Most of the areas of Myatt soils are woodland. If these soils are drained, they are suitable for cultivation. They are friable, and they respond to good management.

Typical profile in woodland 1.7 miles south of Ladson and 50 feet west of U.S. Highway 78:

O1—2 inches to 0, loose leaves (gum and oak), pine needles, and other largely undecomposed organic debris.

A1—0 to 6 inches, very dark-gray (10YR 3/1) loam; few, small, very pale brown (10YR 8/3) quartz grains; moderate, medium, granular structure; slightly sticky when wet, friable when moist; many small, medium, and large roots; abundant small and medium pores; pH 4.2; clear, smooth boundary.

A2—6 to 9 inches, gray (10YR 5/1) loam; few dark-gray streaks along old root channels; moderate, medium, granular structure; slightly sticky, slightly plastic when wet and friable when moist; few small, medium, and large roots; few small and medium pores; pH 4.5; clear, smooth boundary.

B1g—9 to 17 inches, gray (10YR 6/1) loam; common, medium, distinct, brownish-yellow (10YR 6/8) mottles and prominent red (10R 4/6) mottles; moderate, medium, subangular blocky structure; slightly sticky; slightly plastic; patchy clay films on ped faces; few small and medium roots and pores; pH 4.5; clear, smooth boundary.

B2tg—17 to 34 inches, gray (10YR 6/1) clay loam; common, medium, distinct, brownish-yellow (10YR 6/8) mottles and prominent red (10R 4/6) mottles; moderate, medium, subangular blocky structure; slightly sticky, slightly plastic; patchy clay films on ped faces; few small and few medium roots and pores; pH 4.5; clear, smooth boundary.

B3tg—34 to 53 inches, gray (10YR 6/1) clay loam; common, medium, distinct, brownish-yellow (10YR 6/8) mottles; moderate, medium, subangular blocky structure; slightly sticky, plastic; clay films along walls of root channels; few small roots and pores; pH 5.0.

The solum ranges from 42 to 64 inches in thickness. The A horizon ranges from loam to sandy loam in texture and from gray to very dark gray in color. The A1 horizon is 4 to 7 inches in thickness. The B horizon is 35 to 52 inches in thickness.

The B1g horizon ranges from loam to sandy loam in texture and from gray to grayish brown in color. Few to common, fine to medium, red and brownish-yellow mottles are present. The B2tg horizon is gray sandy clay loam to clay loam that has few to many, fine to medium, red and brownish-yellow mottles. The B3tg horizon is gray sandy clay loam to clay; it has red and brownish-yellow mottles.

Soils of the Myatt series occur with soils of the Hockley and Quitman series. The Myatt soils are poorly drained, as compared to the moderately well drained Hockley and the somewhat poorly drained Quitman soils. Myatt soils do not contain a fragipan, but a weakly developed fragipan occurs in the Quitman soils.

Myatt loam (My).—This is a deep, level, poorly drained, acid soil that has a loamy subsoil.

Small areas of Portsmouth, Dunbar, Quitman, and more clayey soils are mapped within the boundaries of this soil. The combined extent of the included areas is less than 6 percent of the total acreage.

Most of this soil is woodland. Corn, soybeans, and small grains grow well if the soil is adequately drained, fertilized, and properly managed otherwise. (Capability unit IVw–1; woodland suitability group 2w3)

Norfolk Series

The Norfolk series consists of nearly level, well-drained, acid, friable soils that have a loamy subsoil.

The surface layer of a typical Norfolk soil is very dark gray loamy fine sand about 2 inches in thickness. The subsurface layer is light yellowish-brown loamy fine sand about 14 inches in thickness. The subsoil, which is about 38 inches in thickness, is light yellowish-brown and yellowish-brown sandy clay loam and fine sandy loam. The substratum is fine sandy loam and sandy clay loam and is various shades of yellow, gray, and red.

Infiltration, permeability, and available water capacity are moderate. Surface runoff is slow. The content of organic matter is low, and inherent fertility is moderate.

About 60 percent of the acreage is wooded, and the rest is in crops and pasture. These soils are well suited to cultivation and respond well to good management.

Typical profile in woodland about 6½ miles north of McClellanville, 60 feet east of a borrow pit on Mechaw Road, and 100 yards west of Germantown Church:

A1—0 to 2 inches, very dark gray (10YR 3/1) loamy fine sand; weak, fine, granular structure; very friable; many fine roots; pH 4.8; clear, smooth boundary.

A2—2 to 16 inches, light yellowish-brown (2.5Y 6/4) loamy fine sand; weak, fine, granular structure; very friable; abundant fine roots in upper part; pH 5.8; clear, smooth boundary.

B1—16 to 19 inches, light yellowish-brown (10YR 6/4) to yellowish-brown (10YR 5/4) fine sandy loam; weak, fine, subangular blocky structure; friable; few fine roots; pH 5.4; clear, smooth boundary.

B21t—19 to 29 inches, yellowish-brown (10YR 5/6) sandy clay loam; few, fine, faint, brownish-yellow mottles; weak to moderate, fine and medium, subangular blocky structure; friable; faint patchy clay films on ped faces; pH 5.3; gradual, wavy boundary.

B22t—29 to 44 inches, yellowish-brown (10YR 5/8) sandy clay loam; few, fine, distinct, light olive-brown and brownish-yellow mottles; weak, medium, subangular blocky structure; friable; few, faint, patchy clay films on ped faces; pH 5.1; gradual, wavy boundary.

B3—44 to 54 inches, yellowish-brown (10YR 5/6) to strong-brown (7.5YR 5/8) sandy clay loam; few, fine, prominent, yellowish-red mottles and common, fine, faint, brownish-yellow mottles; weak, medium, subangular blocky structure; friable; pH 5.2; gradual, wavy boundary.

C—54 to 66 inches, mottled light yellowish-brown (10YR 6/4), strong-brown (7.5YR 5/8), and reddish-yellow (5YR 6/8) fine sandy loam; lenses of sandy clay loam; massive; friable; pH 5.0; gradual, wavy boundary.

The solum ranges from 37 to 70 inches in thickness. The A1 horizon ordinarily is loamy fine sand, but fine sandy loam occurs in a few places. Color of this horizon ranges from very dark gray to dark gray in hue of 10YR. The A2 horizon is loamy fine sand in most places, but is fine sandy loam in a few. This horizon is pale brown to light yellowish brown in hue of 10YR and 2.5Y. The Ap horizon, where present, is a mixture of the A1 horizon and the upper part of the A2 horizon. It is dark gray to brown, and normally about 5 inches in thickness, but because of deep plowing it has a thickness of 10 inches in a few small areas.

The B1 horizon is sandy loam to fine sandy clay loam. Its color is pale brown to yellowish brown in hue of 10YR. The B22t horizon is yellowish brown to brownish yellow in hue of 10YR. The B3 horizon is sandy clay loam to sandy loam. Color varies in this horizon. It is mainly yellowish brown but is strong brown in a few places. Mottles are red, brownish yellow, and light yellowish brown. Mottles of yellowish red, strong brown, light olive brown, brownish yellow, or red are few to common throughout the B horizon.

The C horizon is fine sandy loam to sandy clay loam. Its color is a mixture of gray, red, strong brown, reddish yellow, or yellowish brown.

The Norfolk soils are mapped together with Dothan soils. In some places they are adjacent to Wagram and Hockley soils. The A horizon is thinner in Norfolk soils than it is in Wagram soils. Norfolk soils are well drained as compared to the moderately well drained Dothan soils.

Norfolk and Dothan soils, 0 to 2 percent slopes (NdA).—The soils in this mapping unit are deep, well drained to moderately well drained, and acid. Norfolk and Dothan soils are usually fairly evenly distributed, but a given area of this mapping unit may be Norfolk soil, Dothan soil, or some combination of the two.

The Norfolk soils have a profile like that described for the Norfolk series. In a typical Dothan soil, the surface layer is very dark gray and grayish-brown fine sandy loam. The subsoil is light yellowish-brown and pale-brown sandy clay loam and clay loam in the upper part and gray fine sandy clay loam in the lower part. The lower part contains plinthite, about 10 to 15 percent by volume. The substratum is gray sandy clay loam. Characteristics of Norfolk and Dothan soils are similar except that permeability is moderately slow in Dothan soils as compared to moderate in Norfolk soils.

Areas of Dunbar, Ardilla, Craven, and Myatt soils are mapped within the boundaries of these soils. The combined extent of the included areas is less than 5 percent of the total acreage.

Most of this mapping unit is woodland. Corn, soybeans, small grains, and pasture and hay are grown in cleared areas. Drainage ditches must be dug before Dothan soils can be made suitable for producing crops. (Capability unit is I–1 for Norfolk and IIw–2 for Dothan; woodland suitability group is 3o1 for both)

Orangeburg Series

The Orangeburg series consists of nearly level to gently sloping, acid, well-drained soils that have a predominantly loamy subsoil.

In a typical Orangeburg soil the upper part of the surface layer is dark-brown loamy fine sand about 8 inches in thickness. The subsurface layer is pale-brown loamy fine sand about 3 inches in thickness. The subsoil, which is about 52 inches in thickness, is yellowish-red fine sandy loam in the upper part and red fine sandy clay loam in the middle. The lower part is red, strong-brown, and pale-brown sandy clay loam to sandy loam over yellowish-red, very pale brown, and light-gray loamy sand that contains lenses of sandy loam.

Available water capacity is moderate in these soils. Infiltration is rapid, and permeability is moderately slow. Surface runoff is slow to moderate. These soils are low in content of organic matter and moderate in inherent fertility.

About 60 percent of the acreage of Orangeburg soils is woodland. Most of the rest is either in crops or pasture. A small part of the acreage is used for residences.

Typical profile in cultivated soil, 5 miles north of Rockville and one-fourth mile southeast of route No. S–10–68, the farm-to-market road:

Ap—0 to 8 inches, dark-brown (10YR 4/3) loamy fine sand; weak, fine, granular structure; very friable; many fine grass roots; pH 5.4; clear, smooth boundary.

A2—8 to 11 inches, pale-brown (10YR 6/3) loamy fine sand; weak, fine, granular structure; very friable; few fine grass roots; pH 5.7; clear, smooth boundary.

B1—11 to 18 inches, yellowish-red (5YR 4/8) fine sandy loam; weak, fine, subangular blocky structure; friable; few fine pores; few small tongues of material from A2 horizon; pH 5.0; clear, smooth boundary.

B21t—18 to 25 inches, red (2.5YR 4/6) fine sandy clay loam; moderate, fine, subangular blocky structure; friable; continuous clay films on vertical and horizontal faces of peds; few fine and medium pores; few very fine grass roots; pH 4.7; gradual, wavy boundary.

B22t—25 to 36 inches, red (2.5YR 5/6) fine sandy clay loam; few, fine, distinct mottles and few, medium, distinct mottles of light yellowish brown (10YR 6/4); weak, fine, subangular blocky structure; friable; few clay films on vertical faces of peds; pH 4.8; clear, smooth boundary.

B31—36 to 48 inches, red (2.5YR 4/8), strong-brown (7.5YR 5/8), and pale-brown (10YR 6/3) sandy clay loam to sandy loam; pH 4.7; gradual, irregular boundary.

B32—48 to 63 inches, yellowish-red (5YR 5/6), very pale brown (10YR 7/3), and light-gray (10YR 7/1) loamy sand; sandy loam lenses; pH 4.8.

The solum ranges from 54 to 68 inches in thickness. The A1 horizon, where present, is ordinarily loamy fine sand that is dark gray. The A2 horizon ranges from loamy fine sand to fine sandy loam in texture and from pale brown to light yellowish brown in color. The Ap horizon is a mixture of the A1 horizon and the upper part of the A2 horizon. Texture in this horizon is loamy fine sand to fine sandy loam. Color is dark gray to brown.

The B1 horizon is fine sandy loam to fine sandy clay loam in texture and yellowish brown to yellowish red in color. In the B21t and in the B22t horizons color ranges from red to yellowish red. Texture of the B22t horizon is fine sandy clay loam, but sandy clay occurs in some places. The B3 horizon is sandy clay loam to fine sandy loam in colors of red to strong brown.

The C horizon, which occurs at a greater depth than the maximum depth described in the typical profile, is predominantly loamy sand, but sandy loam and pockets of sandy clay loam occur. The color ranges from light brownish gray to yellowish red.

Orangeburg soils occur with soils of the Charleston and Hockley series. The Orangeburg soils are better drained than the Charleston and Hockley soils. They contain red in the subsoil, a color not found in the Charleston and the Hockley subsoils.

Orangeburg loamy fine sand, 0 to 2 percent slopes (OrA).—This is a well-drained soil that has a red loamy subsoil. It has the profile described as typical of the Orangeburg series.

Areas of Charleston, Hockley, and Norfolk soils 2 to 4 acres in size are mapped within the boundaries of this soil. The combined extent of the included areas is less than 5 percent of the total acreage.

About 60 percent of the acreage of this soil is woodland. The principal crops in cleared areas are corn, snap beans, soybeans, and pasture grasses. Crops grow satisfactorily if the soil is properly managed. Some surface drainage is needed. (Capability unit I–1; woodland suitability group 3o1)

Orangeburg loamy fine sand, 2 to 6 percent slopes (OrB).—This is a well-drained soil that has a predominantly loamy subsoil.

The surface layer is dark-brown to brown loamy fine sand to fine sandy loam. The subsoil is red fine sandy clay loam. Part of the surface layer has eroded away in some areas.

Areas of Charleston, Hockley, and Norfolk soils 2 to 4 acres in size are mapped within the boundaries of this soil. The combined extent of the included areas is less than 5 percent of the total acreage.

About 70 percent of the acreage of this soil is woodland. The principal crops in cleared areas are corn, snap beans, soybeans, and pasture grasses. Surface drainage is not needed, since surface runoff is moderate. Some areas of the surface are eroded. (Capability unit IIe–3; woodland suitability group 3o1)

Osier Series

The Osier series consists of level, deep, poorly drained to very poorly drained, acid soils that are sandy throughout.

The surface layer of a typical Osier soil is black fine sand about 6 inches in thickness. It is underlain by grayish-brown, light-gray, and light brownish-gray sand. The lower part of the sand is mottled. This layer extends to a depth of about 46 inches.

Available water capacity is low in Osier soils. Infiltration and permeability are rapid, but they are impeded by a high water table the year around. Surface drainage is very slow, and these soils are ponded most of the year. Content of organic matter and inherent fertility are low.

Osier soils are not suitable for cultivation.

Typical profile about 6 miles west of McClellanville and 0.2 mile south of U.S. Highway 17 at the electric transmission line on the road to the Shellmore oyster factory:

A1—0 to 6 inches, black (10YR 2/1) fine sand; weak, very fine, granular structure to single grain; very friable to loose; many fine roots; very strongly acid; clear, smooth boundary.

C1g—6 to 10 inches, grayish-brown (10YR 5/2) sand mingled with light-gray and white sand grains; single grain; loose; very strongly acid; clear, smooth boundary.

C2g—10 to 18 inches, light-gray (10YR 7/2) sand; white mottles; single grain; loose; very strongly acid; clear, wavy boundary.

C3g—18 to 46 inches, light brownish-gray (10YR 6/2) sand; medium, fine, light-gray (2.5Y 7/2) and white (10YR 8/1) mottles; single grain; loose; strongly acid.

The A1 horizon in Osier soils ranges from fine sand to loamy fine sand in texture. The C1 horizon is grayish-brown to dark-gray sand to loamy sand. The C2 horizon ranges from light gray to dark gray, and the C3 horizon, from light brownish gray to gray.

Osier soils occur with the Rutlege and Chipley soils. The A horizon in Osier soils is not so thick as the A horizon in Rutledge soils. Osier soils are more poorly drained than the somewhat poorly drained Chipley soils.

Osier fine sand (Os).—This is a level, deep, poorly to very poorly drained, sandy soil.

Areas of Rutlege, Seewee, and Scranton soils 1 to 4 acres in size are mapped within the boundaries of this soil. The combined extent of the included areas is less than 5 percent of the total acreage.

About 90 percent of this soil is in woodland. Pasture grasses are grown not too successfully in cleared areas. (Capability unit Vw–2; woodland suitability group 2w3)

Pamlico Series

The Pamlico series consists of very dark, very poorly drained, organic soils that formed in woody materials in fresh water.

In a typical profile the upper 41 inches consists of very dark brown to black muck. Below this is very dark gray fine sand.

Available water capacity is high in Pamlico soils. Infiltration and permeability are moderate but are impeded by a continuous high water table. Surface runoff is very slow in these soils, and ponding occurs throughout the year. Although the content of organic matter is high, the soils are low in inherent fertility.

Most of the acreage is woodland, but about 5 percent is pasture or is idle.

Typical profile in Big Wambaw Swamp off Whilden Road, about 8 miles west of McClellanville and 0.2 mile south of Murrell Road:

01—3 inches to 0, leaves, twigs, roots, and partially decayed organic matter.

1—0 to 10 inches, very dark brown (10YR 2/2) muck; common small fibers and many small roots; extremely acid.

2—10 to 28 inches, very dark brown (10YR 2/2) to black (N 2/0) muck; many, very fine, white sand grains are visible when dry; few to common fine roots and few to common small fibers; extremely acid.

3—28 to 41 inches, very dark brown (10YR 2/2) muck; numerous, very fine, white sand grains are visible when dry; common, medium, partially decayed roots and woody material; medium to slightly acid.

C—41 to 52 inches +, very dark gray (10YR 3/1) fine sand stained from organic material; single grain; very friable to loose; few to common, fine, decayed roots; medium acid.

The organic layer of muck from the surface to the sand is very dark brown or dark reddish brown and, in a few places, black. It ranges from 20 to 41 inches in thickness. When the soil is dry, numerous, very fine, white sand grains are visible in the muck. Reaction in these soils ranges from extremely acid in the upper part to slightly acid in the lower part.

The Pamlico soils occur in intricate patterns with the Rutlege soils. The two soils are mapped together in the Rutlege-Pamlico complex. (See Rutlege series.) Pamlico soils occur in tracts where there are St. Johns and Leon soils. The St. Johns and Leon soils are deep sands that do not contain an organic layer.

Pamlico muck (Pa).—This is a level, very poorly drained organic soil that formed in woody materials in fresh water.

Areas of Rutlege and Osier soils 5 to 15 acres in size are mapped within the boundaries of this soil. The combined extent of the included areas is less than 10 percent of the total acreage.

About 95 percent of the acreage of this soil is woodland. The rest is either pasture or is idle. This soil is not suitable for cultivation. (Capability unit VIIw–2; not classified for woodland suitability)

Portsmouth Series

The Portsmouth series consists of nearly level, very poorly drained, acid soils that are loamy throughout.

The surface and subsurface layers of a typical Portsmouth soil are fine sandy loam. The surface layer is black and about 10 inches in thickness. The subsurface layer is gray and about 3 inches in thickness. The subsoil, which is about 39 inches in thickness, is dark-gray fine sandy loam in the upper part and gray fine sandy clay loam and fine sandy loam in the lower part. Pockets and lenses of gray loamy sand occur in the lower layers.

Available water capacity is moderate in Portsmouth soils. Infiltration and permeability are also moderate. Surface runoff is slow, and surfaces are ponded most of the year. Inherent fertility is moderate.

Most of these soils are woodland. A small percentage is cultivated. Cultivated areas require intensive drainage. The soils respond well to good management.

Typical profile in woodland 3 miles southeast of Ladson, 1¼ miles southwest of the junction of U.S. Highway 52 and U.S. Highway 78, and 500 feet west of hard-surfaced road:

01—2 inches to 1 inch, largely undecomposed loose leaves (gum, maple, and shrubs).

02—1 inch to 0, largely decomposed organic debris.

A1—0 to 10 inches, black (10YR 2/1) fine sandy loam; weak, medium, granular structure; friable, slightly sticky; many small roots and abundant medium roots; few small and medium pores; pH 4.2; clear, smooth boundary.

A2—10 to 13 inches, gray (10YR 6/1) fine sandy loam; weak, fine, granular structure; friable, nonsticky, nonplastic; few small and few medium roots; few small pores; pH 5.4; clear, smooth boundary.

B1g—13 to 18 inches, dark-gray (10YR 4/1) fine sandy loam; common, medium, distinct, yellowish-brown mottles and common, medium, faint, gray mottles; weak, medium, subangular blocky structure; friable, slightly sticky; few small roots; few small pores; pH 5.1; clear, smooth boundary.

B21tg—18 to 28 inches, gray (10YR 6/1) fine sandy clay loam; common, medium, distinct, dark-brown mottles; moderate, medium, subangular blocky structure; slightly sticky, firm, slightly plastic; few small roots and pores; clay films on ped faces; pH 5.8; gradual, wavy boundary.

B22tg—28 to 41 inches, gray (10YR 5/1) fine sandy loam; pockets and lenses of gray loamy sand; common, medium, distinct, strong-brown mottles; weak, fine, subangular blocky structure; nonsticky, slightly plastic, friable; few small roots and pores; pH 5.6; gradual, wavy boundary.

B23tg—41 to 52 inches +, gray (10YR 6/1) fine sandy clay loam; pockets and lenses of gray loamy sand; few, fine, distinct, yellowish-brown mottles; nonsticky, slightly plastic; few small roots and pores; pH 5.6.

The solum ranges from 50 to 72 inches in thickness. The A1 and Ap horizons are black fine sandy loam, but areas of loam occur in a few places. Color in the A2 horizon is black to gray in hue of 10YR.

The Blg horizon ranges from fine sandy loam to fine sandy clay loam in texture and from gray to dark gray in color. Yellowish-brown, brownish-yellow, and dark-brown mottles occur. The B2tg horizon is gray fine sandy loam to sandy clay. Brownish-yellow, yellowish-brown, dark reddish-brown, strong-brown, and very dark grayish-brown mottles are common.

Portsmouth soils occur with Hockley and Bayboro soils. They are not so well drained as Hockley and do not have the yellowish-brown subsoil. Portsmouth soils are somewhat coarser textured than Bayboro soils.

Portsmouth fine sandy loam (0 to 2 percent slopes) (Po).—This is a nearly level, acid, very poorly drained soil that is loamy throughout.

Areas of Rains, Bayboro, Myatt, and Hockley soils 2 to 6 acres in size are mapped within the boundaries of this soil. The combined extent of the included areas is less than 5 percent of the total acreage.

Most of this soil is woodland. A small amount is cropland or pasture land. If the soil is intensively drained and carefully managed otherwise, it is well suited to grow corn, soybeans, small grains, and pasture grasses. (Capability unit IIIw-4; woodland suitability group 1w3)

Quitman Series

The Quitman series consists of nearly level, deep, somewhat poorly drained, acid soils that have a loamy fragipan in the subsoil.

The surface layer and subsurface layer are loamy sand. The surface layer is black and about 8 inches in thickness. The subsurface layer is light yellowish brown and about 5 inches in thickness. The subsoil, which is about 43 inches in thickness, is light yellowish-brown fine sandy loam in the upper part. The middle part is a brittle, firm, weakly defined fragipan of mottled sandy clay loam that is light brownish gray, yellowish brown, and gray to light gray in color. The lower part of the subsoil is also mottled sandy clay loam that is light gray in color.

Available water capacity is moderately low in Quitman soils. Infiltration is rapid, and permeability is moderate. Both are impeded by the fragipan and by a high water table that occurs during rainy periods. Surface runoff is slow. The soils are low in content of organic matter and low in inherent fertility.

These soils are used mainly as woodland. Cleared areas are suited to cultivation if they are drained. These soils respond well to good management.

Typical profile in woodland 5 miles north of McClellanville, 100 feet northeast of a spur road and one-half mile southeast of Elmwood Road (Forest Service road 210):

A1—0 to 8 inches, black (10YR 2/1) loamy sand; weak, fine, granular structure; very friable; many small roots; pH 4.5; clear, wavy boundary.

A2—8 to 13 inches, light yellowish-brown (2.5Y 6/4) loamy sand; weak, fine, granular structure; very friable; many small roots; pH 4.8; clear, smooth boundary.

B1—13 to 17 inches, light yellowish-brown (2.5Y 6/4) fine sandy loam; common, fine, distinct, yellowish-brown mottles; weak, fine, subangular blocky structure; friable; pH 4.5; clear, smooth boundary.

Bx1—17 to 21 inches, light brownish-gray (2.5Y 6/2) and yellowish-brown (10YR 5/4) light sandy clay loam; common, medium, distinct, strong-brown mottles and common, fine, prominent, red mottles; weak, fine, subangular blocky structure; firm, brittle; few, faint, patchy clay films on ped faces; pH 4.5; clear, smooth boundary.

Bx2—21 to 29 inches, gray to light-gray (10YR 6/1) sandy clay loam; many, medium, distinct, yellowish-brown and red mottles; weak, medium, subangular blocky structure; firm, brittle; distinct patchy clay films on ped faces; pH 5.0; clear, smooth boundary.

B21t—29 to 48 inches, light-gray (2.5Y 7/2) sandy clay loam; many, medium, distinct, brownish-yellow mottles and common, medium, prominent, red mottles; weak, medium, subangular blocky structure; friable; few, faint, patchy clay films on ped faces; common mica flakes; pH 5.2; clear, wavy boundary.

B22t—48 to 56 inches, light-gray (5Y 7/1) sandy clay loam; few pockets of sandy loam containing many, coarse, prominent, brownish-yellow (10YR 6/6) mottles; common, medium, prominent, strong-brown mottles, and few, medium, distinct, light yellowish-brown mottles; massive to weak, fine, subangular blocky structure; friable; common mica flakes; pH 5.4; gradual, wavy boundary.

The solum ranges from 30 to 57 inches in thickness. The A1 horizon ranges from loamy sand to fine sandy loam in texture and from black to very dark brown in color. The A2 horizon is loamy sand to sandy loam in texture and grayish brown to light yellowish brown in color.

The B1 horizon is yellowish brown to light yellowish brown. Strong-brown and light brownish-gray to yellowish-brown mottles are few to common. The Bx1 horizon is sandy clay loam to sandy loam in texture and is light brownish gray to brownish yellow in color. Fine to medium mottles of yellowish brown, strong brown, red, and gray are common to many. The Bx2 horizon is sandy clay loam to sandy loam in texture and is gray or light gray. Medium mottles of yellowish brown, red, gray, and brownish yellow are common to many.

A C horizon at a greater depth than described in the typical profile is sandy clay loam to sandy loam in texture and gray to light gray in color. Mottles of strong brown, brownish yellow, and dark yellowish brown occur.

Quitman soils occur with the Hockley and Rains soils. The weakly developed fragipan that typifies them is not found in either the Hockley or in the Rains soils. Quitman soils are better drained than Rains soils, but they are not so well drained as the Hockley soils.

Quitman loamy sand (Qu).—This is a level, somewhat poorly drained acid soil that has a loamy fragipan in the subsoil.

Areas of Rains, Hockley, and Myatt soils 2 to 5 acres in size are mapped within the boundaries of this soil. The combined extent of the included areas is less than 7 percent of the total acreage.

More than 75 percent of this soil is woodland. The rest is cropland and pasture. The principal crops are corn, snap beans, soybeans, and small grains. The surface must be drained before crops can be produced. The soil is easy to work, and it responds well to good management. (Capability unit IIw-2; woodland suitability group 3w2)

Rains Series

The Rains series consists of nearly level, poorly drained, acid soils that have a loamy surface layer and subsoil.

Typical Rains soils have a 6-inch surface layer that is black sandy loam and a 6-inch subsurface layer that is light-gray fine sandy loam. The subsoil, which is about 38 inches in thickness, is gray and light brownish-gray fine sandy loam, and the substratum is light-gray, yellow, and brown silty clay.

Organic matter and inherent fertility are low in Rains soils, and they have moderately low available water capacity. The moderate infiltration and moderate permeability of these soils are impeded by a high water table during rainy seasons. Surface runoff is slow, and ponding occurs frequently.

About 90 percent of the acreage of these soils is woodland. The remaining 10 percent is cropland and pasture.

Typical profile in woodland 1½ miles northwest of Ladson and 100 feet southeast of a dirt road paralleling the Southern Railroad:

O1—2 inches to 1 inch, largely undecomposed loose oak and gum leaves, pine needles, and organic debris.

O2—1 inch to 0, largely decomposed leaves and organic debris.

A1—0 to 6 inches, black (10YR 2/1) sandy loam; weak, medium, granular structure; very friable; abundant, small, medium, and large roots; abundant small pores; pH 4.2; clear, wavy boundary.

A2—6 to 12 inches, light-gray (10YR 7/2) fine sandy loam; weak, medium, granular structure; very friable; few small and medium roots; abundant small pores; pH 5.0; clear, wavy boundary.

B1g—12 to 18 inches, gray (10YR 6/1) fine sandy loam; common, medium, distinct, light yellowish-brown mottles and few, fine, prominent, strong-brown mottles; weak, medium, subangular blocky structure; friable; few small roots; abundant small pores; gradual, wavy boundary.

B21tg—18 to 32 inches, gray (10YR 6/1) fine sandy loam; common, medium, distinct, yellow and yellowish-brown mottles and few, fine, prominent, strong-brown mottles; weak, medium, subangular blocky structure; friable; faint patchy clay films; few small roots; abundant small roots; abundant small pores; pH 4.4; clear, wavy boundary.

B22tg—32 to 50 inches, light brownish-gray (10YR 6/2) fine sandy loam; common, coarse, distinct, yellowish-brown (10YR 5/6) mottles and few, fine, prominent, strong-brown mottles; weak, medium, subangular blocky structure; slightly sticky, slightly plastic in clay areas but friable in sandy areas; faint patchy clay films; few fine roots; few small pores; pockets of weakly cemented loamy sand that are predominantly yellowish brown (10YR 5/8); pH 4.6; gradual, wavy boundary.

IIC—50 to 68 inches +, light-gray, yellow, and brown silty clay occurring as pockets of clays and loamy sands; pH 4.3.

The solum ranges from 42 to 72 inches in thickness. The Ap horizon, where present, ranges from fine sandy loam to loamy fine san dand is black to very dark gray. The A2 horizon is light gray to gray in hue of 10YR; its texture is fine sandy loam to loamy fine sand.

The B1g horizon is gray fine sandy loam in hue of 10YR, value of 5 or 6, and chroma of 1. Mottles are few to common in this horizon. The B21tg horizon is gray (10YR) fine sandy loam to sandy clay loam. Yellow, yellowish-brown, strong-brown, and gray mottles are few to common. The B22tg horizon is light brownish-gray to gray in hue of 10YR; its texture is sandy loam to sandy clay loam. The B3g horizon, where present, is gray sandy loam to sandy clay loam that in places contains pockets of sandy material.

The C horizon normally ranges from fine sandy loam to silty clay, but it is made up of pockets and lenses of sand and clay.

Rains soils are less well drained than Hockley and Quitman soils and have a more grayish subsoil than either of these kinds of soils.

Rains sandy loam (Ra).—This is a poorly drained acid soil that has a loamy surface layer and subsoil.

Areas of Quitman, Myatt, and Portsmouth soils 2 to 4 acres in size are mapped within the boundaries of this soil. The combined extent of the included areas is less than 5 percent of the total acreage.

About 90 percent of this soil is woodland. The rest is cropland and pasture. The principal crops are corn and pasture grass. The soil needs to be intensively drained and managed to grow these crops well. (Capability unit IIIw-4; woodland suitability group 1w3)

Rutlege Series

The Rutlege series consists of nearly level to depressional, poorly drained to very poorly drained, deep, acid soils that are sandy throughout.

In a typical Rutlege soil the surface layer is black to very dark brown loamy fine sand about 20 inches in thickness. The underlying material is very dark grayish-brown and gray loamy fine sand.

Available water capacity is low in Rutlege soils. Infiltration and permeability are rapid but are impeded by a high water table most of the year. Surface runoff is slow, and these soils are frequently ponded. Inherent fertility is low to moderate.

About 70 percent of the Rutlege acreage is woodland. The rest is either pasture or is idle. Intensive drainage is needed for growing grasses.

Typical profile of Rutlege soil in cropland 3 miles southwest of Charleston on James Island and about 0.8 mile west-southwest of the intersection of Harbor View Road and Fort Johnson Road:

Ap—0 to 8 inches, black (10YR 2/1) loamy fine sand; weak, fine, granular structure; very friable; few white sand grains on surface; pH 5.0; clear, smooth boundary.

A1—8 to 20 inches, very dark brown (10YR 2/2) loamy fine sand; week, fine granular structure; very friable; many fine roots; old root holes filled with black material from Ap horizon; many fine and few medium pores; pH 5.4; clear, smooth boundary.

C1g—20 to 42 inches, very dark grayish-brown (10YR 3/2) loamy fine sand; weak, fine, granular structure to single grain; very friable; few thin roots; many fine and few medium pores; pH 5.2; gradual, wavy boundary.

C2g—42 to 54 inches +, gray (10YR 5/1) loamy fine sand; few light brownish-gray and very pale brown mottles; very friable to loose; pH 5.5; few, fine, firm concretions.

The Ap horizon is loamy fine sand, but fine sand occurs in a few places. The A1 horizon is very dark brown to black loamy fine sand. Some areas of fine sand occur.

The C1g horizon is very dark brown to dark gray in hue of 10YR, value of 2 to 5, and chroma of 1 to 2. A chroma of 2 is predominant in the Sea Island areas of the county. Elsewhere it is usually 1. The C2g horizon is light gray and pale brown to dark gray in hue of 10YR, value of 4 to 7, and chroma of 1 to 3.

The Rutledge soils occur in intricate patterns with Pamlico muck. The soils are mapped together in the Rutledge-Pamlico complex for this reason. They also occur with the separately mapped Chipley and Wando soils. Rutledge soils are poorly to very poorly drained, as compared to the excessively drained to well drained Wando soils and the moderately well drained to somewhat poorly drained Chipley soils.

Rutlege loamy fine sand (Rg).—This is a poorly drained to very poorly drained deep soil that is sandy throughout. It has the profile described as typical for the Rutlege series.

Areas of Seewee, Chipley, St. Johns, Leon, and Scranton soils 1 to 8 acres in size are mapped within the boundaries of this soil. The combined extent of the included areas is less than 6 percent of the total acreage.

About 70 percent of the acreage of this soil is in woodland. Pasture grasses are the principal crops in cleared areas. Intensive drainage and other effective management techniques are needed. (Capability unit Vw-2; woodland suitability group 2w3)

Rutlege-Pamlico complex (Rp).—This mapping unit consists of Rutlege and Pamlico soils that occur along the Edisto River in such an intricate pattern that it was not practical to map them separately. The two kinds of soils are about equal in extent.

The Rutlege soils are near the river, and the Pamlico soils are in a band less than 200 feet wide that borders the highland. The Rutlege soils are sandy; the Pamlico soils are mucks. In many places up to 18 inches of recently deposited material overlies these soils.

At one time these soils were used to grow rice. Now they are used as woodland, as pasture, and as areas for the development of wildlife. (Both parts, capability unit VIIw-2; Rutlege part, woodland group not assigned; Pamlico part, woodland suitability group 2w3)

St. Johns Series

The St. Johns series consists of level, poorly drained, acid soils that are sandy throughout. These soils have a subsoil that is weakly cemented with organic matter.

The surface layer, subsurface layer, subsoil, and substratum of a typical St. Johns soil are fine sand. The surface layer is 6 inches in thickness and is black. The subsurface layer is 5 inches in thickness and is dark gray. The subsoil, weakly cemented by organic matter, is very dark gray in the upper part and dark reddish brown in the lower part. The substratum, which occurs below a depth of 35 inches, is dark yellowish brown.

Surface runoff is slow on St. Johns soils, and ponding is frequent. Infiltration is rapid, but permeability is moderate because of the organic pan. A high water table impedes infiltration and permeability during rainy periods. Available water capacity is low. Content of organic matter and inherent fertility are also low.

Most of the St. Johns acreage is woodland. About 15 percent of it is cultivated, in pasture, or idle.

Typical profile in brushland 3 miles southwest of Charleston and three-fourths mile west-northwest of the intersection of State Highway 171 and Cut Bridge Road:

01—2 inches to ½ inch, loose leaves and organic debris.
02—½ inch to 0, partially decomposed organic debris.
Ap—0 to 6 inches, black (10YR 2/1) fine sand; weak, fine, crumb structure; very friable; many fine and many coarse roots; many white quartz grains that give horizon a salt and pepper appearance; pH 4.5; clear, smooth boundary.
A2—6 to 11 inches, dark-gray (10YR 4/1) fine sand; single grain; loose; few fine roots; pH 4.5; clear, smooth boundary.
B1h—11 to 13 inches, very dark gray (10YR 3/1) fine sand; few white quartz grains; massive; firm when undisturbed, friable when crushed; few fine roots; weakly cemented; pH 4.5; clear, smooth boundary.
B21h—13 to 18 inches, dark reddish-brown (5YR 2/2) fine sand; massive; firm when undisturbed, friable when crushed; few fine roots; few fine pores; weakly cemented; pH 4.6; gradual, wavy boundary.
B22h—18 to 35 inches, dark reddish-brown (5YR 3/3) fine sand; single grain; friable; few fine roots; very weakly cemented; pH 5.6; gradual, wavy boundary.
C—35 to 53 inches +, dark yellowish-brown (10YR 4/4) fine sand; single grain; friable, slightly firm in place; very few fine roots; pH 5.1.

The solum ranges from 29 to 53 inches in thickness. The black A1 horizon ranges from fine sand to loamy fine sand but is mostly fine sand. The Ap horizon is black to gray, depending on organic-matter content. The A2 horizon is dark-gray to gray fine sand to loamy fine sand.

The B1h horizon is very dark gray to black (10YR hue) fine sand to loamy fine sand. This horizon is weakly to moderately cemented by organic matter. The B21h and B22h horizons are dark reddish brown (5YR) to black. The B21h horizon is weakly to strongly cemented fine sand to loamy sand; the B22h horizon is very weakly to moderately cemented fine sand. Some areas of St. Johns soils have two or more separate Bh horizons.

The C horizon is dark yellowish-brown to gray fine sand.

St. Johns soils occur with Chipley and Rutlege soils. They are not so well drained as Chipley soils and have a hardpan that does not occur in either Chipley or Rutlege.

St. Johns fine sand (So).—This is a deep, poorly drained, acid soil that is sandy throughout.

Areas of Seewee, Leon, Scranton, Rutlege, Chipley, and Osier soils are mapped within the boundaries of this soil. The combined extent of the included areas is less than 8 percent of the total acreage.

About 85 percent of this soil is woodland. The soil is poorly suited to general farm crops and pasture, but such crops as Irish potatoes, snap beans, soybeans, and pasture grasses are grown in a few areas with not too favorable results. (Capability unit Vw-3; woodland suitability group 4w3)

Santee Series

The Santee series consists of nearly level very poorly drained soils that have a clayey layer in the subsoil. These soils are acid in the surface layer but are slightly acid to moderately alkaline in the subsoil.

In a typical soil of the Santee series the surface layer is black loam about 6 inches in thickness. The subsoil, about 42 inches in thickness, is black and very dark gray clay loam in the upper part and dark-gray clay loam and clay in the lower part. The upper part is slightly acid; the lower part is neutral and mildly alkaline. The substratum is moderately alkaline dark-gray and greenish-gray clay.

Santee soils have very slow surface runoff and frequently are ponded. They have high available water capacity, slow to moderate infiltration, and slow permeability. Inherent fertility is moderate, and content of organic matter is low.

Although large areas were once used for rice, Santee soils are now wooded.

Typical profile in level woodland on the west side of Thompson Branch Road, 9.4 miles west of McClellanville, one-third mile south of the county line, and one-fourth mile north of Wambaw Creek:

A1—0 to 6 inches, black (N 1/0) loam; weak, fine, granular structure; friable; many fine and many coarse roots; medium acid; clear, smooth boundary.
B21tg—6 to 14 inches, black (N 1/0) clay loam; moderate, fine, granular structure; slightly sticky, slightly plastic; many fine roots; slightly acid; clear, smooth boundary.
B22tg—14 to 23 inches, very dark gray (10YR 3/1) clay loam; few, fine, distinct, olive-brown mottles; moderate, medium, subangular blocky structure; plastic, slightly sticky; patchy clay films; many fine roots; slightly acid; gradual, smooth boundary.
B23tg—23 to 36 inches, dark-gray (5Y 4/1) clay loam to clay; few, fine, distinct, olive-brown mottles; moderate, medium, subangular blocky structure; plastic, slightly sticky; thin patchy clay films; few fine roots; neutral; gradual, smooth boundary.
B3tg—36 to 48 inches, dark-gray (5Y 4/1) clay; few, fine and medium, distinct, olive-brown mottles and yellowish-red staining around old roots and root channels; moderate,

medium, subangular blocky structure; plastic, slightly sticky; few fine and medium roots; mildly alkaline; gradual, smooth boundary.

Cg—48 to 71 inches, dark-gray (5Y 4/1) and greenish-gray (5G 5/1 and 5GY 5/1) clay; massive; plastic; few fine and medium roots; moderately alkaline.

The solum ranges from 40 to 65 inches in thickness and has a base saturation of more than 35 percent. In old ricefields the Ap horizon is black and is 3 to 5 inches in thickness in places. Principal textures of the A horizon are loam, clay loam, and fine sandy loam. Reaction is strongly acid to slightly acid in the A horizon.

The B horizon is gray to very dark gray and black in hue of 10YR to 5Y, value of 3 to 5, and chroma of 0 and 1. Value increases with depth. Olive-brown, yellowish-brown, or brownish-yellow mottles are few to common in this horizon. Texture is clay to clay loam; clay content is 35 to 50 percent, and silt content is 15 to 30 percent. Reaction ranges from medium acid to slightly acid in the upper part of the B horizon to moderately alkaline in the lower part.

The C horizon is very dark gray to greenish gray; mottles of gray to brownish yellow are common in places. Texture in the C horizon is clay to sandy clay loam. Reaction is neutral to moderately alkaline.

Santee soils have a clay loam to clay subsoil and are poorly drained, whereas Chipley soils are sandy throughout and are moderately well drained to somewhat poorly drained. The Santee soils do not have an A2 horizon, but the Yonges soils have this horizon.

Santee clay loam (Sc).—This is a very poorly drained soil that formed mainly in clayey marine sediments. It has a black clay loam surface layer and a dark-gray, neutral to alkaline clay subsoil.

Areas of Santee, Meggett, Yonges, Stono, and Bayboro soils 3 to 5 acres in size are mapped within the boundaries of this soil. The combined extent of these included areas is less than 12 percent of the total acreage.

This soil is now wooded. Large areas were once used for growing rice. Very poor drainage restricts use. With surface drainage, the soil is best suited to pasture. (Capability unit VIw–1; woodland suitability group 1w3)

Santee loam (Se).—This is a very poorly drained soil that has a clayey layer in the subsoil. It has the profile described as typical for the Santee series.

Areas of Santee clay loam and areas of Meggett, Yonges, Bayboro, and Stono soils 2 to 6 acres in size are mapped within the boundaries of this soil. The combined extent of these included areas is less than 10 percent of the total acreage.

This soil is wooded. If intensively drained and properly managed, it is suitable for Irish potatoes, cabbage, corn, and pasture grasses. (Capability unit IIIw–2; woodland suitability group 1w3)

Scranton Series

The Scranton series consists of deep, acid, somewhat poorly drained soils that are sandy throughout.

The surface layer of a typical Scranton soil is black loamy fine sand about 9 inches in thickness. The underlying material is dark grayish-brown loamy fine sand (to a depth of 24 inches) over grayish-brown, light-gray, and white fine sand.

Available water capacity is low in Scranton soils. Infiltration and permeability are rapid but are impeded by a high water table during rainy periods. Surface runoff is slow. Content of organic matter and inherent fertility are low.

When they are adequately drained, Scranton soils are suited to cultivation.

Typical profile on State Highway 97, 800 feet north of its intersection with U.S. Highway 17:

Ap—0 to 9 inches, black (10YR 2/1) loamy fine sand; weak, fine, granular structure; very friable; many fine roots; strongly acid; clear, smooth boundary.

C1—9 to 16 inches, dark grayish-brown (10YR 4/2) loamy fine sand; few, fine, faint, yellowish-brown mottles around root channels; single grain; very friable; many fine roots; strongly acid; clear, smooth boundary.

C2—16 to 24 inches, dark grayish-brown (10YR 4/2) loamy fine sand; few, fine, faint, yellowish-brown mottles around root channels; single grain; very friable; abundant small roots; strongly acid; clear, smooth boundary.

C3—24 to 28 inches, grayish-brown (2.5Y 5/2) fine sand; few, fine, faint, yellowish-brown and strong-brown mottles; single grain; very friable; few fine roots; very strongly acid; clear, smooth boundary.

C4—28 to 52 inches, light-gray (10YR 7/1) and white (10YR 8/1) fine sand; many, medium, distinct, yellowish-brown and few, fine, distinct, strong-brown mottles; structureless; loose; very strongly acid.

In areas not cultivated, the A1 horizon ranges from loamy fine sand to fine sand in texture and from black to very dark gray in color. The A2 horizon is loamy fine sand to fine sand that is dark grayish brown to dark gray in hue of 10YR, value of 4, and chroma of 1 or 2.

The C1 horizon ranges from loamy fine sand to fine sand. Its color is light yellowish brown to dark grayish brown in hue of 10YR, value of 4 to 6, and chroma of 2 to 4. The C2 horizon is loamy fine sand to sand. Its color is dark grayish brown to very pale brown in hue of 10YR, value of 4 to 7, and chroma of 2 or 3. The mottles in this horizon are grayish brown to dark grayish brown and yellowish brown. They are few to common, fine to medium, and faint to distinct.

Scranton soils occur with soils of the Chipley and Rutlege series. They are not so well drained as Chipley soils but are better drained than Rutlege soils. They have low chroma mottles and other indications of wetness at depths of less than 30 inches that are not present in Chipley soils.

Scranton loamy fine sand (Sf).—This is a level somewhat poorly drained, deep, acid soil that is sandy throughout the profile.

Areas of Chipley, Seewee, Osier, and Rutlege soils 2 to 6 acres in size are mapped within the boundaries of this soil. The combined extent of the included areas is less than 8 percent of the total acreage.

About 80 percent of this mapping unit is woodland. The rest is cropland and pasture. The principal crops are soybeans, corn, small grains, and pasture and hay. Crops grow fairly well when this soil is adequately drained and managed. (Capability unit IIIw–1; woodland suitability group 3w2)

Seabrook Series

The Seabrook series consists of deep, acid, moderately well drained soils that are sandy throughout.

In a typical Seabrook soil, the surface layer and the material underlying it are loamy fine sand. The surface layer is very dark grayish brown and is about 9 inches in thickness. The underlying material is dark brown to brownish yellow and light gray, mottled with gray, yellowish red, and strong brown.

Available water capacity is low. Infiltration and permeability are rapid but are impeded by a high water table during rainy seasons. Surface runoff is slow. Content of organic matter is low, and inherent fertility is moderately low. The amount of available phosphorus is higher than in other sandy soils of the county.

About 60 percent of the Seabrook acreage is woodland. The rest is cropland, pasture, and residential areas.

Typical profile in nearly level cropland on James Island, 3 miles west of Fort Johnson and three-fourths mile northeast of intersection of Camp Road and Dills Bluff Road:

Ap—0 to 9 inches, very dark grayish-brown (10YR 3/2) loamy fine sand; weak, fine, granular structure; very friable; many small roots; few to common, strong-brown to dark-brown, hard concretions; pH 5.7; clear, smooth boundary.

C1—9 to 20 inches, dark-brown (10YR 4/3) to dark yellowish-brown (10YR 4/4) loamy fine sand; common, fine, distinct mottles of yellowish red (5YR 4/8); weak, fine, granular structure; few fine pores; few to common, small to large, strong-brown (7.5YR 5/6) and dark-brown (7.5YR 3/2), hard concretions ¼ to ¾ inch in size; pH 4.7; gradual, wavy boundary.

C2—20 to 42 inches, brownish-yellow (10YR 6/6) loamy fine sand; common, large, distinct mottles of brown (10YR 5/3); structureless; very friable; common, large, dark reddish-brown (5YR 3/3), hard concretions, ¾ to 1¼ inches in size; common, large, strong-brown, soft concretions 1 to 2 inches in size; pH 5.2; gradual, wavy boundary.

C3—42 to 54 inches +, light-gray (5Y 7/2) and gray (5Y 5/1) loamy fine sand; very friable; many fine root channels; strong-brown staining around the channels; common, large, firm concretions; pH 5.3.

The A horizon is 10 inches or less of loamy fine sand, loamy sand, or fine sand. It ranges from very dark grayish brown to brown.

The C1 horizon is yellowish-brown to dark-brown loamy fine sand, loamy sand, or sand. The C2 horizon is light olive-brown, brownish-yellow, yellowish-brown, or brown loamy fine sand, loamy sand, or sand. The C3 horizon is light-gray and gray to grayish-brown loamy fine sand to sand.

Dark reddish-brown concretions ⅛ inch to 2 inches in diameter are few to common throughout the profile. They constitute less than 10 percent of the soil material. The content of silt plus clay is 8 to 20 percent at a depth of 10 to 40 inches. The water table is usually 2 to 3 feet during prolonged rainy periods. All horizons below the Ap are strongly to very strongly acid.

Seabrook soils occur with Wando and Rutlege soils. They are moderately well drained, as compared to the excessively drained to well drained Wando soils and the poorly to very poorly drained Rutlege soils. Their reaction is more strongly acid than the reaction in the Wando soils.

Seabrook loamy fine sand (0 to 2 percent slopes) (Sk).—This is a nearly level, acid, moderately well drained soil that is sandy throughout.

Areas of Wando, Kiawah, Rutlege, Charleston, and Edisto soils 1 to 6 acres in size are mapped within the boundaries of this soil. The combined extent of the included areas is less than 7 percent of the total acreage.

About 60 percent of the total acreage of this soil is woodland. The rest is cropland, pasture, and residential areas. The principal crops are tomatoes, soybeans, and snap beans. Cucumbers, Irish potatoes, small grains, grasses for pasture and hay, and legumes are also grown. With adequate drainage and other good management, crops grow satisfactorily. (Capability unit IIIw-1; woodland suitability group 2o1)

Seewee Series

The Seewee series consists of somewhat poorly drained to moderately well drained acid soils that are sandy throughout. These soils contain an old buried surface layer.

In a typical profile the surface layer is black to dark grayish-brown loamy fine sand about 11 inches in thickness. The subsurface layer is brown loamy fine sand about 10 inches in thickness. Below this layer is a buried surface layer of dark-brown fine sand about 9 inches in thickness. The substratum is grayish-brown to light brownish-gray fine sand.

Available water capacity is low in Seewee soils. Infiltration and permeability are rapid but are impeded by a high water table. Surface runoff is slow. Content of organic matter and inherent fertility are low.

Most of the areas of Seewee soils are woodland. A part of the acreage is used for cropland and pasture. These soils are suited to cultivation, and they respond to good management.

Typical profile of Seewee loamy fine sand in nearly level woodland, 3 miles west of McClellanville, 100 feet west of the road built by the International Pulp and Paper Company, and 500 feet north of U.S. Highway 17:

A11—0 to 6 inches, black (10YR 2/1) loamy fine sand; weak, fine, granular structure; very friable; many small and medium roots; pH 5.1; clear, smooth boundary.

A12—6 to 11 inches, dark grayish-brown (10YR 4/2) loamy fine sand; weak, fine, granular structure; very friable; abundant small and few medium roots; pH 5.0; clear, smooth boundary.

A3—11 to 21 inches, brown (10YR 5/3) loamy fine sand; common, medium, faint, yellowish-brown mottles and few, medium, faint, pale-brown mottles; weak, fine, granular structure; few small roots; pH 5.1; clear, smooth boundary.

A1b—21 to 30 inches, dark-brown (10YR 3/3) fine sand; few, fine, faint, dark grayish-brown and grayish-brown mottles; structureless; firm in place, brittle and loose when crushed; few small roots; few fine pores; old root holes and pores stained red (2.5YR 5/6); pH 5.2; gradual, wavy boundary.

C1g—30 to 48 inches, grayish-brown (10YR 5/2) fine sand; common, medium, faint, dark-brown and yellowish-brown mottles; structureless; loose; pH 5.7; gradual, wavy boundary.

C2g—48 to 65 inches, light brownish-gray (2.5Y 6/2) fine sand; common, medium, distinct, yellowish-brown mottles; structureless; loose; strongly acid.

The combined thickness of the A11, A12, and A3 horizons ranges from 15 to 34 inches. The texture of these horizons is mainly loamy fine sand, but loamy sand and fine sand occur in places. The A11 and A12 horizons are black to dark grayish brown. The A3 horizon is pale brown to grayish brown or dark yellowish brown. The content of quartz is less than 90 percent in the A3 horizon. The A1b horizon and all horizons below it are fine sand to sand. Color in the A1b horizon is mainly dark brown but ranges to dark reddish brown, very dark brown, black, and very dark grayish brown. Faint to distinct mottles that have higher values than the matrix and higher or lower chromas occur in the A1b horizon in places. Where it is more than 10 inches in thickness, the lower part of this horizon has color values 1 unit higher than those in the upper part. The total content of iron, aluminum, and organic carbon in the A1b horizon is less than 1 percent.

The C horizons are light gray to brown to light olive brown. They have few to common yellowish-red and brownish-yellow mottles in places.

About 35 percent of the minerals in these soils are weatherable. More than 25 percent of the medium and fine sand grains are considered weatherable. At depths of 10 to 40 inches, the content of fines is 5 to 15 percent.

Seewee soils occur with the deep, sandy Chipley and Rutlege soils. They are not so well drained as Chipley soils, and they are darker colored. They are better drained than Rutlege soils. Seewee soils contain a buried surface layer; Chipley and Rutlege soils do not.

Seewee complex (Sm).—This is a complex of sandy soils. Seewee soils make up about 65 percent of the acreage. These soils are level and somewhat poorly drained to moderately well drained. Typically they have a surface layer of loamy fine sand.

Areas of Chipley, Scranton, Rutlege, Lakeland, and some unnamed soils make up about 35 percent of the acreage. Some of these soils are wetter than Seewee soils, and the dark-colored part of their surface layer is thicker. Others lack the dark-colored layer beneath the surface layer that occurs in soils of the Seewee series. The accompanying soils form an intricate pattern with the Seewee soils, and since they occur in small areas, it is not practical to separate them.

Most of this mapping unit is woodland. Small areas in scattered locations are cropland or pasture. The principal crops are snap beans, tomatoes, corn, cucumbers, and soybeans. The soil is easy to work, and it responds to good management. (Capability unit IIIw-1; woodland suitability group 3w2)

Stono Series

The Stono series consists of very poorly drained, acid soils that have a thick black surface layer and a loamy subsoil.

The surface and subsurface layers of a typical Stono soil are black fine sandy loam. Their combined thickness is about 17 inches. The subsoil, which is about 20 inches in thickness, is very dark gray fine sandy loam in the upper part and dark-gray fine sandy clay loam in the lower part. The substratum is gray loamy fine sand.

Available water capacity is moderate in these soils. Infiltration and permeability are moderate but are impeded by a frequently occurring high water table. Surface runoff is very slow. Inherent fertility is moderate.

Most areas of Stono soils are woodland. A small part of the acreage is cropland and pasture. The principal crops are Irish potatoes, cabbage, corn, and soybeans. When these soils are adequately drained and otherwise properly managed, they are suited to cultivation.

Typical profile in cropland 1½ miles southeast of the Harbor View Road bridge across James Island Creek and one-half mile south of Harbor View Road:

Ap—0 to 9 inches, black (10YR 2/1) fine sandy loam; weak, fine, granular structure; friable; high in content of organic matter; many fine roots; fine and medium dark-red to strong-brown concretions; pH 4.9; clear, smooth boundary.

A2—9 to 17 inches, black (10YR 2/1) fine sandy loam; weak, medium, granular structure; friable; few fine roots; common fine pores; pH 5.2; clear, smooth boundary.

B21tg—17 to 23 inches, very dark gray (10YR 3/1) fine sandy loam; few, fine, prominent mottles of dark reddish brown; weak, medium, subangular blocky structure; friable; many fine pores; faint patchy clay films on ped faces; pH 5.5; gradual, smooth boundary.

B22tg—23 to 37 inches, dark-gray (10YR 4/1) fine sandy clay loam; weak, medium, subangular blocky structure; friable; common, medium, hard, reddish-brown concretions; faint patchy clay films; pH 5.8; gradual, wavy boundary.

IICg—37 to 54 inches +, gray (10YR 6/1) loamy fine sand; friable; many fine mica flakes; pH 5.9.

The solum ranges from 34 to 57 inches in thickness. The A1 horizon ranges from fine sandy loam to loamy fine sand. The Ap horizon is black to very dark gray fine sandy loam to loamy fine sand. Normally the A2 horizon is black to dark-gray fine sandy loam to loamy fine sand. In a few areas it is grayish brown in hue of 10YR.

The B21tg horizon is very dark gray to dark gray in hue of 10YR. Its reaction is usually strongly acid, but it ranges to neutral in some areas. The B22tg horizon is dark gray to dark grayish brown in hue of 10YR. Its texture is fine sandy loam to fine sandy clay loam. The reaction in the B22tg horizon is strongly acid to neutral. Concretions are few to common in the B horizons that occur on the Sea Islands. Elsewhere they are few to none.

The IIC horizon ranges from sand to sandy clay loam or to lenses of sand and sandy loam. The reaction ranges from 5.3 to 7.3 pH but ordinarily is 6.0 or higher.

Stono soils occur with soils of the Meggett, Edisto, and Yonges series. They are coarser textured throughout the profile than Meggett soils. They are more poorly drained than Edisto and Younges soils. The Stono soils typically have a black surface layer about 17 inches in thickness, whereas the surface layer of the Edisto and Yonges soils is not so dark and is slightly thinner.

Stono fine sandy loam (St).—This is a level and very poorly drained soil that has a thick black surface layer and a loamy subsoil.

Areas of Edisto, Yonges, Hockley, Scranton, and Meggett soils 2 to 5 acres in size are mapped within the boundaries of this soil. The combined extent of the included areas is less than 8 percent of the total acreage.

Most of this soil is woodland. When it is adequately drained and otherwise properly managed the soil is suitable for growing Irish potatoes, cabbage, corn, and soybeans. (Capability unit IIw-3; woodland suitability group 1w3)

Tidal Marsh, Firm

Tidal marsh, firm (Tf) is a level, very poorly drained organic land type that formed in woody material. It is saturated with sea water, and the surface is covered by sea water once a month or oftener. The muck that is in this land type probably developed in fresh water during a geologic stage when the coastline was east of its present location. Rising ocean levels evidently have changed to tidal marsh what was once fresh-water muck. Logs and woody material occur under the surface in places.

Available water capacity is moderate in this land type. Infiltration and permeability are moderate but are impeded by a continuous high water table. Surface runoff is very slow. The content of organic matter is high, but inherent fertility is low. Small areas of Capers soils and small "islands" of sandy loam to sandy clay loam are mapped within the boundaries of this land type. The combined extent of the included areas is less than 5 percent of the total acreage.

Salt-tolerant plants, such as black rush and smooth cordgrass, grow in this land type. It is unsuitable for farm crops or trees. It can be used for range pasture. (Capability unit Vw-4; not classified for woodland suitability)

Tidal Marsh, Soft

Tidal marsh, soft (Ts) is a miscellaneous land type occurring on the coast and along tidal streams and rivers between the ocean and the uplands. It is in broad, level, tidal flats that are covered by 6 to 24 inches of salt water at high tide.

The surface layer is dark colored soft clay, clay loam, muck, or peat and is saturated. It is underlain by gray to dark-gray, soft, fine-textured clayey material that is permanently saturated.

This land type contains sulfide. If it is drained or if it becomes aerated, the sulfide oxidizes to form sulfuric acid. The material that results is known as catclay, and many plants die in it. Also, the soil material shrinks greatly when it dries.

Areas of Capers soils are mapped within the boundaries of this land type, and they are inundated by tidal waters along with the Tidal marsh, soft. The combined extent of the included areas is about 10 percent of the total acreage. Tidal marsh, soft, is very unstable and has a low bearing strength. It does not support the weight of cattle. Capers soils, which have a higher bearing strength, are able to support the weight of cattle.

This land type occupies about 20 percent of Charleston County. It is covered by salt-tolerant plants, such as black rush and smooth cordgrass. It is suitable only for natural recreation uses, such as hunting and fishing. (Capability unit VIIIw-2; not classified for woodland suitability)

Wadmalaw Series

The Wadmalaw series consists of poorly drained soils that are loamy throughout. The upper part of the soil is acid, but the subsoil ranges from medium acid to moderately alkaline.

In a typical profile the surface layer and subsurface layer are fine sandy loam. The surface layer is black to dark gray in color and about 13 inches in thickness. The subsoil, which extends to a depth of more than 60 inches, is dark-gray and gray, mainly sandy clay loam.

The Wadmalaw soils have high available water capacity, moderate to slow infiltration, and slow permeability. Surface runoff is slow in these soils. They have a high water table, and ponding occurs during rainy periods. The soils are low in content of organic matter and moderate in inherent fertility.

About 85 percent of the Wadmalaw acreage is woodland. The rest is cropland and pasture. These soils are suitable for crops if they are adequately drained and managed.

Typical profile one-eighth mile south of Meggett Station on the Seaboard Coast Line Railroad, 50 feet south of State Highway 165, and 1,000 feet southeast of the intersection of the railroad and State Highway 165:

A11—0 to 5 inches, black (10YR 2/1) fine sandy loam; weak to moderate, medium, granular structure; very friable; many roots; high in content of organic matter; very strongly acid, pH 5.0; clear, smooth boundary.

A12—5 to 9 inches, very dark gray (10YR 3/1) fine sandy loam; weak, fine, granular structure; very friable; many roots; very strongly acid, pH 5.0; clear, smooth boundary.

A3—9 to 13 inches, dark-gray (10YR 4/1) fine sandy loam; few, fine, light olive-brown mottles; weak, medium, granular structure; very friable; many roots; medium acid, pH 6.0; gradual, smooth boundary.

B1—13 to 17 inches, dark-gray (10YR 4/1) heavy fine sandy loam; common, fine, light olive-brown and brown mottles; weak, medium, subangular blocky structure; very friable; many roots and root holes; few fine pores; medium acid, pH 6.0; gradual, smooth boundary.

B21tg—17 to 27 inches, gray (10YR 5/1) light sandy clay loam; common, fine and medium, dark yellowish-brown and few olive-brown and strong-brown mottles; moderate, medium, subangular blocky structure; friable; patchy clay films; many roots and root holes; few fine pores; neutral, ph 7.3; gradual, smooth boundary.

B22tg—27 to 33 inches, gray (10YR 5/1) sandy clay loam; common, medium, yellowish-brown mottles and few light olive-brown and strong-brown mottles; moderate, medium, subangular blocky structure; friable; patchy clay films on most ped faces; many roots and many root holes; few fine pores; moderately alkaline, pH 8.0; gradual, smooth boundary.

B23tg—33 to 51 inches, gray (5Y 6/1) heavy sandy clay loam; many, medium and coarse, yellowish-brown (10YR 5/6) mottles; strong, medium, prismatic structure which breaks to angular blocky structure; firm, slightly plastic; prominent clay films on vertical ped faces; many roots; many root holes filled with sandier material; few, medium, dark reddish-brown to black concretions; moderately alkaline, pH 8.0; gradual, smooth boundary.

B24tg—51 to 65 inches, gray (5Y 5/1) sandy clay loam; many, medium, olive-yellow and yellowish-brown mottles; moderate to strong, medium, subangular blocky structure; friable; prominent clay films on vertical ped faces; many roots; common root holes filled with darker and sandier material; few, 5 to 8 mm., black ferromagnesian concretions; moderately alkaline, pH 8.0; gradual, smooth boundary.

B25tg—65 to 83 inches, gray (5Y 6/1) sandy clay loam; common, medium, dark-brown and yellowish-brown and greenish-gray mottles; firm; slightly sticky, plastic; few fine roots; few, fine, black ferromagnesian concretions; moderately alkaline, pH 8.0.

The solum extends to a depth of more than 60 inches. Various kinds of minerals occur within it. The A horizon ranges from 8 to 20 inches in thickness. The A1 horizon or the Ap horizon is fine sandy loam to loamy fine sand. It is normally very dark gray to black, but in places it ranges to very dark grayish brown and very dark brown. Some profiles have an A2 horizon that is as much as 8 inches in thickness. The A3 horizon is mainly fine sandy loam, is light brownish gray to dark gray, and it has few to common mottles of light olive brown to brown. Reaction in this horizon is slightly acid to strongly acid. The clay content in the A3 horizon gradually increases with depth.

The B1 horizon and the A3 horizon combined are from 4 to 12 inches in thickness. Just as in the A3 horizon, clay content in the B1 horizon gradually increases with depth. The B1 horizon is mainly fine sandy loam and is dark gray. Reaction is slightly acid to strongly acid. The B2t horizon is more than 45 inches in thickness. It is mainly sandy clay loam, but sandy clay or clay loam occurs in some places in the lower part. The matrix and ped faces are mostly gray in the B2t horizon, but they range to dark gray, light gray, and light brownish gray. Medium brown mottles are common throughout this horizon. Columnar peds are easily observed, and clay films are on the vertical ped faces. A few hard ferromagnesian concretions occur throughout most of the B2t horizon. Reaction in the B2t horizon is slightly acid to moderately alkaline; the most alkaline reaction ordinarily occurs in the lower part.

Wadmalaw soils occur with Hockley and Yonges soils. They are not so well drained as Hockley soils, and they have a coarser textured subsoil than Yonges soils.

Wadmalaw fine sandy loam (0 to 2 percent slopes) (Wa).—This is a nearly level, poorly drained soil that is loamy throughout.

Areas of Meggett, Yonges, Edisto, and Stono soils are mapped within the boundaries of this soil. The combined extent of all these soils is less than 8 percent of the total acreage.

Most of this soil is woodland. Cleared areas are used for Irish potatoes, cabbage, corn, and pasture. (Capability unit IIIw-2; woodland suitability group 1w3)

Wagram Series

This series consists of well-drained, nearly level to gently sloping, acid soils that have a thick sandy surface layer and loamy subsoil.

In a typical Wagram profile the surface layer is very dark grayish-brown and dark-brown loamy fine sand about 16 inches in thickness. The subsurface layer is pale-yellow loamy fine sand. It, too, is about 16 inches in thickness. The subsoil is yellowish-brown sandy clay loam. It extends to a depth of 60 inches or more.

Surface runoff is slow in Wagram soils. They have low to moderate available water capacity, rapid infiltration, and moderate permeability. The content of organic matter is low in these soils, and inherent fertility is moderately low.

Approximately 65 to 70 percent of the Wagram acreage is woodland. The rest is cropland, pasture, or idle land. The Wagram soils are suitable for cultivation and are fairly productive if properly managed.

Typical profile in nearly level woodland on U.S. Highway 17, 3.5 miles south of Rantowles and 200 feet east of Red Hill Church:

O1—1 inch to 0, loose litter made up of pine needles and small roots.

A11—0 to 8 inches, very dark grayish-brown (10YR 3/2) loamy fine sand; weak, fine, granular structure; very friable; many small roots; pH 5.2; gradual, wavy boundary.

A12—8 to 16 inches, dark-brown (10YR 4/3) loamy fine sand; weak, fine, granular structure; very friable; many small roots; pH 5.2; clear, smooth boundary.

A2—16 to 32 inches, pale-yellow (2.5Y 7/4) loamy fine sand; weak, fine, granular structure to structureless; loose to very friable; abundant small roots; pH 5.1; abrupt, smooth boundary.

B21t—32 to 50 inches, yellowish-brown (10YR 5/8) sandy clay loam; moderate, fine, subangular blocky structure; friable; faint patchy clay films; few small roots; pH 5.2; clear, wavy boundary.

B22t—50 to 60 inches +, yellowish-brown (10YR 5/8) sandy clay loam; common, fine, faint, light-gray mottles and few, fine, distinct, yellowish-red mottles; weak, fine, subangular blocky structure; friable; faint patchy clay films; pH 5.1.

The solum ranges from 45 to 71 inches in thickness. The A1 horizon is mainly loamy fine sand but in places is loamy sand. Its color ranges from very dark grayish brown to dark brown in hue 10YR. The A2 horizon is pale yellow to light yellowish brown in hue 10YR or 2.5Y.

The B1 horizon, where present, is yellowish-brown to strong-brown fine sandy loam. The B21t and B22t horizons are mainly fine sandy clay loam but range from fine sandy loam to sandy clay. For the most part these two horizons are yellowish brown, although strong-brown to yellowish-red colors occur in a few places.

The C horizon, which is at a greater depth than the depth to which the typical profile was described, is sandy loam to sandy clay with pockets of sand and clay. Its color is yellowish brown, brownish yellow, gray, or strong brown to red.

The Wagram soils occur with the Chipley and Hockley soils. Wagram soils have a thick loamy fine sand surface layer and sandy clay loam subsoil, as compared to the Chipley soils, which are sandy throughout. The Wagram soils are better drained than the Hockley soils and have a thicker A horizon.

Wagram loamy fine sand, 0 to 6 percent slopes (WgB).—This is a nearly level, well-drained soil that has a thick sandy surface layer and loamy subsoil.

Areas of Norfolk, Lakeland, Chipley, and Hockley soils 2 to 7 acres in size are mapped within the boundaries of this soil. The combined extent of the included areas is less than 6 percent of the total acreage.

This soil is suitable for cultivation and is easy to work. About 65 to 70 percent of the total acreage is woodland. The rest is cropland and pasture. The principal crops are snap beans, soybeans, cucumbers, and corn. (Capability unit IIs–1; woodland suitability group 3s2)

Wando Series

The Wando series consists of excessively drained to well-drained, deep soils that are mainly slightly acid. They are sandy throughout their profile.

A typical Wando soil has a dark-brown surface layer of loamy fine sand about 8 inches in thickness. The underlying material, to a depth of about 51 inches, is brown and strong-brown loamy fine sand. Below this is yellow fine sand.

Surface runoff is slow on Wando soils. Infiltration and permeability are very rapid. The water table is more than 5 feet below the surface. The content of organic matter and inherent fertility are low in these soils.

About 75 percent of the total Wando acreage is woodland. The rest is urban land, cropland, or pasture. These soils are very friable but are poorly suited to cultivation because of their low inherent fertility and droughtiness.

Typical profile in nearly level idle land about 2 miles south of Charleston on Harbor View Road, one-half mile east of the intersection of Harbor View Road and Fort Johnson Road:

Ap—0 to 8 inches, dark-brown (10YR 4/3) loamy fine sand; weak, fine, granular structure; very friable; few, fine, firm to hard, dark reddish-brown concretions; pH 6.1; clear, smooth boundary.

C1—8 to 32 inches, brown (7.5YR 5/4) loamy fine sand; single grain; loose; few to common, small to medium (1/4 to 3/4 inch), firm, dark reddish-brown concretions; pH 6.3; gradual, smooth boundary.

C2—32 to 51 inches, strong-brown (7.5YR 5/6) loamy fine sand; single grain; loose; common, medium and coarse (3/4 to 1 1/4 inches), firm, brown concretions; pH 6.5; gradual, smooth boundary.

C3—51 to 60 inches +, yellow (10YR 7/8) fine sand; few, medium, distinct, light-gray (10YR 6/1) mottles and few, medium, distinct, brown (7.5YR 5/4) mottles; single grain; loose; few, medium, soft and hard, dark-brown concretions; pH 6.3.

The A horizon of Wando soils is brown to dark grayish-brown loamy fine sand or sand. It is less than 10 inches in thickness.

In both the C1 and C2 horizons texture ranges from loamy fine sand to sand. Color is brown to strong brown in the C1 horizon and strong brown to yellowish brown in the C2 horizon. A thin discontinuous layer of concretionary material occurs in places in the C2 horizon. This material is about 3 percent iron and less than 0.1 percent phosphate. Concretions are few to common throughout the entire Wando profile.

The C3 horizon is fine sand or sand that is yellow to brownish yellow in hue 10YR. Chromas and values are greater with depth in this horizon. Moist chromas increase to 6 or more 40 inches from the surface, and moist values reach 5 or more at this depth. Clay content is 4 to 10 percent at depths of 10 to 40 inches, and silt content is 10 to 20 percent.

Laboratory data indicate that the Wando soils contain more phosphorus and calcium than somewhat similar soils located on higher marine terraces.

The Wando soils occur with the Chipley and Rutlege soils. Wando soils are excessively drained to well drained, as opposed to the poorly drained and very poorly drained Rutlege and the moderately well drained to somewhat poorly drained Chipley soils.

Wando loamy fine sand, 0 to 6 percent slopes (WnB).—This is a deep, excessively drained to well drained soil that is sandy throughout.

Mapped within the boundaries of this soil are areas of Chipley, Rutlege, Scranton, Edisto, and Wagram soils 2 to 6 acres in size. The combined extent of these included areas amounts to less than 3 percent of the total acreage.

About 75 percent of the acreage of this soil is woodland. The rest is used for crops, pasture, or urban purposes. Because of the very rapid infiltration rate of this soil, surface runoff seldom occurs. The principal crops are cucumbers, snap beans, soybeans, small grains, and bahiagrass. If this soil is irrigated and properly managed, crops grow fairly well. (Capability unit IVs-1; woodland suitability group 4s2)

Wicksburg Series

The Wicksburg series consists of nearly level to gently sloping, well-drained, acid soils that have a thick sandy surface layer and a mainly clayey subsoil.

The surface layer of a typical Wicksburg soil is very dark grayish-brown loamy fine sand and is about 7 inches in thickness. The subsurface layer is pale brown loamy fine sand and is about 14 inches in thickness. The subsoil is yellowish red, red, and strong-brown in color and is mainly sandy clay. It extends to a depth of 52 inches or more.

Available water capacity is low in the surface layer of Wicksburg soils and moderate in the subsoil. Surface runoff is slow to moderate. Infiltration is rapid in these soils, but permeability is moderately slow. Content of organic matter is low, and inherent fertility is moderately low.

About half of the acreage is woodland. The other half is used mainly for crops and pasture, but partly for residences.

Typical profile of Wicksburg loamy fine sand, 700 feet southwest of U.S. Highway 17 on dirt road, 2.87 miles west of intersection of U.S. Highway 17 and State Highway 162:

Ap—0 to 7 inches, very dark grayish-brown (10YR 3/2) loamy fine sand; weak, fine, granular structure; very friable; abundant small roots; pH 6.1; clear, smooth boundary.

A2—7 to 24 inches, pale-brown (10YR 6/3) loamy fine sand; few, fine, prominent, reddish-yellow mottles; weak, fine, granular structure; very friable; few small roots; pH 6.1; gradual, wavy boundary.

B1—24 to 26 inches, yellowish-red (5YR 5/8) sandy clay loam; few, fine, prominent, pale-brown mottles; weak, moderate, subangular blocky structure; friable; few small roots; pH 5.4; clear, smooth boundary.

B21t—26 to 32 inches, red (2.5YR 4/8) sandy clay; weak, moderate, angular blocky structure; firm; clay films on ped faces; few small roots and pores; pH 5.7; clear, smooth boundary.

B22t—32 to 43 inches, red (10YR 4/8) sandy clay; moderate, fine, angular blocky structure; firm; clay films on ped faces; few small roots and pores; pH 4.5; clear, smooth boundary.

B3t—43 to 52 inches +, strong-brown (7.5YR 5/8) sandy clay; common, medium, distinct, reddish-yellow mottles, few, fine, prominent, red mottles, and few, medium, distinct, light-gray mottles; moderate, medium, angular blocky structure; friable; patchy clay films on ped faces; pH 4.6.

The solum ranges from 45 to 60 inches in thickness. The A horizon is 20 to 32 inches in thickness. The Ap horizon is loamy fine sand to sand in texture and very dark gray to very dark grayish brown in color. In undisturbed areas the A1 horizon is 4 to 6 inches in thickness and pale brown to yellowish brown in color. The A2 horizon is pale-brown to yellowish-brown loamy fine sand to loamy sand.

The B1 horizon is sandy clay loam to sandy loam. The B21t horizon is sandy clay to sandy clay loam. The B22t horizon is strong brown to red, mottled with reddish yellow and red.

Wicksburg soils occur with the Edisto and Yonges soils. They are better drained than the Edisto and Yonges soils, and they have a red subsoil that does not occur in either of the two associated soils. Wicksburg soils have a lower base saturation than the Edisto and Yonges soils.

Wicksburg loamy fine sand, 0 to 6 percent slopes (WoB).—This is a nearly level to gently sloping, well-drained soil that has a thick sandy surface layer and a mainly clayey subsoil.

Orangeburg, Charleston, Edisto, and Hockley soils are mapped within the boundaries of this soil. The combined extent of the included soils is less than 5 percent of the total acreage.

About half of this soil is woodland. The principal crops grown in cultivated areas are tomatoes, cucumbers, snap beans, soybeans, and corn. Minor uses are for pasture and residences. Crops are moderately well suited to this soil if it is properly fertilized and managed. (Capability unit IIe-3; woodland suitability group 4s2)

Yonges Series

This series consists of level, poorly drained soils that have a moderately fine textured and fine textured subsoil. The reaction of these soils ranges from acid in the upper part to moderately alkaline in the lower part.

In a typical soil of the Yonges series the surface and subsurface layers are loamy fine sand and have a combined thickness of about 14 inches. The surface layer is dark grayish brown, and the subsurface layer is light brownish gray. The subsoil, which is about 46 inches in thickness, is gray fine sandy clay loam and fine sandy clay. The substratum is gray and light-brownish gray fine sandy loam.

Base saturation is more than 35 percent in Yonges soils. Available water capacity is moderate, infiltration is moderately rapid, and permeability is moderately slow and impeded by a high water table. Surface runoff is slow in these soils, and ponding occurs during rainy seasons. Inherent fertility is moderate.

Most Yonges soils are woodland. Cleared areas are used for Irish potatoes, cabbage, soybeans, corn, and pasture. The soils are suitable for these crops if they are adequately drained and otherwise well managed.

Typical profile in nearly level cropped area 1¼ miles southeast of Hollywood, one-fourth mile south of the Seaboard Coast Line Railroad, and one-fourth mile west of County Road 79:

Ap—0 to 10 inches, dark grayish-brown (10YR 4/2) loamy fine sand; weak, fine, crumb structure; very friable; many fine roots; pH 6.4; abrupt, smooth boundary.

A2—10 to 14 inches, light brownish-gray (10YR 6/2) loamy fine sand; few, distinct, medium, yellowish-brown mottles; weak, fine, crumb structure; very friable; few fine crop roots; few, fine, soft, dark reddish-brown concretions; pH 5.8; abrupt, smooth boundary.

B21tg—14 to 34 inches, gray (10YR 5/1) fine sandy clay loam; many, medium, distinct mottles of yellowish brown and few, fine, distinct mottles of red; weak, coarse, subangular blocky structure; firm when moist, hard when dry; clay films on vertical and horizontal ped faces; many fine pores and root holes; pH 5.0; gradual, smooth boundary.

B22tg—34 to 42 inches, gray (10YR 6/1) fine sandy clay; many, coarse, distinct, yellowish-brown (10YR 5/6) mottles and few, fine, prominent, yellowish-red mottles; moderate, medium, subangular blocky to prismatic structure; clay films on vertical ped faces; few fine roots and pores; few, fine, dark reddish-brown, soft concretions; pH 5.3; gradual, smooth boundary.

B3tg—42 to 60 inches, gray (10YR 6/1) fine sandy clay loam; common, medium, distinct, yellowish-brown mottles and few, fine, distinct, strong-brown mottles; massive; firm; few fine pores and root holes; few, fine, dark reddish-brown, soft concretions; pH 6.8; gradual, irregular boundary.

C1g—60 to 72 inches, gray (10YR 6/1) and light brownish-gray (2.5Y 6/2) fine sandy loam; common, fine and medium, prominent, yellowish-red mottles and some yellowish-brown mottles that resemble very soft incipient concretions; massive; friable; moderately alkaline; gradual, irregular boundary.

C2—72 to 84 inches, light brownish-gray (2.5Y 6/2) light fine sandy loam; few, fine, prominent, yellowish-red and dark reddish-brown mottles; massive; friable; moderately alkaline.

The solum ranges from 40 to about 72 inches in thickness. The A horizon ranges from loamy fine sand to fine sandy loam and fine sand but is mostly loamy fine sand. The Ap horizon is dark grayish brown to very dark gray. The A1 horizon, if present, is very dark gray to black and is 3 to 6 inches in thickness.

The B horizon is mainly sandy clay loam with a clay content of 20 to 35 percent and a silt content of 15 to 30 percent. It has common to many yellowish-brown mottles and few to common yellowish-red, red, and dark yellowish-brown mottles. The water table is in this horizon and is generally 12 to 36 inches below the surface.

The C horizon is mainly fine sandy loam, but sand and sandy loam lenses occur in some places. This horizon is gray and light brownish gray with common to many yellowish-brown, strong-brown, brownish-yellow, and yellowish-red mottles. The reaction in this horizon is neutral to moderately alkaline.

Yonges soils occur with the Chipley and Hockley soils. The Yonges soils have a B horizon of sandy clay loam and sandy clay, as opposed to the Chipley soils, which are sandy throughout the profile. They are poorly drained, as compared to the moderately well drained Hockley soils. They have a neutral to moderately alkaline C horizon, whereas the Hockley soils are acid throughout.

Yonges loamy fine sand (Yo).—This is a level, deep, poorly drained soil that has a loamy to clayey subsoil.

Areas of Meggett, Edisto, Stono, Wagram, Hockley, and Scranton soils are mapped within the boundaries of this soil. The combined extent of all inclusions is less than 8 percent of the total acreage.

Most of this soil is woodland. A small part of it is cropland and pasture. Surface runoff is slow, and ponding occurs during rainy periods. The soil is easy to work and is very responsive to good management. The principal crops are Irish potatoes, cabbage, and soybeans. The principal pasture grasses are dallisgrass and Coastal bermudagrass. These crops and grasses are suited to the soil if it is adequately drained and managed. (Capability unit IIw-3; woodland suitability group 1w2)

Use and Management of Soils

The soils of Charleston County are used extensively for row crops, close-growing crops, vegetables, and pasture. This section explains how the soils may be used for these main purposes and also as woodland, as wildlife habitat, and in the building of highways, farm ponds, and other engineering structures. Also given are predicted yields of the principal crops under two levels of management.

The management of crops and pasture, of woodland, and of wildlife habitat is discussed by groups of soils. To determine the soils in each of these groups, refer to the "Guide to Mapping Units" at the back of this survey.

Capability Grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The groups are made according to the limitations of the soils when used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops requiring special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for range, for forest trees, or for engineering.

In the capability system, all kinds of soils are grouped at three levels, the capability class, subclass, and unit. These are discussed 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, defined as follows:

Class I soils have few limitations that restrict their use.

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

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

Class IV soils have very severe limitations that reduce the choice of plants, 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 largely to pasture, range, woodland, or wildlife.

Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife.

Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland, or wildlife.

Class VIII soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes.

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, II*e*. 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 too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by *w*, *s*, and *c*, because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation. In Charleston County these soils are all in the *w* category—Vw–2, Vw–3, Vw–4.

CAPABILITY UNITS are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe–3, or IIIw–1. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass.

In the following pages the capability units in Charleston County are described and suggestions for the use and management of the soils are given.

Management by capability units

In this subsection each capability unit is described and some suggestions for use and management of the soils in the unit are given. To save space, the names of soil series, rather than the names of mapping units, are given in the description of many of the capability units. Listing a series name in a capability unit does not imply that all soils of that series are in the unit. Refer to the guide at the back of this publication for the names of all mapping units and the capability unit in which they have been placed.

CAPABILITY UNIT I–1

This unit consists of deep, friable, nearly level, well-drained soils of the Orangeburg and Norfolk series.

The surface layer is loamy fine sand 8 to 16 inches in thickness. The subsoil is mainly sandy clay loam.

The available water capacity is moderate but adequate for most crops. Infiltration is moderately rapid, and permeability is moderate. Runoff is very slow, and there is little or no erosion hazard. Fertility is medium in these soils, and the content of organic matter is low. Acidity is medium.

These soils occupy less than 1 percent of the county. They are mostly wooded. A small part of the acreage is cultivated or is used for pasture. Cotton, corn, vegetables, and small grains are the principal crops. Bahiagrass and Coastal bermudagrass are well suited. Row crops can be grown every year, and fertility can be maintained by fertilizing the soils heavily. Legumes and certain other crops respond to lime.

These soils are easy to till, and they can be worked within a wide range of moisture content. The root zone is deep. Since the soils are nearly level, modern farm machinery is easy to use. Early in the spring, winds cause considerable soil blowing in areas that are dry and freshly plowed. Stripcropping is an effective means of combating the loss of soil and the damage to crops.

CAPABILITY UNIT IIe–2

Faceville fine sandy loam, 2 to 6 percent slopes, is the only soil in this unit. It is a deep, well-drained, friable soil that occurs on gently sloping uplands.

The surface layer is fine sandy loam that ranges from 8 to 12 inches in thickness. The subsoil is slightly sticky clay loam to clay.

The available water capacity in this soil is moderate, but it is ample for crops. Infiltration and permeability are moderate. Surface runoff is medium, and the erosion hazard is slight. The content of organic matter is medium. Fertility is usually high, and the soil retains plant nutrients well. Acidity is medium.

This soil makes up about 0.2 percent of Charleston County. It is mostly in pine and hardwood forests. The principal crops are corn, small grains, and soybeans. Bahiagrass and Coastal bermudagrass for hay and pasture are well suited.

This soil is usually easy to till. It can be worked within a fairly wide range of moisture content but should not be worked too soon after rains. It has a thick root zone.

Erosion is a moderate hazard when this soil is cultivated. If crops that can be planted close together are grown half of the time, this restricts erosion. Contour tillage, planting grass or similar protective cover in waterways, and the conserving of crop residues are other effective controls.

CAPABILITY UNIT IIe–3

This unit consists of deep, acid, well-drained to moderately well drained soils that occur on gently sloping uplands. It contains soils of the Hockley, Orangeburg, and Wicksburg series.

The surface layer is loamy fine sand that ranges from 8 to 24 inches in thickness. The subsoil is sandy clay loam to sandy clay.

The available water capacity is moderate to moderately low in these soils. Infiltration and permeability are moderate. The content of organic matter is low to medium, and fertility is medium.

These soils make up about 1 percent of the county. About 60 percent of their acreage is wooded. These soils are well suited to commonly grown crops. The ones most frequently grown are corn, snap beans, soybeans, and small grains. Bahiagrass and Coastal bermudagrass are suitable for pasture and hay. Contour tillage and waterways that are protected by close-growing, fibrous-rooted plants are needed to control erosion. Crops respond to lime and fertilizer.

CAPABILITY UNIT IIw–2

This unit consists mainly of deep, nearly level, moderately well drained to somewhat poorly drained, strongly acid soils. It contains soils of the Charleston, Dothan, Dunbar, Quitman, and Hockley series.

Typical soils have a loamy fine sand surface layer and a friable to firm sandy loam to clay subsoil.

Available water capacity is moderate to low in these soils, but because of the high water table, moisture is ample for crops. Infiltration is moderate to rapid, and permeability is moderate to slow. Surface runoff is slow, and water stands for long periods of time on areas that are not drained. Fertility and content of organic matter are medium.

These soils make up about 5.4 percent of Charleston County. About 50 percent of their acreage is cultivated. The rest is woodland, roads, businesses, and residential areas.

Soils in this unit are well suited to soybeans, corn, small grains, and vegetables. Among the plants that are well suited to hay and pasture are dallisgrass, bahiagrass, bermudagrass, white clover, and annual lespedeza. Row crops can be grown each year. The cropping system should keep close-growing crops on the soils half of the time. Irrigation is needed during prolonged dry periods.

CAPABILITY UNIT IIw-3

This unit consists of nearly level, somewhat poorly drained to very poorly drained (fig. 2), deep soils. It contains soils of the Edisto, Stono, and Yonges series.

Figure 2.—**Digging an open drainage ditch in Yonges loamy fine sand. (Capability unit IIw-3)**

The surface layer typically is loamy fine sand that is 10 to 14 inches in thickness. The subsoil is sandy loam to sandy clay.

Infiltration is rapid to moderate, and permeability is moderate to moderately slow in these soils. Permeability is impeded by a high water table during rainy periods. Fertility and the content of organic matter are low to moderate. The soils are strongly acid to neutral.

These soils make up about 6.9 percent of Charleston County. They are usually in good tilth, and they have a thick root zone. About 50 percent of their acreage is cultivated. They are suited to Irish potatoes, cabbage, snap beans, soybeans, corn, tomatoes, cucumbers, small grains, and pasture. Bahiagrass and Coastal bermudagrass are adapted to these soils and are suitable for pasture and hay (fig. 3). The suitability of high-value crops is improved by irrigating the soils during prolonged dry periods. Water is supplied by manmade ponds.

CAPABILITY UNIT IIw-5

Craven fine sandy loam is the only soil in this capability unit. It is a moderately well drained to somewhat poorly drained, acid soil.

The surface layer is a thin, friable, very dark gray to dark-gray fine sandy loam. The subsoil is mainly firm, yellowish-brown clay that contains red and strong-brown mottles.

The available water capacity is moderate. Infiltration is moderate, and permeability is slow. Content of organic matter is low, and fertility is moderate. Reaction is strongly acid to very strongly acid, and a soil test is needed as a guide in soil treatment.

This soil occupies about 0.2 percent of the county. About 75 percent of it is used for crops and pasture or is idle. The main crops are corn, small grains, soybeans, and tame pasture. Good tilth is difficult to maintain, and the conserving of crop residues is important. Bahiagrass is well suited as a crop to be grown in rotation with row crops. The soil responds to good management.

CAPABILITY UNIT IIs-1

Wagram loamy fine sand, 0 to 6 percent slopes, the only soil in this unit, is deep, well drained, and nearly level to gently sloping.

The surface layer of this soil is thick, loose loamy fine sand that ranges from 18 to 30 inches in thickness. The subsoil is fine sandy loam to sandy clay loam.

Available water capacity is moderate, but the loamy sand surface layer is slightly droughty, especially for shallow-rooted plants or newly established seedlings. Infiltration is rapid, and permeability is moderately rapid to moderate. Content of organic matter is low, and fertility is moderately low. Acidity is medium.

This soil makes up about 1.3 percent of Charleston County. About 65 percent of the soil is woodland. The rest is cropland, pasture, or idle land. The main crops are snap beans, soybeans, cucumbers, and corn. Bahiagrass and Coastal bermudagrass are suitable for pasture and hay.

This soil is easily cultivated. It has a thick, loose root zone and can be worked within a wide range of moisture content. Farm machinery is easy to use on the gentle and smooth slopes. Early in spring, winds cause considerable soil blowing in exposed areas that are dry and freshly plowed (fig. 4).

CAPABILITY UNIT IIIw-1

This unit consists of moderately well drained and somewhat poorly drained, sandy soils that occur on broad, low ridges. It contains soils of the Chipley, Kiawah, Scranton, Seabrook, and Seewee series.

Figure 3.—**Bahiagrass pasture on artificially drained Edisto loamy fine sand. (Capability unit IIw-3)**

Sand or loamy sand extends from the surface to a depth of 30 inches or more in these soils.

The available water capacity is low, and infiltration and permeability are rapid. Fertility is low to moderately low, content of organic matter is low, and the soils are strongly acid to extremely acid. The water table is near the surface during rainy periods and 3 feet or more below the surface during droughts.

These soils occupy about 15.8 percent of the county. About 35 percent of their acreage is cultivated. The tilth is usually good and the root zone is thick, but the soils are of limited suitability for crops. If they are well managed they are suited to corn, oats, some vegetables, bahiagrass, and Coastal bermudagrass. Because of the widely fluctuating water table, both drainage and irrigation may be necessary. Wind erosion is a problem early in spring. Wind stripping (fig. 5) reduces soil blowing and damage to crops.

CAPABILITY UNIT IIIw-2

This unit consists mainly of poorly drained and very poorly drained soils that occur in low, flat to depressional areas. It contains soils of the Cape Fear, Meggett, Santee, and Wadmalaw series.

The surface layer typically is acid loam or fine sandy loam. The subsoil is dominantly firm sandy clay loam to clay. It is neutral to alkaline in all the soils except the Cape Fear, which has a strongly acid to very strongly acid subsoil.

The available water capacity is mainly high, but is moderate to high in Meggett soils. Permeability is slow to very slow, and infiltration is slow to moderate. Water stands on the surface or a few inches below it during most of the winter and early in spring. These soils are low to moderate in fertility. The thickness of the root zone is limited by the high water table.

These soils occupy about 11.8 percent of the county. They are mostly wooded. Excess surface water (fig. 6) can be eliminated in most areas by leveling and shaping the fields, digging open ditches, and bedding the rows. If drainage is adequate, these soils can be cultivated intensively. They are suited to corn, soybeans, some truck crops, clovers, and bahiagrass.

Row crops can be grown year after year, but rotating row crops with grass improves their quality. Bahiagrass is excellent as a crop grown in rotation with a truck crop.

CAPABILITY UNIT IIIw-4

This unit consists of level, poorly drained to very poorly drained soils of the Portsmouth and Rains series.

The surface layer is friable sandy loam or fine sandy loam. The subsoil is sandy loam to sandy clay.

The available water capacity is moderate to moderately low. Infiltration and permeability are moderate. The content of organic matter is low to moderate, and the fertility is low to moderate.

These soils occupy less than 1 percent of Charleston County. About 90 percent of their acreage is wooded. Open ditches or tile must be used for intensive drainage in cultivated areas. Tilth is usually good, and the root zone is favorable once the soils are adequately drained. They are fairly well suited to truck crops, soybeans, corn, bahiagrass, and clover.

Figure 4.—**Soil blowing on Wagram loamy fine sand, 0 to 6 percent slopes. (Capability unit IIs-1)**

CAPABILITY UNIT IIIw-6

Ardilla fine sandy loam, which is mapped with Dunbar soil, is the only soil in this capability unit. It is nearly level and somewhat poorly drained.

The surface layer is fine sandy loam. The subsoil is fine sandy loam to clay loam in the upper part and sandy clay to clay in the lower part.

Available water capacity is moderate in this soil. Infiltration is also moderate, but permeability is slow. Surface runoff is slow. The content of organic matter is low, and inherent fertility is moderate.

This soil occupies less than 0.5 percent of Charleston County. Most of it is wooded. A small percentage of the acreage is cropland and pasture. Corn, small grains, and pasture grasses are suitable crops.

CAPABILITY UNIT IVw-1

This unit consists of level, poorly drained to very poorly drained, acid soils and nearly level, very poorly drained, nonacid soils. The acid soils occur on stream bottoms. The soils are in the Chastain and Myatt series.

The surface layer is loam to silt loam. The underlying material is silty clay loam to clay.

The available water capacity is moderate. Infiltration is moderate to slow, and permeability is slow. Surface runoff is slow. The content of organic matter is low, and fertility is moderate.

These soils occupy about 1.2 percent of Charleston County. They are presently wooded, but large acreages were once used for growing rice. The Chastain soils are frequently flooded by water from overflowing streams.

Figure 5.—Wind stripping on Seabrook loamy fine sand. (Capability unit IIIw-1)

The Myatt soil is suitable for cultivation if it is intensively drained, fertilized, and otherwise effectively managed. It is suitable for growing Irish potatoes, cabbage, corn, and pasture grasses.

CAPABILITY UNIT IVs-1

This unit consists of excessively drained to well drained sandy soils that occur on ridges and slopes of not more than 6 percent. It contains soils of the Lakeland and Wando series. Loose sand extends to a depth of 60 inches or more.

The available water capacity of these soils is low. Infiltration and permeability are rapid. The content of organic matter is low, and fertility is very low. Reaction is slightly acid to very strongly acid.

These soils occupy 5.8 percent of Charleston County. They are mostly wooded. They are loose when they are dry but are in good tilth when they are moist. The root zone is thick, and the soils can be worked within a wide range of moisture content. Because of the sand and low available water capacity, the soils are droughty. They warm early in spring and are suited to vegetables that mature early. Early corn, sweetpotatoes, melons, rye, bahiagrass, and bermudagrass grow fairly well.

Large open fields are particularly vulnerable to wind erosion. A good way to combat this is to plant crops in strips at right angles to the prevailing wind and to alternate each strip of clean-tilled crop with a strip of close-growing vegetation. Rye is excellent for the alternating strip.

Bahiagrass can be rotated with the regular crops to reduce damage from wind erosion, supply organic matter to the soil, and improve tilth.

CAPABILITY UNIT Vw-2

This unit consists of level to nearly level, poorly drained to very poorly drained soils that occur on broad flats and in drainageways. It contains soils of the Dawhoo, Osier, and Rutlege series.

In most places the surface layer is loose sand. In very poorly drained areas this layer is usually mucky. An underlying layer of sand extends to a depth of 50 inches or more.

The available water capacity is low. The loose, sandy surface layer favors rapid infiltration and permeability, but the soils are in low areas and water is on the surface or just below it for long periods of time. The content of organic matter is low to high, and the fertility is low. The soils are very strongly acid to extremely acid.

These soils occupy about 7.7 percent of Charleston County. Although a few small areas are pasture, most of

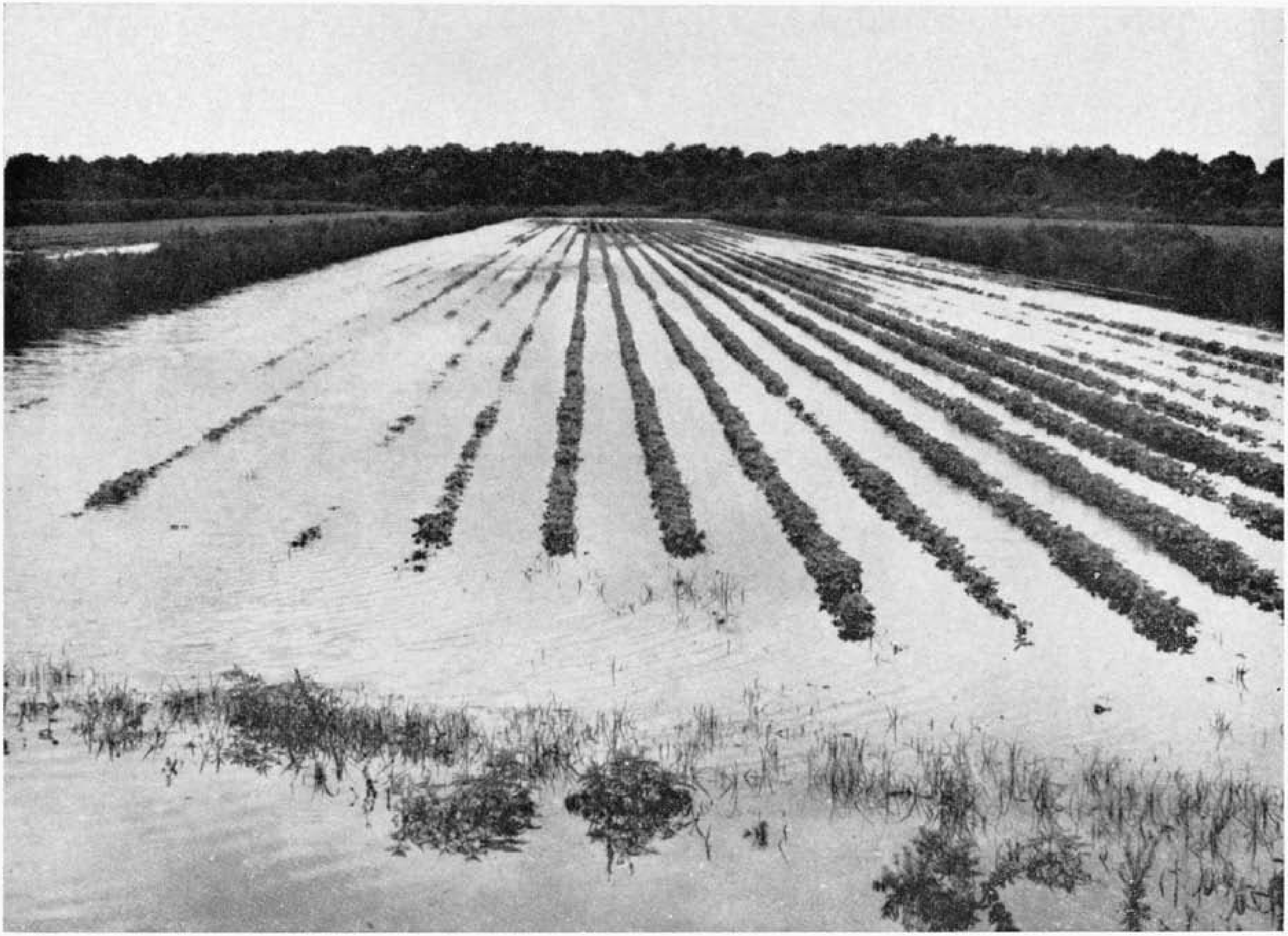

Figure 6.—**Inadequately drained Meggett loam. (Capability unit IIIw-2)**

the acreage is wooded. The soils are well suited to pine trees, but ponded areas must be drained for satisfactory growth. Areas that are used for permanent pasture must be drained intensively. Among the suitable pasture plants are oats, rye, bahiagrass, dallisgrass, annual lespedeza, and white clover.

CAPABILITY UNIT Vw-3

This unit consists of somewhat poorly drained and poorly drained, wet, acid, sandy soils of the Leon and St. Johns series.

The surface layer and the underlying layer are sand. Below these is a sand hardpan that is cemented by organic matter. Loose sand underlies the hardpan.

The available water capacity depends on the height of the water table, which fluctuates considerably. Infiltration is rapid, but moisture moves slowly through the hardpan. Fertility and the content of organic matter are low.

These soils make up about 3.7 percent of Charleston County. They are mostly wooded but are used for pasture in places. Although the tilth is generally good, the root zone is shallow. Most of the acreage is not suited to cultivation, but bahiagrass and white clover grow fairly well if the soils are managed intensively.

During spring and summer, heavy rains sometimes damage pasture plants. Shallow, open drainage ditches along the perimeter of the field are usually adequate for draining off excess surface water. Low spots on the surface should be filled in by grading.

CAPABILITY UNIT Vw-4

This unit consists of very poorly drained soils that occur on tidal flats. It contains soil of the Capers series and Tidal marsh, firm.

The surface layer is silty clay loam to muck. It is underlain by silty clay. The surface and subsurface layers are slightly acid to medium acid when not drained and extremely acid when artificially drained.

The available water capacity is moderate to high in these soils. Surface runoff is very slow, infiltration is moderate, and permeability is moderate to slow. Permeability is impeded by a high saline water table. Inherent fertility is low to moderate, and the content of organic matter is high.

These soils occupy about 6 percent of Charleston County. Because of their salt and sulfur content, they are not suited to cultivation or woodland. They can be used for wildlife habitat and for range pasture (fig. 7).

CAPABILITY UNIT VIw-1

This unit consists of poorly drained to very poorly drained, fine-textured soils. These soils are of the Bayboro, Meggett, and Santee series.

The available water capacity is moderate to high in these soils. Infiltration is moderate to slow, and permeability is slow to very slow. Surface runoff is slow, and the soils are covered by water for several months at a time. The content of organic matter and fertility are moderate to low.

These soils occupy 4.8 percent of Charleston County. They are mostly wooded, but a small percentage of the total acreage is used for pasture. Drainage and other effective management practices are required for producing good pasture. Drainage improves timber production.

CAPABILITY UNIT VIIw-2

This unit contains Pamlico muck and soils of the Rutlege-Pamlico complex. These soils are poorly drained to very poorly drained.

The surface layer of Pamlico muck is organic and is about 20 to 41 inches in thickness. It is underlain by sand. The available water capacity is high in this soil. Infiltration and permeability are moderate, but they are impeded by a continuous high water table. Runoff is very slow, and surfaces are ponded throughout the year. Although the content of organic matter is high in Pamlico muck, fertility is low.

In the Rutlege-Pamlico complex, the Rutlege soil is sandy and the Pamlico soil is muck. In many places up to 18 inches of recently deposited material overlies the soils in this complex.

Soils of this unit occupy about 1 percent of Charleston County. About 95 percent of their acreage is wooded. The rest is pasture or idle land. These soils are not suited to cultivation.

CAPABILITY UNIT VIIs-1

Crevasse-Dawhoo complex, rolling, the only mapping unit in this capability unit, is deep and very poorly drained to excessively drained. It occurs on long, narrow, gently sloping to moderately steep ridges and flats along the Atlantic coast. The surface layer and underlying material are fine sand.

The available water capacity is low. Infiltration and permeability are rapid. The content of organic matter is low, and fertility is low.

Figure 7.—Vegetation on Capers silty clay loam and Tidal marsh, firm. (Capability unit Vw-4)

370-925—71——4

This soil occupies about 1.7 percent of Charleston County. About 90 percent of this acreage is wooded. The soil is not suited to cultivation, but it can be used for range pasture and recreation.

CAPABILITY UNIT VIIs-2

This unit consists of the Mine pits and dumps and Made land mapping units. These are areas where phosphate has been mined and areas where marsh material has been deposited during dredging operations. Such areas are sand, clay, or a mixture of both. There is no set pattern of arrangement. Fragments of phosphate rock and seashells are in the soil material in some places.

Large areas in and around the city of Charleston have been filled in with soil that is made up of a variety of materials. Where such areas contain clayey material dug from soft marshes, the soil is ordinarily strongly acid and has a high shrink-swell potential.

Major reclamation must be done before Mine pits and dumps can be put to practical use. The pits, which occupy about 2 percent of Charleston County, usually contain several feet of water.

CAPABILITY UNIT VIIIw-2

Tidal marsh, soft, is the only soil in this capability unit. It occurs along tidal streams and on broad, level, tidal flats between the ocean and the uplands. It is very unstable, and it has a very low bearing strength. It is covered twice daily by 6 to 24 inches of sea water. This unit occupies about 20 percent of Charleston County.

The surface layer and subsoil are saturated with water. The subsoil is soft and is fine textured.

This soil is suitable only for wildlife habitat and such recreational uses as hunting.

CAPABILITY UNIT VIIIs-1

Coastal beaches and Dune land, the only soil in this unit, consists of nearly level, sandy beaches that are covered by tides twice daily, and sand dunes that are mounded by the wind.

The available water capacity is very low in this soil. The content of organic matter and fertility are also very low.

Protective plant cover on this soil is either lacking or sparse, and sand is continuously moved by the wind (fig. 8, *top*). Storms and hurricane tides frequently erode the shoreline and dunes (fig. 8, *bottom*).

This soil occupies about 1 percent of Charleston County. It is used extensively for bathing and summer recreation. It is not suitable for cultivation, pasture, or woodland.

Soil Suitability for Crops

In table 2 the soils of the county in capability classes I through IV are rated according to their suitability for common crops. A rating of *1* indicates that a soil is well suited to the crop. Hazards are few, intensive management is not needed, and favorable yields are likely. A rating of *2* indicates that the soil is fairly well suited to the crop, but growth is limited by excessive moisture, too little moisture, a shallow root zone, low fertility, or some other undesirable characteristic. A rating of *3* indicates that the soil is not well suited to the crop and that favorable yields are likely to occur only where intensive management is practiced. Generally this management is not economically feasible. A rating of *4* indicates that the soil is poorly suited to the crop, and attempting to grow the crop on it would be impractical.

Estimated yields

Table 3 presents estimated average acre yields of principal crops on soils of Charleston County at two levels of management. In columns A are average yields obtained through management prevalent in the county, and in columns B are yields to be expected under improved management.

Estimates of average yields obtained through prevalent, or common, management are based largely on observations made by members of the soil survey party, on information obtained by interviewing farmers and other agricultural workers who have had experience with soils and crops in the county, and on comparisons of soils in this county with soils in other counties of the State for which yield records are available.

The management practices needed to obtain yields shown in columns B of table 3 are (1) proper choice and rotation of crops; (2) correct use of commercial fertilizer, lime, and manure; (3) correct methods of tillage; (4) return of organic matter to the soils; (5) adequate control of water; (6) maintenance or improvement of workability of the soil; and (7) conservation of soil material, plant nutrients, and soil moisture.

The response of a soil to management can be measured, in part, by comparing yields in columns A of table 3 with those in columns B. Most soils in the county produce higher yields when management is improved.

Use of Soils as Woodland [2]

In the original forest that covered much of Charleston County, pine, oak, and hickory were on the uplands, and cypress and bottom-land hardwoods were on the flood plains and other alluvial areas. The virgin forest provided material for naval stores and logging industries. Gradually more pine invaded the uplands, but in recent years cutting and fire-protection practices have favored the growth of hardwoods on them once again. Hardwoods invaded those lowlands in the original forest that were abandoned after they had been cleared of native trees and cultivated.

Areas of forest land are still prevalent in the county, and farmers have become more and more concerned with woodland conservation. The total woodland area was listed at 48 percent as recently as 1958 (1958 forest survey of South Carolina) (*8*).[3] Since 1929 approximately 8 million trees have been planted on 8,000 acres (*15*) in the county. More than 352,000 trees were planted during the 1965-66 season alone.

Forest types in the county are in the following groups according to the Society of American Foresters classification (*12*): longleaf pine, loblolly pine, hardwood-pine, and swamp and bottom-land hardwoods. These groups contain many different forest types. Longleaf pine and scrub oaks are usually predominant on droughty soils,

[2] By GEORGE E. SMITH, JR., woodland conservationist, Soil Conservation Service.

[3] Italicized numbers in parentheses refer to Literature Cited, page 75.

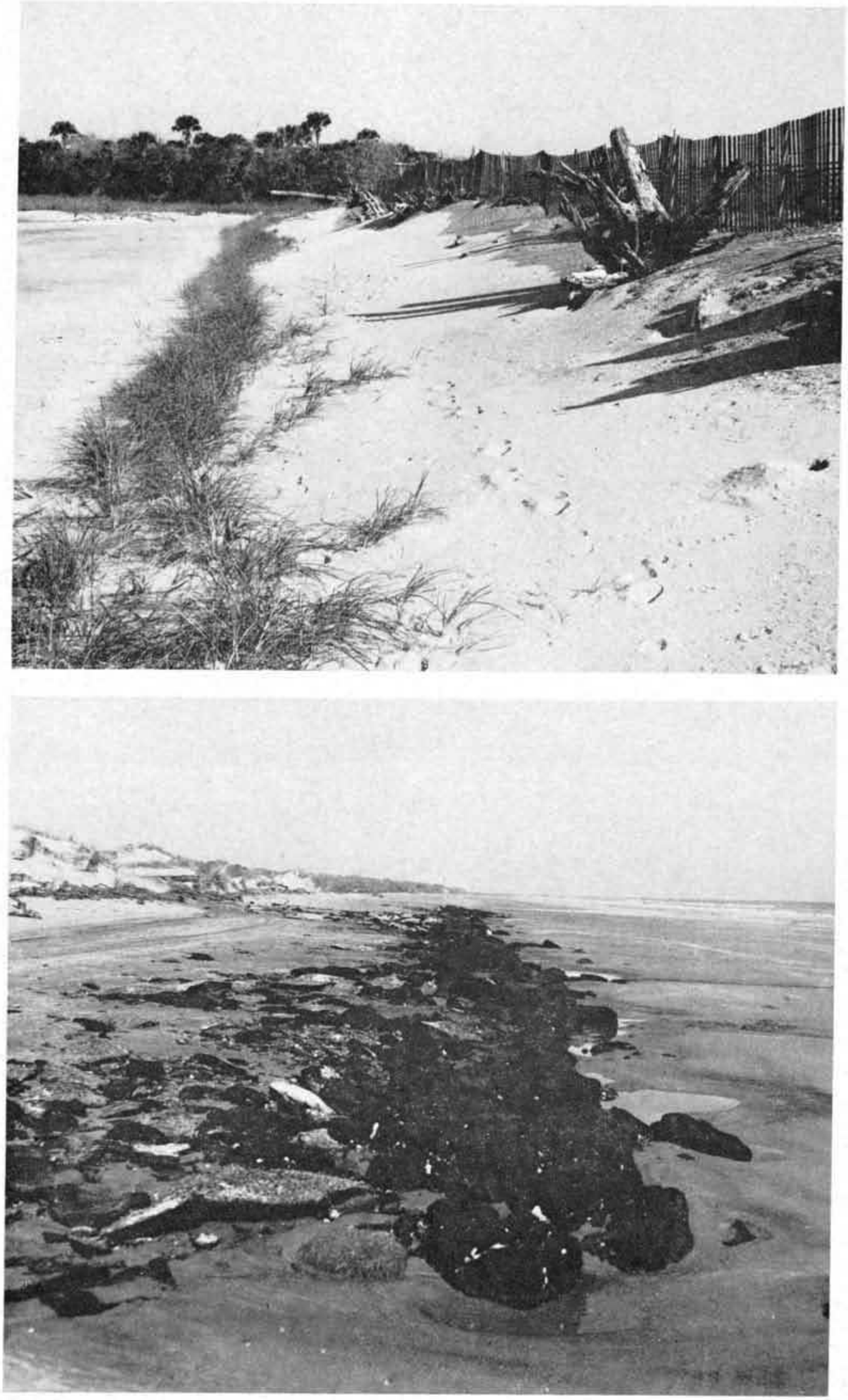

Figure 8.—Top, Snow fence and American beachgrass used to control erosion on beach sands. *Bottom,* Coastal beach paved street damaged by waves during storm.

and loblolly pine and longleaf pine are predominant on moist, well-drained uplands. On soils in alluvium that are very poorly drained and have excessive surface water, cypress and tupelo are predominant. Bottom-land hardwoods are the most common on the soils in alluvium, if such soils are well drained to poorly drained.

Soils differ in their suitability for trees because they are at different elevations and positions and have different characteristics. Those characteristics of soils that determine the supply of moisture and growing space for the roots of the trees are the most important. Among such characteristics are the thickness of the surface layer and subsoil, the texture and consistence of the soil material, the depth to impermeable materials, and the depth to the water table. Other important characteristics are the supply and availability of nutrients (*4*) and drainage and aeration. Drainage and aeration depend on the characteristics of the individual soil and the slope and irregularities of the surface.

Not only do soils in Charleston County differ greatly in suitability for woodland use, they are also very much different in the combinations of species they will grow. Some are suited to hardwoods; others are suited to pine; yet others are suited to both hardwoods and pine.

TABLE 2.—*Suitability of soils in capability classes I through IV for specified crops*

[Soils rated 1 are well suited; 2, fairly well suited; 3, not well suited; and 4, poorly suited]

Soil	Corn	Grain sorghum and millet	Soybeans	Green beans	Cucumbers	Potatoes and cabbage	Tomatoes	Oats and rye	Bermudagrass and bahiagrass	Ryegrass	White clover	Lespedeza	
												Annual	Sericea
Cape Fear loam	2	2	2	3	4	3	4	2	2	2	1	2	4
Charleston loamy fine sand	2	1	1	2	1	2	1	2	1	2	2	2	2
Chastain soils	3	3	3	3	4	4	4	3	3	3	2	2	4
Chipley loamy fine sand	2	2	3	3	3	3	3	3	2	2	3	2	3
Craven fine sandy loam	1	1	1	1	2	2	2	2	1	1	1	2	3
Dunbar and Ardilla fine sandy loams, 0 to 2 percent slopes	1	2	1	2	3	2	3	1	2	2	1	1	3
Edisto loamy fine sand	1	1	1	1	1	1	2	1	1	1	2	1	3
Faceville fine sandy loam, 2 to 6 percent slopes	1	1	1	2	1	2	1	2	1	1	2	2	2
Hockley loamy fine sand, 0 to 2 percentslopes	1	1	1	2	1	2	1	2	1	1	2	2	2
Hockley loamy fine sand, 2 to 6 percent slopes	1	1	1	2	1	2	1	2	1	1	2	2	2
Kiawah loamy fine sand	2	2	2	2	2	1	2	2	2	2	3	2	3
Lakeland sand, 0 to 6 percent slopes	3	3	3	4	4	4	3	3	2	3	4	4	2
Meggett loam	2	2	2	2	3	2	4	2	2	2	2	2	4
Myatt loam	2	2	2	2	3	3	4	2	2	2	1	1	4
Norfolk and Dothan soils, 0 to 2 percent slopes	1	1	1	3	2	3	1	1	1	1	4	3	1
Orangeburg loamy fine sand, 0 to 2 percent slopes	2	2	2	2	2	3	2	2	2	2	3	3	2
Orangeburg loamy fine sand, 2 to 6 percent slopes	2	2	2	2	2	3	2	2	2	2	3	3	2
Portsmouth fine sandy loam	2	2	2	2	2	2	4	2	2	2	1	1	4
Quitman loamy sand	1	1	1	1	2	2	3	2	3	2	2	1	4
Rains sandy loam	3	3	3	3	3	3	4	3	4	3	2	2	4
Santee loam	2	2	3	3	4	3	4	3	4	1	1	2	4
Scranton loamy fine sand	2	2	3	3	3	3	3	3	4	2	3	2	3
Seabrook loamy fine sand	2	2	2	2	2	3	2	2	3	2	3	3	3
Seewee complex	2	2	3	3	3	3	3	3	4	2	3	2	3
Stono fine sandy loam	1	1	1	1	2	1	2	2	3	2	1	1	3
Wadmalaw fine sandy loam	2	2	2	2	3	2	4	2	4	2	2	2	4
Wagram loamy fine sand, 0 to 6 percent slopes	2	2	2	3	3	3	2	2	2	2	4	4	2
Wando loamy fine sand, 0 to 6 percent slopes	3	3	3	4	3	4	3	3	4	3	4	4	2
Wicksburg loamy fine sand, 0 to 6 percent slopes	2	2	2	3	2	3	3	2	3	2	3	3	2
Yonges loamy fine sand	1	1	1	1	1	1	2	1	2	1	1	2	3

TABLE 3.—*Estimated average acre yields of principal crops under two levels of management*

[Yields in columns A are those obtained through management prevalent in the county; yields in columns B are those expected under improved management. Absence of data indicates crop is not commonly grown or soil is not suited to it]

Soil	Corn		Soybeans		Cabbage		Cucumbers		Irish potatoes		Snap beans		Tomatoes		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*40-lb. crates*	*40-lb. crates*	*Cow-acre-days* [1]	*Cow-acre days* [1]
Bayboro sandy clay loam	—	—	—	—	—	—	—	—	—	—	—	—	—	—	150	200
Cape Fear loam	65	75	25	40	—	—	440	510	180	250	—	—	—	—	370	450
Capers silty clay loam	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Charleston loamy fine sand	55	75	30	40	6	8	350	400	180	225	200	250	385	450	300	350
Chastain soils	40	50	15	25	—	—	—	—	—	—	—	—	—	—	250	300
Chipley loamy fine sand	40	60	22	27	4	6	340	400	165	200	170	200	375	412	250	300
Coastal beaches and Dune land	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Craven fine sandy loam	50	70	18	25	—	—	—	—	—	—	—	—	—	—	250	300
Crevasse-Dawhoo complex, rolling	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dawhoo and Rutlege loamy fine sands	—	—	—	—	—	—	—	—	—	—	—	—	—	—	150	200
Dunbar and Ardilla fine sandy loams, 0 to 2 percent slopes	70	85	25	40	—	—	—	—	—	—	170	200	170	225	250	300
Edisto loamy fine sand	65	90	30	45	9	13	300	375	185	275	240	275	380	450	350	400
Faceville fine sandy loam, 2 to 6 percent slopes	40	60	25	35	—	—	—	—	—	—	—	—	—	—	210	250
Hockley loamy fine sand, 0 to 2 percent slopes	60	80	20	30	7	10	270	350	175	225	190	250	360	400	325	350
Hockley loamy fine sand, 2 to 6 percent slopes	55	75	14	25	6	9	250	310	150	190	180	215	340	375	275	315
Kiawah loamy fine sand	60	80	20	35	6	9	225	375	175	275	180	220	400	460	310	400
Lakeland sand, 0 to 6 percent slopes	20	45	10	18	—	—	—	—	—	—	—	—	—	—	175	200
Leon fine sand	—	—	—	—	—	—	—	—	—	—	—	—	—	—	155	200
Meggett clay loam	—	—	—	—	—	—	—	—	—	—	—	—	—	—	350	400
Meggett loam	60	70	22	30	6	8	—	—	180	240	—	—	—	—	400	450
Myatt loam	55	70	20	33	—	—	—	—	—	—	—	—	—	—	300	350
Norfolk and Dothan soils, 0 to 2 percent slopes	70	85	25	40	—	—	—	—	—	—	170	200	170	225	250	300
Orangeburg loamy fine sand, 0 to 2 percent slopes	55	70	20	38	4	6	225	300	—	—	160	200	295	375	250	275
Orangeburg loamy fine sand, 2 to 6 percent slopes	45	60	18	33	3	5	200	275	—	—	150	180	230	300	225	265
Osier fine sand	—	—	—	—	—	—	—	—	—	—	—	—	—	—	180	210
Pamlico muck	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Portsmouth fine sandy loam	50	70	22	35	5	7	280	350	180	250	185	275	300	370	350	400
Quitman loamy sand	65	80	22	40	5	7	340	400	185	225	200	250	335	400	300	350
Rains sandy loam	45	75	20	35	4	6	200	300	160	200	160	235	270	330	350	400
Rutlege loamy fine sand	—	—	—	—	—	—	—	—	—	—	—	—	—	—	150	175
Rutlege-Pamlico complex	—	—	—	—	—	—	—	—	—	—	—	—	—	—	150	175
St. Johns fine sand	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	160
Santee clay loam	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	200
Santee loam	60	75	20	33	6	8	—	—	—	—	—	—	—	—	350	400
Scranton loamy fine sand	50	70	15	25	4	6	160	220	140	180	160	200	190	260	250	300
Seabrook loamy fine sand	40	60	20	30	5	6	250	400	140	200	160	210	195	310	250	300
Seewee complex	50	65	18	25	—	—	275	350	—	—	170	200	285	260	260	300
Stono fine sandy loam	60	80	20	35	8	13	300	400	190	275	220	300	380	450	350	400
Wadmalaw fine sandy loam	60	70	22	30	6	8	—	—	180	250	—	—	—	—	400	450
Wagram loamy fine sand, 0 to 6 percent slopes	45	60	17	25	—	—	200	275	—	—	160	200	280	337	285	320
Wando loamy fine sand, 0 to 6 percent slopes	18	35	12	20	—	—	180	275	—	—	120	180	140	200	200	250
Wicksburg loamy fine sand, 0 to 6 percent slopes	55	70	20	38	4	6	225	300	—	—	160	200	295	375	250	275
Yonges loamy fine sand	55	75	20	35	9	13	200	350	175	250	160	225	310	400	350	400

[1] Cow-acre-days is a term used to express the number of days per year one acre will support one animal (one cow, one steer, or one horse; five hogs; or seven sheep or goats) without injury to the pasture.

Woodland suitability grouping

Wooded areas can be managed more easily if their soils are grouped according to those characteristics that affect the growth of trees and the control of that growth. With this in mind, soils of the county were placed in 12 woodland suitability groups. Each group represents a different level of fitness for the growth and management of trees. All soils in a single group are suited to essentially the same wood crops; all require about the same management; all have about the same potential for productivity.

Each group is identified by a three-part symbol, such as 1o1, 3s2, 4w3, etc. The first part is always an Arabic numeral; the second is a lower case letter of the alphabet; and the third is another Arabic numeral. The first indicates potential productivity; the second tells what kind of physiographic or soil characteristic causes the greatest hazard or limitation; the third indicates the severity of the hazards or limitations.

In Charleston County the first digit of a woodland suitability group is always *1*, *2*, *3*, or *4*. These are the four classes of potential productivity in the county. The class of productivity becomes poorer as the size of the number increases. Thus, *1* is very high, *2* is high, *3* is moderate, and *4* is low.

In Charleston County the second digit is always *w*, *s*, or *o*. The letter *w* indicates that the greatest hazard or limitation in management or woodland use is caused by wetness. This wetness, in turn, is caused by restricted drainage, fluctuating or high water tables, or overflow hazards that adversely affect the forest stand and its development or management. The letter *s* indicates that the greatest hazard or limitation is caused by the amount of coarse-textured material in the profile. The letter *o* indicates that the soils have no significant restriction or limitation for woodland use or management.

The third digit is always *1*, *2*, or *3*. This numeral indicates the severity of the hazards, limitations, or both. The higher the number, the greater are the hazards and limitations. If the digit is a *1*, they are slight or nonexistent; if it is a *2*, they are moderate; if it is a *3*, they are severe.

Descriptions of woodland suitability groups

The 12 woodland suitability groups of Charleston County are described in this subsection. If a group contains only one mapping unit, that mapping unit is listed by name; where two or more mapping units are in a group, the names of the pertinent soil series are listed.

Two of the terms used to describe the characteristics of the suitability groups need explaining. Those terms are *seedling mortality* and *equipment limitations*.

Seedling mortality refers to the influence of the soil or topography on the loss of trees during the seedling stage, not taking into account possible competition from other plants. If 0 to 25 percent of all seedlings are expected to die, this influence is *slight*. If the expectancy is between 25 and 50 percent, the influence is *moderate*. If more than 50 percent are not expected to survive, it is *severe*. Planting and special seedbeds are required for adequate restocking where the influence is severe. Superior planting methods must be used in such cases.

Equipment limitations are those factors that restrict or prohibit the use of equipment that is commonly needed for tending and harvesting trees. Slope, soil wetness, and other conditions determine the degree of limitation. If there are no restrictions on the kind of equipment that can be used and if the equipment can be used during all seasons, the limitations are *slight*. Limitations are *moderate* if the kind of equipment or its operation is limited by (1) slope, stones, or obstruction; (2) seasonal wetness; (3) physical characteristics of the soil; and (4) possible injury to tree roots or to the structure or stability of the soil. Limitations are *severe* if special equipment must be used and that use is restricted by safety of operation and by one or more of the controlling factors listed for a moderate limitation.

Since the hazard of plant competition is considered severe for most soils in Charleston County, this hazard is not included in each individual description. By the same token, erosion and windthrow hazards are considered slight throughout the county, so they are not described separately. Also, material on special ratings and interpretations for urban use has already been documented (*9*), so this information is not supplied here. Thus, equipment limitations and seedling mortality are the only hazards that are individually rated in the group descriptions that follow. These two limitations are placed in one of the three categories previously mentioned — *slight*, *moderate*, or *severe*.

WOODLAND SUITABILITY GROUP 1o1

Charleston loamy fine sand is the only mapping unit in this group. It is very highly productive and has slight or no limitations for woodland use. It is suitable for pines and upland hardwoods.

WOODLAND SUITABILITY GROUP 1w2

Soils in this group are very highly productive, but seedling mortality is moderate. Because of poor and somewhat poor drainage they are moderate in equipment limitations.

Pines and wetland hardwoods are suitable for soils in this group. Management of water is needed for maximum production and access.

This group contains soils of the Edisto and Yonges series.

WOODLAND SUITABILITY GROUP 1w3

Soils in this group are very highly productive, but seedling mortality is severe. Equipment limitations are severe because of the very poor to poor drainage.

Where water is not managed, wetland hardwoods are suited to soils in this group. Where it is managed, both wetland hardwoods and pines are suited.

This group contains soils of the Bayboro, Cape Fear, Chastain, Meggett, Portsmouth, Rains, Santee, Stono, and Wadmalaw series.

WOODLAND SUITABILITY GROUP 2o1

Seabrook loamy fine sand is the only mapping unit in this group. It is highly productive and has slight or no limitations for woodland use. It is suitable for pines and upland hardwoods.

WOODLAND SUITABILITY GROUP 2w2

Dunbar and Ardilla fine sandy loams, 0 to 2 percent slopes, is the only mapping unit in this group. It is highly productive but has moderate equipment limitations because of somewhat poor drainage. Seedling mortality is moderate in this soil. It is suitable for pines and wetland hardwoods, but water management is needed for maximum production and access.

WOODLAND SUITABILITY GROUP 2w3

Soils in this group are highly productive, but seedling mortality is severe. Because of poor to very poor drainage, equipment limitations are severe.

The soils are suitable for pines and wetland hardwoods where water is managed. Without this management, they are suitable for cypress, tupelo, and other wetland hardwoods (fig. 9).

This group contains soils of the Dawhoo, Myatt, Osier, and Rutlege series.

Figure 9.—Cypress and wetland hardwoods in Dawhoo and Rutlege loamy fine sands.

WOODLAND SUITABILITY GROUP 3o1

Soils in this group are moderately productive and have slight or no limitations for woodland use. They are suitable for pines and upland hardwoods.

This group contains Norfolk and Dothan soils, 0 to 2 percent slopes, and soils of the Chipley, Craven, Faceville, Hockley (fig. 10), and Orangeburg series.

WOODLAND SUITABILITY GROUP 3s2

Wagram loamy fine sand, 0 to 6 percent slopes, is the only mapping unit in this group. It is moderately productive and seedling mortality is moderate. Because of its low available water capacity and poor traction on the surface, this soil is moderate in equipment limitations.

Pines are suitable for this soil.

WOODLAND SUITABILITY GROUP 3w2

Soils in this group are moderately productive, and seedling mortality is moderate. With one exception they are moderate in equipment limitations because of somewhat poor drainage. The exception is areas of the Seewee complex that are well drained. In such areas equipment hazards are rated as slight.

Pines and hardwoods are suited to soils in this group. Management of water is needed for maximum production and access.

This group contains soils of the Kiawah, Quitman, Scranton, and Seewee series.

WOODLAND SUITABILITY GROUP 4s2

All soils in this group except the Dawhoo are low in productivity. Productivity of the Dawhoo soil is high. All the soils are moderate in seedling mortality. These soils are moderate in equipment limitations. All but the Dawhoo soils are in this category because of low available water capacity and poor traction on the loose surface soils. The Dawhoo soils, which occur in the troughs, are rated as moderate because of very poor drainage.

The soils in this group are suitable for pines. Dawhoo soils are suitable for both pines and hardwoods.

This group contains soils of the Crevasse, Dawhoo, Lakeland, Wando, and Wicksburg series.

WOODLAND SUITABILITY GROUP 4w2

Leon fine sand is the only mapping unit in this group. It is low in productivity, and seedling mortality is moderate. Because of its organic pan layer and somewhat poor drainage, it has moderate equipment limitations.

Where management of water is applied for maximum production and access, pines are suitable. Without water management, pond pine and the poor quality wetland hardwoods are suitable.

WOODLAND SUITABILITY GROUP 4w3

St. Johns fine sand is the only mapping unit in this group. It is low in productivity, and seedling mortality is severe. Because of the poor drainage and the organic hardpan, equipment limitations are severe.

Where water is managed to gain maximum production and best access, pines and wetland hardwoods are suitable. Without water management, pond pine, cypress, and wetland hardwoods are suitable.

***Figure 10.*—Well-stocked stand of longleaf pine on a Hockley loamy fine sand.**

Woodland yields

Data on growth and yields of unmanaged stands are not a true measure of potential productivity of stands that are managed, but such information permits a comparison of productivity between sites or between species on the same site. Also, by comparing potential yields of wood crops and potential yields of other crops on a site, one can decide the use of land that best meets the objectives.

The potential timber productivity of a soil is expressed as *site index*. Site index is the height in feet that a specified kind of tree will grow in 50 years. Site indexes of productivity classes indicated by the first digit of the woodland suitability designations are shown in table 4. Observations made by the Soil Conservation Service (*19*) and the South Carolina State Commission of Forestry (*4*) are the bases for site indexes (fig. 11 and fig. 12). Figure 11 can be used to convert the average site index for 50-year-old, well-stocked, unmanaged stands of longleaf, shortleaf, loblolly, and slash pines into board feet of average annual growth per acre. Similar information for southern hardwoods can be obtained from figure 12.

TABLE 4.—*Site indexes of productivity classes indicated by the first digit of the woodland suitability designations*

Forest types or species	Site index			
	Class 1 (very high)	Class 2 (high)	Class 3 (moderate)	Class 4 (low)
Loblolly pine	95+	85–95	75–85	65–75
Slash pine	95+	85–95	75–85	65–75
Longleaf pine	85+	75–85	65–75	55–65
Shortleaf pine	85+	75–85	65–75	55–65
Yellow-poplar	100+	85–100	75–85	65–75
Cottonwood	100+	85–100	75–85	65–75
Sweetgum	95+	85–95	75–85	65–75
Water oak	95+	85–95	75–85	65–75
Red oak	85+	75–85	65–75	55–65
Water tupelo	75+	65–75	55–65	45–55
Redcedar	65+	55–65	45–55	35–45

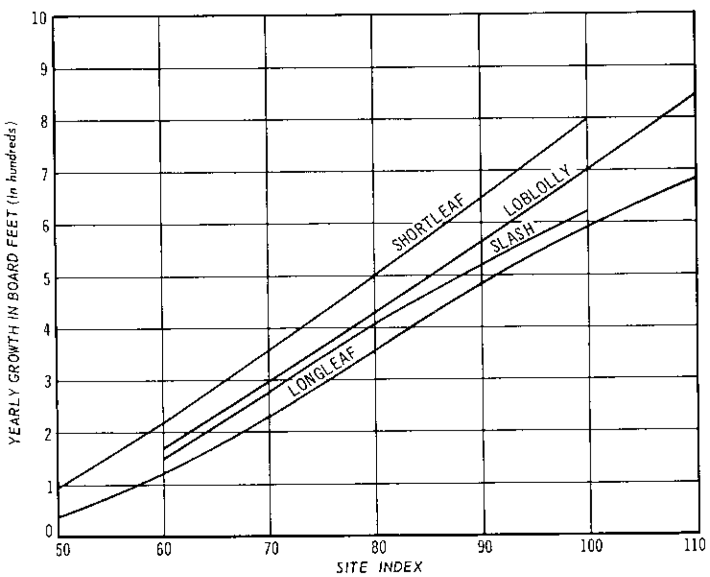

Figure 11.*—Average yearly growth per acre in board feet for 50-year-old, well-stocked stands of southern pines. (Scribner log rule, all stems 8 inches or larger in diameter.) *(17)

Use of Soils for Wildlife Habitat [4]

Soils directly influence kinds and amounts of vegetation and amounts of water available, and in this way indirectly influence the kinds of wildlife that can live in an area.

In table 5, soils of this county are rated according to their suitability as sites for producing elements of wildlife habitat, as for example, grain and seed crops, grasses and legumes, and wetland food and cover plants. The ratings take into account mainly the characteristics of the soils and closely related natural factors of the environment. They do not take into account climate, present use of the soils, or present distribution of wildlife and people. For this reason, selection of a site for development as a habitat for wildlife requires inspection at the site.

[4] By W. W. NEELY, biologist, Soil Conservation Service.

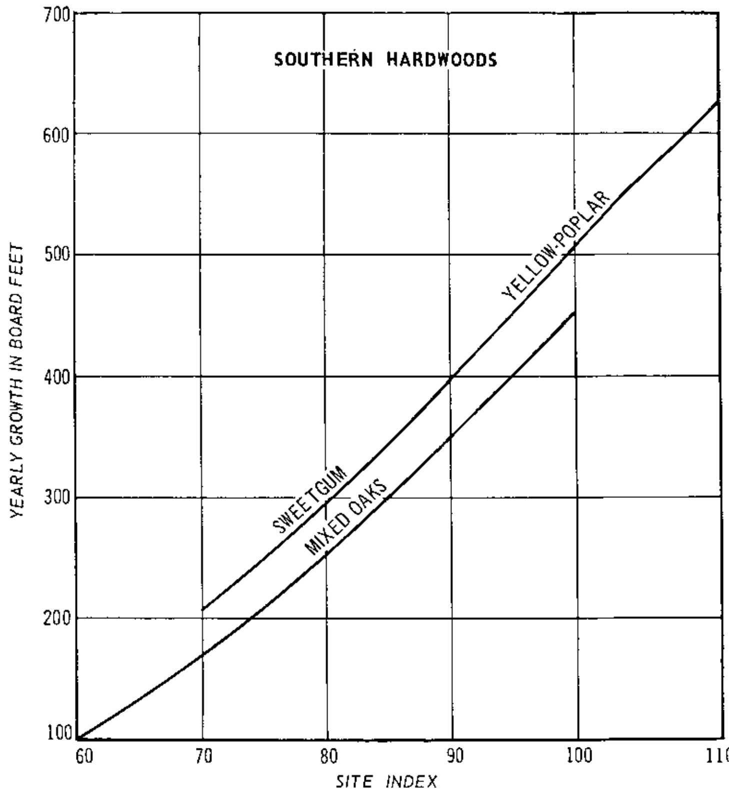

***Figure 12.*—Average yearly growth per acre in board feet for well-stocked, even-aged southern hardwood stands to age 60. (Scribner log rule.)**

The soils are also rated in table 5 according to their suitability as a habitat for openland, woodland, and wetland wildlife. These ratings are related to the ratings made for elements of wildlife habitat. For example, Charleston loamy fine sand is rated in table 5 as unsuited to shallow-water developments, and consequently, as unsuited to wetland wildlife.

Numerical ratings in table 5 range from 1 to 4. A rating of 1 means that the soil is well suited to the element of wildlife habitat, and habitats generally are easily created, improved, and maintained. Few or no limitations affect management in this category, and satisfactory results are expected when the soil is used for the prescribed purpose.

A rating of 2 means that the soil is suited to the element of wildlife habitat, and habitats can be created, improved, or maintained in most places. Moderate intensity of management and fairly frequent attention may be required for satisfactory results, however.

A rating of 3 means that the soil is poorly suited to the element of wildlife, and limitations for the designated use are rather severe. Habitats can be created, improved, or maintained in most places, but management is difficult and expensive and requires intensive effort.

A rating of 4 means that the soil is unsuited to the element of wildlife habitat and that unsatisfactory results are to be expected. It is either impossible or impractical to create, improve, or maintain habitats on soils in this category.

TABLE 5.—*Suitability of soils for elements of wildlife habitats and kinds of wildlife*

[Soils rated 1 are well suited; 2, suited; 3, poorly suited; 4, unsuited]

Soil	Elements of wildlife habitat								Kinds of wildlife		
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants	Coniferous woody plants	Wetland food and cover plants	Shallow-water developments	Ponds	Openland wildlife	Woodland wildlife	Wetland wildlife
Bayboro sandy clay loam	3	2	4	3	4	1	1	4	3	4	1
Cape Fear loam	3	2	4	3	4	1	1	4	3	4	1
Capers silty clay loam	4	4	4	4	4	1	1	4	4	4	1
Charleston loamy fine sand	2	1	2	2	1	4	4	3	2	2	4
Chastain soils	3	3	4	1	4	1	2	4	3	1	1
Chipley loamy fine sand	3	2	2	3	1	3	4	4	2	2	4
Coastal beaches and Dune land	4	4	4	4	4	4	4	4	4	4	4
Craven fine sandy loam	2	2	1	2	1	4	4	3	2	1	4
Crevassee-Dawhoo complex, rolling	4	4	3	2	3	3	4	4	3	2	3
Dawhoo and Rutlege loamy fine sands	4	4	3	2	3	3	3	4	3	2	3
Dunbar and Ardilla fine sandy loams, 0 to 2 percent slopes	2	2	2	2	1	3	2	3	1	1	3
Edisto loamy fine sand	2	2	2	2	1	2	2	4	2	2	2
Faceville fine sandy loam, 2 to 6 percent slopes	2	2	2	2	2	4	4	2	1	1	4
Hockley loamy fine sand, 0 to 2 percent slopes	2	2	1	1	1	3	3	4	1	1	3
Hockley loamy fine sand, 2 to 6 percent slopes	2	2	1	1	1	4	4	3	1	1	4
Kiawah loamy fine sand	2	2	2	2	2	3	3	4	2	2	3
Lakeland sand, 0 to 6 percent slopes	3	3	3	3	2	4	4	4	3	3	4
Leon fine sand	4	4	2	2	3	3	3	4	3	2	3
Made land [1]											
Meggett clay loam	4	4	3	2	3	1	1	4	4	2	1
Meggett loam	3	3	2	2	2	3	3	4	3	2	3
Mine pits and dumps [1]											
Myatt loam	3	3	2	1	1	3	3	4	3	1	3
Norfolk and Dothan soils, 0 to 2 percent slopes	1	1	1	1	2	4	4	3	1	1	4
Orangeburg loamy fine sand, 0 to 2 percent slopes	2	2	2	2	1	4	4	3	1	1	4
Orangeburg loamy fine sand, 2 to 6 percent slopes	2	2	2	2	1	4	4	2	1	1	4
Osier fine sand	4	4	3	2	2	3	3	4	4	2	3
Pamlico muck	4	4	4	3	4	2	3	4	4	3	3
Portsmouth fine sandy loam	3	2	2	2	2	3	2	4	3	2	2
Quitman loamy sand	2	2	2	2	1	3	3	4	2	2	3
Rains sandy loam	3	3	2	1	1	2	3	4	3	2	3
Rutlege loamy fine sand	4	4	3	2	3	3	3	4	3	2	3
Rutlege-Pamlico complex	4	3	4	4	4	1	2	4	4	4	1
St. Johns fine sand	4	4	3	3	3	3	3	4	4	3	3
Santee clay loam	4	3	4	3	4	1	1	4	4	3	1
Santee loam	2	2	2	2	2	2	2	4	2	2	2
Scranton loamy fine sand	3	2	2	2	2	3	3	4	2	2	3
Seabrook loamy fine sand	2	2	2	2	1	4	4	4	2	2	4
Seewee complex	3	2	2	2	1	4	4	4	2	2	4
Stono fine sandy loam	2	2	2	1	1	3	3	4	1	1	3
Tidal marsh, firm	4	4	4	4	4	1	3	4	4	4	2
Tidal marsh, soft	4	4	4	4	4	1	4	4	4	4	2
Wadmalaw fine sandy loam	3	3	3	2	2	3	3	4	3	2	3
Wagram loamy fine sand, 0 to 6 percent slopes	2	2	2	2	2	4	4	3	1	2	4
Wando loamy fine sand, 0 to 6 percent slopes	3	3	3	3	2	4	4	3	3	3	4
Wicksburg loamy fine sand, 0 to 6 percent slopes	2	2	1	1	1	4	4	3	1	1	4
Yonges loamy fine sand	2	2	1	1	1	3	3	4	1	1	3

[1] Onsite determination necessary.

The significance of each subheading in table 5 under "Elements of wildlife habitat" and "Kinds of wildlife" is given in the following paragraphs.

Grain and seed crops are annual grain-producing or seed-producing plants, such as corn, sorghum, millet, and soybeans.

Grasses and legumes are domestic grasses and legumes that are established by planting. They provide food and cover for wildlife. Grasses include bahiagrass, ryegrass, and panicgrass; legumes include annual lespedeza, shrub lespedeza, and other clovers.

Wild herbaceous upland plants are native or introduced perennial grasses, forbs, and weeds that provide food and cover for upland wildlife. Beggarweed, perennial lespedeza, wild bean, pokeweed, and cheatgrass are typical examples.

Hardwood woody plants are nonconiferous trees, shrubs, and woody vines that produce wildlife food in the form of fruits, nuts, buds, catkins, or browse. Such plants commonly grow in their natural environment, but they may be planted and developed through wildlife management programs. Typical species in this category are oak, beech, cherry, dogwood, maple, viburnum, grape, honeysuckle, greenbrier, and eleagnus.

Coniferous woody plants are cone-bearing trees and shrubs that provide cover and frequently furnish food in the form of browse, seeds, or fruitlike cones. They commonly grow in their natural environment, but they may be planted and managed. Typical plants in this category are pines, cedars, and ornamental trees and shrubs.

Wetland food and cover plants are annual and perennial herbaceous plants that grow wild on moist and wet sites. They furnish food and cover mostly for wetland wildlife. Typical examples of plants are smartweed, wild millet, spikerush and other rushes, sedges, burreed, tearthumb, and aneilema. Submersed and floating aquatics are not included in this category.

Shallow-water developments are areas of fresh and brackish (saline) water where low dikes or other water-control structures are built to create habitats that are suitable for waterfowl. Some are designed to be drained, planted, and then flooded; others are permanent inpoundments that grow submersed aquatics.

Ponds are small bodies of water deep enough and of suitable quality to be impounded primarily for the use of fish production.

Openland wildlife are birds and mammals that normally live in meadows, pastures, and open areas where grasses, herbs, and shrubby plants grow. Quail, doves, meadowlarks, field sparrows, cottontail rabbits, and foxes are typical examples of openland wildlife.

Woodland wildlife are birds and mammals that normally live in wooded areas of hardwood trees, coniferous trees, and shrubs. Woodcocks, thrushes, wild turkeys, vireos, squirrels, and raccoons are typical examples of woodland wildlife.

Wetland wildlife are birds and mammals that normally live in wet areas, marshes, and swamps. Ducks, geese, rails, shore birds, herons, minks, and muskrats are typical examples of wetland wildlife.

Engineering Behavior of Soils [5]

The properties of soils that are of special interest to engineers are those that affect design, construction, and maintenance of roads, airports, foundations for buildings, drainage systems, and farm ponds. Among such properties are size of soil particles, plasticity, permeability, depth to water table, and reaction (pH). Data on these and related properties are presented in tables 6, 7, and 8 in this section. Information in these tables can be helpful in—

1. Making soil and land-use studies that aid in selecting and developing sites for industries, businesses, residences, and recreational areas.
2. Making preliminary estimates of the engineering properties of soils for planning agricultural drainage systems, farm ponds, and irrigation systems.
3. Making preliminary evaluations of soil and ground conditions that aid in selecting locations for highways, airports, and pipelines and in planning detailed investigations at the selected sites.
4. Determining the suitability of soils for cross-country movement of vehicles and construction equipment.
5. Correlating performance of engineering structures with soil mapping units and thus developing information that can be used in designing and maintaining such structures.
6. Supplementing information obtained from published maps, reports, and photographs for the purpose of developing soil maps and reports that can be used readily by engineers.
7. Developing other preliminary estimates for construction purposes pertinent to the particular area.

Much useful knowledge about the behavior of soils is available in this section, but it is not intended as a substitute for the detailed sampling and testing ordinarily done at the site chosen for major construction. The information in tables 6, 7, and 8 can be used mainly in selecting sites suitable for more detailed field investigation. Engineers can find additional information about the soils in the sections "How This Survey Was Made," "Descriptions of the Soils," and "Formation and Classification of Soils."

Some of the terms used in this section and elsewhere in this soil survey may not be familiar to engineers. Others, though they appear familiar, have special meaning in soil science. Many such terms are defined in the Glossary.

Engineering test data and classification

Engineering data in table 6 were obtained by testing samples of principal soils in six extensive series. The soils were sampled and analyzed to a depth of 6 feet or less, so the data are not adequate for evaluating the engineering characteristics of the soils at greater depths. The data are not applicable to specific locations other than those tested, and onsite inspections are therefore necessary where individual projects are planned.

The engineering test data and the engineering soil classifications in table 6 are based on tests to determine liquid and plastic limits and on mechanical analyses. Mechanical

[5] By T. E. Ayers, agricultural engineer, Soil Conservation Service.

analyses were made by the combined sieve and hydrometer methods. Plastic limits were obtained by determining the moisture content at which the soil passed from a semisolid to a plastic state, and liquid limits by determining the moisture content at which the soil passed from a plastic to a liquid state. The plasticity index was then calculated by determining the numerical difference between the plasticity and liquid limits (*10*).

Most highway engineers classify soil materials according to the system approved by the American Association of State Highway Officials (*1*). In this system, soil materials are classified in seven principal groups, A–1 through A–7. A–1 materials are the best for road subgrades, A–2 are next best, and so on down to A–7, the poorest material for subgrades.

Within each group the relative engineering value of the soil material is indicated by a group index number. Numbers range from 0 for the best materials to 20 for the poorest. The group index number, when present, is in parentheses at the right of the group symbol.

Some engineers prefer to use the Unified system (*21*) to classify soil materials. In this system soil materials are

TABLE 6.—*Engineering*

Soil name and location	Parent material	Depth
Charleston loamy fine sand:		*Inches*
On James Island, 2,500 feet northwest of intersection of James Island Creek Bridge and County Roads 53 and 28 and 1,600 feet west of County Road 53 on south side of field road. (Modal profile)	Coastal Plain sandy loams	0–9 14–30 38–53
In pecan orchard on west side of State Highways 10 and 89, about 2¾ miles southeast of intersection of State Highways 89 and 174, 7 miles southwest of Hollywood, and 6 miles south of Adams Run. (Thicker A horizon and coarser textured substratum than in modal profile)	Coastal Plain sandy loams	0–9 21–30 43–52
Edisto loamy fine sand:		
In cropland 200 feet west of State Highway 41 and 2 miles from intersection of State Highway 41 and U.S. Highway 17. (Modal profile)	Coastal Plain sands and sandy loams.	0–7 11–19 24–43 43–58
In cropland 1½ miles southeast of Hollywood on north side of field road, 650 feet south of Seaboard Coast Line Railroad and 950 feet west of County Road 79. (Slightly finer textured substratum than in modal profile)	Coastal Plain sands and sandy loams.	0–10 14–19 36–46
On James Island in cropland, 66 feet west of State Highway 171 and 1,600 feet north of James Island Creek. (Coarser textured substratum than in modal profile)	Coastal Plain sands and sandy loams.	0–9 12–26 40–50
Hockley loamy fine sand:		
In cropland 900 feet west of Stono River Road and 1½ miles south of James Island Creek Bridge. (Modal profile)	----------------------------	0–9 13–20 29–40
In cropland ¼ mile west of State Highway 165 and 1¼ miles south of Meggett. (Finer textured than modal profile)	Coastal Plain sandy clay loams and sandy clays.	0–10 14–30 50–60
Kiawah loamy fine sand:		
In cropland 800 feet west of State Highway 171 and ½ mile south of intersection of State Highway 171 and Kings Highway (State Highway 94). (Modal profile)	Coastal Plain sands.	0–10 20–32 32–43
In longleaf pine woods 150 feet east of dirt road and 435 feet north of U.S. Highway 17 and Awendaw Post Office. (Finer textured surface layer than in modal profile)	Acid Coastal Plain sands.	0–6 19–25 25–33 33–48

See footnotes at end of table.

placed in one of eight classes of coarse-grained materials, or in one of six classes of fine-grained materials, or are classified as highly organic.

Both the Unified and the American Association of State Highway Officials (AASHO) systems were used to classify soils in table 6.

Soil properties significant to engineering

The soils in this county and estimates of their physical and chemical properties are shown in table 7. In this table, the texture of each layer is listed according to the textural classification of the United States Department of Agriculture (*13*). Also listed for each layer is the estimated percentage of soil material that passes a No. 10, 40, and 200 sieve.

Permeability of each layer was estimated for material that had not been compacted. Permeability refers to the rate at which water moves through the soil material and depends largely on the texture and structure of the soil (*16*).

Available water capacity is approximately the amount of capillary water in the soil when downward flow by

test data for soils [1]

Mechanical analysis [2]					Liquid limit	Plasticity index (*10*)	Classification	
Percentage passing sieve—				Percentage smaller than 0.005 mm.			AASHO [3]	Unified [4]
No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 60 (0.25 mm.)	No. 200 (0.074 mm.)					
100	98	92	22	12	(5)	(5)	A-2-4(0)	SM
100	98	92	25	17	(5)	(5)	A-2-4(0)	SM
100	94	83	16	15	(5)	(5)	A-2-4(0)	SM
100	100	99	30	10	(5)	(5)	A-2-4(0)	SM
100	100	100	42	24	24	4	A-4(1)	SM-SC
100	100	99	22	13	(5)	(5)	A-2-4(0)	SM
100	99	98	29	7	(5)	(5)	A-2-4(0)	SM
100	100	99	49	29	23	5	A-4(3)	SM-SC
100	100	100	41	26	25	4	A-4(1)	SM-SC
100	100	99	43	25	(5)	(5)	A-4(2)	SM
100	99	98	33	5	(5)	(5)	A-2-4(0)	SM
100	100	99	48	23	(5)	(5)	A-4(3)	SM
100	100	100	52	24	(5)	(5)	A-4(3)	ML
100	99	97	29	13	(5)	(5)	A-2-4(0)	SM
100	98	97	35	22	(5)	(5)	A-2-4(0)	SM
100	97	94	16	11	(5)	(5)	A-2-4(0)	SM
100	99	95	17	8	(5)	(5)	A-2-4(0)	SM
100	100	98	41	32	25	7	A-4(1)	SM-SC
100	100	98	26	23	(5)	(5)	A-2-4(0)	SM
100	99	98	31	9	(5)	(5)	A-2-4(0)	SM
100	100	100	50	26	32	12	A-6(4)	SC
100	100	100	41	18	(5)	(5)	A-4(1)	SM
100	86	75	11	8	(5)	(5)	A-2-4(0)	SP-SM
100	81	68	11	9	(5)	(5)	A-2-4(0)	SP-SM
100	78	49	5	5	(5)	(5)	A-3(0)	SP-SM
100	91	69	25	16	(5)	(5)	A-2-4(0)	SM
100	91	66	12	9	(5)	(5)	A-2-4(0)	SP-SM
100	92	61	10	5	(5)	(5)	A-3(0)	SP-SM
100	89	52	5	4	(5)	(5)	A-3(0)	SP

TABLE 6.—*Engineering*

Soil name and location	Parent material	Depth
		Inches
Wadmalaw fine sandy loam:		
In woodland 1¼ miles north of U.S. Highway 17 and 2¾ miles northeast of intersection of U.S. Highway 17 and road in woods on International Pulp and Paper Co. land. (Modal profile)	Alkaline Coastal Plain clays to sandy clays.	0–5 13–25 52–60
In woodland 4 miles south of Adams Run Village, 1 mile south of Seaboard Coast Line Railroad, and ¾ mile west of U.S. Highway 174. (Finer textured than modal profile)	Alkaline Coastal Plain clays to sandy clays.	0–5 9–27 27–48
In cropland 1¼ miles southwest of Hollywood and ¼ mile west of Meggett Elementary School. (Coarser textured than modal profile)	Alkaline Coastal Plain clays to sandy clays.	0–6 22–38 38–48
Yonges loamy fine sand:		
In cropland 1¼ miles southeast of Hollywood, ¼ mile south of Seaboard Coast Line Railroad, and ¼ mile west of County Road 79. (Modal profile)	Nonacid Coastal Plain sandy clay loams.	0–10 14–34 42–60
In woodland 1¼ miles southeast of Cainhoy, 1¼ miles northwest of tidal inlet, and 100 feet west of road in woods. (Finer textured in subsoil than modal profile)	Nonacid Coastal Plain sandy clay loams.	0–3 25–43 50–69

[1] Tests performed by the South Carolina State Highway Department in cooperation with the U.S. Department of Commerce, Bureau of Public Roads (BPR) according to standard procedures of the American Association of State Highway Officials (AASHO) (*1*).

[2] Mechanical analyses according to AASHO Designation T 88. Results by this procedure frequently may differ somewhat from results that would have been attained by the soil survey procedure of the Soil Conservation Service. In the AASHO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes for a soil.

TABLE 7.—*Estimated*

[Made land (Ma) and Mine pits and dumps (Mp) are

Soil series and map symbols	Depth to seasonal high water table	Depth from surface in a typical profile	Classification
			Dominant USDA texture
	Feet	*Inches*	
Ardilla (Mapped only with soils of Dunbar series.)	[1] 2–3	0–12 12–16 16–46 46–60	Fine sandy loam Clay loam Clay to sandy clay Sandy loam
Bayboro (Bc)	[1] 0–3	0–16 16–39 39–50	Sandy clay loam Sandy clay Sandy clay loam
Cape Fear (Cf)	[1] 0–3	0–12 12–18 18–31 31–50	Loam Clay loam Clay Clay loam and sandy clay loam
Capers (Cg)	[2] 0–1	0–5 5–50	Silty clay loam Silty clay
Charleston (Ch)	2–5	0–16 16–52	Loamy fine sand Fine sandy loam

See footnotes at end of table.

test data for soils [1]—Continued

Mechanical analysis [2]					Liquid limit	Plasticity index (*10*)	Classification	
Percentage passing sieve—				Percentage smaller than 0.005 mm.			AASHO [3]	Unified [4]
No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 60 (0.25 mm.)	No. 200 (0.074 mm.)					
100	98	96	52	18	(5)	(5)	A-4(3)	ML
100	99	98	77	41	32	12	A-6(9)	CL
100	99	98	68	43	43	27	A-7-6(14)	CL
100	99	98	66	11	(5)	(5)	A-4(6)	ML
100	100	99	90	61	65	41	A-7-6(20)	CH
100	100	100	93	56	56	34	A-7-6(19)	CH
100	92	87	30	8	(5)	(5)	A-2-4(0)	SM
100	94	92	54	35	34	17	A-6(6)	CL
100	95	91	52	33	38	20	A-6(7)	CL
100	100	99	52	5	(5)	(5)	A-4(3)	ML
100	100	99	66	29	26	8	A-4(6)	CL
100	100	100	64	27	26	5	A-4(6)	ML-CL
100	95	93	49	10	(5)	(5)	A-4(3)	SM
100	100	99	70	43	44	25	A-7-6(14)	CL
100	100	99	61	35	38	19	A-6(9)	CL

[3] Based on standard Specifications for Highway Materials and Methods of Sampling and Testing (Pt. 1, Ed. 8): AASHO Designation M 145-49 (*1*).

[4] Based on the Unified Soil Classification System, Waterways Experiment Station, Corps of Engineers, March 1953 (*21*). The Soil Conservation Service and Bureau of Public Roads have agreed to consider that all soils having a plasticity index within 2 points from the A-line are to be given a borderline classification. Examples of borderline classifications obtained by this use are SP-SM, ML-CL, and SM-SC.

[5] Nonplastic.

properties of the soils

variable, and for this reason their properties were not estimated]

Classification—Continued		Percentage passing sieve—			Permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO	No. 10 (2.0 mm.)	No. 40 (0.40 mm.)	No. 200 (0.074 mm.)				
					Inches per hour	*Inches per inch of soil*	*pH value*	
SM or ML	A-4	100	70-85	40-55	0. 63-2. 0	0. 15-0. 11	5. 1-5. 5	Low.
CL	A-6	100	90-100	70-80	<0. 2	0. 13-0. 15	4. 5-5. 0	Moderate.
CH	A-7	100	90-100	75-95	<0. 2	0. 15-0. 17	4. 5-5. 0	High.
SM	A-2, A-6	100	60-70	30-40	<0. 2	0. 13-0. 15	4. 5-5. 0	Moderate to high.
SC or CL	A-6	100	80-90	35-55	0. 63-2. 0	0. 13-0. 15	5. 1-5. 5	Low.
CL, SC	A-7	100	85-95	45-60	<0. 2	0. 15-0. 17	4. 5-5. 0	High.
SC or CL	A-6	100	80-90	35-55	<0. 2	0. 15-0. 17	4. 5-5. 0	Low.
CL	A-6	100	85-95	60-75	0. 63-2. 0	0. 13-0. 15	4. 5-5. 0	High.
CL	A-6 or A-7	100	90-100	70-80	<0. 2	0. 15-0. 17	4. 5-5. 0	High.
CH	A-7	100	90-100	75-95	<0. 2	0. 15-0. 17	4. 5-5. 0	Very high.
CL	A-6 or A-7	100	80-100	35-80	<0. 2	0. 15-0. 17	4. 5-5. 0	High.
CL	A-7	100	95-100	85-95	0. 2-0. 63	0. 15-0. 17	5. 6-6. 0	High.
CH	A-7	100	95-100	90-95	<0. 2	0. 13-0. 15	6. 1-6. 5	High.
SM	A-2-4	100	85-100	15-35	>6. 3	0. 05-0. 07	5. 1-5. 5	Low.
SM, SC	A-2, A-4	100	80-100	25-45	2. 0-6. 3	0. 10-0. 13	4. 5-5. 0	Low.

TABLE 7.—*Estimated*

Soil series and map symbols	Depth to seasonal high water table	Depth from surface in a typical profile	Classification
			Dominant USDA texture
	Feet	*Inches*	
Chastain (Ck)	[1] 0–2	0–7	Silt loam
		7–14	Silty clay loam
		14–42	Clay loam
Chipley (Cm)	2–5	0–10	Loamy fine sand
		10–40	Loamy sand
		40–50	Sand
Coastal beaches and Dune land (Co)	[2] 0–2	0–50	Sand
Craven (Cr)	2–5	0–9	Fine sandy loam
		9–12	Loam
		12–44	Clay
		44–56	Sandy clay loam
Crevasse (CvC) (For properties of Dawhoo soils, refer to the Dawhoo series.)	0–2	0–60	Fine sand
Dawhoo (Da) (For properties of Rutlege soils, refer to the Rutlege series.)	[1] 0–2	0–30	Loamy fine sand
		30–60	Fine sand
Dothan (Mapped only with soils of Norfolk series.)	2–3	0–15	Fine sandy loam
		15–20	Sandy clay loam
		20–29	Clay loam
		29–40	Sandy clay
		40–68	Sandy clay loam
Dunbar (DdA) (For properties of the Ardilla soils, refer to the Ardilla series.)	1–3	0–9	Fine sandy loam
		9–28	Sandy clay
		28–60	Sandy clay loam
Edisto (Ed)	2–3	0–14	Loamy fine sand
		14–27	Fine sandy loam
		27–36	Loamy fine sand
		36–62	Fine sandy loam (fragipan)
		62–70	Fine sandy clay loam (fragipan)
		70–84	Fine sand
Faceville (FvB)	5+	0–11	Fine sandy loam
		11–36	Clay loam to clay
		36–50	Clay
Hockley (HoA, HoB)	2–5	0–13	Loamy fine sand
		13–60	Fine sandy clay loam
Kiawah (Ka)	1–2	0–48	Loamy fine sand
		48–72	Fine sand
Lakeland (LaB)	5+	0–60	Sand
Leon (Le)	1–2+	0–48	Sand
Meggett:			
Loam (Mg)	[1] 0–2	0–4	Loam
		4–14	Clay loam
		14–72	Clay
Clay loam (Me)	0–2	0–14	Clay loam
		14–72	Clay
Myatt (My)	[1] 0–2	0–17	Loam
		17–53	Clay loam
Norfolk (NdA) (For properties of Dothan soils, refer to the Dothan series.)	5+	0–16	Loamy fine sand
		16–19	Fine sandy loam
		19–54	Sandy clay loam
		54–66	Fine sandy loam

See footnotes at end of table.

properties of the soils—Continued

Classification—Continued		Percentage passing sieve—			Permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO	No. 10 (2.0 mm.)	No. 40 (0.40 mm.)	No. 200 (0.074 mm.)				
					Inches per hour	*Inches per inch of soil*	*pH value*	
ML or CL	A-4	100	90-100	70-90	0. 2-0. 63	0. 14-0. 16	5. 1-5. 5	Moderate.
CL	A-7	100	95-100	85-95	<0. 2	0. 14-0. 16	5. 1-5. 5	High.
CL	A-6 or A-7	100	90-100	70-80	<0. 2	0. 15-0. 17	5. 1-5. 5	High.
SM	A-2	100	65-80	20-35	>6. 3	------------	5. 1-5. 5	Low.
SM	A-2	100	50-75	15-30	>6. 3	0. 06-0. 1	5. 1-5. 5	Low.
SP or SM	A-3	100	50-70	5-15	>6. 3	0. 03-0. 08	5. 6-6. 0	Low.
SP or SM	A-3	100	50-70	5-15	>6. 3	0. 03-0. 08	5. 6-6. 0	Low.
SM or ML	A-4	100	70-85	40-55	0. 63-2. 0	0. 13-0. 15	5. 1-5. 5	Moderate.
CL	A-6	100	85-95	60-75	0. 63-2. 0	0. 13-0. 15	5. 1-5. 5	High.
CH	A-7	100	90-100	75-95	<0. 2	0. 15-0. 17	4. 5-5. 0	High.
SC or CL	A-6	100	80-90	35-55	<0. 2	0. 15-0. 17	4. 5-5. 0	Moderate.
SM	A-2	100	65-80	20-35	6. 3-20. 0	0. 05-0. 1	5. 1-5. 5	Low.
SM	A-2	100	50-75	15-30	6. 3-20. 0	0. 05-0. 1	6. 1-6. 5	Low.
SM	A-2	100	65-80	20-35	6. 3-20. 0	0. 05-0. 1	6. 1-6. 5	Low.
SM or ML	A-4	100	70-85	40-55	2. 0-6. 3	0. 13-0. 15	5. 1-5. 5	Low.
SC or CL	A-6	100	80-90	35-55	0. 63-2. 0	0. 13-0. 15	5. 1-5. 5	Moderate.
CL	A-6 or A-7	100	90-100	70-80	0. 63-2. 0	0. 13-0. 15	5. 1-5. 5	High.
SC or CL	A-7	100	85-95	45-60	0. 63-2. 0	0. 13-0. 15	4. 5-5. 0	Moderate.
SC or CL	A-6	100	80-90	35-55	0. 2-0. 63	0. 13-0. 15	5. 1-5. 5	Moderate.
SM or CL	A-4	100	70-85	40-55	0. 63-2. 0	0. 13-0. 15	5. 1-5. 5	Low.
SC or CL	A-7	100	85-95	45-60	0. 63-2. 0	0. 13-0. 15	4. 5-5. 0	Moderately high.
SC or CL	A-6	100	80-90	35-55	0. 2-0. 63	0. 13-0. 15	4. 5-5. 0	Moderate.
SM	A-2, A-4	100	90-100	25-40	6. 3-20. 0	0. 05-0. 08	5. 1-5. 5	Low.
SM-SC	A-2, A-4	100	90-100	30-50	2. 0-6. 3	0. 13-0. 15	5. 1-5. 5	Low.
SM-SC	A-2, A-4	100	90-100	30-50	6. 3-20. 0	0. 05-0. 08	4. 5-5. 0	Low.
ML	A-4	100	85-100	50-65	2. 0-6. 3	0. 13-0. 15	4. 5-5. 0	Low.
CL	A-6	100	80-100	50-75	0. 2-0. 63	0. 10-0. 15	4. 5-5. 0	Moderate.
SM	A-2-4	100	80-100	5-20	6. 3-20. 0	0. 03-0. 08	4. 5-5. 0	Low.
SM or ML	A-4	100	70-85	40-55	2. 0-6. 3	0. 13-0. 15	5. 1-5. 5	Low.
CL	A-6 or A-7	100	90-100	70-80	0. 63-2. 0	0. 13-0. 15	4. 5-5. 0	Moderate.
CH	A-7	100	90-100	75-95	0. 63-2. 0	0. 15-0. 17	5. 1-5. 5	Moderate.
SM	A-2-4	100	90-100	25-35	2. 0-6. 3	0. 08-0. 12	5. 1-5. 5	Low.
SM-SC	A-2, A-4	100	90-100	20-45	0. 63-2. 0	0. 10-0. 14	4. 5-5. 0	Moderate.
SP-SM	A-2	100	85-100	5-25	6. 3-20. 0	0. 08-0. 12	5. 1-5. 5	Low.
SP	A-3	100	80-100	5-20	6. 3-20. 0	0. 05-0. 08	5. 6-6. 0	Low.
SP, SM	A-2 or A-3	100	50-70	5-15	6. 3-20. 0	0. 03-0. 08	4. 5-5. 5	Low.
SP, SM	A-2 or A-3	100	50-70	5-15	6. 3-20. 0	0. 03-0. 08	4. 2-6. 2	Low.
CL	A-6	100	85-95	60-75	0. 2-0. 63	0. 15-0. 17	4. 5-5. 0	Moderate.
CL	A-6 or A-7	100	90-100	70-80	0. 06-0. 2	0. 15-0. 17	4. 5-5. 0	High.
CH	A-7	100	90-100	75-95	0. 06-0. 2	0. 15-0. 17	6. 6-7. 3	High.
CL	A-6 or A-7	100	90-100	70-80	0. 2-0. 63	0. 15-0. 17	4. 5-5. 0	High.
CH	A-7	100	90-100	75-95	0. 06-0. 2	0. 15-0. 17	6. 6-7. 3	High.
CL	A-6	100	85-95	60-75	0. 63-2. 0	0. 15-0. 17	4. 5-5. 0	Moderate.
CL	A-6 or A-7	100	90-100	70-80	0. 06-0. 2	0. 15-0. 17	4. 5-5. 0	Moderate.
SM or ML	A-4	100	90-95	40-60	2. 0-6. 3	0. 10-0. 14	5. 6-6. 0	Low.
SM or CL	A-4	100	70-85	40-55	2. 0-6. 3	0. 13-0. 15	5. 1-5. 5	Low.
SC or CL	A-6	100	80-90	35-55	0. 63-2. 0	0. 13-0. 15	5. 1-5. 5	Moderate.
SM or CL	A-4	100	70-85	40-55	2. 0-6. 3	0. 13-0. 15	4. 5-5. 0	Low.

TABLE 7.—*Estimated*

Soil series and map symbols	Depth to seasonal high water table	Depth from surface in a typical profile	Classification: Dominant USDA texture
	Feet	*Inches*	
Orangeburg (OrA, OrB)	2–3	0–11	Loamy fine sand
		11–18	Fine sandy loam
		18–48	Sandy clay loam
		48–63	Loamy sand
Osier (Os)	[1] 1–2	0–46	Sand
Pamlico (Pa)	[1] 0–1	0–41	Muck
		41–52	Fine sand
Portsmouth (Po)	[1] 1–2	0–18	Fine sandy loam
		18–52	Fine sandy clay loam
Quitman (Qu)	[1] 1–3	0–13	Loamy sand
		13–21	Fine sandy loam to sandy clay loam
		21–56	Sandy clay loam
Rains (Ra)	[1] 1–2	0–50	Sandy loam
Rutlege (Rg, Rp) (For properties of Pamlico soils in Rp, refer to Pamlico series.)	[1] 1–2	0–54	Loamy fine sand
St. Johns (Sa)	[1] 1–2	0–53	Fine sand
Santee:			
Clay loam (Sc)	[1] 0–2	0–36	Clay loam to clay
		36–71	Clay
Loam (Se)	[1] 0–2	0–6	Loam
		6–36	Clay loam
		36–71	Clay
Scranton (Sf)	1–2	0–24	Loamy fine sand
		24–52	Fine sand
Seabrook (Sk)	2–3	0–54	Loamy fine sand
Seewee (Sm)	[1] 1–2	0–21	Loamy fine sand
		21–65	Fine sand
Stono (St)	[1] 1–3	0–23	Fine sandy loam
		23–37	Fine sandy clay loam
		37–54	Loamy fine sand
Tidal marsh:			
Firm (Tf)	[2] 0–1	0–40	Muck
Soft (Ts)	[2] 0–1	0–40	Silty clay
Wadmalaw (Wa)	[1] 0–2	0–13	Fine sandy loam
		13–83	Sandy clay loam
Wagram (WgB)	5+	0–32	Loamy fine sand
		32–60	Sandy clay loam
Wando (WnB)	5+	0–51	Loamy fine sand
		51–60	Fine sand
Wicksburg (WoB)	2–3	0–24	Loamy fine sand
		24–52	Sandy clay loam and sandy clay
Yonges (Yo)	1–2	0–14	Loamy fine sand
		14–34	Fine sandy clay loam
		34–42	Fine sandy clay
		42–60	Fine sandy clay loam
		60–84	Fine sandy loam

[1] Subject to flooding.

properties of the soils—Continued

Classification—Continued		Percentage passing sieve—			Permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO	No. 10 (2.0 mm.)	No. 40 (0.40 mm.)	No. 200 (0.074 mm.)				
					Inches per hour	*Inches per inch of soil*	*pH value*	
SM or ML	A-4	100	90-95	40-60	2. 0-6. 3	0. 10-0. 15	5. 1-5. 5	Low.
SM or CL	A-4	100	70-85	40-55	2. 0-6. 3	0. 13-0. 15	4. 5-5. 0	Low.
SC or CL	A-6	100	80-90	35-55	0. 63-2. 0	0. 13-0. 15	4. 5-5. 0	Moderate.
SM or SC	A-2	100	50-75	15-30	2. 0-6. 3	0. 10-0. 15	4. 5-5. 0	Low to moderate.
SP or SM	A-2 or A-3	100	50-70	5-15	6. 3-20. 0	0. 03-0. 08	4. 5-5. 0	Low.
OL	A-4	100	80-90	50-60	0. 63-2. 0	0. 08-0. 10	<4. 5	Low.
SM	A-2	100	65-80	20-35	0. 63-2. 0	0. 05-0. 08	5. 6-6. 0	Low.
SM or ML	A-4	100	70-85	40-55	2. 0-6. 3	0. 13-0. 15	<4. 5	Low.
SC	A-6	100	80-90	35-50	0. 63-2. 0	0. 12-0. 16	5. 6-6. 0	Moderate.
SM	A-2	100	50-75	15-30	2. 0-6. 3	0. 10-0. 14	4. 5-5. 0	Low.
SM or CL	A-2, A-4	100	70-85	25-55	0. 63-2. 0	0. 13-0. 15	4. 5-5. 0	Moderate.
SC or CL	A-6	100	80-90	35-55	0. 63-2. 0	0. 13-0. 15	5. 1-5. 5	Moderate.
SM	A-2 or A-4	100	60-70	30-40	0. 63-2. 0	0. 10-0. 14	4. 5-5. 0	Low.
SM or ML	A-4	100	90-95	40-60	0. 63-2. 0	0. 05-0. 08	5. 1-5. 5	Low.
SM	A-2	100	65-80	20-35	6. 3-20. 0	0. 03-0. 08	4. 5-5. 0	Low.
CL	A-6 or A-7	100	90-100	70-80	0. 2-0. 63	0. 14-0. 16	5. 1-5. 5	High.
CH	A-7	100	90-100	75-95	0. 06-0. 2	0. 12-0. 14	6. 1-6. 5	High.
ML or CL	A-6	100	85-95	60-75	0. 63-2. 0	0. 15-0. 17	5. 6-6. 0	Moderate.
CL	A-6 or A-7	100	90-100	70-80	0. 06-0. 2	0. 15-0. 17	6. 1-6. 5	High.
CH	A-7	100	90-100	75-95	0. 06-0. 2	0. 15-0. 17	7. 4-7. 8	High.
SM or ML	A-2, A-4	100	70-85	20-55	6. 3-20. 0	0. 08-0. 12	5. 1-5. 5	Low.
SM	A-2	100	65-80	20-35	6. 3-20. 0	0. 05-0. 08	4. 3-5. 5	Low.
SM or ML	A-4	100	90-95	40-60	6. 3-20. 0	0. 05-0. 08	5. 1-6. 0	Low.
SM or ML	A-4	100	90-95	40-60	2. 0-6. 3	0. 05-0. 08	5. 1-5. 5	Low.
SM	A-2	100	65-80	20-35	6. 3-20. 0	0. 03-0. 05	5. 6-6. 0	Low.
SC or ML	A-4	100	70-85	40-55	2. 0-6. 3	0. 12-0. 16	5. 1-5. 5	Low.
SC or CL	A-6	100	80-90	35-55	0. 63-2. 0	0. 15-0. 17	5. 6-6. 0	Low to moderate.
SM or ML	A-4	100	90-95	40-60	0. 63-2. 0	0. 12-0. 16	5. 6-6. 0	Low.
OL	A-4	100	90-95	50-60	0. 63-2. 0	0. 12-0. 16	<4. 5-7. 0	Low.
MH	A-7	100	95-100	90-95	0. 2-6. 3	0. 12-0. 16	<4. 5-7. 0	High.
ML or SM	A-4, A-2-4	100	85-100	25-70	0. 63-2. 0	0. 15-0. 17	4. 5-5. 0	Moderate to low.
CL	A-6	100	90-100	60-95	0. 06-0. 2	0. 15-0. 17	7. 9-8. 4	Moderate.
SM or ML	A-2, A-4	100	90-95	25-60	6. 3-20. 0	0. 05-0. 08	5. 1-5. 5	Low.
SC	A-6	100	80-90	35-50	0. 63-2. 0	0. 15-0. 17	5. 1-5. 5	Low.
SM	A-4	100	90-95	35-50	>20. 0	0. 05-0. 08	6. 1-6. 5	Low.
SM	A-2	100	65-80	20-35	>20. 0	0. 03-0. 08	6. 1-6. 5	Low.
SM	A-4	100	90-95	35-50	2. 0-6. 3	0. 05-0. 08	6. 1-6. 5	Low.
SC or CL	A-6	100	80-90	35-55	0. 2-0. 63	0. 15-0. 17	4. 5-5. 0	Low to moderate.
SM, ML	A-4	100	90-100	35-70	2. 0-6. 3	0. 10-0. 12	5. 6-6. 0	Low.
CL	A-7-6	100	90-100	60-75	0. 2-0. 63	0. 12-0. 15	4. 5-5. 0	Low to moderate.
CL	A-7-6	100	90-100	55-75	0. 63-2. 0	0. 14-0. 16	5. 1-5. 5	Moderate.
CL	A-6	100	90-100	55-75	0. 2-0. 63	0. 14-0. 16	6. 6-7. 3	Moderate.
SM or CL	A-4	100	70-100	40-50	0. 63-2. 0	0. 14-0. 16	7. 9-8. 4	Moderate.

[2] Subject to daily flooding by salt water.

gravity has practically stopped. In table 7 it is the amount of water held in the range between field capacity and the wilting point and is expressed in inches of water per inch of soil.

Reaction is shown in numerical form expressing pH value. A soil having a pH of less than 7.0 is acid, and one having a pH of more than 7.0 is alkaline. Extreme acidity or alkalinity can have an important effect on the engineering structures or on the treatment needed to stabilize soils.

Shrink-swell potential indicates how much a soil changes in volume when its moisture content changes. In general, soils having a high clay content (CH and A-7) have a high shrink-swell potential.

Depth to bedrock is not shown in table 7. Bedrock is at such depth under most soils of this county that it has little effect on most uses of the soils.

Sanitary, highway, and conservation engineering

This subsection summarizes general information about suitability of soils for sanitary, highway, and conservation engineering that is pertinent but cannot conveniently be presented in tables.

Sanitary engineering.—Suitability of a soil for septic tanks and sewage-disposal fields depends mainly on its permeability, its depth to water table, and the hazard of flooding. Slope and depth to bedrock also are important, but these are not problems in Charleston County. Soils that have a high water table or are likely to be flooded have severe limitations as sites for sewage-disposal fields (table 8). Examples of such soils in this county are Portsmouth fine sandy loam, Quitman loamy sand, Rains sandy loam, and St. Johns fine sand (fig. 13).

Among soils having slow permeability are those of the Bayboro, Chastain, and Meggett series, and soils with very slow permeability are those of the Cape Fear series. Soils having slow or very slow permeability are severely limited as sites for sewage-disposal fields.

Soils that have low filtering action, as for example Lakeland sand and Wando loamy fine sand, are severely limited as sites for sewage-disposal fields because of the possibility of pollution of nearby water sources.

The soils mentioned in the foregoing paragraphs are those having more serious limitations as sites for sewage-disposal systems. On many other soils of the county limitations are less critical, but onsite investigation is still necessary to determine whether it is feasible to use them for disposal fields. For example, a soil may be rated as having a slight limitation as a site for a disposal field, but the site chosen for construction may be of such limited extent that it will not provide a disposal field of sufficient size to serve the structure that is to be built.

Figure 13.—**Surface water on St. Johns fine sand after 3 inches of rain. (Septic tanks will not function in this soil unless hardpan is broken up and water table lowered.)**

Highway engineering.—Because Santee and Meggett soils have poor internal drainage, slow permeability, and a plastic subsoil, they are not desirable for use as surface material on unpaved roads or as material for subgrade. Capers silty clay loam, Tidal marsh, firm, and Tidal marsh, soft, are not suitable for road fill and provide a poor foundation because they have a continuous high water table and are very unstable.

Cuts and fills should be sloped at as mild a gradient as is needed to allow proper stabilization and maintenance. All cuts and fills should be seeded to suitable plants as soon after construction as possible.

Conservation engineering.—In Charleston County, conservation engineering consists of the construction of drainage systems, irrigation systems, and farm ponds, and the development of water-control facilities in wet lands for the purpose of improving habitat for wildlife.

Most of the soils in this county require good drainage before they can be farmed properly. The method of drainage and the intensity of its application depend on the characteristics of the soil and the use made of it. Open ditches and tile are used to control high water tables, dispose of excess water, remove surface runoff, and prevent seepage of water into wet areas. Dikes and water-control structures are used to prevent flooding and to provide better drainage for many of the lower soils adjacent to salt marshes.

Irrigation in this county is limited mostly to nurseries and to farms growing truck crops. Most of the soils are best suited to sprinkler irrigation, but other systems have been installed successfully on some soils of the county.

Many farm ponds and excavated pits have been constructed in Charleston County. They are a major source of water for both irrigation and livestock. Natural sites for the impounded type of pond are limited, but the high water table and topography permit construction of such ponds at some sites normally not desirable, provided some excavation is done. Nearly all the ponds are stocked with fish.

Use of Soils in Community Development [6]

Table 9 rates the limitation of soils when they are used as foundations for dwellings and as campsites, intensive play areas, fairways for golf courses, picnic areas, sites for light industries, and trafficways. Ratings are *slight*, *moderate*, *severe*, and *very severe*. The properties of the soil that mainly determine its rating are listed for all ratings except *slight*. The ratings and the significance of each are as follows:

- *slight*—Only a few limitations, if any, and these can be easily overcome.
- *moderate*—Limitations are present and must be recognized, but it is practical to overcome them.
- *severe*—Limitations are difficult to overcome and therefore the suitability for the specified use is questionable.
- *very severe*—Limitations are so restrictive that it may not be practical to overcome them.

In the following paragraphs the factors and circumstances considered when deriving ratings are listed under headings extracted from table 9.

Foundations for dwellings.—In this column of table 9, the soils are rated for use as foundations of one- to three-story dwellings. It is assumed that such dwellings are served by public or community sewage systems. The following properties and conditions of the soil were considered in determining the ratings: maximum load that soil can safely support (presumptive bearing value), shrink-swell potential, height of water table, and hazard of flooding.

Recreational sites.—In the columns under this heading of table 9, soils are rated for use as campsites, intensive play areas, fairways for golf courses, and picnic areas. The following properties of the soils were considered in determining the ratings: slope, erodibility, productivity, and trafficability. Trafficability, in turn, was determined mainly by the water table and the hazard of flooding.

Sites for light industries.—In this column of table 9, soils are rated for use as sites for one- to three-story industrial buildings. It is assumed that such buildings are served by public or community sewage systems. The following properties and conditions of the soil were considered in determining the ratings: maximum load that the soil can safely support (presumptive bearing value), shrink-swell potential, height of water table, corrosion potential, and hazard of flooding.

Trafficways.—In this column of table 9, soils are rated for their suitability as sites for low-cost roads and streets in residential areas. Such trafficways must require little preparation of the subgrade and only small cuts and fills. The following properties and conditions of the soil were considered in determining the ratings: slope, height of water table, hazard of flooding, and traffic supporting capacity.

Formation and Classification of Soils [7]

The first part of this section tells how the factors of soil formation affected the development of the soils in Charleston County. The second explains the current system of soil classification and placement of each soil series in the county according to the current system of classification and the system that was adopted in 1938.

Factors of Soil Formation

Soil is the product of soil-forming processes that act upon accumulated or deposited geologic materials. 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 both by the lay of the land (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 areas one factor dominates in formation and fixes most of the properties of the soil. In most areas, however, the interaction of all five factors determines what kind of soil is formed.

[6] By T. E. AYERS, agricultural engineer, Soil Conservation Service.

[7] By R. D. WELLS, State soil correlator.

TABLE 8.—*Engineering*

[Because they are variable in characteristics, interpretations were

Soil series and map symbols	Suitability as source of—		Limitations for septic tank filter fields	Soil features adversely affecting—
	Topsoil	Road fill		Sewage lagoons
Ardilla (Mapped only with soils of Dunbar series.)	Fair	Poor	Severe: frequent flooding, high water table, slow permeability.	Frequent flooding
Bayboro (Bc)	Fair	Poor	Severe: very frequent flooding, very high water table, slow permeability, percolation rate of more than 75 minutes per inch.	Very frequent flooding, high shrink-swell potential.
Cape Fear (Cf)	Fair	Poor	Severe: very frequent flooding, very high water table, slow permeability, percolation rate of more than 75 minutes per inch.	Very frequent flooding, high shrink-swell potential.
Capers (Cg)	Unsuitable	Unsuitable	Severe: very frequent flooding, continuous high saline water table.	Very frequent flooding, high shrink-swell potential.
Charleston (Ch)	Fair	Good	Moderate: moderately high water table.	Moderate permeability
Chastain (Ck)	Poor	Poor	Severe: very frequent flooding, very high water table, percolation rate slower than 75 minutes per inch.	Very frequent flooding
Chipley (Cm)	Poor	Good	Moderate: moderately high water table, percolation rate of 45 to 75 minutes per inch.	Rapid permeability
Coastal beaches and Dune land (Co).	Poor	Good	Severe: low filtering action, very frequent flooding, high water table.	Rapid permeability, very frequent flooding.
Craven (Cr)	Fair	Poor	Severe: percolation rate slower than 75 minutes per inch.	None
Crevasse (CvC) (For interpretations of Dawhoo soils, refer to Dawhoo series.)	Poor	Good	Severe: low filtering action	Rapid permeability
Dawhoo (Da) (For interpretations of Rutlege soil, refer to Rutlege series.)	Poor	Fair	Severe: very frequent flooding, high water table.	Rapid permeability
Dothan (Mapped only with soils of Norfolk series.)	Fair	Fair	Moderate: percolation rate of 45 to 75 minutes per inch.	Moderate permeability
Dunbar (DdA) (For interpretations of Ardilla soil, refer to Ardilla series.)	Fair	Fair	Severe: percolation rate of more than 75 minutes per inch, frequent flooding, high water table.	Moderately slow permeability.

interpretations of soils

not made for Made land (Ma) and Mine pits and dumps (Mp)]

Soil features adversely affecting—Continued				
Highway location	Farm ponds		Agricultural drainage	Sprinkler irrigation
	Reservoir areas	Embankment		
Poor traffic-supporting capacity; high water table, frequent flooding.	None	Low to high shrink-swell potential.	High water table, slow permeability, frequent flooding.	Slow infiltration.
Very poor traffic-supporting capacity; very high water table, very frequent flooding.	None	High shrink-swell potential.	Slow permeability, very high water table, very frequent flooding.	Slow infiltration.
Very poor traffic-supporting capacity; very high water table, very frequent flooding.	None	High shrink-swell potential.	High water table, very slow permeability, very frequent flooding.	Slow infiltration.
Very poor traffic-supporting capacity; very frequent flooding, continuous high saline water table.	Poor stability	High shrink-swell potential.	Continuous high saline water table, very frequent flooding, slow permeability.	Slow infiltration.
Moderate shrink-swell potential.	Rapid permeability from depth of 0 to 16 inches.	Rapid permeability from depth of 0 to 16 inches.	Moderately high water table.	None.
Poor traffic-supporting capacity; very frequent flooding, very high water table.	Slow permeability	High shrink-swell potential.	Flooding, high water table.	None.
Moderately high water table	Rapid permeability	Rapid permeability	Moderately high water table.	None.
Very frequent flooding, high water table, severe erodibility.	Rapid permeability	Rapid permeability, severe erodibility.	Not needed	Low water-holding capacity.
Poor traffic-supporting capacity; high shrink-swell potential.	None	High shrink-swell potential.	Slow permeability	Moderate infiltration.
Severe inherent erodibility	Rapid permeability	Rapid permeability, severe erodibility.	Not needed	Low water-holding capacity.
Very frequent flooding, high water table.	Rapid permeability	Rapid permeability	Very frequent flooding, high water table.	Low water-holding capacity.
Fair traffic-supporting capacity	Moderate permeability	Moderate permeability	High water table	None.
Poor traffic-supporting capacity, frequent flooding, high water table.	Moderately slow permeability.	Moderately slow permeability, moderately high shrink-swell potential.	Frequent flooding, high water table.	Moderate infiltration.

TABLE 8.—*Engineering*

Soil series and map symbols	Suitability as source of—		Limitations for septic tank filter fields	Soil features adversely affecting—
	Topsoil	Road fill		Sewage lagoons
Edisto (Ed)	Good	Good	Severe: flooding, high water table.	Moderately rapid permeability.
Faceville (FvB)	Fair	Poor	Severe: percolation rate of more than 75 minutes per inch.	None
Hockley (HoA, HoB)	Fair	Good	Slight: percolation rate of less than 45 minutes per inch.	Moderate permeability
Kiawah (Ka)	Poor	Good	Moderate: high water table	Rapid permeability
Lakeland (LaB)	Poor	Good	Severe: low filtering action	Rapid permeability
Leon (Le)	Poor	Good	Severe: high water table	Rapid permeability
Meggett (Me, Mg)	Fair	Poor	Severe: very frequent flooding, high water table, percolation rate of more than 75 minutes per inch.	Very frequent flooding, high shrink-swell potential.
Myatt (My)	Fair	Poor	Severe: very frequent flooding, high water table, percolation rate of more than 75 minutes per inch.	Very frequent flooding
Norfolk (NdA) (For interpretations of Dothan soil, refer to the Dothan series.)	Fair	Good	Slight	Moderate permeability
Orangeburg (OrA, OrB)	Fair	Poor	Moderate: percolation rate of 45 to 75 minutes per inch.	Moderate permeability
Osier (Os)	Poor	Good	Severe: very frequent flooding, high water table.	Very frequent flooding, rapid permeability.
Pamlico (Pa)	Poor	Poor	Severe: very frequent flooding, continuous high water table.	Very frequent flooding, rapid permeability.
Portsmouth (Po)	Good	Fair	Severe: very frequent flooding, high water table.	Very frequent flooding, moderate permeability.
Quitman (Qu)	Fair	Good	Severe: frequent flooding, high water table.	Frequent flooding, moderate permeability.
Rains (Ra)	Fair	Fair	Severe: very frequent flooding, high water table.	Very frequent flooding

interpretations of soils—Continued

Soil features adversely affecting—Continued

Highway location	Farm ponds		Agricultural drainage	Sprinkler irrigation
	Reservoir areas	Embankment		
Flooding, high water table	Moderately rapid permeability.	Moderately rapid permeability.	Flooding, high water table.	None.
Poor traffic-supporting capacity; moderate shrink-swell potential.	None	Poor stability, moderate shrink-swell potential.	Not needed	Moderate infiltration.
Fair traffic-supporting capacity.	Moderate permeability	Moderate permeability	Moderately high water table.	None.
Severe erodibility	Rapid permeability	Rapid permeability, severe erodibility.	High water table	Low water-holding capacity.
Severe erodibility	Rapid permeability	Rapid permeability, severe erodibility.	Not needed	Low water-holding capacity.
High water table	Rapid permeability	Rapid permeability	High water table	Low water-holding capacity.
Poor traffic-supporting capacity; very frequent flooding, high water table, high shrink-swell potential.	None	High shrink-swell potential.	Very frequent flooding, high water table, slow permeability.	Slow infiltration.
Poor traffic-supporting capacity; very frequent flooding, high water table, moderate shrink-swell potential.	None	Moderate shrink-swell potential.	Very frequent flooding, high water table, slow permeability.	Slow infiltration.
None	Moderate permeability	Moderate permeability	None	None.
Poor traffic-supporting capacity; moderate to high shrink-swell potential.	Moderate permeability	Moderate permeability, moderate shrink-swell potential.	Moderate permeability	Moderate infiltration.
Very frequent flooding, high water table.	Rapid permeability	Rapid permeability	Very frequent flooding, high water table.	Low water-holding capacity.
Poor traffic-supporting capacity; very frequent flooding, continuous high water table.	Rapid permeability	Rapid permeability	Very frequent flooding, continuous high water table.	Not suited.
Fair traffic-supporting capacity; very frequent flooding, high water table.	Moderate permeability	Moderate permeability	Very frequent flooding, high water table.	None.
Frequent flooding, high water table.	Moderate permeability	Moderate permeability	Frequent flooding, high water table.	None.
Fair traffic-supporting capacity; very frequent flooding, high water table.	Moderate permeability	Moderate permeability	Very frequent flooding, high water table.	None.

TABLE 8.—*Engineering*

Soil series and map symbols	Suitability as source of—		Limitations for septic tank filter fields	Soil features adversely affecting—
	Topsoil	Road fill		Sewage lagoons
Rutlege (Rg, Rp) (For interpretations of Pamlico soil, refer to the Pamlico series.)	Poor	Fair	Severe: very frequent flooding, high water table.	Very frequent flooding, rapid permeability.
St. Johns (Sa)	Poor	Fair	Severe: frequent flooding, high water table.	Frequent flooding, rapid permeability.
Santee:				
Clay loam (Sc)	Poor	Poor	Severe: very frequent flooding, high water table, percolation rate of more than 75 minutes per inch.	Very frequent flooding
Loam (Se)	Fair	Poor	Severe: very frequent flooding, high water table, percolation rate of more than 75 minutes per inch.	Very frequent flooding, moderate permeability to a depth of 16 inches.
Scranton (Sf)	Poor	Good	Severe: high water table	Rapid permeability
Seabrook (Sk)	Poor	Good	Moderate: moderately high water table.	Rapid permeability
Seewee (Sm)	Poor	Good	Severe: frequent flooding, high water table.	Rapid permeability
Stono (St)	Good	Fair	Severe: frequent flooding high water table.	Moderate permeability
Tidal marsh:				
Firm (Tf)	Unsuitable	Unsuitable	Severe: very frequent flooding, continuous high water table, flooded daily by salt water.	Very frequent flooding, rapid permeability.
Soft (Ts)	Unsuitable	Unsuitable	Severe: very frequent flooding, continuous high water table, flooded daily by salt water.	Very frequent flooding, moderate permeability.
Wadmalaw (Wa)	Fair	Fair	Severe: very frequent flooding, high water table, percolation rate of more than 75 minutes per inch.	Very frequent flooding
Wagram (WgB)	Fair	Good	Slight: moderate permeability at a depth of 24 to 60 inches.	Rapid permeability to depth of 24 inches.
Wando (WnB)	Poor	Good	Slight: low filtering action	Rapid permeability
Wicksburg (WoB)	Poor	Good	Slight: moderately slow permeability.	Moderately slow permeability.
Yonges (Yo)	Fair	Fair	Severe: percolation rate of more than 75 minutes per inch.	None

interpretations of soils—Continued

Soil features adversely affecting—Continued				
Highway location	Farm ponds		Agricultural drainage	Sprinkler irrigation
	Reservoir areas	Embankment		
Very frequent flooding, high water table.	Rapid permeability	Rapid permeability	Very frequent flooding, high water table.	Low water-holding capacity.
Frequent flooding, high water table.	Rapid permeability	Rapid permeability	Frequent flooding, high water table.	Low water-holding capacity.
Poor traffic-supporting capacity; very frequent flooding, high water table, high shrink-swell potential.	None	High shrink-swell potential, poor stability.	Very frequent flooding, high water table, slow permeability.	Slow infiltration.
Poor traffic-supporting capacity; very frequent flooding, high water table, high shrink-swell potential.	None	High shrink-swell potential, poor stability.	Very frequent flooding, high water table, slow permeability.	Slow infiltration.
Severe erodibility	Rapid permeability	Rapid permeability, severe erodibility.	High water table	Low water-holding capacity.
Moderately high water table	Rapid permeability	Rapid permeability	Moderately high water table.	None.
Frequent flooding, high water table.	Rapid permeability	Rapid permeability	Frequent flooding, high water table.	Low water-holding capacity.
Frequent flooding, high water table.	Moderate permeability	Moderate permeability	Frequent flooding, high water table.	Low water-holding capacity.
Very frequent flooding, continuous high water table.	Rapid permeability	Rapid permeability, high shrink-swell potential, poor stability.	Very frequent flooding, continuous high water table, flooded daily by tide.	Unsuitable.
Very frequent flooding, continuous high water table.	Moderate permeability	Moderate permeability, high shrink-swell potential, very poor stability.	Very frequent flooding, continuous high water table, flooded daily by tide.	Unsuitable.
Very frequent flooding, high water table and moderate shrink-swell potential.	None	High shrink-swell potential, poor stability.	Very frequent flooding, high water table, slow permeability.	Slow infiltration.
None	Rapid permeability to depth of 24 inches.	Rapid permeability to depth of 24 inches.	Not usually needed	Low water-holding capacity.
Severe erodibility	Rapid permeability	Rapid permeability	Not needed	Low water-holding capacity.
None	Moderately slow permeability to depth of 30 inches.	Moderately slow permeability.	None	None.
Moderate shrink-swell potential at depth of 14 to 20 inches.	None	Moderate shrink-swell potential at depth of 14 to 20 inches.	Moderately slow permeability.	Slow infiltration.

TABLE 9.—*Estimated limitations of*

[See text for definitions of ratings *slight, moderate, severe,* and *very severe.* Because they are variable in characteristics. Made land (Ma) and mate and do not correlate with such

Soil series and map symbols	Foundations for dwellings	Recreational sites	
		Campsites	Intensive play areas
Ardilla (Mapped only with soils of Dunbar series.)	Moderate: frequent flooding, high water table.	Moderate: fair trafficability	Moderate: fair trafficability
Bayboro (Bc)	Severe: very frequent flooding, high water table, high shrink-swell potential.	Severe: very poor trafficability.	Severe: very poor trafficability.
Cape Fear (Cf)	Severe: very frequent flooding, high water table, moderate shrink-swell potential.	Severe: very poor trafficability.	Severe: very poor trafficability.
Capers (Cg)	Very severe: very frequent flooding, continuous saline high water table, low presumptive bearing value, high shrink-swell potential.	Very severe: very poor trafficability.	Very severe: very poor trafficability.
Charleston (Ch)	Slight	Slight	Slight
Chastain (Ck)	Very severe: very frequent flooding, high water table, low presumptive bearing value.	Very severe: very poor trafficability.	Very severe: very poor trafficability.
Chipley (Cm)	Moderate: moderately high water table.	Slight	Slight
Coastal beaches and Dune land (Co).	Severe: very frequent flooding, high water table.	Severe: poor trafficability	Severe: poor trafficability
Craven (Cr)	Moderate: low presumptive bearing value, high shrink-swell potential.	Slight	Slight
Crevasse (CvC) (For limitations of Dawhoo soil, refer to the Dawhoo series.)	Slight	Slight	Slight
Dawhoo (Da) (For limitations of Rutlege soil, refer to the Rutlege series.)	Very severe: very frequent flooding, high water table.	Severe: very poor trafficability.	Very severe: very poor trafficability.
Dothan (Mapped only with soils of Norfolk series.)	Moderate: high water table	Moderate: fair trafficability	Moderate: fair trafficability
Dunbar (DdA) (For limitations of Ardilla soil, refer to the Ardilla series.)	Moderate: frequent flooding, high water table, moderate shrink-swell potential.	Moderate: fair trafficability	Moderate: fair trafficability
Edisto (Ed)	Moderate: frequent flooding, high water table.	Moderate: fair trafficability	Moderate: fair trafficability
Faceville (FvB)	Moderate: moderate shrink-swell potential.	Slight	Slight
Hockley (HoA, HoB)	Slight	Slight	Slight
Kiawah (Ka)	Moderate: high water table	Moderate: poor trafficability	Moderate: poor trafficability
Lakeland (LaB)	Slight	Slight	Slight
Leon (Le)	Moderate: infrequent flooding, high water table.	Slight: fair trafficability	Slight: fair trafficability
Meggett (Me, Mg)	Severe: poor presumptive bearing value, high shrink-swell potential, very frequent flooding, high water table.	Severe: very poor trafficability	Severe: very poor trafficability.
Myatt (My)	Severe: low presumptive bearing value, very frequent flooding, high water table.	Severe: poor trafficability	Severe: poor trafficability

soils for community development

Mine pits and dumps (Mp) were not rated in this table. References to presumptive bearing value in this table are general and approximate measures of pressure as pounds per square foot]

Recreational sites—Continued		Sites for light industries	Trafficways
Golf fairways	Picnic areas		
Moderate: fair trafficability	Moderate: fair trafficability	Moderate: frequent flooding, high water table.	Moderate: fair traffic supporting capacity; frequent flooding, high water table.
Severe: very poor trafficability	Severe: very poor trafficability.	Severe: very frequent flooding, high water table, high shrink-swell potential.	Severe: very poor traffic supporting capacity; very frequent flooding, high water table.
Severe: very poor trafficability	Severe: very poor trafficability.	Severe: very frequent flooding, high water table, moderate shrink-swell potential.	Severe: very poor traffic supporting capacity; very frequent flooding, high water table.
Very severe: very poor trafficability.	Very severe: very poor trafficability.	Very severe: very frequent flooding, continuous saline high water table, low presumptive bearing value, high shrink-swell potential, high corrosion potential.	Very severe: very poor traffic supporting capacity; very frequent flooding, continuous saline high water table.
Slight	Slight	Slight	Slight.
Very severe: very poor trafficability.	Very severe: very poor trafficability.	Very severe: very frequent flooding, high water table, low presumptive bearing value.	Very severe: poor traffic supporting capacity; very frequent flooding, high water table.
Slight	Slight	Slight	Slight
Severe: poor trafficability, low productivity.	Severe: poor trafficability.	Severe: very frequent flooding, high water table, severe erodibility.	Severe: very frequent flooding, high water table, severe erodibility.
Slight	Slight	Moderate: low presumptive bearing value, high shrink-swell potential.	Moderate: poor traffic supporting capacity.
Moderate: low productivity	Slight	Slight	Slight.
Very severe: very poor trafficability.	Very severe: very poor trafficability.	Very severe: very frequent flooding, high water table, high corrosion potential.	Severe: very frequent flooding, high water table.
Moderate: fair trafficability	Moderate: fair trafficability.	Moderate: high water table	Moderate: fair traffic supporting capacity; high water table.
Moderate: fair trafficability	Moderate: fair trafficability.	Severe: frequent flooding, high water table, moderate shrink-swell potential.	Severe: poor traffic supporting capacity; frequent flooding, high water table, moderate shrink-swell potential.
Moderate: fair trafficability	Moderate: fair trafficability.	Severe: frequent flooding, high water table.	Severe: frequent flooding, high water table.
Slight	Slight	Moderate: moderate shrink-swell potential.	Moderate: poor traffic supporting capacity.
Slight	Slight	Slight	Slight.
Moderate: poor trafficability	Moderate: poor trafficability.	Moderate: high water table	Moderate: high water table.
Moderate: low productivity	Slight	Slight	Slight.
Moderate: fair trafficability, low productivity.	Slight: fair trafficability	Moderate: infrequent flooding, high water table.	Moderate: infrequent flooding, high water table.
Severe: very poor trafficability.	Severe: very poor trafficability.	Severe: very frequent flooding, high water table, low presumptive bearing value, high shrink-swell potential, high corrosion potential.	Severe: poor traffic supporting capacity; very frequent flooding, high water table.
Severe: poor trafficability	Severe: poor trafficability	Severe: low presumptive bearing value, very frequent flooding, high water table.	Severe: poor traffic supporting capacity; very frequent flooding, high water table.

TABLE 9.—*Estimated limitations of soils*

Soil series and map symbols	Foundations for dwellings	Recreational sites	
		Campsites	Intensive play areas
Norfolk (NdA) (For limitations of Dothan soil, refer to the Dothan series.)	Moderate: fair presumptive bearing value.	Slight	Slight
Orangeburg (OrA, OrB)	Slight	Slight	Slight
Osier (Os)	Severe: very frequent flooding, high water table.	Severe: poor trafficability	Severe: poor trafficability
Pamlico (Pa)	Very severe: low presumptive bearing value, very frequent flooding, high water table.	Very severe: very poor trafficability.	Very severe: very poor trafficability.
Portsmouth (Po)	Severe: moderate presumptive bearing value, very frequent flooding, high water table.	Severe: very poor traffica-ability.	Severe: very poor trafficability.
Quitman (Qu)	Moderate: frequent flooding, high water table.	Moderate: poor trafficability	Moderate: poor trafficability
Rains (Ra)	Severe: very frequent flooding, high water table, low presumptive bearing value.	Severe: poor trafficability	Severe: poor trafficability
Rutlege (Rg, Rp) (For limitations of Pamlico soil in Rp, refer to the Pamlico series.)	Severe: very frequent flooding, high water table.	Severe: poor trafficability	Severe: poor trafficability
St. Johns (Sa)	Severe: frequent flooding, high water table.	Severe: poor trafficability	Severe: poor trafficability
Santee:			
Clay loam (Sc)	Severe: very frequent flooding, high water table, low presumptive bearing value, high shrink-swell potential.	Severe: poor trafficability	Severe: poor trafficability
Loam (Se)	Severe: very frequent flooding, high water table, low presumptive bearing value, high shrink-swell potential.	Severe: poor trafficability	Severe: poor trafficability
Scranton (Sf)	Moderate: infrequent flooding, high water table.	Moderate: fair trafficability	Moderate: fair trafficability
Seabrook (Sk)	Slight	Slight	Slight
Seewee (Sm)	Moderate: frequent flooding, high water table.	Moderate: poor trafficability	Moderate: poor trafficability
Stono (St)	Moderate: high water table, frequent flooding.	Moderate: poor trafficability	Moderate: poor trafficability
Tidal marsh:			
Firm (Tf)	Very severe: very frequent flooding, continuous high water table, low presumptive bearing value.	Very severe: very poor trafficability.	Very severe: very poor trafficability.
Soft (Ts)	Very severe: very frequent flooding, continuous flooding, poor presumptive bearing value, high shrink-swell potential.	Very severe: very poor trafficability.	Very severe: very poor trafficability.
Wadmalaw (Wa)	Severe: very frequent flooding, high water table, low presumptive bearing value, moderate shrink-swell potential.	Severe: poor trafficability	Severe: poor trafficability.
Wagram (WgB)	Slight	Slight	Slight
Wando (WnB)	Slight	Slight	Slight
Wicksburg (WoB)	Slight	Slight	Slight
Yonges (Yo)	Moderate: high water table, infrequent flooding.	Moderate: fair trafficability	Moderate: fair trafficability

for community development—Continued

Recreational sites—Continued: Golf fairways	Recreational sites—Continued: Picnic areas	Sites for light industries	Trafficways
Slight	Slight	Moderate: fair presumptive bearing value.	Slight.
Slight	Slight	Slight	Slight.
Severe: poor trafficability	Severe: poor trafficability	Severe: very frequent flooding, high water table.	Severe: very frequent flooding, high water table.
Very severe: very poor trafficability, low productivity.	Very severe: very poor trafficability.	Very severe: very frequent flooding, continuous high water table, low presumptive bearing value, high corrosion potential.	Very severe: poor traffic supporting capacity; very frequent flooding, continuous high water table.
Severe: very poor trafficability	Severe: very poor trafficability.	Severe: moderate presumptive bearing value, very frequent flooding, high water table.	Severe: fair traffic supporting capacity; very frequent flooding, high water table.
Moderate: poor trafficability	Moderate: poor trafficability	Moderate: frequent flooding, high water table.	Moderate: frequent flooding, high water table.
Severe: poor trafficability	Severe: poor trafficability	Severe: very frequent flooding, high water table, low presumptive bearing value.	Severe: very frequent flooding, high water table.
Severe: poor trafficability	Severe: poor trafficability	Severe: very frequent flooding, high water table.	Severe: very frequent flooding, high water table.
Severe: poor trafficability	Severe: poor trafficability	Severe: frequent flooding, high water table.	Severe: frequent flooding, high water table.
Severe: poor trafficability	Severe: poor trafficability	Severe: very frequent flooding, high water table, low presumptive bearing value, high shrink-swell potential.	Severe: poor traffic supporting capacity; very frequent flooding, high water table.
Severe: poor trafficability	Severe: poor trafficability	Severe: very frequent flooding, high water table, low presumptive bearing value, high shrink-swell potential.	Severe: poor traffic supporting capacity; very frequent flooding, high water table.
Moderate: fair trafficability	Moderate: fair trafficability	Moderate: infrequent flooding, high water table.	Moderate: infrequent flooding, high water table.
Slight	Slight	Slight	Slight.
Moderate: poor trafficability	Moderate: poor trafficability	Moderate: frequent flooding, high water table.	Moderate: frequent flooding, high water table.
Moderate: poor trafficability	Moderate: poor trafficability	Moderate: frequent flooding, high water table.	Moderate: frequent flooding, high water table.
Very severe: very poor trafficability.	Very severe: very poor trafficability.	Very severe: very frequent flooding, continuous high water table, low presumptive bearing value.	Very severe: poor traffic supporting capacity; very frequent flooding, continuous high water table.
Very severe: very poor trafficability.	Very severe: very poor trafficability.	Very severe: very frequent flooding continuous high water table, low presumptive bearing value, high shrink-swell potential.	Very severe: poor traffic supporting capacity; very frequent flooding, continuous high water table.
Severe: poor trafficability	Severe: poor trafficability	Severe: very frequent flooding, high water table, low presumptive bearing value, moderate shrink-swell potential.	Severe: very poor traffic supporting capacity; very frequent flooding, high water table.
Slight	Slight	Slight	Slight.
Slight: low productivity	Slight	Slight	Slight.
Slight	Slight	Slight	Slight.
Moderate: fair trafficability	Moderate: fair trafficability	Moderate: infrequent flooding, high water table.	Moderate: infrequent flooding, high water table.

Some understanding of the complex soil-forming process can be gained by considering each of the five factors separately. Nevertheless, it is necessary to keep in mind that no one factor operates independently of the others.

Parent material

Parent material is the unconsolidated mass from which a soil is formed. It has much to do with the mineral and chemical composition of the soil. In Charleston County the parent materials are marine or fluvial deposits, in most places sand or loam, but in some places clay or marl.

There are three distinct terrace formations in this county: the Recent, the Pamlico, and the Talbot (*3*).

The Recent terrace ranges from about sea level to 6 feet above and occurs along the coast and inland a few miles up major streams. The soils on it are primarily those of the Capers series and Tidal marsh lands.

The Pamlico terrace ranges from about 6 to 25 feet above sea level. It covers most of the county that is not covered by the Recent terrace.

The Talbot terrace ranges from about 25 to 42 feet above sea level. It occurs on the small panhandle southeast of Ladson, in some places in the western part of the county, and on a narrow strip running along the Berkeley County line from southwest of Wambaw Creek almost to the Wando River.

Both the Pamlico and Talbot terraces in some places contain lime at a depth of 4 feet or more. This has caused some soil areas to have alkaline reaction.

Climate

Climate, particularly precipitation and temperature, affects the physical, chemical, and biological relationships in the soil. The growth and activity of living organisms is increased by a warm, humid climate. Weathering of parent materials is speeded by moisture and warm temperatures. Rain supplies water that dissolves minerals, aids chemical and biological activities, and transports dissolved minerals and organic material through layers of the soil. Much rain causes leaching of soluble bases and translocation down through the profile of the less soluble and finer textured materials. The amount of water that actually percolates through a soil depends, however, on the rainfall, length of the frost-free season, lay of the land (relief), and permeability of the soil material.

Charleston County has a temperate climate. Rainfall is heavy and well distributed through the year. Distribution and amount of rainfall, length of the frost-free season, lay of the land and permeability of the soil material have had marked effect on formation of soils in the county. The climate has been fairly uniform for the entire county, however, and for this reason climate does not account for significant differences among the soils.

Living organisms

The quantity and type of plants and animals that live in and on the soil are determined mainly by the climate. Other factors, such as parent material, lay of the land (relief), and age of the soil, help to determine this to a lesser extent.

In most areas of Charleston County, the fungi, bacteria, and other micro-organisms occur within a few inches of the surface. Here they hasten the normal weathering process of the minerals. Bacteria and fungi decompose organic matter and release nutrients for plant use. They are indispensable during soil formation.

Earthworms and other small invertebrates are chiefly active in the A horizon and upper part of the B horizon in soils of Charleston County. They slowly but continuously mix the soil material of these horizons.

Originally the native vegetation in the better drained areas of the county was mainly oak, hickory, longleaf pine, and loblolly pine. On the wetter areas it was mainly yellow-poplar, sweetgum, ash, cypress, maple, and blackgum. The larger trees influenced the development of the soil in several ways: roots brought nutrients up from the depths; uprooted trees lifted soil material up from lower horizons; and as large roots decayed, they left channels in the soil that were refilled by soil material from above.

Relief

Relief, or lay of the land, influences soil formation because it affects moisture, temperature, and erosion. In some very steep areas the soils are thin because erosion removes soil materials as fast as they are formed.

Most of Charleston County is nearly level. Only a few areas have slopes of as much as 6 percent. Because so much of the county is nearly level, the drainage pattern is poorly defined and many of the soils, as for example the Dawhoo and Stono, are saturated with water most of the year.

Time

The time required for well-defined horizons to form in a soil depends on the rate at which climate and living organisms act on parent material of the soil.

In this county, typical young soils, or those having weakly defined horizons, are on the Recent terrace. Soils of the Capers series are of this kind. Soils formed in sandy parent material, as those of the Chipley and Crevasse series, also have weakly defined horizons. Horizons are only moderately distinct in soils that have developed in low areas permanently saturated with water.

The soils of this county on the Pamlico and Talbot terraces, as for example the Hockley and Kiawah, have clearly defined horizons.

Classification of Soils

Soils are classified so that we may more easily remember their significant characteristics. Classification enables us to assemble knowledge about the soils, see their relationship to one another and the whole environment, and to develop principles that help us understand their behavior and their response to management. First through classification and then through the use of soil maps, we can apply our knowledge of soils to specific tracts of land.

In soil classification, soils are placed in narrow categories so that knowledge about them can be organized and applied in managing farms, fields, and woodlands; in developing rural areas; in engineering work; and in many other ways. They are placed in broad classes to facilitate study and comparison in large areas, such as countries and continents.

Two systems of classifying soils have been used in the United States in recent years. The older system was adopted in 1938 (*2*) and later revised (*14*). The current system was adopted for general use by the National Cooperative Soil Survey in 1965. Because this system is under continual study (*11*, *18*), readers interested in its development should obtain the latest literature available. In table 10, the soil series in Charleston County are listed and are classified by order, subgroup, and family in the current system.

Ten soil orders are recognized in the current classification system: Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. Properties that tend to give broad climatic grouping of soils are used to differentiate eight of the ten orders. The remaining two, Entisols and Histosols, occur in many different climates.

Seven of the ten soil orders are represented in Charleston County. Those orders are the Entisols, Inceptisols, Mollisols, Spodosols, Alfisols, Ultisols, and Histosols.

Entisols are recent mineral soils that do not have genetic horizons or have only the beginning of such horizons. *Inceptisols* are soils on young but not recent land surfaces. *Mollisols* have a thick, soft, friable surface layer that has been darkened by organic matter. They have a high base supply. *Spodosols* have horizons in which organic colloids, iron, and aluminum compounds, or both, have accumulated. *Alfisols* have a clay-enriched B horizon that has a high base saturation. *Ultisols* have distinct horizons, are commonly on old land surfaces, and contain a clay-enriched B horizon that has low base saturation. *Histosols* are organic soils.

Suborders are subdivisions that narrow the broad climatic range permitted in the soil orders. The soil properties used to separate suborders mainly reflect either the presence or absence of waterlogging or soil differences resulting from the climate or vegetation. In Charleston County, soils dominated by characteristics related to wetness form a suborder in each of the orders except Histosols. Soils that are generally moist form suborders in the Ultisol and Alfisol orders, and soils dominated by sandy materials make up a suborder in the Entisol order.

Great groups are subdivisions of soil suborders. They are differentiated within suborders according to the presence, absence, or arrangement of diagnostic horizons and features. A diagnostic horizon contains illuvial clay, iron, or humus; or is a surface horizon that is dark colored;

TABLE 10.—*Soil series classified according to the current system of classification*

Series	Current classification [1]		
	Family	Subgroup	Order
Ardilla	Fine-loamy, siliceous, thermic	Plinthaquic Paleudults	Ultisols.
Bayboro	Clayey, mixed, thermic (kaolinitic)	Umbric Paleaquults	Ultisols.
Cape Fear	Clayey, mixed, thermic (kaolinitic)	Typic Umbraquults	Ultisols.
Capers	Fine, mixed-sulfureous, nonacid, thermic	Typic Thiaquents	Entisols.
Charleston	Coarse-loamy, mixed, thermic	Aquultic Hapludalfs	Alfisols.
Chastain	Fine, kaolinitic, acid, thermic	Fluventic Haplaquepts	Inceptisols.
Chipley	Siliceous, thermic, coated	Aquic Quartzipsamments	Entisols.
Craven	Clayey, mixed, thermic	Aquic Hapludults	Ultisols.
Crevasse	Mixed, thermic	Typic Udipsamments	Entisols.
Dawhoo	Sandy, siliceous, thermic	Typic Humaquepts	Inceptisols.
Dothan	Fine-loamy, siliceous, thermic	Plinthic Paleudults	Ultisols.
Dunbar	Clayey, kaolinitic, thermic	Aeric Paleaquults	Ultisols.
Edisto	Coarse-loamy, siliceous, thermic	Glossaquic Fragiudalfs	Alfisols.
Faceville	Clayey, kaolinitic, thermic	Typic Paleudults	Ultisols.
Hockley	Fine-loamy, mixed, thermic (siliceous)	Plinthic Paleudalfs	Alfisols.
Kiawah	Sandy, mixed, thermic	Aeric Umbric Ochraqualfs	Alfisols.
Lakeland	Siliceous, thermic, coated	Typic Quartzipsamments	Entisols.
Leon	Sandy, siliceous, thermic	Aeric Haplaquods	Spodosols.
Meggett	Fine, mixed, thermic	Typic Albaqualfs	Alfisols.
Myatt	Fine-loamy, siliceous, thermic	Typic Ochraquults	Ultisols.
Norfolk	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Orangeburg	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Osier	Siliceous, thermic	Typic Psammaquents	Entisols.
Pamlico	Sandy, siliceous, dysic, thermic	Terric Medisaprists	Histosols.
Portsmouth	Fine-loamy, siliceous, thermic	Typic Umbraquults	Ultisols.
Quitman	Coarse-loamy, mixed, thermic	Aquic Fragiudults	Ultisols.
Rains	Fine-loamy, siliceous, thermic	Typic Paleaquults	Ultisols.
Rutlege	Sandy, siliceous, thermic	Typic Humaquepts	Inceptisols.
St. Johns	Sandy, siliceous, hyperthermic	Typic Haplaquods	Spodosols.
Santee	Fine, mixed, noncalcareous, thermic	Typic Hapalquolls	Mollisols.
Scranton	Siliceous, thermic	Mollic Psammaquents	Entisols.
Seabrook	Siliceous, thermic, coated	Aquic Quartzipsamments	Entisols.
Seewee	Mixed, thermic	Aquic Udipsamments	Entisols.
Stono	Fine-loamy, mixed, noncalcareous, thermic.	Typic Argiaquolls	Mollisols.
Wadmalaw	Fine-loamy, mixed, thermic	Umbric Ochraqualfs	Alfisols.
Wagram	Loamy, siliceous, thermic	Arenic Paleudults	Ultisols.
Wando	Siliceous, thermic, coated	Typic Quartzipsamments	Entisols.
Wicksburg	Clayey, kaolinitic, thermic	Arenic Paleudults	Ultisols.
Yonges	Fine-loamy, mixed, thermic	Typic Albaqualfs	Alfisols.

[1] Placement of some soils in the current system of classification is based on the best information available at the time of publication.

or is a horizon containing a pan that interferes with water movement and root development.

The names of the great soil groups in Charleston County are not shown in table 10, but they can be easily learned because they form the last word in the name of the subgroups. For example, soils of the Ardilla series are in the Plinthaquic Paleudult subgroup, and from the last word in this name it is known that they are in the Paleudult great group.

Subgroups are subdivisions of a great group. One subgroup in a great group represents the central, or modal, concept of that group. One or more other subgroups in the group, called intergrades, have properties of this group in which they occur, and also some properties of another great group, suborder, or order. The names of subgroups are derived by placing one or more adjectives before the name of the great group. If, for example, a subgroup is typical, or modal, for its great group, the first word in the name of the subgroup is "Typic."

Families are subdivisions of subgroups. They are established primarily on a basis of properties that are important to the growth of plants or to the behavior of soils when they are used in engineering projects. Specific properties that are most commonly used to differentiate among families are texture, mineral content, and temperature. Less common, but used to identify some families, are such characteristics of the soil as depth, reaction (pH), permeability, consistence, moisture equivalent, and its slope or shape.

Additional Facts About the County

Climate, physiography, drainage, and geology of Charleston County are described in the first part of this section. The history of crop production in the county is discussed in the second part.

Climate[8]

The climate of Charleston County is mild and temperate, and rainfall is distributed well throughout the year. Day-to-day weather is controlled largely by the movement of pressure systems across the country, but complete exchanges of air masses are relatively few in summer when masses of tropical maritime air persist for long periods.

Climate of areas nearest the ocean is modified. The influence of the ocean is particularly noticeable in winter when minimum temperatures are sometimes 10 to 15 degrees higher in the city of Charleston than at the airport 10 miles inland. Maximum temperatures in the city, on the other hand, are 3 degrees lower.

Wind direction affects life and work along the coast. Prevailing winds in the city of Charleston are northerly in fall and winter and southerly in spring and summer. Average windspeed is about 9 miles per hour. In the city of Charleston area, the strongest wind recorded for 1 minute in recent years was 76 miles per hour, and that came from the southwest.

It rains one-tenth of an inch or more about 67 days in an average year. The most annual rainfall recorded in recent years was about 72 inches at Charleston Airport in 1958. The least was about 29 inches in the city of Charleston in 1931 (*5*, *6*). About 41 percent of the annual rainfall is in summer, the rainiest season of all. Except for occasional tropical storms, these summer rains are generally showers or thundershowers that occur at various intensities and in scattered areas (*5*, *6*).

Average relative humidity for the year is approximately 75 percent. Average daily (1:00 p.m.) recordings in recent years range from a maximum of 64 percent in July to a minimum of 49 percent in April.

Skies are cloudy or overcast about 41 percent of an average year. Clouds are below 500 feet about 3 percent of the year and below 1,000 feet 6 percent of it. The sun is visible 67 percent of the daylight hours in an average year. From December to May it is visible 57 to 73 percent of these hours.

Summer is warm and humid. Temperatures of 90 degrees or higher occur 49 days in an average year. Temperatures of 100 degrees or higher are infrequent. Because of the cooling effect of sea breezes, maximum temperatures in summer are generally several degrees lower along the coast than inland.

Extreme temperatures are rare from late in September to early in November, and the weather is mostly sunny. Prewinter cold spells begin late in November. The threat of hurricanes striking the coast is at a maximum late in summer and early in fall. Some hurricanes that affected the Charleston area occurred in August of 1885, 1893, 1911, 1940, 1952, and in September of 1928 and 1959. A storm tide of 11.2 feet above mean low water, the highest for which accurate records of height have been obtained, was recorded at the time of the August 1893 hurricane.

The winter months, December, January, and February, are mild. Rainfall is generally fairly uniform, but a few thundershowers occur. The average amount of rain in winter is 18 percent of the total for the year. Snow of any significant amount is rarely measured, but the possibility of a snow flurry exists, especially in January. On the average there is less than one cold wave and severe freeze in winter. Temperatures of 20 degrees or less along the coast and in the city of Charleston are unusual (*5*, *6*).

The climate in the county is favorable for vegetables, livestock and livestock products, soybeans, and forest products. Moisture accumulates in the soils during winter and spring, and in most years soils are at field capacity at planting time. Dry periods are sufficient to permit tillage. The mean freeze-free interval (a measure of the growing season) lasts about 294 days near the central coast and about 266 days inland at Charleston airport. Thus, the growing season is long enough for crops to be planted over a period of weeks, or even months, and still allow plenty of time for crops to mature. The probabilities of the last freezing temperatures in spring and the first in fall are shown in table 11.

The amount of rainfall in the growing season is normally suitable for crop growth. In some years, however, it is either inadequate or excessive. Table 12 shows that extreme monthly and annual deficiencies may occur 1 year in 10, and extreme excesses, 1 year in 10. For example, the average rainfall in July is 7.7 inches, but 1 year

[8] By NATHAN KRONBERG, State climatologist, U. S. Weather Bureau.

in 10 it may be less than 3.5 inches, and in another July in the same period, rainfall may be more than 11.9 inches.

Table 13 shows estimated probability of drought days in Charleston County on soils having capacity to hold, respectively, 1, 2, 3, 4, and 5 inches of water available to plants. A drought day is one in which there is no water in the soil that is available to plants (*20*). The estimates in table 13 were obtained by using the Penman method for computing evapotranspiration; that is, consumption of moisture by evaporation and by transpiration from plants.

Disastrous droughts occurred in the county in 1925 and 1954. Partial droughts occur once or twice every 10 years. Even in a normal year, most crops would benefit from irrigation.

The duration and amount of rainfall for the period 1897–1961 was recorded by an automatic rain gauge at the customhouse site in Charleston. Maximum intensity for the period is shown in the following list:

Duration (hours):	*Inches*
1	4.11
2	6.64
3	7.42
6	8.62
12	9.03
24	10.57

TABLE 11.—*Probabilities of last freezing temperatures in spring and first in fall* (*5, 7*)

Probability	Dates for given probability and temperature [1]		
	24° F. or less	28° F. or less	32° F. or less
Spring:			
1 year in 10 later than	February 21	March 10	April 2
2 years in 10 later than	February 13	March 2	March 25
5 years in 10 later than	January 31	February 15	March 11
Fall:			
1 year in 10 earlier than	December 13	November 24	November 15
2 years in 10 earlier than	December 19	December 1	November 21
5 years in 10 [2] earlier than	(3)	December 14	December 2

[1] Near the coast temperatures of 24° F. or less occur about 15 days earlier in spring and 4 days later in fall; temperatures of 28° F. or less, about 6 days earlier in spring and 4 days later in fall; and temperatures of 32° F. or less, about 22 days earlier in spring and 4 days later in fall.

[2] Near the coast incidence is less than 50 percent.

[3] Freeze would not occur at 50 percent probability.

TABLE 12.—*Temperature and precipitation*

Month	Temperature				Precipitation			
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with— Maximum temperature equal to or higher than—	Two years in 10 will have at least 4 days with— Minimum temperature equal to or lower than—	Average monthly total	One year in 10 will have— Less than—	One year in 10 will have— More than—	Average snowfall
	°*F.*	°*F.*	°*F.*	°*F.*	*Inches*	*Inches*	*Inches*	*Inches*
January	61	39	76	24	2.5	0.8	4.2	(1)
February	63	40	77	27	3.3	.9	5.9	(1)
March	68	45	82	30	3.9	1.5	6.8	(1)
April	76	53	85	42	2.9	.9	4.8	0
May	83	61	90	51	3.6	.8	6.0	0
June	88	68	94	60	5.0	1.5	7.6	0
July	89	71	96	66	7.7	3.5	11.9	0
August	89	71	95	65	6.6	2.0	10.2	0
September	85	66	92	57	5.8	1.5	10.2	0
October	77	55	85	41	2.8	.6	5.7	0
November	68	44	81	31	2.1	.6	3.9	(1)
December	61	39	75	24	2.9	1.0	4.5	.1
Year	76	54	(2) 98	(3) 18	49.1	31.5	62.6	.1

[1] Trace (less than 0.05 inch).

[2] Average highest annual maximum.

[3] Average lowest annual minimum.

TABLE 13.—*Probabilities of drought days on soils of five different moisture-storage capacities* (*20*)

Month [1]	Probability	Minimum number of drought days if soil has moisture-storage capacity of [2]—				
		1 inch	2 inches	3 inches	4 inches	5 inches
April	1 in 10	17	0	0	0	0
	2 in 10	15	0	0	0	0
	3 in 10	13	0	0	0	0
	5 in 10	11	0	0	0	0
May	1 in 10	29	27	24	17	10
	2 in 10	26	23	20	13	6
	3 in 10	23	20	16	10	0
	5 in 10	20	16	11	0	0
June	1 in 10	22	21	20	20	17
	2 in 10	19	18	17	16	13
	3 in 10	19	15	14	13	10
	5 in 10	14	11	10	8	0
July	1 in 10	18	14	12	11	11
	2 in 10	15	10	8	8	7
	3 in 10	13	8	6	6	5
	5 in 10	10	0	0	0	0
August	1 to 10	18	14	10	8	7
	2 in 10	15	9	0	0	0
	3 in 10	13	5	0	0	0
	5 in 10	9	0	0	0	0
September	1 in 10	21	15	12	9	7
	2 in 10	18	11	7	0	0
	3 in 10	15	8	0	0	0
	5 in 10	14	0	0	0	0
October	1 in 10	28	25	22	18	13
	2 in 10	24	19	15	10	0
	3 in 10	21	15	10	0	0
	5 in 10	16	8	0	0	0

[1] Months of January, February, March, November, and December are not shown because crops are rarely damaged by drought in these months.
[2] Inches of water that the soil can hold and make available to plants.

Physiography, Drainage, and Geology

Charleston County is part of the lower Atlantic Coastal Plain. The county is mostly level but in places is slightly undulating. Elevations range from sea level to 70 feet. The coastline is irregular and approximately 100 miles long. It is indented by tidal streams that provide natural outlets for drainage.

Charleston County is drained by the South Edisto, North Edisto, Stono, Ashley, Cooper, Wando, Wadmalaw, and Santee Rivers. These rivers and their tributaries form somewhat of a dendritic pattern and flow mainly in a southeastern direction. Natural interior drains are extensions of tidal streams because elevation increases only slightly with distance inland. These drains are broad and flat and are heavily vegetated. Channels on them are small or nonexistent, and extensive ponding occurs in lower areas.

The geology of the county is characteristic of the Atlantic Coastal Plain. Unconsolidated, water-layered deposits of sands and clays, 6 to 20 feet in thickness, are underlain by thick beds of soft marl. Fine-textured sediments in the tidal marshes are of recent origin. New deposits are being aided by the action of tidal waters.

There are three distinct terrace formations in the county: the Recent, the Pamlico, and the Talbot (*3*).

The Recent terrace ranges from about sea level to 6 feet above and occurs along the coast and inland a few miles up major streams. The soils on it are primarily those of the Capers series and Tidal marsh lands.

The Pamlico terrace ranges from about 6 to 25 feet above sea level. It covers most of the county that is not covered by the Recent terrace.

The Talbot terrace ranges from about 25 to 42 feet above sea level. It occurs on the small panhandle southeast of Ladson, in some places in the western part of the county, and in a narrow strip running along the Berkeley County line from southwest of Wambaw Creek almost to the Wando River.

History of Crop Production

The first colonists settled in Charleston County in 1670 near the present city of Charleston. These were English to whom King Charles had granted the territory known as Carolina. Many French Huguenots joined the new settlers after the Edict of Nantes was revoked in 1685.

Potatoes, Indian corn, and tobacco were the earliest crops. Other products were ship timber, naval stores, and hides. A short-lived experimental farm to test crops that might be suitable to the New World was developed in 1671. Experiments with alfalfa, then known as lucerne, were unsuccessful because of the poorly drained acid soils.

Rice culture was begun in 1691 and reached its peak about 1863. It declined at the end of the Civil War and finally ended after the hurricanes of 1911. During the first 75 years, rice was grown on inland swamps. After that it was grown on bottom lands of the Edisto and Santee Rivers.

Silk culture was tried by the early settlers but found to be unprofitable. Cultivation of indigo began in 1741, aided by a parliamentary bounty of 6 pence per pound. Cultivation ceased when parliament withdrew the bounty after the Revolutionary War.

Culture of Sea Island long-staple cotton began in 1790 and ended in the 1920's because of the boll weevil. A shorter staple cotton replaced it. At present there are less than 40 acres of cotton in the county.

The growing of vegetables in the county began about 1900. Principal crops today are tomatoes, snap beans, cucumbers, cabbage, and Irish potatoes. Soybeans and corn are also grown and are considered important crops in the county.

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Glossary

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity. The capacity of a soil to hold water in a form available to plants. Amount of moisture held in soil between field capacity, or about one-third atmosphere of tension, and the wilting coefficient, or about 15 atmospheres of tension.

Base saturation. The degree to which material that has base-exchange properties is saturated with exchangeable cations other than hydrogen, expressed as a percentage of the cation-exchange capacity.

Calcareous soil. A soil containing enough lime or calcium carbonate (often with magnesium carbonate) to effervesce (fizz) visibly when treated with cold, dilute hydrochloric acid.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of clay on the surface of a soil aggregate. Synonyms: clay coat, clay skin.

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 and brittle; little affected by moistening.

Erosion. The wearing away of the land surface by wind (sandblast), running water, and other geological agents.

Fertility, soil. The quality of a soil that enables it to provide compounds, in adequate amounts and proper balance, for the growth of specified plants, when other growth factors, such as light, moisture, temperature, and the physical condition (or tilth) of the soil are favorable.

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic matter and clay but is rich in silt or very fine sand. The layer is seemingly cemented. When dry, it is hard or very hard and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Gleyed soil. A soil in which waterlogging and lack of oxygen have caused the material in one or more horizons to be neutral gray in color. The term "gleyed" is applied to soil horizons with yellow and gray mottling caused by intermittent waterlogging.

Horizon, soil. A layer of soil, approximately parallel to the surface that has distinct characteristics produced by soil-forming processes. These are the major horizons:
O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.
A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).
B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.
C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.
R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Infiltration. The downward entry of water into the immediate surface of soil, or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Leaching. The removal of soluble materials from soils or other materials by percolating water.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical mineralogical, and biological properties of the various horizons, and their thickness and arrangement in the soil profile.

Mottled. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicate poor aeration and lack of 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 these: *fine*, less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium*, ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse*, more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Munsell notation. A system for designating color by degrees of the three simple variable—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with a hue of 10YR, a value of 6, and a chroma of 4.

Natural soil drainage. Refers to the conditions of frequency and duration of periods of saturation or partial saturation that existed during the development of the soil, 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 different classes of natural soil drainage are recognized.
Excessively drained soils are commonly very porous and rapidly permeable and have a low water-holding capacity.
Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.
Well-drained soils are nearly free from mottling and are commonly of intermediate texture.
Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and the C horizons.
Somewhat poorly drained soils are wet for significant periods but not all the time, and in Podzolic soils commonly have mottlings below 6 to 16 inches in the lower A horizon and in the B and C horizons.
Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.
Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Nutrient, plant. Any element taken in by a plant that is essential to its growth and used by it in the production of food and tissue. Nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps other elements obtained from the soil, and carbon, hydrogen, and oxygen, obtained largely from the air and water, are plant nutrients.

Pan. A layer in a soil that is firmly compacted or very rich in clay. Frequently the word "pan" is combined with other words that more explicitly indicate the nature of the layers; for example, *hardpan, fragipan, claypan*, and *organic pan*.

Parent material. The disintegrated and partly weathered rock from which soil has formed.

Permeability. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid*, and *very rapid*.

Phase, soil. A subdivision of a soil, series, or other unit in the soil classification system made because of differences in the soil that affect its management but do not affect its classification in the natural landscape. A soil type, for example, may be divided into phases because of differences in slope, stoniness, thickness, or some other characteristic that affects its management but not its behavior in the natural landscape.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other dilutents that commonly shows as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to hardpan or to irregular aggregates on repeated wetting and drying, or it is the hardened relicts of the soft, red mottles. It is a form of the material that has been called laterite.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Saline soil. A soil that contains soluble salts in amounts that impair growth of plants but that does not contain excess exchangeable sodium.

Sand. Individual rock or mineral fragments in soils having diameters ranging from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Sequum. A sequence consisting of an eluvial horizon and the underlying illuvial horizon. If two sequa are present in a single soil profile (as in Edisto soils, for example), it is said to have a bisequum.

Series, soil. A group of soils developed from a particular type of parent material and having genetic horizons that, except for texture of the surface layer, are similar in differentiating characteristics and in arrangement in the profile.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes 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 other plant and animal life characteristic of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. 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 (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. Technically the part of the soil below the solum.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay*, and *clay*. The sand loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Type, soil. A subdivision of the soil series that is made on the basis of differences in the texture of the surface layer.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and the soil series to which the mapping unit belongs. In referring to a capability unit or a woodland suitability group, read the introduction to the section it is in for general information about its management. Lack of information in the "Woodland suitability group" column indicates the soil is not used as woodland. Other information is given in text and tables as follows:

Acreage and extent, table 1, p. 7.
Estimated yields, table 3, p. 43.
Use of soils for wildlife habitat, table 5, p. 48.
Engineering uses of the soils, tables 6 and 7, pp. 50 to 57 and table 8, pp. 60 to 65.

Map symbol	Mapping unit	Described on page	Capability unit Symbol	Capability unit Page	Woodland suitability group Number	Woodland suitability group Page
Bc	Bayboro sandy clay loam	8	VIw-1	39	1w3	44
Cf	Cape Fear loam	8	IIIw-2	35	1w3	44
Cg	Capers silty clay loam	9	Vw-4	38	---	--
Ch	Charleston loamy fine sand	9	IIw-2	33	1o1	44
Ck	Chastain soils	10	IVw-1	36	1w3	44
Cm	Chipley loamy fine sand	10	IIIw-1	34	3o1	45
Co	Coastal beaches and Dune land	11	VIIIs-1	40	---	--
Cr	Craven fine sandy loam	11	IIw-5	34	3o1	45
CvC	Crevasse-Dawhoo complex, rolling	12	VIIs-1	39	4s2	45
Da	Dawhoo and Rutlege loamy fine sands	12	Vw-2	37	2w3	45
DdA	Dunbar and Ardilla fine sandy loams, 0 to 2 percent slopes	14				
	Dunbar soil	--	IIw-2	33	2w2	44
	Ardilla soil	--	IIIw-6	36	2w2	44
Ed	Edisto loamy fine sand	15	IIw-3	34	1w2	44
FvB	Faceville fine sandy loam, 2 to 6 percent slopes	15	IIe-2	33	3o1	45
HoA	Hockley loamy fine sand, 0 to 2 percent slopes	16	IIw-2	33	3o1	45
HoB	Hockley loamy fine sand, 2 to 6 percent slopes	16	IIe-3	33	3o1	45
Ka	Kiawah loamy fine sand	17	IIIw-1	34	3w2	45
LaB	Lakeland sand, 0 to 6 percent slopes	17	IVs-1	37	4s2	45
Le	Leon fine sand	18	Vw-3	38	4w2	45
Ma	Made land	18	VIIs-2	40	---	--
Me	Meggett clay loam	19	VIw-1	39	1w3	44
Mg	Meggett loam	19	IIIw-2	35	1w3	44
Mp	Mine pits and dumps	19	VIIs-2	40	---	--
My	Myatt loam	20	IVw-1	36	2w3	45
NdA	Norfolk and Dothan soils, 0 to 2 percent slopes	20				
	Norfolk soil	--	I-1	33	3o1	45
	Dothan soil	--	IIw-2	33	3o1	45
OrA	Orangeburg loamy fine sand, 0 to 2 percent slopes	21	I-1	33	3o1	45
OrB	Orangeburg loamy fine sand, 2 to 6 percent slopes	21	IIe-3	33	3o1	45
Os	Osier fine sand	22	Vw-2	37	2w3	45
Pa	Pamlico muck	22	VIIw-2	39	---	--
Po	Portsmouth fine sandy loam	23	IIIw-4	35	1w3	44
Qu	Quitman loamy sand	23	IIw-2	33	3w2	45
Ra	Rains sandy loam	24	IIIw-4	35	1w3	44
Rg	Rutlege loamy fine sand	24	Vw-2	37	2w3	45
Rp	Rutlege-Pamlico complex	25				
	Rutlege soil	--	VIIw-2	39	2w3	45
	Pamlico soil	--	VIIw-2	39	---	--
Sa	St. Johns fine sand	25	Vw-3	38	4w3	45
Sc	Santee clay loam	26	VIw-1	39	1w3	44
Se	Santee loam	26	IIIw-2	35	1w3	44
Sf	Scranton loamy fine sand	26	IIIw-1	34	3w2	45
Sk	Seabrook loamy fine sand	27	IIIw-1	34	2o1	44
Sm	Seewee complex	28	IIIw-1	34	3w2	45
St	Stono fine sandy loam	28	IIw-3	34	1w3	44
Tf	Tidal marsh, firm	28	Vw-4	38	---	--
Ts	Tidal marsh, soft	28	VIIIw-2	40	---	--
Wa	Wadmalaw fine sandy loam	29	IIIw-2	35	1w3	44
WgB	Wagram loamy fine sand, 0 to 6 percent slopes	30	IIs-1	34	3s2	45
WnB	Wando loamy fine sand, 0 to 6 percent slopes	31	IVs-1	37	4s2	45
WoB	Wicksburg loamy fine sand, 0 to 6 percent slopes	31	IIe-3	33	4s2	45
Yo	Yonges loamy fine sand	32	IIw-3	34	1w2	44

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(1) mail: U.S. Department of Agriculture
Office of the Assistant Secretary for Civil Rights
1400 Independence Avenue, SW
Washington, D.C. 20250-9410;

(2) fax: (202) 690-7442; or

(3) email: program.intake@usda.gov.

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